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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO

CASE NO. 20140
(QUINTANA)

Table of Contents

Exhibit 1

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

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

CASE NO. 20140

APPLICATION

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

(1) NGL proposes to drill the Quintana SWD #1 well at a surface location 869 feet from the South line and 1730 feet from the East line of Section 36, Township 22 South, Range 26 East, NMPM, Eddy County, New Mexico for the purpose of operating a salt water disposal well.

(2) NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 12,583'-13,656'.

(3) NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day.

(4) NGL anticipates using an average pressure of 1,887 psi for this well, and it requests that a maximum pressure of 2,516 psi be approved for the well.

(5) A proposed C-108 for the subject well is attached hereto in Attachment A.

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

WHEREFORE, NGL requests that this application be set for hearing before an Examiner of the Oil Conservation Division on December 6, 2018; and that after notice and hearing, the Division enter its order approving this application.

Respectfully submitted,

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

By: _____

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

CASE NO. _____: Application of NGL Water Solutions Permian, LLC for approval of salt water disposal well in Eddy County, New Mexico. Applicant seeks an order approving disposal into the Silurian-Devonian formation through the Quintana SWD #1 well at a surface location 869 feet from the South line and 1730 feet from the East line of Section 36, Township 22 South, Range 26 East, NMPM, Eddy County, New Mexico for the purpose of operating a salt water disposal well. NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 12,583'-13,656'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said area is located approximately 5 miles south of Carlsbad, New Mexico.

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

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

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

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

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.

CHRIS WEYAND
Print or Type Name

Signature

10-04-2018
Date

512-600-1764
Phone Number

CHRIS@LONQUIST.COM
e-mail Address

EXHIBIT A

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 ___X___Disposal _____Storage
Application qualifies for administrative approval? ___X___Yes _____No

II. OPERATOR: NGL WATER SOLUTIONS PERMIAN, LLC

ADDRESS: 1509 W WALL ST // STE 306 // MIDLAND, TX 79701

CONTACT PARTY: SARAH JORDAN PHONE: (432) 685-0005 x1989

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes ___X___No
If yes, give the Division order number authorizing the project: _____

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

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

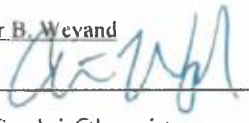
*XI Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: Christopher B. Wevand TITLE: Consulting Engineer

SIGNATURE:  DATE: 10/16/2018

E-MAIL ADDRESS: chris@lonquist.com

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

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: NGL WATER SOLUTIONS PERMIAN, LLC

WELL NAME & NUMBER: QUINTANA SWD #1

WELL LOCATION: 869' FSL & 1,730' FEL | O | 36 | 22S | 26E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 24.000" Casing Size: 20.000"

Cemented with: 1,003 sx. *or* _____ ft³

Top of Cement: surface Method Determined: circulation

1st Intermediate Casing

Hole Size: 17.500" Casing Size: 13.375"

Cemented with: 2,600 sx. *or* _____ ft³

Top of Cement: surface Method Determined: circulation

2nd Intermediate Casing

Hole Size: 12.250" Casing Size: 9.625"

Cemented with: 2,771 sx. *or* _____ ft³

Top of Cement: surface Method Determined: circulation

Production Liner

Hole Size: 8.500"

Casing Size: 7.625"

Cemented with: 136 sx.

or _____ ft³

Top of Cement: 8,700'

Method Determined: calculation

Total Depth: 13,656'

Injection Interval

12,583 feet to 13,656 feet

(Open Hole)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 7", 26 lb/ft, P-110, TCPC from 0'- 8,600' and 5.500", 17 lb/ft, P-110 LTC from 8,600'- 12,550'
Lining Material: Duoline

Type of Packer: 7-5/8" x 5" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim

Packer Setting Depth: 12,550'

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

Additional Data

1. Is this a new well drilled for injection? ___X___Yes _____No

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

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

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

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. No, new drill.

5. Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
   Delaware: 1,946'
   Bone Spring: 5,094'
   Wolfcamp: 8,968
   Strawn: 9,945'
   Atoka: 10,428'
   Morrow: 10,953'

NGL Quintana
Eddy County NM
Vertical Injection - Devonian, Silurian, Fusselman, Montoya

Location - Sec 36, Township 22 S, Range 26 E | **Drill/Complete-** $8.52MM | **AFE #** | **TD** 13,656' | **GL/KB** 3,218.1

Directions to Site - from Carlsbad follow US Hwy 285 Sand US 180/US 62W to West Derrick Road, Turn East into location. Lat/Long 32.34290, -104.24333

Geologic Tops	Section	Problems	Bit/BHA	Mud	Casing	Logging	Cement (HOLD)	Injection String
Salado Anh - 379' Top of 1st Stage Tail - 400' **Surface TD - 450'**	**Surface** Drill 24" 0' - 450'. Set and Cement 20" Casing	Loss Circulation Hole Cleaning and Wellbore stability in the Red Beds Anhydrite in the Rustler	24" Tricone 9-5/8" x 8" MM 9 jts: 8" DC 3 jts: 5" HWDP 5 " DP to surface	Spud mud	450' of 20" 94# J55 BTC Centralizers - bottom 2 joints and every 3rd jt thereafter, Cement basket 5th jt from surface	No Logs	1003 sx of 14.8ppg HALCEM (TM) SYSTEM 1 % Calcium Chloride, Pellet. 60% XS, TT 4hrs. CSD 1000psi after 10hrs	
Top Salt (Tx) NM - 595' Base Salt (Bx) NM - 1499' DV With ECP - 1,920' **Intermediate 1 TD - 1,940'**	**1st Intermediate** Drill 1490' of 17-1/2" Hole 450' - 1940" Set and Cement 13-3/8" Casing	Seepage Losses Possible H2S Anhydrite Salt Losses in the Bell Canyon.	17-1/2" PDC 8" MM" DC 5" HWDP and 5" DP to Surface 400' Target Radius	Brine with sweeps	5M A Section Casing Bowl 1940' of 13-3/8" 68# L80 BTC Centralizers - bottom jt, every 3rd joint in open hole and 2 jt inside the surface casing	Mudlogger on site by 1000' MWD GR Triple combo wireline logs	**Lead** - 1274sx of 12.9ppg ECONOCEM (TM) SYSTEM , 0.1250 lbm/sk Poly-E-Flake. TT 4.5hrs 15% XS **Tail** - 1327 sx 14.8ppg HALCEM (TM) SYSTEM. 15% XS, 3 hrs TT. 1000psi CSD after 10 hrs	8600' of 7" 26ppf, P110 TCPC Duoline Internally Coated Injection Tubing
Delaware Mtn Group - 1946' Lamar Limestone - 1948' Bell Canyon - 1968' Cherry Canyon - 2585' Brushy Canyon - 3650' Bone Spring - 5,094 Bone Spring Lime 1 - 5208' **DV Tool - 6,000'** Bone Spring Sd 1 - 6286' Bone Spring Lime 2 - 6516' Bone Spring Sd 2 - 6836' Bone Spring Lime 3 - 6933' **Top Of Liner 8,700'** Bone Spring Sd 3 - 8388' Wolfcamp - 8968' **2nd Int TD - 9,200'**	**2nd Intermediate** Drill 7280' of 12-1/4" Hole 1950' - 9200' Set 9-5/8" Intermediate Casing and Cement in 3 Stages	Hard Drilling in the Brushy Canyon. Seepage to complete loss Water flows Some Anhydrite H2S possible Production in the Bone Spring and Wolfcamp Ballooning is possible in Cherry Canyon and Brushy if broken down	12-1/4" PDC 8" MM 9jts: 8" DC 8" Jars 21 jts: 5" HWDP 5" DP to Surface	OBM	10M B Section 9200' of 9-5/8" 53.5# HCL80 BTC DV tool at at 6000' and 1920'. Extermally Coated Casing between DV tools (4080'). The rest sandblasted Centralizers - bottom jt, 100' aside of DV tools, every 3rd joint in open hole and 5 within the surface casing	MWD GR Triple combo + CBL of 13-3/8" Casing	**Stage 3 - Lead** - 709 sx of 12.9ppg ECONOCEM (TM) SYSTEM . TT 4.5hrs. **Tail** - 272sx of 14.8ppg HALCEM (TM) SYSTEM. 0% XS. TT 3hrs, CSD 1000psi after 10hrs **Stage 2 - Lead** - 521 sx of 12.9ppg ECONOCEM (TM) SYSTEM . TT 6hrs. **Tail** - 443sx of 14.8ppg HALCEM (TM) SYSTEM. 25% XS. TT 4.5hrs, CSD 1000psi after 10hrs **Stage 1 - Lead** - 443 sx of 12.9ppg ECONOCEM SYSTEM . TT 7hrs. **Tail** - 384sx of 14.8ppg HALCEM SYSTEM. 25% XS. TT 5hrs. CSD 1000psi after 10hrs	3950' of 5-1/2" 17ppf, P110 TCPC Duoline Internally Coated Injection Tubing
Penn - 9858' Atoka - 10428' Morrow - 10953' Barnett - 11928' Miss Lst - 12105' Woodford - 12477' **Perm Packer - 12,550'** Devonian (Sil-Dev) - 12563' **3rd Int TD - 12,583'**	**3rd Intermediate** Drill 3383' of 8-1/2" Hole 9200' - 12,583' Set 7-5/8" Liner and Cement in Single Stage	High Pressure (up to 13ppg) and wellbore instability (fracturing) expected in the Wolfcamp. Production in the Wolfcamp, Atoka and Morrow. Hard Drilling in the Morrow Clastic	8-1/2" PDC 6-3/4" MM 6" DC 6" Jars 5" HWDP and 5" DP to Surface	Weighted OBM	3883' of 7-5/8", 39#, P110 - EC HDL - Vam FJ. Sandblasted Centralizers on and 1 jt above shoe jt and then every 2nd jt.	MWD GR Triple combo, CBL of 9-5/8" Casing	136 Sx of 14.8ppg HALCEM (TM) SYSTEM. TT 8 hrs, 25% XS. 1000psi CDS after 10hrs	7-5/8" x 5" TCPC Permanent Packer with High Temp Elastomer and full Inconel 925 trim
Silurian Carbonate - 12896' Fusselman - 13076' Montoya - 13556' **TD 13,656'**	**Injection Interval** Drill 1073' of 6-1/2" hole 12,583' - 13,656'	Chert is possible. Loss of Circulation is expected. H2S encountered on the Striker 3 well. BHT estimated at 280F	6-1/2" PDC 4-3/4"MM 4-3/4" DC 4-3/4" Jars 4" DP to Surface	Fresh Water - possible flows	Openhole completion	MWD GR Triple Combo with FMI, CBL of 7-5/8"	Displace with 3% KCl (or heavier brine if necessary)	

NGL Water Solutions Permian, LLC

Quintana SWD No. 1

FORM C-108 Supplemental Information

III. Well Data

A. Wellbore Information

1.

Well information	
Lease Name	Quintana SWD
Well No.	1
Location	S-36 T-22S R-26E
Footage Location	869' FSL & 1,730 FEL

2.

a. Wellbore Description

Casing Information				
Type	Surface	Intermediate	Production	Liner
OD	20"	13.375"	9.625"	7.625"
WT	0.500"	0.480"	0.545"	0.500
ID	19.000"	12.415"	8.535"	6.625"
Drift ID	18.812"	12.259"	8.535"	6.500"
COD	21.000"	14.375"	10.625"	7.625"
Weight	106.5 lb/ft	68 lb/ft	53.5 lb/ft	39 lb/ft
Grade	J-55	HCL-80	P-110	Q-125
Hole Size	24"	17.5"	12.25"	8.5"
Depth Set	450'	1,940'	9,200'	8,700' – 12,583'

b. Cementing Program

Cement Information				
Casing String	Surface	Intermediate	Production	Liner
Lead Cement	N/A	ECONOCEM	ECONOCEM	N/A
Lead Cement Volume	N/A	1,274 sx	Stage 1: 443 sx Stage 2: 521 sx Stage 3: 709 sx	
Tail Cement	HALCEM	HALCEM	HALCEM	HALCEM
Tail Cement Volume	1,003 sx	1,327 sx	Stage 1: 384 sx Stage 2: 443 sx Stage 3: 272 sx	136 sx
Cement Excess	60%	15%	25%, 25%, 0%	25%
TOC	Surface	Surface	Surface	8,700'
Method	Circulate to Surface	Circulate to Surface	Circulate to Surface	Logged

3. Tubing Description

Tubing Information		
OD	7"	5.5"
WT	0.362"	0.304"
ID	6.276"	4.892"
Drift ID	7.875"	6.050"
COD	6.151"	4.653"
Weight	26 lb/ft	17 lb/ft
Grade	P-110 TCPC	P-110 TCPC
Depth Set	0'-8,600'	8,600'-12,550'

Tubing will be lined with Duoline.

4. Packer Description

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

B. Completion Information

1. Injection Formation: Devonian, Silurian, Fusselman, Montoya (Top 100')
2. Gross Injection Interval: 12,583– 13,656'

Completion Type: Open Hole

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

Formation	Depth
Delaware	1,946'
Bone Spring	5,094'
Wolfcamp	8,968'
Strawn	9,945'
Atoka	10,428'
Morrow	10,953'

VI. Area of Review

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

VII. Proposed Operation Data

1. Proposed Daily Rate of Fluids to be Injection:

   Average Volume: 40,000 BPD
   Maximum Volume: 50,000 BPD

2. Closed System

3. Anticipated Injection Pressure:

   Average Injection Pressure: 1,887 PSI (surface pressure)
   Maximum Injection Pressure: 2,516 PSI (surface pressure)

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

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

VIII. Geological Data

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

A. Injection Zone: Siluro-Devonian Formation

Formation	Depth
Rustler	Eroded, not present
Salado	379'
Delaware	1,946'
Bone Spring	5,094'
Wolfcamp	8,968'
Penn	9,858'
Atoka	10,428'
Morrow	10,953'
Mississippian Lime	12,105'
Woodford	12,477'
Devonian	12,563'
Fusselman	13,076
Montoya	13,556

B. Underground Sources of Drinking Water

There are several fresh water wells within 1-mile of the proposed Quintana SWD #1 location which appear to be producing from the Cenozoic Alluvium. These are shown on the attached map. Total depth and depth to water were reported for seven of these wells. Total depth ranges from 125 ft to 265 ft with an average of 214 ft. Depth to water ranges from 115 ft to 200 ft with an average of 164 ft. Additionally, the upper Rustler will be protected.

IX. Proposed Stimulation Program

Stimulate with up to 50,000 gallons of acid.

X. Logging and Test Data on the Well

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

XI. Chemical Analysis of Fresh Water Wells

Quite a few fresh water wells exist within one mile of the well location. Fresh water samples were obtained from two of the wells (**C-00355 and C-0028 S**). Analysis of these samples, a map, and several Water Rights Summaries from the New Mexico Office of the State Engineer are attached.

XII. Affirmative Statement of Examination of Geologic and Engineering Data

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

NAME: John C. Webb

TITLE: Sr. Geologist

SIGNATURE: John C. Webb

DATE: Oct 17, 2018

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

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-101
Revised July 18, 2013

☐ AMENDED REPORT

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

[1] Operator Name and Address	[2] OGRID Number
NGL WATER SOLUTIONS PERMIAN, LLC 1509 W WALL ST, STE 306 MIDLAND, TX 79701	372338
	[3] API Number TBD

[4] Property Code	[5] Property Name	[6] Well No.
	QUINTANA SWD	1

[7] Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet from	N/S Line	Feet From	E/W Line	County
O	36	22S	26E	N/A	869'	SOUTH	1730'	EAST	EDDY

[8] Proposed Bottom Hole Location

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

[9] Pool Information

Pool Name	Pool Code
SWD; Silurian-Devonian	96101

Additional Well Information

[11] Work Type	[12] Well Type	[13] Cable/Rotary	[14] Lease Type	[15] Ground Level Elevation
N	SWD	R	Private	3218.1
[16] Multiple	**[17] Proposed Depth**	**[18] Formation**	**[19] Contractor**	**[20] Spud Date**
N	13,656'	Siluro-Devonian	TBD	ASAP

Depth to Ground water	Distance from nearest fresh water well	Distance to nearest surface water
164'	2,790'	4,650'

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

[21] Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surface	24"	20"	94 lb/ft	450'	1,003	Surface
Intermediate	17.5"	13.375"	68 lb/ft	1,940'	2,601	Surface
Production	12.25"	9.625"	53.5lb/ft	9,200'	1,673	Surface
Prod. Liner	8.5"	7.625"	39 lb/ft	8,700' - 12,583'	136	8,700'
Tubing	N/A	7"	26 lb/ft	0' - 8,600'	N/A	N/A
Tubing	N/A	5.5"	17 lb/ft	8,600' - 12,550'	N/A	N/A

Casing/Cement Program: Additional Comments

See attached schematic.

[22] Proposed Blowout Prevention Program

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

[23] I hereby certify that the information given above is true and complete to the best of my knowledge and belief. I further certify that I have complied with 19.15.14.9 (A) NMAC ☐ and/or 19.15.14.9 (B) NMAC ☒, if applicable. Signature:	OIL CONSERVATION DIVISION Approved By:
Printed name: Christopher B. Weyand	Title:
Title: Consulting Engineer	Approved Date: / Expiration Date:
E-mail Address: chris@lonquist.com	
Date: 10/5/2018 / Phone: (512) 600-1764	Conditions of Approval Attached

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
	96101	SWD; Silurian-Devonian

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

[7] OGRID No.	[8] Operator Name	[9] Elevation
372338	NGL WATER SOLUTIONS PERMIAN, LLC	3218.1'±

[10] Surface Location

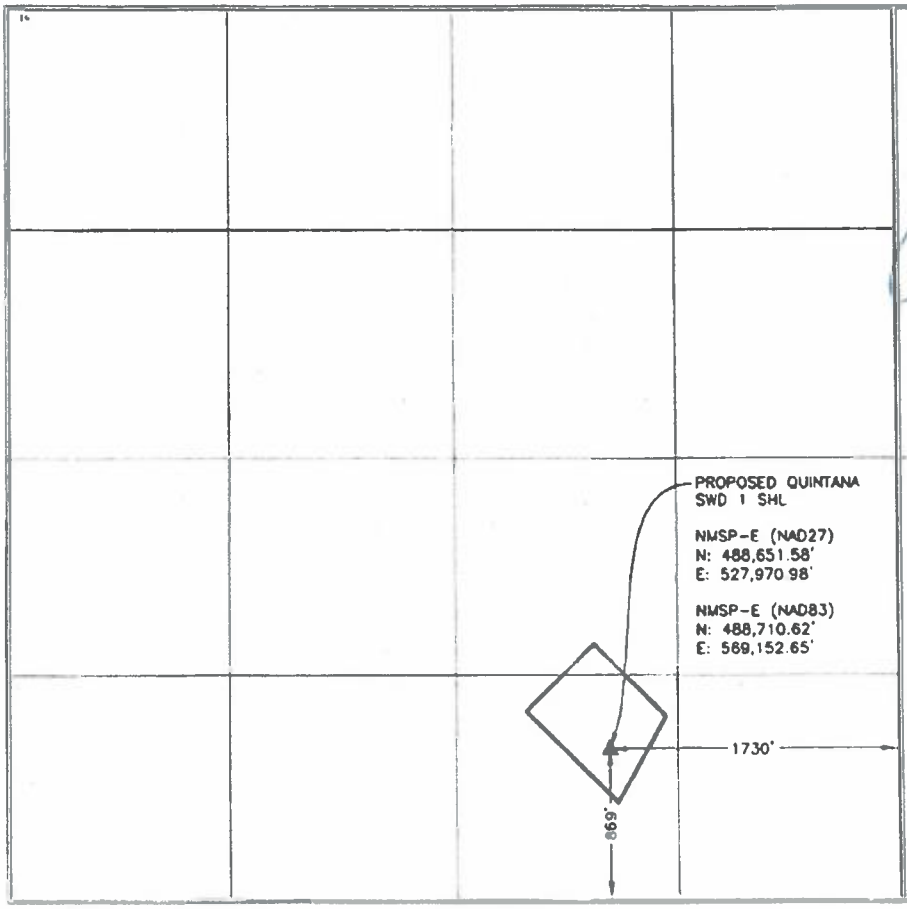
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
O	36	22 S	26 E	N/A	869'	SOUTH	1730'	EAST	EDDY

[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.
10.0			

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.



[17] OPERATOR CERTIFICATION

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

Signature — Date: 10/16/2018

Chris Weyand
Printed Name

chris@lonquist.com
E-mail Address

[18] SURVEYOR CERTIFICATION

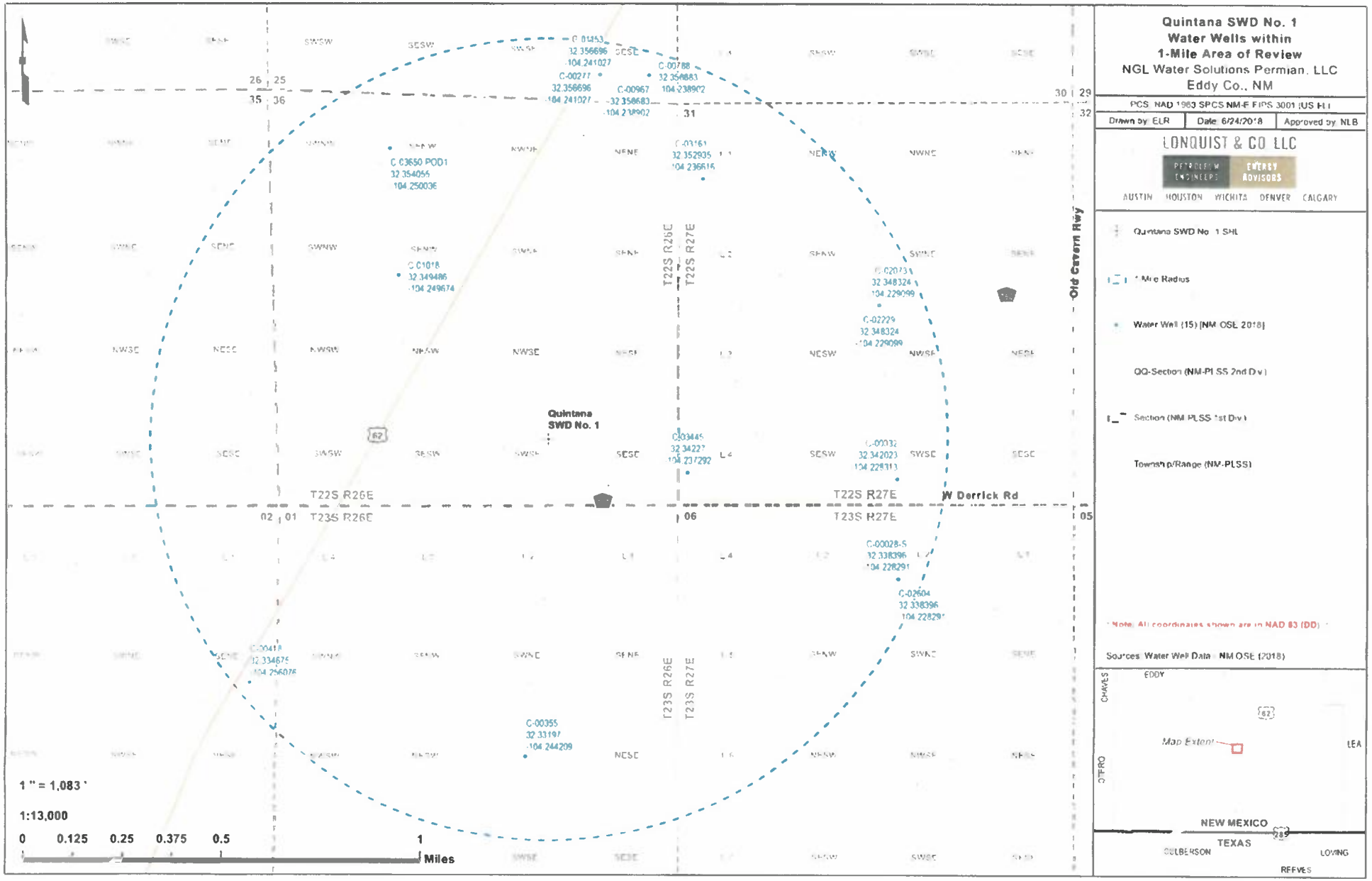
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

7/19/2018
Date of Survey

Signature and Seal of Professional Surveyor

Certificate Number 23001

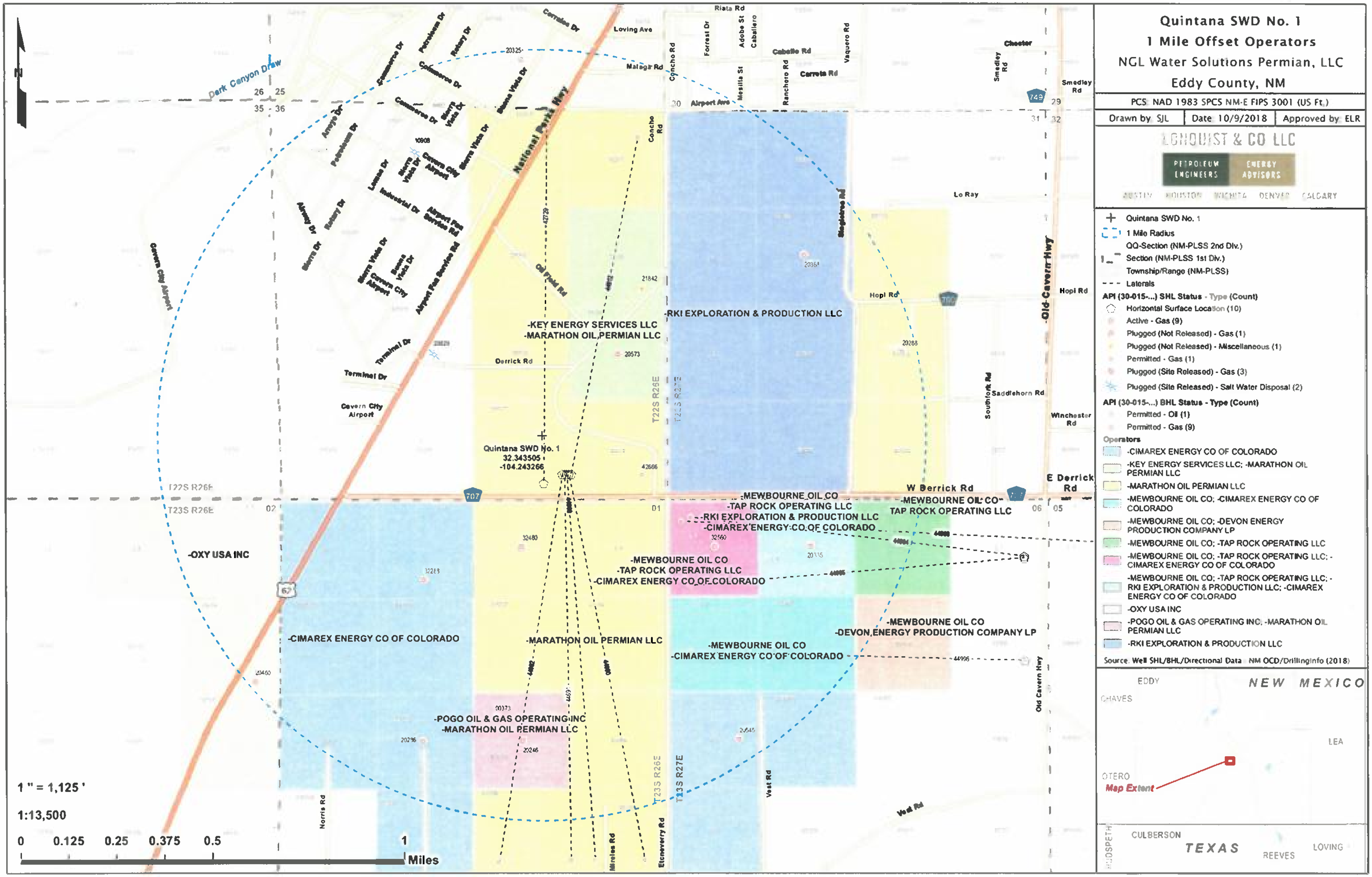
CODY A. CLARK
NEW MEXICO
23001
PROFESSIONAL SURVEYOR


Quintana SWD No. 1
Water Wells within
1-Mile Area of Review
NGL Water Solutions Permian, LLC
Eddy Co., NM
PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft)
Drawn by: ELR
Date: 6/24/2018
Approved by: NLB
LONQUIST & CO LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
Quintana SWD No. 1 SHL
1 Mile Radius
Water Well (15) (NM OSE 2018)
QQ-Section (NM-PLSS 2nd Div)
Section (NM-PLSS 1st Div)
Township/Range (NM-PLSS)
* Note: All coordinates shown are in NAD 83 (DD) *
Sources: Water Well Data - NM OSE (2018)
Quintana SWD No. 1
T22S R26E
T22S R27E
T23S R26E
T23S R27E
W Derrick Rd
Old Cavern Rwy
C-03650 POD1
32.354055
-104.250036
C-01018
32.349486
-104.249674
C-03161
32.352935
-104.236616
C-00277
32.356696
-104.241027
C-00967
32.356683
-104.238902
C-00788
32.356683
-104.238902
C-02073
32.348324
-104.229099
C-02229
32.348324
-104.229099
C-03445
32.34227
-104.237292
C-00332
32.342023
-104.228313
C-00028-S
32.338396
-104.228291
C-02604
32.338396
-104.228291
C-00418
32.334675
-104.256076
C-00355
32.33197
-104.244209
1 " = 1,083 '
1:13,000
0 0.125 0.25 0.375 0.5 1
Miles
EDDY
CHAVES
LEA
Map Extent
NEW MEXICO
TEXAS
CULBERSON
LOVING
REEVES

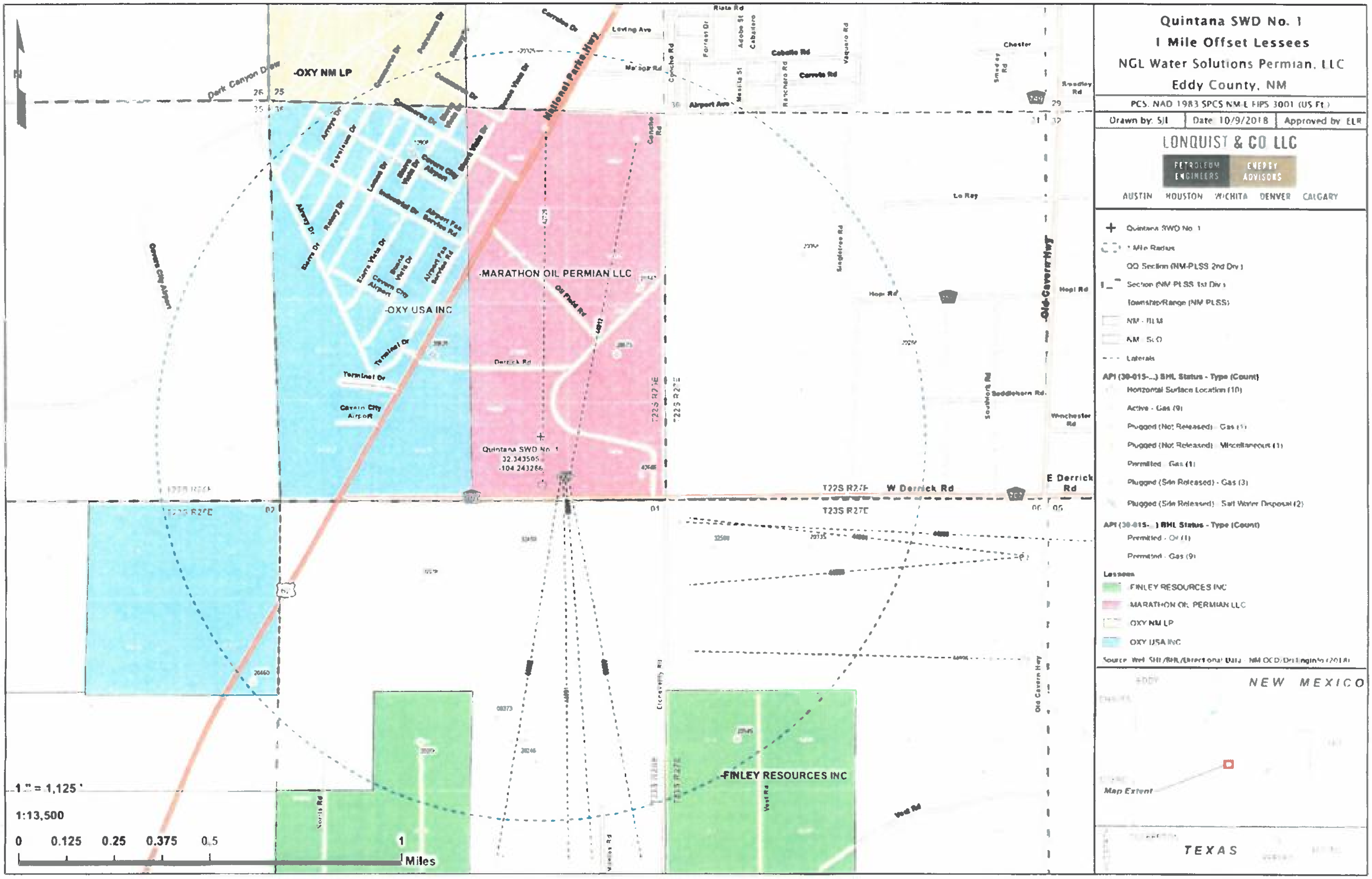
Quintana SWD No. 1

1 Mile Area of Review List

API (30-015-...)	WELL NAME	WELL TYPE	STATUS	OPERATOR	TVD (FT.)	LATITUDE (NAD83 DD)	LONGITUDE (NAD83 DD)	DATE DRILLED
00373	PRE-ONGARD WELL #001	G	P	PRE-ONGARD WELL OPERATOR	0	32.3328896000	-104.245208700	1/1/1900
10908	SALTY BILL SWD #001	S	P	CORINNE GRACE	99999	32.3541756000	-104.248863200	12/31/9999
20246	COLLATT ESTATE COM #001	G	H	POGO OIL & GAS OPERATING, INC	11950	32.3319893000	-104.244140600	8/28/1969
20286	GULF FEDERAL #001	G	A	CIMAREX ENERGY CO. OF COLORADO	12075	32.3319626000	-104.248588600	3/7/1970
20288	ALLEN #001	G	P	SABRE OP INC	11825	32.3466415000	-104.227211000	3/4/1970
20325	CITY OF CARLSBAD COM #001	G	A	OXY USA INC	99999	32.3576775000	-104.244110100	9/15/1970
20335	JOELL #001	G	A	RKI EXPLORATION & PRODUCTION, LLC	10830	32.3393593000	-104.231308000	12/10/1970
20368	LITTLE JEWEL COM #001	G	A	RKI EXPLORATION & PRODUCTION, LLC	99999	32.3503036000	-104.231552100	1/16/1971
20460	GRADONOCO #001	G	A	OXY USA INC	99999	32.3342590000	-104.256034900	6/25/1971
20545	GULF FEDERAL COM #002	G	A	CIMAREX ENERGY CO. OF COLORADO	11833	32.33205030000	-104.23452000000	12/10/1971
20573	GRACE CARLSBAD #001	G	A	KEY ENERGY SERVICES, LLC	11875	32.3465805000	-104.239845300	2/11/1972
20829	AIRPORT GRACE #001	S	P	BOLD ENERGY, L.P.	11956	32.3465767000	-104.248031600	12/31/9999
21842	CITY OF CARLSBAD #001	M	H	KEY ENERGY SERVICES, LLC	9	32.3490677000	-104.238777200	12/31/9999
32288	GULF FEDERAL COM #003	G	A	CIMAREX ENERGY CO. OF COLORADO	12100	32.3381081000	-104.248504600	10/9/2002
32480	COLLATT #002	G	P	CHI OPERATING INC	11970	32.33932110000	-104.24413300000	11/25/2002
32560	GULF FEDERAL COM #004	G	A	CIMAREX ENERGY CO. OF COLORADO	12000	32.3393364000	-104.235580400	10/23/2003
42666	AIRPORT 36 STATE #001	G	N	MARATHON OIL PERMIAN LLC	0	32.3420406952	-104.238790771	12/31/9999
42729	AIRPORT 36 STATE #002H	G	N	MARATHON OIL PERMIAN LLC	0	32.3417177186	-104.243183997	12/31/9999
44689	CATAPULT FEE 23 26 1 WA #006H	O	N	MARATHON OIL PERMIAN LLC	0	32.3420430600	-104.242158800	12/31/9999
44690	CATAPULT FEE 23 26 1 WXY #010H	G	N	MARATHON OIL PERMIAN LLC	0	32.34204299000	-104.24206160000	12/31/9999
44691	CATAPULT FEE 23 26 1 WA #005H	G	N	MARATHON OIL PERMIAN LLC	0	32.3420431300	-104.242255900	12/31/9999
44692	CATAPULT FEE 23 26 1 WXY #003H	G	N	MARATHON OIL PERMIAN LLC	0	32.3420432000	-104.242353000	12/31/9999
44912	AIRPORT STATE 22 26 36 WXY #010H	G	N	MARATHON OIL PERMIAN LLC	0	32.3420429200	-104.241964500	12/31/9999
44994	STINGER 6 W0AD FEE #001H	G	N	MEWBOURNE OIL CO	0	32.33896500000	-104.22184400000	12/31/9999
44995	STINGER 6 W0AD FEE #002H	G	N	MEWBOURNE OIL CO	0	32.33890300000	-104.22183900000	12/31/9999
44996	STINGER 6 W0HF FEE #003H	G	N	MEWBOURNE OIL CO	0	32.3350390000	-104.221809000	12/31/9999
44998	PLINY THE ELDER 23S27E0605 #201	G	N	TAP ROCK OPERATING, LLC	0	32.3388081000	-104.202629900	12/31/9999



