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: Jay Management Company, LLC **OGRID Number:** 247692
Well Name: G.S. State No. 1 **API:** 30-025-22811
Pool: North Bagley Permo Penn **Pool Code:** N/A

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.

Jim Foster
Print or Type Name

Signature

10/20/18
Date

979-324-2139
Phone Number

jim@teamtimberwolf.com
e-mail Address

Affidavit of Publication

STATE OF NEW MEXICO
COUNTY OF LEA

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

Beginning with the issue dated
October 12, 2018
and ending with the issue dated
October 12, 2018.

Daniel Russell
Publisher

Sworn and subscribed to before me this
12th day of October 2018.

Gussie Black
Business Manager

My commission expires
January 29, 2019
(Seal)

OFFICIAL SEAL
GUSSIE BLACK
Notary Public
State of New Mexico
My Commission Expires 1-29-19

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

LEGAL NOTICE
OCTOBER 12, 2018

Public Notice for the G.S. State #1 (API: 30-025-22811)
Jay Management Company, LLC
1001 West Loop, Suite 750
Houston, Texas 77027
(713) 621-6785
Contact Party: Jim Foster (979) 324-2139

Jay Management intends to submit an injection permit for the above referenced well. The purpose of this injection permit is for disposal of produced water associated with oil and gas production activities. The well will be permitted as a commercial disposal well, injecting into the Pennsylvanian formation. The location of the well is 1,874 feet from the East Line and 2,086 feet from the North Line of Section 8, Township 11S, Range 33E, which is in the SW/4 of the NE/4 of the aforementioned section.

The formation name is the Pennsylvanian; injection intervals to be between a depth of 9,192' to 10,345'; a maximum injection rate of 6,000 barrels per day with maximum pressure of 1,200 PSI.

Interested parties must file objections or request a hearing with the Oil Conservation Division, 1220 South St. Francis Dr., Santa Fe, New Mexico 87505, within 15 days, by Monday the 29th of October.
#33319

67114900 00219367

MORGAN VIZI
TIMBERWOLF ENVIRONMENTAL
1920 W. VILLA MARIA, STE 205
BRYAN, TX 77807

October 26,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **783441916905**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Mailroom
Signed for by:	R.ROMERO	**Delivery location:**	310 OLD SANTA FE TRL SANTA FE, NM 87501
Service type:	FedEx Priority Overnight	**Delivery date:**	Oct 26, 2018 09:41
Special Handling:	Deliver Weekday		

Shipping Information:

Tracking number:	783441916905	**Ship date:**	Oct 25, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
Attn oil and gas division
THE NEW MEXICO STATE LAND
310 OLD SANTA FE TRL
SANTA FE, NM 87501 US

Shipper:
morgan vizi
1920 W VILLA MARIA RD STE 205
BRYAN, TX 77807 US

Thank you for choosing FedEx.

October 26,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **783441974014**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	M.RANKAN	**Delivery location:**	104 S 4TH ST ARTESIA, NM 88210
Service type:	FedEx Priority Overnight	**Delivery date:**	Oct 26, 2018 10:08
Special Handling:	Deliver Weekday Adult Signature Required		

Shipping Information:

Tracking number:	783441974014	**Ship date:**	Oct 25, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
EOG Y RESOURCES
EOG RESOURCES
104 S 4TH ST
ARTESIA, NM 88210 US

Shipper:
morgan vizi
1920 W VILLA MARIA RD STE 205
BRYAN, TX 77807 US

Thank you for choosing FedEx.

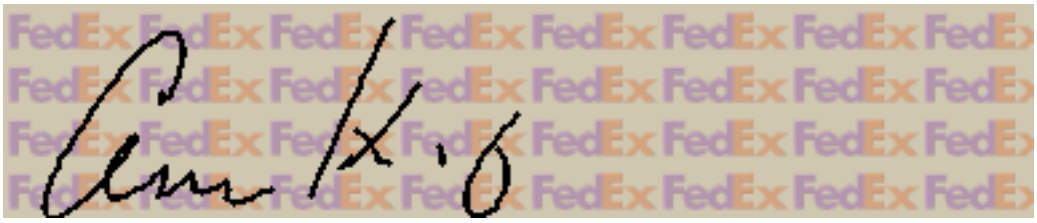
November 30,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **783460566890**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Mailroom
Signed for by:	A.KILLOY	**Delivery location:**	1220 S SAINT FRANCIS DR SANTA FE, NM 87505
Service type:	FedEx Priority Overnight	**Delivery date:**	Oct 29, 2018 10:01
Special Handling:	Deliver Weekday		



Shipping Information:

Tracking number:	783460566890	**Ship date:**	Oct 26, 2018
		Weight:	3.0 lbs/1.4 kg

Recipient:
MICHAEL MCMILLAN
district 4 santa fe
1220 S SAINT FRANCIS DR
SANTA FE, NM 87505 US

Shipper:
jim foster
1920 W VILLA MARIA RD STE 205
BRYAN, TX 77807 US

Thank you for choosing FedEx.

November 30,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 783460492552.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	B.BERTHA	**Delivery location:**	OCD DISTRICT 1 Hobbs, NM 88240
Service type:	FedEx Priority Overnight	**Delivery date:**	Oct 29, 2018 09:19
Special Handling:	Deliver Weekday Adult Signature Required		

Shipping Information:

Tracking number:	783460492552	**Ship date:**	Oct 26, 2018
		Weight:	1.0 lbs/0.5 kg

Recipient:
maxey brown
district 1 hobbs
1625 n french dr
Hobbs, NM 88240 US

Shipper:
jim foster
1920 W VILLA MARIA RD STE 205
BRYAN, TX 77807 US

Thank you for choosing FedEx.

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
June 19, 2008

WELL API NO. 30-025-22811

5. Indicate Type of Lease STATE ☑ FEE ☐

6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: G S State

1. Type of Well: Oil Well ☑ Gas Well ☐ Other

8. Well Number 1

2. Name of Operator: JAY MANAGEMENT COMPANY, LLC

9. OGRID Number 247692

3. Address of Operator: 1001 WEST LOOP SOUTH, SUITE 750 HOUSTON,TX 77027

10. Pool name or Wildcat: BAGLEY PERMO PENN NORTH

4. Well Location
Unit Letter G : 2086 feet from the NORTH line and 1874 feet from the EAST line
Section 8 Township 11S Range 33E NMPM County LEA

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* 4301' GL

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: Convert to SWD ☑		OTHER: ☐	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

1. TIH with PKR and 2-7/8" work string tubing. Set PKR @ 9092'.
2. Pressure test casing to 500 psi.
3. Acidize Perf with 15% NEFE.
4. POOH with PKR and 2-7/8" work string.
5. TIH with PKR and 2-7/8" plastic-lined tubing. Set PKR @ 9092'
6. Pressure test casing for MIT.
7. Put well Online.

Spud Date: Rig Release Date:

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

SIGNATURE Clayton Griffin TITLE Operations Manager DATE 10/25/2018

Type or print name Clay Griffin E-mail address: cgriffin@jaymgt.com PHONE: 574-707-5691

For State Use Only

APPROVED BY: TITLE DATE

Conditions of Approval (if any):

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section.

Operator	Lease	Well No.
Major, Giebel & Forster	Gulf State	1

Unit Letter	Section	Township	Range	County
G	8	11	33	Lea

Actual Footage Location of Well: 1874 feet from the East line and 2086 feet from the North line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage:
Will furnish later	Pennsylvanian	Undesignated	80 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

