Initial Application Part I

Recieved: 01/20/2022

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

Revised March 23, 2017

RECEIVED:	REVIEWER:	TYPE:	APP NO:

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: Apache Corporation **OGRID Number:** 873
Well Name: Northeast Drinkard Unit 617 **API:** 30-025-06580
Pool: Eunice; Blinebry-Tubb-Drinkard, North **Pool Code:** 22900

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

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

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

FOR OCD ONLY
☐ Notice Complete
☐ Application Content Complete

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

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

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

Brian Wood
Print or Type Name

Signature

1-20-22
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: XXX Secondary Recovery _____ Pressure Maintenance _____ Disposal _____ Storage
Application qualifies for administrative approval? XXX Yes _____ No

II. OPERATOR: APACHE CORPORATION

ADDRESS: 303 VETERANS AIRPARK LANE, SUITE 3000, MIDLAND, TX 79705

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: R-8541

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.

NORTHEAST DRINKARD UNIT 617
30-025-06580

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).

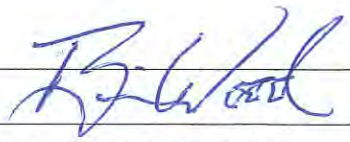
*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

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: BRIAN WOOD TITLE: CONSULTANT

SIGNATURE:  DATE: JAN. 19, 2022

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

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.

I. Goal is to deepen an oil well and convert it to a water injection well. The well is currently 6613' deep and producing from the Blinebry, Tubb, and Drinkard from 5696' to 6551'. Well will be deepened 137' to 6650', a liner run and cemented to GL, and will inject into the Drinkard from 6440' to 6627'.

The Drinkard is part of the Eunice; Blinebry-Tubb-Drinkard, North Pool (aka, Eunice; BLI-TU-DR, North and pool code = 22900). The well and zone are part of the Northeast Drinkard Unit (Unit #300160, Case 9231, Order R-8540) that was established in 1987 by Shell. The Unit was subsequently operated by Altura, and now, by Apache. It is an active water flood.

Note that the 1987 applicant in Case 9232, Order R-8541 transposed the location of the 617 with 615. ("615W" is used twice in the 1987 application. However, well location and well bore diagram match the 617. Order R-8541 has the 615 location and correct pre-Unit name.) Apache filed to deepen the 615 on December 8, 2021.

II. Operator: Apache Corporation (OGRID #873)
Operator phone number: (432) 818-1062
Operator address: 303 Veterans Airpark Lane, Suite 3000
Midland, TX 79705
Contact for Application: Brian Wood (Permits West, Inc.)
Phone: (505) 466-8120

III. A. (1) Lease: fee (Andrews)
Lease Size: 80 acres (see Exhibit A for C-102 and map)
Closest Lease Line: 660'
Lease Area: E2NW4 Section 14, T. 21 S., R. 37 E.
Unit Size: 4,938 acres
Closest Unit Line: 660'
Unit Area:

T. 21 S., R. 37 E.
Section 2: all
Section 3: all
Section 4: Lots 1, 8, 9, & 16
Section 10: all

Section 11: SW4
Section 14: NW4
Section 15, 22, & 23: all

A. (2) Surface casing (13.375", 48#, H-40) was set in 1952 at 201' in a 17.5" hole and cemented to GL with 250 sacks. Circulated 60 sacks.

Intermediate casing (8.625", 32#, H-40) was set at 2988' in a 12.25" hole and cemented to 375' (temperature survey) with 1800 sacks. Followed up with a top job of 220 sacks.

A 7.875" hole was drilled to 6613'. Production liner (5.5" O. D., 17#, J-55) was set from 2768' to 6546' and cemented with 300 sacks. Reversed out 200 sacks. Well was completed open hole in the Drinkard from 6546' to 6613'.

A 4.75" hole will be drilled to 6750'. A 4.5", 12.75#, L-80 EZGO FJ4 flush joint liner will be run to 6730' and cemented to GL with 275 sacks. Liners will be perforated from 6440' to 6627' in the Drinkard.

Mechanical integrity of the casing will be assured by hydraulically pressure testing to 500 psi for 30 minutes.

A. (3) Tubing specifications are 2.375", J-55, 4.7#, and internally plastic coated. Setting depth will be 6400'. (Top perforation will be 6440'.)

A. (4) A lock set injection packer will be set at 6392' (48' above the highest perforation of 6440').

B. (1) Injection zone will be the Drinkard. It is in the Eunice; Blinebry-Tubb-Drinkard, North Pool. Estimated fracture gradient is 0.56 psi per foot.

B. (2) Injection interval will be 6440' to 6627'. The well is now cased to 6546' and will be cased to 6675'.

B. (3) Well was originally drilled as a Drinkard oil well.

B. (4) Will perforate from 6440' to 6627'.

B. (5) Next higher oil or gas zone within the area of review is the Tubb at 6095' - 6439'. Injection interval will be 6440' - 6627'. Tubb is unitized with the Drinkard. Next lower oil or gas zone within the area of review is the Abo. Its estimated top is at 6700'.

IV. This is not a horizontal or vertical expansion of an existing injection project. The case file for the unit approval (R-8540) includes a discussion of the Drinkard water flood. The water flood (R-8541) was approved at the same time in 1987. Nineteen water flood expansions have been approved since then. Closest unit boundary is 660' south and 660' east. Five injection wells are within a half-mile radius (see Exhibit B).

V. Exhibit B shows and tabulates all 30 existing wells (24 producers + 5 injectors + 1 P&A) within a half-mile radius, regardless of depth. Exhibit C shows all 615 existing wells (438 oil or gas producing wells + 107 injection or disposal wells + 66 P & A wells + 3 waterflood supply wells + 1 brine supply well + 48 fresh water wells) within a two-mile radius.

Exhibit D shows and tabulates all leases (BLM, fee, and NMSLO) within a half-mile radius. Exhibit E shows all lessors (BLM, fee, and NMSLO) within a two-mile radius.

VI. Thirty existing wells are within a half-mile. Twenty-nine of the wells penetrated the Drinkard (top = 6440'). The 29 penetrators include 23 oil or gas wells, 5 water injectors, and 1 P&A well. Exhibit F tabulates the penetrators and diagrams the P&A well.

VII. 1. Average injection rate will be ≈750 bwpd. Maximum will be 1000 bwpd.

2. System will be closed. The well is tied into the existing Unit pipeline system. It consists of a branched pattern with centrifugal pumps.

3. Average injection pressure will be ≈1000 psi. Standard maximum injection pressure would be 1288 psi (= 0.2 psi/foot x 6440' (top perforation)). However, in accordance with IPI-185, Apache requests a maximum injection pressure of 1375 psi.

4. Water source will be water pumped from existing ≈4000' deep San Andres water supply wells plus produced water from the Blinebry, Tubb, and Drinkard zones. Source water and produced water are collected in separate skim tanks. The two water streams (source and produced) are commingled in a storage tank before being piped to injection wells. A comparison of analyses from the discharge pump and San Andres follows. Complete analyses are in Exhibit G.

	Injection Pump Discharge	San Andres 919-S
Anion/Cation Ratio	1.0	N/A
Barium	0.1 mg/l	0.38 mg/l
Bicarbonate	671.0 mg/l	562.0 mg/l
Calcium	1,099.0 mg/l	608.0 mg/l
Carbon Dioxide	80.0 ppm	80.0 ppm
Chloride	10,086.0 mg/l	6,200.0 mg/l
Hydrogen Sulfide	90.0 ppm	408.0 ppm
Iron	0.3 mg/l	0.0 mg/l
Magnesium	439.0 mg/l	244.0 mg/l
Manganese	N/A	0.01 mg/l
pH	7.5	6.49
Potassium	115.0 mg/l	N/A
Sodium	5,799.5 mg/l	3,909.0 mg/l
Strontium	28.0 mg/	19.0 mg/l
Sulfate	2,465.0 mg/l	1,750.0 mg/l
Total Dissolved Solids	20,702.9 mg/l	13,273.0 mg/l

5. Blinebry, Tubb, and Drinkard produce in the Unit. Project goal is to increase production.

VIII. The Unit is on the north end of a north-northwest to south-southeast trending anticline. It is part of the Penrose Skelly trend and parallels the west edge of the Central Basin Platform. Dips are ≈1˚ to ≈2˚. Core data summary shows:

	Blinebry	Tubb	Drinkard
Porosity (%)	9.79	8.28	11
Permeability (md)	2.45	1.19	2.45
Lithology	dolomite, packstone	sandy dolomite	limestone, packstone, grainstone

Adjacent to the Northeast Drinkard Unit are three other Drinkard water floods (Apache's West Blinebry Drinkard and East Blinebry Drinkard Units and Southwest Royalties' Central Drinkard Unit).

Notable depths are:

Quaternary = 0'
Rustler = 1275'
Yates = 2580'
Seven Rivers = 2820'
Queen = 3385'
Grayburg = 3725'
San Andres = 3970'
Glorieta = 5164'
Blinebry = 5625'
Tubb = 6095'
Drinkard = 6440'
injection interval = 6440' - 6627'
current TD = 6613'
proposed TD = 6650'
Abo = 6700'

State Engineer records (Exhibit H) show four water wells are ≥6633' deep and within 1.22 to 1.95 miles. All four were oil wells that were plugged back to produce

from the San Andres for water floods. San Andres water had a TDS of 13,273 in NEDU 919S (Exhibit H). Excluding those four wells, then the deepest water well within 2-miles is 198'. NEDU 617 is 1.8 miles south of the Ogallala aquifer and >10 miles northeast of the Capitan Reef. No existing underground drinking water source is below the Drinkard within a mile radius. Produced water has been disposed into two zones (Grayburg, San Andres) above the Drinkard within T. 21 S., R. 37 E. via eight SWD wells. Over 195,658,607 barrels of water have been injected in the Northeast Drinkard Unit to date.

IX. The well will be stimulated with acid to clean out scale or fill.

X. A SP-resistivity log is on file with NMOCD.

XI. Sample analyses from a water well are in Exhibit I. The water well is not in the State Engineer's records. The water well is 1.05 miles northeast in Section 12 and is equipped with an electric pump. It was the only active water well within 2 miles that was found during October 6 and 21, 2021 field inspections. Four water wells within 1.2 miles were found, but all were dry.

XII. Apache (Exhibit J) is not aware of any geologic or engineering data that may indicate the Drinkard is in hydrologic connection with any underground source of water. There are 144 active Drinkard injectors in New Mexico. Previously approved Unit water flood expansions are WFX-583, -624, -674, -722, -740, -752, -759, -774, -784, -881, -882, -896, -906, -907, -910, -911, -971, -975, and -1045.

XIII. A legal ad (see Exhibit K) was published on December 23, 2021. Notice (this application) has been sent (Exhibit L) to the surface owner (J. A. Bryant), lessees of record (Chevron USA, J R Cone, Occidental Permian, Southwest Royalties), government lessors (BLM, NMSLO), and all other well operators (J R Cone, Southwest Royalties) within the ½ mile area of review.

EXHIBIT G

Baker Petrolite

from WFX-784

South Permian Basin Region
10520 West I-20 East
Odessa, TX 79765
(915) 498-9191
Lab Team Leader - Sheila Hernandez
(915) 495-7240

Water Analysis Report by Baker Petrolite

Company:	APACHE CORPORATION	Sales RDT:	33102
Region:	PERMIAN BASIN	Account Manager:	MIKE EDWARDS (505) 910-9517
Area:	EUNICE, NM	Sample #:	223099
Lease/Platform:	NORTHEAST DRINKARD UNIT	Analysis ID #:	28971
Entity (or well #):	WATER INJECTION STATION	Analysis Cost	$40.00
Formation:	UNKNOWN		
Sample Point:	INJECTION PUMP DISCHARGE		

Summary	
Sampling Date:	10/3/02
Analysis Date:	10/4/02
Analyst:	SHEILA HERNANDE
TDS (mg/l or g/m3):	20702.9
Density (g/cm3, tonne/m3):	1.015
Anion/Cation Ratio:	1.000000
Carbon Dioxide:	60 PPM
Oxygen:	
Comments:	

Analysis of Sample 223099 @ 75 °F

Anions	mg/l	meq/l
Chloride:	10086.0	284.49
Bicarbonate:	671.0	11.
Carbonate:	0.0	0.
Sulfate	2465.0	51.32
Phosphate:		
Borate:		
Silicate:		
Hydrogen Sulfide:		90 PPM
pH at time of sampling:		7.5
pH at time of analysis:		
pH used in Calculation:		7.5

Cations	mg/l	meq/l
Sodium:	5799.5	252.26
Magnesium:	439.0	36.11
Calcium:	1099.0	54.84
Strontium:	28.0	0.64
Barium:	0.1	0.
Iron:	0.3	0.01
Potassium:	115.0	2.94
Aluminum:		
Chromium:		
Copper:		
Lead:		
Manganese:		
Nickel:		

Conditions		Values Calculated at the Given Conditions - Amounts of Scale in lb/1000 bbl										
Temp	Gauge Press.	Calcite $CaCO_3$		Gypsum $CaSO_4 \cdot 2H_2O$		Anhydrite $CaSO_4$		Celestite $SrSO_4$		Barite $BaSO_4$		CO_2 Press
°F	psi	Index	Amount	Index	Amount	Index	Amount	Index	Amount	Index	Amount	psi
80	0	1.18	75.54	-0.08	0.00	-0.14	0.00	0.07	2.75	0.75	0.00	0.21
100	0	1.25	85.15	-0.09	0.00	-0.09	0.00	0.07	3.09	0.60	0.00	0.3
120	0	1.33	95.11	-0.10	0.00	-0.02	0.00	0.09	3.78	0.47	0.00	0.42
140	0	1.41	105.41	-0.10	0.00	0.08	128.07	0.11	4.46	0.36	0.00	0.56

Note 1: When assessing the severity of the scale problem, both the saturation index (SI) and amount of scale must be considered.