Quintana SWD No. 1
1 Mile Offset Operators
NGL Water Solutions Permian, LLC
Eddy County, NM
PCS: NAD 1983 SPCS NM-E FIPS 3001 (US Ft.)
Drawn by: SJL
Date: 10/9/2018
Approved by: ELR
LONQUIST & CO LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
Quintana SWD No. 1
1 Mile Radius
QQ-Section (NM-PLSS 2nd Div.)
Section (NM-PLSS 1st Div.)
Township/Range (NM-PLSS)
Laterals
API (30-015-...) SHL Status - Type (Count)
Horizontal Surface Location (10)
Active - Gas (9)
Plugged (Not Released) - Gas (1)
Plugged (Not Released) - Miscellaneous (1)
Permitted - Gas (1)
Plugged (Site Released) - Gas (3)
Plugged (Site Released) - Salt Water Disposal (2)
API (30-015-...) BHL Status - Type (Count)
Permitted - Oil (1)
Permitted - Gas (9)
Operators
-CIMAREX ENERGY CO OF COLORADO
-KEY ENERGY SERVICES LLC; -MARATHON OIL PERMIAN LLC
-MARATHON OIL PERMIAN LLC
-MEWBOURNE OIL CO; -CIMAREX ENERGY CO OF COLORADO
-MEWBOURNE OIL CO; -DEVON ENERGY PRODUCTION COMPANY LP
-MEWBOURNE OIL CO; -TAP ROCK OPERATING LLC
-MEWBOURNE OIL CO; -TAP ROCK OPERATING LLC; -CIMAREX ENERGY CO OF COLORADO
-MEWBOURNE OIL CO; -TAP ROCK OPERATING LLC; -RKI EXPLORATION & PRODUCTION LLC; -CIMAREX ENERGY CO OF COLORADO
-OXY USA INC
-POGO OIL & GAS OPERATING INC; -MARATHON OIL PERMIAN LLC
-RKI EXPLORATION & PRODUCTION LLC
Source: Well SHL/BHL/Directional Data: NM OCD/DrillingInfo (2018)
EDDY
CHAVES
NEW MEXICO
LEA
OTERO
Map Extent
CULBERSON
TEXAS
REEVES
LOVING
-KEY ENERGY SERVICES LLC
-MARATHON OIL PERMIAN LLC
-RKI EXPLORATION & PRODUCTION LLC
Quintana SWD No. 1
32.343505
-104.243266
-OXY USA INC
-CIMAREX ENERGY CO OF COLORADO
-MARATHON OIL PERMIAN LLC
-MEWBOURNE OIL CO
-TAP ROCK OPERATING LLC
-RKI EXPLORATION & PRODUCTION LLC
-CIMAREX ENERGY CO OF COLORADO
-MEWBOURNE OIL CO
-TAP ROCK OPERATING LLC
-MEWBOURNE OIL CO
-TAP ROCK OPERATING LLC
-CIMAREX ENERGY CO OF COLORADO
-MEWBOURNE OIL CO
-DEVON ENERGY PRODUCTION COMPANY LP
-MEWBOURNE OIL CO
-CIMAREX ENERGY CO OF COLORADO
-POGO OIL & GAS OPERATING INC
-MARATHON OIL PERMIAN LLC
T22S R26E
T23S R26E
T22S R27E
T23S R27E
National Parks Hwy
W Derrick Rd
E Derrick Rd
Old Cavern Hwy
Derrick Rd
Hopi Rd
Saddlehorn Rd
Cavern City Airport
Dark Canyon Draw
1 " = 1,125 '
1:13,500
0 0.125 0.25 0.375 0.5 1 Miles


Quintana SWD No. 1
1 Mile Offset Lessees
NGL Water Solutions Permian, LLC
Eddy County, NM
PCS: NAD 1983 SPCS NM E FIPS 3001 (US Ft)
Drawn by: SJI
Date: 10/9/2018
Approved by: ELR
LONQUIST & CO LLC
PETROLEUM ENGINEERS
ENERGY ADVISORS
AUSTIN HOUSTON WICHITA DENVER CALGARY
Quintana SWD No. 1
1 Mile Radius
Laterals
Lessees
FINLEY RESOURCES INC
MARATHON OIL PERMIAN LLC
OXY NM LP
OXY USA INC
NEW MEXICO
TEXAS
Map Extent
OXY NM LP
OXY USA INC
MARATHON OIL PERMIAN LLC
FINLEY RESOURCES INC
Quintana SWD No. 1
32.343505
-104.243266
National Parks Hwy
Old Cavern Hwy
W Derrick Rd
E Derrick Rd
Derrick Rd
Airport Ave
Loving Ave
Riata Rd
Caballo Rd
Corvete Rd
Dark Canyon Draw
Cavern City Airport
Terminal Dr
T22S R27E
T23S R27E
1 " = 1,125 '
1:13,500
0 0.125 0.25 0.375 0.5 1
Miles

Quintana SWD #1: Offsetting Produced Water Analysis																	
wellname	api	section	township	range	unit	county	formation	ph	tds_mgL	sodium_mgL	calcium_mgL	iron_mgL	magnesium_mgL	manganese_mgL	chloride_mgL	bicarbonate_mgL	sulfate_mgL	co2_mgL
MILLER RANCH UNIT #001	3001520179	18	22S	25E	J	EDDY	DELAWARE		24800						10400	1530	3360	
TRACY #001	3001520204	10	22S	27E	C	EDDY	DELAWARE		158000						96200	572	1400	
ROOKIE STATE #001	3001510060	7	22S	26E	B	EDDY	BONE SPRING		67985						39150	61	1148	
BURTON FLAT DEEP UNIT #058H	3001541057	2	21S	27E	L	EDDY	BONE SPRING 1ST SAND	7	185973	67682	1106.6	162.8	249	1.94	114605.7	59.8	0	350
CERF 10 FEDERAL #003H	3001541058	9	21S	27E	A	EDDY	BONE SPRING 1ST SAND	6.8	178476	68523.6	985	0	241	0	105464	951.6	0	60
CLETUS 28 STATE COM #004H	3001542625	28	23S	26E	P	EDDY	BONE SPRING 2ND SAND	7.3	176249	61583.9	2802.1	19.4	433.4	0	108190.9	1110	0	420
BO DUKE FEDERAL 5 #003H	3001542693	5	23S	26E	O	EDDY	BONE SPRING 2ND SAND	7.2	165576	57796.7	3162.7	26.6	507.7	0	100583.3	1098	0	340
CONE BUTTE UT #001	3001510007	19	22S	24E	D	EDDY	WOLFCAMP		4104						932	420	1540	
MAHUN STATE #001	3001520138	16	22S	22E	F	EDDY	WOLFCAMP	8	4568						426	695	2100	
COWDEN FEDERAL #001	3001520025	4	21S	29E	K	EDDY	STRAWN	6.1	93824						57400	220	270	
WILLIAMS GAS COM #001	3001522686	25	23S	28E	C	EDDY	ATOKA	7.9	217050						128000	1030	3300	
BIG EDDY UT #001	3001502475	36	21S	28E	C	EDDY	ATOKA		50026						29200	762	1150	
CARNERO PEAK UT #001	3001510053	31	22S	25E	A	EDDY	MORROW		73321						42080	590	505	
MIDWEST L FEDERAL GAS COM #001	3001520828	34	22S	26E	K	EDDY	MORROW	6.3	180083						109000	210	1900	

Quintana SWD No. 1

2 Mile Area of Review

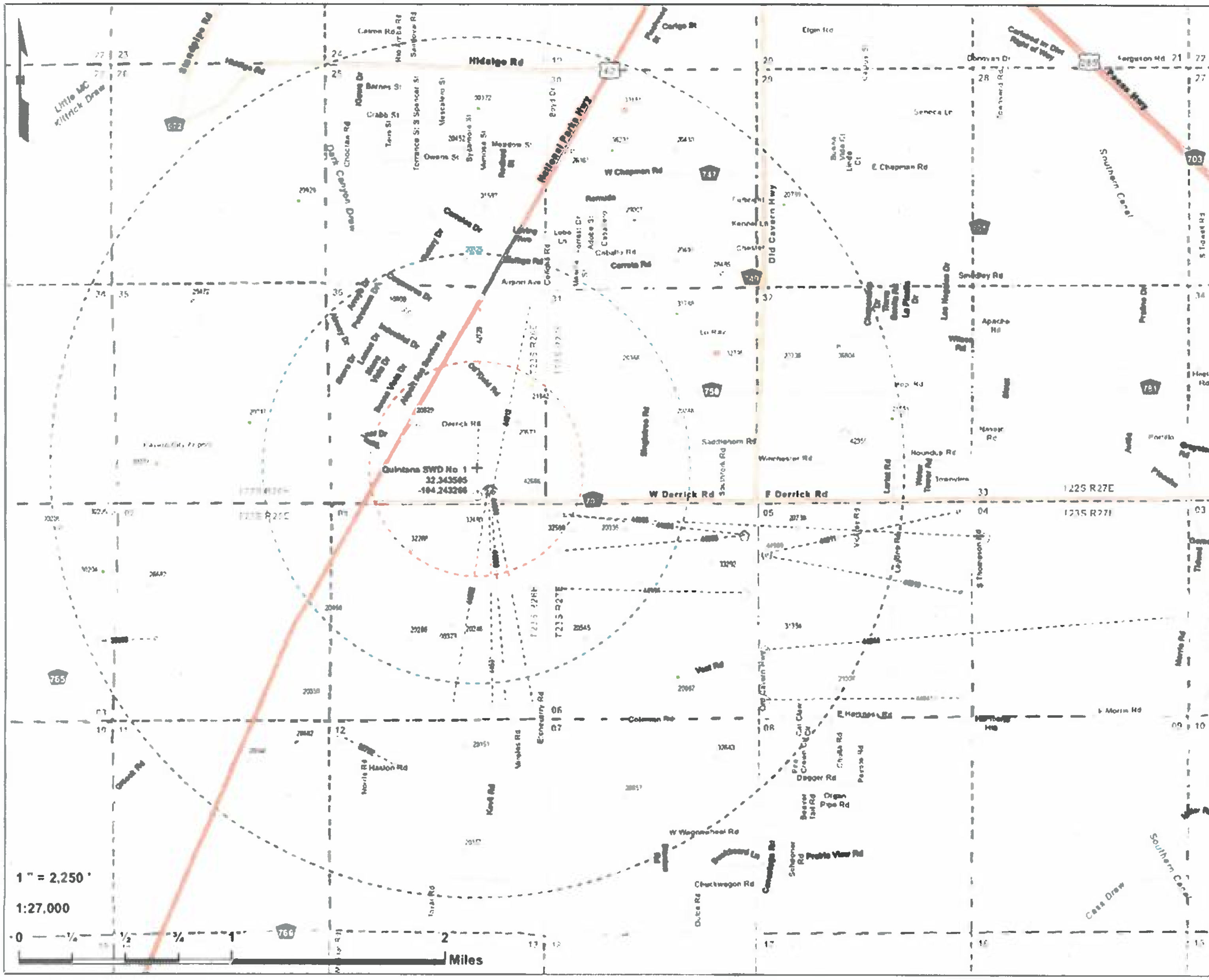
NGL Water Solutions Permian, LLC

Eddy County, NM

PCS: NAD 1983 SPCS NM E FIPS 3001 (US Ft)

Drawn by: SJL | Date: 10/9/2018 | Approved by: ELR

LONQUIST & CO. LLC — PETROLEUM ENGINEERS / ENERGY ADVISORS — AUSTIN HOUSTON WICHITA DENVER CALGARY



Legend

- Quintana SWD No. 1
- 1/2 Mile Radius
- 1 Mile Radius
- 2 Mile Radius
- QQ Section (NM-PLSS 2nd Div.)
- Section (NM PLSS 1st Div.)
- Township/Range (NM PLSS)
- Laterals

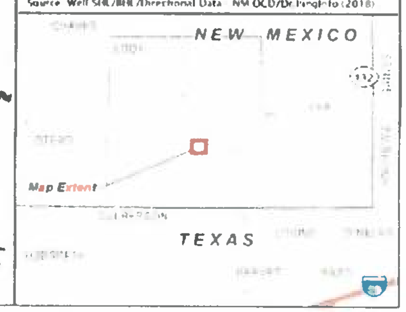
API (30-015-...) SHL Status - Type (Count)

- Horizontal Surface Location (17)
- Active - Oil (1)
- Active - Gas (20)
- Canceled Location (8)
- Plugged (Not Released) - Oil (1)
- Plugged (Not Released) - Gas (2)
- Plugged (Not Released) - Miscellaneous (1)
- Permitted - Gas (1)
- Shut In - Gas (2)
- Plugged (Site Released) - Oil (9)
- Plugged (Site Released) - Gas (7)
- Plugged (Site Released) - Salt Water Disposal (2)

API (30-015-...) BHL Status - Type (Count)

- Active - Gas (2)
- Permitted - Oil (1)
- Permitted - Gas (11)
- Canceled Location (3)

Source: Well SHL/BHL/Directional Data - NM OCD/DrillingInfo (2018)



New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Twn	Rng	(NAD83 UTM in meters) X	Y
	C 00355	1	4		01	23S	26E	571131	3577484*

Driller License:		**Driller Company:**			
Driller Name:	H.W. ETZ, JR.				
Drill Start Date:	09/18/1952	**Drill Finish Date:**	10/24/1952	**Plug Date:**	
Log File Date:	08/11/1958	**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:	8.63	**Depth Well:**	2065 feet	**Depth Water:**	

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

10/16/18 2:18 PM POINT OF DIVERSION SUMMARY

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Twn	Rng	(NAD83 UTM in meters) X	Y
	C 00028 S	3	1	2	06	23S	27E	572624	3578207*

Driller License: 24 **Driller Company:** BRININSTOOL, M.D.

Driller Name: HEMLER, HOWARD

Drill Start Date: 04/20/1953 **Drill Finish Date:** 04/30/1953 **Plug Date:**

Log File Date: 06/09/1953 **PCW Rcv Date:** 06/09/1953 **Source:** Shallow

Pump Type: TURBIN **Pipe Discharge Size:** 7" **Estimated Yield:**

Casing Size: 16.00 **Depth Well:** 231 feet **Depth Water:** 190 feet

Water Bearing Stratifications:	Top	Bottom	Description
	180	197	Limestone/Dolomite/Chalk

Casing Perforations:	Top	Bottom
	70	85

Meter Number: 473 **Meter Make:** WATER SPEC

Meter Serial Number: 934655 **Meter Multiplier:** 1.0000

Number of Dials: 3 **Meter Type:** Diversion

Unit of Measure: Acre-Feet **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Quarterly

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount
12/30/1998	1999	108	A	ms		0
04/29/1999	1999	108	A	ms		0
07/29/1999	1999	197	A	ms		88.656
10/06/1999	1999	288	A	ms		90.837
12/27/1999	1999	304	A	ms		16.287
04/05/2000	2000	316	A	mb		12.558
07/06/2000	2000	440	A	MB		123.926
10/18/2000	2000	529	A	MB		88.095
01/04/2001	2000	529	A	ms		0
04/26/2001	2001	582	A	ms		53.396
07/19/2001	2001	689	A	ms		106.970
11/12/2001	2001	732	A	tg		43.085
04/11/2002	2002	732	A	ms		0
09/24/2002	2002	884	A	ms		151.591
01/02/2003	2002	900	A	ms		16.091

*UTM location was derived from PLSS - see Help

Meter Readings (in Acre-Feet)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount
05/15/2003	2003	909	A	ms		9.788
08/26/2003	2003	31	R	ab	Meter Rollover	121.851
10/22/2003	2003	69	A	MS		37.522
02/04/2004	2003	88	A	ab		19.432
04/21/2004	2004	118	A	TW		29.571
07/13/2004	2004	216	A	RM		97.906
10/19/2004	2004	247	A	TW		31.425
05/24/2005	2005	111	A	ms		0
05/24/2005	2005	177	A	ms		65.887
07/05/2005	2005	244	A	JW		66.804
10/12/2005	2005	292	A	TW		48.685
01/04/2006	2005	292	A	TW		0
04/04/2006	2006	304	A	tw		11.593
07/06/2006	2006	413	A	tw		108.712
01/02/2007	2006	545	A	tw		132.489
04/27/2007	2007	591	A	tw		46.004
07/17/2007	2007	703	A	tw		111.499
10/04/2007	2007	764	A	tw		60.981
01/02/2008	2007	770	A	tw		6.849
04/01/2008	2008	770	A	tw		0
07/15/2008	2008	834	A	tw		63.712
10/23/2008	2008	850	A	tw		15.570
01/13/2009	2008	853	A	tw		3.109
01/04/2010	2009	952	A	tw		99.413
04/26/2010	2010	972	A	tw		19.852
07/26/2010	2010	987	A	tw		14.989
01/26/2011	2010	995	A	tw		8.223
09/20/2011	2011	11	R	tw	Meter Rollover	15.227
01/30/2012	2011	11	A	tw		0
04/30/2012	2012	11	A	tw		0
10/03/2012	2012	11	A	tw		0
12/27/2012	2012	11	A	tw		0
01/28/2014	2013	11	A	tw		0
07/25/2014	2014	11	A	tw		0
01/28/2015	2014	11	A	tw		0
01/21/2016	2015	11	A	tw		0
02/10/2017	2016	12	A	tw		1.140

**YTD Meter Amounts:	Year	Amount
	1999	195.780
	2000	224.579
	2001	203.451

**YTD Meter Amounts:	Year	Amount
	2002	167.682
	2003	188.593
	2004	158.902
	2005	181.376
	2006	252.794
	2007	225.333
	2008	82.391
	2009	99.413
	2010	43.064
	2011	15.227
	2012	0
	2013	0
	2014	0
	2015	0
	2016	1.140

Meter Number: 474 **Meter Make:** GE

Meter Serial Number: 31361444 **Meter Multiplier:** 1.0000

Number of Dials: 5 **Meter Type:** Power Child

Unit of Measure: Kilowatt Hours **Return Flow Percent:**

Usage Multiplier: **Reading Frequency:** Quarterly (No Reading Expected)

Meter Readings in (Kilowatt Hours)

Read Date	Year	Mtr Reading	Flag	Rdr	Comment	Mtr Amount
12/20/1998	1999	14307	A	ms		0
04/29/1999	1999	14635	A	ms		328.000
07/20/1999	1999	15314	A	ms		679.000
10/06/1999	1999	16112	A	ms		798.000
12/28/1999	1999	16258	A	ms		146.000
04/05/2000	2000	16387	A	mb		129.000
07/06/2000	2000	17551	A	mb		1164.000
10/18/2000	2000	18498	A	MB		947.000
07/19/2001	2001	29880	A	ms		11382.000
01/05/2005	2004	21744	R	JW	Meter Rollover	91864.000
03/28/2005	2005	21815	A	JW		71.000
05/24/2005	2005	22973	A	JW		1158.000

**YTD Meter Amounts:	Year	Amount
	1999	1951.000
	2000	2240.000
	2001	11382.000
	2004	91864.000
	2005	1229.000

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Twn	Rng	(NAD83 UTM in meters) X	Y
	C 03161	3	1	1	31	22S	27E	571829	3579813*

Driller License: 1348 **Driller Company:** TAYLOR WATER WELL SERVICE

Driller Name:

Drill Start Date:	01/31/2006	**Drill Finish Date:**	02/03/2006	**Plug Date:**	
Log File Date:	03/13/2006	**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:		**Depth Well:**	200 feet	**Depth Water:**	

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

New Mexico Office of the State Engineer
Point of Diversion Summary

Well Tag	POD Number	(quarters are 1=NW 2=NE 3=SW 4=SE) (quarters are smallest to largest) Q64	Q16	Q4	Sec	Twn	Rng	(NAD83 UTM in meters) X	Y
	C 01018	3	4	1	36	22S	26E	570603	3579422*

Driller License: 30 **Driller Company:** BARRON, EMMETT

Driller Name: BARRON, EMMETT

Drill Start Date:	08/01/1961	**Drill Finish Date:**	08/03/1961	**Plug Date:**	
Log File Date:	10/25/1961	**PCW Rcv Date:**		**Source:**	Shallow
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	
Casing Size:	5.50	**Depth Well:**	125 feet	**Depth Water:**	115 feet

Water Bearing Stratifications:	Top	Bottom	Description
	120	125	Sandstone/Gravel/Conglomerate

Casing Perforations:	Top	Bottom
	115	125

*UTM location was derived from PLSS - see Help

CARDINAL Laboratories

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

July 10, 2018

CHRIS WEYAND

Lonquist Field Services, LLC

3345 Bee Cave Road, Suite 201

Austin, TX 78746

RE: WATER SAMPLES

Enclosed are the results of analyses for samples received by the laboratory on 07/03/18 15:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-17-10. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

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

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

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

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C-00355	H801820-01	Water	03-Jul-18 11:00	03-Jul-18 15:15
C-0028 S	H801820-02	Water	03-Jul-18 12:00	03-Jul-18 15:15

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

C-00355

H801820-01 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	**307**		5.00	mg/L	1	8062505	AC	05-Jul-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8062505	AC	05-Jul-18	310.1	
Chloride*	**1480**		4.00	mg/L	1	8070302	AC	05-Jul-18	4500-Cl-B	
Conductivity*	**6000**		1.00	uS/cm	1	8070308	AC	03-Jul-18	120.1	
pH*	**7.07**		0.100	pH Units	1	8070308	AC	03-Jul-18	150.1	
Resistivity	**1.67**			Ohms/m	1	8070308	AC	03-Jul-18	120.1	
Specific Gravity @ 60° F	**1.007**		0.000	[blank]	1	8070505	AC	05-Jul-18	SM 2710F	
Sulfate*	**1110**		250	mg/L	25	8070315	AC	03-Jul-18	375.4	
TDS*	**3970**		5.00	mg/L	1	8070311	AC	06-Jul-18	160.1	
Alkalinity, Total*	**252**		4.00	mg/L	1	8062505	AC	05-Jul-18	310.1	
Sulfide, total	**0.0227**		0.0100	mg/L	1	8070506	AC	05-Jul-18	376.2	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Barium*	<0.050		0.050	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Calcium*	**458**		0.100	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Iron*	<0.050		0.050	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Magnesium*	**286**		1.00	mg/L	10	B807059	JDA	10-Jul-18	EPA200.7	
Potassium*	**4.76**		1.00	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Sodium*	**359**		1.00	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

C-0028 S

H801820-02 (Water)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Analyst	Analyzed	Method	Notes
Cardinal Laboratories										
Inorganic Compounds										
Alkalinity, Bicarbonate	400		5.00	mg/L	1	8062505	AC	05-Jul-18	310.1	
Alkalinity, Carbonate	<1.00		1.00	mg/L	1	8062505	AC	05-Jul-18	310.1	
Chloride*	1700		4.00	mg/L	1	8070302	AC	05-Jul-18	4500-Cl-B	
Conductivity*	6810		1.00	uS/cm	1	8070308	AC	03-Jul-18	120.1	
pH*	7.46		0.100	pH Units	1	8070308	AC	03-Jul-18	150.1	
Resistivity	1.47			Ohms/m	1	8070308	AC	03-Jul-18	120.1	
Specific Gravity @ 60° F	1.003		0.000	[blank]	1	8070505	AC	05-Jul-18	SM 2710F	
Sulfate*	1460		250	mg/L	25	8070315	AC	03-Jul-18	375.4	
TDS*	4290		5.00	mg/L	1	8070311	AC	06-Jul-18	160.1	
Alkalinity, Total*	328		4.00	mg/L	1	8062505	AC	10-Jul-18	310.1	
Sulfide, total	<0.0100		0.0100	mg/L	1	8070506	AC	05-Jul-18	376.2	
Green Analytical Laboratories										
Total Recoverable Metals by ICP (E200.7)										
Barium*	<0.050		0.050	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Calcium*	469		0.100	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Iron*	0.115		0.050	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Magnesium*	417		1.00	mg/L	10	B807059	JDA	10-Jul-18	EPA200.7	
Potassium*	4.90		1.00	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	
Sodium*	370		1.00	mg/L	1	B807059	JDA	10-Jul-18	EPA200.7	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8062505 - General Prep - Wet Chem										
Blank (8062505-BLK1)				Prepared & Analyzed: 25-Jun-18						
Alkalinity, Carbonate	ND	1.00	mg/L							
Alkalinity, Bicarbonate	5.00	5.00	mg/L							
Alkalinity, Total	4.00	4.00	mg/L							
LCS (8062505-BS1)				Prepared & Analyzed: 25-Jun-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120			
Alkalinity, Bicarbonate	305	12.5	mg/L				80-120			
Alkalinity, Total	250	10.0	mg/L	250		100	80-120			
LCS Dup (8062505-BSD1)				Prepared & Analyzed: 25-Jun-18						
Alkalinity, Carbonate	ND	2.50	mg/L				80-120		20	
Alkalinity, Bicarbonate	355	12.5	mg/L				80-120	15.2	20	
Alkalinity, Total	290	10.0	mg/L	250		116	80-120	14.8	20	
Batch 8070302 - General Prep - Wet Chem										
Blank (8070302-BLK1)				Prepared & Analyzed: 05-Jul-18						
Chloride	ND	4.00	mg/L							
LCS (8070302-BS1)				Prepared & Analyzed: 05-Jul-18						
Chloride	104	4.00	mg/L	100		104	80-120			
LCS Dup (8070302-BSD1)				Prepared & Analyzed: 05-Jul-18						
Chloride	100	4.00	mg/L	100		100	80-120	3.92	20	
Batch 8070308 - General Prep - Wet Chem										
LCS (8070308-BS1)				Prepared & Analyzed: 03-Jul-18						
Conductivity	482		uS/cm	500		96.4	80-120			
pH	7.08		pH Units	7.00		101	90-110			

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8070308 - General Prep - Wet Chem										
Duplicate (8070308-DUP1)	Source: H801762-01			Prepared & Analyzed: 03-Jul-18						
Conductivity	8320	1.00	uS/cm		8390			0.838	20	
pH	6.95	0.100	pH Units		7.19			3.39	20	
Resistivity	1.20		Ohms/m		1.19			0.838	20	
Batch 8070311 - Filtration										
Blank (8070311-BLK1)				Prepared: 03-Jul-18 Analyzed: 09-Jul-18						
TDS	ND	5.00	mg/L							
LCS (8070311-BS1)				Prepared: 03-Jul-18 Analyzed: 05-Jul-18						
TDS	482	5.00	mg/L	527		91.5	80-120			
Duplicate (8070311-DUP1)	Source: H801800-02			Prepared: 03-Jul-18 Analyzed: 05-Jul-18						
TDS	1730	5.00	mg/L		1720			0.348	20	
Batch 8070315 - General Prep - Wet Chem										
Blank (8070315-BLK1)				Prepared & Analyzed: 03-Jul-18						
Sulfate	ND	10.0	mg/L							
LCS (8070315-BS1)				Prepared & Analyzed: 03-Jul-18						
Sulfate	18.1	10.0	mg/L	20.0		90.6	80-120			
LCS Dup (8070315-BSD1)				Prepared & Analyzed: 03-Jul-18						
Sulfate	18.9	10.0	mg/L	20.0		94.4	80-120	4.22	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

Inorganic Compounds - Quality Control

Cardinal Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 8070505 - General Prep - Wet Chem										
Duplicate (8070505-DUP1)		**Source: H801820-01**		Prepared: 03-Jul-18 Analyzed: 05-Jul-18						
Specific Gravity @ 60° F	1.006	0.000	[blank]		1.007			0.142	20	
Batch 8070506 - General Prep - Wet Chem										
Blank (8070506-BLK1)				Prepared & Analyzed: 05-Jul-18						
Sulfide, total	ND	0.0100	mg/L							
Duplicate (8070506-DUP1)		**Source: H801820-01**		**Prepared & Analyzed: 05-Jul-18**						
Sulfide, total	0.0218	0.0100	mg/L		0.0227			3.69	20	

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Lonquist Field Services, LLC 3345 Bee Cave Road, Suite 201 Austin TX, 78746	Project: WATER SAMPLES Project Number: NONE GIVEN Project Manager: CHRIS WEYAND Fax To: (512) 732-9816	Reported: 10-Jul-18 17:03

Total Recoverable Metals by ICP (E200.7) - Quality Control

Green Analytical Laboratories

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B807059 - Total Rec. 200.7/200.8/200.2										
Blank (B807059-BLK1)				Prepared: 09-Jul-18 Analyzed: 10-Jul-18						
Sodium	ND	1.00	mg/L							
Magnesium	ND	0.100	mg/L							
Barium	ND	0.050	mg/L							
Calcium	ND	0.100	mg/L							
Potassium	ND	1.00	mg/L							
Iron	ND	0.050	mg/L							
LCS (B807059-BS1)				Prepared: 09-Jul-18 Analyzed: 10-Jul-18						
Magnesium	18.7	0.100	mg/L	20.0		93.6	85-115			
Iron	3.67	0.050	mg/L	4.00		91.7	85-115			
Potassium	7.71	1.00	mg/L	8.00		96.3	85-115			
Sodium	3.13	1.00	mg/L	3.24		96.6	85-115			
Barium	1.90	0.050	mg/L	2.00		94.9	85-115			
Calcium	3.78	0.100	mg/L	4.00		94.5	85-115			
LCS Dup (B807059-BSD1)				Prepared: 09-Jul-18 Analyzed: 10-Jul-18						
Sodium	3.11	1.00	mg/L	3.24		96.0	85-115	0.589	20	
Potassium	7.56	1.00	mg/L	8.00		94.5	85-115	1.88	20	
Magnesium	18.6	0.100	mg/L	20.0		93.0	85-115	0.545	20	
Barium	1.90	0.050	mg/L	2.00		95.0	85-115	0.0910	20	
Calcium	3.77	0.100	mg/L	4.00		94.2	85-115	0.312	20	
Iron	3.66	0.050	mg/L	4.00		91.6	85-115	0.146	20	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

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

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name: Kongquist		**BILL TO**	
Project Manager:		P.O. #:	
Address:		Company:	
City:	State: Zip:	Attn:	
Phone #:	Fax #:	Address:	
Project #:	Project Owner:	City:	
Project Name: Water Samples		State: Zip:	
Project Location:		Phone #:	
Sampler Name:		Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST													
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE	ICE / COOL	OTHER:	DATE	TIME	Scale Index	T. Sulfide												
H41820	C-00355																											
1	C-00285	G	3	✓									7-3	11 00	✓	✓												
2		C	1	1									7-3	12:00	1	L												

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising whether based in contract or tort, shall be limited to the amount paid by the client for the analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within 30 days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By:	Date: 7-3-18	Received By: Tamara Oldaker	Phone Result: ☐ Yes ☐ No	Add'l Phone #:	
	Time: 3:15		Fax Result: ☐ Yes ☐ No	Add'l Fax #:	
Relinquished By:	Date:	Received By:	REMARKS: Kush!		
	Time:				
Delivered By: (Circle One) 12.1°C	Sample Condition: Cool ☐ Yes ☐ No; Intact ☐ Yes ☐ No	CHECKED BY: (Initials) TO#5			
Sampler - UPS - Bus - Other: Corrected 12.0°C					

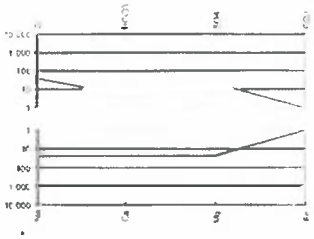
+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

Company	LONGQUIST FIELD SERVICES	Date Sampled	07/03/18
Lease Name	WATER SAMPLES	Company Rep	CHRIS WEYAND
Well Number	C-00355 (H801820-01)		
Location	NOT GIVEN		

	ANALYSIS					
1	pH	7.07				
2	Specific Gravity @ 60/60 F	1.0070				
3	CaCO3 Saturation Index @ 80 F	+0.701	'Calcium Carbonate Scale Possible'			
	@ 140 F	+1.401	'Calcium Carbonate Scale Possible'			
	Dissolved Gasses					
4	Hydrogen Sulfide	0.023	PPM			
5	Carbon Dioxide	ND	PPM			
6	Dissolved Oxygen	ND	PPM			
	Cations		/	Eq. Wt	=	MEQ/L
7	Calcium (Ca++)	458.00	/	20.1	=	22.79
8	Magnesium (Mg++)	286.00	/	12.2	=	23.44
9	Sodium (Na+)	359	/	23.0	=	23.23
10	Barium (Ba++)	0.000	/	68.7	=	0.00
	Anions					
11	Hydroxyl (OH-)	0	/	17.0	=	0.00
12	Carbonate (CO3=)	0	/	30.0	=	0.00
13	Bicarbonate (HCO3-)	307	/	61.1	=	5.02
14	Sulfate (SO4=)	1,110	/	48.8	=	22.75
15	Chloride (Cl-)	1,480	/	35.5	=	41.69
	Other					
16	Total Iron (Fe)	0.000	/	18.2	=	0.00
17	Total Dissolved Solids	3,970				
18	Total Hardness As CaCO3	2,321.0				
19	Calcium Sulfate Solubility @ 90 F	2,452				
20	Resistivity (Measured)	1.670	Ohm/Meters		@ 77	Degrees (F)

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	5.02	=	407
CaSO4	68.07	X	17.76	=	1,209
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	0.00	=	0
MgSO4	60.19	X	0.00	=	0
MgCl2	47.62	X	23.44	=	1,116
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	4.98	=	354
NaCl	58.46	X	18.25	=	1,067

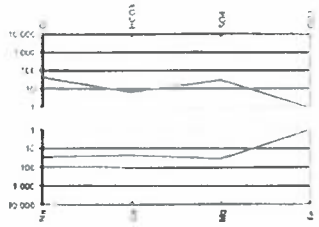
ND = Not Determined

CARDINAL LABORATORIES
SCALE INDEX WATER ANALYSIS REPORT

Company	LONGQUIST FIELD SERVICES	Date Sampled	07/03/18
Lease Name	WATER SAMPLES	Company Rep	CHRIS WEYAND
Well Number	C-0028 S (H801820-02)		
Location	NOT GIVEN		

	ANALYSIS					
1.	pH	7.46				
2.	Specific Gravity @ 60/60 F.	1.0030				
3.	CaCO3 Saturation Index @ 80 F.	+0.826	'Calcium Carbonate Scale Possible'			
	@ 140 F.	+1.526	'Calcium Carbonate Scale Possible'			
	Dissolved Gasses					
4.	Hydrogen Sulfide	0.000	PPM			
5.	Carbon Dioxide	ND	PPM			
6.	Dissolved Oxygen	ND	PPM			
	Cations		/	Eq. Wt.	=	MEQ/L
7.	Calcium (Ca++)	469.00	/	20.1	=	23.33
8.	Magnesium (Mg++)	417.00	/	12.2	=	34.18
9.	Sodium (Na+)	370	/	23.0	=	26.84
10.	Barium (Ba++)	0.000	/	68.7	=	0.00
	Anions					
11.	Hydroxyl (OH-)	0	/	17.0	=	0.00
12.	Carbonate (CO3=)	0	/	30.0	=	0.00
13.	Bicarbonate (HCO3-)	400	/	61.1	=	6.55
14.	Sulfate (SO4=)	1,460	/	48.8	=	29.92
15.	Chloride (Cl-)	1,700	/	35.5	=	47.89
	Other					
16.	Total Iron (Fe)	0.115	/	18.2	=	0.01
17.	Total Dissolved Solids	4,290				
18.	Total Hardness As CaCO3	2,888.0				
19.	Calcium Sulfate Solubility @ 90 F.	2,234				
20.	Resistivity (Measured)	1.470	Ohm/Meters		@ 77	Degrees (F)

Logarithmic Water Pattern



PROBABLE MINERAL COMPOSITION

COMPOUND	Eq. Wt.	X	MEQ/L	=	mg/L
Ca(HCO3)2	81.04	X	6.55	=	531
CaSO4	68.07	X	16.79	=	1,143
CaCl2	55.50	X	0.00	=	0
Mg(HCO3)2	73.17	X	0.00	=	0
MgSO4	60.19	X	13.13	=	790
MgCl2	47.62	X	21.05	=	1,002
NaHCO3	84.00	X	0.00	=	0
NaSO4	71.03	X	0.00	=	0
NaCl	58.46	X	26.84	=	1,569

ND = Not Determined

Exhibit 2

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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO

CASE NO. 20140
(QUINTANA)

AFFIDAVIT OF SCOTT J. WILSON

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Scott J. Wilson, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am the Senior Vice President for Ryder Scott Company in Denver, Colorado. My responsibilities at Ryder Scott Company include the performance of reserve appraisals, technical evaluations, and reservoir analysis.

3. I have obtained a bachelor's degree in petroleum engineering from the Colorado School of Mines, and a master's degree business from the University of Colorado. I have worked as a petroleum engineer since 1983.

4. I am familiar with the amended application that NGL Water Solutions Permian, LLC ("NGL") has filed in this matter, and I have conducted a nodal analysis and reservoir study

related to the area which is the subject matter of the application. A copy of my study is attached hereto as Exhibit A.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Quintana SWD #1 well, which is a salt water disposal well.

6. The well will be spaced out and will not be located closer than approximately 1 mile from other disposal wells, approved for injection into the Devonian and Silurian formations.

7. The approved injection zone for the well is located below the base of the Woodford Shale formation and above the Ordovician formation, which consists of significant shale deposits.

8. I have reviewed step rate tests for similar disposal wells drilled within the area and conducted a nodal analysis. It is my opinion that a large percentage of surface pressure it was encountering using smaller diameter tubing was a result of friction pressure. In Case No. 15720 evidence had been presented to the Division showing that up to 85% of this surface pressure was due to friction. Increasing the tubing size would reduce friction and would conserve pump horsepower, fuel, and reduce emissions.

9. My nodal analysis indicates that increasing the tubing size to 7" by 5 ½" would not significantly increase reservoir pressures over a twenty-year time period. The injection zone is located within a reservoir with significant thickness which consists of high permeability rocks, which results in only very small pressure increases even when injection is increased to a rate of 50,000 barrels per day over a 20 year period.

10. It is my opinion that increasing the tubing size will not cause fractures in the formation. Wellhead pressures are set at a maximum that is below the formation fracture pressure and, as a result, it is impossible to get above the formation fracture pressure while honoring

wellhead pressure constraints. Consequently, it is highly unlikely that increasing the tubing size in the well would result in fractures to the formation.

11. I have also studied the potential impact on pore pressures and put together a simulation of the radial influence that the well would have if larger tubing is used for a period of time. A copy of this study is included within Exhibit A to this affidavit. This study shows that it is anticipated that there will be a minimal impact on reservoir pressures and that the majority of fluids will not travel greater than 1 mile in 20 years.

12. My studies further indicate that additional injection wells located one mile away from the well will not create any materially adverse pressures in the formation.

13. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

Scott J. Wilson

SUBSCRIBED AND SWORN to before me this 8th day of May, 2019 by Scott J. Wilson.