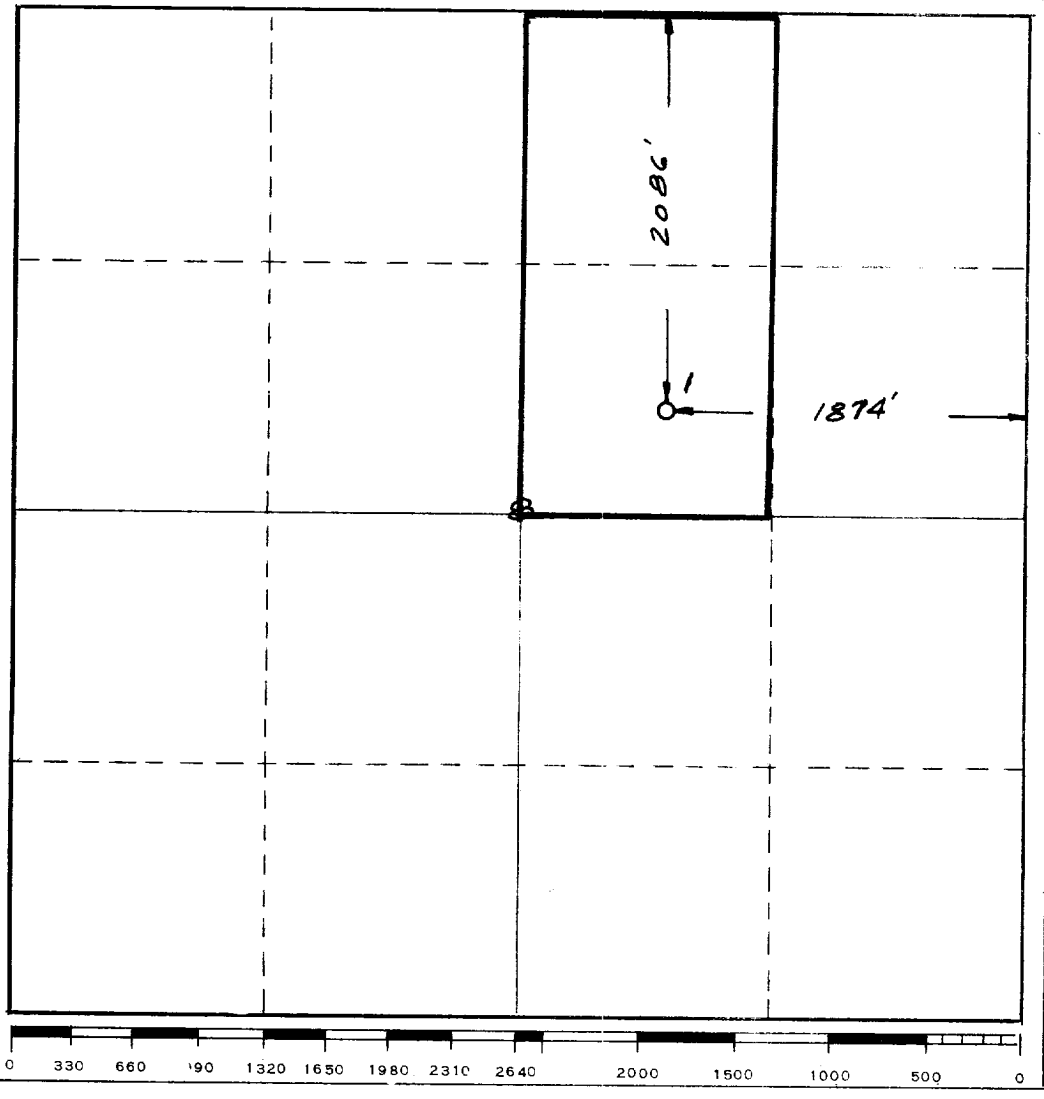
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

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 interests, has been approved by the Commission.



CERTIFICATION

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

Name: William G. Kerr

Position: Engineer

Company: Major, Giebel & Forster

Date: October 18, 1968

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: October 11, 1968

Registered Professional Engineer and/or Land Surveyor

Mark E. Shown

Certificate No. 2189

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: Jay Management Company, LLC

ADDRESS: 1001 West Loop, Suite 750, Houston, Texas 77027

CONTACT PARTY: Jim Foster PHONE: (979) 324-2139

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? ___X___ Yes _____ No
If yes, give the Division order number authorizing the project: 247692

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: Jim Foster TITLE: Consultant

SIGNATURE: _____ DATE: October 23, 2018

E-MAIL ADDRESS: jim@teamtimberwolf.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: December 30, 1968

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

III. WELL DATA

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

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

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

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

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

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

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

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

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

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

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

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

XIV. PROOF OF NOTICE

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

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

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

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

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

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

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

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

Side 1

INJECTION WELL DATA SHEET

OPERATOR: Jay Management Company, LLC

WELL NAME & NUMBER: G.S. State #1

WELL LOCATION: 2086'FNL 1874' FEL | G | 8 | 11S | 33E

FOOTAGE LOCATION | UNIT LETTER | SECTION | TOWNSHIP | RANGE

WELLBORE SCHEMATIC

See Schematics Section

WELL CONSTRUCTION DATA

Surface Casing

Hole Size: 17 1/2'' Casing Size: 12 3/4''

Cemented with: 350 sx. ***or*** _____ ft^3

Top of Cement: Surface Method Determined: Circulated

Intermediate Casing

Hole Size: 11'' Casing Size: 8 5/8''

Cemented with: 400 sx. ***or*** _____ ft^3

Top of Cement: 2,150 ft Method Determined: Calculated

Production Casing

Hole Size: 7 7/8'' Casing Size: 5 1/2''

Cemented with: 575 sx. ***or*** _____ ft^3

Top of Cement: 7,080 ft Method Determined: Calculated

Total Depth: 10,400 ft

Injection Interval

9,192 ft to 10,345 ft

(Perforated)

Side 2

INJECTION WELL DATA SHEET

Tubing Size: 2 7/8'' Lining Material: Plastic Lined

Type of Packer: Model R packer

Packer Setting Depth: 9,092'

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

Additional Data

1. Is this a new well drilled for injection? _____Yes __X__No

   If no, for what purpose was the well originally drilled? Oil Production
   This well is to be converted into a commercial salt water disposal well.

2. Name of the Injection Formation: Pennsylvanian

3. Name of Field or Pool (if applicable): North Bagley Oil Field

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.

   Previous:
   Well has been perforated at 9,192 – 9,228; 9,446 – 9,470; 9,602-10,354

   Proposed:
   None

   Give the name and depths of any oil or gas zones underlying or overlying the proposed injection zone in this area:
   Permian Wolfcamp Carbonate: 8,700', Penn: Cisco 8,741', Canyon 8,741', Strawn 9,904', Atoka 10,845

V. Please see Figures 1 and 2 for all wells and leases located within a two-mile radius and the area of review.

VI. Please see Tables A-1 and A-2 (in the tables section) for a tabulation of data on all wells and leases of public record in the area. Schematics for the plugged wells can be found in the schematics section.

VII. Proposed Operation

1. Proposed average and maximum daily rate and volume of fluids to be injected;	5,000 Daily average 6,000 Maximum
2. Whether the system is open or closed;	Closed
3. Proposed average and maximum injection pressure;	Avg: 1000 PSI Max: 1200 PSI
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,	Re-inject produced water
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.).	Chemical analysis of the Pennsylvanian Formation is attached as Table B-1 in the tables section.

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.*

The proposed injection zone is in the Pennsylvanian formation. Lithologically it is a limestone of shelf origin.

DEPTH	Lithology	Geologic Name	Thickness
9,192 – 9,228	Limestone	Pennsylvanian Cisco	36
9,446 – 9,470	Limestone	Pennsylvanian Cisco	24
9,602 – 9,619	Limestone	Pennsylvanian Canyon	5
10,147 – 10,180	Limestone	Pennsylvanian Strawn	5
10,216 – 10,290	Limestone	Pennsylvanian Strawn	8
10,325 – 10,354	Limestone	Pennsylvanian Strawn	5
Total			83'

The fresh water aquifer at this site is the Ogallala found from near surface depth of 380’.

IX. *Describe the proposed stimulation program, if any.*

Acidizing

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

Logs have been filed with OCD (December 30, 1968).

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.*

A water well survey of the area revealed only one water well located within a one-mile radius of the G.S. State #1. Results are documented in Timberwolf's report entitled *Water Well Resources and Water Quality Report* and has been attached to this application in the referenced documents section. Additionally, a chemical analysis is presented in Table B-2 in the tables section.

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.*

Jay Management attests that a thorough examination has been made of all available geologic, engineering, and well data and that no hydrologic connection exists between the proposed injection interval and the overlying fresh water aquifer.

An engineering report from Syfan Engineering, LLC titled *Injection Study* and dated February 23, 2018, regarding the offset of the State OG SWD No. 2 well can be found in the referenced documents section. The G.S. State #1 is located 2,800 feet to the west-northwest of the State OG SWD No. 2.