Note 2: Precipitation of each scale is considered separately. Total scale will be less than the sum of the amounts of the five scales.

Note 3: The reported CO2 pressure is actually the calculated CO2 fugacity. It is usually nearly the same as the CO2 partial pressure.

UNICHEM

A Division of BJ Services Company

EXHIBIT G

Lab Test No. 23748

Apache

Sample Date : 3/10/99

Water Analysis

Listed below please find water analysis report from : NEDU #919-S

WFX-774 application indicates this is San Andres source water

Specific Gravity :		1.009
Total Dissolved Solids :		13273
pH :		6.49
Conductivity (µmhos):		
Ionic Strength :		0.265

Cations:		mg/l
Calcium	(Ca++):	608
Magnesium	(Mg++):	244
Sodium	(Na+):	3909
Iron	(Fe++):	0.00
Dissolved Iron	(Fe++):	
Barium	(Ba++):	0.38
Strontium	(Sr):	19
Manganese	(Mn++):	0.01
Resistivity :		

Anions:		
Bicarbonate	(HCO3-):	562
Carbonate	(CO3--):	
Hydroxide	(OH-):	0
Sulfate	(SO4--):	1750
Chloride	(Cl-):	6200

Gases:		ppm		
Carbon Dioxide	(CO2):	80.00	Oxygen	(O2):
Hydrogen Sulfide	(H2S):	408.00		

Scale Index (positive value indicates scale tendency) a blank indicates some tests were not run

Temperature		CaCO3 SI	CaSO4 SI
86F	30.0C	-0.14	-17.28
104F	40.0C	0.09	-17.28
122F	50.0C	0.35	-17.28
140F	60.0C	0.57	-16.80
168F	70.0C	0.87	-15.02
176F	80.0C	1.20	-15.51

Comments :

cc: Jerry White
Jay Brown

P.O. Box 61427 • Midland, TX 79711 • 4312 S. County Rd 1298, Midland, TX 79765
Office: (915) 563-0241 • Fax: (915) 563 0243

EXHIBIT H

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	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
CP 01794 POD4		CP	LE	3	3	1	14	21S	37E	674662	3595126	515	28	19	9
CP 01794 POD1		CP	LE	3	3	1	14	21S	37E	674646	3595143	526	34	18	16
CP 01794 POD6		CP	LE	3	3	1	14	21S	37E	674624	3595194	541	104		
CP 01794 POD3		CP	LE	3	3	1	14	21S	37E	674623	3595163	545	34		
CP 01794 POD5		CP	LE	3	3	1	14	21S	37E	674606	3595176	561	30	22	8
CP 01794 POD2		CP	LE	3	3	1	14	21S	37E	674594	3595204	569	198		
CP 01185 POD2		CP	LE		1	3	14	21S	37E	674623	3594674	788	70		
CP 01185 POD1		CP	LE		1	3	14	21S	37E	674598	3594689	795	70		
CP 01185 POD4		CP	LE		1	3	14	21S	37E	674633	3594610	829	70		
CP 01110 POD1		CP	LE		1	3	14	21S	37E	674586	3594648	833	70		
CP 01110 POD2		CP	LE		1	3	14	21S	37E	674586	3594648	833	70		
CP 01110 POD3		CP	LE		1	3	14	21S	37E	674586	3594648	833	70		
CP 01110 POD4		CP	LE		1	3	14	21S	37E	674586	3594648	833	20		
CP 01110 POD5		CP	LE		1	3	14	21S	37E	674586	3594648	833	20		
CP 01574 POD2		CP	LE	1	3	3	14	21S	37E	674666	3594578	834	68	57	11
CP 01185 POD3		CP	LE		1	3	14	21S	37E	674592	3594620	849	70		
CP 01574 POD1		CP	LE	2	4	4	15	21S	37E	674559	3594598	888	68	57	11
CP 00235 POD2		CP	LE	1	2	1	23	21S	37E	675083	3594144*	1108	96	65	31
CP 00235 POD1		CP	LE	2	2	1	23	21S	37E	675283	3594144*	1112	81		
CP 00239 POD1		CP	LE	1	1	2	23	21S	37E	675485	3594152*	1144	89	61	28
CP 00235 POD6		CP	LE	2	1	1	23	21S	37E	674881	3594137*	1147	85	65	20
CP 00235 POD3		CP	LE	1	1	1	23	21S	37E	674681	3594137*	1212	90	61	29
CP 00562		CP	LE	1	2	2	23	21S	37E	675887	3594159*	1309	136	65	71
CP 00240 POD1		CP	LE	4	2	1	23	21S	37E	675283	3593944*	1311			
CP 00241 POD1		CP	LE	4	2	1	23	21S	37E	675283	3593944*	1311	79		
CP 00235 POD8		CP	LE	3	1	2	23	21S	37E	675485	3593952*	1337	94	58	36
CP 00236 POD1		CP	LE	3	1	2	23	21S	37E	675485	3593952*	1337	83		
CP 00235 POD7		CP	LE	3	1	1	23	21S	37E	674681	3593937*	1398	85	65	20

EXHIBIT H

CP 00235 POD5	CP	LE	1	4	1	23	21S	37E	675090	3593742*	1509	90	70	20
CP 00700	CP	LE			2	23	21S	37E	675794	3593851*	1535	75	65	10
CP 00235 POD10	CP	LE	1	3	2	23	21S	37E	675492	3593749*	1536	92	60	32
CP 00235 POD11	CP	LE	1	3	2	23	21S	37E	675492	3593749*	1536	97	60	37
CP 00237 POD1	CP	LE	1	3	2	23	21S	37E	675492	3593749*	1536	84		
CP 00134 POD1	CP	LE	1	1	1	24	21S	37E	676289	3594166*	1563	85		
CP 00235 POD4	CP	LE	1	3	1	23	21S	37E	674688	3593735*	1587	100	80	20
CP 00235 POD9	CP	LE	3	4	1	23	21S	37E	675090	3593542*	1709	94	58	36
CP 00238 POD1	CP	LE	3	3	2	23	21S	37E	675492	3593549*	1732	81		
CP 00137 POD1	CP	LE	2	2	1	13	21S	37E	676862	3595783*	1781	65		
CP 01575 POD2	CP	LE	2	2	1	22	21S	37E	673615	3594181	1879	35	35	0
CP 01141 POD4	CP	LE				15	21S	37E	673556	3594239	1897	45		
CP 01141 POD2	CP	LE				15	21S	37E	673543	3594250	1902	40		
CP 01141 POD3	CP	LE				15	21S	37E	673520	3594272	1910	40		
CP 01575 POD1	CP	LE	1	2	1	22	21S	37E	673544	3594204	1925	40	35	5
CP 00729 POD1	CP	LE	4	1	3	15	21S	37E	673259	3594711*	1977	8015		
CP 00731 POD1	CP	LE		2	1	22	21S	37E	673577	3594015*	2009	8130		
CP 00252 POD1	CP	LE	4	2	4	22	21S	37E	674493	3593125*	2227	106	78	28
CP 00732 POD1	CP	LE		4	1	22	21S	37E	673584	3593613*	2273	6633		
CP 00286 POD1	CP	LE	2	1	2	10	21S	37E	674019	3597338*	2380	70		
CP 00554	CP	LE		2	2	16	21S	37E	672744	3595610*	2444	80	70	10
CP 01222 POD3	CP	LE	2	4	4	23	21S	37E	676036	3592871	2534	60	48	12
CP 00881	CP	LE		4	4	22	21S	37E	674402	3592824*	2542	95	53	42
CP 00251 POD1	CP	LE	2	3	4	22	21S	37E	674099	3592915*	2565	103		
CP 01741 POD1	CP	LE	1	3	4	03	21S	37E	673895	3597759	2810	45		
CP 00017 POD1	CP	LE	2	1	2	27	21S	37E	674106	3592513*	2933	101		
CP 01636 POD3	CP	LE	2	2	1	27	21S	37E	673782	3592501	3075	96		
CP 00733 POD1	CP	LE		3	3	22	21S	37E	673196	3592801*	3140	7864		
CP 00285 POD1	CP	LE	3	1	2	27	21S	37E	673906	3592313*	3194	80		

Average Depth to Water: **55 feet**

Minimum Depth: **18 feet**

Maximum Depth: **80 feet**

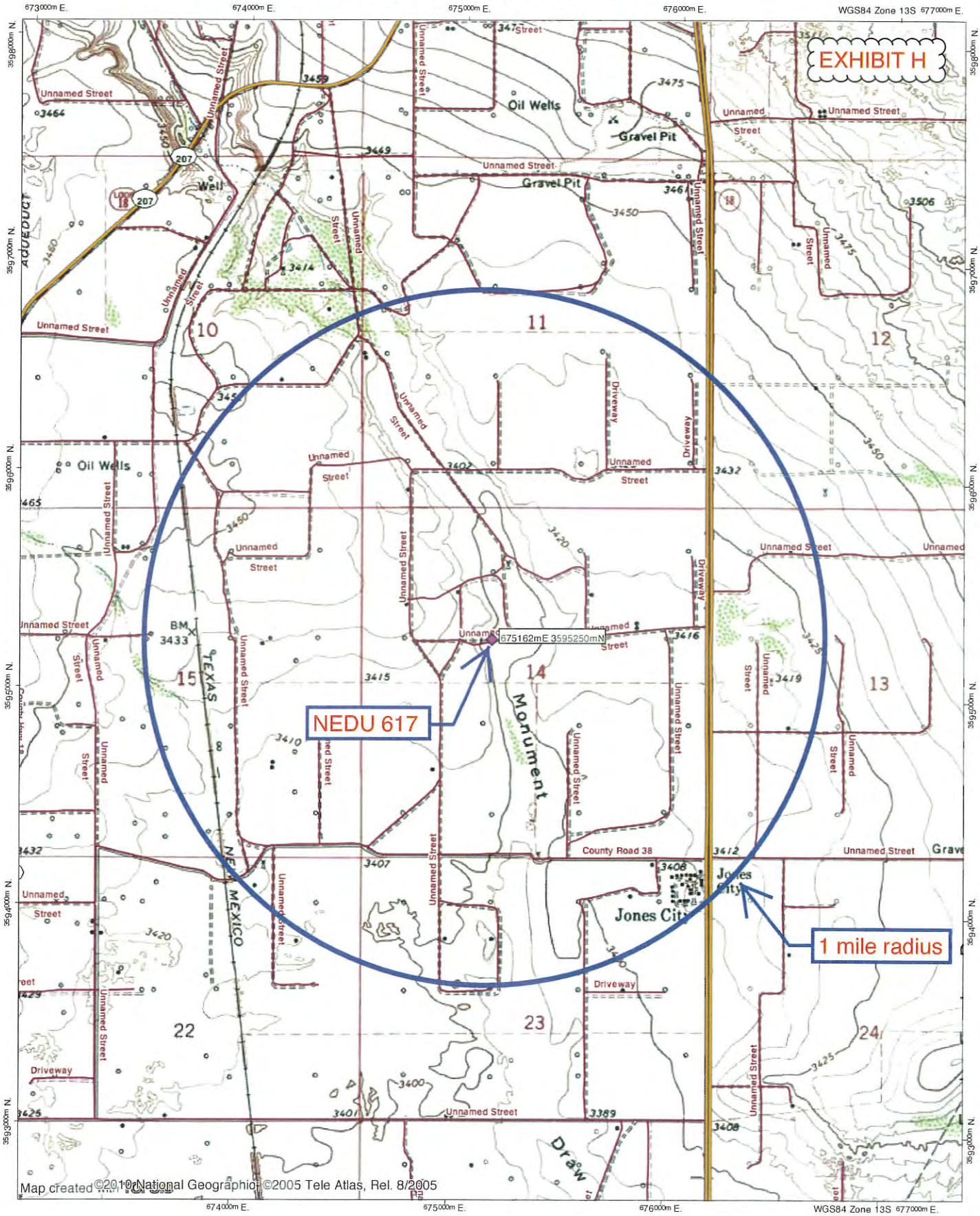
Record Count: 57

UTMNAD83 Radius Search (in meters):