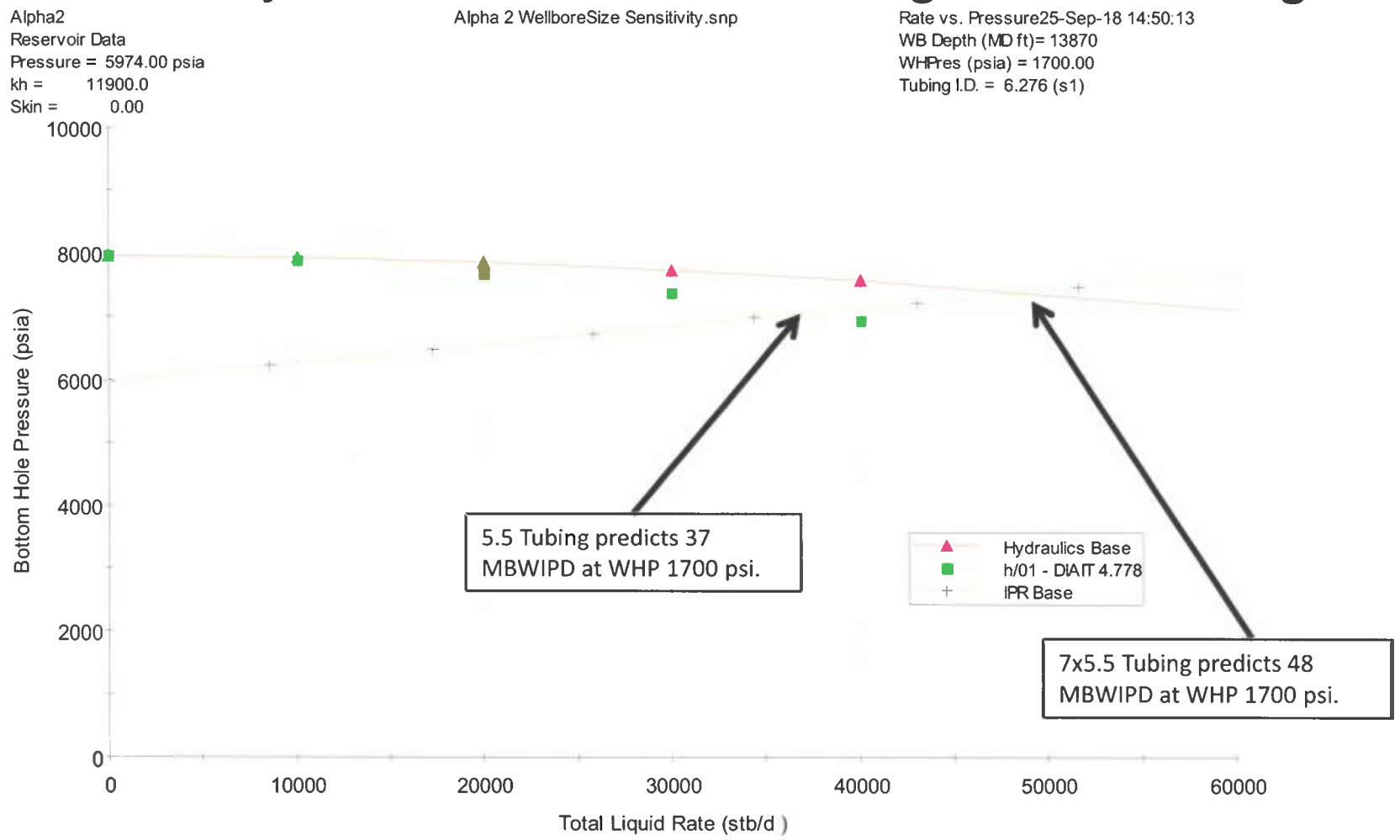
Notary Public

My commission expires: 8/23/21

DARSHAE E RODRIGUEZ
Notary Public - State of Colorado
Notary ID 20134006986
My Commission Expires Aug 23, 2021

NGL Water Solutions, LLC

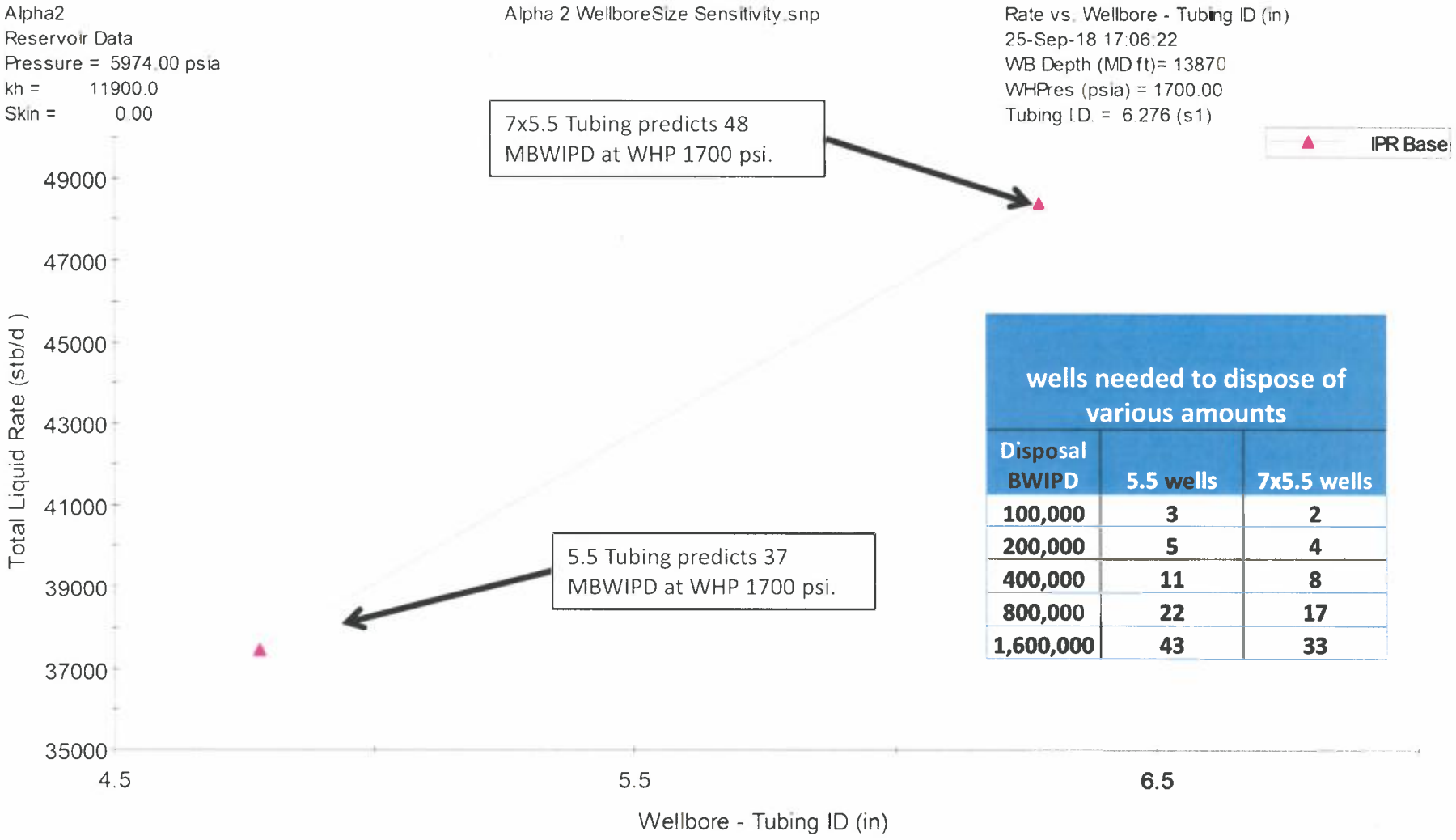
Typical Wellbore Hydraulics Models predict a 30% increase in maximum injection rate between 5.5 tubing and 7x5.5 tubing.



tabbies
EXHIBIT A

NGL Water Solutions, LLC

Increased injection rate per well equates to fewer injectors.



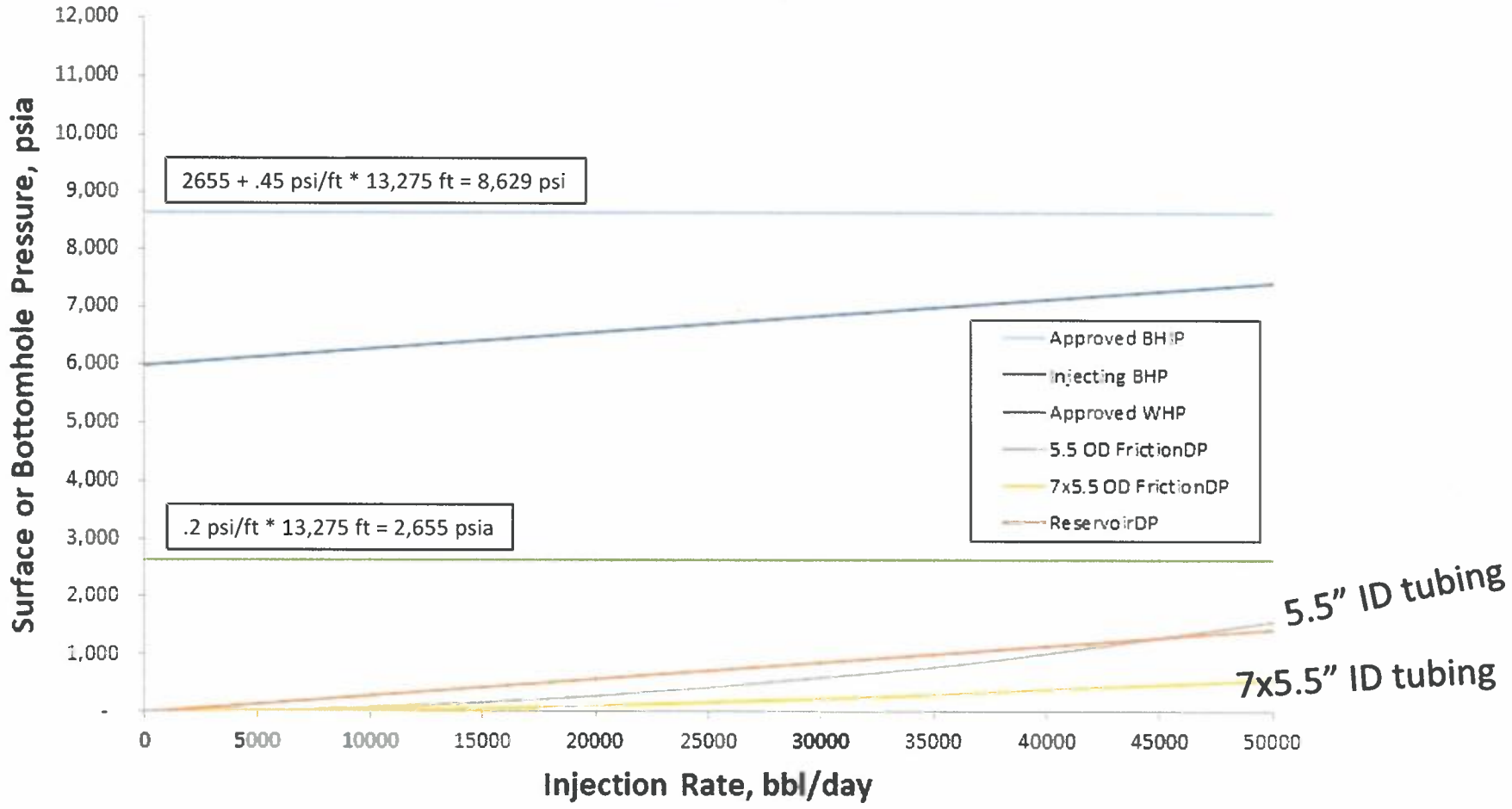
wells needed to dispose of various amounts		
Disposal BWIPD	5.5 wells	7x5.5 wells
100,000	3	2
200,000	5	4
400,000	11	8
800,000	22	17
1,600,000	43	33

NGL Water Solutions, LLC

Increasing tubing size will decrease friction losses and conserve horsepower.

2 example tubing sizes and their impact on friction losses.

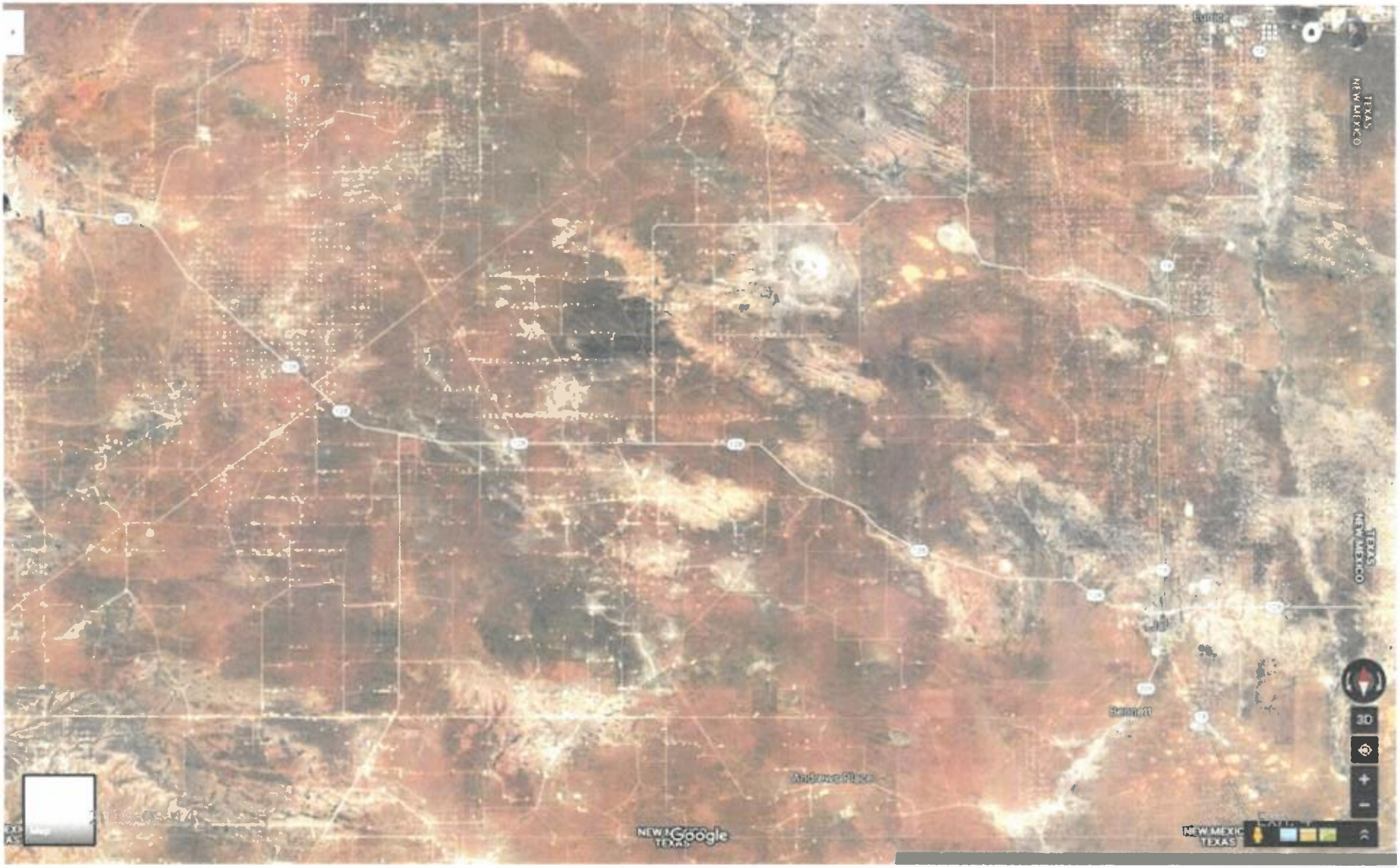
Pressure losses at various injection rates



Exh. A4

NGL Water Solutions, LLC

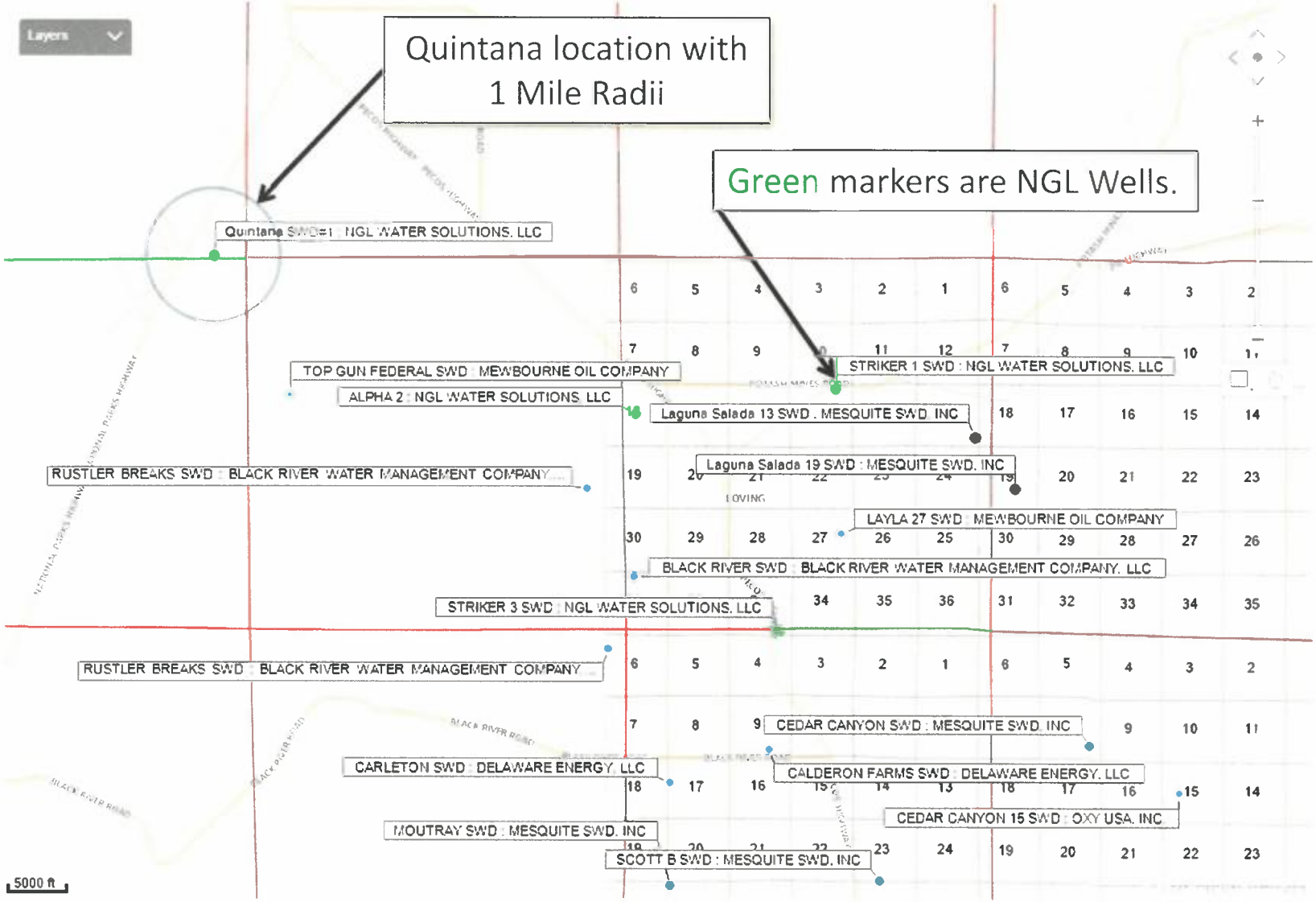
Terrain is level and infrastructure is plentiful.



NGL Water Solutions, LLC

Exh. A5

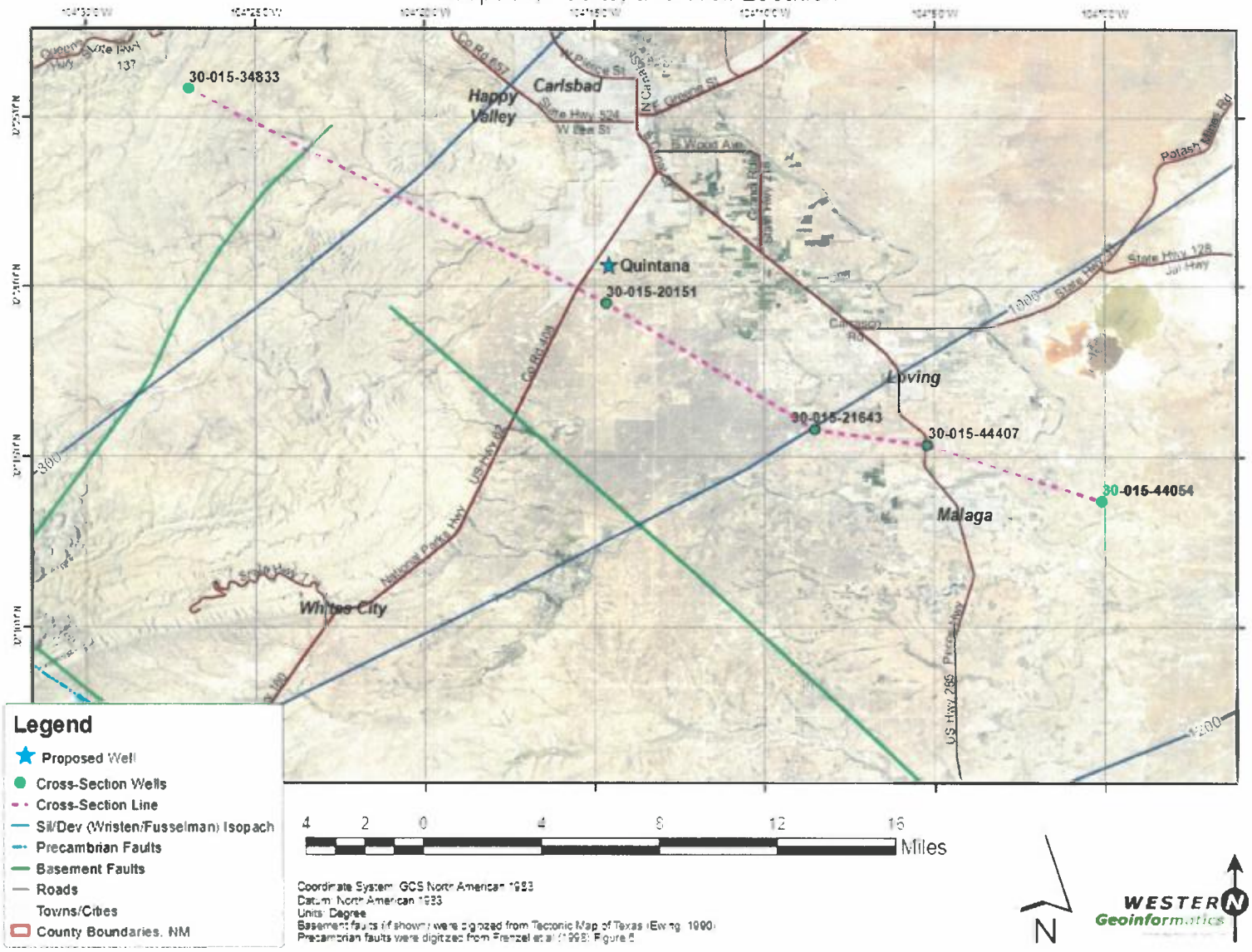
Wells injecting water into the Devonian formation in the area.
Area is roughly 22 miles (E-W) by 15 miles (N-S)



NGL Water Solutions, LLC

Exh. A6

Sil/Dev Thickness at Quintana is 900 feet

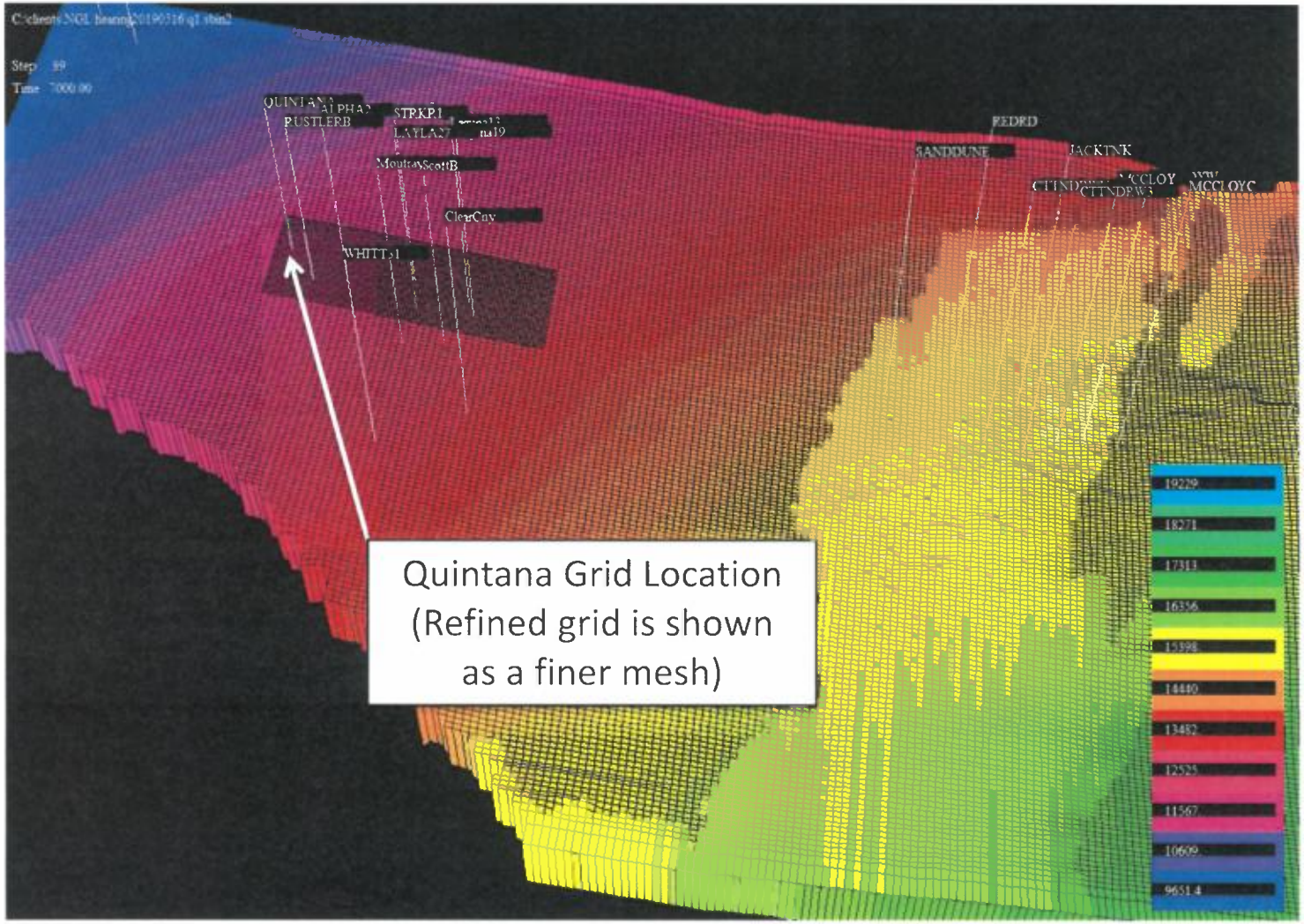


NGL Water Solutions, LLC

Simulation Grid matches Structure and Thickness

Reservoir Simulation grid incorporates the NGL proposed wells and the close offsets.

Observation wells are placed in grid corners to monitor the large scale pressure distribution.

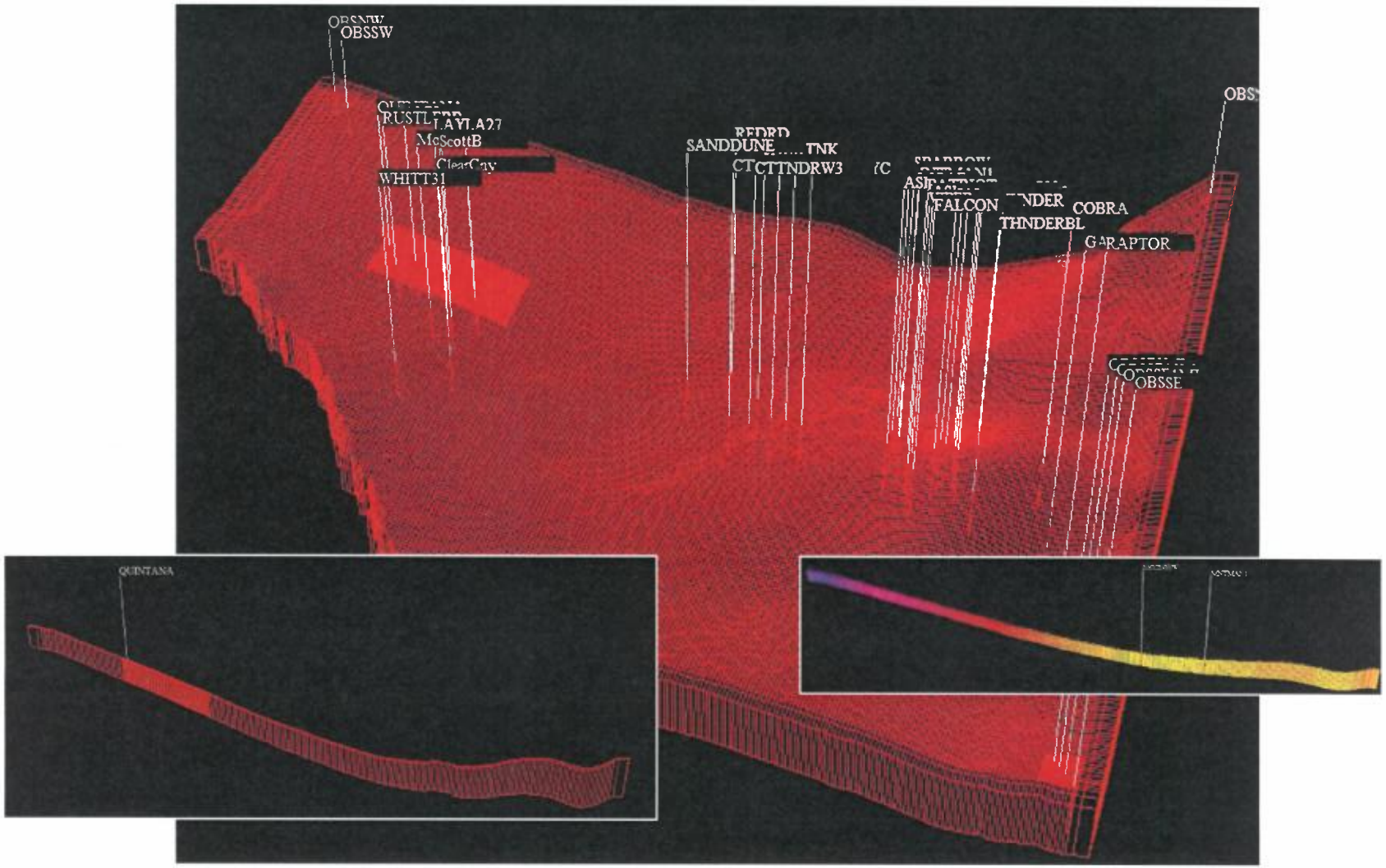


Exh. A8

NGL Water Solutions, LLC

3D view of grid shows Structural Relief.

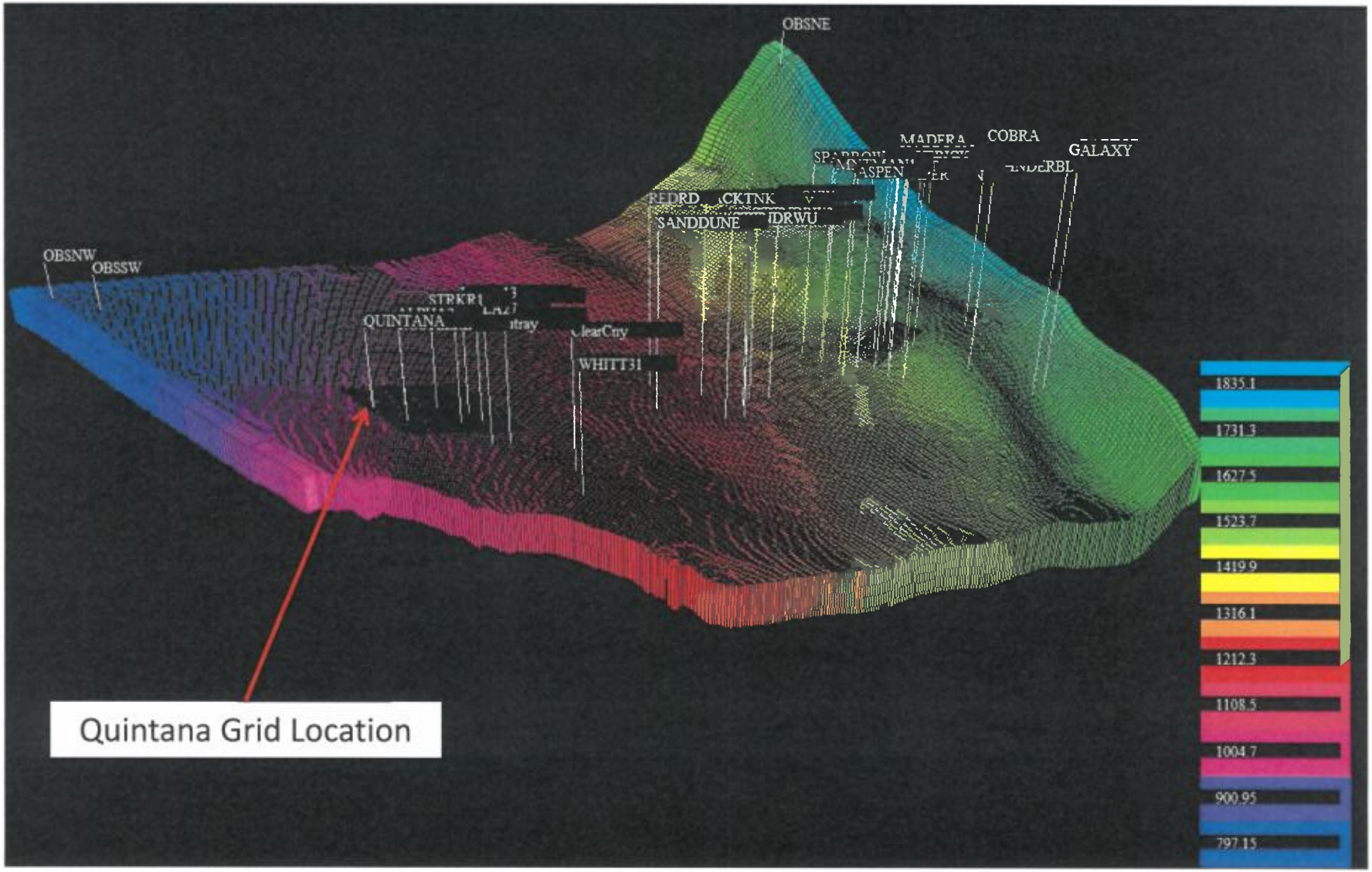
Thickness is accurate but not easy to see at this aspect ratio.



Exh. A9

NGL Water Solutions, LLC

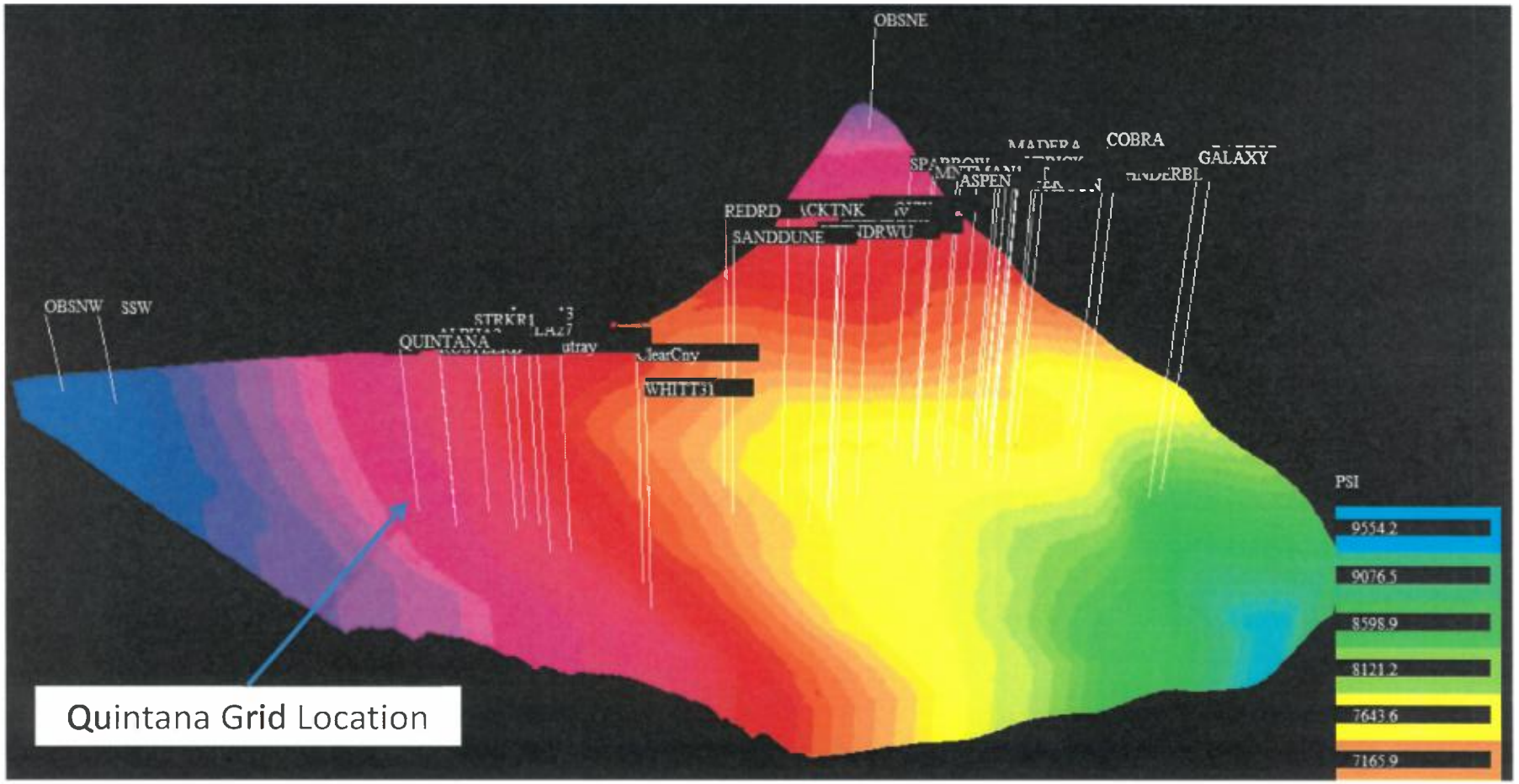
Light Blue color to the North East represents the thickest Sil/Dev.