Figures

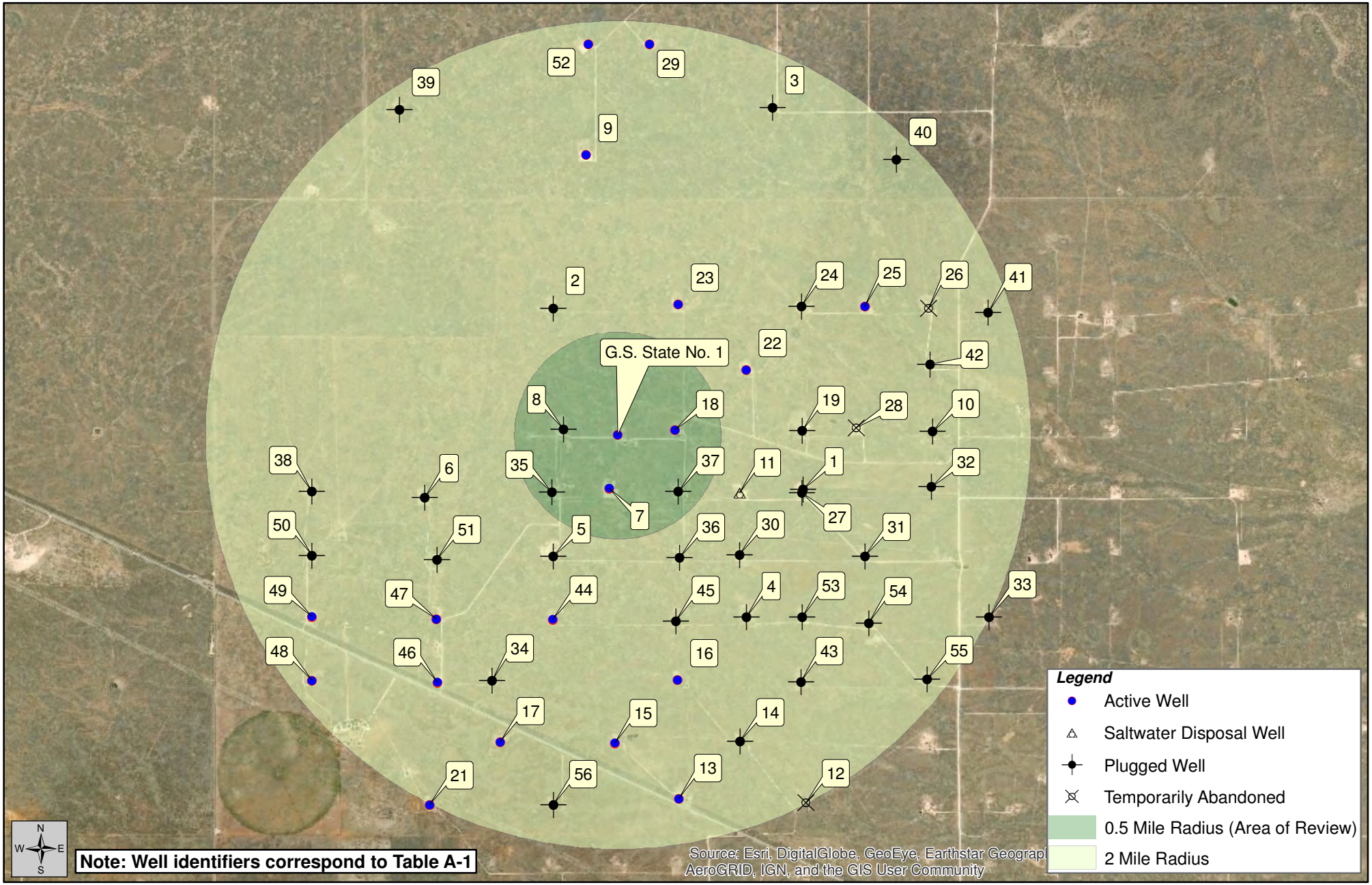


Figure 1
2 Mile Radius and Area of Review Map

Application for Authorization to Inject

October 16, 2018

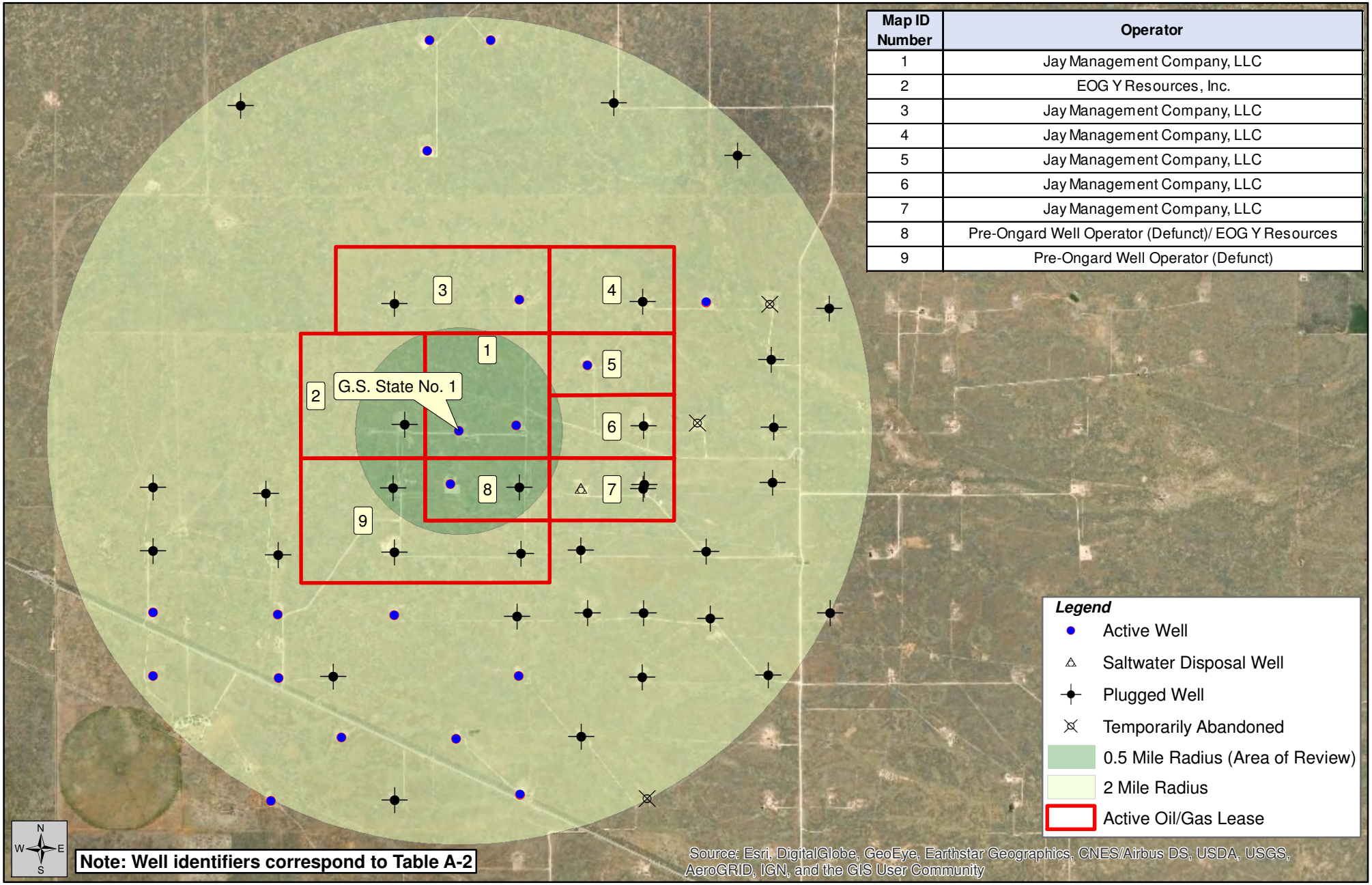
1:40,000
0 1 2 3 4 Miles

TIMBERWOLF ENVIRONMENTAL

Created By:
Russell Greer
TE Project No.: ISR-180051

G.S. State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE



Map ID Number	Operator
1	Jay Management Company, LLC
2	EOG Y Resources, Inc.
3	Jay Management Company, LLC
4	Jay Management Company, LLC
5	Jay Management Company, LLC
6	Jay Management Company, LLC
7	Jay Management Company, LLC
8	Pre-Ongard Well Operator (Defunct)/ EOG Y Resources
9	Pre-Ongard Well Operator (Defunct)

Figure 2
Active Oil/Gas Well and Lease Location Map

Application for Authorization to Inject

October 16, 2018

TIMBERWOLF ENVIRONMENTAL

1:40,000
0 1 2 3 4 Miles

Created By:
Russell Greer
TE Project No.: ISR-180051

G.S. State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Tables

Table A-1. Oil and Gas Wells within a 2 Mile Radius of the G.S. State No. 1
Application for Authorization to Inject
Jay Management, Lea County, New Mexico