Easting (X): 675162 **Northing (Y):** 3595250 **Radius:** 3220

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

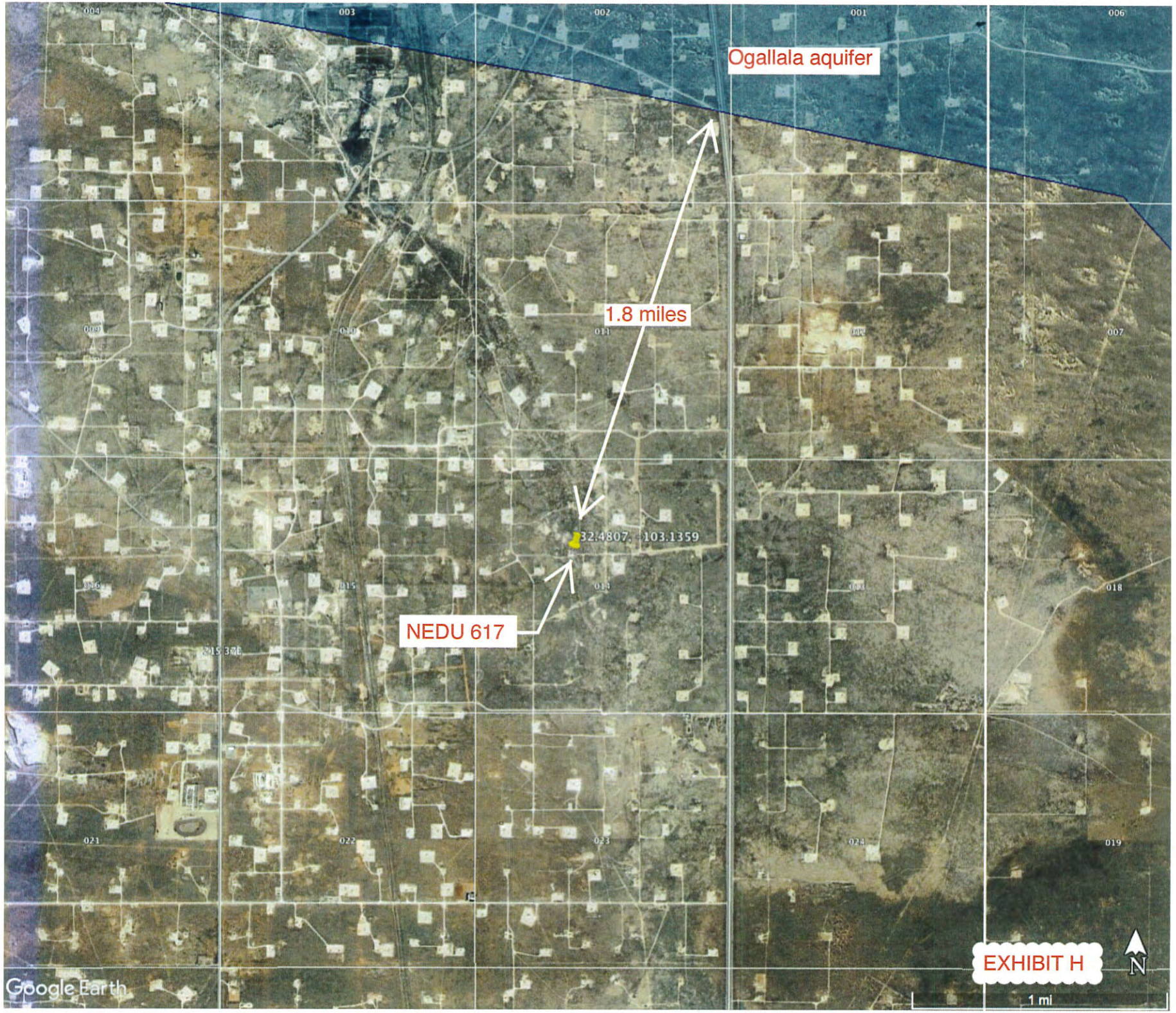
TOPO! map printed on 01/09/22 from "Untitled.tpo"



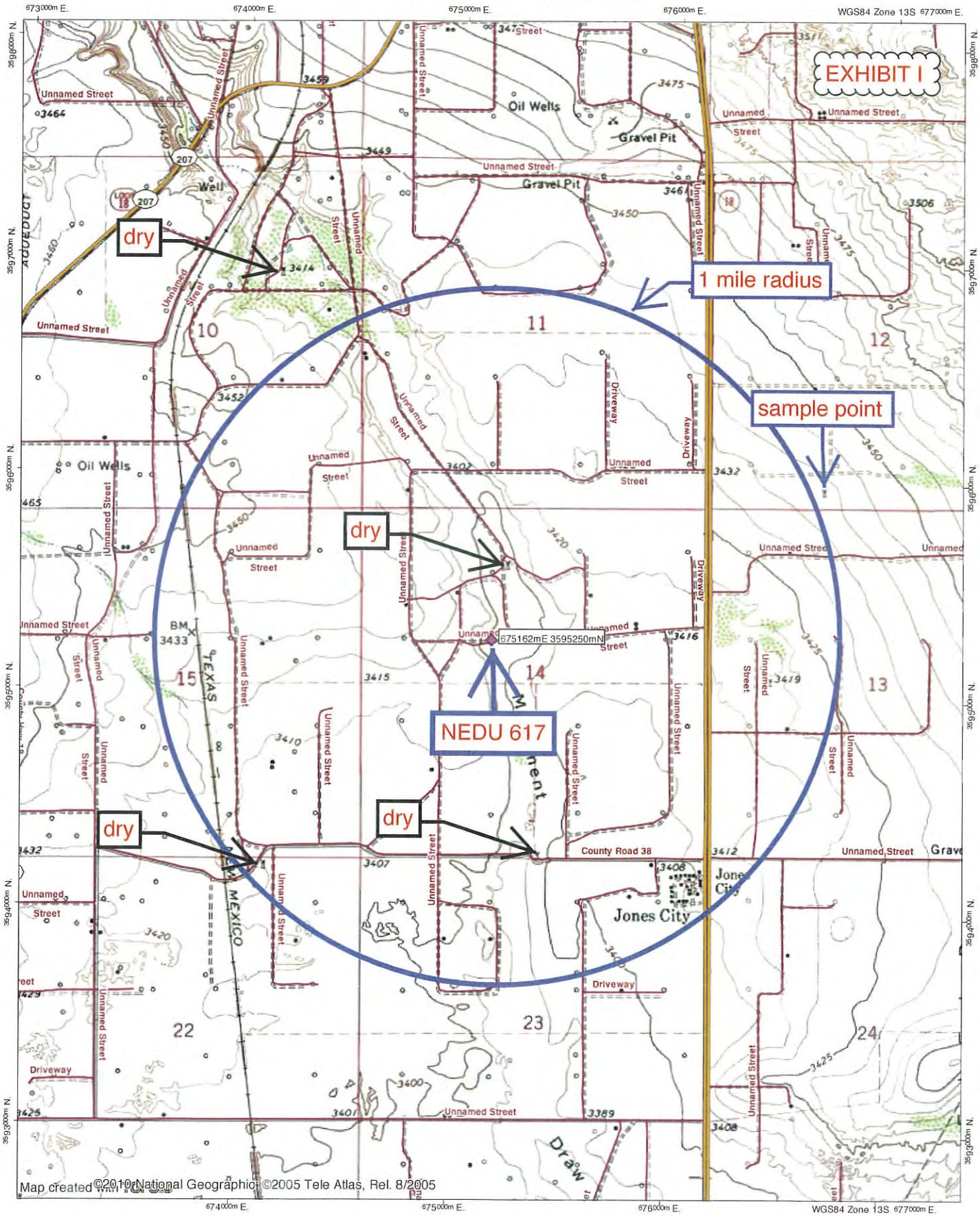
NATIONAL GEOGRAPHIC

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 6° 01/09/22


Ogallala aquifer
1.8 miles
32.4807, -103.1359
NEDU 617
EXHIBIT H
N
1 mi
Google Earth

TOPO! map printed on 01/09/22 from "Untitled.tpo"



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
6°
01/09/22

EXHIBIT I

Analytical Re

Lab Order **2110749**

Hall Environmental Analysis Laboratory, Inc.

Date Reported: **10/28/2021**

CLIENT: Permits West
Project: NEDV
Lab ID: 2110749-001 **Matrix:** AQUEOUS

Client Sample ID: Sec. 12
Collection Date: 10/14/2021 12:25:00 PM
Received Date: 10/15/2021 11:08:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 1664B						Analyst: **dms**	
N-Hexane Extractable Material	ND	9.77		mg/L	1	10/19/2021 3:05:00 PM	63347
EPA METHOD 300.0: ANIONS						Analyst: **JMT**	
Chloride	800	50	*	mg/L	100	10/15/2021 4:12:00 PM	R82122
SM2540C MOD: TOTAL DISSOLVED SOLIDS						Analyst: **KS**	
Total Dissolved Solids	2190	40.0	*D	mg/L	1	10/25/2021 10:31:00 AM	63460

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

EXHIBIT I

WO#: **2110749**

28-Oct-21

Client: Permits West

Project: NEDV

Sample ID: **MB-63347**	SampType: **MBLK**	TestCode: **EPA Method 1664B**
Client ID: **PBW**	Batch ID: **63347**	RunNo: **82169**
Prep Date: **10/18/2021**	Analysis Date: **10/19/2021**	SeqNo: **2911233** 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-63347**	SampType: **LCS**	TestCode: **EPA Method 1664B**
Client ID: **LCSW**	Batch ID: **63347**	RunNo: **82169**
Prep Date: **10/18/2021**	Analysis Date: **10/19/2021**	SeqNo: **2911235** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	38.0	10.0	40.00	0	95.0	78	114			

Sample ID: **LCSD-63347-2**	SampType: **LCSD**	TestCode: **EPA Method 1664B**
Client ID: **LCSS02**	Batch ID: **63347**	RunNo: **82169**
Prep Date: **10/18/2021**	Analysis Date: **10/19/2021**	SeqNo: **2911243** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	38.2	10.0	40.00	0	95.5	78	114	0.525	20	

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

EXHIBIT I

WO#: **2110749**

28-Oct-21

Client: Permits West

Project: NEDV

Sample ID: **MB**	SampType: **mblk**	TestCode: **EPA Method 300.0: Anions**
Client ID: **PBW**	Batch ID: **R82122**	RunNo: **82122**
Prep Date:	Analysis Date: **10/15/2021**	SeqNo: **2909242** 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: **R82122**	RunNo: **82122**
Prep Date:	Analysis Date: **10/15/2021**	SeqNo: **2909243** 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	97.5	90	110			

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

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

EXHIBIT I

WO#: **2110749**

28-Oct-21

Client: Permits West

Project: NEDV

Sample ID: **MB-63460**	SampType: **MBLK**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **PBW**	Batch ID: **63460**	RunNo: **82301**
Prep Date: **10/21/2021**	Analysis Date: **10/25/2021**	SeqNo: **2918092** 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-63460**	SampType: **LCS**	TestCode: **SM2540C MOD: Total Dissolved Solids**
Client ID: **LCSW**	Batch ID: **63460**	RunNo: **82301**
Prep Date: **10/21/2021**	Analysis Date: **10/25/2021**	SeqNo: **2918093** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	1030	20.0	1000	0	103	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


empty meter box
Water well in SENE Section 10.
EXHIBIT I


EXHIBIT I
missing vanes
no rod
Windmill in NENW Section 14.

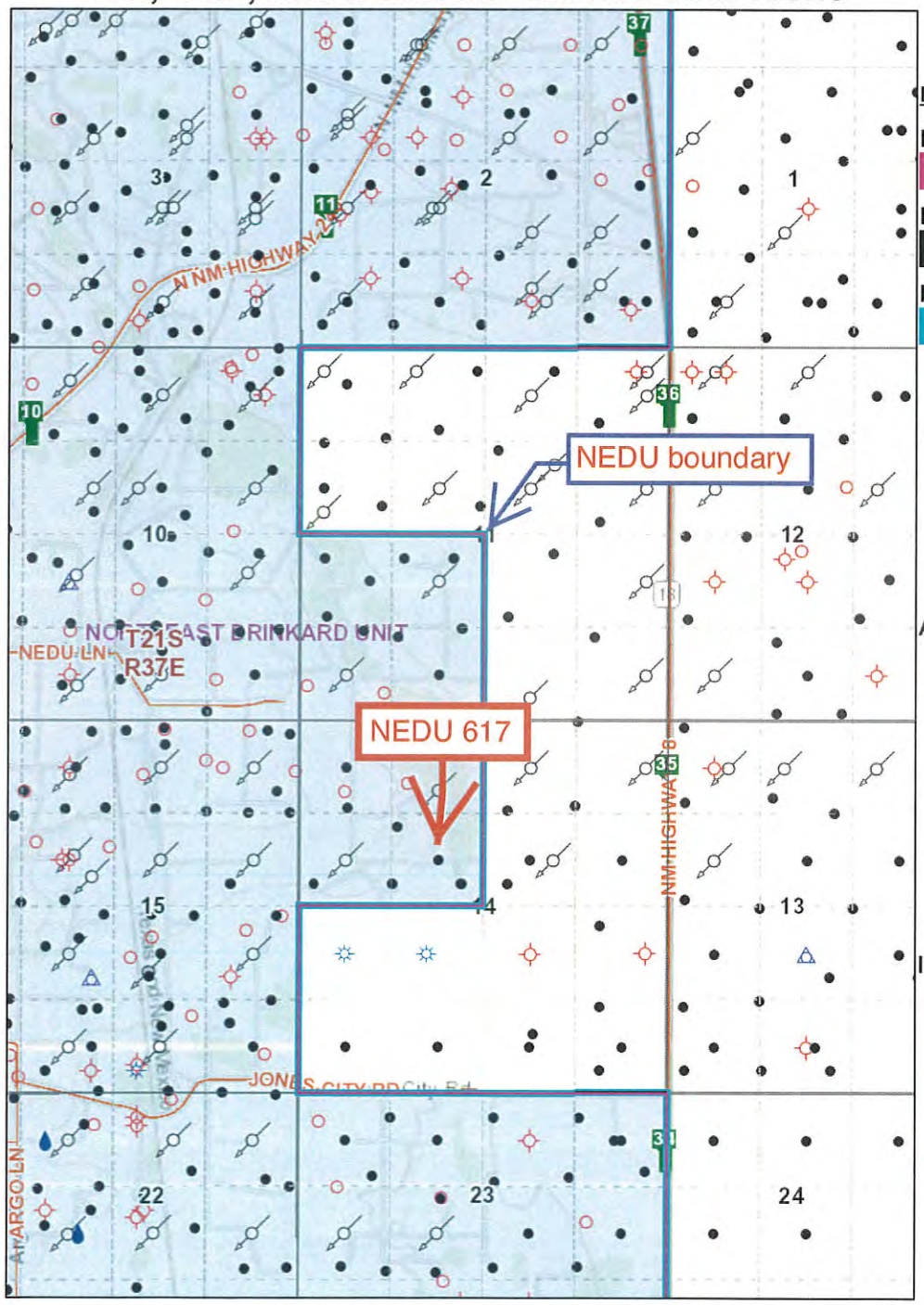

Capped well in SWSE Section 14.
EXHIBIT I


Disconnected well in NWNE Section 15.
EXHIBIT I

New Mexico State Land Office

EXHIBIT A

Oil, Gas, and Minerals Leases and Wells



Legend

polygonLayer
Override 1

polygonLayer
Override 1

polygonLayer
Override 1

County Seats
State Boundary
County Boundaries
Townships
Sections
Subdivisions

Active Wells
Water Storage
Miscellaneous
Salt Water Disposal
Injection
Carbon Dioxide
Gas
Oil

Inactive Wells
Plugged / Dry / Abandoned
Cancelled / Not Drilled

Highway Mileposts
Detailed Roads
Unit Agreement Boundaries

0 0.25 0.5 1 mi

0 0.375 0.75 1.5 km

N

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.

