

# Initial Application Part I

Received 11/29/20

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

TX2T1-201129-C-1080

Revised March 23, 2017

RECEIVED: <b>11/29/20</b>	REVIEWER:	TYPE: <b>SWD</b>	APP NO: <b>pBL2033542431</b>
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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:** Longfellow Energy, LP **OGRID Number:** 372210  
**Well Name:** Muskegon 20 State Com 1 **API:** 30-015-26397  
**Pool:** SWD; Cisco **Pool Code:** 96099

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

- 1) **TYPE OF APPLICATION:** Check those which apply for [A]  
 A. Location – Spacing Unit – Simultaneous Dedication  
☐ NSL ☐ NSP (PROJECT AREA) ☐ NSP (PRORATION UNIT) ☐ SD
- B. Check one only for [I] or [II]  
 [I] Commingling – Storage – Measurement  
☐ DHC ☐ CTB ☐ PLC ☐ PC ☐ OLS ☐ OLM  
 [II] Injection – Disposal – Pressure Increase – Enhanced Oil Recovery  
☐ WFX ☐ PMX ☒ SWD ☐ IPI ☐ EOR ☐ PPR

**SWD-2408**

- 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

**FOR OCD ONLY**

<input type="checkbox"/>	Notice Complete
<input type="checkbox"/>	Application Content Complete

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

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

Brian Wood

Print or Type Name

Signature

11-25-20

Date

505 466-8120

Phone Number

brian@permitswest.com

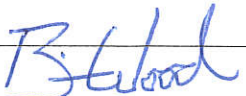
e-mail Address

STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL  
RESOURCES DEPARTMENT

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

FORM C-108  
Revised June 10, 2003

**APPLICATION FOR AUTHORIZATION TO INJECT**

- I. PURPOSE: \_\_\_\_\_ Secondary Recovery \_\_\_\_\_ Pressure Maintenance \_\_\_\_\_ XXX Disposal \_\_\_\_\_ Storage  
Application qualifies for administrative approval? \_\_\_\_\_ XXX Yes \_\_\_\_\_ No
- II. OPERATOR: LONGFELLOW ENERGY, LP  
ADDRESS: 16803 NORTH DALLAS PARKWAY, ADDISON TX 75001  
CONTACT PARTY: BRIAN WOOD (PERMITS WEST, INC.) PHONE: 505 466-8120
- III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection.  
Additional sheets may be attached if necessary.
- IV. Is this an expansion of an existing project? \_\_\_\_\_ Yes XXX No  
If yes, give the Division order number authorizing the project: \_\_\_\_\_
- V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
- VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
- VII. Attach data on the proposed operation, including: **MUSKEGON 20 STATE COM 1**  
**30-015-26397**
1. Proposed average and maximum daily rate and volume of fluids to be injected;
  2. Whether the system is open or closed;
  3. Proposed average and maximum injection pressure;
  4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
  5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).
- \*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.
- IX. Describe the proposed stimulation program, if any.
- \*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).
- \*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
- XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.
- XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.
- XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
- NAME: BRIAN WOOD  TITLE: CONSULTANT  
SIGNATURE: \_\_\_\_\_ DATE: NOV. 20, 2020  
E-MAIL ADDRESS: brian@permitswest.com
- \* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: \_\_\_\_\_

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



Side 2

## III. WELL DATA

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

- (1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.
- (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
- (3) A description of the tubing to be used including its size, lining material, and setting depth.
- (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

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

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

- (1) The name of the injection formation and, if applicable, the field or pool name.
- (2) The injection interval and whether it is perforated or open-hole.
- (3) State if the well was drilled for injection or, if not, the original purpose of the well.
- (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
- (5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

## XIV. PROOF OF NOTICE

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

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

- (1) The name, address, phone number, and contact party for the applicant;
- (2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;
- (3) The formation name and depth with expected maximum injection rates and pressures; and,
- (4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days.

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

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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.

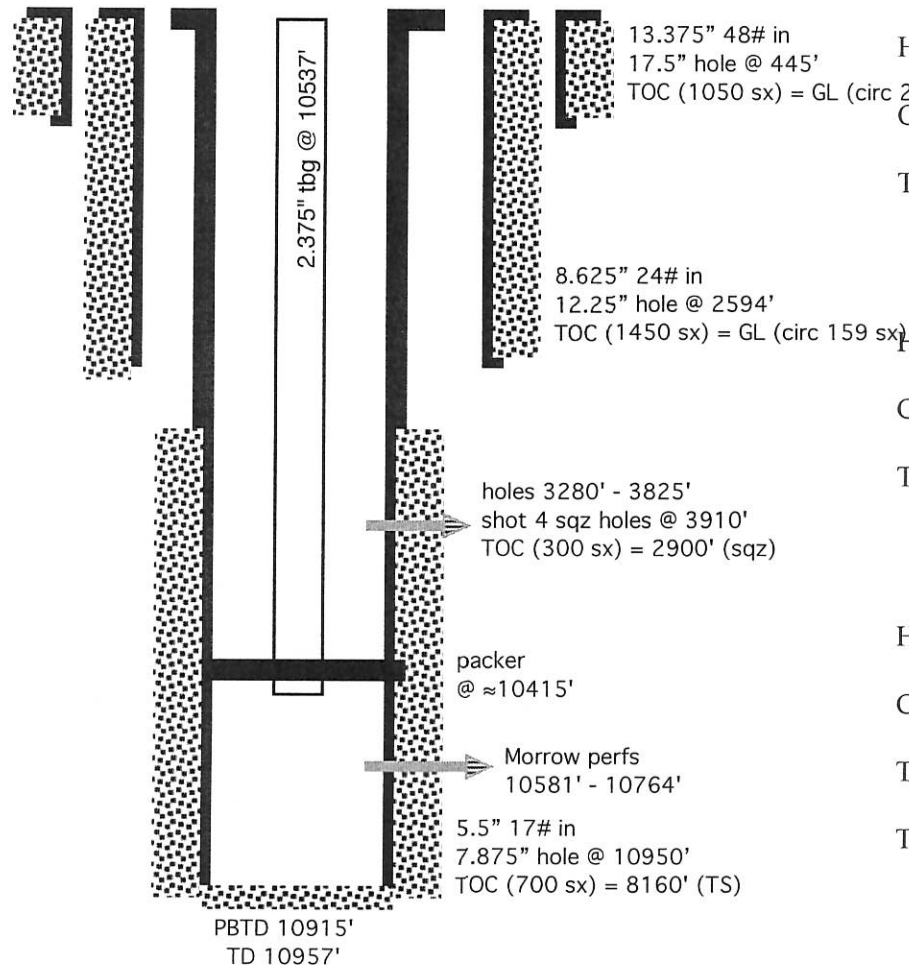


## INJECTION WELL DATA SHEET

OPERATOR: LONGFELLOW ENERGY, LPWELL NAME & NUMBER: MUSKEGON 20 STATE COM 1WELL LOCATION: 1980' FNL & 660' FEL  
FOOTAGE LOCATIONH  
UNIT LETTER20  
SECTION17 S  
TOWNSHIP29 E  
RANGEWELLBORE SCHEMATIC

"As Is"

(not to scale)

WELL CONSTRUCTION DATASurface CasingHole Size: 17.5" Casing Size: 13.375"Cemented with: 1050 sx. *or* \_\_\_\_\_ ft<sup>3</sup>Top of Cement: GL Method Determined: CIRC. 20 SXIntermediate CasingHole Size: 12.25" Casing Size: 8.625"Cemented with: 1450 sx. *or* \_\_\_\_\_ ft<sup>3</sup>Top of Cement: GL Method Determined: CIRC 159 SXProduction CasingHole Size: 7.875" Casing Size: 5.5"Cemented with: 1000 sx. *or* \_\_\_\_\_ ft<sup>3</sup>Top of Cement: 2900' Method Determined: SOZTotal Depth: 10957'Injection Interval9080 feet to 9395'

(Perforated or Open Hole; indicate which)

■■■■■■■■■■

OPERATOR: LONGFELLOW ENERGY, LP

WELL NAME & NUMBER: MUSKEGON 20 STATE COM 1

WELL LOCATION: 1980' FNL & 660' FEL  
FOOTAGE LOCATION

H	UNIT LETTER
1	A
2	B
3	C
4	D
5	E
6	F
7	G
8	H
9	I
10	J
11	K
12	L
13	M
14	N
15	O
16	P
17	Q
18	R
19	S
20	T
21	U
22	V
23	W
24	X
25	Y
26	Z

20  
SECTION

17 S  
TOWNSHIP

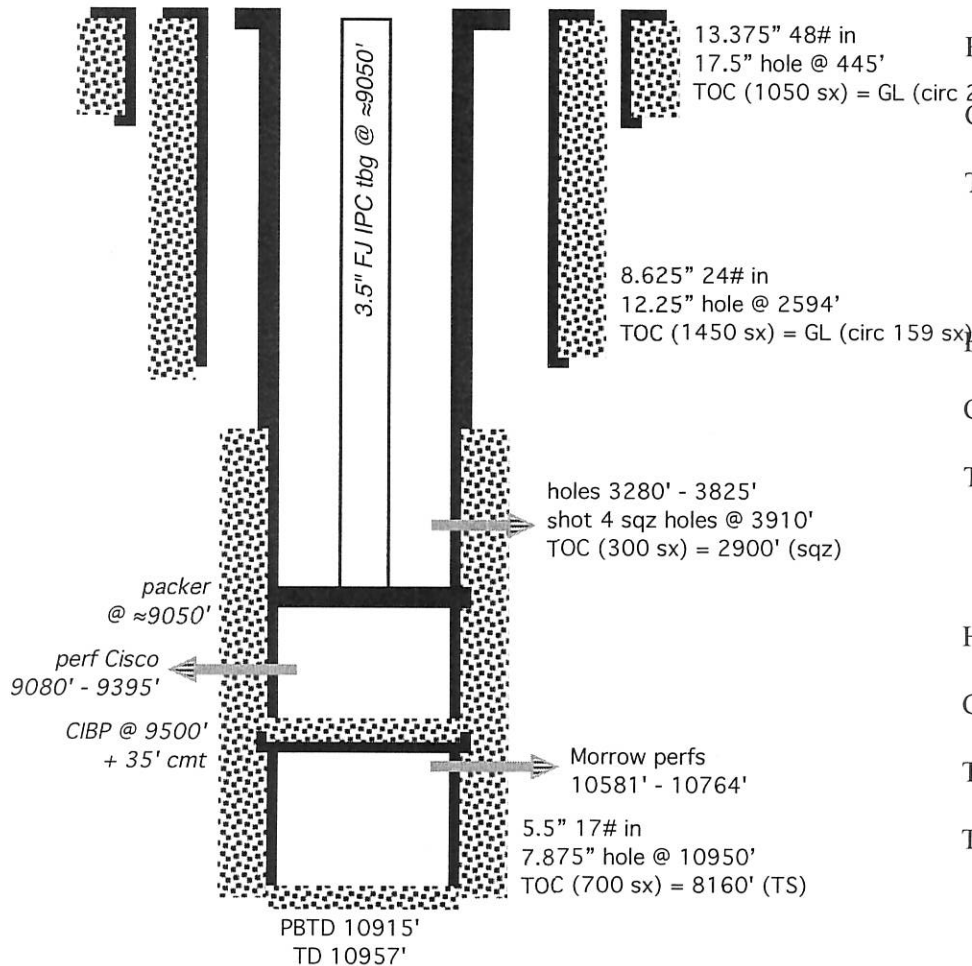
29 E

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RANGE

### WELLBORE SCHEMATIC

"Proposed"  
(not to scale)



### WELL CONSTRUCTION DATA

### Surface Casing

Hole Size: 17.5"

Casing Size: 13.375"

Cemented with: 1050 sx.