Map ID Number	Operator	Well Name	API Number	Spud Date	Status	Depth (ft)	NAD83 Coordinates		Pool Name
							Lattitude (°N)	Longtitude (°W)	
1	Chesapeake	OG State #001	30-025-30566	03/06/89	Plugged	8,804	33.378805	103.621445	North Bagley, Permo Penn
2	Chesapeake	Candy Com #001	30-025-22350	11/27/67	Plugged	10,440	33.389321	103.638820	North Bagley, Permo Penn
3	Chesapeake	Largo 36 State #001	30-025-35615	08/17/01	Plugged	11,333	33.400990	103.623561	Cuerno Largo, Upper Pennsylvanian, Wildcat, Atoka
4	COG Operating LLC	Bagley 16 State #001	30-025-36903	06/25/05	Plugged	11,050	33.371346	103.625392	North Bagley, Permo Penn
5	Dwight A Tipton	Shea Climenko #001	30-025-22281	10/12/67	Plugged	10,370	33.374887	103.638825	North Bagley, Permo Penn
6	Elk Oil Co	R R State #001	30-025-29004	11/02/84	Plugged	10,450	33.378295	103.647764	North Bagley, Permo Penn
7	EOG Y Resources	Quetsal AQA State #001	30-025-33460	06/01/96	Active	11,050	33.378856	103.634927	North Bagley, Permo Penn, Atoka
8	EOG Y Resources	Champlin AQD State #001	30-025-23043	03/04/69	Plugged	11,300	33.382296	103.638107	North Bagley, Permo Penn
9	EOG Y Resources	Raitt Bid State #001	30-025-37982	07/31/06	Active	11,212	33.398251	103.636538	Cuerno Largo, Upper Pennsylvanian
10	Fasken Oil and Ranch LTD	Felmont Collier #001	30-025-21245	06/15/65	Plugged	10,325	33.382149	103.612443	North Bagley, Permo Penn
11	Jay Management	State OG SWD #002	30-025-31381	10/15/91	Active SWD	9,000	33.378607	103.625849	North Bagley, Permo Penn, SWD Cisco, SWD Strawn
12	Jay Management	State NBN #001	30-025-00998	02/16/59	TA	11,607	33.360568	103.621246	North Bagley, Permo Penn
13	Jay Management	Andover Federal #001	30-025-21904	10/29/66	Active	10,250	33.360815	103.630082	North Bagley, Permo Penn
14	Jay Management	Christensen State #001	30-025-22017	01/31/67	Plugged	10,360	33.364140	103.625833	North Bagley, Permo Penn
15	Jay Management	Dolly #001	30-025-22370	12/21/67	Active	10,300	33.364041	103.634538	North Bagley, Permo Penn
16	Jay Management	Shell State Com #001	30-025-22226	08/24/67	Active	10,300	33.367713	103.630171	North Bagley, Permo Penn
17	Jay Management	Chaney Federal #001	30-025-22554	05/14/68	Active	10,300	33.364126	103.642509	North Bagley, Permo Penn
18	Jay Management	Gulf Sohio State #001	30-025-21194	05/11/65	Active	10,355	33.382265	103.630358	North Bagley, Permo Penn, Wolfcamp
19	Jay Management	Collier #001	30-025-00994	08/13/62	Plugged	11,400	33.382215	103.621504	North Bagley, Permo Penn
20	Jay Management	GS State #001	30-025-22811	10/23/68	Active	10,400	33.381967	103.634339	North Bagley, Permo Penn
21	Jay Management	Tilly #001	30-025-22702	08/21/68	Active	10,370	33.360451	103.647415	North Bagley, Permo Penn
22	Jay Management	JFG Collier #001	30-025-22108	05/07/87	Active	10,410	33.385749	103.625415	North Bagley, Permo Penn
23	Jay Management	Sohio B State #001	30-025-22122	05/20/67	Active	10,510	33.389560	103.630121	North Bagley, Permo Penn
24	Jay Management	Lulu #001	30-025-22256	09/21/67	Plugged	10,436	33.389441	103.621564	North Bagley, Permo Penn
25	Jay Management	Sohio A State #001	30-025-22206	07/31/67	Active	10,450	33.389441	103.617144	North Bagley, Permo Penn
26	Jay Management	Sohio State #001	30-025-22043	03/01/67	TA	10,450	33.389321	103.612723	North Bagley, Permo Penn
27	LBO New Mexico Inc	State OG #001	30-025-22329	11/14/67	Plugged	10,270	33.378592	103.621524	North Bagley, Permo Penn
28	Lease Holders Acquisitios, Inc	Bagley #002	30-025-38192	06/02/07	TA	10,500	33.382389	103.617761	North Bagley, Permo Penn
29	Legacy Reserves	Sidewinder State #001	30-025-31012	09/22/90	Active	10,460	33.404680	103.632117	Cuerno Largo, Upper Pennsylvanian
30	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22467	03/18/68	Plugged	10,355	33.374994	103.625868	North Bagley, Permo Penn
31	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22077	05/11/67	Plugged	10,300	33.374910	103.617144	North Bagley, Permo Penn
32	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-20677	05/01/65	Plugged	10,217	33.378931	103.612524	North Bagley, Permo Penn
33	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22184	07/20/67	Plugged	10,258	33.371362	103.608501	North Bagley, Permo Penn
34	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22577	06/23/68	Plugged	10,360	33.367675	103.643063	North Bagley, Permo Penn
35	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22377	12/28/67	Plugged	10,400	33.378618	103.638920	North Bagley, Permo Penn
36	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22197	09/05/67	Plugged	10,360	33.374807	103.630031	North Bagley, Permo Penn
37	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22068	04/04/67	Plugged	10,400	33.378658	103.630126	North Bagley, Permo Penn
38	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-23533	07/01/70	Plugged	10,460	33.378652	103.655607	N/A
39	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-21393	05/29/65	Plugged	4,510	33.400871	103.649516	N/A
40	Pre-Ongard Well Operator	Pre-Ongard Well #001	30-025-22179	07/18/67	Plugged	10,450	33.397976	103.614951	N/A

Table A-1. Oil and Gas Wells within a 2 Mile Radius of the G.S. State No. 1
Application for Authorization to Inject
Jay Management, Lea County, New Mexico

Map ID Number	Operator	Well Name	API Number	Spud Date	Status	Depth (ft)	NAD83 Coordinates		Pool Name
							Lattitude (°N)	Longtitude (°W)	
41	Pre-Ongard Well Operator	Pre-Ongard Well #002	30-025-22385	03/13/68	Plugged	10,290	33.389069	103.608562	N/A
42	Pride Energy	Bagley #001	30-025-20610	10/16/64	Plugged	10,360	33.386069	103.612612	North Bagley, Permo Penn
43	Prime Operating	State DG #001	30-025-21948	12/16/66	Plugged	10,268	33.367621	103.621597	North Bagley, Permo Penn
44	Prime Operating	State DK #002	30-025-22392	01/14/68	Active	10,270	33.371242	103.638849	North Bagley, Permo Penn
45	Prime Operating	State DK #001	30-025-22314	11/07/67	Plugged	10,338	33.371151	103.630297	North Bagley, Permo Penn
46	Read & Stevens Inc	Shell State #002	30-025-22596	06/05/68	Active	10,370	33.367577	103.646878	North Bagley, Permo Penn
47	Read & Stevens Inc	Shell State #001	30-025-22409	01/24/68	Active	10,363	33.371266	103.646949	North Bagley, Permo Penn
48	Read & Stevens Inc	Shell State #004	30-025-23190	08/07/69	Active	10,400	33.367695	103.655607	North Bagley, Permo Penn
49	Read & Stevens Inc	Shell State #003	30-025-23014	02/14/69	Active	10,410	33.371387	103.655607	North Bagley, Permo Penn
50	Read & Stevens Inc	State E #001	30-025-23353	11/06/69	Plugged	10,421	33.374960	103.655607	North Bagley, Permo Penn
51	Read & Stevens Inc	Sun State #001	30-025-22718	09/15/68	Plugged	10,400	33.374722	103.646908	North Bagley, Permo Penn
52	Remnant Oil Operating	Yates State #001	30-025-30984	08/20/90	Active	10,440	33.404680	103.636396	Cuerno Largo, Upper Pennsylvanian
53	Sabre Op INC	Bagley State #003	30-025-22016	01/28/67	Plugged	10,275	33.371362	103.621502	North Bagley, Permo Penn
54	Sabre Op INC	Bagley State #002	30-025-21928	12/04/66	Plugged	10,200	33.371025	103.616868	North Bagley, Permo Penn
55	Sabre Op INC	Bagley State #001	30-025-21889	10/18/66	Plugged	10,200	33.367740	103.612827	North Bagley, Permo Penn
56	Tipperary Oil & Gas Corp	Helen #001	30-025-22440	02/22/68	Plugged	10,346	33.360467	103.638817	North Bagley, Permo Penn

Table A-2. Operator within a 1/2 Mile Radius of G.S. State No. 1
Application for Authorization to Inject
Jay Management, Lea County, New Mexico

Map ID Number	Operator	Lease Name	Surface Owner	Mineral Owner
1	Jay Management Company, LLC	Gulf Sohio St	State	State
2	EOG Y Resources, Inc.	Champlin	State	State
3	Jay Management Company, LLC	Sohio B	State	State
4	Jay Management Company, LLC	Lulu	State	State
5	Jay Management Company, LLC	Collier	Pearce	Private
6	Jay Management Company, LLC	Collier etal	Pearce	Private
7	Jay Management Company, LLC	State OG/Len St	State	State
8	Pre-Ongard Well Operator (Defunct)/ EOG Y Resources	Champlin	State	State
9	Pre-Ongard Well Operator (Defunct)	Dwight A Tipton	State	State

Table B-1. Produced Water Samples for the G.S. State No. 1
Application for Authorizatin to Inject
Jay Management, Lea County, New Mexico

Well Name	API	Section	Township	Range	Unit	Formation	Sample Source	TDS mg/L	Chloride mg/L
HISSOM A STATE #001	30-025-20677	9	11S	33E	I	PERMO-PENNSYLVANIAN	UNKNOWN	69,713	--
HISSOM A STATE #001	30-025-20677	9	11S	33E	I	N/A	UNKNOWN	69,713	40,540
CHAMPLIN AQD STATE #001	30-025-23043	8	11S	33E	F	PERMO-PENNSYLVANIAN	UNKNOWN	--	70,290
CHAMPLIN AQD STATE #001	30-025-23043	8	11S	33E	F	PERMO-PENNSYLVANIAN	UNKNOWN	--	69,438
STATE F #001	30-025-00995	10	11S	33E	K	PERMO-PENNSYLVANIAN	UNKNOWN	55,607	33,600
J P COLLIER #001	30-025-00996	10	11S	33E	F	PERMO-PENNSYLVANIAN	UNKNOWN	54,972	34,110
MPC STATE #001	30-025-20608	27	11S	33E	H	PENNSYLVANIAN	DST	47,386	26,400
STATE NBF #001	30-025-20891	22	11S	33E	F	PERMO-PENNSYLVANIAN	DST	46,082	26,080
STATE NBF #001	30-025-20891	22	11S	33E	F	PERMO-PENNSYLVANIAN	DST	42,573	24,470
STATE NBF #001	30-025-20891	22	11S	33E	F	PERMO-PENNSYLVANIAN	DST	60,103	30,030
DALLAS #001	30-025-22434	26	11S	33E	H	PERMO-PENNSYLVANIAN	WELLHEAD	78,068	47,500
MARY ELLEN DALLAS #001	30-025-00997	15	11S	33E	P	PERMO-PENNSYLVANIAN	UNKNOWN	60,289	36,540
STATE NBN #001	30-025-00998	16	11S	33E	N	PERMO-PENNSYLVANIAN	UNKNOWN	36,985	21,800
STATE NBN #001	30-025-00998	16	11S	33E	N	PERMO-PENNSYLVANIAN	DST	41,450	24,600
STATE BT N #001	30-025-01012	34	11S	33E	P	DEVONIAN	UNKNOWN	51,781	30,040
STATE BT P #001	30-025-01014	34	11S	33E	E	PERMO-PENNSYLVANIAN	PRODUCTION TEST	73,630	42,400
DALLAS #001	30-025-22330	15	11S	33E	J	PERMO-PENNSYLVANIAN	N/A	56,532	35,527