NGL Water Solutions, LLC

Exh. A10

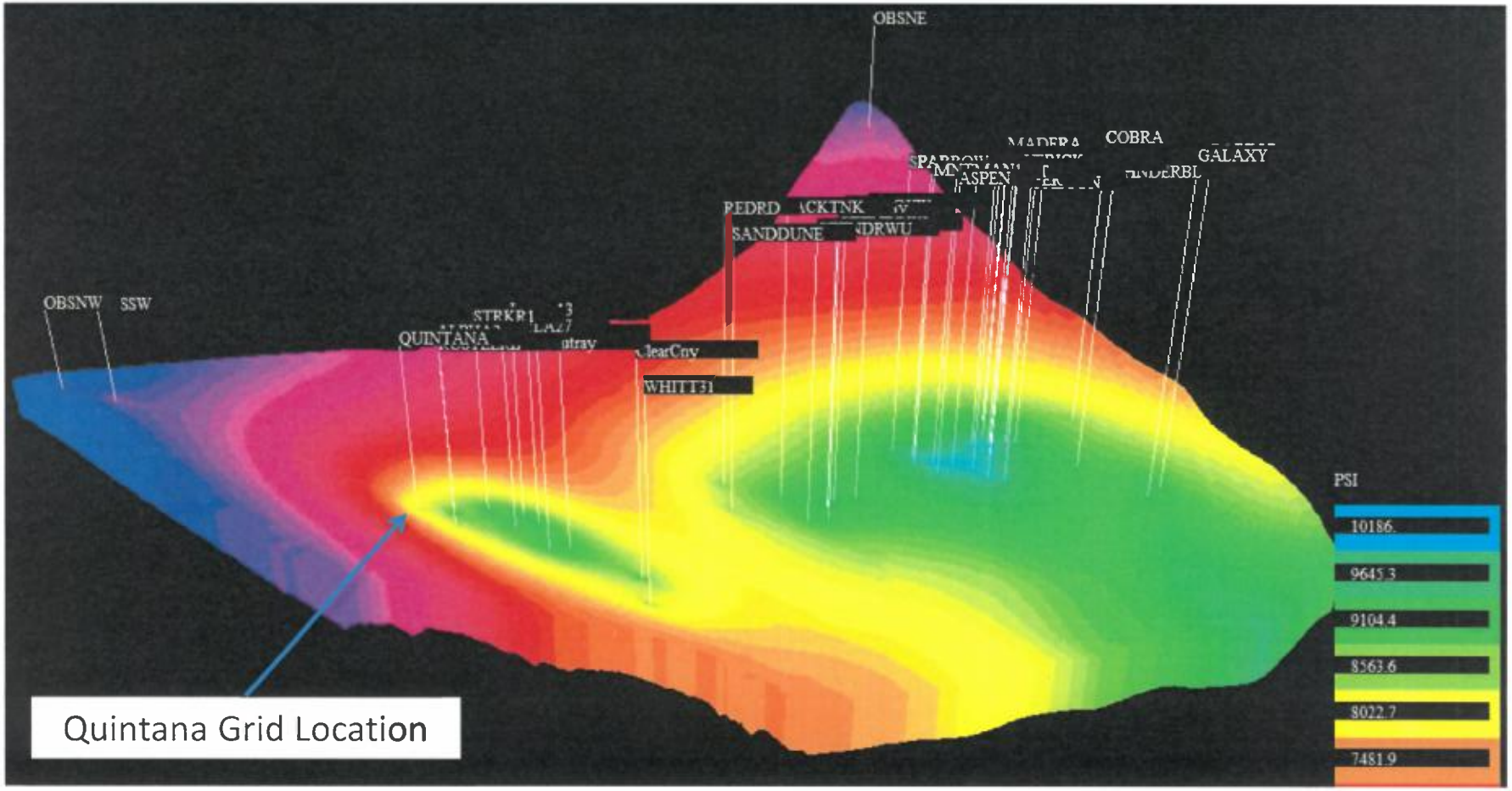
Initial pressure is equilibrated by the model based on grid cell depth, fluids(water) and capillary pressure.



NGL Water Solutions, LLC

Exh. A11

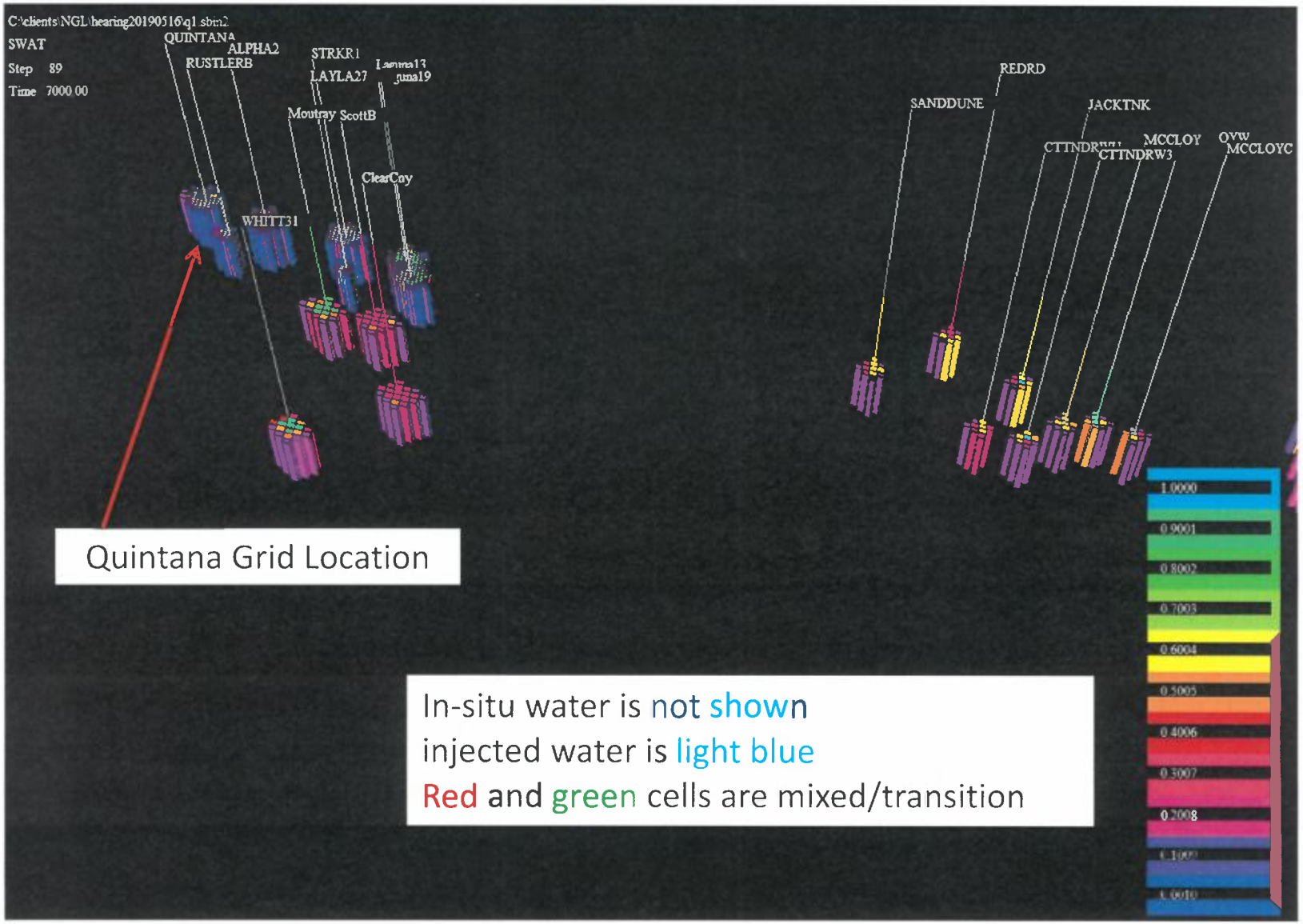
Pressure at 20 years is affected by original pressure, injected volumes, and the ability of the reservoir to dissipate pressure.



Exh. A12

NGL Water Solutions, LLC

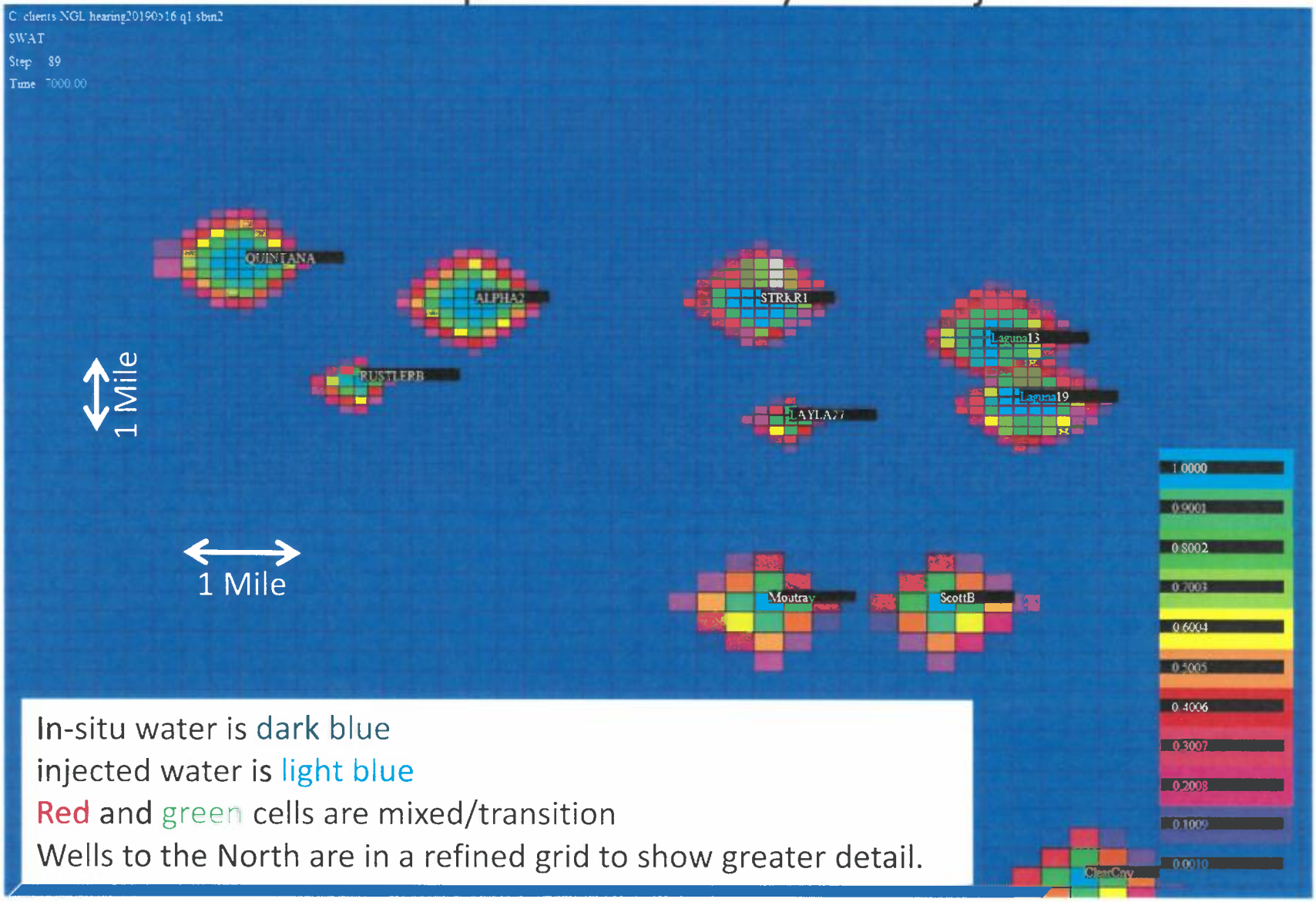
Large scale saturation profiles after 20 years of injection.



Exh. A13

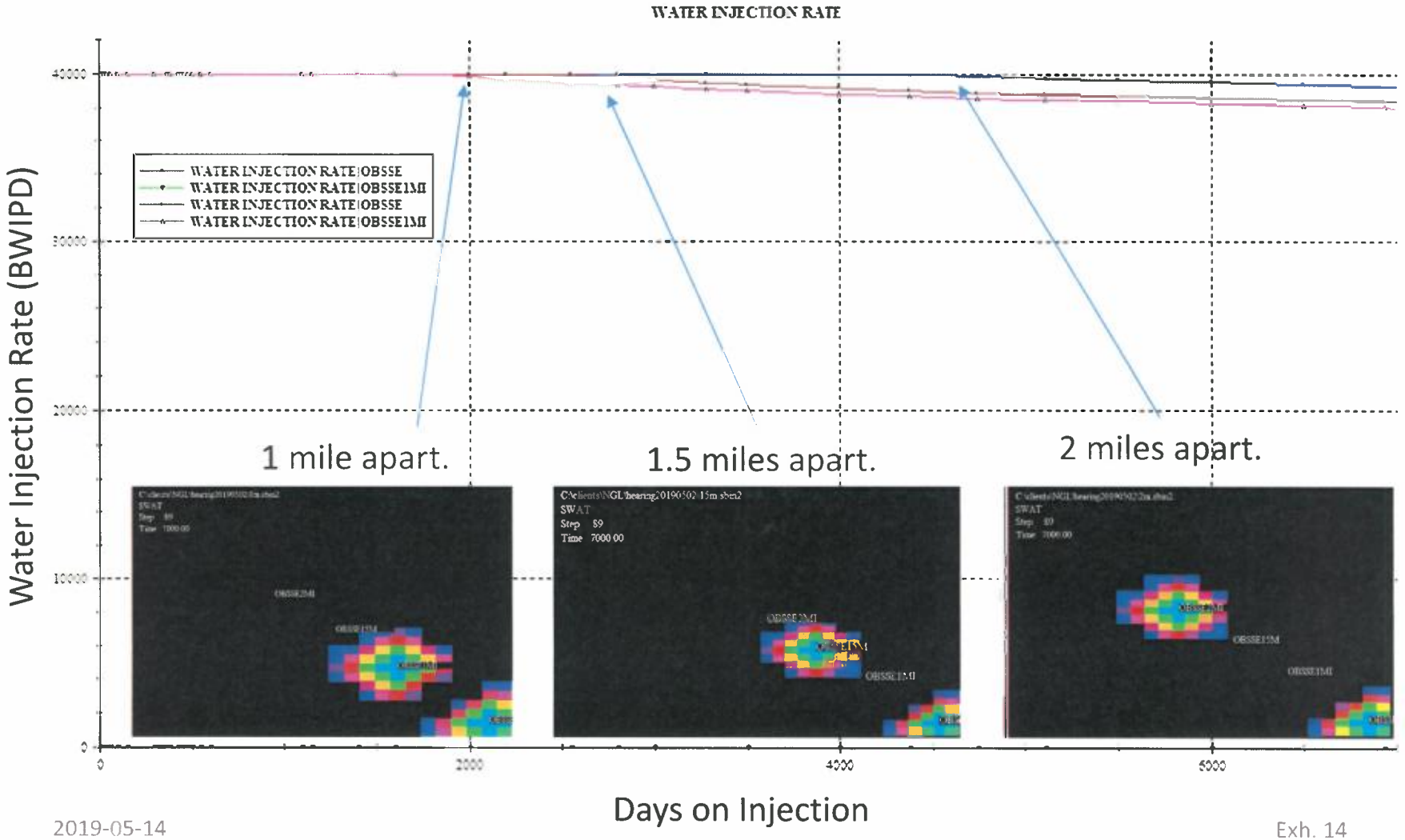
NGL Water Solutions, LLC

Detailed saturation profiles after 20 years of injection.

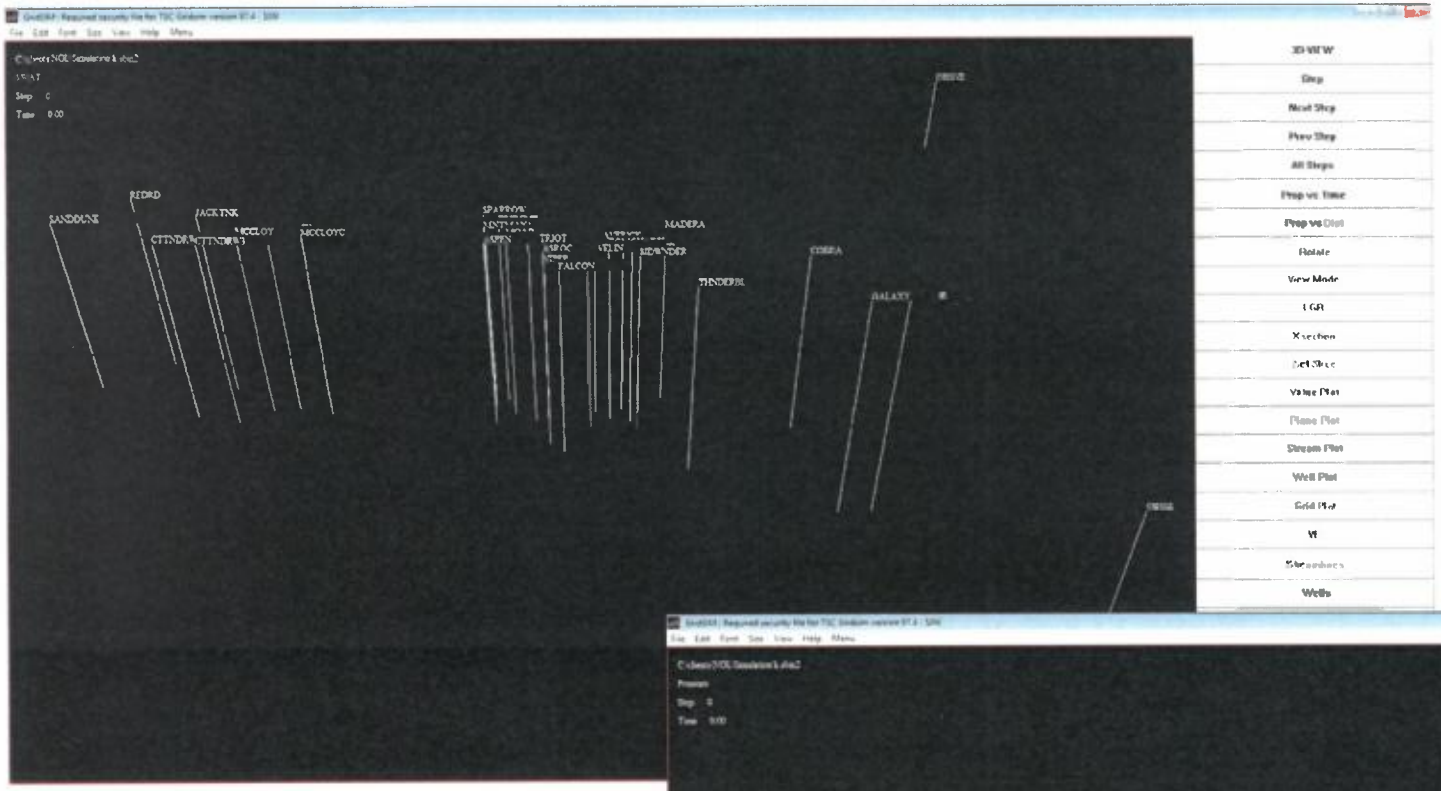


NGL Water Solutions, LLC

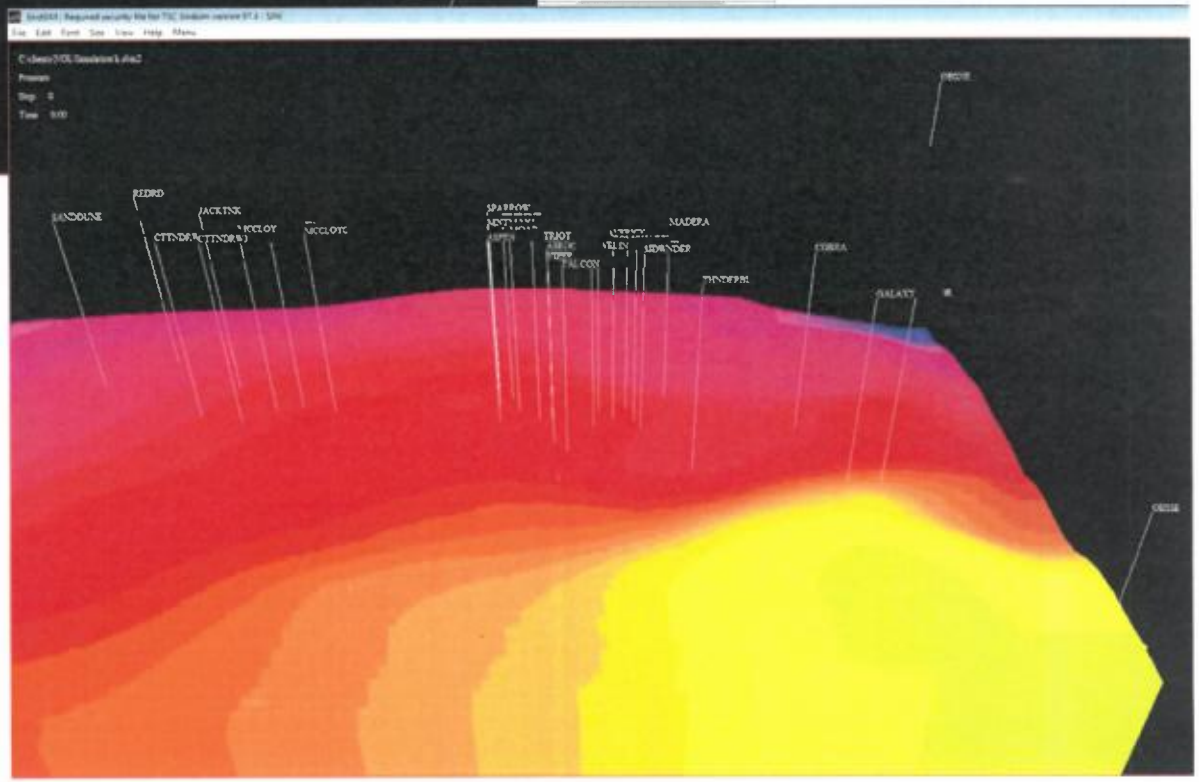
Typical wells showing interference when spaced 1, 1.5, and 2 miles apart.
Closer spacing causes rates to fall, but not significantly.



Exh. A15



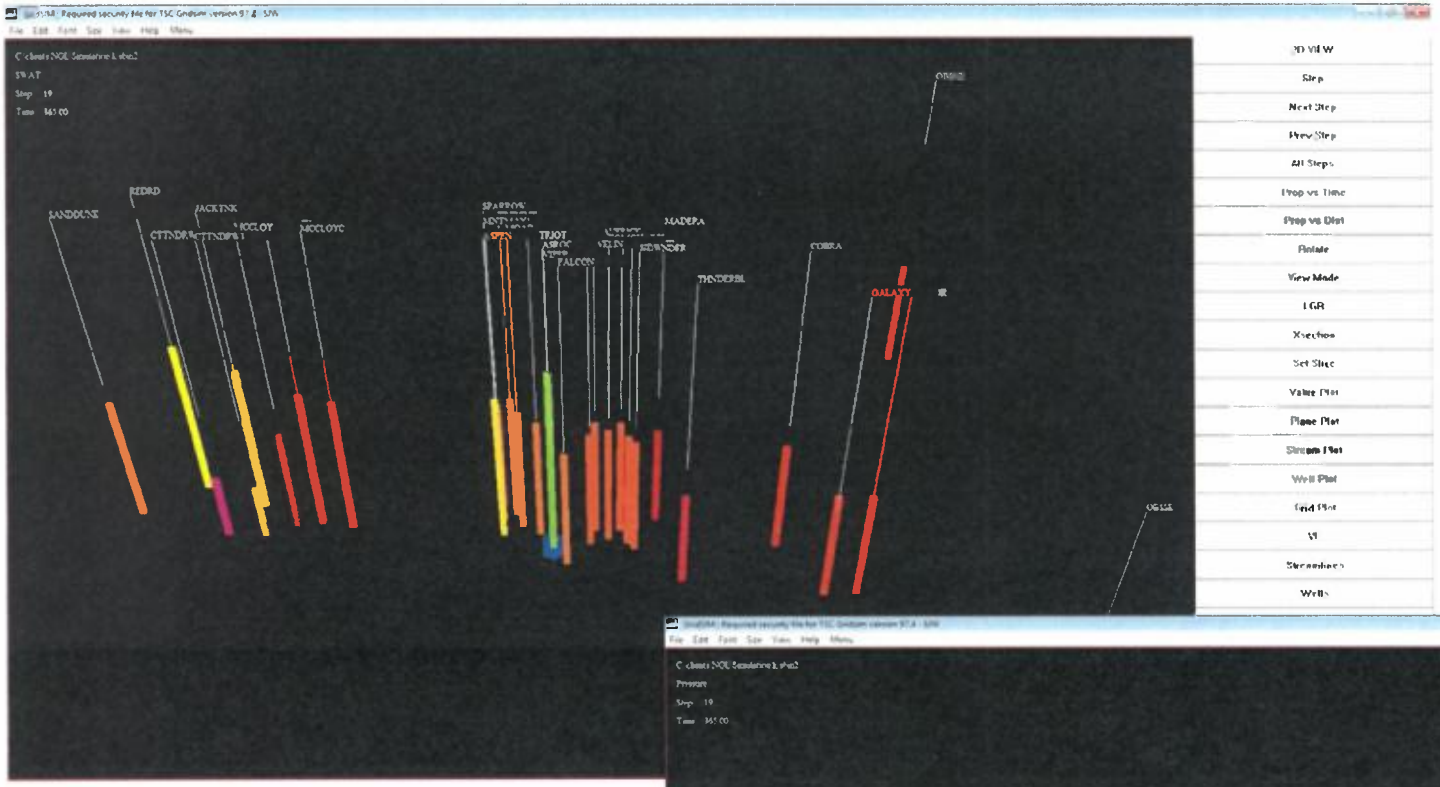
2019
(0 years)



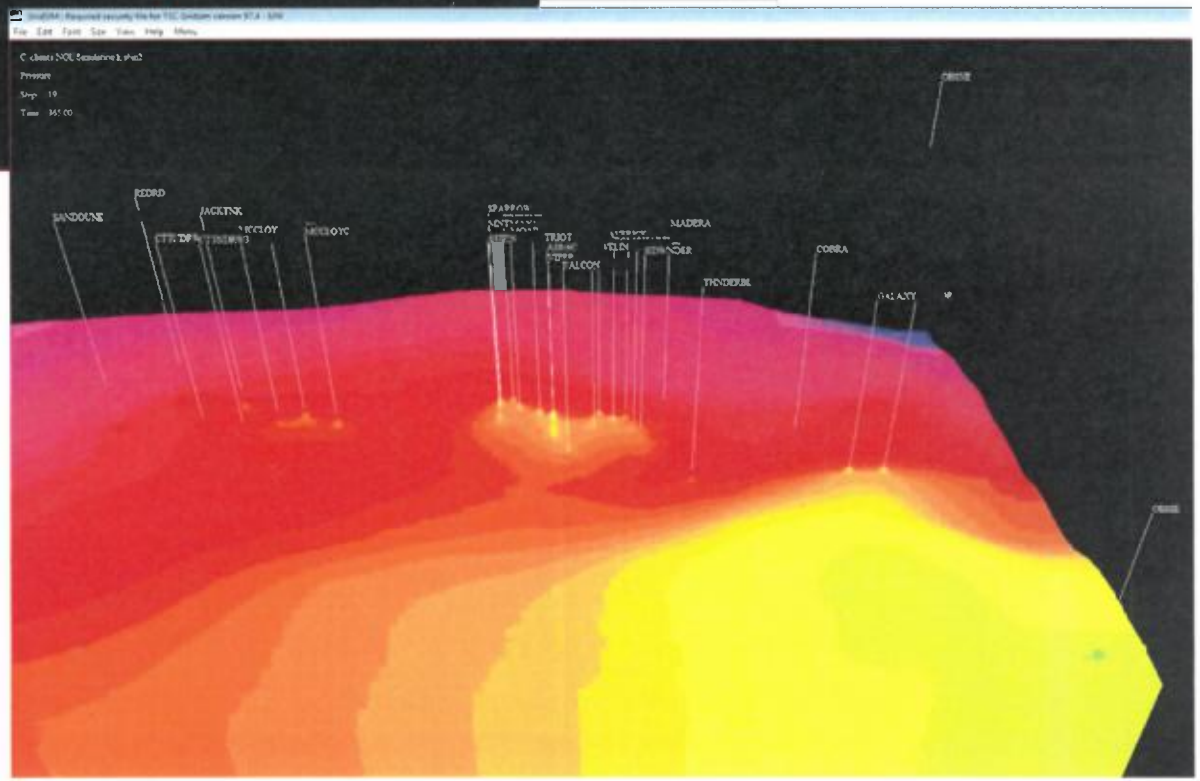
Water movement & Pressure

2019-05-14

Exh. A16



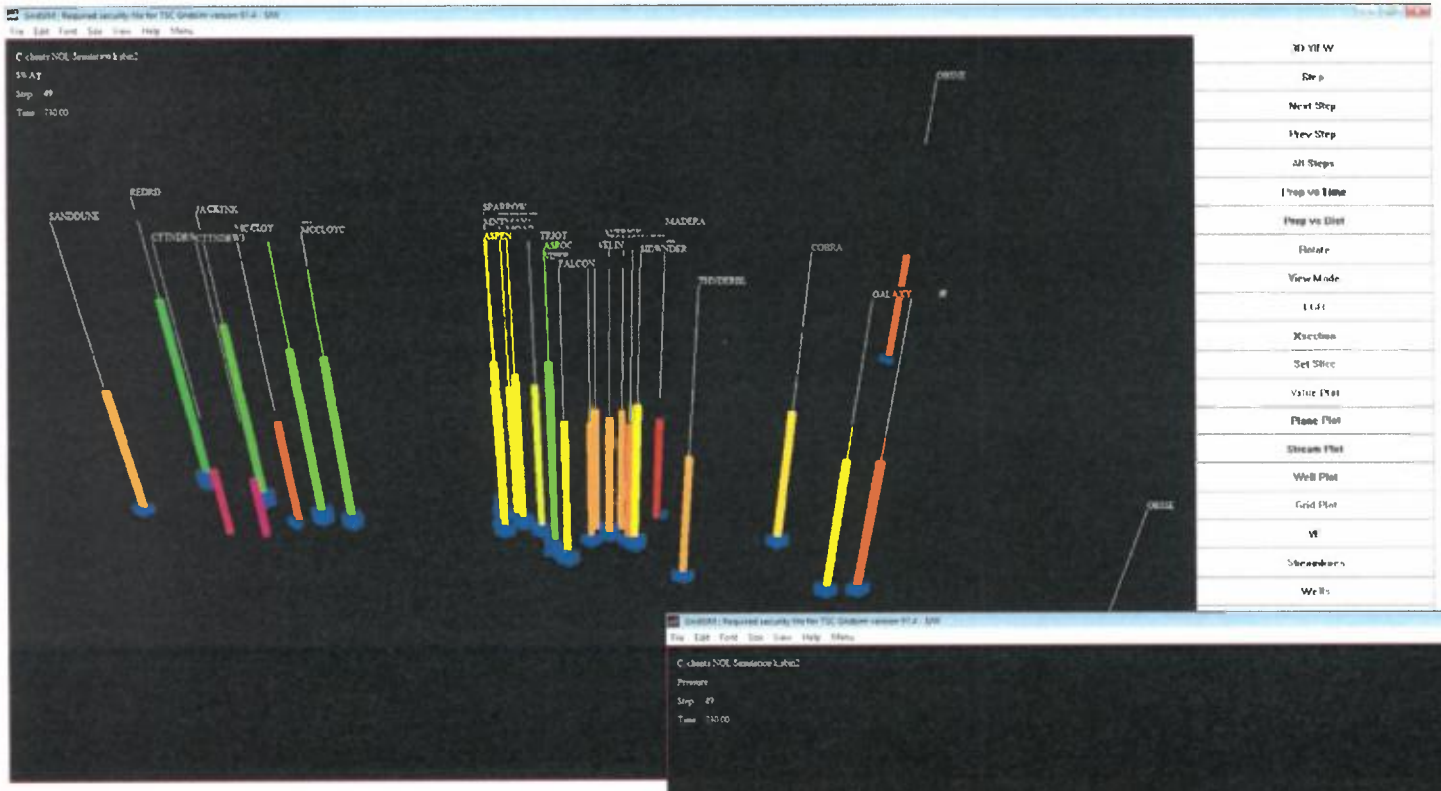
2020
(1 year)

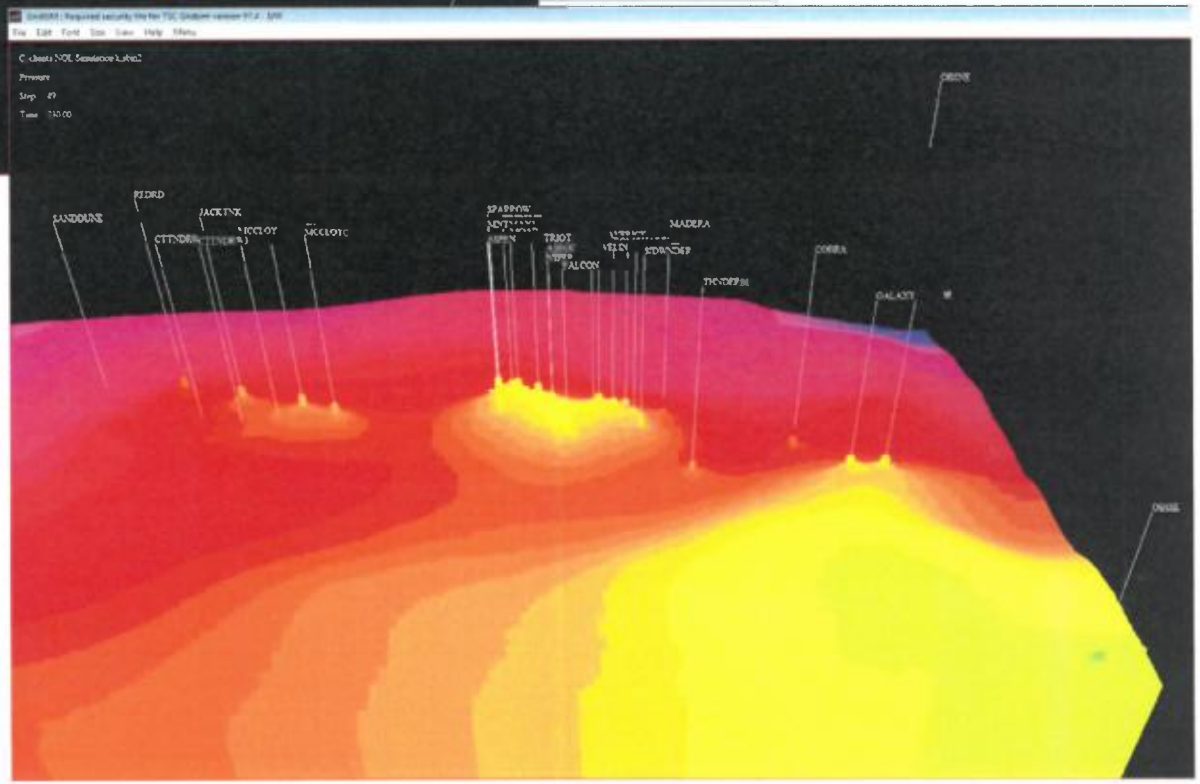


Water movement & Pressure

2019-05-14

Exh. A17



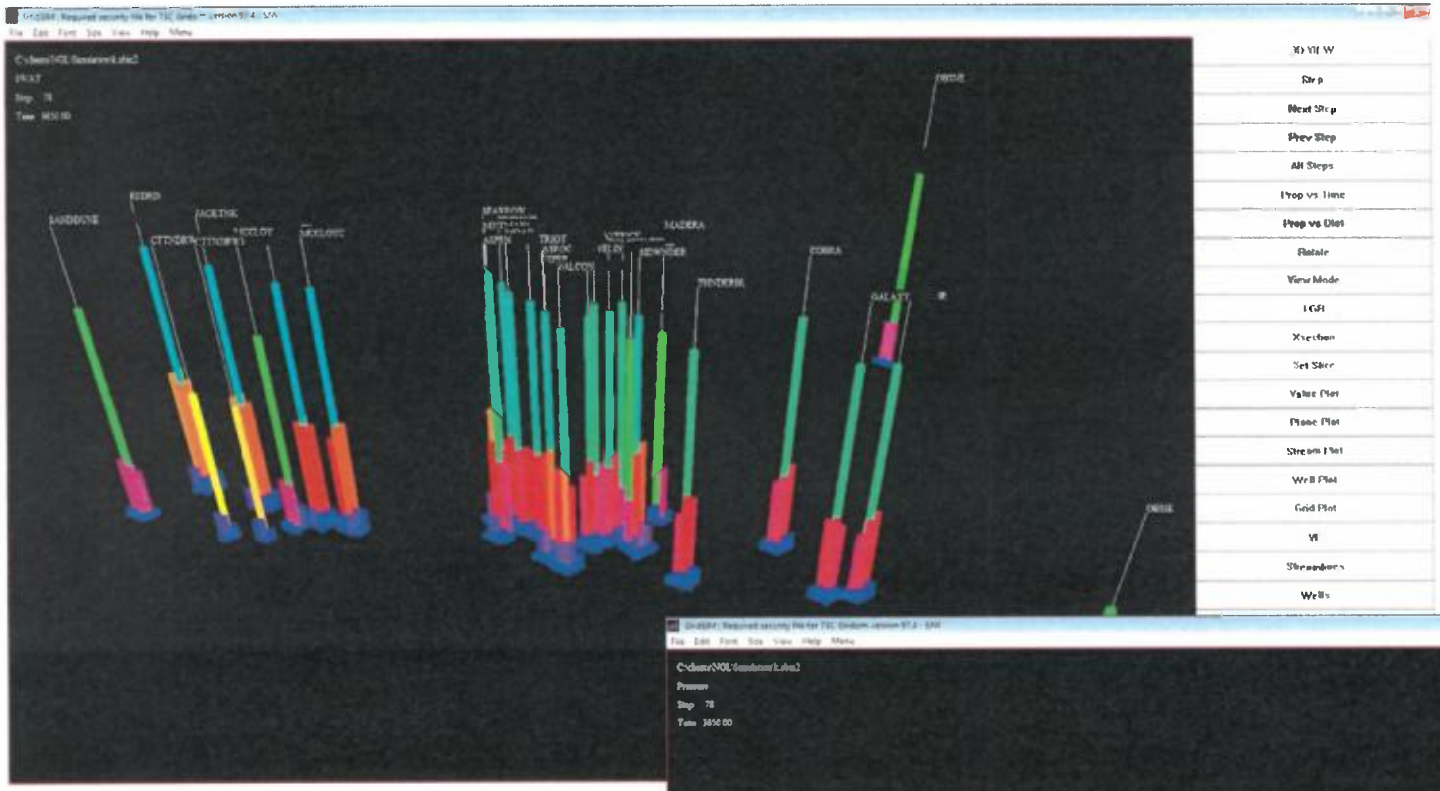


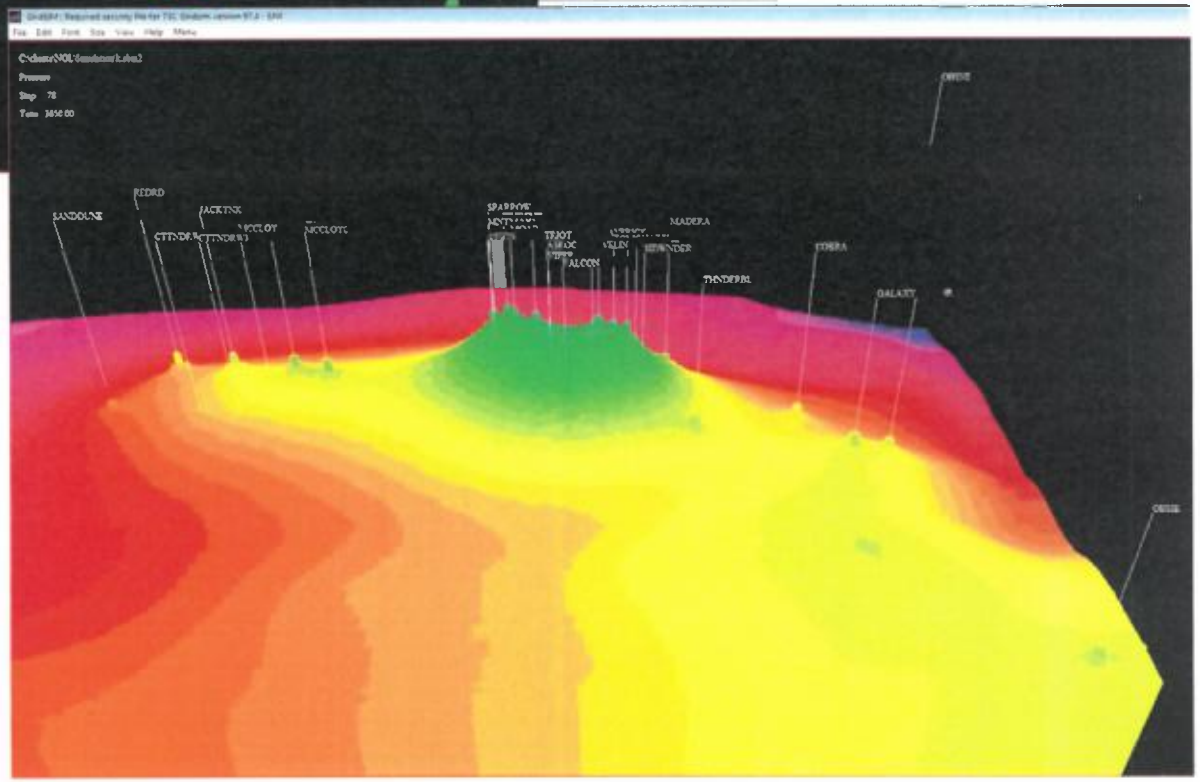
2021 (2 years)