*or* \_\_\_\_\_ ft<sup>3</sup>

Top of Cement: GL

Method Determined: CIRC. 20 SX

### Intermediate Casing

5x) Hole Size: 12.25"

Casing Size: 8.625"

Cemented with: 1450 sx.

or \_\_\_\_\_ ft<sup>3</sup>

Top of Cement: GL

Method Determined: CIRC 159 SX

### Production Casing

Hole Size: 7.875"

Casing Size: 5.5"

Cemented with: 1000 sx.

or \_\_\_\_\_ ft<sup>3</sup>

Top of Cement: 2900'

Method Determined: SQZ

Total Depth: 10957'

### Injection Interval

9080 feet to 9395'

(Perforated or Open Hole; indicate which)

**INJECTION WELL DATA SHEET**Tubing Size: FJ 3.5" J-55 9.3# Lining Material: INTERNAL PLASTIC COATType of Packer: ASI-XPacker Setting Depth: ≈9050'

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

Additional Data

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

If no, for what purpose was the well originally drilled? MORROW GAS WELL

2. Name of the Injection Formation: CISCO

3. Name of Field or Pool (if applicable): SWD; CISCO (96099)

4. Has the well ever been perforated in any other zone(s)? List all such perforated intervals and give plugging detail, i.e. sacks of cement or plug(s) used. YES  
GLORIETA SQUEEZED @ 3910 WITH 300 SX  
MORROW PERFORATED 10581' - 10764' & WILL ISOLATE W/ CIBP @ 9500' + 35' CMT

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

OVER: SEVEN RIVERS (1105'), QUEEN (1690'), GRAYBURG (2062'),  
SAN ANDRES (2346'), GLORIETA (3795'), YESO (3867'), TUBB (5320')

UNDER: MORROW (10279')



LONGFELLOW ENERGY, LP  
MUSKEGON 20 STATE COM 1  
1980' FNL & 660' FEL  
SEC. 20, T. 17 S., R. 29 E., EDDY COUNTY, NM

PAGE 1

30-015-26397

I. Plan is to convert a TSI 10,957' deep Morrow gas well to a SWD; Cisco (96099) saltwater disposal well. Disposal will be from 9080' to 9395' in the Cisco. Well is on NM State Land Office surface and minerals. See Exhibit A for a USGS map and C-102 forms. Well last produced (26 Mcf in 21 days) in April 2020.

II. Operator: Longfellow Energy, LP (OGRID 372210)  
Operator phone number: (972) 590-9900  
Operator address: 16803 North Dallas Parkway, Addison TX 75001  
Contact for Application: Brian Wood (Permits West, Inc.)  
Phone: (505) 466-8120

III. A. (1) Lease: NMSLO B0-6846-0003  
Lease Size: 440.00 acres  
Closest Lease Line: 660'  
Lease: NE4 Section 20, T. 17 S., R. 29 E. et al

A. (2) Surface casing (13.375", 48#) is set at 445' in a 17.5" hole and cemented to GL with 1050 sacks (circulated 20 sacks).

Intermediate casing (8.625", 24#) is set at 2594' in a 12.25" hole and cemented to GL with 1450 sacks (circulated 159 sacks).

Production casing (5.5", 17#) is set at 10,950' in a 7.875" hole and cemented to 8140' (temperature) with 700 sacks. (Holes were found in casing 3314' – 3825' in 2007. Squeeze job was performed in 2008 with 300 sacks. TOC is now 2900'.) A CIBP will be set @ 9500' and topped with  $\geq 35'$  of cement to isolate the deeper zones.

A. (3) IPC tubing (flush joint 3.5", 9.3#, J-55, BT&C) will be set @  $\approx 9050'$ . (Disposal interval will be 9080' – 9395'.)

A. (4) A 5.5" ASI-X packer will be set @  $\approx 9050'$  (or in any event,  $\leq 100'$  above the top perforation (9080').

LONGFELLOW ENERGY, LP  
MUSKEGON 20 STATE COM 1  
1980' FNL & 660' FEL  
SEC. 20, T. 17 S., R. 29 E., EDDY COUNTY, NM

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- B. (1) Disposal zone will be carbonates in the SWD; Cisco (96099).
- B. (2) Disposal interval (9080' to 9395') will be perforated.
- B. (3) This existing well was drilled as a Morrow gas well in 1990.
- B. (4) Morrow is perforated from 10,581' to 10,764'. Holes were subsequently found in the casing from 3280' to 3510'. Four holes were shot in the Glorieta at 3910' and 300 sacks squeezed. TOC = 2900'.
- B. (5) Next higher oil or gas zone in the area of review is the Tubb. Tubb bottom is at  $\approx 6018'$ , or  $\approx 2763'$  above the Cisco. Morrow is the only producing oil or gas zone in the area of review below the Cisco. Morrow top is at 10,279', or 720' below the bottom of the Cisco. Closest Cisco producer (30-015-30723) is 2-3/4 miles SSE in G-4-18s-29e. Closest existing Cisco SWD well (30-015-30874) is 3021' SSE in M-21-17s-29e. Closest existing SWD; Cisco-Canyon well (30-015-39771) is 7397' northeast in K-15-17s-29e.

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

V. Exhibit B shows and tabulates 52 wells (47 producers + 5 P&A) within a half-mile (2640') radius. None of the wells within a half-mile penetrated the Cisco. Two wells just beyond (1' and 9') a half-mile did penetrate the Cisco. The closer of the two is P&A and the other is an active gas well. Exhibit C shows 841 existing wells (653 oil or gas + 163 P&A + 21 water injectors or disposers + 3 gas storage + 1 water) within a 2-mile radius.

Exhibit D maps and tabulates all well operators (regardless of depth), leases, and lessors (only NMSLO & BLM) within a half-mile radius. Exhibit E shows all leases (only NMSLO & BLM) within a 2-mile radius.



LONGFELLOW ENERGY, LP  
MUSKEGON 20 STATE COM 1  
1980' FNL & 660' FEL  
SEC. 20, T. 17 S., R. 29 E., EDDY COUNTY, NM

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VI. None (Exhibit F) of the 52 wells within a half-mile (2640' radius) penetrated the Cisco. Two penetrators are just beyond (2641' & 2649') Well construction abstracts are in Exhibit F. The closer of the two is P&A and a diagram of its wellbore is in Exhibit F.

- VII.
1. Average injection rate will be  $\approx 15,000$  bwpd. Maximum injection rate will be 20,000 bwpd.
  2. System will be closed and open.
  3. Average injection pressure will be  $\approx 1500$  psi. Maximum injection pressure will be 1816 psi ( $= 0.2$  psi/ft  $\times$  9080' (highest perforation)).
  4. Water source will be produced water from Permian Basin wells. Exhibit G tabulates T. 17 S., R. 28 & 29 E. produced water analyses from New Mexico Produced Water Quality Database v.2. No compatibility problems have been reported from the closest (3021' SSE) SWD; Cisco well (30-015-30874; M-21-17s-29e). A minimum 10,166,336 barrels have been disposed to date in 15 years of operation.
  5. The Cisco has not been found productive of oil and gas within a mile. WAIDS analysis (Exhibit H) shows Cisco TDS at 216,236 mg/l.

VIII. The Cisco (779' thick) is comprised of limestone, dolomite, shale, and sandstone. Closest possible underground source of drinking water above the proposed disposal interval are the red beds in the top  $\approx 200'$ . Deepest water well within 2-miles is 131'. The  $>1.5$ -mile thick interval between the bottom of the red beds and the top of the Cisco include multiple confining layers of anhydrite, salt, and shale.

State Engineer records (Exhibit I) show the only water well (RA 11807 POD 1) within 2-miles is 1.39 miles southeast in K-22-17s-29e. It was sampled (Exhibit I) October 9, 2020. Muskegon 20 State Com 1 is 13 miles north of the Capitan and 15 miles west of the Ogallala.

No underground source of drinking water is below the proposed disposal zone. Produced water is currently being injected in 46 wells (Abo, Glorieta, Grayburg, Queen, San Andres, Seven Rivers, and Yeso) and disposed in 18 wells (Canyon, Cisco, Penn, Upper Penn, Strawn) within 17s-29e.



LONGFELLOW ENERGY, LP  
MUSKEGON 20 STATE COM 1  
1980' FNL & 660' FEL  
SEC. 20, T. 17 S., R. 29 E., EDDY COUNTY, NM

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30-015-26397

Formation tops are:

Quaternary = 0'  
Rustler = 360'  
Salt = 395'  
Yates = 855'  
Seven Rivers = 1105'  
Queen = 1690'  
Grayburg = 2062'  
San Andres = 2346'  
Glorieta = 3795'  
Yeso = 3867'  
Blinberry = 4445'  
Tubb = 5320'  
Abo = 6019'  
Wolfcamp = 7131'  
Cisco = 8781'  
*Proposed Disposal Zone = 9080' - 9395'*  
CIBP: 9500' + 35' of cement  
Canyon = 9560'  
Strawn = 9870'  
Atoka = 10123'  
Morrow = 10279'  
Mississippian = 10888'  
PBSD = 10915'  
TD = 10957'

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

X. LDT/CNL and MSFL/DLL logs are on file with NMOCD.

XI. No water well is within a mile. A water well 1.39 miles southeast was sampled (Exhibit I) on October 9, 2020.

LONGFELLOW ENERGY, LP  
MUSKEGON 20 STATE COM 1  
1980' FNL & 660' FEL  
SEC. 20, T. 17 S., R. 29 E., EDDY COUNTY, NM

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30-015-26397

XII. Longfellow Energy, LP is not aware of any geologic or engineering data (Exhibit J) that may indicate the Cisco is in hydrologic connection with any underground source of water. Twenty-one SWD; Cisco wells (and eleven SWD; Cisco-Canyon) wells are active in New Mexico.

XIII. Legal ad (Exhibit K) was published in the Artesia newspaper on October 22, 2020. Notice (this application) is being sent (Exhibit L) to the surface owner (NMSLO), lessors, lessees of record, operating right holders, and well operators within a half-mile.