Data pertaining to New Mexico State Trust Lands are provisional and subject to revision, and do not constitute an official record of title. Official records may be reviewed at the New Mexico State Land Office in Santa Fe, New Mexico.

Map Created: 11/13/2021

EXHIBIT A

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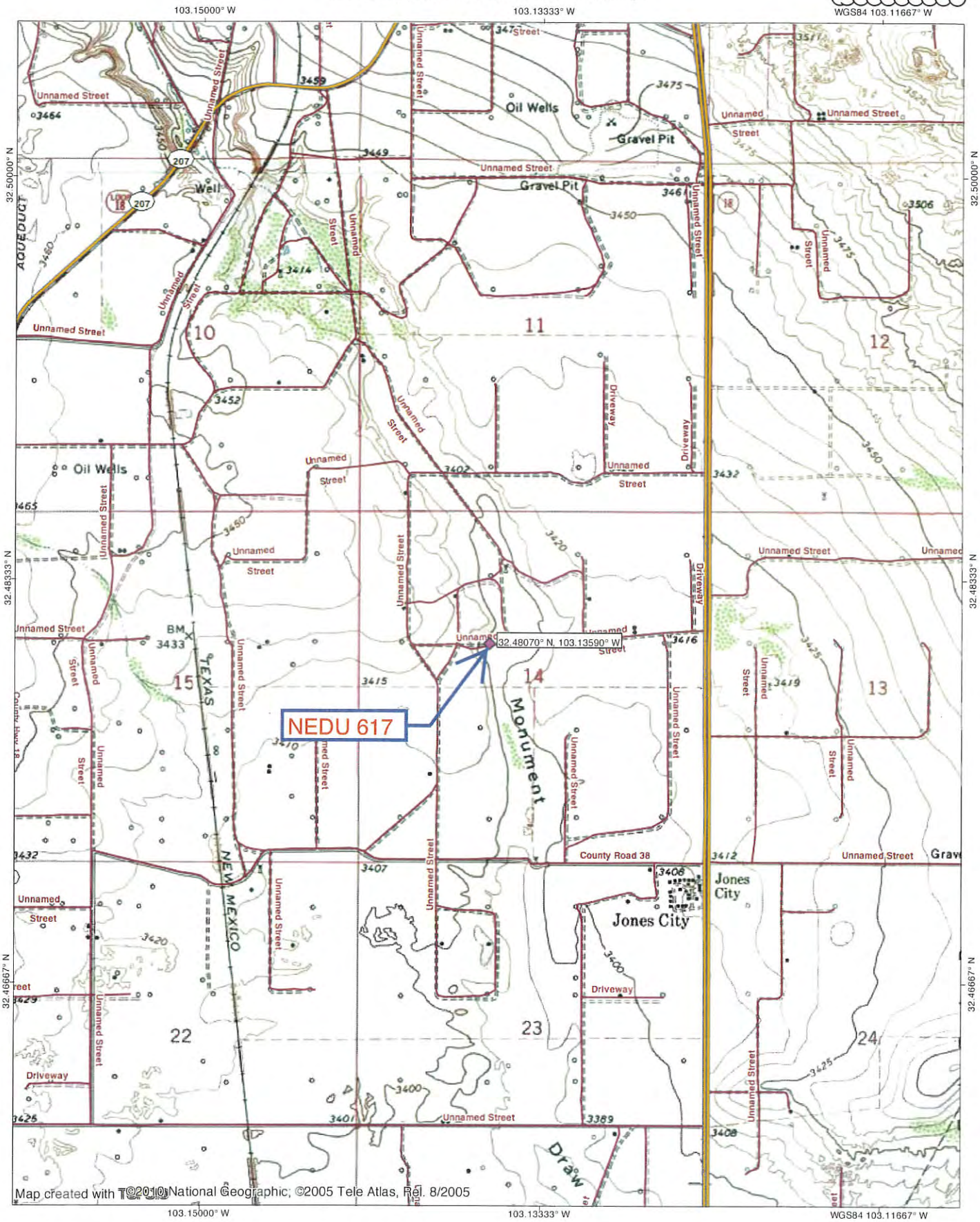

NATIONAL GEOGRAPHIC

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 6°

01/09/22

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U.S.
LAND OFFICE
TRANSPORTER OIL / GAS
PRORATION OFFICE
OPERATOR

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

SEE INSTRUCTIONS FOR COMPLETING THIS FORM ON THE REVERSE SIDE

FORM C-128
Revised 5/1/57

EXHIBIT A

SECTION A

Operator	Lease	Well No.
Shell Oil Company	Andrews	1

Unit Letter	Section	Township	Range	County
F	14	21S	37E	Lea

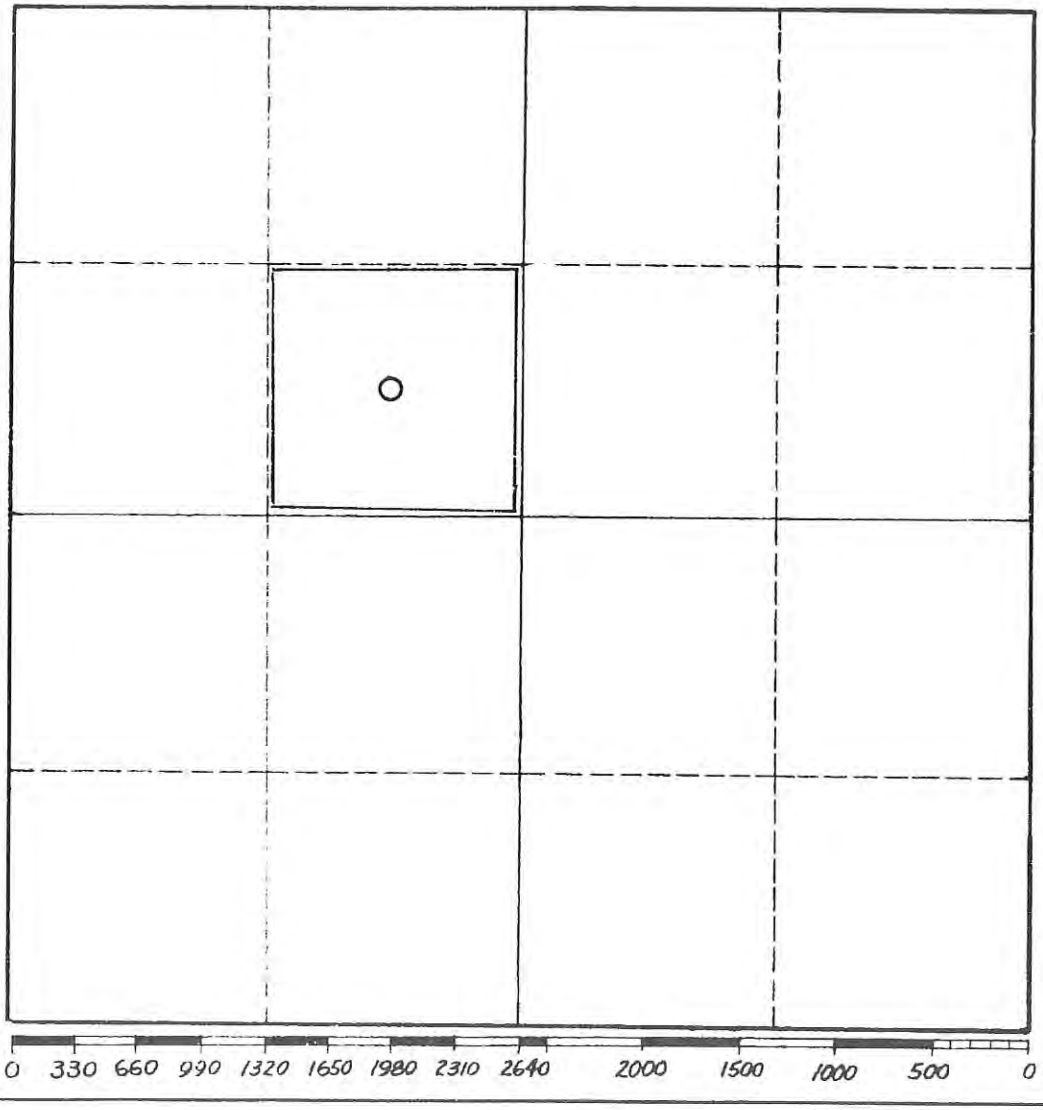
Actual Footage Location of Well:
1980 feet from the north line and 1980 feet from the west line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
3402'	Blinebry	Blinebry	40 Acres

1. Is the Operator the only owner in the dedicated acreage outlined on the plat below? YES X NO _____. *("Owner" means the person who has the right to drill into and to produce from any pool and to appropriate the production either for himself or for himself and another. (65-3-29 (e) NMSA 1935 Comp.)*
2. If the answer to question one is "no," have the interests of all the owners been consolidated by communitization agreement or otherwise? YES _____ NO _____. If answer is "yes," Type of Consolidation _____
3. If the answer to question two is "no," list all the owners and their respective interests below:

Owner	Land Description

SECTION B



CERTIFICATION

I hereby certify that the information in *SECTION A* above is true and complete to the best of my knowledge and belief.

Original Signed By
R. A. LOWERY

Name
R. A. Lowery

Position
District Exploitation Engineer

Company
Shell Oil Company

Date
October 15, 1962

I hereby certify that the well location shown on the plat in *SECTION B* 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 knowledge and belief.

Date Surveyed

Registered Professional Engineer and/or Land Surveyor

Certificate No.

Affidavit of Publication

EXHIBIT K

STATE OF NEW MEXICO
COUNTY OF LEA

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

Beginning with the issue dated
December 23, 2021
and ending with the issue dated
December 23, 2021.

LEGAL NOTICE
December 23, 2021

Apache Corporation is applying to deepen and convert its Northeast Drinkard Unit 617 oil well to a water injection well. The well is at 1980 FNL & 1980 FWL, Sec. 14, T. 21 S., R. 37 E., Lea County, NM. This is 3 miles NNE of Eunice, NM. Water will be injected at a maximum pressure of 1,375 psi into the Drinkard formation from 6,440' to 6,627'. Maximum injection rate will be 1,000 bwpd. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 or ocd.engineer@state.nm.us within 15 days. NMOCD Engineering Bureau phone is 505 476-3441. 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.
#37168

Publisher

Sworn and subscribed to before me this
23rd day of December 2021.

Business Manager

My commission expires
January 29, 2023
(Seal)

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

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

02108485 00261972

BRIAN WOOD
PERMITS WEST
37 VERANO LOOP
SANTA FE, NM 87508

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

EXHIBIT K

January 19, 2022

James Allan Bryant
8204 Indigo Court NE
Albuquerque NM 87112

TYPICAL NOTICE

Apache Corporation is planning (see attached application) to deepen its Northeast Drinkard Unit 617 oil well by 137' and convert it to aa water injection well. As required by NM Oil Conservation Division (NMOCD) Rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

Well Name: Northeast Drinkard Unit 617 (fee lease) proposed TD: 6650'
Proposed Injection Zone: Drinkard from 6440' to 6627'
Where: 1980' FNL & 1980' FWL Sec. 14, T. 21 S., R. 37 E., Lea County, NM
Approximate Location: 3 air miles north-northeast of Eunice, NM
Applicant Name: Apache Corporation (432) 818-1167
Applicant's Address: 303 Veterans Airpark Lane, #3000, Midland, TX 79705

Submittal Information: Application for a water injection 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. The NMOCD Enginering Bureau address is 1220 South St. Francis Dr. Santa Fe, NM 87505. Phone number is (505) 476-3441. E-mail address is: ocd.engineer@state.nm.us

Please call me if you have any questions.