Table B-2. Fresh Water Sample Results for the G.S. State No. 1
Application for Authorization to Inject
Jay Management Company
Bagley North Oil Field, Lea County, New Mexico

Sample ID	Sample Date	TPH (mg/L)	Volatile Organic Compounds (mg/L)				Anions (mg/L)				Cations (mg/L)				General Water Quality Parameters			Dissolved Metals (mg/L)							
			B	T	E	X	Cl	SO_4	CO_3	BiCarb	Na	Ca	Mg	K	pH	Sp. Cond.	TDS	As	Ba	Cd	Cr	Pb	Se	Ag	Hg
															S.U.	mmhos/cm	mg/L								
3 G.S. State	03/13/18	< 0.71	< 0.00018	< 0.00020	< 0.00020	< 0.00037	120	130	< 20	130	41[B]	110	14	2.1	7.7[HF]	860	690	0.0055[J]	0.06	< 0.00028	< 0.0016	< 0.0022	0.0071[J]	< 0.0013	< 0.000082
Regulatory Limits		--	**0.01** [3]	**0.75** [3]	**0.75** [3]	**0.62** [3]	**250** [2]	**250** [2]	--	--	--	--	--	--	**6.5 - 8.5** [2]	--	**500** [2]	**0.01** [1]	**2.0** [1]	**0.005** [1]	**0.1** [1]	**0.015** [1]	**0.05** [1]	**0.10** [2]	**0.002** [1]

[1] EPA Primary Drinking Water Standards
[2] EPA Secondary Drinking Water Standards
[3] NMOCD standards from Title 20 NMAC § 6.2
[J] - analyte detected below quantation limit
[H] - sample prepped or analyzed beyond specified holding time
[b] - analyte detected in blank
mg/L - milligrams per liter
-- - no applicable limit

s.u. - Standard units
Sp. Cond. - Specific conductance
mmhos/cm - millimhos per centimeter
ohm-m - ohms per meter
TDS - total dissolved solids
TSS - total suspended solids
NTU - Nephelometric turbidity unit
- concentration exceeds recommended action level

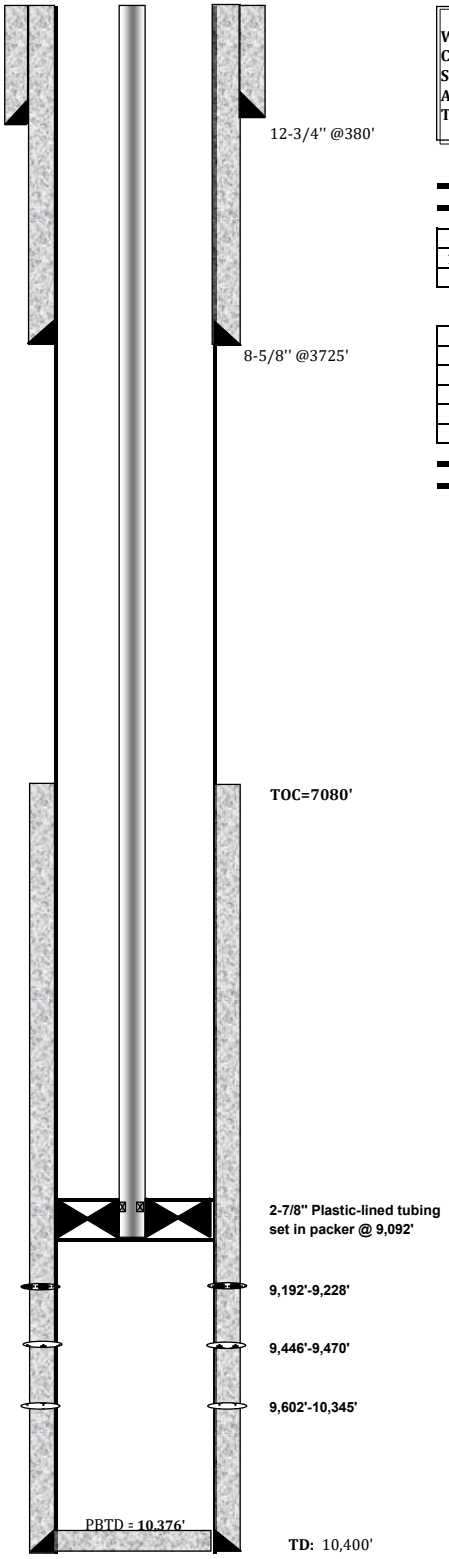
CO_2 - carbon dioxide
Cl - Chloride
SO_4 - Sulfate
CO_3 - Carbonate
BiCarb - Bicarbonate
Na - Sodium
Ca - Calcium
Mg - Magnesium

As - arsenic
Ba - barium
Cd - cadmium
Cr - chromium
Pb - lead
Se - selenium
Ag - silver
Hg - mercury

Schematics

Jay Management Company, LLC

PROPOSED COMPLETION



WELL:	G.S.# 1	**SPUD DATE:**	23-Oct-68	**LSE #:**	8969-2
COUNTY:	Lea	**EARLY COMP DATE:**	11-Dec-68	**FIELD:**	Bagley; Permo Penn, North
STATE:	NM			**LOCATION:**	2086' FNL & 1874' FEL
API #:	30-025-22811			**FORMATION:**	Penn
TD:	10,400'	**PBTD:**	10,376'	**ELEVATION:**	4312 KB

CASING RECORD

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	BIT SZ.	SX CMT.	TOP CMT.
12-3/4''	34#				380'			350	Surf.
8-5/8''	32# & 34#				3725'			400	2150'

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	BIT SZ.	SX CMT.	TOP CMT.
5-1/2''	17#				10,400'			575	7080'

TUBING

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	

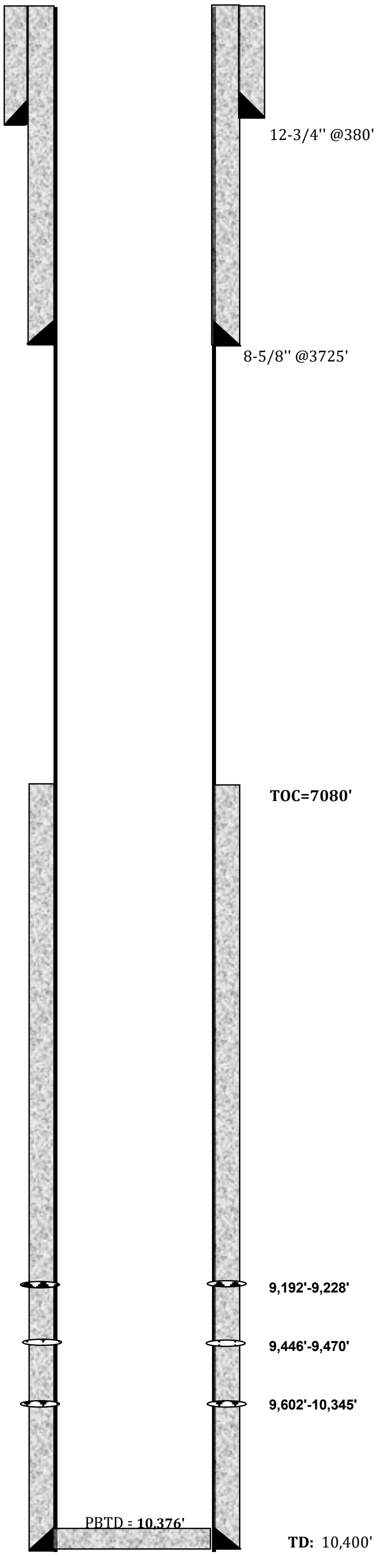
PERFORATION RECORD

DATE	TOP	BOTTOM	SPF	ZONE	STATUS
12/11/1968	9,602'	10,354'		Penn	Open
1995	9,446'	9,470'		Penn	Open
1995	9,192'	9,228'		Penn	Open

Oct-18	Perform casing integrity test.
Pending	Acidize Perf with 15%
	Run 2-7/8'' plastic-lined tubing set in packer @9,092'

Jay Management Company, LLC

CURRENT COMPLETION



WELL:	G.S.# 1	**SPUD DATE:**	23-Oct-68	**LSE #:**	8969-2
COUNTY:	Lea	**EARLY COMP DATE:**	11-Dec-68	**FIELD:**	Bagley; Permo Penn, North
STATE:	NM			**LOCATION:**	2086' FNL & 1874' FEL
API #:	30-025-22811			**FORMATION:**	Penn
TD:	10,400'	**PBTD:**	10,376'	**ELEVATION:**	4312 KB

CASING RECORD

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	BIT SZ.	SX CMT.	TOP CMT.
12-3/4''	34#				380'			350	Surf.
8-5/8''	32# & 34#				3725'			400	2150'

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	BIT SZ.	SX CMT.	TOP CMT.
5-1/2''	17#				10,400'			575	7080'

TUBING

O.D.	WT./FT.	GRADE	THD	TOP	BTM	NO. JTS.	