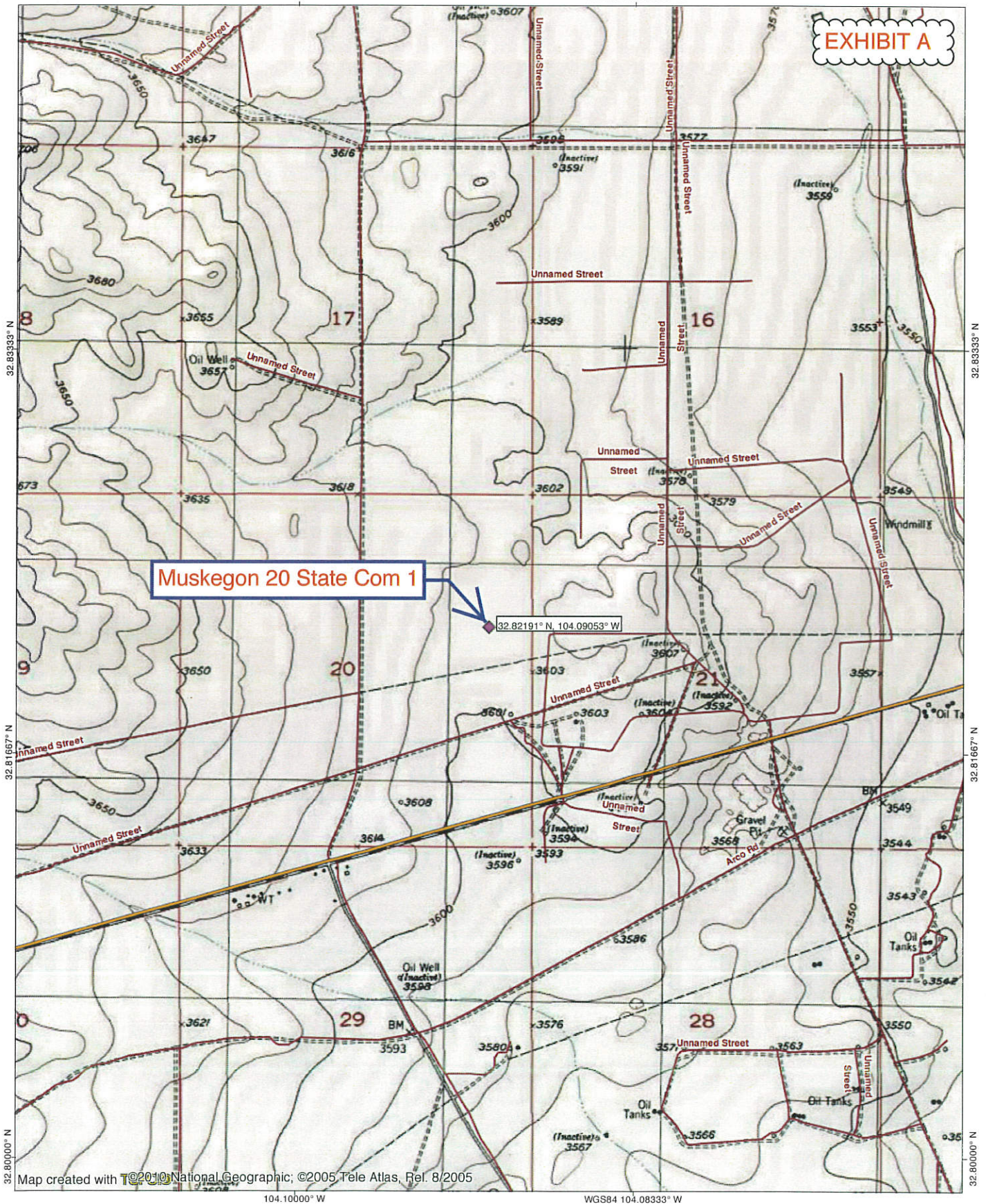


TOPO! map printed on 10/01/20 from "Untitled.tpo"

104.10000° W

WGS84 104.08333° W

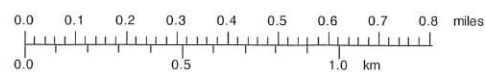
EXHIBIT A



Map created with 2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005

104.10000° W

WGS84 104.08333° W



TN MN

7°

10/01/20



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

**EXHIBIT A**

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number <b>30-015-26397</b>	<sup>2</sup> Pool Code <b>96099</b>	<sup>3</sup> Pool Name <b>SWD; CISCO</b>
<sup>4</sup> Property Code	<sup>5</sup> Property Name <b>MUSKEGON 20 STATE COM</b>	<sup>6</sup> Well Number <b>1</b>
<sup>7</sup> OGRID No. <b>372210</b>	<sup>8</sup> Operator Name <b>LONGFELLOW ENERGY, LP</b>	<sup>9</sup> Elevation <b>3605'</b>

<sup>10</sup> Surface Location

UL or lot no. <b>H</b>	Section <b>20</b>	Township <b>17 S</b>	Range <b>29 E</b>	Lot Idn	Feet from the <b>1980</b>	North/South line <b>NORTH</b>	Feet from the <b>660</b>	East/West line <b>EAST</b>	County <b>EDDY</b>
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<sup>11</sup> 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
<sup>12</sup> Dedicated Acres	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.						

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

	<p><b><sup>17</sup> OPERATOR CERTIFICATION</b> 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.</p> <p>Signature  Date <b>11-8-20</b></p> <p><b>BRIAN WOOD</b> Printed Name</p> <p><b>brian@permitswest.com</b> E-mail Address</p> <p><b>505 466-8120</b></p>	
	<p><b><sup>18</sup> SURVEYOR CERTIFICATION</b> 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.</p> <p><b>5-29-90</b> Date of Survey</p> <p>Signature and Seal of Professional Surveyor: <b>Original survey by John W. West #676 is on file with NMOCD.</b></p> <p>Certificate Number</p>	

Submit to Appropriate  
District Office  
State Lease - 4 copies  
Fee Lease - 3 copies

Energy, Minerals and Natural Resources Department

Form C-104  
Revised 1-1-89

## OIL CONSERVATION DIVISION

P.O. Box 2088

Santa Fe, New Mexico 87504-2088

EXHIBIT A

## DISTRICT I

P.O. Box 1980, Hobbs, NM 88240

## DISTRICT II

P.O. Drawer DD, Artesia, NM 88210

## DISTRICT III

1000 Rio Brizos Rd., Aztec, NM 87410

## WELL LOCATION AND ACREAGE DEDICATION PLAT

All Distances must be from the outer boundaries of the section

Operator SANTA FE ENERGY OPERATING PARTNERS, L.P.			Lease Muskegon State "20" Com.		Well No. 1
Unit Letter H	Section 20	Township 17 South	Range 29 East	County Eddy	

## Actual Footage Location of Well:

1980	feet from the	North	line and	660	feet from the	East	line
Ground level Elev. 3605.1	Producing Formation Morrow		Pool Empire South (Morrow)		Dedicated Acreage: 320 Acres		

1. Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interest of all owners been consolidated by communitization, unitization, force-pooling, etc.?  
☒ Yes    ☐ No    If answer is "yes" type of consolidation Communitization  
 If answer is "no" list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary).  
 No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interest, has been approved by the Division.

## OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief.

Signature

Darrell Roberts

Printed Name

Darrell Roberts

Position

Senior Drilling Engineer

Company Santa Fe Energy

Operating Partners, L.P.

Date

June 7, 1990

## SURVEYOR CERTIFICATION

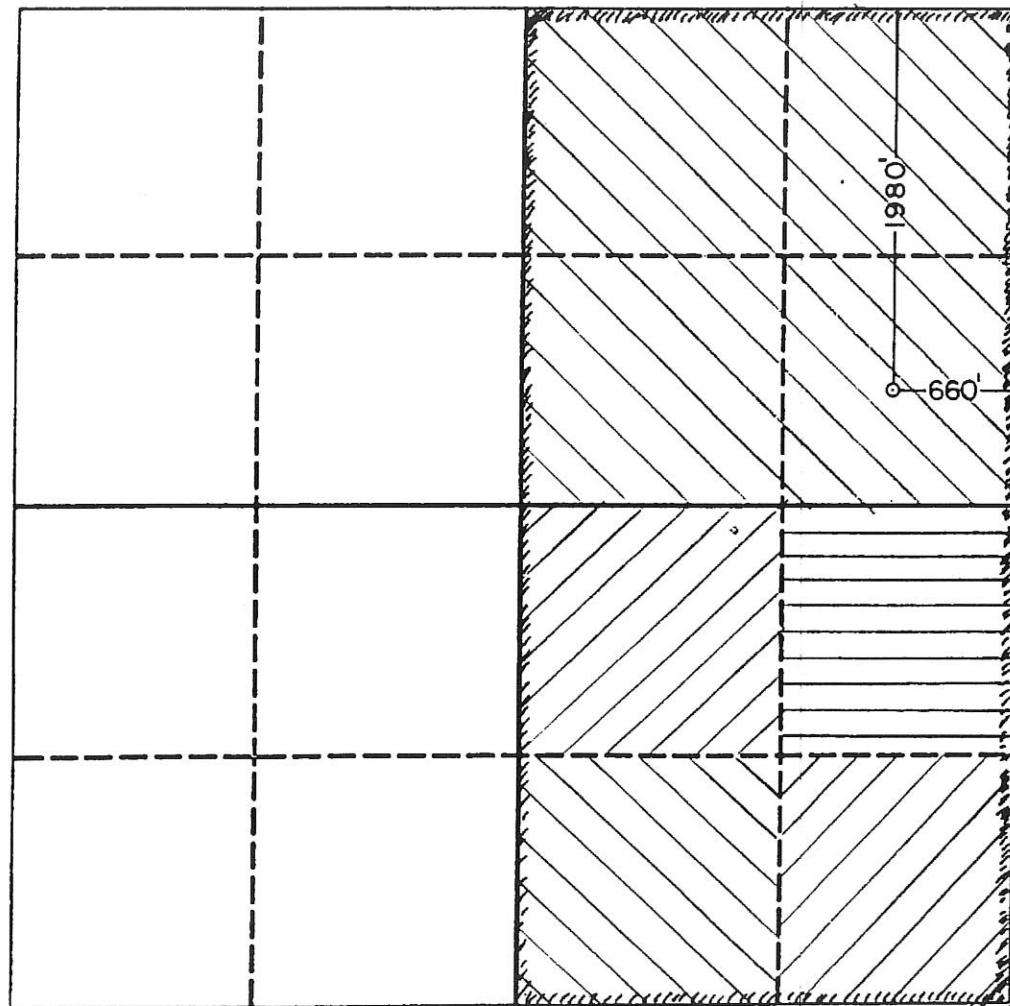
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed

May 29, 1990

Signature &amp; Seal of Professional Surveyor

JOHN W. WEST, 876  
RONALD J. EIDSON, 879  
NEW MEXICO  
JOHN W. WEST



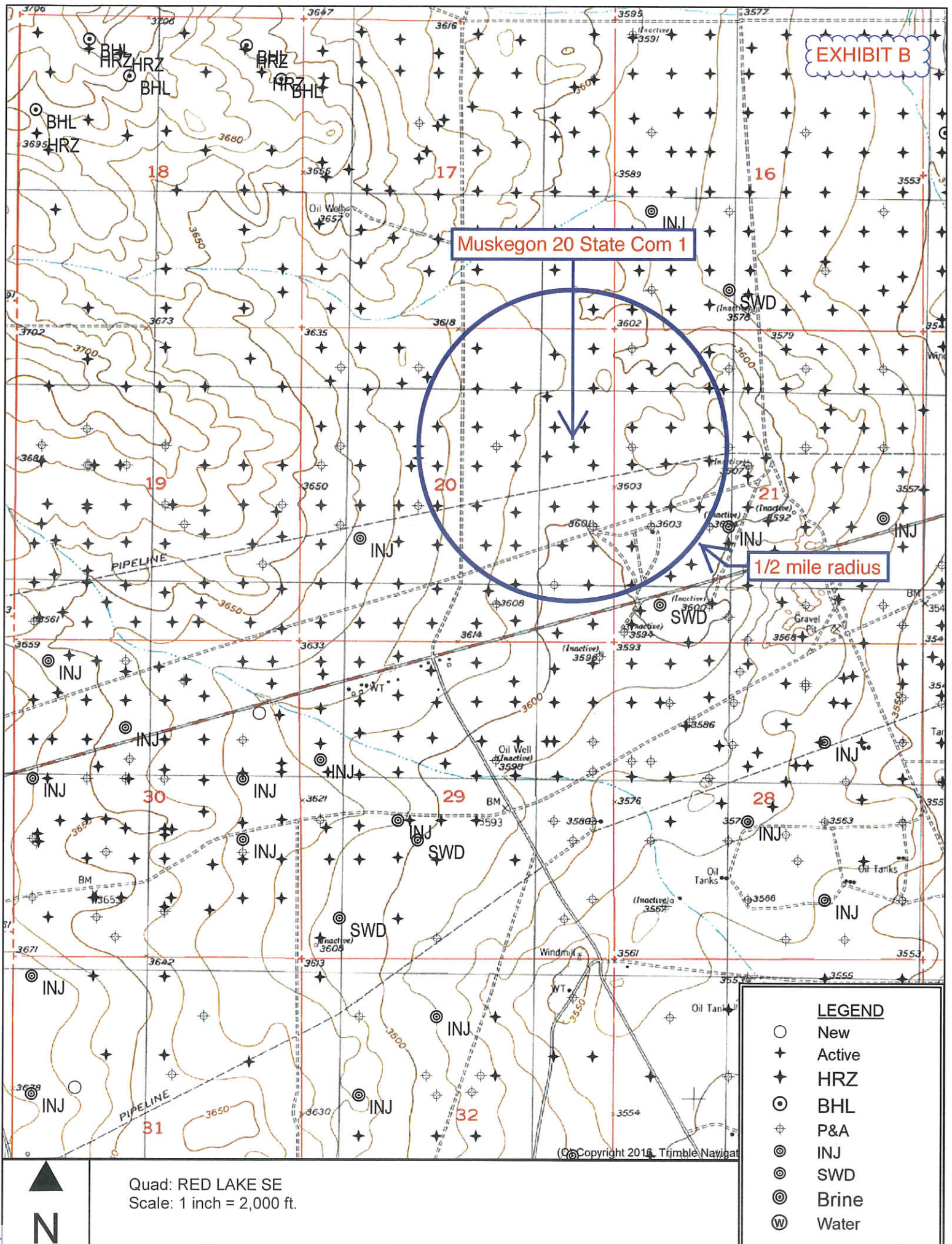
125030

B6846

B1266

VC 0004







## SORTED BY DISTANCE FROM MUSKEGON 20 STATE COM 1

API	OPERATOR	WELL	STATUS	UNIT- SECTION- T17S- R29E	TVD	ZONE @ TD	FEET FROM MUSKEGON 20 STATE COM 1
3001533097	Longfellow	State 20 B 015	O	H-20	4312	Yeso	375
3001530919	Longfellow	State 20 B 002	O	H-20	4994	Yeso	447
3001530921	Longfellow	State 20 B 004	O	H-20	4916	Yeso	472
3001533156	Longfellow	State 20 B 016	O	H-20	4290	Yeso	492
3001510823	Mack	G J West Coop Unit 035	P&A	E-21	2700	San Andres	991
3001535721	Spur	G J West Coop Unit 169	O	E-21	5458	Tubb	1032
3001533205	Longfellow	State 20 B 020	O	G-20	4325	Yeso	1037
3001530918	Longfellow	State 20 B 001	O	A-20	5020	Yeso	1043
3001527359	Spur	G J West Coop Unit 114	O	E-21	5518	Tubb	1044
3001530968	Longfellow	State 20 B 006	O	G-20	4533	Yeso	1051
3001531951	Spur	Muskegon S State 004	O	I-20	4373	Yeso	1057
3001530732	Spur	Muskegon S State 002	O	I-20	4370	Yeso	1058
3001503012	Continental	State M-20 001	P&A	G-20	2848	San Andres	1330
3001503017	Maralo	State J 005	P&A	I-20	2243	Grayburg	1375
3001535456	Spur	G J West Coop Unit 152	O	D-21	5515	Tubb	1400
3001530922	Longfellow	State 20 B 005	O	B-20	4584	Yeso	1409
3001537151	Spur	G J West Coop Unit 257	O	L-21	5498	Tubb	1412
3001534383	Spur	Rincon State 008	O	J-20	4295	Yeso	1490
3001530920	Longfellow	State 20 B 003	O	A-20	4969	Yeso	1588
3001527358	Spur	G J West Coop Unit 113	O	E-21	5550	Tubb	1592

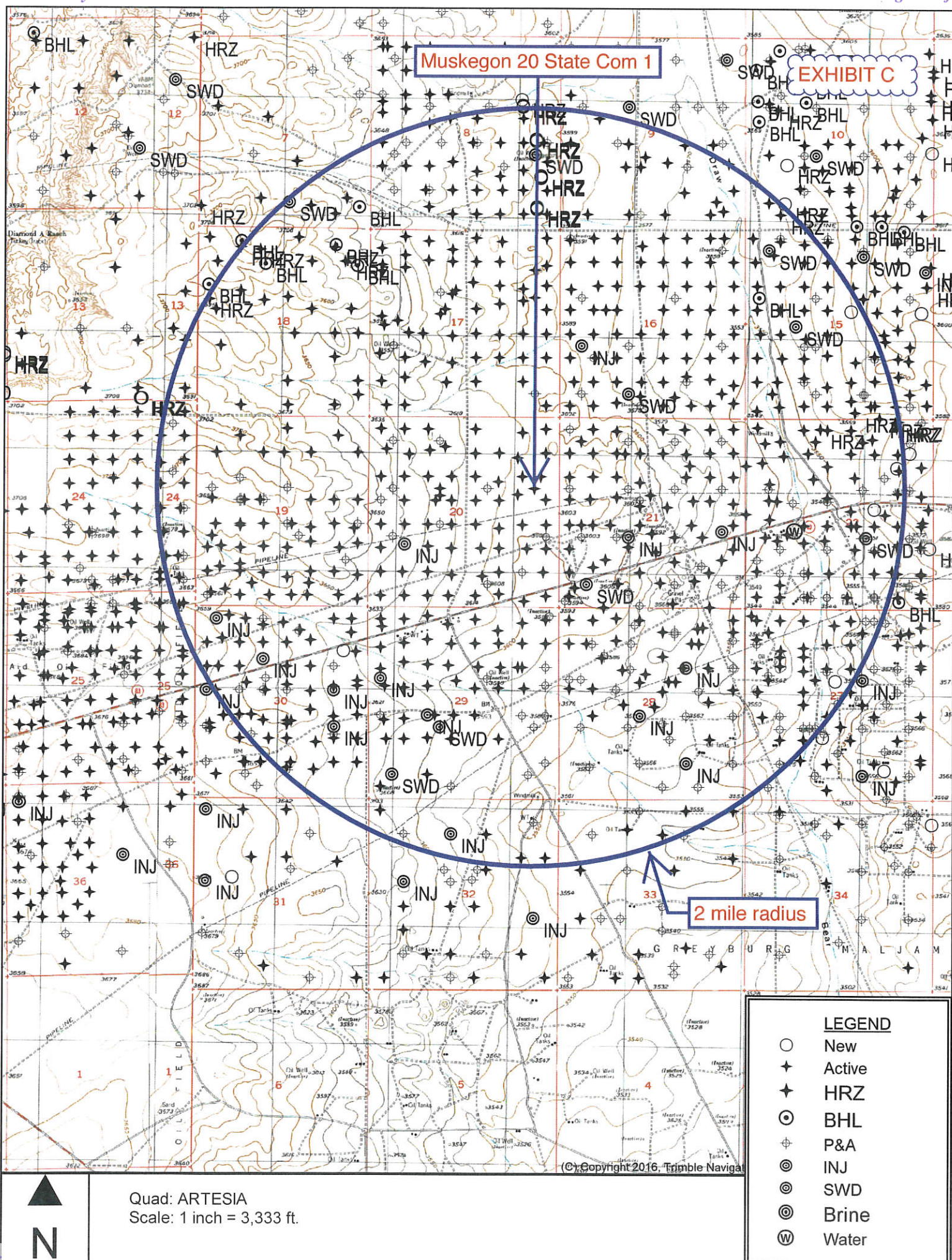
SORTED BY DISTANCE FROM MUSKEGON 20 STATE COM 1

API	OPERATOR	WELL	STATUS	UNIT- SECTION- T17S- R29E	TVD	ZONE @ TD	FEET FROM MUSKEGON 20 STATE COM 1
3001537862	Spur	G J West Coop Unit 307	O	L-21	5545	Tubb	1662
3001531950	Spur	Muskegon S State 003	O	I-20	4380	Yeso	1676
3001533069	Longfellow	State 20 B 014	O	A-20	4327	Yeso	1683
3001536700	Spur	G J West Coop Unit 251	O	E-21	5459	Tubb	1686
3001533070	Longfellow	State 20 B 017	O	G-20	4315	Yeso	1693
3001531053	Longfellow	State 20 B 008	O	G-20	5000	Yeso	1696
3001530724	Spur	Muskegon S State 001	O	I-20	4308	Yeso	1697
3001520124	Spur	G J West Coop Unit 048	O	D-21	4225	Yeso	1868
3001503021	Mack	G J West Coop Unit 034	P&A	L-21	4028	Yeso	1880
3001527360	Spur	G J West Coop Unit 115	O	D-21	4758	Yeso	1927
3001533215	Longfellow	State 20 B 019	O	B-20	4337	Yeso	1927
3001535654	Spur	G J West Coop Unit 164	O	L-21	5540	Tubb	1936
3001530675	Spur	Rincon State 003	O	J-20	4335	Yeso	1937
3001530943	Spur	Rincon State 004	O	J-20	4375	Yeso	1938
3001527377	Spur	G J West Coop Unit 107	O	L-21	5555	Tubb	1939
3001532158	Spur	Rincon State 007	O	J-20	4401	Yeso	2243
3001533241	Longfellow	State 20 B 018	O	A-20	4302	Yeso	2272
3001536056	Spur	G J West Coop Unit 184	O	F-21	5473	Tubb	2328
3001531269	Mewbourne	Empire 20 State 003	O	F-20	4290	Yeso	2333
3001531446	Longfellow	Phillips 17 FEDERAL 003	O	P-17	4427	Yeso	2333

SORTED BY DISTANCE FROM MUSKEGON 20 STATE COM 1

API	OPERATOR	WELL	STATUS	UNIT-SECTION-T17S-R29E	TVD	ZONE @ TD	FEET FROM MUSKEGON 20 STATE COM 1
3001535873	Mewbourne	Empire 20 State 004	O	F-20	7500	Wolfcamp	2336
3001537436	Spur	G J West Coop Unit 250	O	D-21	5545	Tubb	2336
3001532063	Spur	Rincon State 006	O	P-20	4474	Yeso	2339
3001527364	Spur	G J West Coop Unit 119	O	F-21	5516	Tubb	2340
3001531052	Longfellow	State 20 B 007	O	B-20	5000	Yeso	2346
3001530860	COG	Rincon State 002	P&A	P-20	4355	Yeso	2347
3001527259	Spur	G J West Coop Unit 106	O	K-21	5050	Yeso	2371
3001535986	Spur	G J West Coop Unit 179	O	M-16	5494	Tubb	2513
3001534495	Spur	Mesquite State 014	O	K-20	6020	Tubb	2516
3001537150	Spur	G J West Coop Unit 249	O	C-21	5504	Tubb	2520
3001531054	Longfellow	State 20 B 010	O	O-20	5000	Yeso	2526
3001537438	Spur	G J West Coop Unit 258	O	M-21	5512	Tubb	2529
3001534283	Cimarex of CO	Muskegon 17 Federal Com 002	P&A	P-17	10915	Mississippian	2641
3001503013	Rover	Humble State 001	O	F-20	2286	Grayburg	2642
3001527135	Mewbourne	Empire 20 State 001	G	F-20	10920	Mississippian	2649