Water movement & Pressure

2019-05-14

Exh. A18



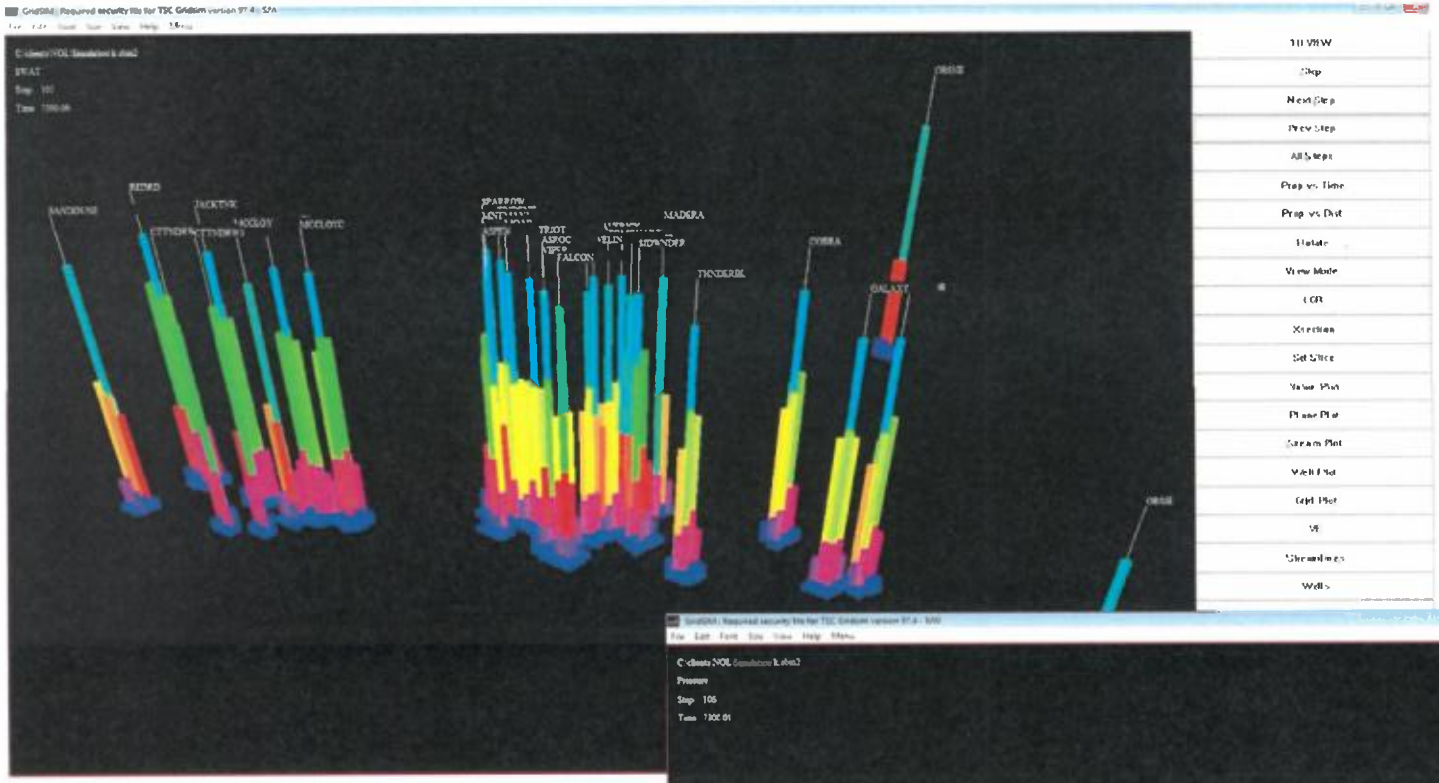


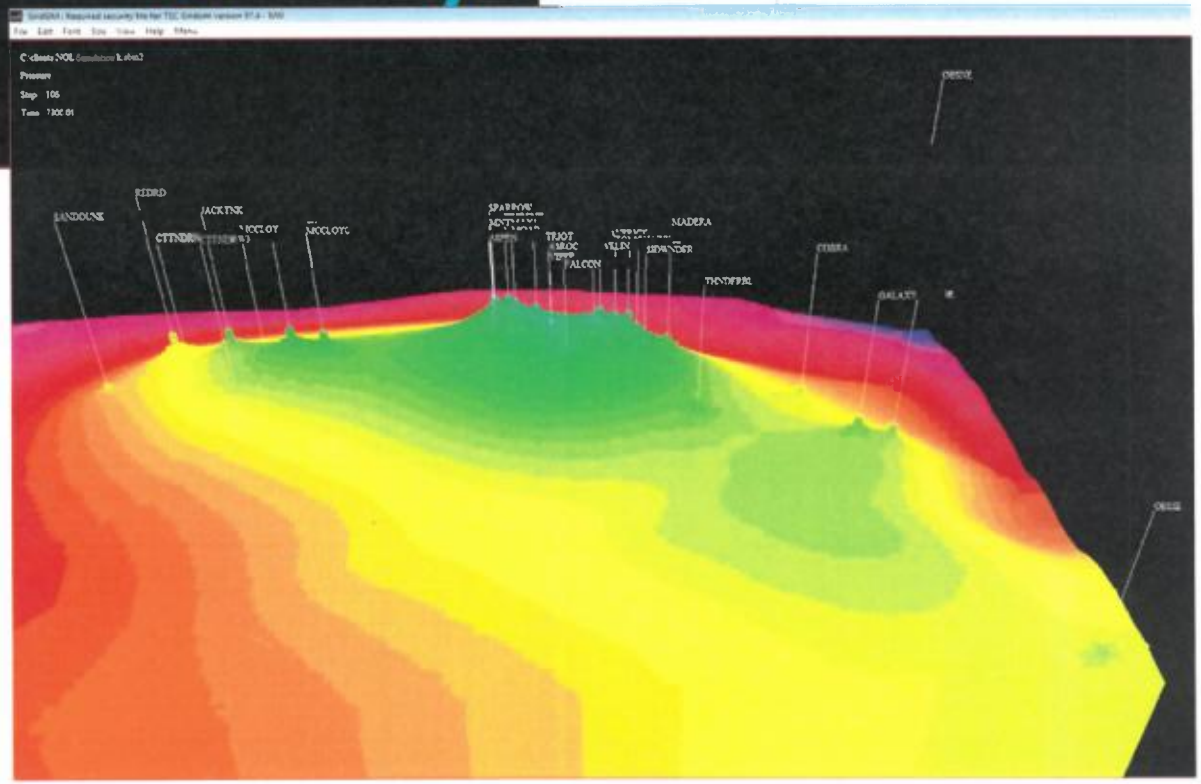
2029
(10 years)

Water movement & Pressure

2019-05-14

Exh. A19





2039
(20 years)

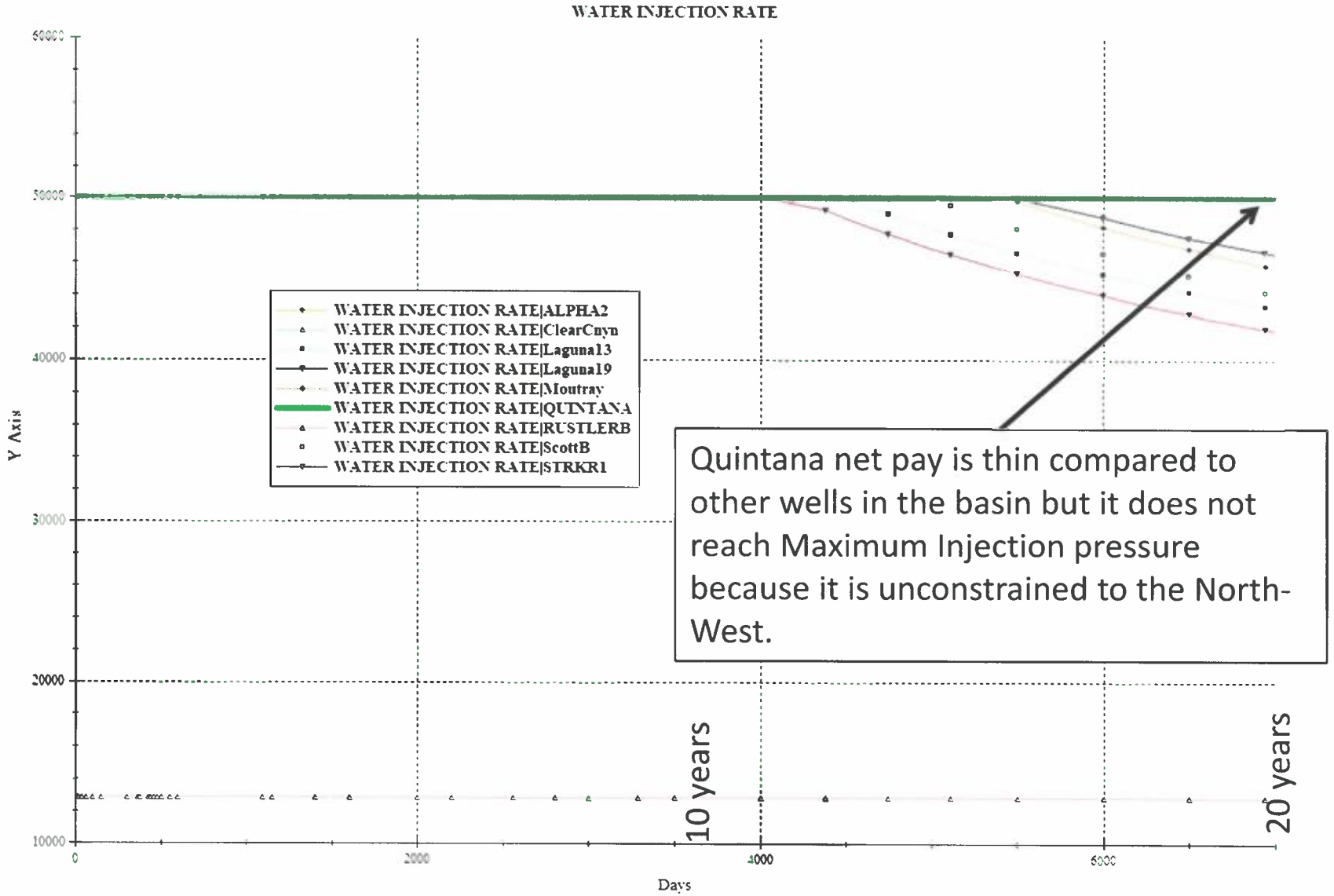
Water movement & Pressure

2019-05-14

NGL Water Solutions, LLC

Exh. A20

Simulation predictions for some individual wells



Quintana net pay is thin compared to other wells in the basin but it does not reach Maximum Injection pressure because it is unconstrained to the North-West.

Exhibit 3

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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO

CASE NO. 20140
(QUINTANA)

AFFIDAVIT OF DR. KATE ZEIGLER

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, Dr. Kate Zeigler, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I am the senior geologist at Zeigler Geologic Consulting, and I provide a wide range of geoscience related services to companies and other entities in Southeastern New Mexico.

3. I have obtained a bachelor's degree in geology from Rice University, a master's degree in paleontology from the University of New Mexico, and a Ph.D. in stratigraphy and paleomagnetism from the University of New Mexico. Additionally, I have completed several surface geologic maps for the New Mexico Bureau of Geology and Mineral Resource's Geologic Mapping Program as well as for independent operators who are exploring prospects within the western Permian Basin. I have also conducted a prior geologic study concerning what is

commonly referred to as the Devonian and Silurian formations in Southeastern New Mexico to help determine whether the approval of 7" by 5 ½" tubing is appropriate in Devonian and Silurian salt water disposal wells approved by the New Mexico Oil Conservation Division.

4. I am familiar with the application that NGL Water Solutions Permian, LLC ("NGL") has filed in this matter, and I have conducted a geologic study of the lands which are the subject matter of the application. A copy of my geologic study, including cross sections, a structure map and isopach are is included in Attachment A to this affidavit.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Quintana SWD #1 well (Case No. 20140), which is a salt water disposal well.

6. I have been informed that the injection intervals for the well will be isolated to the Devonian and Silurian formations (also referred to as the Wristen Group and Fusselman Formation) and the well will have four strings of casing protecting the fresh water aquifer, the salt-bearing interval, the Permian aged rocks through the Wolfcamp Formation. The deepest casing is 7 5/8", which is cemented and cement is circulated on the 7 5/8" casing.

7. The well will be spaced out and not located closer than approximately 1 mile from other disposal wells that have been approved for injection into the Devonian and Silurian formations.

8. The injection zone for the well is located below the Woodford Shale. The Woodford Shale is an Upper Devonian unit which has low porosity and permeability and consists predominantly of shale and mudstone with some carbonate beds. The Woodford Shale acts as a permeability boundary to prevent fluids from moving upward out of the underlying formations. The Woodford Shale formation in the areas where the well is located is between 50 feet and 90 feet thick.

9. Below the injection zone for the well is the Ordovician formation, also referred to as the Simpson Group. which contains sequences of shale that make up approximately 55% of the total thickness of the formation in any given place and can likewise act as a permeability boundary which prevents fluids from migrating downwards into deeper formations and the basement rock. In the areas where the well is located, the Ordovician formation is between 100' and 150' feet thick and, as a result, there is a significant thickness in this lower shale. Below the Ordovician is the Ellenburger Formation, which is up to 600 feet thick.

10. Based on my geologic study of the area, it is my opinion that the approved injection zone for the well is located below the base of the Woodford Shale formation and above the Simpson Group formation, both of which consist of significant shale deposits. Evidence indicates that shale formations located above and below the approved injection zones will likely restrict fluids from migrating beyond the approved injection zones for the well.

11. The well will primarily be injecting fluids into the Wristen Group and Fusselman Formation, with some fluids potentially being injected into the Upper Montoya Group. Each of these rock units are located within what is commonly referred to by operators and the Division as the "Devonian-Silurian" formations. These zones consist of a very thick sequence of limestone and dolostone which has significant primary and secondary porosity and permeability that is collectively between 800 and 900 feet thick.

12. It is my opinion that there is no risk to freshwater resources for injection within the Wristen Group, Fusselman, and Upper Montoya Group because of the depth of these sub-formations and the upper shale permeability boundary created by the Woodford Shale.

13. I have also studied the location of known fault lines within the area where the well is proposed to be drilled and the closest known fault line to the well is located approximately 6 miles away from where the well is proposed to be drilled.

14. There are no currently recognized production shales within the Wristen Group, Fusselman Formation, and Upper Montoya Group in this part of the western Permian Basin. While there may be some isolated traps located within these sub-formations, it takes significant ability with imaging to be able to locate these deposits in order to properly target them.

15. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

16. In my opinion, the granting of this application is in the interests of conservation and the prevention of waste.

[Signature page follows]

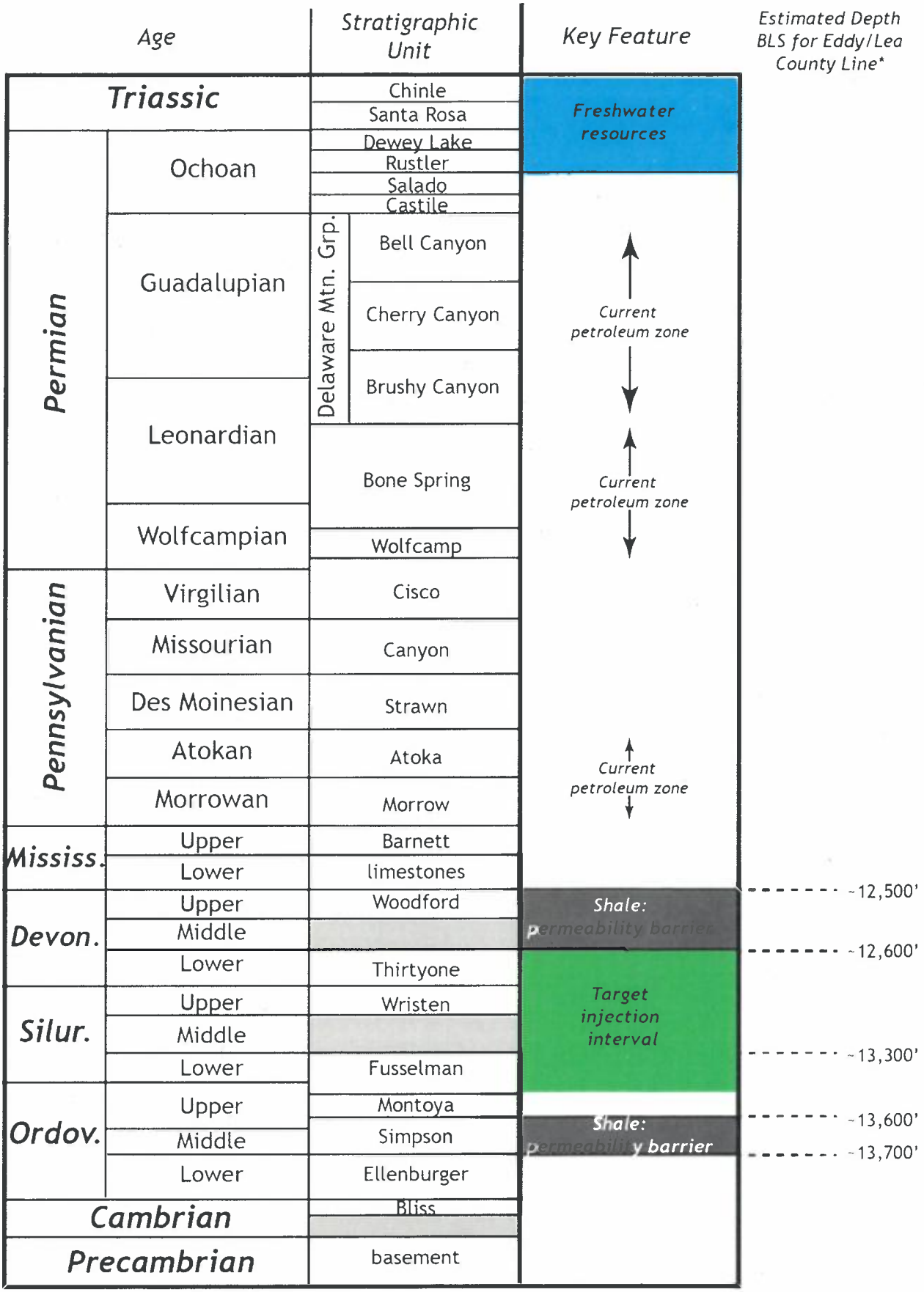
Dr. Kate Zeigler

SUBSCRIBED AND SWORN to before me this 13th day of May, 2019 by Dr. Kate Zeigler.

Notary Public

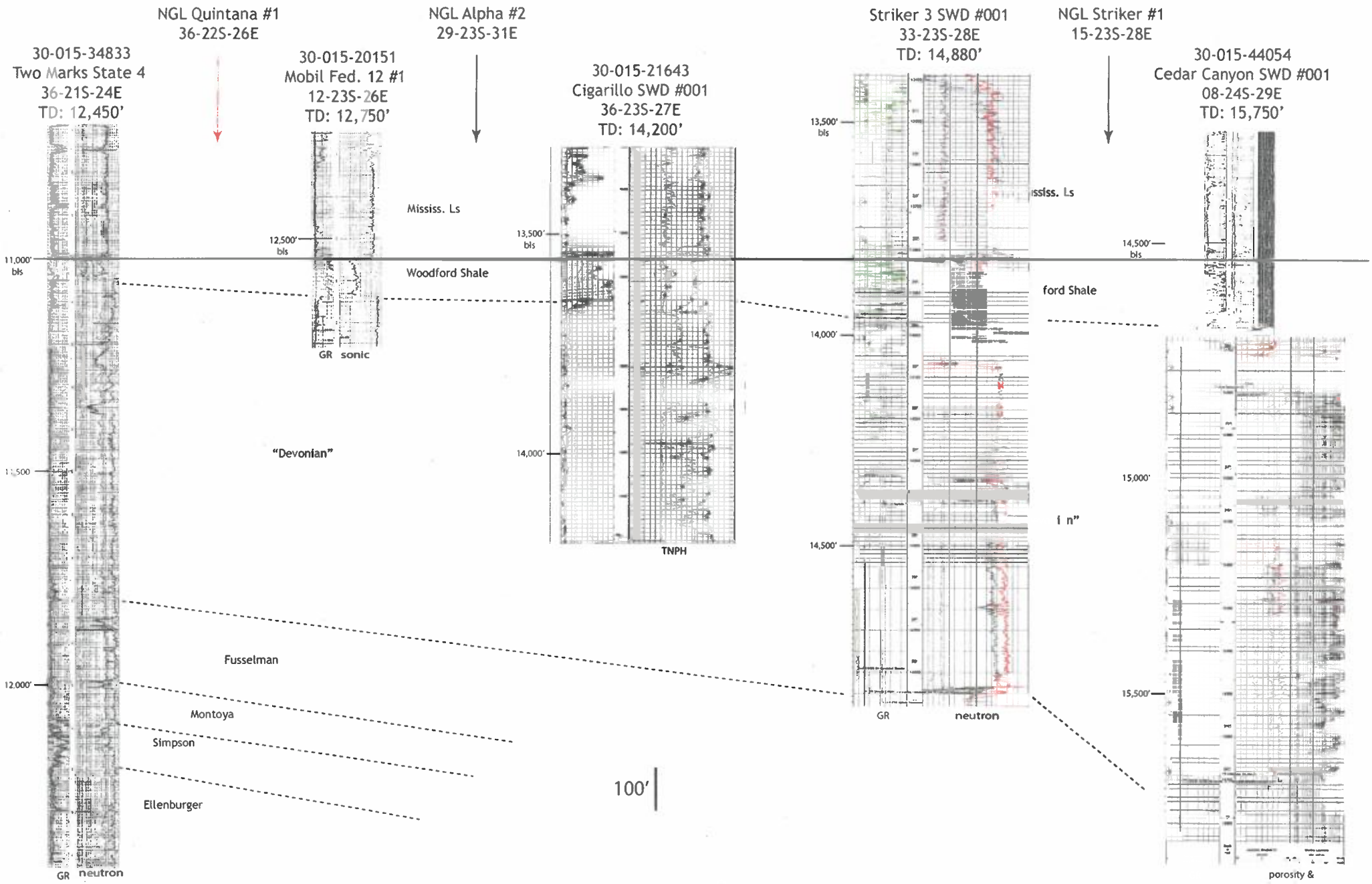
My commission expires: 4/20/22

OFFICIAL SEAL
EMELI R. FERRERO
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires 4/20/22

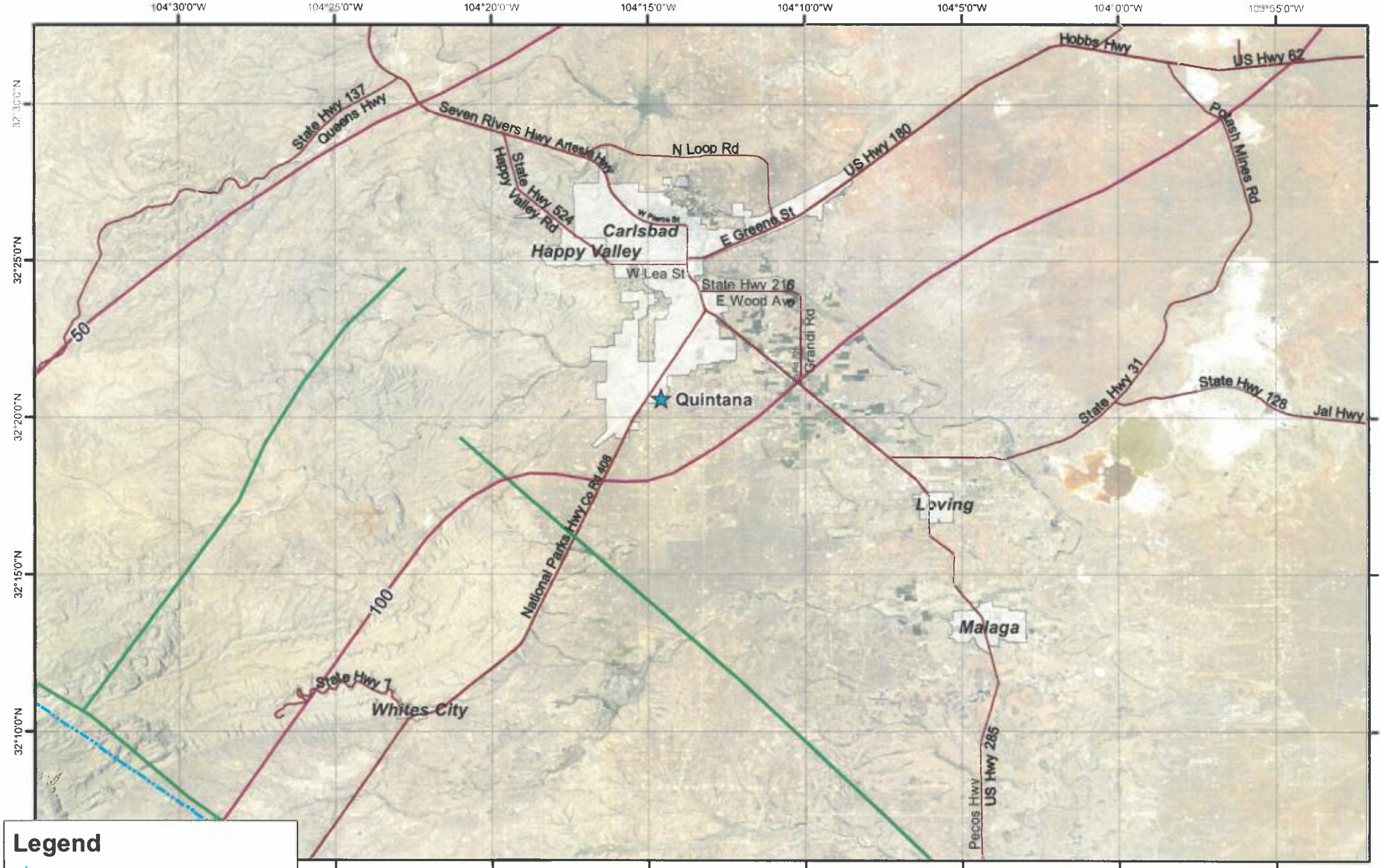


Stratigraphic chart for the Delaware Basin from Broadhead (2017).
* Based on data from 30-015-20151 Mobil Fed. 12 #1 (12-23S-26E) and 30-015-34833 Two Marks State 4 (36-21S-24E).

EXHIBIT A


NGL Quintana #1
36-22S-26E
NGL Alpha #2
29-23S-31E
Striker 3 SWD #001
33-23S-28E
TD: 14,880'
NGL Striker #1
15-23S-28E
30-015-34833
Two Marks State 4
36-21S-24E
TD: 12,450'
30-015-20151
Mobil Fed. 12 #1
12-23S-26E
TD: 12,750'
30-015-21643
Cigarillo SWD #001
36-23S-27E
TD: 14,200'
30-015-44054
Cedar Canyon SWD #001
08-24S-29E
TD: 15,750'
11,000' bls
12,500' bls
13,500' bls
14,000'
14,500' bls
Mississ. Ls
Woodford Shale
GR sonic
TNPH
GR neutron
"Devonian"
Fusselman
Montoya
Simpson
Ellenburger
12,000'
15,000'
15,500'
100'
porosity &

Late Devonian Isopach, Faults, and Well Location



Legend

- Proposed Well
- Late Devonian (Woodford) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

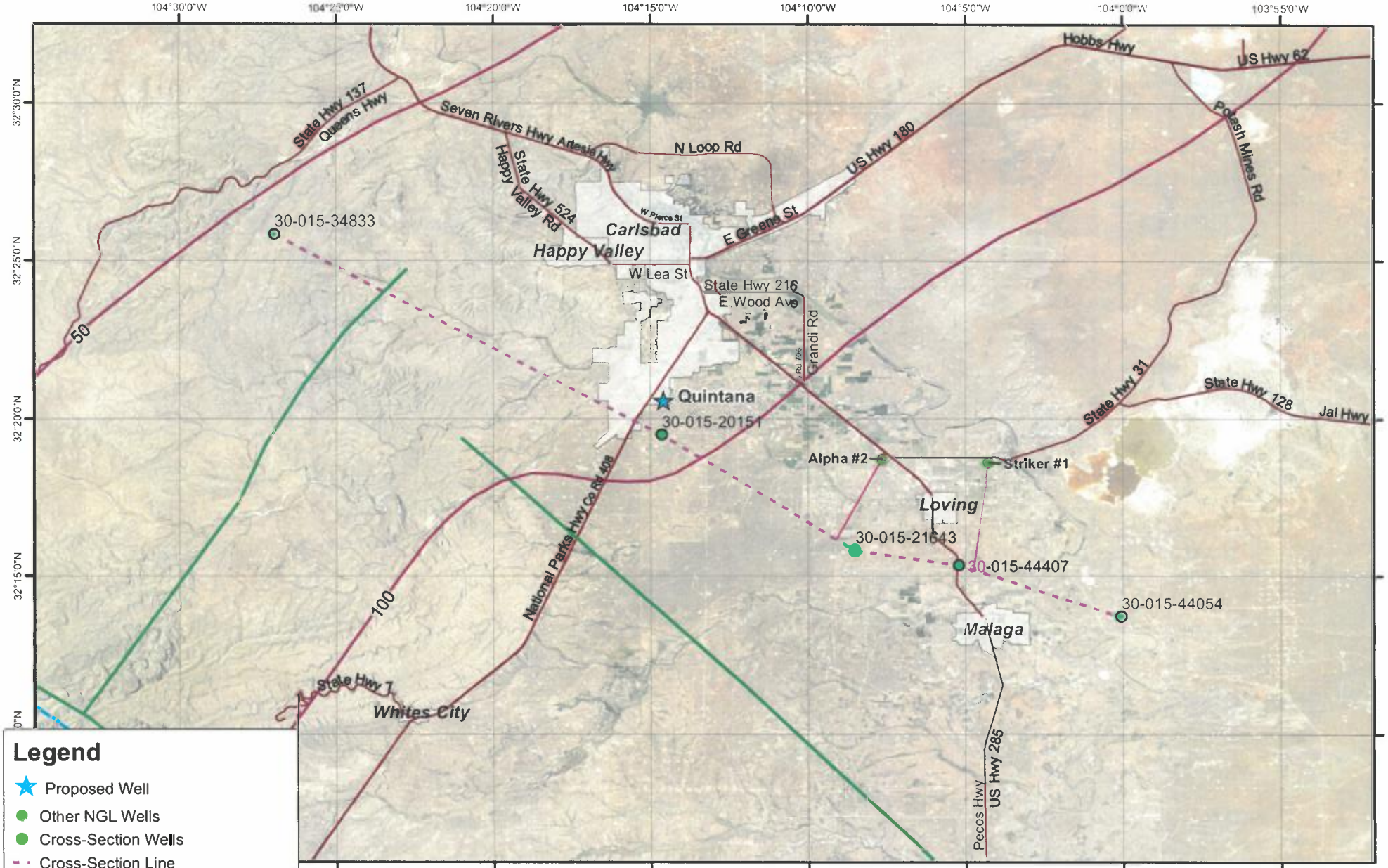
5 2.5 0 5 10 15 20 Miles

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

N

WESTERN Geoinformatics

Late Devonian Isopach, Faults, and Well Location



Legend

- Proposed Well
- Other NGL Wells
- Cross-Section Wells
- Cross-Section Line
- Tie_Lines
- Late Devonian (Woodford) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

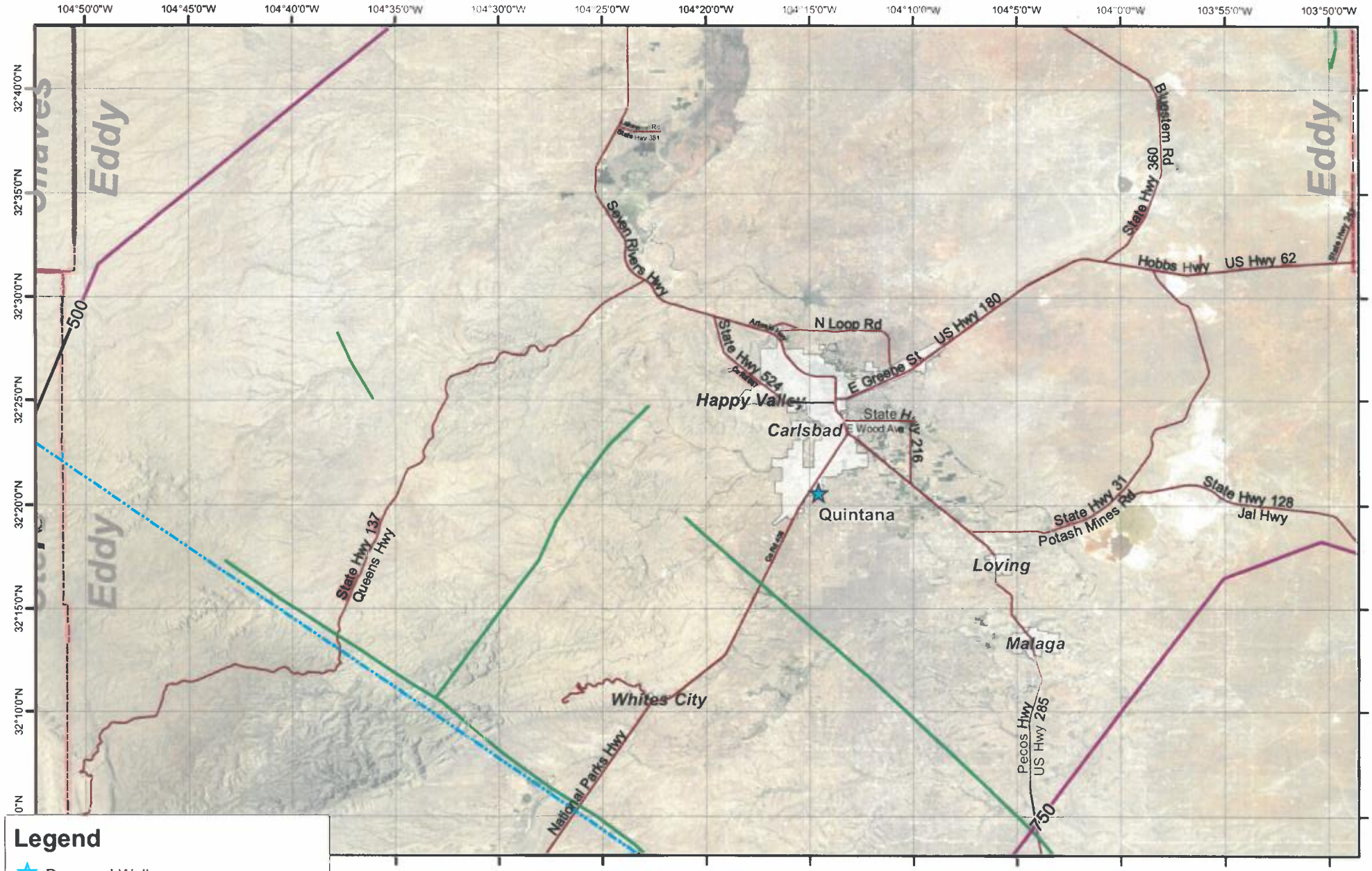
5 2.5 0 5 10 15 20 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics