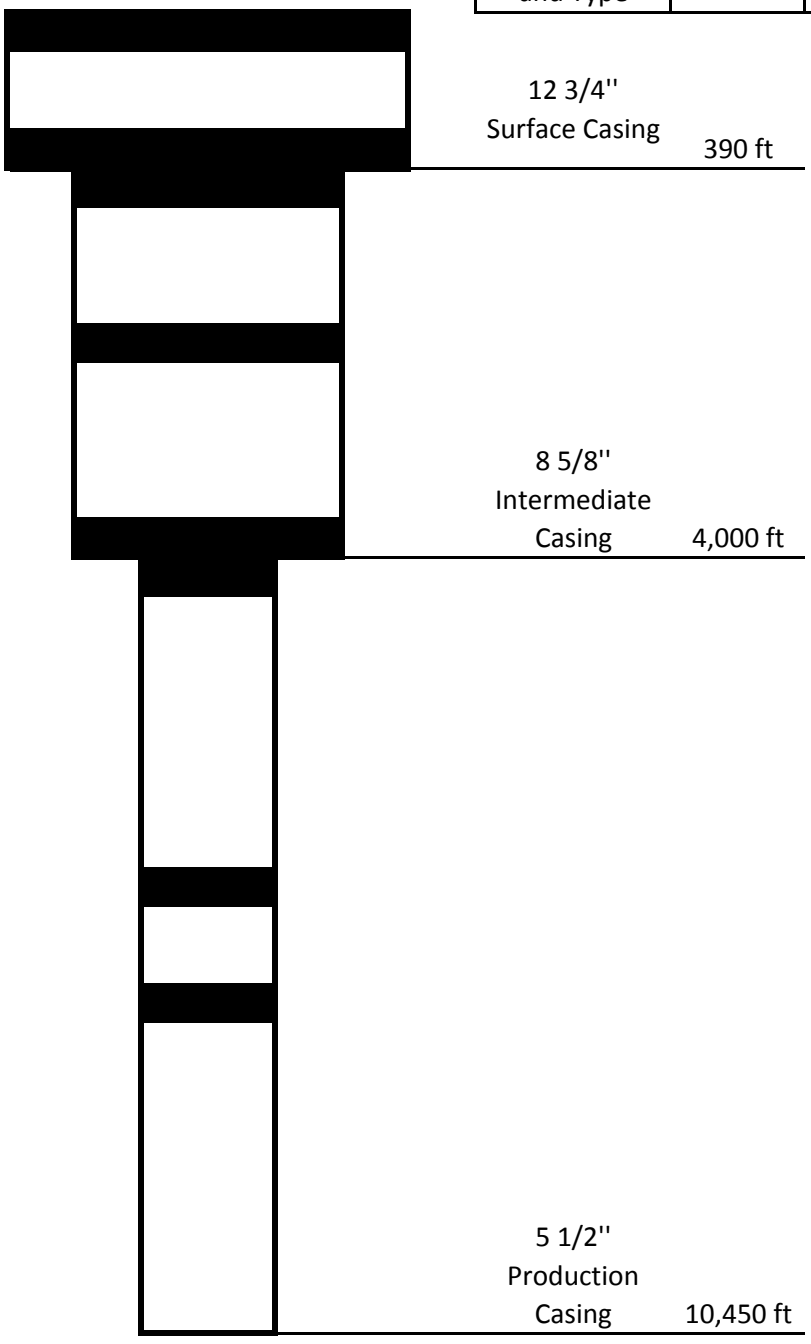
PERFORATION RECORD

DATE	TOP	BOTTOM	SPF	ZONE	STATUS
12/11/1968	9,602'	10,354'		Penn	Open
N/A	9,446'	9,470'			Open
N/A	9,192'	9,228'			Open

Plugged Well Schematic

Operator: EOG Y Resources
Well: Champlin AQD State #001
API: 30-025-23043

Twolf Reference #: 8



Casing Size (in) and Type	Depth (ft)	Plugging Depth	Cement (sx)
		0-60	10 sx
12 3/4'' Surface Casing	390 ft	323-408	10 sx
		408-424	30 sx
		1,635-1,810	35 sx
8 5/8'' Intermediate Casing	4,000 ft	3,697-3,805	35 sx
		4,922-5,100	35 sx
		7,110-7,350	25 sx
		8,350-8,605	25 sx
5 1/2'' Production Casing	10,450 ft		

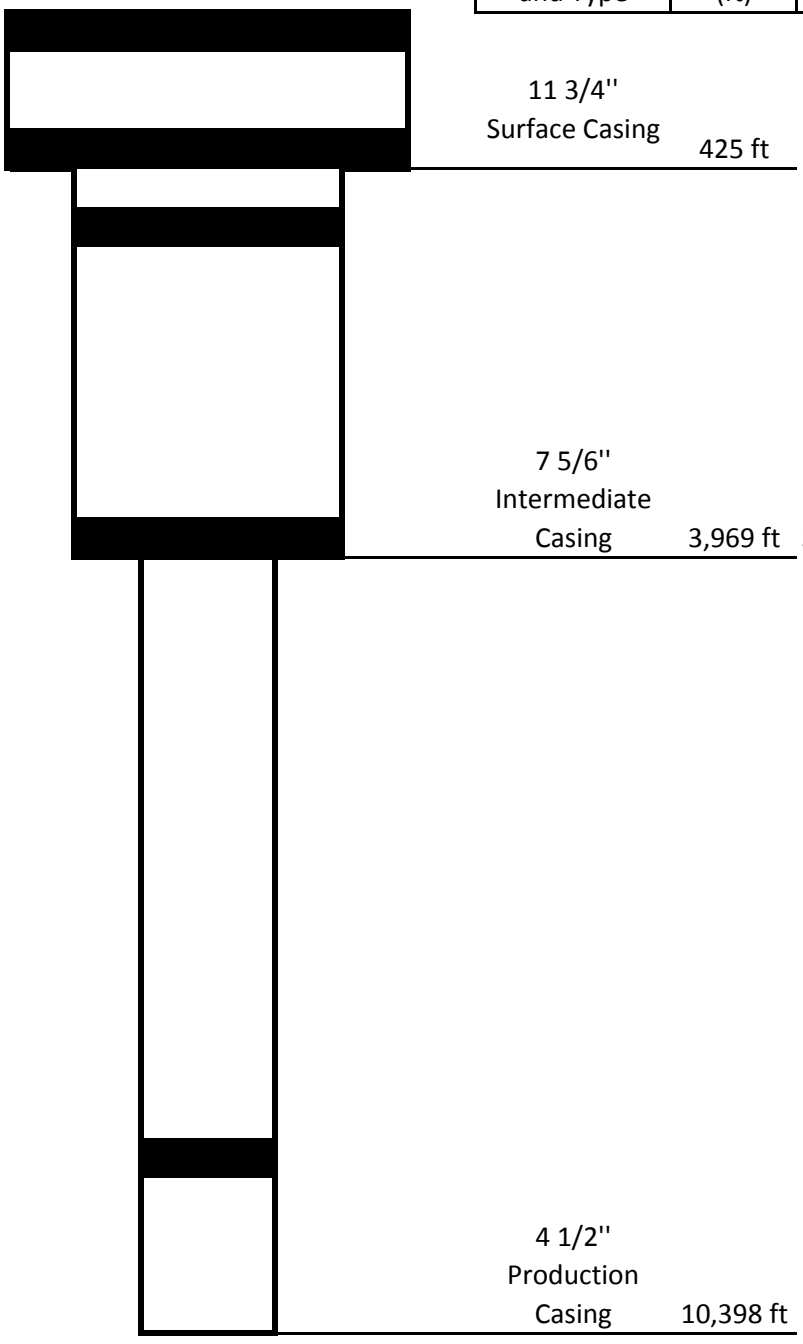
Cement Plug

Plugged Well Schematic

Operator: Pre-Ongard Well Operator
Well: Pre-Ongard Well #001
API: 30-025-22377

Twolf Reference #: 35

Casing Size (in) and Type	Depth (ft)	Plugging Depth (ft)	Cement (sx)
		0-10 ft	10 sx
11 3/4'' Surface Casing	425 ft	317-425 ft	75 sx
		735-800 ft	45 sx
7 5/6'' Intermediate Casing	3,969 ft	3,803-3,984 ft	75 sx
		8,500 ft	250 sx
4 1/2'' Production Casing	10,398 ft		