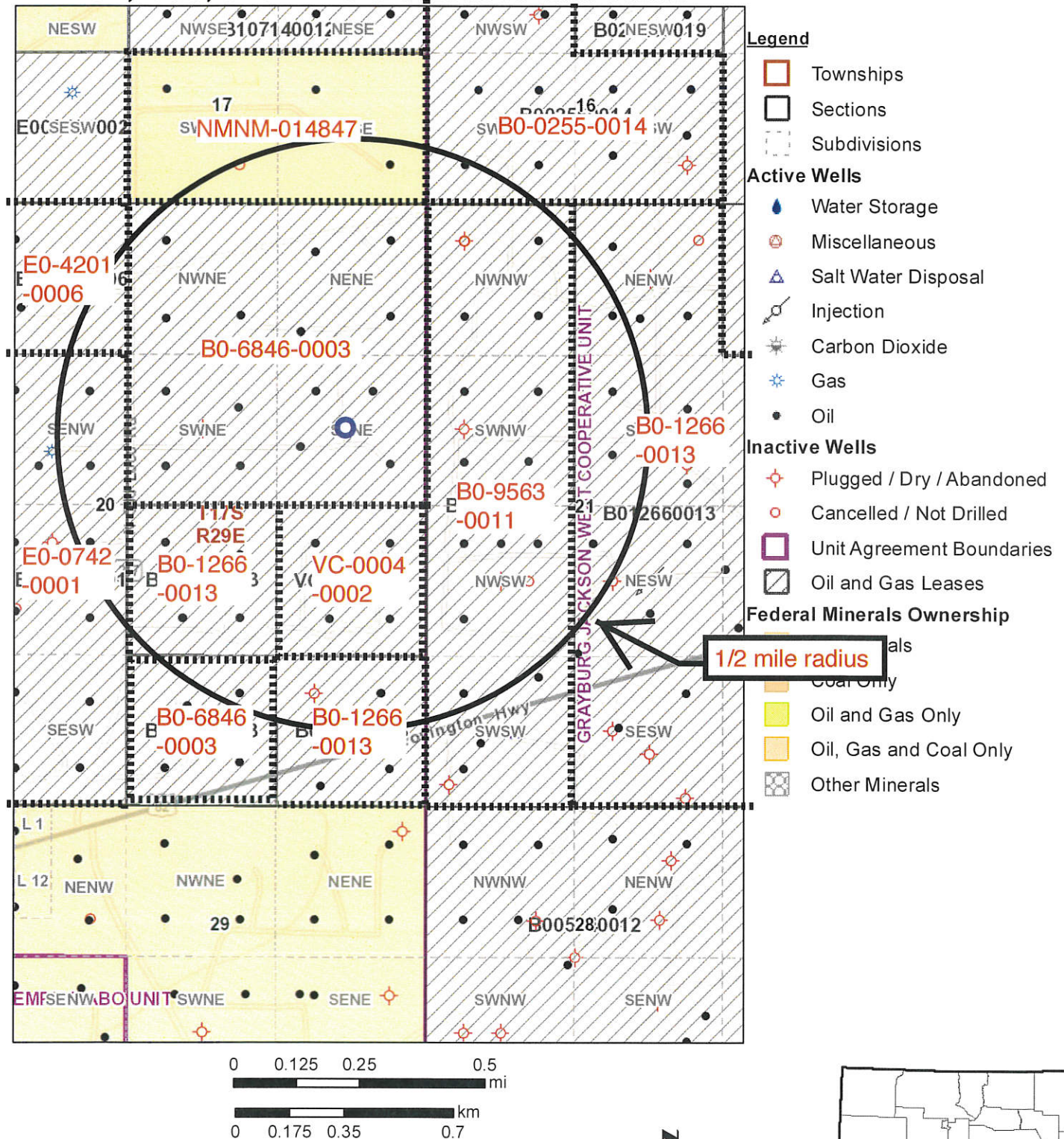




New Mexico State Land Office

EXHIBIT D

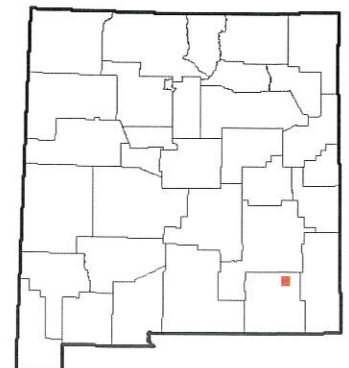
## Oil, Gas, and Minerals Leases and Wells



## Disclaimer:

The New Mexico State Land Office assumes no responsibility or liability for, or in connection with the accuracy, reliability or use of the information provided herein with respect to State Land Office data or data from other sources.

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





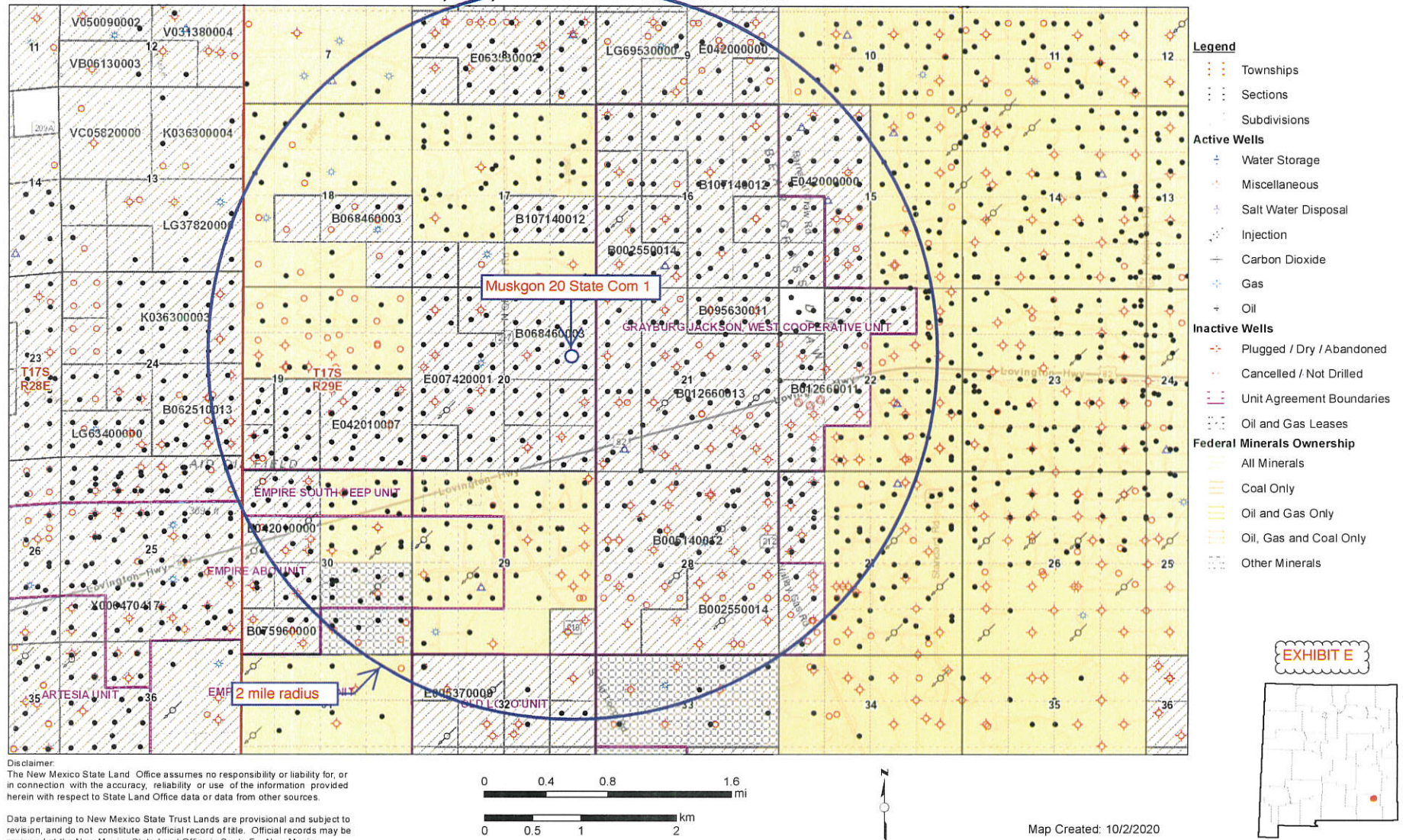
## MUSKEGON 20 STATE COM 1 AREA OF REVIEW LEASES

Aliquot Parts in Area of Review (T. 17 S., R. 29 E.)	Lessor	Lease	Lessee of Record	Well Operators (none Canyon)
SWSW Sec. 16	NMSLO	B0-0255-0014	SEP	Spur
S2SE4 Sec. 17	BLM	NMNM-014847	ConocoPhillips	Longfellow, ConocoPhillips
NE4 & SWSE Sec. 20	NMSLO	B0-6846-0003	Longfellow	Longfellow
NENW Sec. 20	NMSLO	E0-4201-0006	Longfellow	Longfellow, Mewbourne
SENW & NESW Sec. 20	NMSLO	E0-0742-0001	Mewbourne	Mewbourne, Rover, Spur
NESE Sec. 20	NMSLO	VC-0004-0002	SEP	Spur
NWSE & SESE Sec. 20	NMSLO	B0-1266-0013	SEP	Spur
E2NW4 & NESW Sec. 21	NMSLO	B0-1266-0013	SEP	Spur
W2W2 Sec. 21	NMSLO	B0-9563-0011	SEP	Spur



New Mexico State Land Office

## Oil, Gas, and Minerals Leases and Wells





CISCO PENETRATORS WITHIN 2649' RADIUS

WELL	SPUD	TVD	POOL	STATUS	HOLE O.D.	CASING O.D.	SET @	CEMENT	TOC	HOW TOC DETERMINED
Muskegon 17 Federal Com 002	3/26/06	10915	Mississippian	P&A	17.5	13.375	254	528 sx	Surface	Circ 8 sx to GL
30-015-34283					12.25	9.625	4515	2430 sx	260	Temp survey
P-17-17S-29E					8.75	5.5	10915	1430 sx	3769	CBL
Empire 20 State 001	9/25/92	10920	Mississippian	G	17.5	13.375	490	520 sx	Surface	Circ 50 sx to GL
30-015-27135					12.25	9.625	2600	1050 sx	Surface	Circ 21 sx to GL
F-20-17S-29E					8.75	5.5	10,920	3065 sx	Surface	Circ 50 sx to GL

EXHIBIT F

HOLE SIZE 17.5"SALT SECTIONS TOP 405BASE 990

RIIP

60' - SURT

95 sx plug  
3' - 225'