Sincerely,

Brian Wood

EXHIBIT K

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
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City, State, ZIP+4®	Midland TX 79710
	Apache NEDU 617

0535 02

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Carlsbad, NM 88220

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☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	BLM
Street and Apt. No., or PO Box No.	620 E. Greene
City, State, ZIP+4®	Carlsbad NM 88220
	Apache NEDU 617

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Santa Fe, NM 87504

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	NMSLO
Street and Apt. No., or PO Box No.	P. O. Box 1148
City, State, ZIP+4®	Santa Fe NM 87504
	Apache NEDU 617

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Houston, TX 77210

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☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	Occidental Permian LTD
Street and Apt. No., or PO Box No.	P. O. Box 4294
City, State, ZIP+4®	Houston TX 77210
	Apache NEDU 617

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Albuquerque, NM 87122

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Extra Services & Fees (check box, add fee as appropriate)	$3.05
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	J. A. Bryant
Street and Apt. No., or PO Box No.	8204 Indigo Court NE
City, State, ZIP+4®	Albuquerque NM 87122
	Apache NEDU 617

0535 02

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

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Midland, TX 79706

Certified Mail Fee	$3.75
Extra Services & Fees (check box, add fee as appropriate)	$3.05
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	Chevron USA Inc
Street and Apt. No., or PO Box No.	6301 Deauville
City, State, ZIP+4®	Midland TX 79706
	Apache NEDU 617

0535 02

Postmark Here JAN 20 2022

01/20/2022

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

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OFFICIAL USE

7020 1810 0000 3948 6737

Lubbock, TX 79408

Certified Mail Fee	$3.75
Extra Services & Fees (check box, add fee as appropriate)	$3.05
☐ Return Receipt (hardcopy)	$0.00
☐ Return Receipt (electronic)	$0.00
☐ Certified Mail Restricted Delivery	$0.00
☐ Adult Signature Required	$0.00
☐ Adult Signature Restricted Delivery $	
Postage	$1.96
Total Postage and Fees	$8.76
Sent To	J. R. Cone Operating, LLC
Street and Apt. No., or PO Box No.	P. O. Box 10217
City, State, ZIP+4®	Lubbock TX 79408
	Apache NEDU 617

0535 02

Postmark Here JAN 20 2022

01/20/2022

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

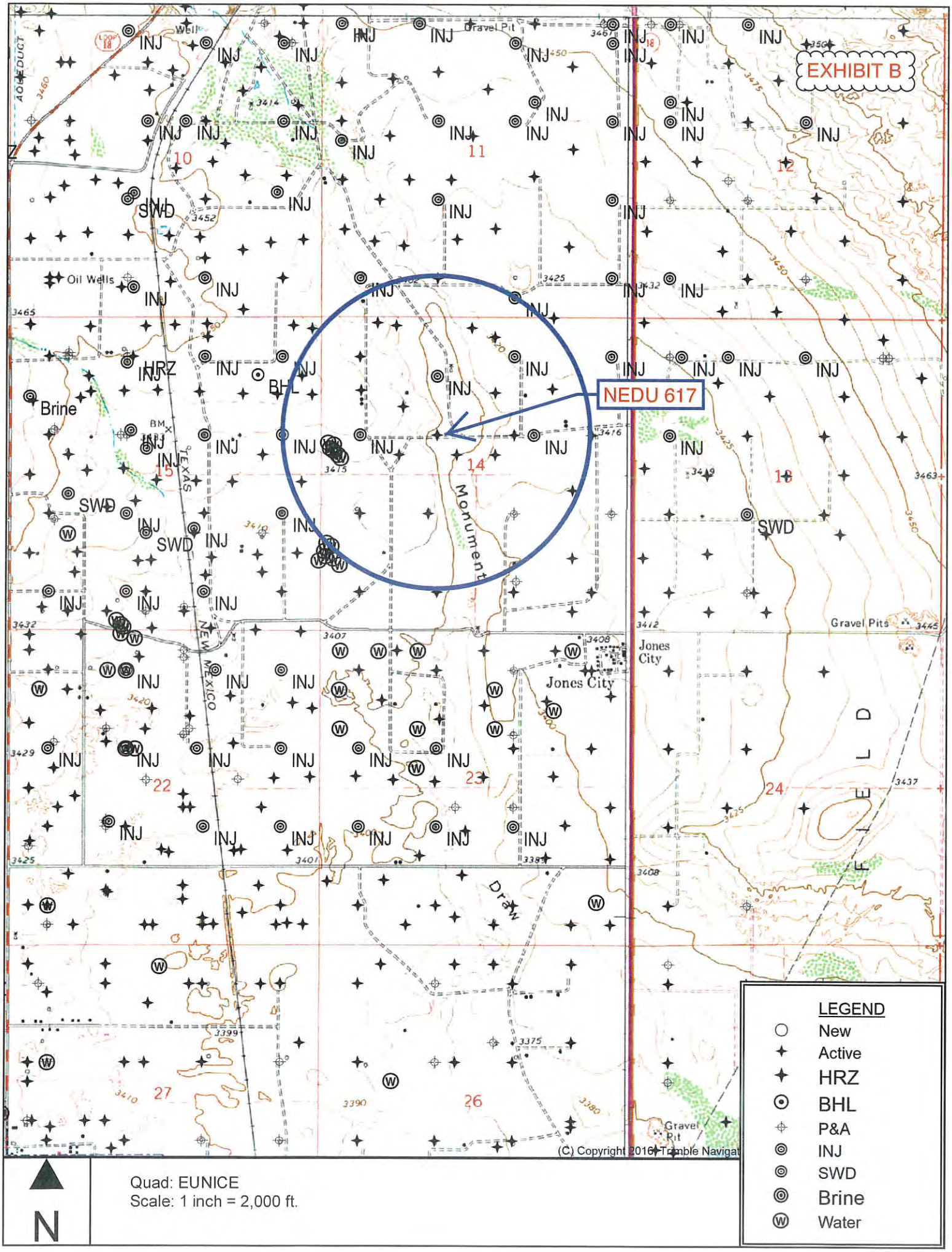


EXHIBIT B
NEDU 617
Jones City
Gravel Pits
Monument Draw
NEW MEXICO
TEXAS
Oil Wells
Brine
Gravel Pit
(C) Copyright 2016 Trimble Navigat
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Brine
Water
N
Quad: EUNICE
Scale: 1 inch = 2,000 ft.

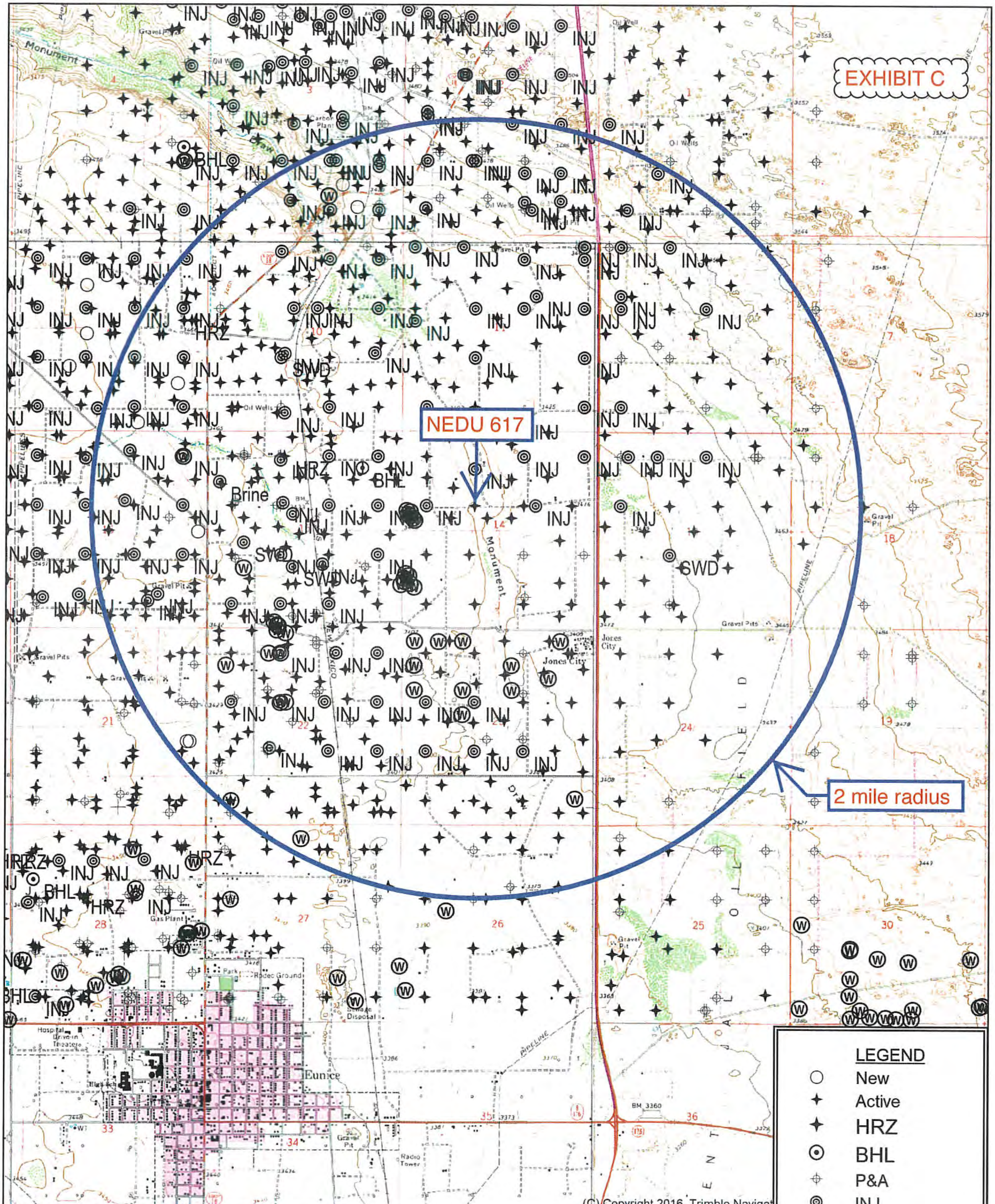
WELLS WITHIN 1/2 MILE RADIUS OF NEDU 617

API	OPERATOR	WELL	STATUS	UNIT-SECTION-T21S-R37E	TVD	ZONE @ TD	FEET FROM NEDU 617
3002537724	Apache	NEDU 630	O	F-14	6751	Abo	468
3002536804	Apache	NEDU 626	O	F-14	6850	Abo	732
3002534741	Apache	NEDU 621	O	F-14	6820	Abo	755
3002506581	Apache	NEDU 616	I	C-14	7743	Granite Wash	990
3002539275	Apache	EBDU 089	O	G-14	6905	Abo	1019
3002537729	Apache	NEDU 530	O	K-14	6900	Abo	1108
3002538113	Apache	EBDU 060	O	B-14	6875	Abo	1197
3002506582	Apache	EBDU 049	O	G-14	7573	Granite Wash	1295
3002506339	Apache	NEDU 615	I	E-14	6643	Drinkard	1327
3002506571	JR Cone	Eubanks 003	G	K-14	7525	granite	1329
3002541618	Apache	NEDU 635	O	D-14	6950	Abo	1507
3002506584	Apache	EBDU 051	I	G-14	5850	Blinebry	1627
3002537029	Apache	NEDU 627	O	E-14	6850	Abo	1809
3002506583	Apache	EBDU 050	I	B-14	6631	Drinkard	1849
3002506577	Chevron	Naomi Keenum 001	P&A	J-14	7325	Abo	1850
3002506569	JR Cone	Eubanks 002	G	L-14	6622	Drinkard	1871
3002506579	Apache	NEDU 614	O	D-14	7614	granite	1872
3002537249	Apache	NEDU 529	O	C-14	6875	Abo	1895
3002536810	Apache	EBDU 052	O	B-14	6850	Abo	1911
3002534740	Apache	NEDU 518	O	D-14	6860	Abo	1971

WELLS WITHIN 1/2 MILE RADIUS OF NEDU 617

API	OPERATOR	WELL	STATUS	UNIT-SECTION-T21S-R37E	TVD	ZONE @ TD	FEET FROM NEDU 617
3002539057	Apache	EBDU 081	O	B-14	6925	Abo	2097
3002541168	Apache	NEDU 565	O	D-14	6945	Abo	2146
3002534410	Apache	NEDU 619	O	A-15	6810	Abo	2251
3002539588	Apache	NEDU 634	O	I-15	7002	Abo	2452
3002538280	Apache	EBDU 061	O	I-14	6875	Abo	2473
3002536021	Chevron	State S 011	O	A-15	4010	San Andres	2524
3002506573	Apache	EBDU 043	O	H-14	6648	Drinkard	2622
3002506572	JR Cone	Eubanks 004	O	N-14	7350	Abo	2640
3002509919	Apache	NEDU 613	I	H-15	6641	Drinkard	2640
3002506533	Apache	NEDU 513	O	N-11	6711	Drinkard	2640
3002506478	*Apache*	*EBDU 017*	*I*	*O-11*	*7577*	*granite*	*2648*