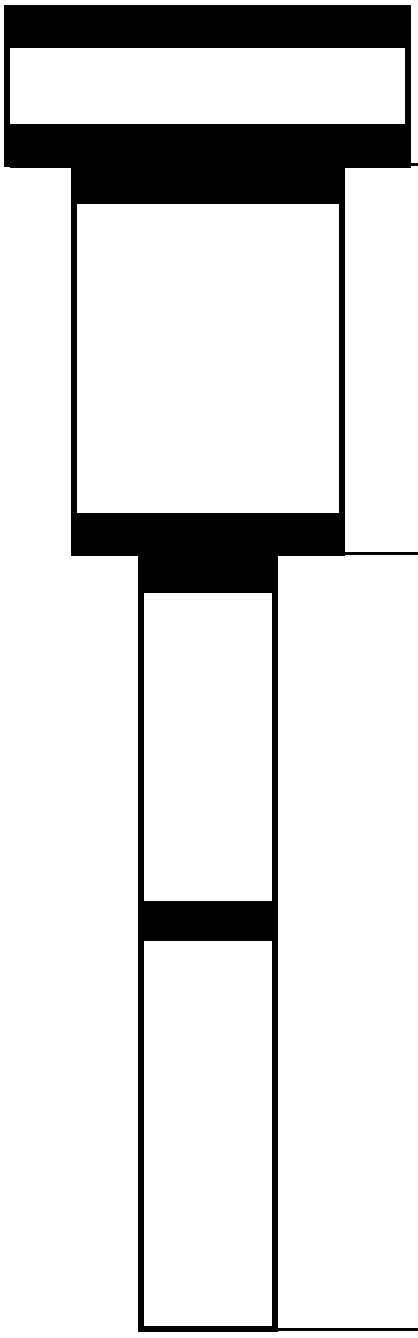
Cement Plug

Plugged Well Schematic

Operator: Pre-Ongard Well Operator
Well: Pre-Ongard Well #001
API: 30-025-22068

Twolf Reference #: 37

Casing Size (in) and Type	Depth (ft)	Plugging Depth	Cement (sx)
		0-10 ft	10 sx
13 3/8'' Surface Casing	375 ft	275-375 ft	70 sx
		745-796 ft	50 sx
8 5/8'' Intermediate Casing	3,735 ft	3,645-3,785 ft	50 sx
		4,320-4,420 ft	50 sx
		5,673-7,300 ft	100 sx
4 1/2'' Production Casing	10,400 ft		



Cement Plug

Mechanical Integrity Test

Submit 3 Copies To Appropriate District Office
District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Ave., Artesia, NM 88240
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

HOBBS OCD
OCT 22 2018
RECEIVED

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
June 19, 2008

WELL API NO.	30-025-22811
5. Indicate Type of Lease	STATE ☑ FEE ☐
6. State Oil & Gas Lease No.	

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name	G S State
1. Type of Well: Oil Well ☑ Gas Well ☐ Other	8. Well Number 1
2. Name of Operator JAY MANAGEMENT COMPANY, LLC	9. OGRID Number 247692
3. Address of Operator 1001 WEST LOOP SOUTH, SUITE 750 HOUSTON,TX 77027	10. Pool name or Wildcat BAGLEY PERMO PENN NORTH

4. Well Location
Unit Letter G : 2086 feet from the NORTH line and 1874 feet from the EAST line
Section 8 Township 11S Range 33E NMPM County LEA

11. Elevation *(Show whether DR, RKB, RT, GR, etc.)* 4301' GL

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
PERFORM REMEDIAL WORK ☐	PLUG AND ABANDON ☐	REMEDIAL WORK ☐	ALTERING CASING ☐
TEMPORARILY ABANDON ☐	CHANGE PLANS ☐	COMMENCE DRILLING OPNS. ☐	P AND A ☐
PULL OR ALTER CASING ☐	MULTIPLE COMPL ☐	CASING/CEMENT JOB ☐	
DOWNHOLE COMMINGLE ☐			
OTHER: Convert to SWD ☑		OTHER: ☐	

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 1103. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

1. Jay Management perform casing integrity test 10/11/2018
2. Evaluate this well for SWD.

Spud Date: Rig Release Date:

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

SIGNATURE [signature] TITLE District Manager DATE 10/17/2018

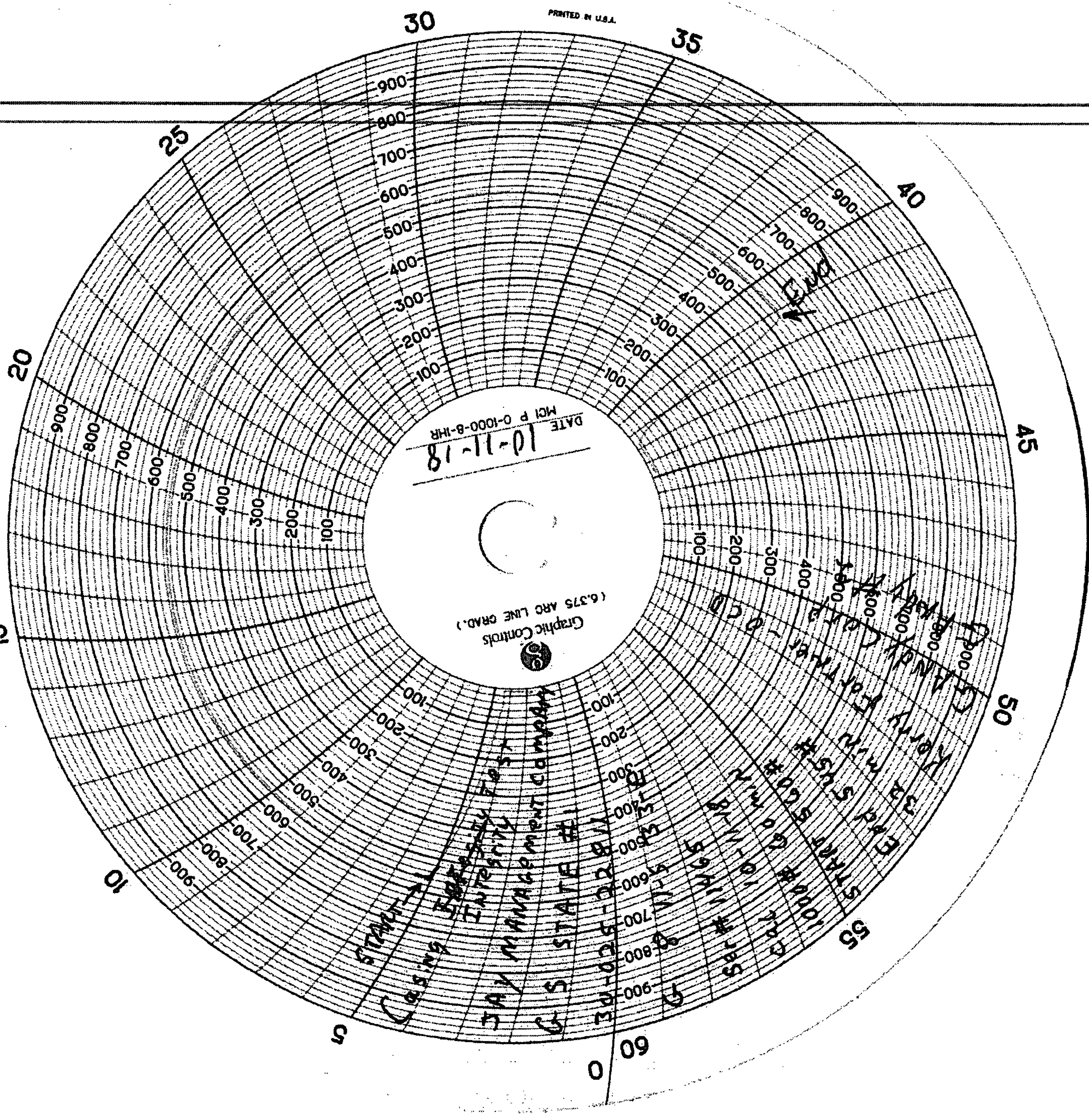
Type or print name Clay Griffin E-mail address: cgriffin@jaymgt.com PHONE: 574-707-5691

For State Use Only

APPROVED BY: Accepted for Record Only TITLE DATE

Conditions of Approval (if any): MBBrown 10/22/2018

MB


PRINTED IN U.S.A.
DATE 10-11-18
MCI P 0-1000-8-1HR
Graphic Controls
(6.375 ARC LINE GRAD.)
START
Casing
INTEGRITY TEST
JAY MANAGEMENT COMPANY
STATE #1

Referenced Documents

Syfan Engineering, LLC
309 W. 7th Street
Suite 500
Fort Worth, TX 76102
(Cell) 281-889-8774
(E-Mail) frank.syfan@gmail.com

PETROLEUM ENGINEERING CONSULTANTS
DRILLING – WORKOVERS – COMPLETIONS – HYDRAULIC FRACTURING – RESERVOIR ENGINEERING
TEXAS PROFESSIONAL ENGINEER NO. 65255

February 23, 2018

Mr. Amir Sanker
Jay Management Company
1001 West Loop South
Suite 750
Houston, TX 77027

Re: Injection Study
State OG SWD #2
Pool: Cisco-Cisco SWD-Strawn
Lea County, NM
API No. 30-025-31381

Dear Mr. Sanker,

At the request of Mr. Coby Denham of Denham Energy ("DE") on behalf of Jay Management Company ("JMC"), Syfan Engineering, LLC ("Syfan") has prepared an injection study of the State OG SWD No. 2 in the Cisco-Cisco SWD-Strawn Pool located in Lea County, NM. Syfan has reviewed the applicable data supplied by JMC regarding recompleting the State OG SWD #2 to inject produced waters into the San Andres formation.