Lower Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Lower Ordovician (Ellenburger) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

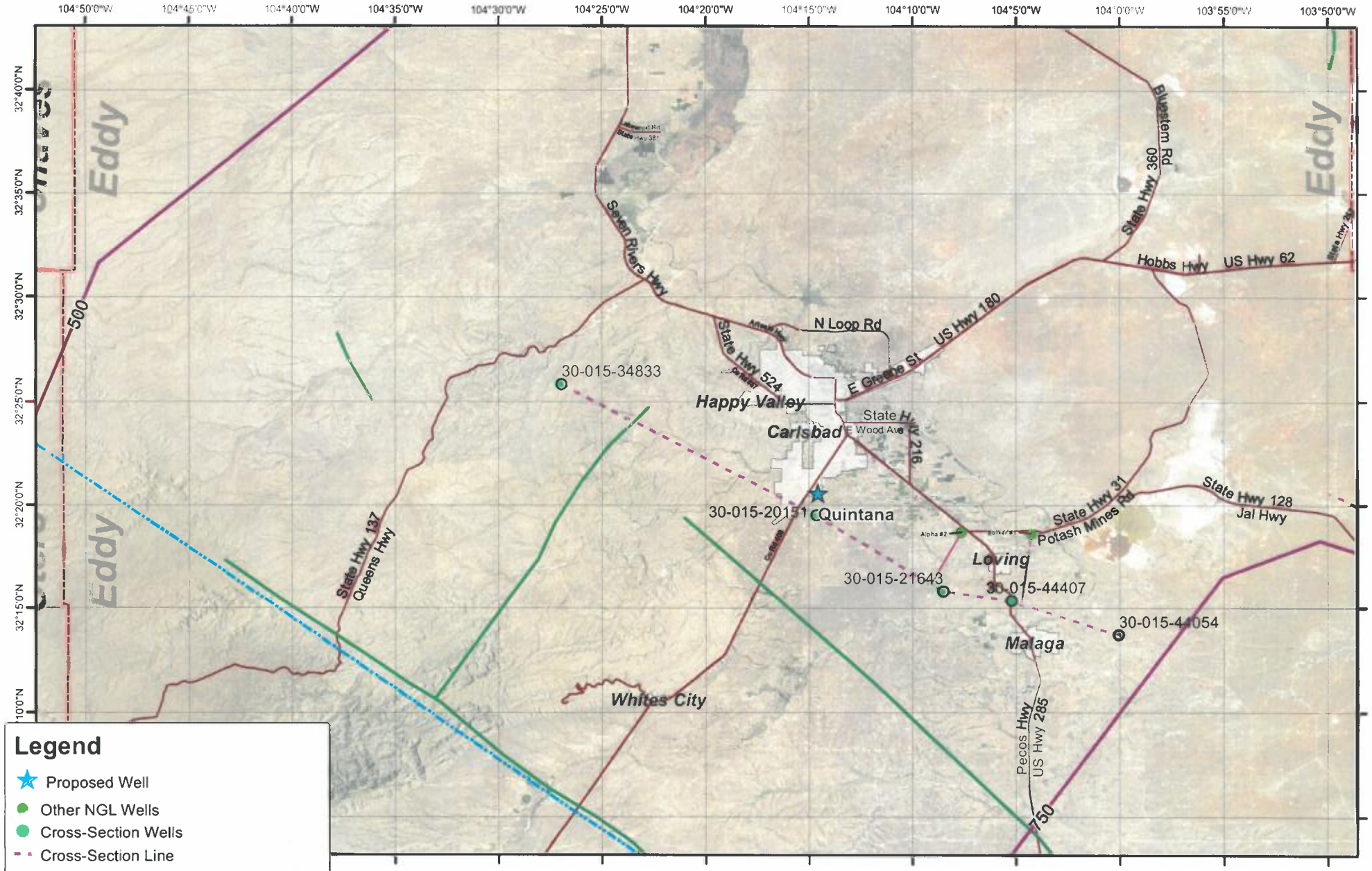
7.5 3.75 0 7.5 15 22.5 30 Miles

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

N

WESTERN Geoinformatics

Lower Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Other NGL Wells
- Cross-Section Wells
- Cross-Section Line
- Tie_Lines
- Lower Ordovician (Ellenburger) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

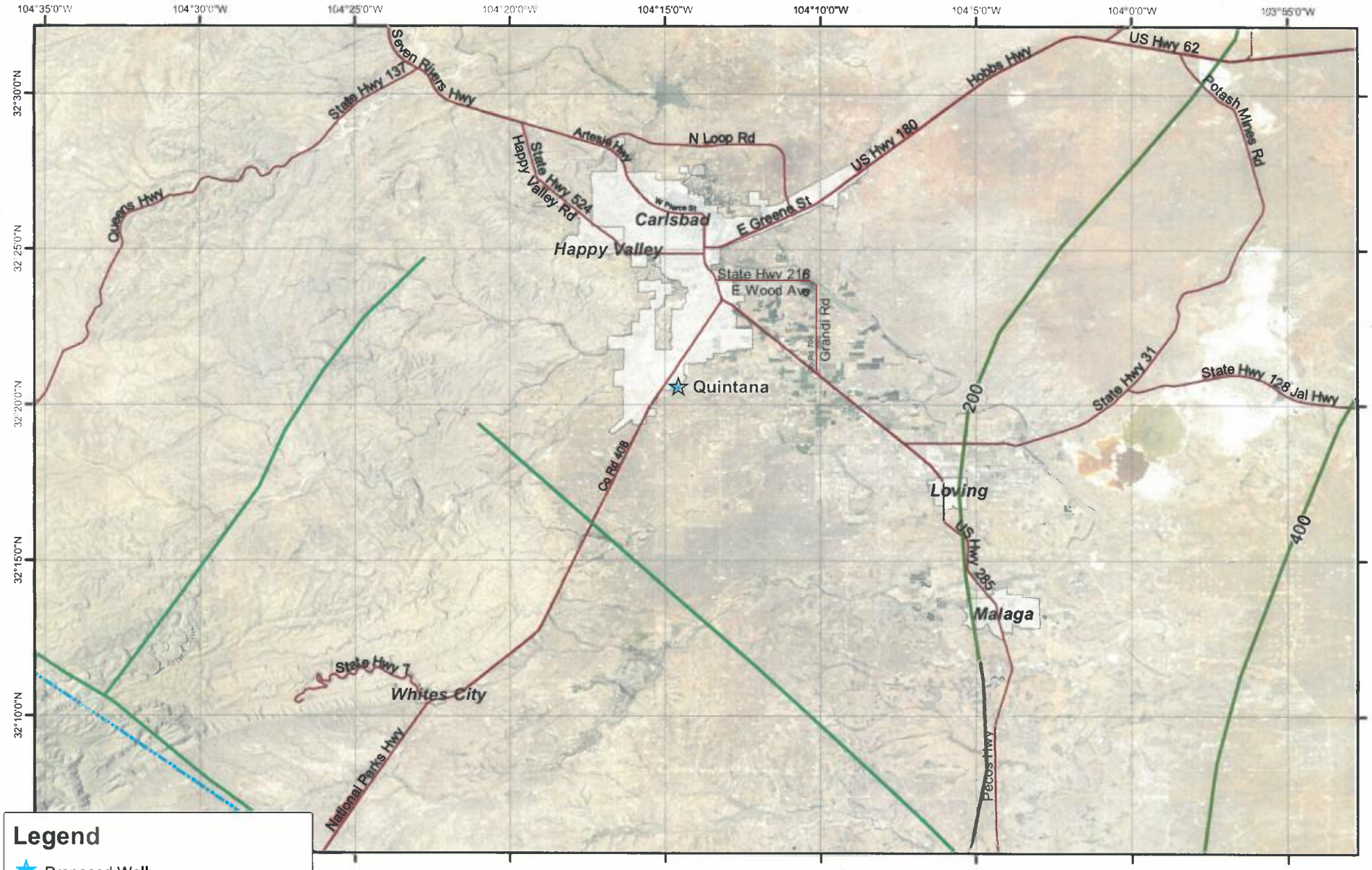
7.5 3.75 0 7.5 15 22.5 30 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics

Middle Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Middle Ordovician (Simpson) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

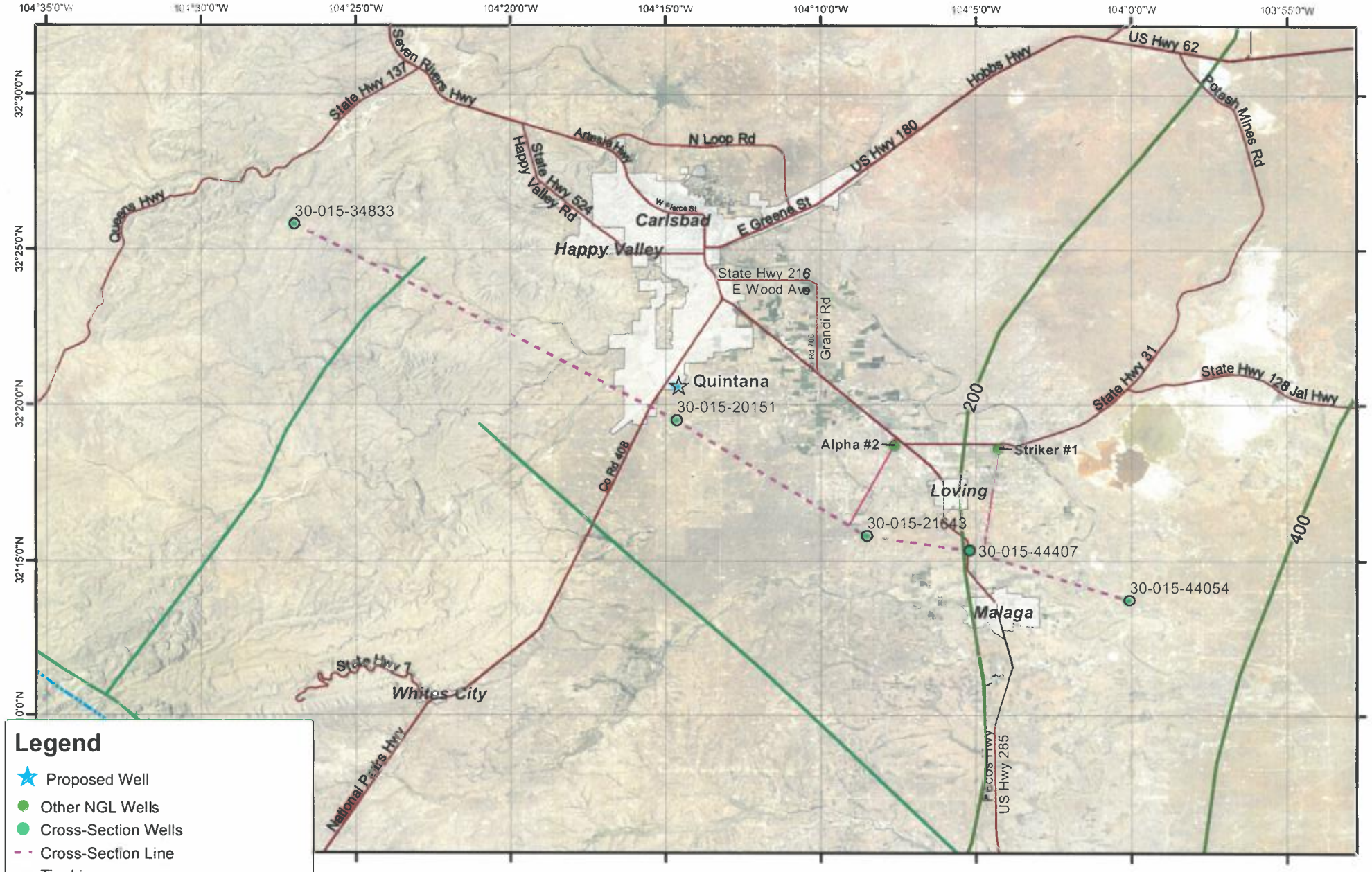
5 2.5 0 5 10 15 20 Miles

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

N

WESTERN Geoinformatics

Middle Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Other NGL Wells
- Cross-Section Wells
- Cross-Section Line
- Tie_Lines
- Middle Ordovician (Simpson) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

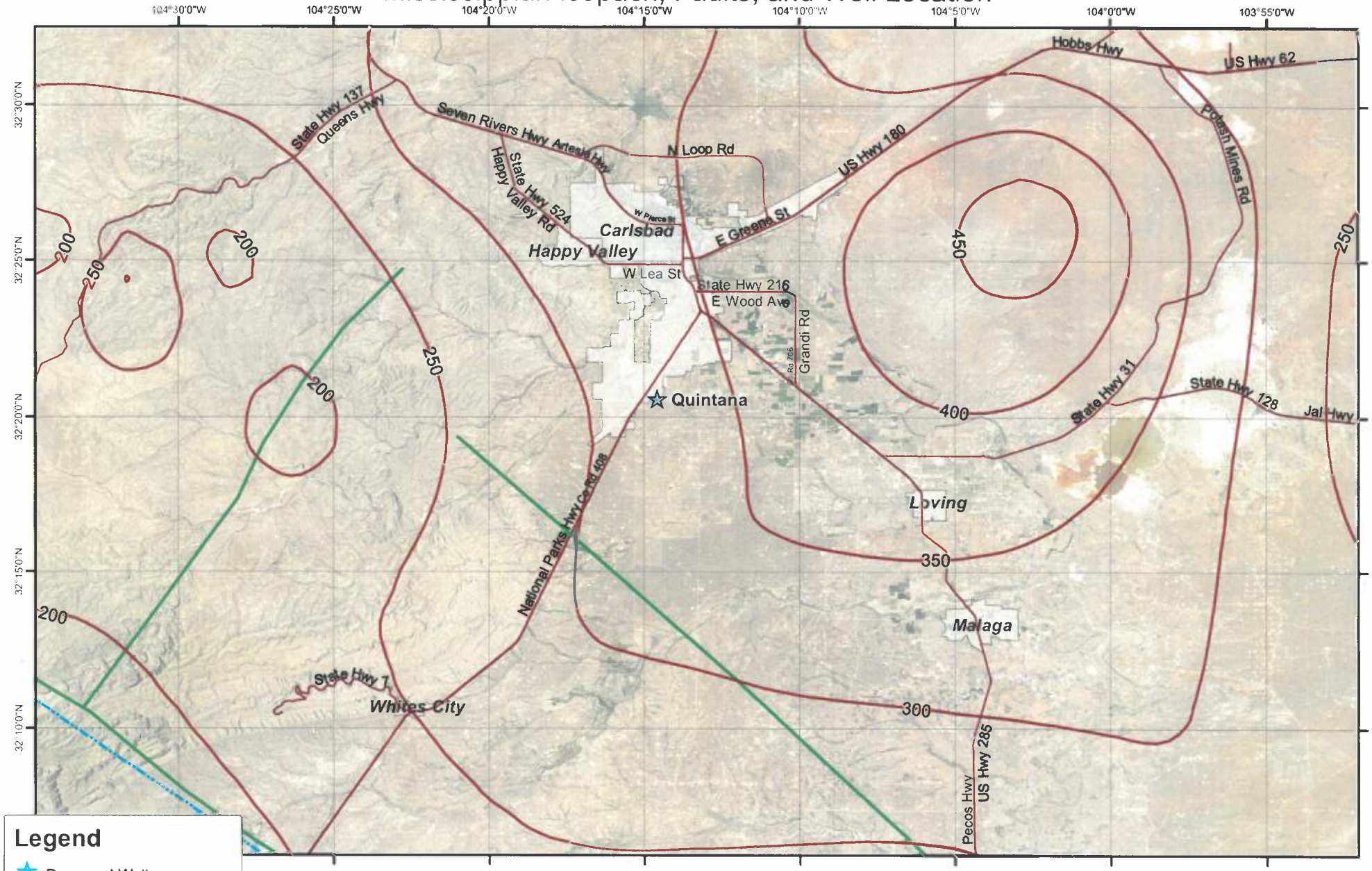
5 2.5 0 5 10 15 20 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics

Mississippian Isopach, Faults, and Well Location



Legend

- Proposed Well
- Mississippian (Barnett) ISO
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

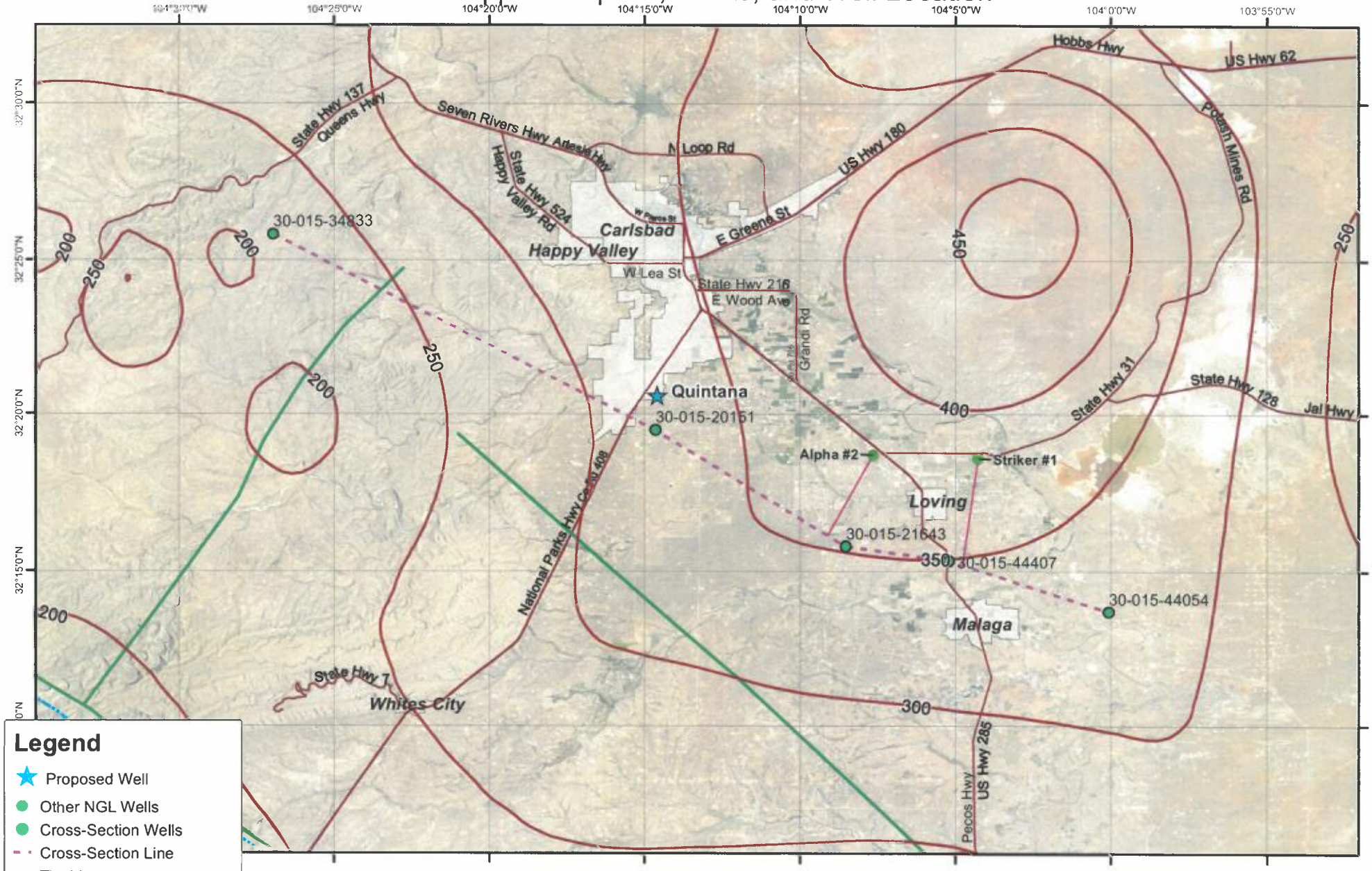
5 2.5 0 5 10 15 20 Miles

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

N

WESTERN Geoinformatics

Mississippian Isopach, Faults, and Well Location



Legend

- Proposed Well
- Other NGL Wells
- Cross-Section Wells
- Cross-Section Line
- Tie_Lines
- Mississippian (Barnett) ISO
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

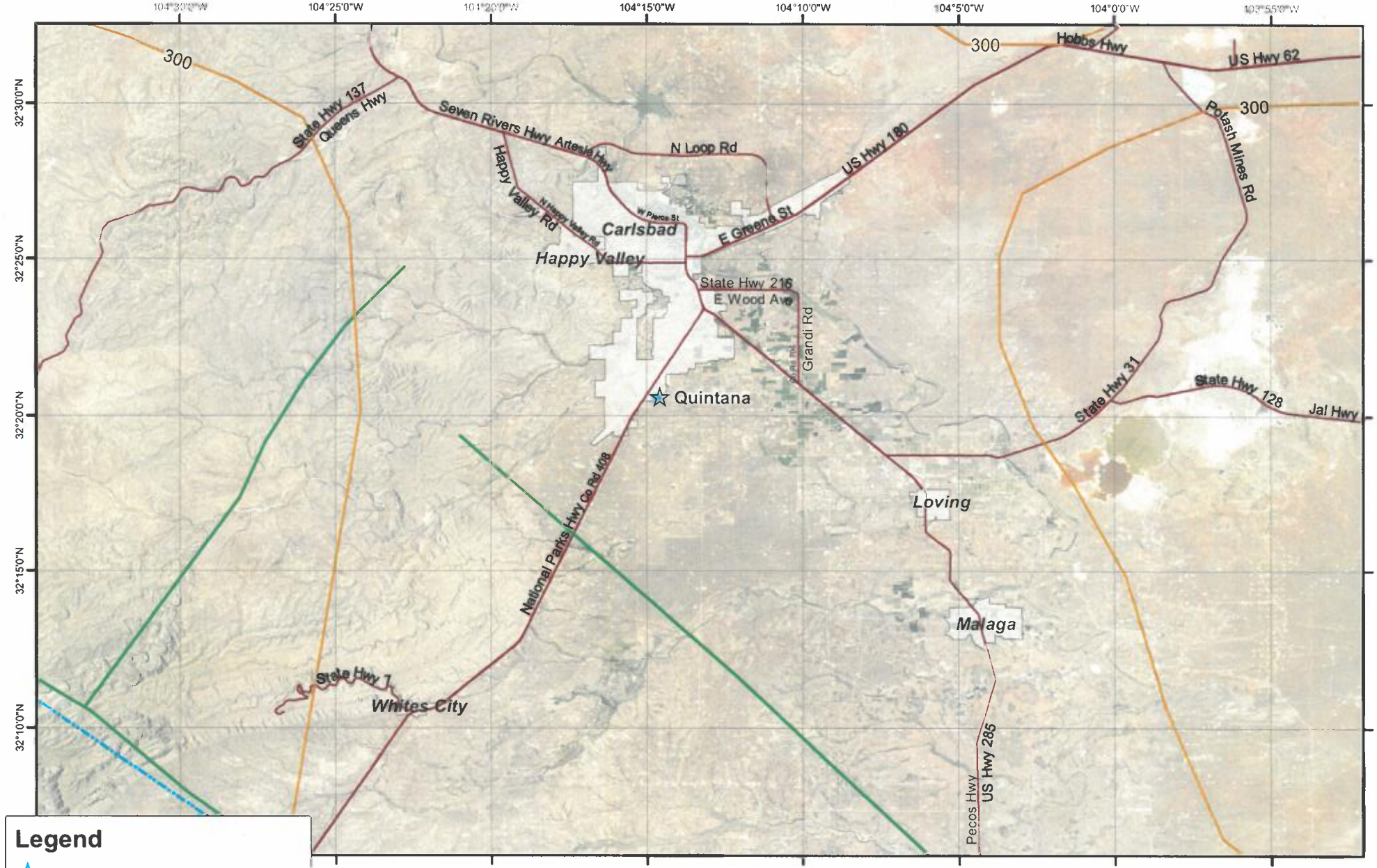
5 2.5 0 5 10 15 20 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics

Upper Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Upper Ordovician (Montoya) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

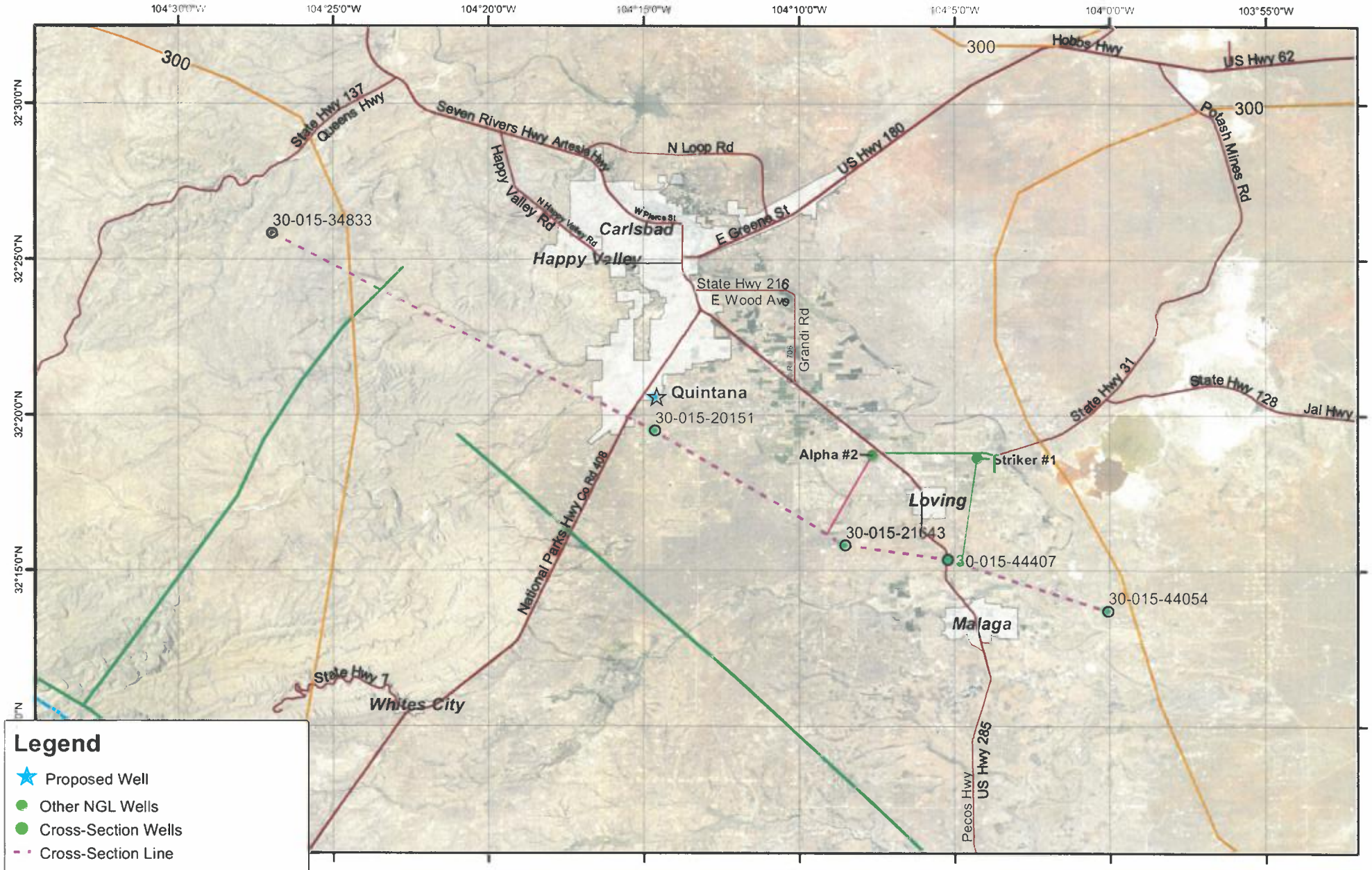
5 2.5 0 5 10 15 20 Miles

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

N

WESTERN Geoinformatics

Upper Ordovician Isopach, Faults, and Well Location



Legend

- Proposed Well
- Other NGL Wells
- Cross-Section Wells
- Cross-Section Line
- Tie_Lines
- Upper Ordovician (Montoya) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

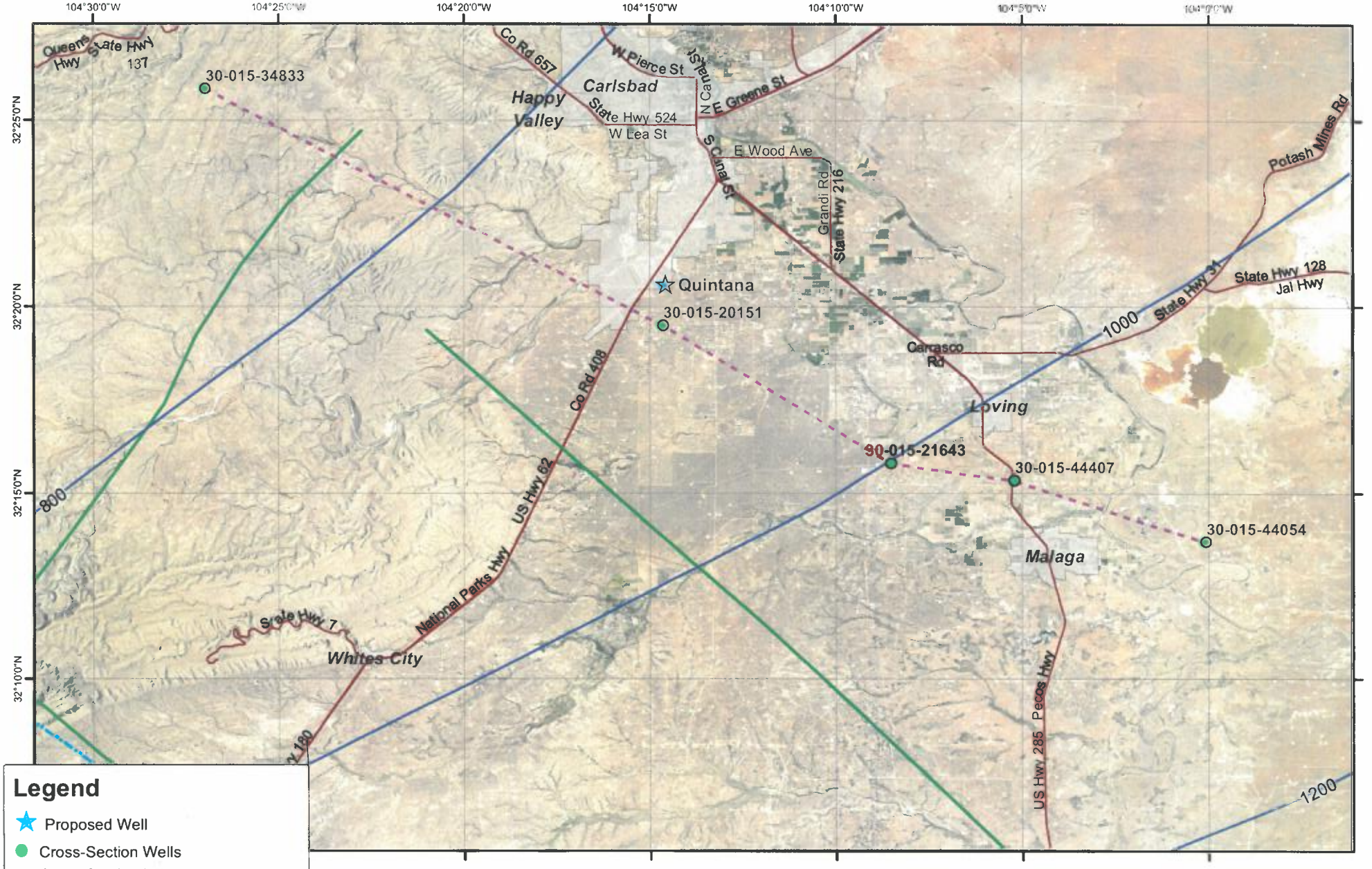
5 2.5 0 5 10 15 20 Miles

N

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics

Isopach, Faults, and Well Location



Legend

- Proposed Well
- Cross-Section Wells
- Cross-Section Line
- Sil/Dev (Wristen/Fusselman) Isopach
- Precambrian Faults
- Basement Faults
- Roads
- Towns/Cities
- County Boundaries, NM

Coordinate System: GCS North American 1983
Datum: North American 1983
Units: Degree
Basement faults (if shown) were digitized from Tectonic Map of Texas (Ewing, 1990)
Precambrian faults were digitized from Frenzel et al (1998) Figure 6.

WESTERN Geoinformatics
CUSTOM MAPPING FOR EVERYONE

Exhibit 4

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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO

CASE NO. 20140
(QUINTANA)

AFFIDAVIT OF DR. STEVEN TAYLOR

STATE OF NEW MEXICO)
) SS.
COUNTY OF BERNALILLO)

I, Dr. Steven Taylor, make the following affidavit based upon my own personal knowledge.

1. I am over eighteen (18) years of age and am otherwise competent to make the statements contained herein.

2. I have worked at the Los Alamos National Labs from 1991 to 2006. I currently am the secretary of GeoEnergy Monitoring Systems, Inc., a company that builds and conducts seismic monitoring.

3. I have obtained a Bachelor of Science degree in geology at Ohio University (1975) and a Ph.D. in Geophysics at the Massachusetts Institute of Technology (1980).

4. I am familiar with the application that NGL Water Solutions Permian, LLC ("NGL") has filed in this matter and I have conducted a study related to the areas which is the subject matter of the application.

5. The applicant, NGL (OGRID No. 372338), seeks an order approving the Quintana SWD #1 well (Case No. 20140), which is a salt water disposal well.

6. The injection zone for the well is located below the base of the Woodford Shale formation and above the Ordovician formation, which consists of significant shale deposits.

7. The closest known fault line is located approximately 2 to 20 miles away from where the well is proposed to be located.

8. I have studied seismic catalogs, unpublished catalogs and USGS catalogs for the time period of 2010 – 2017 selective events within 50 km of one the Striker SWD wells, as well as recent data from seismic monitors my company has installed near the Striker SWD wells. Attached as Exhibit A is a copy of my study. My study concludes that there is very little seismic activity in the areas where the well is proposed to be located.

9. I have also reviewed information provided by FTI Platt Sparks involving several different fault slip probability analysis conducted, using a tool created by Stanford University. These fault slip potential models showed low probability of slip or earthquakes to known mapped faults located closest to the well. A copy of the studies are attached hereto as Exhibit B.

10. I attest that the information provided herein is correct and complete to the best of my knowledge and belief.

[Signature page follows]

Dr. Steven Taylor

SUBSCRIBED AND SWORN to before me this 14 th day of May, 2019 by Dr. Steven Taylor.

Notary Public

My commission expires: 4/8/2025

ASHLEY M. MARSH
Comm. No. 20190696
NOTARY PUBLIC
Expires: 04/08/2025
STATE OF IDAHO

Seismic Catalog Analysis Within 50 km of Quintana SWD #1 Well

Prepared for NGL-Permian
by
GeoEnergy Monitoring Systems
May 9, 2019

Analysis is based on NMT seismic catalogs, unpublished catalogs and USGS catalogs for the time period 2010-2017 selecting events within 50 km of the Quintana SWD well. Additionally, seismic monitoring through April 30, 2019 from the three NGL seismic stations installed at Striker 2, Striker 3 and Striker 6 SWD wells on September 6, 2018. NGL/GeoEMS installed a seismic monitor at the Salty Dog SWD well (SDOG) in Texas just across New Mexico border on March 28, 2019 that will help constrain locations in southeastern NM.

Striker Two (STR2), Sand Dunes well, Lat/Long: 32.2072820/-103.7557370
Striker Three (STR3), Gossett well, Lat/Long: 32.2551110/-104.0868610
Striker Six (STR6), Madera well, Lat/Long: 32.2091150/-103.5359570
Salty Dog (SDOG), Salty Dog well, Lat/Long: 32.22531/ -103.045212

Figure 1 shows seismic station locations with estimated detection levels for M 1.0 (green circles) and M 1.5 (red circles) along with NGL-Permian stations (yellow pushpins). **Figure 2** shows seismicity listed in Table 1 shown as red circles and additional regional stations from TexNet and NMT (green pushpins). These regional stations are used along with the 3 Striker SWD seismic stations for regional monitoring.

The USGS reports no events in the vicinity since 2010. New Mexico Tech runs a seismic network (SC) north of the wells for the DOE Waste Isolation Plant (only short-period vertical components). There are a total of seven seismic events in this time period ranging in magnitude from 1.0 to 3.1. Since the NGL seismic deployment, there have been event detections listed in Table 2 having preliminary locations using available regional data (**Figure 3**). Due to the small magnitudes, the signal-to-noise levels are low so the locations have large uncertainty and there is little constraint on depth.