EXHIBIT B

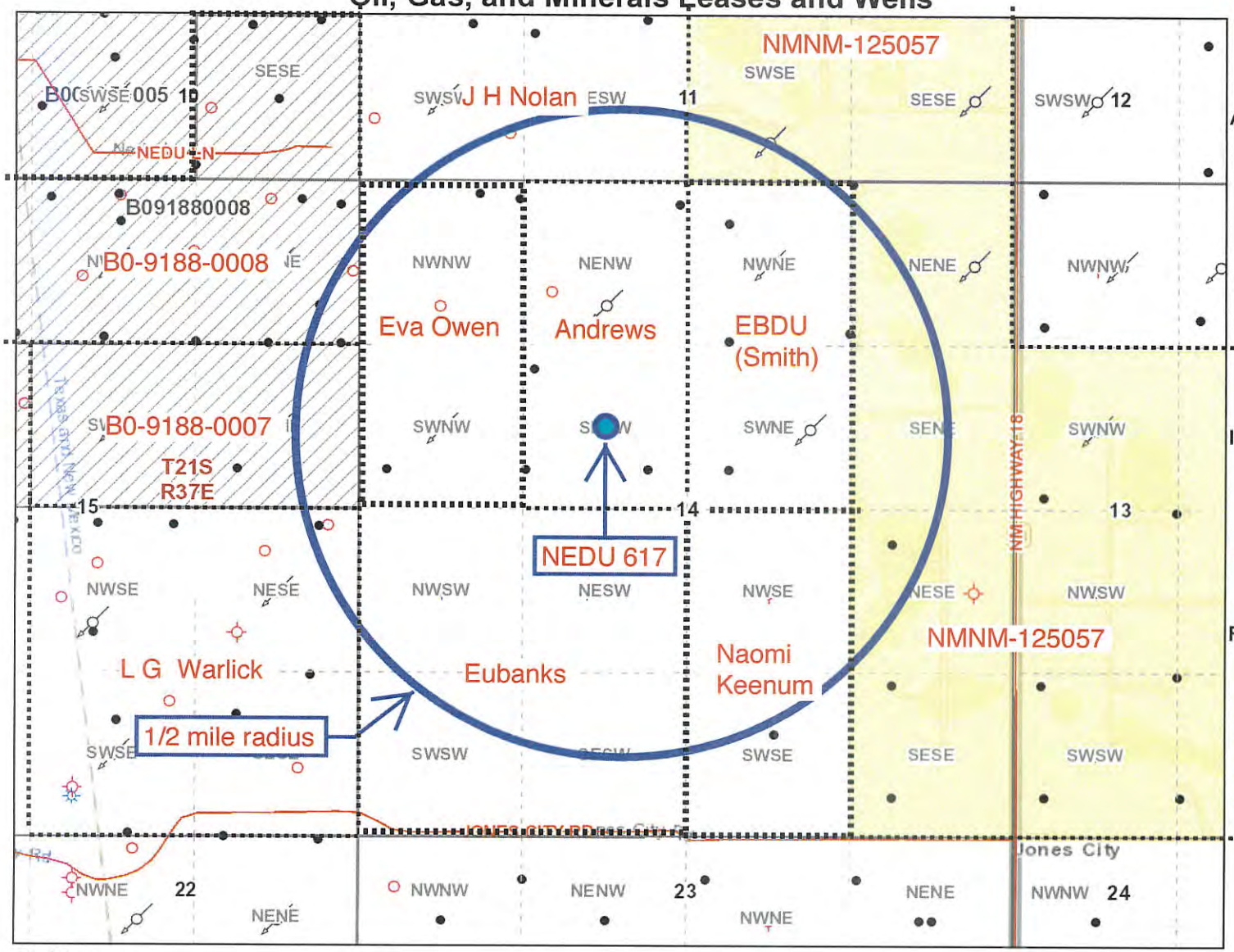


N

Quad: JAL
Scale: 1 inch = 3,333 ft.

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
- Detailed Roads
- Oil and Gas Leases

Federal Minerals Ownership

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

EXHIBIT D

Created: 11/25/2021

N

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

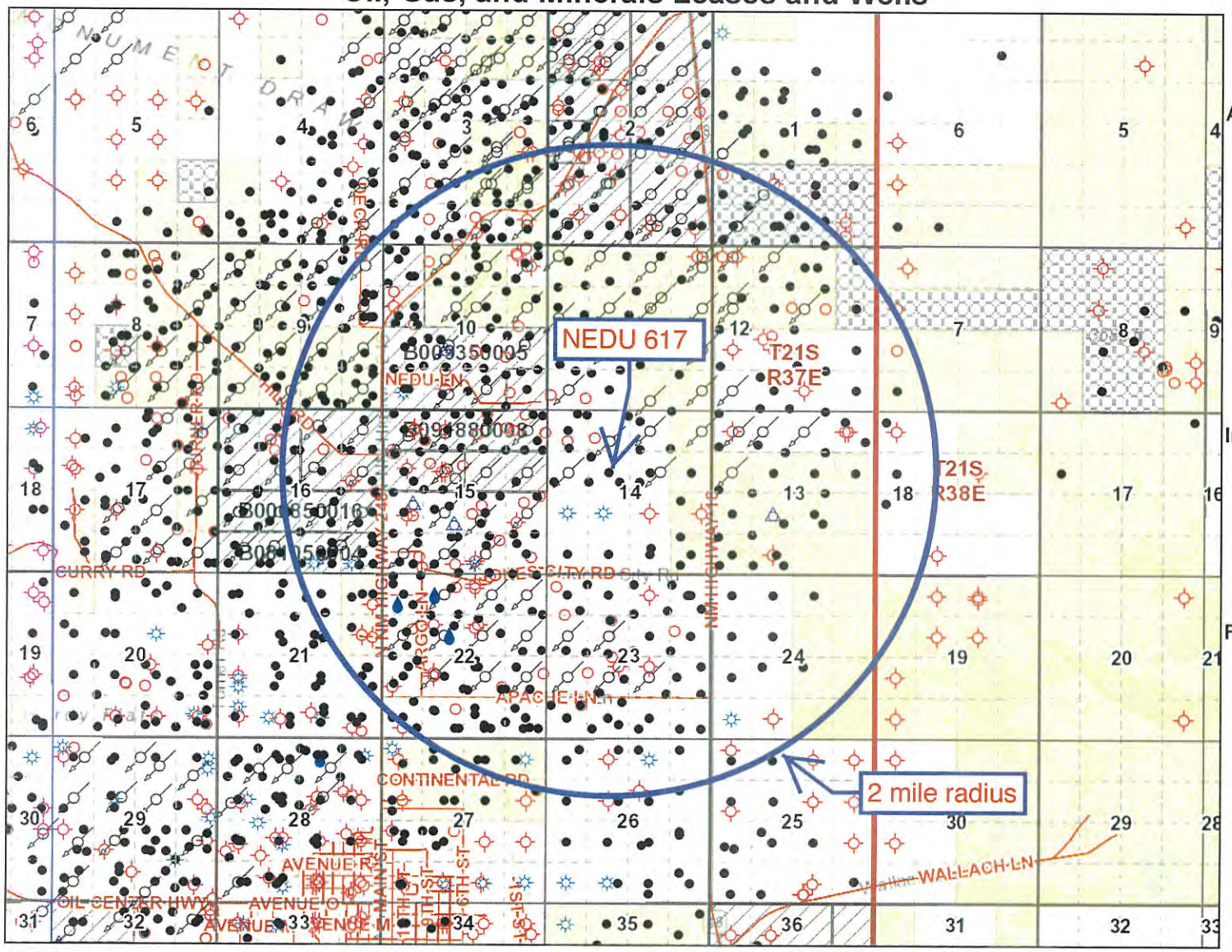
NEDU 615 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review (T. 21 S., R. 37 E.)	Lessor	Lease	Lessee(s) of Record	Well Operators (all zones)
SWSE Sec. 11	BLM	NMNM-125057	Apache	Apache
S2SW4 Sec. 11	fee	J H Nolan (NEDU)	Apache	Apache
E2NE4 & NESE Sec. 14	BLM	NMNM-125057	Apache	Apache
W2NE4 Sec. 14	fee	Smith (EBDU)	Apache	Apache
E2NW4 Sec. 14	fee	Andrews (NEDU)	Apache	Apache
W2NW4 Sec. 14	fee	Eva Owen	Apache	Apache
SW4 Sec. 14	fee	Eubanks	J R Cone	J R Cone
W2SE4 Sec. 14	fee	Naomi Keenum	Southwest Royalties	Southwest Royalties
NENE Sec. 15	NMSLO	B0-9188-0008 (NEDU)	Chevron USA	Apache, SW Royalties
SENE Sec. 15	NMSLO	B0-9188-0007 (NEDU)	Occidental Permian	Apache
NESE Sec. 15	fee	L G Warlick (NEDU)	Apache	Apache

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
- Detailed Roads
- Oil and Gas Leases

Federal Minerals Ownership

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

EXHIBIT E

Created: 11/25/2021

N

0 0.5 1 2 mi

0 1 2 4 km

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
NEDU 630	5/11/06	6751	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1288	500 sx	GL	Circ 70 sx
3002537724					7.875	5.5	6751	900 sx	150	CBL
F-14-21S-37E										
NEDU 626	10/29/04	6850	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1275	600 sx	GL	Circ 141 sx
30-025-36804					7.875	5.5	6850	1150 sx	137	CBL
F-14-21S-37E										
NEDU 621	6/16/00	6820	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1261	460 sx	GL	Circ 81 sx
30-025-34741					7.875	5.5	6820	1425 sx	GL	Circ 116 sx
F-14-21S-37E										
NEDU 616	11/13/52	7743	Eunice; Bli-Tu-Dr, N	I	17.25	13.375	222	250 sx	GL	Circ 50 sx
3002506581					11	8.625	3001	1800 sx	GL	Circ 400 sx
C-14-21S-37E					7.875	5.5	6940	250 sx	4985	Temp Survey

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
EBDU 089	8/23/09	6905	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1345	650 sx	GL	Circ
3002539275					7.875	5.5	6905	1150 sx	GL	Circ
G-14-21S-37E										
NEDU 530	4/24/06	6900	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1218	500 sx	GL	Circ 107 sx
3002537729					7.875	5.5	6900	1225 sx	186	CBL
K-11-21S-37E										
EBDU 060	5/5/07	6875	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1312	600 sx	GL	Circ
3002538113					7.875	5.5	6875	1100 sx	40	CBL
B-14-21S-37E										
EBDU 049	3/14/52	7573	Eunice; Bli-Tu-Dr, N	O	17.25	13.375	205	250 sx	GL	Circ 65 sx
3002506582					11	8.625	3000	2400 sx	GL	Circ
G-14-21S-37E					7.875	5.5	6808	300 sx	No report	No report

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
NEDU 615	8/17/49	6643	Eunice; Bli-Tu-Dr, N	I	17.25	13.375	164	125 sx	GL	Circ
30-025-06339					12.25	9.625	2736	600 sx	1414	Temp survey
E-14-21S-37E					8.75	7	6600	600 sx	3875	Temp survey
Eubanks 003	11/11/52	7525	Blinebry Oil and Gas (Oil) & Drinkard	G	17.5	13.375	249	200 sx	GL	Circ
3002506571					11	8.875	2857	1600 sx	GL	Circ
K-14-21S-37E					7.75	5.5	6842	600 sx	No report	No report
NEDU 635	2/28/14	6950	Eunice; Bli-Tu-Dr, N	O	11	8.625	1264	430 sx	GL	Circ 63 sx
30-025-41618					7.875	5.5	6953	1250 sx	GL	Circ 217 sx
D-14-21S-37E										
NEDU 627	1/23/05	6850	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1170	575 sx	GL	Circ 125 sx
30-025-37029					7.875	5.5	6850	1050 sx	200	Circ 125 sx
E-14-21S-37E										

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
EBDU 050	5/5/63	6631	Eunice;Bli-Tu-Dr, N	I	17.25	13.375	211	250 sx	GL	No report
3002506583					11	8.625	2987	2040 sx	GL	Circ 400 sx
B-14-21S-37E					7.875	5.5	6481	350 sx	4100	Temp Survey
Naomi Keenum 001	12/16/52	7325	Blinebry Oil and Gas (Oil) & Drinkard	P&A	17.25	12.75	200	250 sx	GL	Circ 25 sx
3002506577					11	8.625	2999	2025 sx	GL	Circ 24 sx
J-14-21S-37E					7.875	5.5	7325	695 sx	3098	Temp Survey
Eubanks 002	4/18/49	6622	Blinebry Oil and Gas (Oil) & Drinkard	G	16.75	13.375	242	200 sx	GL	Circ
30-025-06569					9.75	8.625	2791	1200 sx	No report	No report
L-14-21S-37E					7.75	5.5	6567	500 sx	3550	Estimated
NEDU 614	4/8/50	7614	Eunice; Bli-Tu-Dr, N	O	17.25	13.375	170	150 sx	GL	Circ
30-025-06579					11	8.625	2930	800 sx	1350	Temp survey
D-14-21S-37E					7.875	5.5	7608	875 sx	3152	Temp survey

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
NEDU 529	7/7/05	6875	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1198	575 sx	GL	Circ 128 sx
3002537249					7.875	5.5	6898	1300 sx	150	CBL
C-14-21S-37E										
EBDU 052	12/10/04	8001	Eunice;Bli-Tu-Dr, N	O	12.25	8.625	1274	575 sx	GL	Circ 121 sx
3002536810					7.875	5.5	6850	1100 sx	1290	Circ 151 sx to pit
B-14-21S-37E										
NEDU 518	6/1/00	6860	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1269	460 sx	GL	Circ 125 sx to pit
30-025-34740					7.875	5.5	6860	1400 sx	1290	No report
D-14-21S-37E										
EBDU 081	9/26/08	6925	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1375	700 sx	GL	Circ
3002539057					7.875	5.5	6925	1600 sx	114	CBL
B-14-21S-37E										