CAVE / KARST

SPEC. WATER

TOC SURF

GL - circ 8 sx

INT  
PROD

GL - no report

3769' - CBL

H-40  
CASING SIZE 13 3/8 48"  
TD 254HOLE SIZE 12 1/4"25 sx 1940' - 2140'  
25 sx 2140' - 2195'  
25 sx 2195' - 2305'

TOC 3769

60 sx plug  
225' - 320'75 sx plug  
918' - 1130'

FORMATIONS Yates 895

SA 2205

Gloria 5325

ABO 7040

WC 7240

ST 9908

AT 10110

MR 10500

Miss 10740

35 sx plug 3518' - 4615'

25 sx plug 5225' - 5425'

50 sx plug 6778' - 7101'  
25 sx plug 7101' - 7101'  
40 sx plug 7101' - 7290'

30 sx plug 9393' - 9755'

J-55  
CASING SIZE 9 5/8 40"  
TD 4515  
HOLE SIZE 8 3/4"

ABO

4800 200' plug strawn  
10000

CIBA + 35' cmt @ 10180

CIBA 10320 + 35' cmt

CIBA  
10500  
35' cmt

DVT

PERFORATIONS 10545 - 10597

10 300 - 10435

10 222 - 10 226

7040 - 7238

P-110  
CASING SIZE 5 1/2 17"  
TD 10915

fished out 1074' 5-1/2" csg

Muskegon 17 Federal Com 2

30-015-34283

660 FSL &amp; 660 FEL 17-17s-29e

Spud 3-26-06

P&amp;A 4-21-09



## PRODUCED WATER ANALYSES (in mg/l) T. 17 S., R. 28 and 29 E.

API	Section	Township	Range	Formation	TDS	Chloride	Bicarbonate	Sulfate
3001501583	27	17S	28E	Abo	224062	135900	378	699
3001501673	32	17S	28E	Abo	34958	19380	2217	1980
3001503083	25	17S	29E	Abo	59305	28980	1677	6934
3001503083	25	17S	29E	Abo	65091	38030	995	2069
3001503183	29	17S	29E	Abo	29400	13700	2520	2800
3001501595	28	17S	28E	Artesia	237482	147300	46	1044
3001501595	28	17S	28E	Artesia	230189	143300	35	925
3001501595	28	17S	28E	Artesia	217219	133800	137	1030
3001501595	28	17S	28E	Artesia	241926	149300	35	1162
3001501595	28	17S	28E	Artesia	30400	12800	2320	4500
3001501595	28	17S	28E	Artesia	222174	137000	109	922
3001501652	31	17S	28E	Artesia	187566	109300	575	4910
3001530889	32	17S	28E	Artesia	163842	111692	836	44
3001530889	32	17S	28E	Artesia	97568	61161	245	2111
3001530299	33	17S	28E	Artesia	194617	129205	674	4405
3001502886	4	17S	29E	Artesia	38560	21670	668	2157
3001502891	4	17S	29E	Artesia	227185	140700	47	900
3001502912	7	17S	29E	Artesia	267895	166300	47	625
3001502996	16	17S	29E	Artesia	102782	57400	450	5600
3001502996	16	17S	29E	Artesia	120438	71800	989	653
3001502996	16	17S	29E	Artesia	1751	799	200	210
3001502996	16	17S	29E	Artesia	138560	75600	1200	9000
3001503019	21	17S	29E	Artesia	237424			
3001503019	21	17S	29E	Artesia	68550	39100	850	2500
3001503019	21	17S	29E	Artesia	69875	41200	485	1800
3001503019	21	17S	29E	Artesia	132353	78840	332	2628
3001503019	21	17S	29E	Artesia	37260	17200	1610	4800
3001503042	22	17S	29E	Artesia	178711	104425	402	4600
3001503034	22	17S	29E	Artesia	56179	31824	716	2350
3001503042	22	17S	29E	Artesia	146796	88400	69	2030
3001503170	28	17S	29E	Artesia	195904	129855	587	4825
3001531125	28	17S	29E	Artesia	240561	176450	91	1054
3001531125	28	17S	29E	Artesia	174045	120583	433	2087
3001503172	28	17S	29E	Artesia	29210	12500	2370	3950
3001503172	28	17S	29E	Artesia	29961	13360	1387	4284
3001503196	33	17S	29E	Artesia	277375	172900	194	1384
3001530334	33	17S	28E	Glorieta/Yeso	206471	137940	504	4742
3001502866	2	17S	29E	Grayburg/San Andres	1406	780	10	550
3001502873	3	17S	29E	Grayburg/San Andres	109000	63070	339	3538

## PRODUCED WATER ANALYSES (in mg/l) T. 17 S., R. 28 and 29 E.

API	Section	Township	Range	Formation	TDS	Chloride	Bicarbonate	Sulfate
3001521279	31	17S	29E	Morrow	35148	19800	1510	450
3001521279	31	17S	29E	Morrow	33627	19300	900	540
3001502933	9	17S	29E	Permo-Penn	310744	192950	179	1259
3001537329	5	17S	28E	Wolfcamp	92636	54800	207	0
3001537429	5	17S	28E	Wolfcamp	84981	50400	171	0
3001538084	5	17S	28E	Wolfcamp	84923	49800	635	0
3001537429	5	17S	28E	Wolfcamp	91974	55168	439	0
3001538084	5	17S	28E	Wolfcamp	93671	54565	427	0
3001538084	5	17S	28E	Wolfcamp	67849	39804	98	2172
3001530915	19	17S	29E	Yeso	192637	130436	822	2724
3001530916	19	17S	29E	Yeso	212361	142111	945	4613
3001530944	19	17S	29E	Yeso	215197	144157	409	4785
3001530917	19	17S	29E	Yeso	213384	142829	448	4903
3001530307	29	17S	29E	Yeso	208172	140286	612	3456
3001530451	29	17S	29E	Yeso	182240	121966	933	3445
3001530307	29	17S	29E	Yeso	200501	133638	822	4560
3001530931	29	17S	29E	Yeso	207695	138951	495	4750
3001530305	29	17S	29E	Yeso	207078	137913	660	5163
3001530694	29	17S	29E	Yeso	194357	152244	1112	5958
3001530575	30	17S	29E	Yeso	9557	3819	806	1616
3001530575	30	17S	29E	Yeso	8483	3308	448	1711



ANALYSES IN MG/L

API	Section	Township	Range	Formation	TDS	Calcium	Magnesium	Chloride	Bicarbonate	Sulfate
3001526468	14	20S	24E	CISCO	216236	4576	463	53321	72619	952



## New Mexico Office of the State Engineer

EXHIBIT I

## Water Column/Average Depth to Water

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

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

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

(quarters are smallest to largest) (NAD83 UTM in meters)

(In feet)

POD Number	Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	DepthWell	DepthWater	Water Column
RA 11807 PODI		RA	ED	1	2	3	22	17S	29E	587360	3631585	2252	131	76	55

Average Depth to Water: 76 feet

Minimum Depth: 76 feet

Maximum Depth: 76 feet

Record Count: 1

UTMNAD83 Radius Search (in meters):

Easting (X): 585131

Northing (Y): 3631910

Radius: 3220

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

10/1/20 1:46 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER



TOPO! map printed on 10/01/20 from "Untitled.tpo"

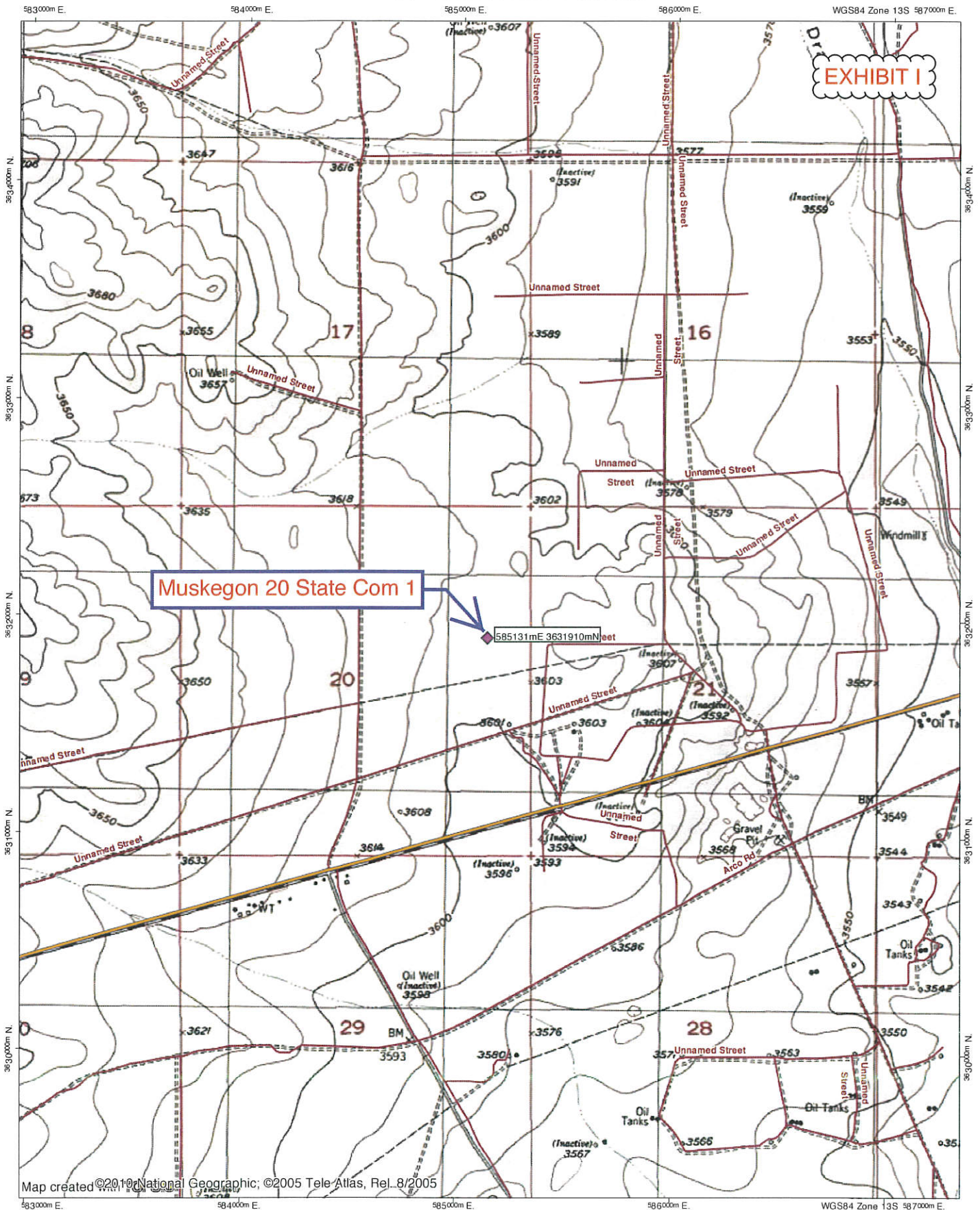
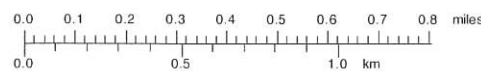