Table 1: Seismicity Within 50 km of Striker SWD Wells 2010-2017

Date	Origin Time GMT	Latitude	Longitude	Depth (km)	Magnitude
20111227	23:10:37	32.37	-103.95	NaN	1.6
20120318	10:57:22	32.281	-103.892	5.0	3.1
20170211	14:34:27	32.29	-103.92	NaN	1.5
20170302	11:38:53	32.37	-103.88	NaN	1.7
20170325	22:46:01	32.13	-103.77	NaN	1
20170503	17:47:21	32.082	-103.023	5.0	2.6
20170814	01:09:56	32.39	-103.56	NaN	1.2

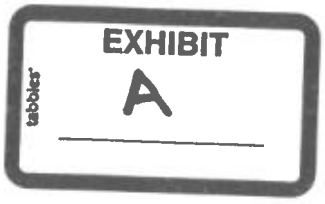


Table 2. New Mexico Area Reporting Period Seismicity (km units)

Date	Origin Time (GMT)	Lat	Long	Depth	Loc Error	M	(+/-)
09/10/18	23:35:43.942	32.1793	-103.5283	1	5.58	1.25	0.23
09/14/18	06:57:47.614	32.1540	-103.5030	1	5.58	1.11	0.41
09/15/18	16:48:21.041	32.1630	-103.5211	1	5.37	1.50	0.00
10/13/18	22:07:22.259	32.0998	-103.4560	6	5.64	1.60	0.12
11/18/18	09:04:52.707	32.2526	-103.7853	5	3.77	1.75	0.20
12/09/18	18:51:00.805	32.3634	-103.8510	1	2.09	1.44	0.08
01/03/19	09:15:48.809	32.2761	-103.6732	6	5.64	1.63	0.00
01/03/19	23:05:33.122	32.2599	-103.7654	4	5.51	1.60	0.25
01/04/19	09:45:38.943	32.2346	-103.7798	4	4.34	1.98	0.38
01/09/19	10:18:54.389	32.2255	-103.7166	5	2.80	1.47	0.41
01/27/19	07:33:47.127	32.2219	-103.7220	5	3.53	1.72	0.31
02/19/19	09:35:15.109	32.2443	-103.6898	1	4.17	1.20	0.00

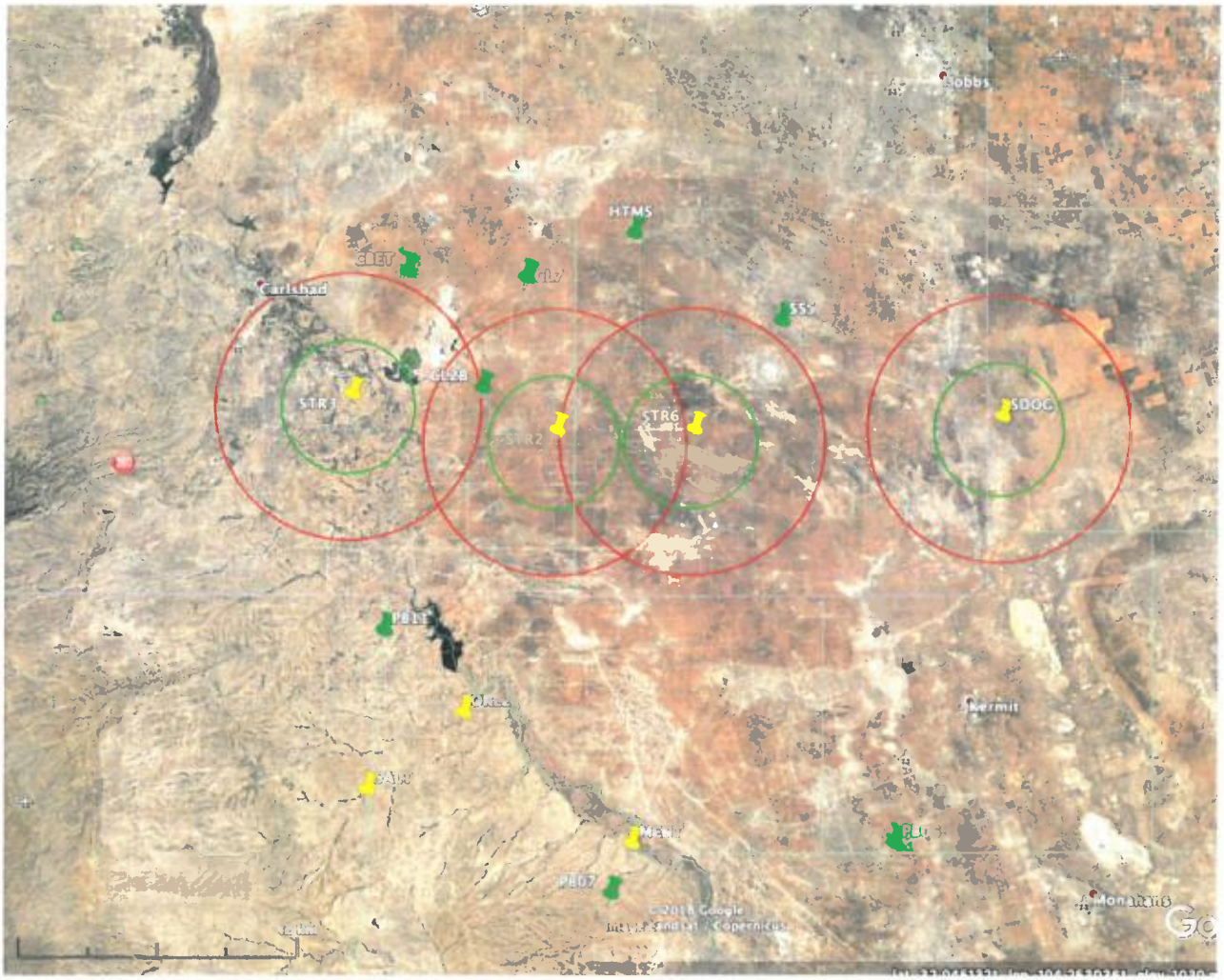


Figure 1. Striker SWD wells seismic station locations and existing NGL-Permian seismic stations (yellow pushpins). Green and red circles around stations show approximate detection levels for ML 1.0 and 1.5, respectively.

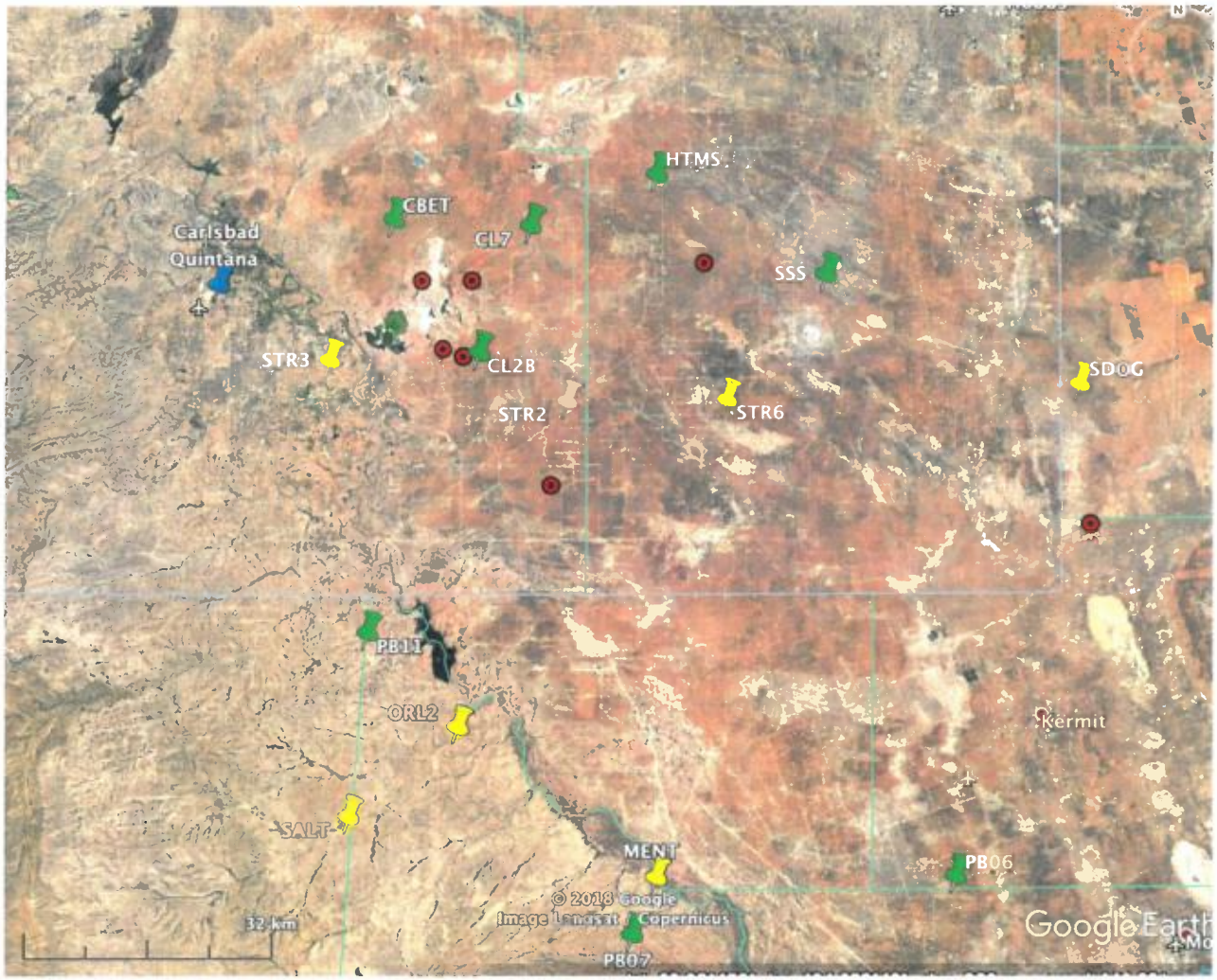


Figure 2. Striker SWD wells seismic station locations (yellow push pins) and existing NGL-Permian seismic stations (yellow pushpins). Other regional seismic stations run by TexNet and New Mexico Tech are shown as green pushpins. Historic seismicity listed in Table 1 shown as red circles. Quintana SWD well shown as blue pushpin.

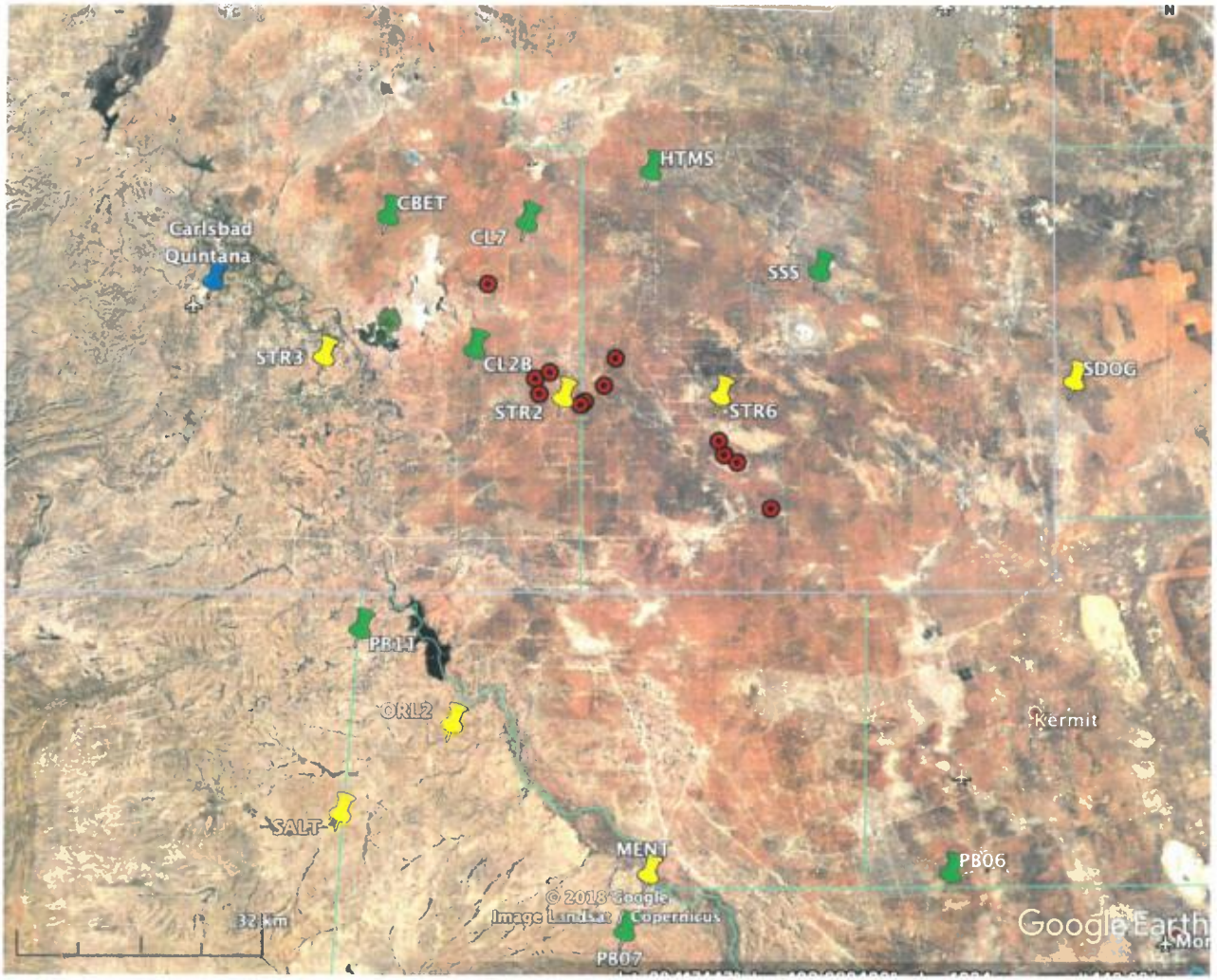


Figure 3. Seismic events in between September 6 and April 30, 2019 as red circles (Table 2). Seismic stations as yellow (NGL) or green (NMT and TexNet) pushpins. Quintana SWD well shown as blue pushpin.

FTI™
PLATT SPARKS

Texas Registered Engineering Firm No F – 16381

May 15, 2019

RE: Application for Fluid Injection or Disposal Permit
NGL Water Solutions Permian, LLC
Quintana SWD #1
Eddy County, New Mexico

FSP Analysis (Fault slip potential)

I have reviewed the geology and seismic activity near the Quintana SWD #1 and I would conclude that this well does not pose a risk related to seismicity in this area. The Area of review (AOR) and subject well are shown on **Map 1 (FSP Exh. 2)** in relation to the historical earthquake events in the area. (USGS) One event dated 11-28-74.

An FSP analysis of the area indicates that minimal pressure increases are calculated in the areas where seismicity has occurred to date and SWD injection is not a plausible explanation for the seismicity events to date in this area.

** The FSP software used for this analysis was jointly developed by Stanford University, Exxon Mobil and XTO Energy as a tool for estimating fault slip potential resulting from fluid injection.*

FSP Methodology

- FSP input variables were determined from nearby Deep injection wells in the review area and published data. (**FSP Exh.1**)
- Stress gradients and pore pressure gradients were derived from testing and published papers (**FSP Exh.1**).
- Fault slip potential (FSP) was analyzed in the area of review shown on **FSP Exh.2 Map 1.** The analysis integrates all of the proposed well locations as well as any existing injection wells in order to fully assess the pressure implications of injection in the area and the potential for slip along existing faults. Historical USGS earthquake events are denoted by the "blue" bulls-eye symbols.

925-A Capital of Texas Highway, South | Austin, TX 78746
512.327.6930 telephone | 512.327.7069 fax | ftiplattsparks.com

- Azimuth direction of Shmax was derived from Snee/Zoback 2018. (**FSP Exh.3**)
- Viscosity and density of the formation fluid was derived from temperature and salinity values at the mid-point injection depth (**FSP Exh.4**)
- The wells input into the FSP model and the potential faults in the area are shown on **FSP Exh. 5.**
    - Existing injection wells are projected into the future at the last reported injection volume and then held constant.
    - The subject well is tested at the proposed maximum injection rate and held constant for 20 years. If the ΔP at the well exceeds the allowed injection pressure, then the modelled injection rates are decreased over time to stay within the allowed maximum injection pressure. This analysis is important because the model should represent realistic injection values over the life of the model and arbitrarily using the permitted rate over the life of the well does not reflect the reality that as the reservoir pressure increases the well's ability to inject fluid may be reduced.
    - The Subject well is denoted in the model as follows:
        - Q1 - Quintana SWD
    - Also included in the model are existing SWD injection wells as follows:
        - A - Alpha 2
        - B - Top Gun Federal SWD #1
        - C – Iceman State SWD #1
        - D – Rustler Breaks SWD #1
- **FSP Exh.6** shows the geomechanical properties of the possible faults.
- **FSP Exh.7** shows the pressure to slip, ΔP, at each possible fault segment.
- **FSP Exh.8** shows the probability of fault slip for each fault segment and shows that a ΔP 800 psi increase at segment F3 and/or F4 shows a 10% probability of fault slip. The model calculates a ΔP increase of 397 and 151 psi at these fault segments by 2045 thus

the calculated pressures remain well below the 10% probability level. (See FSP Exh. 12)

- **FSP Exh.9 - FSP Exh.11** show the calculated pressures at the possible fault segments as of 1/1/2025, 1/1/2035, and 1/1/2045. Note that by 2045 none of the faults have reached pressures that would initiate fault slip.
- **FSP Exh.12** shows the pressure recap for all of the modelled fault segments as of 2045 and the corresponding pressures required to cause fault slip. Also shown are the sources of the fault segments included in the model and the depths where fault displacement can be demonstrated.

FSP Analysis (Findings and Conclusions)

The NW-SE faults and fault trends in this area of review are not optimally oriented to slip. The orientation of the faults requires significant pressure changes (ΔP +4,400 psi) based on the fixed input parameters the ΔP increase at the most proximal fault only reaches 63 psi by 2045.

The potential NE-SW fault in this area is more optimally oriented to slip. The orientation of this fault requires pressure changes of ΔP +1,176 psi based on the fixed input parameters and the ΔP increase at the most proximal fault (F3) reaches 397 psi by 2045. Upon closer examination wells B & C are the main reason this fault reaches this pressure by 2045.

This model assumes constant injection rates over the next +25 years which is not a typical scenario as SWD wells tend to decrease injection volumes over time as the well ages and disposal demand decreases in the area. If injection volumes are lower over time than the modelled values, then the risk for fault slip is lowered.

In the event seismicity should occur in the future, the wells closest to the faults (proposed and existing) should be the wells considered for modification or reduction of injection rates. At this time there is no evidence to support rate reduction for any of the existing or proposed wells.

Should you have any questions, please do not hesitate to call me at (512) 327-6930 or email me at todd.reynolds@ftiplattsparks.com.

Regards,

Todd W. Reynolds – Geologist/Geophysicist

Managing Director, Economics/FTI Platt Sparks

Todd W Reynolds

FTI Platt Sparks

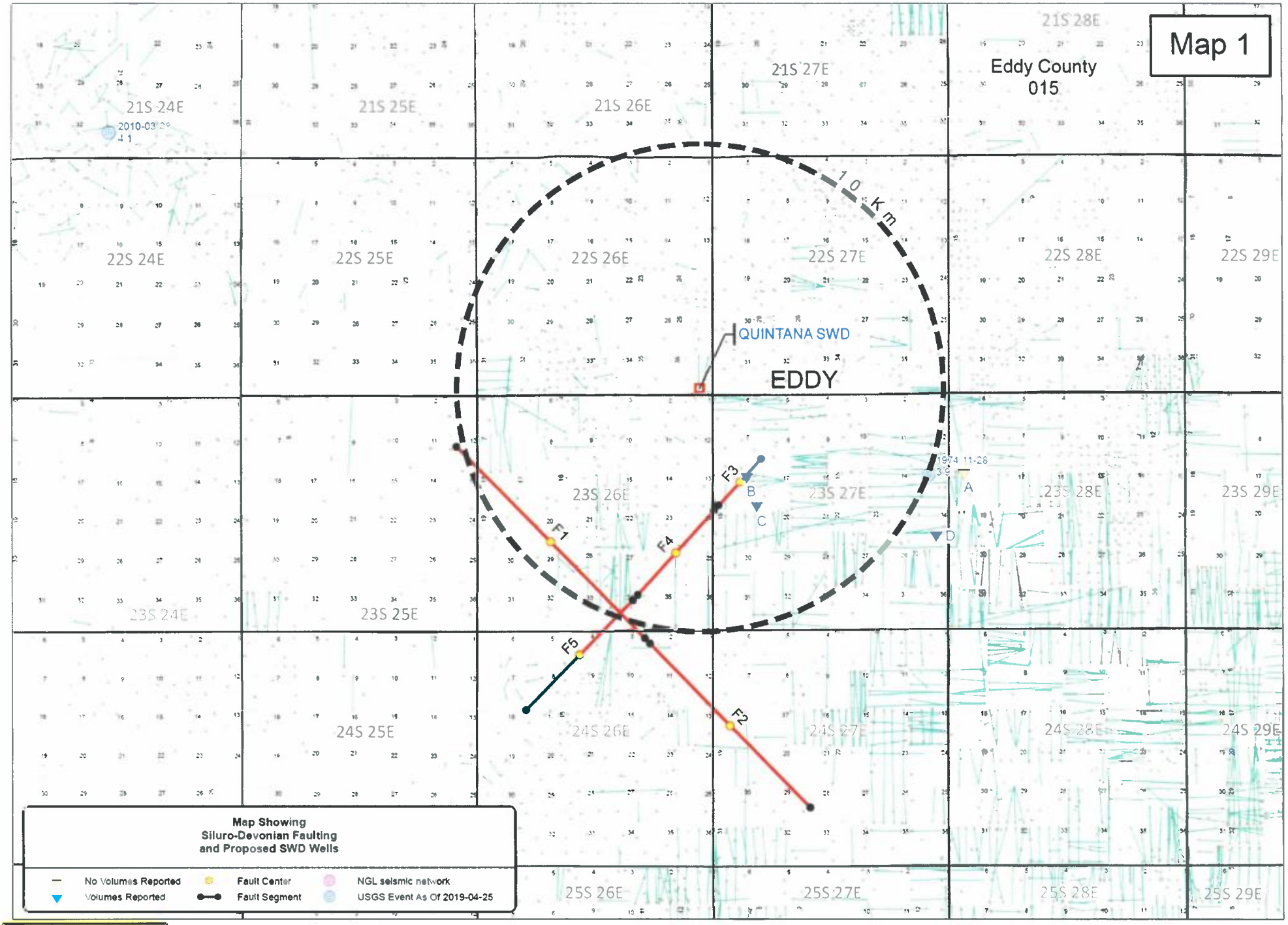
512.327.6930 office

FTI PLATT SPARKS

FSP DATA WORKSHEET (General information and Input data)

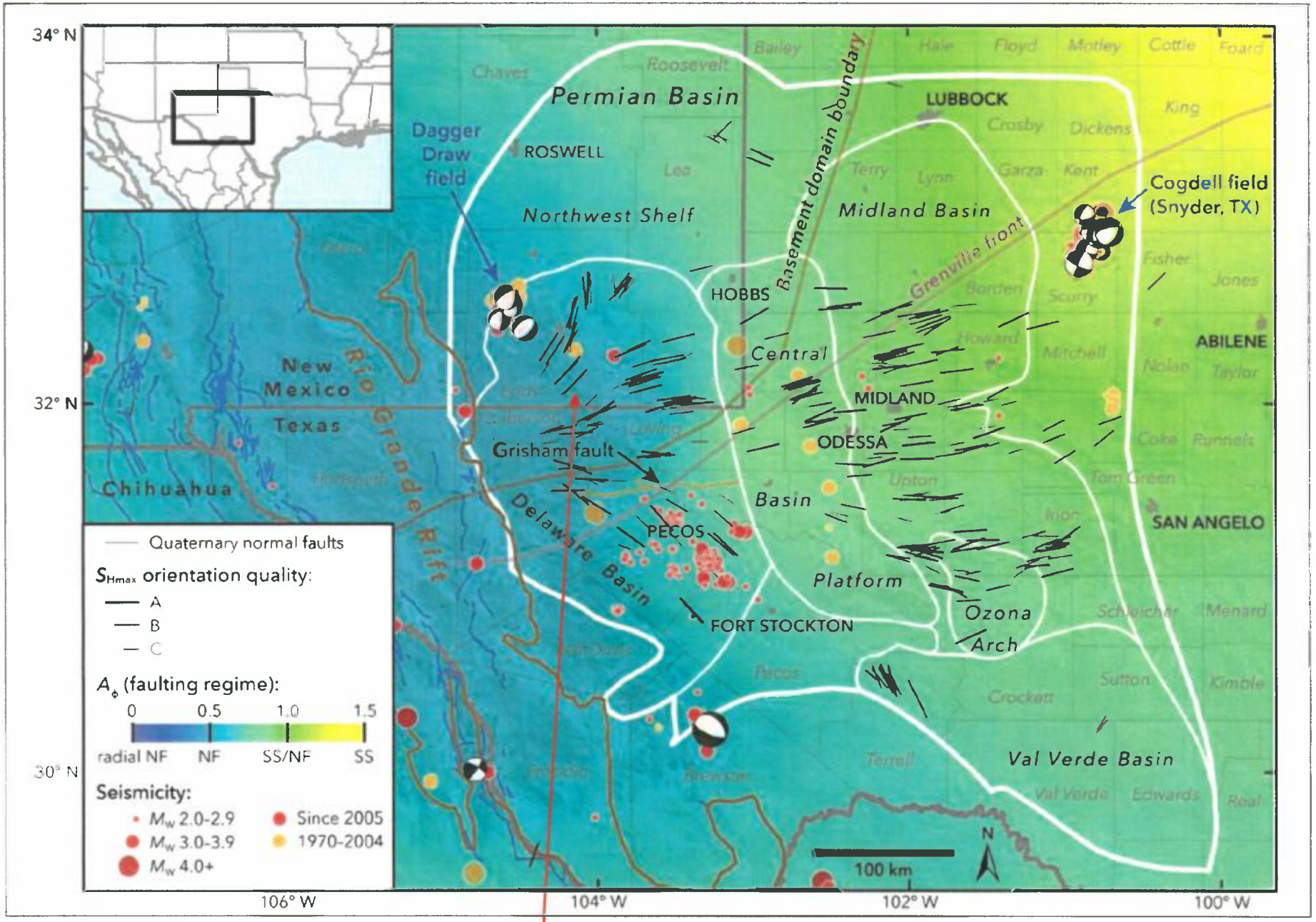
		Comments	Variance (+/-)
Well	**Quintana SWD #1**		
Operator	NGL Water Solutions Permian, LLC		
API			
Top Injection Depth (ft)	12583		
Base Injection Depth(ft)	13656		
Mid Injection Depth(ft)	13120		
Mid Injection Depth(m)	3999		
Injection Formation(s)	Siluro-Devonian, Fusselman		
Est Water Resistivity (@75 F)	0.1	*SPE 1982 (W. Texas & SE New Mexico)*	
Est Formation Temp (F)	189	*Temp graphs (UTPB 2006)*	
Est Formation Temp (C)	87	*Temp graphs (UTPB 2006)*	
Est Formation Salinity (ppt)	25	*Log charts (Schlumberger)*	
Density (kg/m3)	985	*Calculated*	40
Viscosity (Pa.s)	0.00035	*Calculated*	0.00005
Compressibility-Formation (1/Pa)	8.70E-10	*Estimated*	
Compressibility-Fluid (1/Pa)	4.57E-10	*Estimated*	
Aquifer thickness (ft)	537		50
Porosity (%)	6		2
Perm (mD)	20		4
Vertical stress grad. (psi/ft)	1.1	*Calculated from density log*	0.05
Min. Horiz. Stress grad. (psi/ft)	0.67	*A-Phi of .52 from Snee/Zoback*	0.02
Max. Horiz. Stress grad. (psi/ft)	0.89	*Determined from A Phi parameter (0.6)*	0.02
Initial Pore Pressure grad. (psi/ft)	0.46	*Normal saltwater pore pressure gradient*	0.01
Azimuth of Max Horiz Stress (deg)	35	*From Snee/Zoback*	5
Fault Orientation (deg)	Dependent on Fault		5
Fault Dip (deg)	85		5
Friction of Coefficient	0.6	*typical for pre-existing fault/facture*	0.02
njection pressure @ 0.25 psi/ft	3146		
njection rate (bbls/day)	40000		

FSP Exh. 1



FSP Exh. 2

FTI
PLATT S PARKS
Texas Registered Engineering Firm No F - 16381



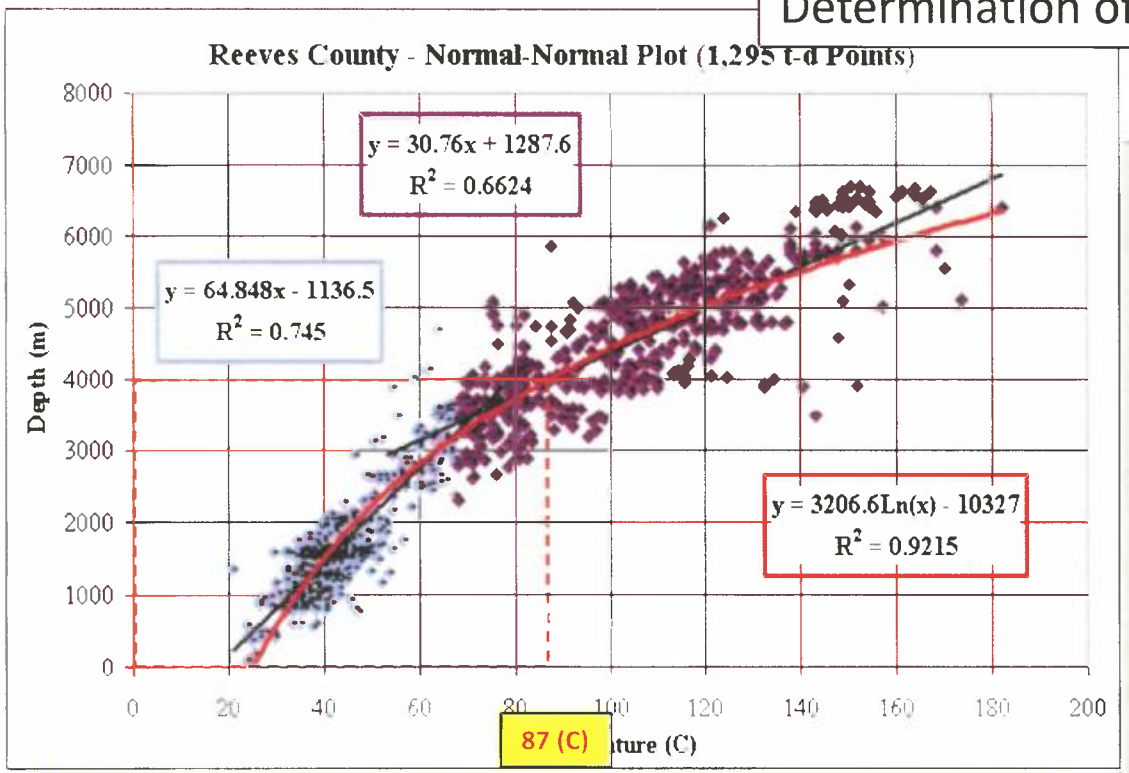
FSP Exh. 3

Stress Data Inputs

35

Azimuth Shmax
Subject Area

Determination of Density and Viscosity



SEAWATER DENSITY & VISCOSITY CALCULATOR

Please enter the values of salinity and temperature of the effluent or ambient water (p=1atm):

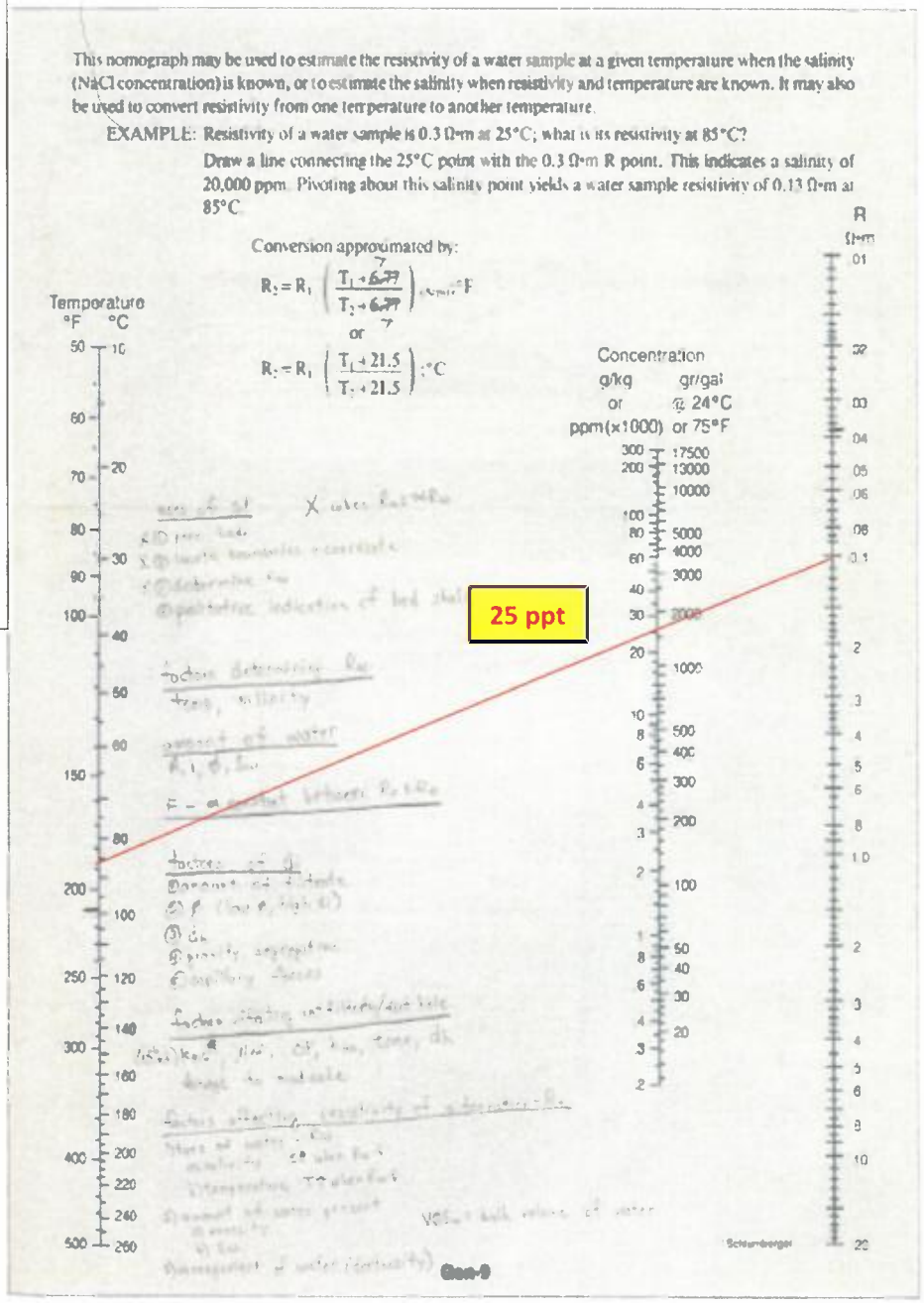
Salinity:	Sal =	25.00	ppt	for ρ: 0 ≤ Sal ≤ 160 ppt for μ: 0 ≤ Sal ≤ 130 ppt
Temperature:	T =	87.00	°C	10 ≤ T ≤ 180 °C

Density:	ρ =	985.643	kg/m³
Dynamic Viscosity:	μ =	0.346	*10⁻³ kg/m s
Kinematic Viscosity:	ν =	0.351	*10⁻⁶ m²/s

(2002): Fundamentals of Sea Water Desalination (Appendix A: Thermodynamic Properties

FSP Exh. 4

Resistivity Nomograph for NaCl Solutions



Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

MODEL INPU... | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

- All Faults
- Fault #1
- Fault #2
- Fault #3
- Fault #4
- Fault #5
- Fault #6

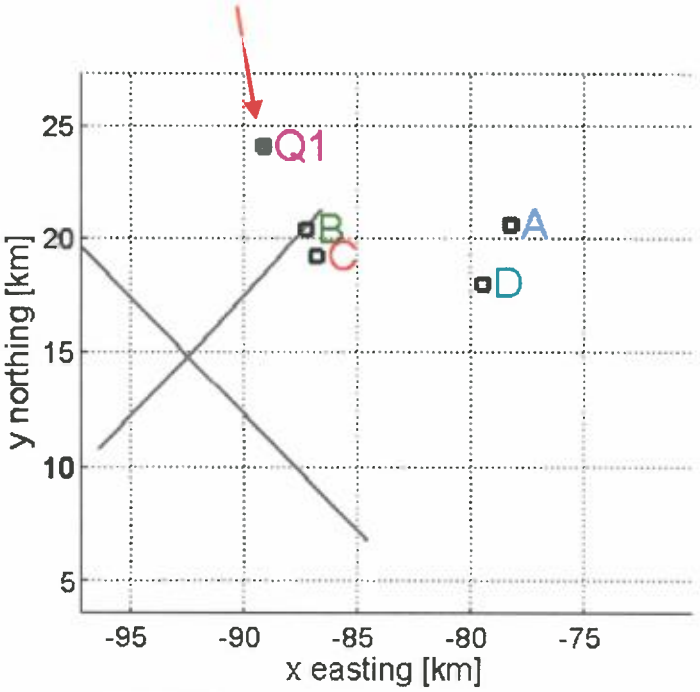
Calculate

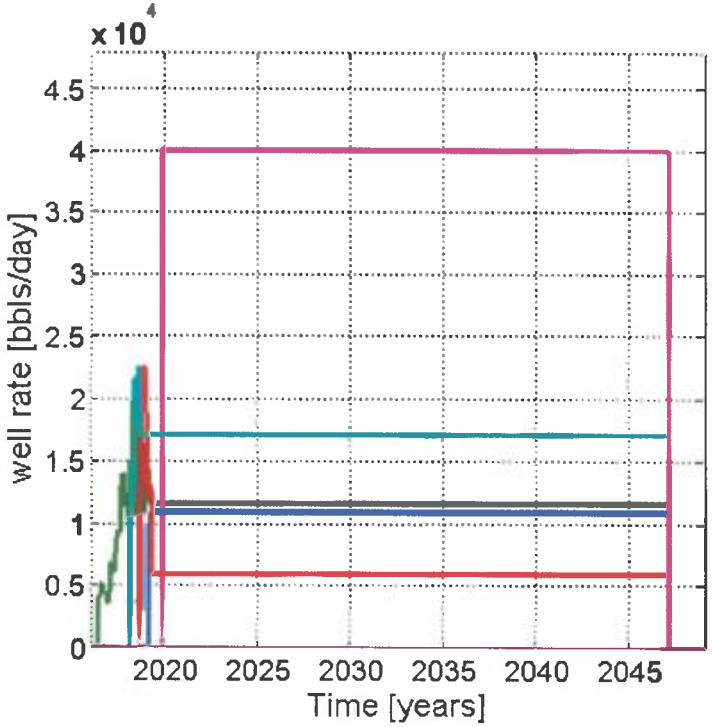
FSP Exh. 5

Stress Regime: Normal Faulting

Select Well: All

Subject well: Quintana #1





Subject Well input at 40,000 bbls/day beginning rate
4 other injection wells in area of study