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
NEDU 565	9/8/13	6945	Eunice; Bli-Tu-Dr, N	O	11	8.625	1285	475 sx	GL	Circ 64 sx
30-025-41168					7.875	5.5	6955	1350 sx	136	CBL
D-14-21S-37E										
NEDU 619	6/18/98	6810	Eunice; Bli-Tu-Dr, N	O	11	8.625	1330	410 sx	GL	Circ 105 sx
30-025-34410					7.875	5.5	3810	1275 sx	GL	Circ 33 sx
A-15-21S-37E										
NEDU 634	12/22/09	7002	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1312	650 sx	GL	Circ
30-025-39588					7.875	5.5	7002	1150 sx	200	No report
I-15-21S-37E										
EBDU 061	4/26/07	6875	Eunice; Bli-Tu-Dr, N	O	12.25	8.625	1325	600 sx	GL	Circ
3002538280					7.875	5.5	6875	1050 sx	100	CBL
I-14-21S-37E										

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
EBDU 043	10/23/52	6648	Eunice; Bli-Tu-Dr, N	O	17.5	13.375	250	250 sx	GL	Circ
3002506573					12.25	9.625	3149	1570 sx	550	Temp Survey
H-14-21S-37E					8.75	7	6583	625 sx	3250	Temp Survey
Eubanks 004	10/30/59	7350	Blinebry	O	13.375	9.625	1319	300 sx	GL	Circ
3002506572					8.75	7	6883	700 sx	4180	Calc
N-14-21S-37E										
NEDU 513	5/12/55	6711	Eunice;Bli-Tu-Dr, N	O	13.75	10.75	254	250 sx	GL	Circ
3002506533					9.875	7.625	3049	1242 sx	700	No report
N-11-21S-37E					7.625	5.5	6479	467 sx	GL	Circ
3002506478					12.25	9.625	2996	2100 sx	GL	Circ
O-11-21S-37E					8.75	7	7576	861 sx	3380	Temp Survey

EXHIBIT F

DRINKARD PENETRATORS WITHIN 1/2 MILE OF NEDU 617

SORTED BY DISTANCE FROM NEDU 617

WELL	SPUD	TVD	POOL	WELL TYPE	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
EBDU 017	9/3/59	7577	Eunice;Bli-Tu-Dr, N	I	17.5	13.375	268	250 sx	GL	Circ
3002506478					12.25	9.625	2996	2100 sx	GL	Circ
O-11-21S-37E					8.75	7	7576	861 sx	3380	Temp Survey

Well: **Naomi Keenum** Field: **Blinebry/Drinkard** Reservoir: **Blinebry Oil & Gas/Drinkar**

Location:
1980' FS & 1980' EL
Section 14 Unit Letter J
Township: 21S
Range 37E
County Lea State: NM

Elevations:
GL: 3413'
KB: '12
DF: '

Well ID Info:
Chevno: FA7682
API No. 30-025-06577
L5/L6: UCU462200
WBS
Initial Compl. Date: 1/24/53

EXHIBIT F

spud 12-16-52
P&A 7-15-15

125 sx
GL - 1200'

Surf. Csg: 12 3/4", 50#, H-40
Set: @ 200' w/ 250 sks
Size Hole: 17 1/4"
Circ: Yes **TOC:** Surface
TOC By: Circulated

100 sx
1200' - 2091'

100 sx
2091'-3050'

Csg: 8 5/8", 28,32#, H-40, J-55
Set: @ 2999' w/ 2025 sks
Size Hole: 11"
Circ: Yes **TOC:** 3098
TOC By: Circulated

This wellbore diagram is based on the most recent information regarding wellbore configuration and equipment that could be found in the Midland Office well files and computer databases as of the update date below. Verify what is in the hole with the well file in the Eunice Field Office. Discuss w/ WEO Engineer, WO Rep, OS, ALS, & FS prior to rigging up on well regarding any hazards or unknown issues pertaining to the well.

25 sx
5049'-5289'

Perfs:	Status:
5721'- 5829'	Blinebry - Open

CMT @ 6465'
CIBP @ 6500'

6525-27'	Drinkard - open
6554-56'	Drinkard - open
6573-75'	Drinkard - open
6597-99'	Drinkard - open
6618-20'	Drinkard - open
6636-38'	Drinkard - open

Junk in the well @ 6627
CMT @ 6690'
CIBP @ 6700'

6850-6900'	Drinkard - abandoned
6920-6980'	Drinkard - abandoned
7000-7080'	Drinkard - abandoned
7110-7170'	Drinkard - abandoned

CMT @ 7179'
CIBP @ 7190'

7200-7300'	Drinkard - abandoned

Prod. Csg: 5 1/2", 17, 15.5, 14#, N-80,J-55,H-40
Set: @ 7325' w/ 695 sks
Size Hole: 7 7/8"
Circ: Yes **TOC:** Surface
TOC By: Circulated

COTD: 6627'
PBTD: 6690'
TD: 7325'

CMT @ 7315'

Side 1

INJECTION WELL DATA SHEET

OPERATOR: APACHE CORPORATION

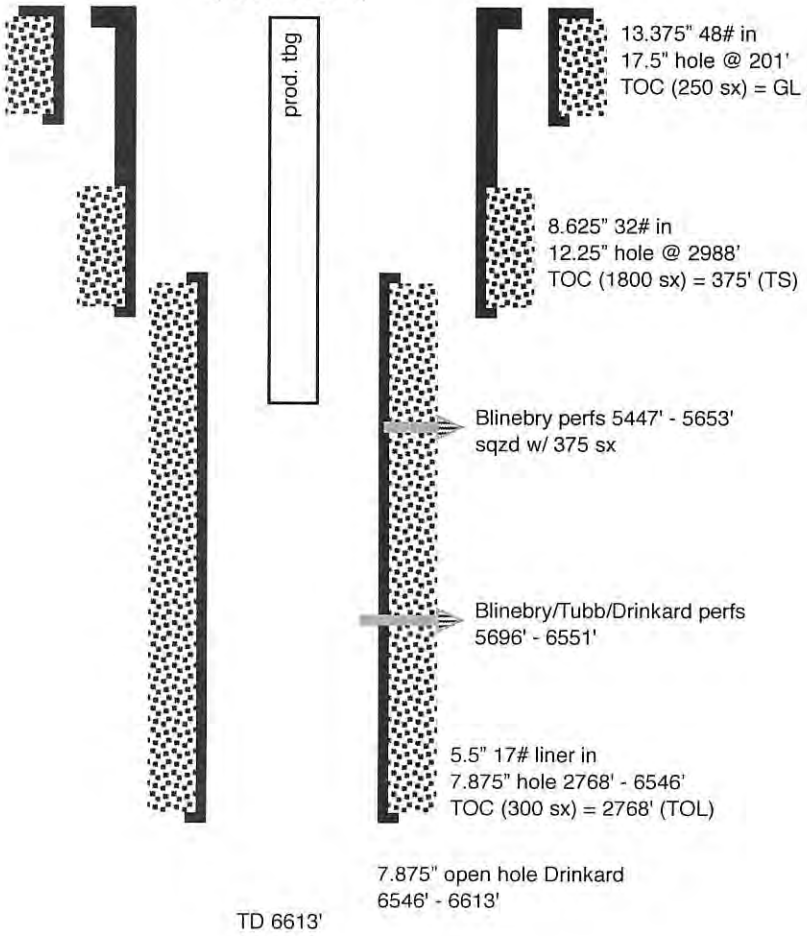
WELL NAME & NUMBER: NORTHEAST DRINKARD UNIT 617

WELL LOCATION:	1980' FNL & 1980' FWL	F	14	21 S	37 E
	FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC

"AS IS"

(not to scale)



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5" Casing Size: 13.375"

Cemented with: 250 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 60 SX

Intermediate Casing

Hole Size: 12.25" Casing Size: 8.625"

Cemented with: 2020 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC.

Production Casing

Hole Size: 7.875" Casing Size: 5.5"

Cemented with: 300 sx. *or* _____ ft³

Top of Cement: 2768' Method Determined: TOP LINER

Total Depth: now: 6613'; plan: 6650'

Injection Interval

6440 feet to 6627'

(Perforated or Open Hole; indicate which)

Side 1

INJECTION WELL DATA SHEET

OPERATOR: APACHE CORPORATION

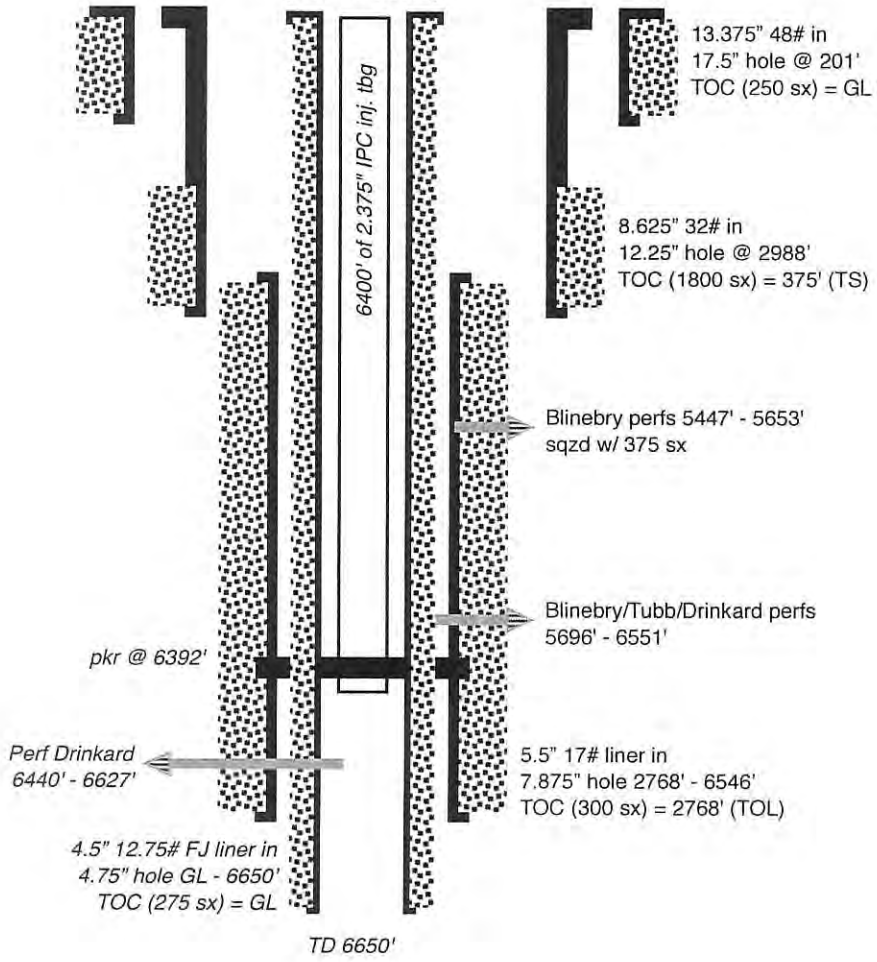
WELL NAME & NUMBER: NORTHEAST DRINKARD UNIT 617

WELL LOCATION:	1980' FNL & 1980' FWL	F	14	21 S	37 E
	FOOTAGE LOCATION	UNIT LETTER	SECTION	TOWNSHIP	RANGE

WELLBORE SCHEMATIC

"PROPOSED"

(not to scale)



WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17.5" Casing Size: 13.375"

Cemented with: 250 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC. 60 SX

Intermediate Casing

Hole Size: 12.25" Casing Size: 8.625"

Cemented with: 2020 sx. *or* _____ ft³

Top of Cement: SURFACE Method Determined: CIRC.

Production Casing

Hole Size: 7.875" Casing Size: 5.5"

Cemented with: 300 sx. *or* _____ ft³

Top of Cement: 2768' Method Determined: TOP LINER

Total Depth: now: 6613'; plan: 6650'

Injection Interval

6440 feet to 6627'

(Perforated or Open Hole; indicate which)

INJECTION WELL DATA SHEET

Tubing Size: 2-3/8" J-55 4.7# Lining Material: INTERNAL PLASTIC COAT

Type of Packer: LOCK SET INJECTION

Packer Setting Depth: ≈6392'

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

Additional Data

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

   If no, for what purpose was the well originally drilled? DRINKARD OIL WELL

2. Name of the Injection Formation: DRINKARD

3. Name of Field or Pool (if applicable): EUNICE; BLI-TU-DR, NORTH (POOL CODE 22900)

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. YES
   BLINEBRY PERFS: 5547'- 5653'; LATER SQUEEZED WITH 375 SX
   BLINEBRY/TUBB/DRINKARD PERFS: 5696' - 6595'
   DRINKARD OPEN HOLE: 6595' - 6613'

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

   OVER: GRAYBURG (3725'), SAN ANDRES (3970'), BLINEBRY (5625'), TUBB (6095')

   UNDER: ABO (6700')

EZGO™ Connection Data Sheet

Your Requirements

Pipe Size (OD): **4.5 in** | Weight: **12.75 lb/ft** | Grade: **L-80** | Connection: **EZGO™ FJ4**

Material	
Grade	L-80
Minimum Yield Strength	80,000 psi
Minimum Ultimate Strength	95,000 psi

Pipe Dimensions	
Nominal OD	4.5 in
Nominal ID	3.958 in
Nominal Wall Thickness	0.271 in
Nominal Weight	12.75lbs/ft
Plain End Weight	12.25 lbs/ft
Nominal Pipe Body Area	3.6 sq in

Pipe Body Performance	
Minimum Pipe Body Yield Strength	288,000 lbs
Minimum Collapse Pressure	7,500 psi
Minimum Internal Yield Pressure	8,430 psi
Hydrostatic Test Pressure	7,700 psi

Torque Values	
Minimum Final Torque	2,200 ft-lbs
Maximum Final Torque	3,000 ft-lbs

EZGO™ Connection Dimensions	
Connection OD	4.5 in
Connection ID	3.883 in
Connection Drift Diameter	3.833 in
Make-Up Loss	2.05 in
Joint Efficiency	52.5 %

EZGO™ Connection Performance	
Joint Strength	150,000 lbs
Compression Rating	90,000 lbs
Collapse Pressure Rating	3,000 psi
Internal Pressure Resistance	3,000 psi

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

EXHIBIT J

NM Oil Conservation Division
1220 S. St. Francis Dr.
Santa Fe, NM 87505

Re: Geology Statement
Apache Corporation
Northeast Drinkard Unit #617
Section 14, T. 21S, R. 37E
Lea County, New Mexico

To whom it may concern:

Publicly available geologic and engineering data related to the proposed well have been thoroughly reviewed, and no evidence for open faults or any other hydrologic connection between the proposed Drinkard injection zone and any underground sources of drinking water has been found. Please see the attached seismic risk assessment for additional information.