EXHIBIT I

Muskegon 20 State Com 1

585131mE 3631910mN

Map created ©2010 National Geographic; ©2005 Tele Atlas, Rel. 8/2005



TN MN  
7°  
10/01/20

EXHIBIT I

Analytical Report

Lab Order 2010547

Date Reported: 10/26/2020

**Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Permits West**Client Sample ID:** Loco Hills GSF-RA-11807**Project:** Muskegon 20 State Com 1**Collection Date:** 10/9/2020 8:55:00 AM**Lab ID:** 2010547-001**Matrix:** AQUEOUS**Received Date:** 10/9/2020 4:13:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 1664B</b>							Analyst: <b>KMN</b>
N-Hexane Extractable Material	ND	9.77		mg/L	1	10/14/2020 11:31:00 AM	55792
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	23	10		mg/L	20	10/9/2020 10:27:36 PM	R72580
<b>SM2540C MOD: TOTAL DISSOLVED SOLIDS</b>							Analyst: <b>MH</b>
Total Dissolved Solids	260	20.0		mg/L	1	10/15/2020 3:10:00 PM	55818

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

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





Analytical Report

Lab Order 2010547

Date Reported: 10/26/2020

**Hall Environmental Analysis Laboratory, Inc.****CLIENT:** Permits West**Client Sample ID:** RA 08233**Project:** Muskegon 20 State Com 1**Collection Date:** 10/9/2020 9:35:00 AM**Lab ID:** 2010547-002**Matrix:** AQUEOUS**Received Date:** 10/9/2020 4:13:00 PM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed	Batch
<b>EPA METHOD 1664B</b>							Analyst: <b>KMN</b>
N-Hexane Extractable Material	ND	9.39		mg/L	1	10/14/2020 11:31:00 AM	55792
<b>EPA METHOD 300.0: ANIONS</b>							Analyst: <b>JMT</b>
Chloride	2800	100	*	mg/L	200	10/22/2020 5:36:06 PM	R72867
<b>SM2540C MOD: TOTAL DISSOLVED SOLIDS</b>							Analyst: <b>MH</b>
Total Dissolved Solids	7700	20.0	*	mg/L	1	10/15/2020 3:10:00 PM	55818

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

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

**QC SUMMARY REPORT****Hall Environmental Analysis Laboratory, Inc.****EXHIBIT I**

WO#: 2010547

26-Oct-20

**Client:** Permits West  
**Project:** Muskegon 20 State Com 1

Sample ID: <b>MB-55792</b>	SampType: <b>MBLK</b>	TestCode: <b>EPA Method 1664B</b>								
Client ID: <b>PBW</b>	Batch ID: <b>55792</b>	RunNo: <b>72635</b>								
Prep Date: <b>10/13/2020</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>2550799</b>	Units: <b>mg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	ND	10.0								

Sample ID: <b>LCS-55792</b>	SampType: <b>LCS</b>	TestCode: <b>EPA Method 1664B</b>								
Client ID: <b>LCSW</b>	Batch ID: <b>55792</b>	RunNo: <b>72635</b>								
Prep Date: <b>10/13/2020</b>	Analysis Date: <b>10/14/2020</b>	SeqNo: <b>2550800</b>	Units: <b>mg/L</b>							
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
N-Hexane Extractable Material	38.4	10.0	40.00	0	96.0	78	114			

**Qualifiers:**

\* Value exceeds Maximum Contaminant Level.  
D Sample Diluted Due to Matrix  
H Holding times for preparation or analysis exceeded  
ND Not Detected at the Reporting Limit  
PQL Practical Quantitative Limit  
S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank  
E Value above quantitation range  
J Analyte detected below quantitation limits  
P Sample pH Not In Range  
RL Reporting Limit





WO#: 2010547

26-Oct-20

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

**Client:** Permits West  
**Project:** Muskegon 20 State Com 1

Sample ID: MB	SampType: mblk	TestCode: EPA Method 300.0: Anions								
Client ID: PBW	Batch ID: R72580	RunNo: 72580								
Prep Date:	Analysis Date: 10/9/2020	SeqNo: 2548539 Units: mg/L								
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: <b>LCS</b>		SampType: <b>lcs</b>		TestCode: <b>EPA Method 300.0: Anions</b>						
Client ID: <b>LCSW</b>		Batch ID: <b>R72580</b>		RunNo: <b>72580</b>						
Prep Date:		Analysis Date: <b>10/9/2020</b>		SeqNo: <b>2548545</b>		Units: <b>mg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.5	0.50	5.000	0	90.1	90	110			

Sample ID: MB		SampType: mblk		TestCode: EPA Method 300.0: Anions						
Client ID: PBW		Batch ID: R72867		RunNo: 72867						
Prep Date:		Analysis Date: 10/22/2020		SeqNo: 2561188		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	0.50								

Sample ID: LCS		SampType: Ics			TestCode: EPA Method 300.0: Anions					
Client ID: LCSW		Batch ID: R72867			RunNo: 72867					
Prep Date:		Analysis Date: 10/22/2020			SeqNo: 2561189		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	4.6	0.50	5.000	0	92.3	90	110			

### Qualifiers:

\* Value exceeds Maximum Contaminant Level.  
 D Sample Diluted Due to Matrix  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 PQL Practical Quantitative Limit  
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 P Sample pH Not In Range  
 RL Reporting Limit



WO#: 2010547

26-Oct-20

# QC SUMMARY REPORT

## Hall Environmental Analysis Laboratory, Inc.

**Client:** Permits West  
**Project:** Muskegon 20 State Com 1

Sample ID: MB-55818		SampType: MBLK			TestCode: SM2540C MOD: Total Dissolved Solids					
Client ID: PBW		Batch ID: 55818			RunNo: 72677					
Prep Date: 10/14/2020		Analysis Date: 10/15/2020			SeqNo: 2552764		Units: mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	ND	20.0								

Sample ID: <b>LCS-55818</b>		SampType: <b>LCS</b>		TestCode: <b>SM2540C MOD: Total Dissolved Solids</b>						
Client ID: <b>LCSW</b>		Batch ID: <b>55818</b>		RunNo: <b>72677</b>						
Prep Date: <b>10/14/2020</b>		Analysis Date: <b>10/15/2020</b>		SeqNo: <b>2552765</b>		Units: <b>mg/L</b>				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	999	20.0	1000	0	99.9	80	120			

Sample ID: 2010547-001ADUP		SampType: DUP		TestCode: SM2540C MOD: Total Dissolved Solids						
Client ID: Loco Hills GSF-RA-		Batch ID: 55818		RunNo: 72677						
Prep Date: 10/14/2020		Analysis Date: 10/15/2020		SeqNo: 2552768		Units: mg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Total Dissolved Solids	266	20.0						2.28	10	

### Qualifiers:

\* Value exceeds Maximum Contaminant Level.  
 D Sample Diluted Due to Matrix  
 H Holding times for preparation or analysis exceeded  
 ND Not Detected at the Reporting Limit  
 PQL Practical Quantitative Limit  
 S % Recovery outside of range due to dilution or matrix

B Analyte detected in the associated Method Blank  
 E Value above quantitation range  
 J Analyte detected below quantitation limits  
 P Sample pH Not In Range  
 RL Reporting Limit





NM Oil Conservation Division  
1220 S. St. Francis Dr.  
Santa Fe, NM 8705

**Re: Geology Statement**  
**Longfellow Energy LP**  
**Muskegon 20 State Com No. 1**  
**Section 20, T. 17S, R. 29E**  
**Eddy County, New Mexico**

To whom it may concern:

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

Sincerely,

Cory Walk  
Geologist



**Geologic Assessment**  
**Longfellow Energy L.P.**  
**Muskegon 20 State Com No. 1**  
**Section 20, Township 17 South, Range 29 East**  
**Eddy County, New Mexico**

**Cory Walk**

A handwritten signature in black ink that reads "Cory Walk".

**B.S., M.S.**

**Geologist**

**Permits West Inc.**

**November 11, 2020**





## **General Information**

Longfellow Energy proposes to convert the Muskegon 20 State Com 1 to a salt water disposal (SWD) well in the NE 1/4, section 20, T17S, R29E, about 18 miles east of Artesia, NM in the Permian Basin. The proposed injection zone is within the Cisco formation from 9,080'-9,395' below ground surface. This report assesses any potential concerns relating to the connection between the injection zone and known underground potable water sources.

## **Groundwater Sources**

Quaternary Alluvium acts as the principal aquifer used for potable ground water near the Muskegon 20 State Com 1 location (Hendrickson and Jones, 1952). Nicholson and Clebsch (1961) state, "Potable ground water is not available below the Permian and Triassic unconformity but, because this boundary is not easily defined, the top of the Rustler anhydrite formation is regarded as the effective lower limit of 'potable' ground water." Around the Muskegon 20 State Com 1, the Rustler Formation lies at a depth of ~360 feet bgs.

## **Faults and Fractures**

The Geologic Map of New Mexico (2003) shows the nearest fault to the SWD location is found 18 miles to the northwest (Figure 1). A large accumulation of northwest trending Basin and Range style normal faults lie ~65 miles from the proposed water injection well. This fault zone is interpreted to be a southeastern extension of the Rio Grande Rift zone (Muehlberger et al., 1978) and is the only area in which deeply penetrating faults exist throughout the region.

A structure contour map of the Precambrian Basement shows the Muskegon 20 State Com 1 well is approximately 11 miles to the nearest Precambrian basement fault (Figure 1; Modified from Ruppel et al., 2009). However, Montgomery (1997) shows that these faults remain deep below the surface and do not act as conduits between the Pennsylvanian Cisco formation and aquifers near the surface (Figure 2).

## **Stratigraphy**

Well data indicates ~8,720 ft of rock separating the top of the injection zone within the Cisco formation from the previously stated lower limit of potable water at the top of the Rustler anhydrite formation. Within the separating ~8,720 feet of strata include several horizons of impermeable formations including the Rustler anhydrite and Salado halite formations.