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHAN... | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

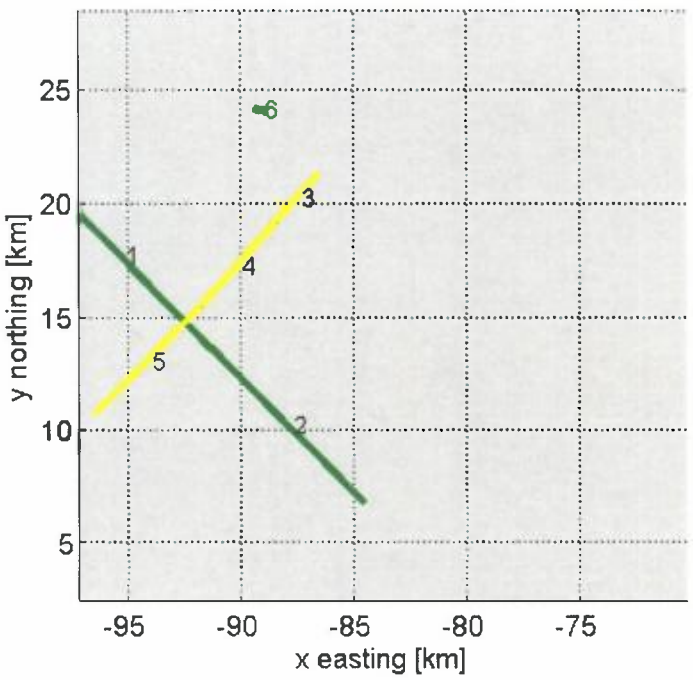
All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6

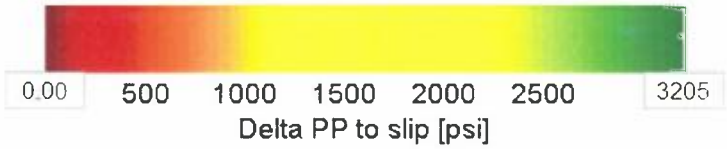
Calculate

a) Fault Number

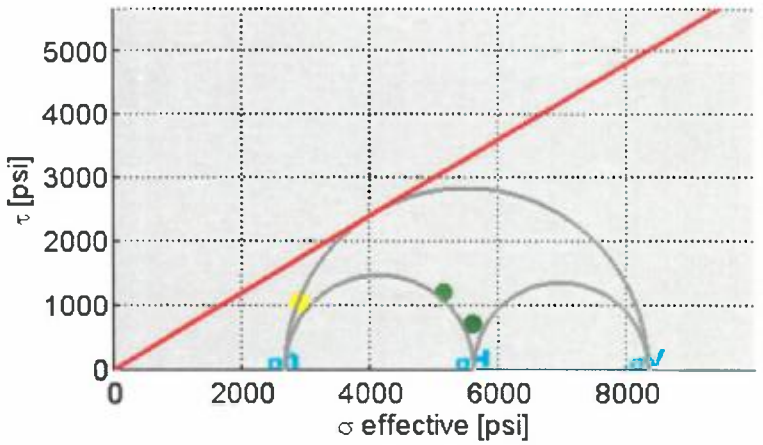
Help

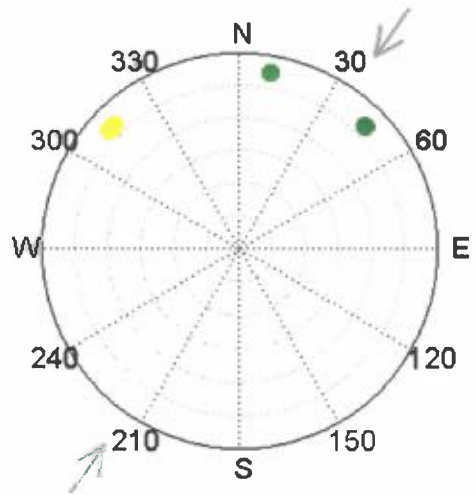
Fault segment numbers





Stress Regime: Normal Faulting





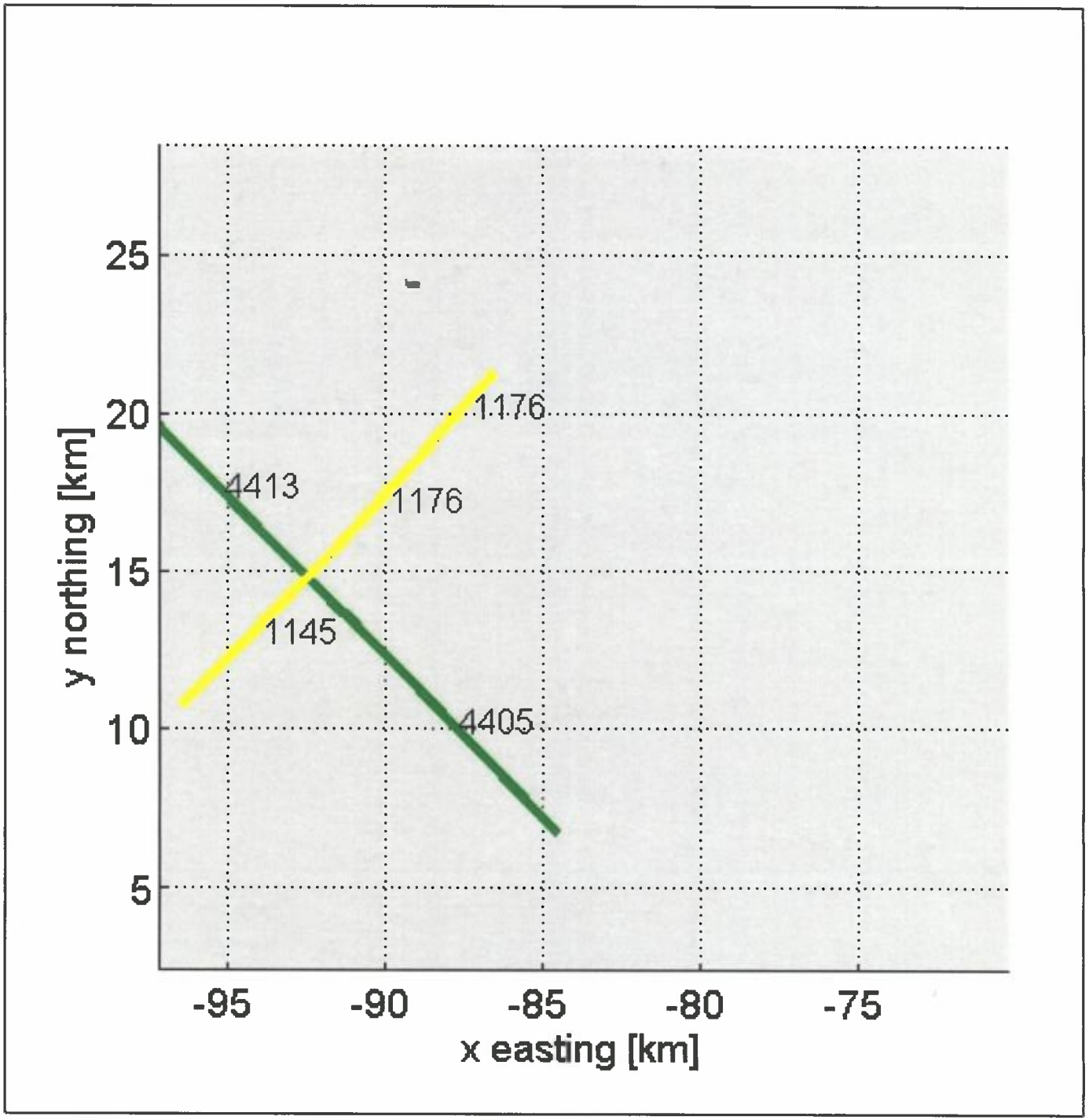
Stereonet Show: Fault Normals

FSP Exh. 6

Calculated Pore Pressure to Slip

ΔP

At each fault segment



FSP Exh 7

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

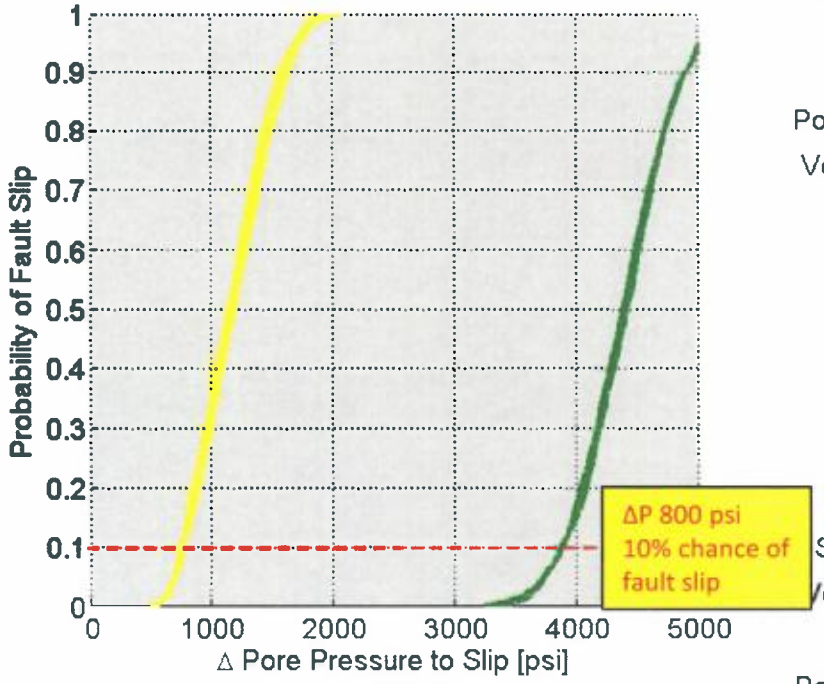
MODEL INPUTS | GEOMECHANICS | PROB. GEOM... | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

All Faults
Fault #1
Fault #2
Fault #3
Fault #4
Fault #5
Fault #6

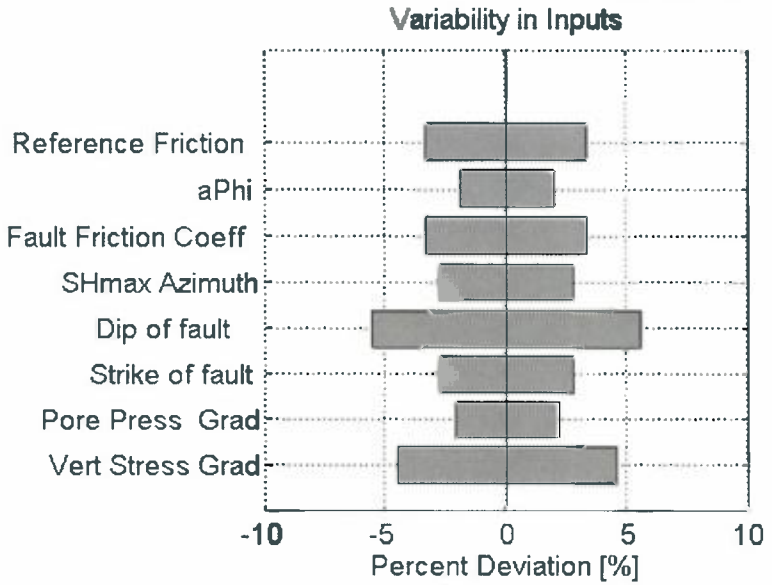
Calculate

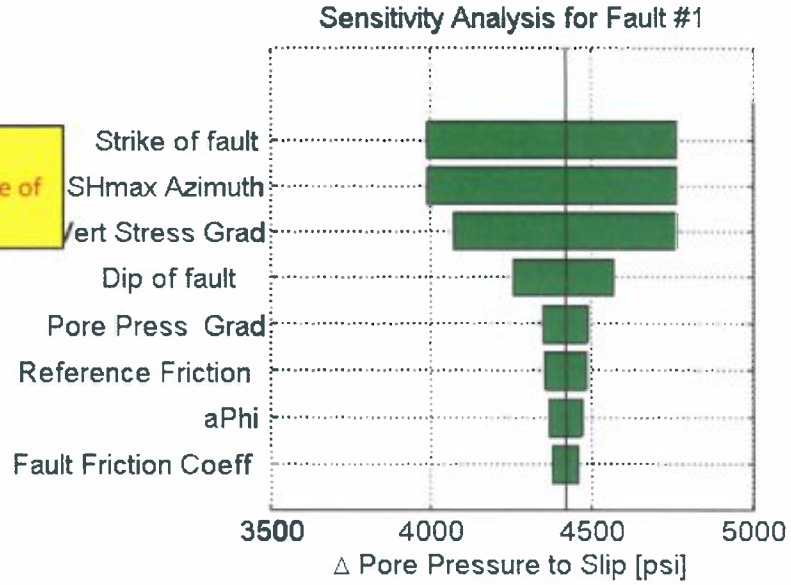
Load Distributions | Run Analysis



Max Delta PP [psi]: 5000

Export CDF data | Show Input Distributions





FSP Exh. 8

Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.02 FSP

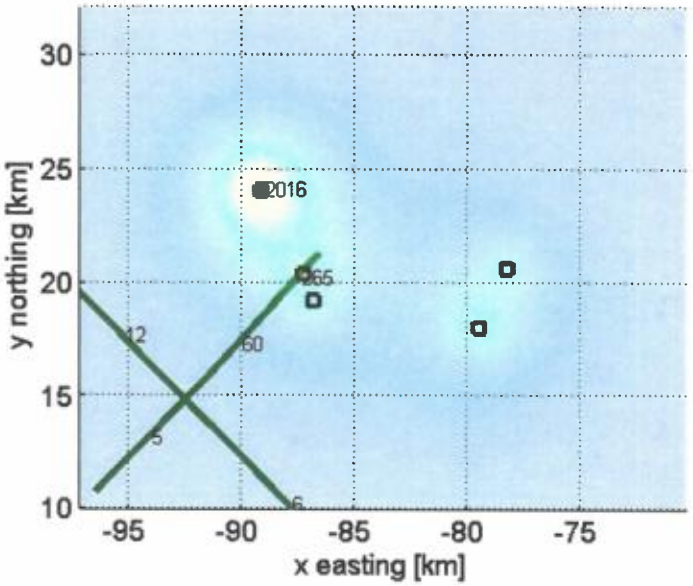
Calculate

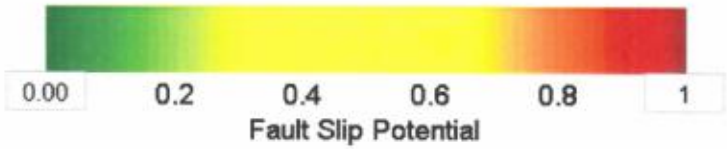
FSP Exh. 9

Export

b) PP Change at fault [psi]

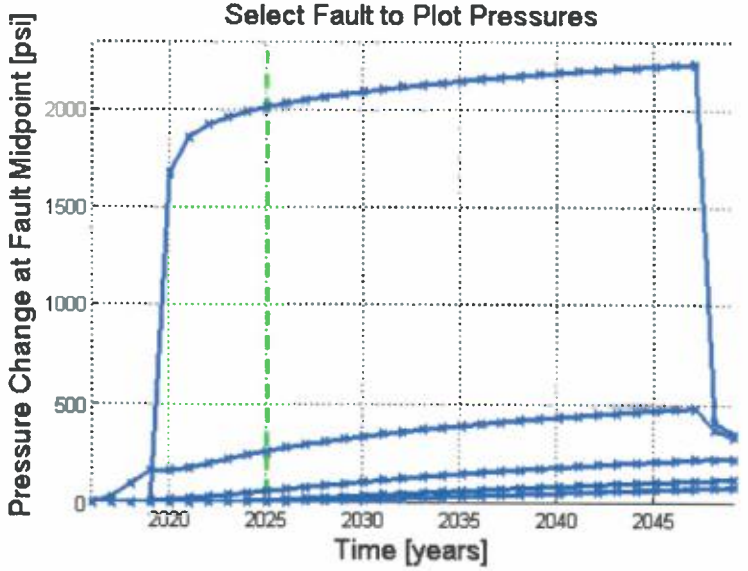
Summary Plots





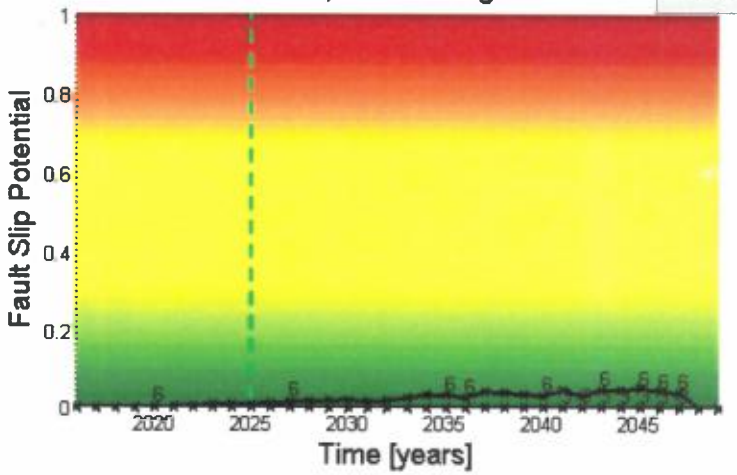
Year: 2025

Select Fault to Plot Pressures



Export

All Faults, FSP Through Time



Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.02 FSP

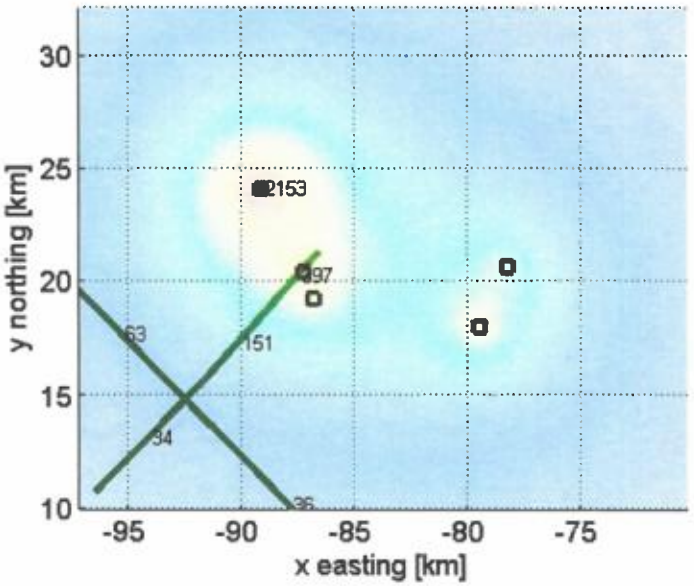
Calculate

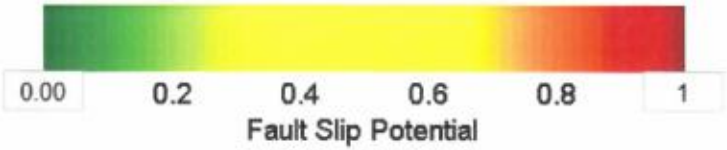
FSP Exh. 10

b) PP Change at fault [psi]

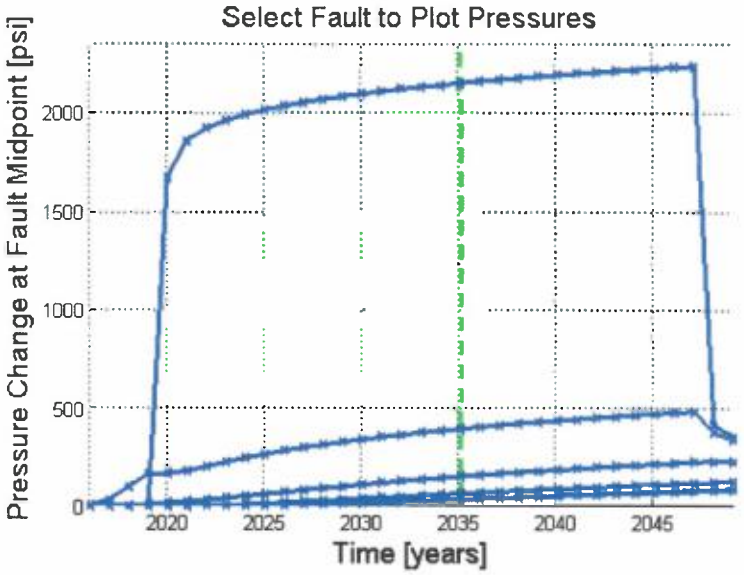
Summary Plots

Export

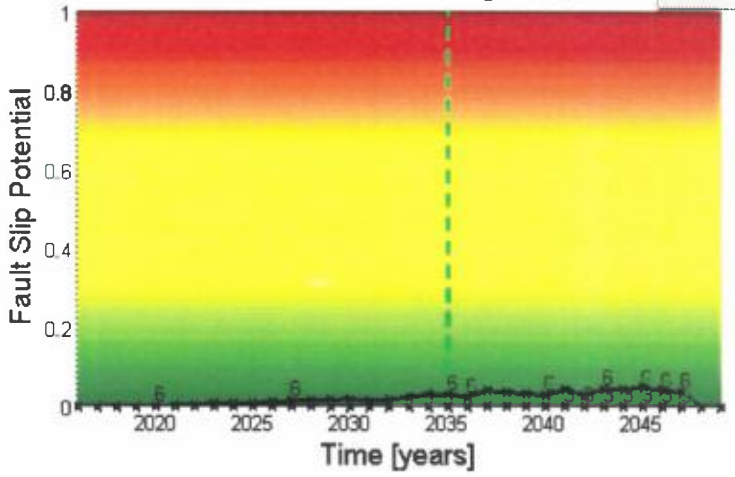




Year: 2035



Export



Fault Slip Potential v1.07

File Data Inputs Export Image Zoom

Fault Slip Potential

MODEL INPUTS | GEOMECHANICS | PROB. GEOMECH | HYDROLOGY | PROB. HYDRO | INTEGRATED

Fault Selector:

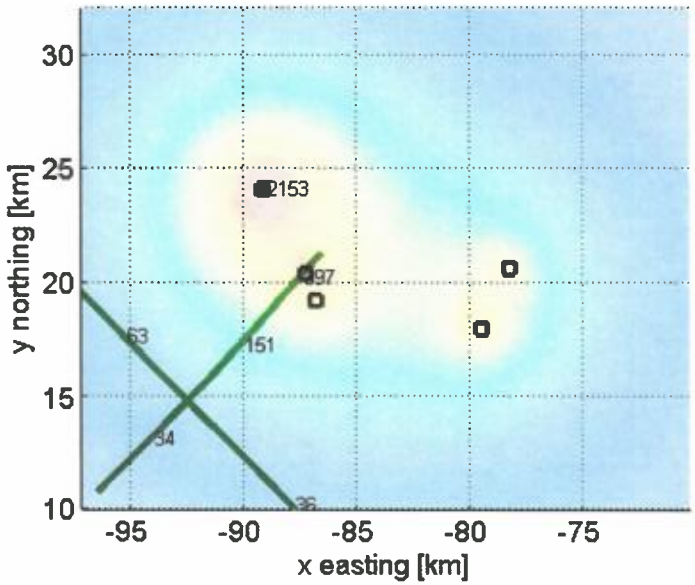
All Faults
Fault #1, 0.00 FSP
Fault #2, 0.00 FSP
Fault #3, 0.00 FSP
Fault #4, 0.00 FSP
Fault #5, 0.00 FSP
Fault #6, 0.03 FSP

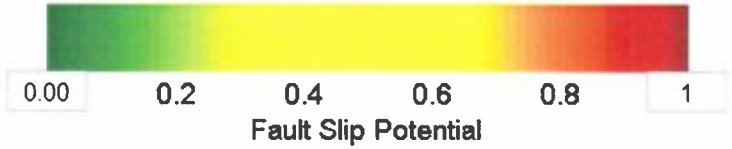
Calculate

FSP Exh. 11

b) PP Change at fault [psi]

Summary Plots

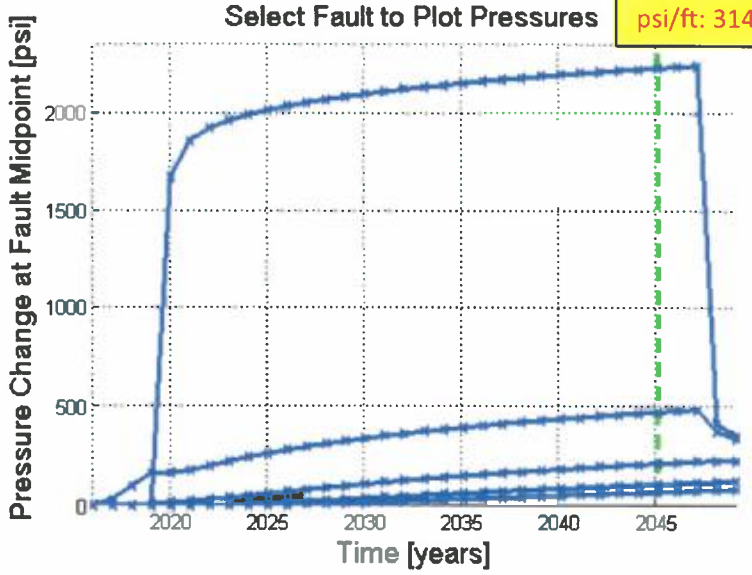




Year: 2045

Export

Max Injection Pressure @ 0.25 psi/ft: 3146 psi



Export

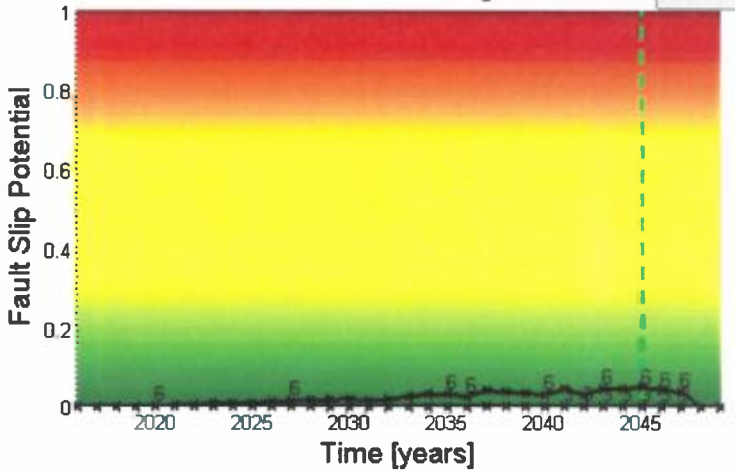


Table 1

FSP ANALYSIS WITH SUBJECT WELL

Fault Segment	Fault Source	ΔP to slip	ΔP at 2045
F1	BEG (Basement)	4,413	63
F2	BEG (Basement)	4,405	36
F3	BEG (Basement)	1,176	397
F4	BEG (Basement)	1,176	151
F5	BEG (Basement)	1,145	34
F6	ΔP BHP	* Pressure limit 3,146 psi	2,153

FSP Exh. 12

Exhibit 5

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

APPLICATION OF NGL WATER SOLUTIONS PERMIAN, LLC FOR APPROVAL OF SALT WATER DISPOSAL WELL IN EDDY COUNTY, NEW MEXICO

CASE NO. 20140
(QUINTANA)

AFFIDAVIT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

Deana M. Bennett, attorney in fact and authorized representative of NGL Water Solutions Permian LLC, the Applicant herein, being first duly sworn, upon oath, states that the above-referenced Application was provided under a notice letter and that proof of receipt is attached hereto.

Deana M. Bennett

SUBSCRIBED AND SWORN to before me this 13th day of May, 2019 by Deana M. Bennett.

Stephanie Taylor

Notary Public

My commission expires 6-23-2020

OFFICIAL SEAL
Stephanie Taylor
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires: 6-23-2020

Karlene Schuman
Modrall Sperling Roehl Harris & Sisk P.A.
500 Fourth Street, Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED
12/12/2018

Firm Mailing Book ID: 157161

Line	Article Number	Name, Street & P.O. Address	Postage	Fee	R.R.Fee	Reference	Rest.Del.Fee Contents
1	9314 8699 0430 0053 8636 25	Oil Conservation Division District II 811 S. First St., Artesia Artesia NM 88210	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
2	9314 8699 0430 0053 8636 32	NEW MEXICO STATE LAND OFFICE P.O. Box 1148 Santa FE NM 87504	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
3	9314 8699 0430 0053 8636 49	BUREAU OF LAND MGMT 301 Dinosaur Trail Santa Fe NM 87508	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
4	9314 8699 0430 0053 8636 56	OXY USA INC PO BOX 4294 HOUSTON Houston TX 77210	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
5	9314 8699 0430 0053 8636 63	MARATHON OIL PERMIAN, LLC 5555 SAN FELIPE ST. HOUSTON Houston TX 77056	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
6	9314 8699 0430 0053 8636 70	RKI EXPLORATION & PRODUCTION LLC 3817 NW EXPRESSSWAY SUITE 950 Oklahoma City OK 73112	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
7	9314 8699 0430 0053 8636 87	KEY ENERGY SERVICES LLC PO BOX 99 2105 AVENUE O Eunice NM 88231	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
8	9314 8699 0430 0053 8636 94	MEWBOURNE OIL CO P.O. Box 5270 Hobbs NM 88241	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
9	9314 8699 0430 0053 8637 00	TAP ROCK OPERATING, LLC 602 Park Point Drive Suite 200 Golden CO 80401	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
10	9314 8699 0430 0053 8637 17	DEVON ENERGY PRODUCTION COMPANY, LP 20 N Broadway Oklahoma City OK 73102	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
11	9314 8699 0430 0053 8637 24	POGO OIL & GAS OPERATING INC 1515 CALLE SUR, STE 174 Hobbs NM 88240	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
12	9314 8699 0430 0053 8637 31	CIMAREX ENERGY CO OF COLORADO 600 N. MARIENFELD STREET SUITE 600 Midland TX 79701	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
13	9314 8699 0430 0053 8637 48	MRC Permian 5400 LBJ Freeway, Suite 1500 Dallas TX 75240	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
14	9314 8699 0430 0053 8637 55	Foundations Minerals, LLC PO Box 50820 Midland TX 79710	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
15	9314 8699 0430 0053 8637 62	Mavros Minerals, LLC PO Box 50820 Midland TX 79710	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice

ALBUQUERQUE NM 87101 DEC 12 2018 USPS

Karlene Schuman
Modrall Sperling Roehl Harris & Sisk P.A.
500 Fourth Street, Suite 1000
Albuquerque NM 87102

PS Form 3877

Type of Mailing: CERTIFIED
12/12/2018

Firm Mailing Book ID: 157161

Line	Article Number	Name, Street & P.O. Address	Postage	Fee	R.R.Fee	Reference	Rest.Del.Fee Contents
16	9314 8699 0430 0053 8637 79	Oak Valley Mineral and Land, LP PO Box 50820 Midland TX 79710	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
17	9314 8699 0430 0053 8637 86	CHI Energy, Inc. PO Box 1799 Midland TX 79702	$2.05	$3.45	$1.50	87806-0003	$0.00 Notice
		Totals:	$34.85	$58.65	**$25.50**		**$0.00**
						Grand Total:	$119.00

List Number of Pieces Listed by Sender	Total Number of Pieces Received at Post Office	Postmaster: Name of receiving employee	Dated:
17			

Transaction Report Details - CertifiedPro.net
Firm Mail Book ID= 157161
Generated: 5/14/2019 9:58:34 AM

USPS Article Number	Date Created	Name 1	Address	Ci	State	Zip	Ma	Status	Service Options	Mail Delivery Date
9314869904300053863786	2018-12-12 1:17 PM	CHI Energy, Inc.	PO Box 1759	Midland	TX	79702	Delivered		Return Receipt - Electronic	12-28-2018
9314869904300053863779	2018-12-12 1:17 PM	Oak Valley Mineral and Land, LP	PO Box 50820	Midland	TX	79710	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863762	2018-12-12 1:17 PM	Mavros Minerals, LLC	PO Box 50820	Midland	TX	79710	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863755	2018-12-12 1:17 PM	Foundations Minerals, LLC	PO Box 50820	Midland	TX	79710	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863748	2018-12-12 1:17 PM	MRC Permian	5400 LBJ Freeway, Suite 1500	Dallas	TX	75240	Delivered		Return Receipt - Electronic	12-18-2018
9314869904300053863731	2018-12-12 1:17 PM	CIMAREX ENERGY CO OF COLORADO	600 N. MARIENFELD STREET SUITE 600	Midland	TX	79701	Lost		Return Receipt - Electronic	
9314869904300053863724	2018-12-12 1:17 PM	POGO OIL & GAS OPERATING INC	1515 CALLE SUR, STE 174	Hobbs	NM	88240	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863717	2018-12-12 1:17 PM	DEVON ENERGY PRODUCTION COMPANY, LP	20 N Broadway	Oklahoma City	OK	73102	To be Returned		Return Receipt - Electronic	
9314869904300053863700	2018-12-12 1:17 PM	TAP ROCK OPERATING, LLC	602 Park Point Drive Suite 200	Golden	CO	80401	Delivered		Return Receipt - Electronic	12-15-2018
9314869904300053863694	2018-12-12 1:17 PM	MEWBOURNE OIL CO	P.O. Box 5270	Hobbs	NM	88241	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863687	2018-12-12 1:17 PM	KEY ENERGY SERVICES LLC	PO BOX 99 2105 AVENUE O	Eunice	NM	88231	Delivered		Return Receipt - Electronic	12-17-2018
9314869904300053863670	2018-12-12 1:17 PM	RKI EXPLORATION & PRODUCTION LLC	3817 NW EXPRESSSWAY SUITE 950	Oklahoma City	OK	73112	To be Returned		Return Receipt - Electronic	
9314869904300053863663	2018-12-12 1:17 PM	MARATHON OIL PERMIAN, LLC	5555 SAN FELIPE ST. HOUSTON	Houston	TX	77056	Delivered		Return Receipt - Electronic	12-19-2018
9314869904300053863656	2018-12-12 1:17 PM	OXY USA INC	PO BOX 4294 HOUSTON	Houston	TX	77210	Delivered		Return Receipt - Electronic	12-19-2018
9314869904300053863649	2018-12-12 1:17 PM	BUREAU OF LAND MGMT	301 Dinosaur Trail	Santa Fe	NM	87508	Delivered		Return Receipt - Electronic	12-14-2018
9314869904300053863632	2018-12-12 1:17 PM	NEW MEXICO STATE LAND OFFICE	P.O. Box 1148	Santa FE	NM	87504	Delivered		Return Receipt - Electronic	12-14-2018
9314869904300053863625	2018-12-12 1:17 PM	Oil Conservation Division District II	811 S. First St., Artesia	Artesia	NM	88210	Delivered		Return Receipt - Electronic	12-17-2018

CARLSBAD
CURRENT-ARGUS

AFFIDAVIT OF PUBLICATION

Ad No.
0001272064

MODRALL SPERLING
PO BOX 2168

ALBUQUERQUE NM 87103

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:

12/26/18

Legal Clerk

Subscribed and sworn before me this
26th of December 2018.

State of WI, County of Brown
NOTARY PUBLIC

9-19-21

My Commission Expires

VICKY FELTY
NOTARY PUBLIC
STATE OF WISCONSIN

Ad#:0001272064
P O : Quintana Publication
# of Affidavits :0.00

CASENO. 20140: Notice to all affected parties, as **devisees of NEW; MEXICO STATE LAND OFFICE** **MGMT; OXY USA INC; MARATHON OIL PERMIAN,** **TION & PRODUCTIONLLC; KEY ENERGYSERVICE** **OIL CO ; TAP ROCK OPERATING,LLC; DEVON EN** **COMPANY, LP ; POGO OIL & GAS OPERATINGINC** **CO OF COLORADO;MRC PERMIAN; FOUNDATIO** **MAVROS MINERALS,LLC; OAK VALLEYMINERAL** **ENERGY,INC.: NGL Water Solutions Permian, LLC,** **Suite 306, Midland, Texas 79701 is filing an app** **along with a C-108 (Application for Authorizatior** **New Mexico Oil Conservation Division for approv** **posal well in Eddy County, New Mexico.** The St through its Oil Conservation Division, hereby gives sion will conduct a public hearing at 8:15 a.m. on consider this application. In this application, NGL se ing disposal into the Silurian-Devonian formation th **SWD #1** well at a surface location 869 feet from the feet from the East line of Section 36, Township 22 S NMPM, Eddy County, New Mexico for the purpose water disposal well. NGL seeks authority to inject Silurian-Devonian formation at a depth of 12,583'- seeks approval of the use of 7 inch tubing inside th mediate casings and 5 ½ inch tubing inside the lin the Division approve a maximum daily injection 50,000 bbls per day. Said area is located approxima Carlsbad, New Mexico.
December 26, 2018

CASE NO. 20140: Notice to all affected parties, as well as the heirs and devisees of NEW; MEXICO STATE LAND OFFICE; BUREAU OF LAND MGMT; OXY USA INC; MARATHON OIL PERMIAN, LLC; RKI EXPLORATION & PRODUCTION LLC; KEY ENERGY SERVICES LLC; MEWBOURNE OIL CO ; TAP ROCK OPERATING, LLC; DEVON ENERGY PRODUCTION COMPANY, LP ; POGO OIL & GAS OPERATING INC; CIMAREX ENERGY CO OF COLORADO; MRC PERMIAN; FOUNDATIONS MINERALS, LLC; MAVROS MINERALS, LLC; OAK VALLEY MINERAL AND LAND, LP; CHI ENERGY, INC.: NGL Water Solutions Permian, LLC, 1509 W. Wall Street. Suite 306, Midland, Texas 79701 is filing an application for hearing along with a C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division for approval of salt water disposal well in Eddy County, New Mexico. The State of New Mexico, through its Oil Conservation Division, hereby gives notice that the Division will conduct a public hearing at 8:15 a.m. on January 10, 2019, to consider this application. In this application, NGL seeks an order approving disposal into the Silurian-Devonian formation through the Quintana SWD #1 well at a surface location 869 feet from the South line and 1730 feet from the East line of Section 36, Township 22 South, Range 26 East, NMPM, Eddy County, New Mexico for the purpose of operating a salt water disposal well. NGL seeks authority to inject salt water into the Silurian-Devonian formation at a depth of 12,583'-13,656'. NGL further seeks approval of the use of 7 inch tubing inside the surface and intermediate casings and 5 ½ inch tubing inside the liner and requests that the Division approve a maximum daily injection rate for the well of 50,000 bbls per day. Said area is located approximately 5 miles south of Carlsbad, New Mexico.
December 26, 2018