Sincerely,

Cory Walk

Cory Walk
Geologist

EXHIBIT J

Seismic Risk Assessment

Apache Corporation

Northeast Drinkard Unit #617

Section 14, Township 21 South, Range 37 East

Lea County, New Mexico

Cory Walk, M.S.

Cory Walk

Geologist

Permits West Inc.

December 15, 2021

EXHIBIT J

GENERAL INFORMATION

Northeast Drinkard Unit #617 is located in the NW ¼, section 14, T21S, R37E, about 3 miles north-northeast of Eunice, NM in the Central Basin Platform of the greater Permian Basin. Apache Corporation proposes to deepen and convert this existing oil well to a water injection well. The proposed injection zone is within the Drinkard member of the Yeso Formation through a cased hole from 6,440'-6,627' below ground surface. The Drinkard is primarily a carbonate reservoir. 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 injection site since 1970 (Fig 1). According to this dataset, the nearest historical earthquake occurred June 2, 2001 about 10.1 miles (~16.3 km) south and had a magnitude of 3.3.

Basement Faults and Subsurface Conditions

A structure contour map (Fig. 1) of the Precambrian basement shows the Northeast Drinkard Unit #617 is approximately 1.2 miles from the nearest basement-penetrating fault inferred by Ewing et al (1990) and about 63 miles from the nearest surface fault.

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 Northeast Drinkard Unit #617 site, Snee and Zoback indicate a **S_{Hmax} direction of N075°E and an A_φ of 0.81, indicating a normal/strike-slip faulting stress regime**.

Induced seismicity is a growing concern of deep injection wells. Snee and Zoback (2018) show that due to its orientation, the nearest Precambrian fault has a low probability of slipping (Fig. 2). Also, the proposed injection zone is much shallower in the Drinkard member of the Yeso Formation and therefore would not affect the deep Precambrian faults. In addition to the existing fault orientation, the vertical (approx. 1550') and horizontal (1.2 miles) separation between the proposed SWD injection zone and any deep Precambrian faults is large enough to infer that there is no immediate concern or potential of induced seismicity as a result from this injection well.

EXHIBIT J

GROUNDWATER SOURCES

Three principal aquifers are used for potable groundwater in southern Lea County; these geologic units include the Triassic Santa Rosa formation, Tertiary Ogallala formation, and Quaternary alluvium. 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 Northeast Drinkard Unit #617 well, the top of a thick anhydrite unit interpreted to represent the Rustler Formation lies at a depth of ~1285 feet bgs.

STRATIGRAPHY

A thick permeability barrier (Rustler Anhydrite and Salado Fm; 1500+ ft thick) exists above the targeted Drinkard injection zone. Well data indicates ~5,155 ft of rock separating the top of the injection zone from the previously stated lower limit of potable water at the top of the Rustler anhydrite formation.

CONCLUDING STATEMENT

All available geologic and engineering data evaluated around the Northeast Drinkard Unit #617 well show no potential structural or stratigraphic connection between the Drinkard injection zone and any subsurface potable water sources. The shallow injection zone, spatial location and orientation of nearby faults also removes any major concern of inducing seismic activity.

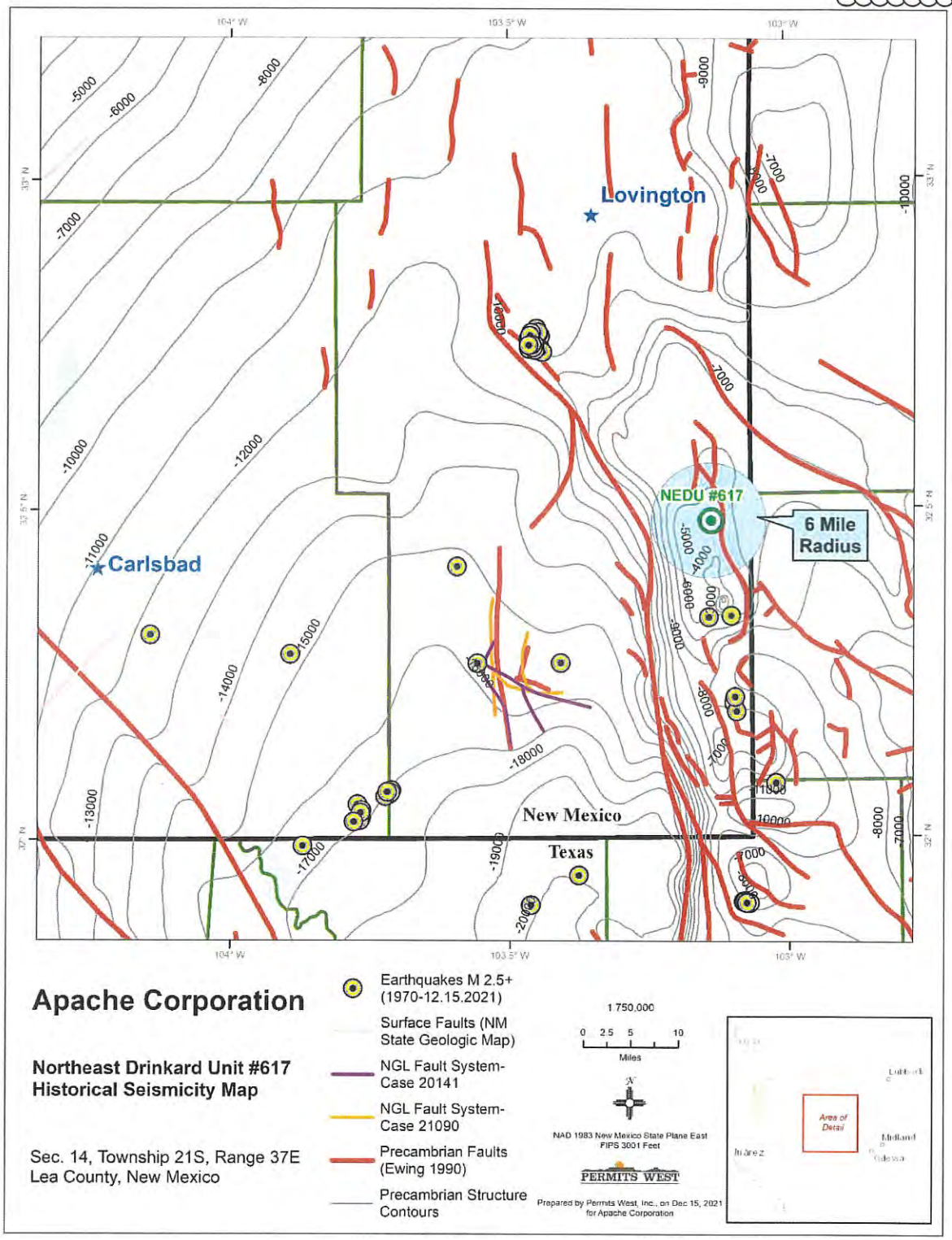


Figure 1. Structural contour map of the Precambrian basement in feet below sea level. Red lines represent the locations of Precambrian basement-penetrating faults (Ewing et al., 1990). The Northeast Drinkard Unit #617 well lies ~1.2 miles west of the closest deeply penetrating fault, ~63 miles from the nearest surface fault and ~10.1 miles from the closest historic earthquake.

EXHIBIT J

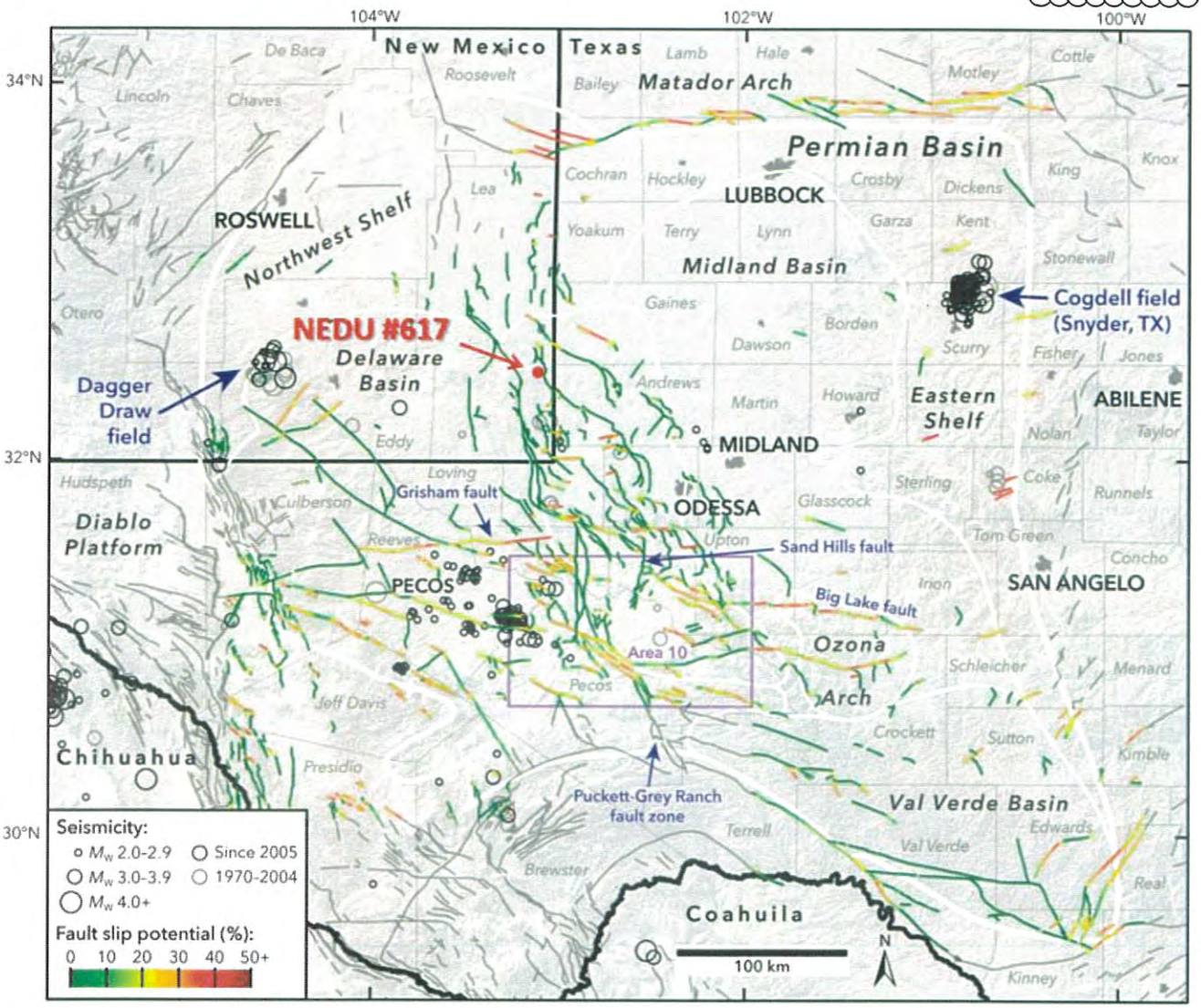


Figure 2. Modified from Snee and Zoback (2018). The nearest deep Precambrian fault lies ~1.2 miles east of the proposed SWD well and has a low probability (0%) of slip. Also, the proposed injection zone is much shallower in the Drinkard and therefore removes any major concern of inducing seismicity on any known fault.

EXHIBIT J

References Cited

Ewing, T. E., 1990, The tectonic map of Texas: Austin, Bureau of Economic Geology, The University of Texas at Austin.

Geologic Map of New Mexico, New Mexico Bureau of Geology and Mineral Resources, 2003, Scale 1:500,000.

Nicholson, A., Jr., and Clebsch, A., Jr., 1961, Geology and ground-water conditions in southern Lea County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Ground-Water Report 6, 123 pp., 2 plates.

Snee, J.-E.L., Zoback, M.D., 2018, State of stress in the Permian Basin, Texas and New Mexico: Implications for induced seismicity: Leading Edge, v. 37, p. 127–134.