## **Concluding Statement**

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

## EXHIBIT J

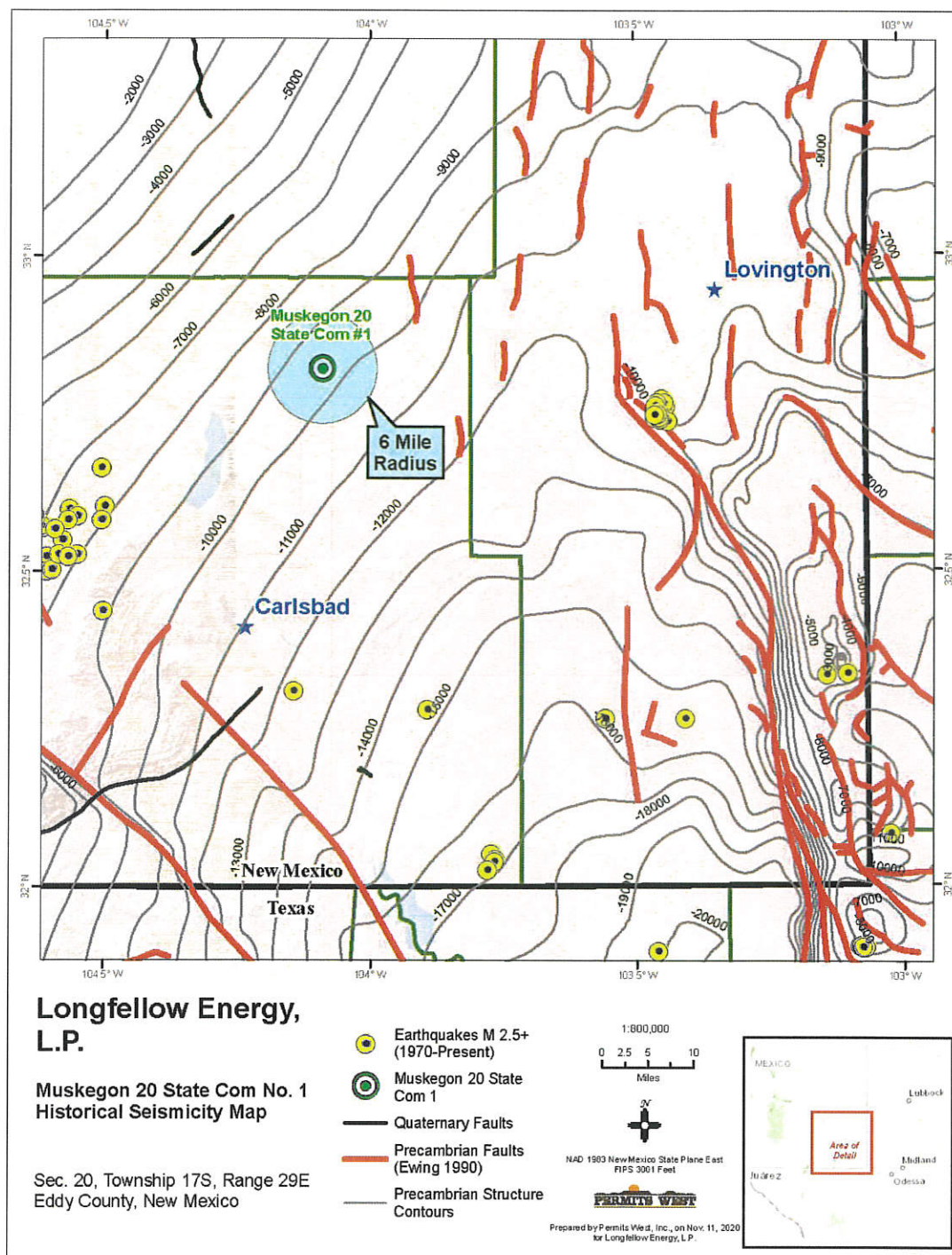


Figure 1. Structural contour map of the Precambrian Basement. Thick red lines represent the locations of deep Precambrian basement faults and black lines represent Quaternary surface faults.



## EXHIBIT J

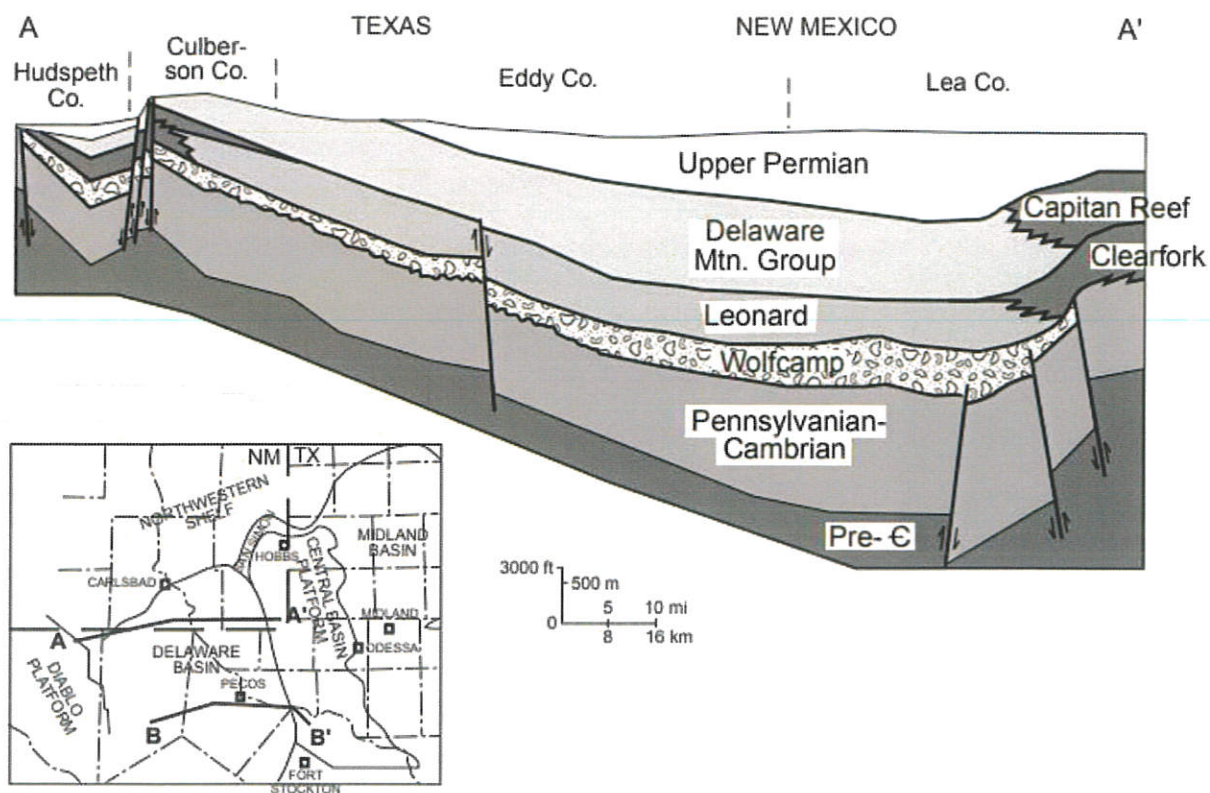


Figure 2. Cross section of the Permian Basin from Montgomery (1997). Notice the basement faults within the basin do not reach the surface and therefore do not act as conduits to near surface aquifers.



## References Cited

- Geologic Map of New Mexico, New Mexico Bureau of Geology and Mineral Resources, 2003, Scale 1:500,000.
- Hendrickson, G. E., and Jones, R. S., 1952, Geology and Ground-Water Resources of Eddy County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Ground-Water Report 3, 179 pp., 6 plates.
- Montgomery, S. L., 1997, Permian Bone Spring Formation: Sandstone play in the Delaware basin: Part I. Slope: AAPG Bulletin, v. 81, p. 1239–1258.
- Muehlberger, W.R., Belcher, R.C., and Goetz, L.K., 1978, Quaternary faulting in Trans-Pecos Texas: Geology, v. 6, p. 337–340.
- Nicholson, A., Jr., and Clebsch, A., Jr., 1961, Geology and ground-water conditions in southern Lea County, New Mexico: New Mexico Bureau of Mines and Mineral Resources, Ground-Water Report 6, 123 pp., 2 plates.
- Ruppel, S.C., 2009, Integrated synthesis of the Permian basin: data and models for recovering existing and undiscovered oil resources from the largest oil-bearing basin: U.S. Oil & Natural Gas Technology, Bureau Economic Geology, The University of Texas at Austin, p. 1-959.



**Affidavit of Publication**

No. 25580

State of New Mexico

Publisher

County of Eddy:

**Danny Scott**

being duly sworn says that he is the

Publisher

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

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was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

1 Consecutive weeks/day on the same day as follows:

First Publication October 22, 2020

Second Publication \_\_\_\_\_

Third Publication \_\_\_\_\_

Fourth Publication \_\_\_\_\_

Fifth Publication \_\_\_\_\_

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Seventh Publication \_\_\_\_\_

Subscribed and sworn before me this

22nd day of October 2020



OFFICIAL SEAL

Latisha Romine

NOTARY PUBLIC-STATE OF NEW MEXICO

My commission expires: 5/12/2023

*Latisha Romine*

Latisha Romine

Notary Public, Eddy County, New Mexico

**Copy of Publication:****EXHIBIT K****Legal Notice**

Longfellow Energy, LP will apply to plug back and convert the Muskegon 20 State Com 1 to a saltwater disposal well. The well will dispose into the Cisco formation from 9,080' to 9,395'. It is 6 miles west of Loco Hills, NM and 18 miles east of Artesia, NM at 1980' FNL & 660' FEL Sec. 20, T. 17 S., R. 29 E., Eddy County, NM. Maximum disposal rate will be 20,000 bwpd. Maximum injection pressure will be 1,816 psi. Interested parties must file objections or requests for hearing with the NM Oil Conservation Division, 1220 South Saint Francis Dr., Santa Fe, NM 87505 within 15 days. Additional information can be obtained by contacting: Brian Wood, Permits West, Inc., 37 Verano Loop, Santa Fe, NM 87508. Phone number is (505) 466-8120.

Published in the Artesia Daily Press, Artesia, N.M., Oct. 22, 2020 Legal No. 25580.



November 20, 2020

NM State Land Office  
PO Box 1148  
Santa Fe NM 87504

Longfellow Energy, LP is applying (see attached application) to plug back and convert the Muskegon 20 State Com 1 gas well to a saltwater disposal well. As required by NM Oil Conservation Division (NMOCD) rules, I am notifying you of the following proposal. This letter is a notice only. No action is needed unless you have questions or objections.

Well: Muskegon 20 State Com 1      TD = 10957'

Proposed Disposal Zone: Cisco (9080' - 9395')

Location: 1980' FNL & 660' FEL Sec. 20, T. 17 S., R. 29 E., Eddy County, NM

Approximate Location: 18 miles of Artesia, NM

Applicant Name: Longfellow Energy, LP      (972) 242-8851

Applicant's Address: 16803 North Dallas Parkway, Addison TX 75001

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

Please call me if you have any questions.

Sincerely,

Brian Wood



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☐ Return Receipt (electronic) \$  
☐ Certified Mail Restricted Delivery \$  
☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box InterEnergy A LP  
 15455 Dallas Pkwy Ste 600  
 City, State, ZIP+4® Addison, TX 75001  
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☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box Verigen OG Co  
 6450 S Lewis #200  
 City, State, ZIP+4® Tulsa, OK 74136  
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☐ Return Receipt (electronic) \$  
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☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box Warren Hanson  
 PO Box 9  
 City, State, ZIP+4® Glencoe, NM 86324  
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☐ Return Receipt (electronic) \$  
☐ Certified Mail Restricted Delivery \$  
☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box Westall Oil & Gas LLC  
 PO Box 4362  
 City, State, ZIP+4® Loco Hills, NM 88255  
 PS Form 3800, April 2015 (with PSN 7530-01-000-9000) See Reverse for Instructions

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☐ Return Receipt (electronic) \$  
☐ Certified Mail Restricted Delivery \$  
☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box Westall Oil & Gas LLC  
 PO Box 4  
 City, State, ZIP+4® Loco Hills, NM 88255  
 PS Form 3800, April 2015 (with PSN 7530-01-000-9000) See Reverse for Instructions

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Extra Services & Fees (check box, add fee as appropriate)  
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☐ Return Receipt (electronic) \$  
☐ Certified Mail Restricted Delivery \$  
☐ Adult Signature Required \$  
☐ Adult Signature Restricted Delivery \$  
 Postage \$  
 Total Postage and Fees \$  
 Sent To  
 Street and Apt. No., or PO Box PNMSUD  
 PO Box 1148  
 City, State, ZIP+4® Santa Fe, NM 87504  
 PS Form 3800, April 2015 (with PSN 7530-01-000-9000) See Reverse for Instructions

EXHIBIT L