CONCLUSIONS

1. Injection into the State OG SWD #2 should not cause a vertical fracture in the San Andres formation if surface injection pressures are limited to 1,700 psi.
2. Injection volumes in the State OG SWD #2 should not communicate vertically with either the Ogallala Aquifer, or surrounding deeper productive horizons.

RECOMMENDATIONS

1. Obtain an up to date Aquifer Depth Letter from the NMOCD for the State OG SWD #2.
2. The State OG SWD #2 should be approved for SWD through perforations 4,590' – 4,829' and injection should be down a tubing string under a sealing packer to prevent excessive surface pressures.
3. The Maximum Allowable Surface Injection Pressure ("MASIP") should be 1,710 psi.

INTRODUCTION

According to available public records reviewed from the New Mexico Oil Conservation Division, LBO New Mexico, Inc. (the Original Operator of Record) spudded the State OG #2 on 10/15/1991 and drilled vertically to a total depth of 11,000 ft.

Initially a 17" hole was drilled and 13-3/8", 48.0 lb/ft casing was run to 367' and cemented back to surface with 350 sacks of Class C Cement. Then an 11" hole was drilled and 8-5/8", 32.0 and 24.0 lb/ft casing was run to 3,810' and cemented back to surface with 1,150 sacks of cement. A 7-7/8" hole was then drilled to 11,000' (well TD). After logging the well, 5-1/2", 17.0 and 20.0 lb/ft casing was run and cemented with 2,025 sacks of cement, which was circulated back to surface. The well was perforated from 10,804' – 10,810' in the Morrow formation. A CIBP was set over the Morrow perforations @ 10,615' and sealed with 20 sacks of cement. The well was completed in the Strawn formation through perforations 10,206' – 10,216', 10,224' – 10,232', and 10,282' – 10,294'as a producing oil well with the completion approved by the NMOCD on January 24,1992. According to records filed with the NMOCD, the State OG #2 was not hydraulically fracture stimulated on completion.

The State OG #2 was converted to SWD under Burro Pipeline Corporation (Operator of Record at that time) and began taking water on February 4, 1994. The well was officially called the State OG SWD-548 #2 according to NMOCD records. The original Strawn perforations (3 sets ranging from 10,206' – 10,294') were deemed non-productive due to depletion and three additional sets of perforations were opened. The added perforations were from 9,154' – 9,164', 9,231' – 9,236', and 9,388' – 9,398'.

Jay Management Company, LLC was approved as the new Operator of Record by the NMOCD on October 29, 2008 and took over operation of the State OG SWD #2. Jay Management has applied to the NMOCD to seal off the existing perforations in the Pennsylvanian and recomplete the well as a SWD in the San Andres formation. The proposed perforations in the San Andres are listed in Table 1.

Table 1
State OG SWD #2
Proposed San Andres Perforations

Formation	Upper Interval	Lower Interval
San Andres Formation	4,590'	4,595'
San Andres Formation	4,638.5'	4,652'
San Andres Formation	4,735'	4,750'
San Andres Formation	4,780'	4,786'
San Andres Formation	4,814'	4,820'
San Andres Formation	4,825'	4,829'

STATE OG SWD #2 ENGINEERING ANALYSIS

A review of the geology associated with the San Andres formation for the State OG SWD #2 according to information obtained from the USGS, indicates that the formation is continuous throughout the field and Lea County area. The San Andres is Permian in geologic age

and consists of laminated limestone/dolomite, sandstone, and shale beds. The formation also is interbedded in places by gypsum/evaporites and redbeds. Thus, all wellbores which penetrate the San Andres surrounding the State OG SWD #2 are probably in pressure communication.

As part of the application process, JMC has stated that an average 5,000 BWPD will be injected into the San Andres perforations with a stated maximum injection rate of 6,000 BWPD.

Syfan reviewed the logs associated with the San Andres formation in the State OG SWD #2 and analysis indicates the lithology in the injection intervals to be primarily limestone with porosities ranging from 6% - 20%. Local knowledge of the San Andres also provides that the porous limestone intervals are separated vertically by laminations of limestone/dolomite, sandstone, and shale and thus the likelihood of vertical communication with other zones is considered by Syfan to be extremely remote. The fresh water aquifer in this area is listed as the Ogallala found near 380' from surface. This aquifer would be protected from injection waters intended for the San Andres by the 13-3/8" and 5-5/8" casing strings, both of which were cemented back to surface. Schematics have been provided which identify all wells drilled within two (2) miles of the State OG SWD #2 location.

Offset P&A Well Analysis

As part of the Engineering Analysis performed on the area immediately surrounding the State OG SWD #2, Syfan looked six (6) wells Plugged and Abandoned (P&A) that are located within ½-mile of the well's location. These wells are listed in Table 2. According to the information received by Syfan on the wells in Table 2, all were P&A'd according to NMOCD regulations with multiple cement plugs set between the intermediate casing seat and the surface. These plugs should be more than adequate to prevent vertical migration and water contamination of the Ogallala aquifer.

Table 2
P&A Wells Located Within 1/2 -Mile of State OG SWD #2

Operator	Well Name	API No.
Jay Management Company LLC	Collier #001	30-025-00994
Chesapeake	State OG 1-9	30-025-30586
LBO New Mexico Inc.	State OG #002	30-025-22329
Pre-Ongard Well Operator	Southland Royalty C #001	30-025-22467
Pre-Ongard Well Operator	Dwight A Tipton #001	30-025-22197
Pre-Ongard Well Operator	Tipperary Oil & Gas #001	30-025-22068

In addition, due to the blanket nature of the San Andres formation in the area surrounding the State OG SWD #2, pressure from injected waters should dissipate over a wide aerial extent, thus reducing the probability of creating a vertical fracture in the San Andres. The extremely laminated nature of the San Andres formation would also virtually eliminate the possibility of vertical communication not only with the Ogallala but also the Pennsylvanian, Strawn, and Morrow formations which have been deemed productive in the area.

Producing Well Analyses

Syfan studied five (5) wells located less than or equal to 1-mile distance and surrounding the State OG SWD #2. This was done to determine the possibility damaging the producing wells within 1-

mile of the Stage OG SWD #2 due to SWD into the San Andres formation. Analysis of the information provided by JMC, shown in Table 3, indicates that all five currently producing wells are completed in the zones within or below the Wolfcamp and Pennsylvanian formations. The uppermost reported perforations and the estimated geologic top of the Pennsylvanian is included in Table 3. As shown in the table, all five of the offset producing wells located within 1 mile are completed significantly deeper than the proposed San Andres injection zone and therefore, should be totally isolated from vertical communication.

Table 3
Producing Wells Within 1-Mile of State OG SWD #2

Operator	Well Name	API No.	Distance	Top of Prod. Formation.	Upper-Most Perforation
Jay Management	Gulf-Sohio State #001**	30-025-21194	<1/2 Mi.	8,744'	Unk
Jay Management	JFG Collier #001	30-025-22108	< 1.0 Mi	9,185'	9,192'
Jay Management	Shell State Com #001	30-025-22226	< 1.0 Mi	9,108'	9,882'
Jay Management	GS State #001	30-025-22811	< 1.0 Mi	8,492'	8,603'
EOG Y Resources	Quetsal AQA State #001	30-025-33460	< 1.0 Mi	10,840'	10,845

** **Note**: The Gulf-Sohio State #001 was originally completed in the Pennsylvanian below 9,400'. NMOCD records indicated on a Form C-102 that the well was producing from the Wolfcamp B formation. No Wolfcamp B perforations were found, but the top of the Wolfcamp was reported to be 8,744'.

Maximum Surface Injection Pressure

It will be necessary in any injection scenario to limit the maximum surface injection pressure as not to hydraulically fracture the injection formation. JMC reported the Fracture Gradient (FG) for the San Andres formation to be approximately 0.80 – 0.85 psi/ft. Eq. 1 is the formula used to calculate the Hydrostatic Head (HH) of the fluid column. Eq. 2 then uses the HH calculation to determine the MASIP.

Using a depth of 4,590' to the proposed top perforation and assuming a normal field saltwater weight of 8.8 lbs/gal, the calculated HH of the fluid column would be 2,100 psi. Since the FG reported for the San Andres is estimated, Syfan used a 10% Safety Factor from the lower value, which yields a FG equal to 0.72 psi/ft. Plugging these numbers into Eq. 2 yields a calculated BHFP of 3,305 psi.

The friction losses in the pipe are a function of the fluid type, viscosity, and injection rate and would be additive to the maximum allowable surface pressure. The Maximum Daily Injection Volume is estimated to be 6,000 BWPD which equals a 24-hour injection rate slightly less than 4.5 BPM. Using a pump rate of 4.5 BPM, saltwater friction losses in 2-7/8" tubing are estimated to be 110 psi per 1,000 ft of depth. Therefore, the estimated pipe friction pressure would be 505 psi. Solving for Eq. 2 yields a calculated MASIP of 1,710 psi.

Equation 1
Hydrostatic Head Calculation

$$HH = (FW)(D)(0.052)$$

Equation 2
Maximum Allowable Surface Treating Pressure Calculation

$$SIP = BHFP - HH + \Delta P_P$$

Where:
BHFP = Bottomhole Fracture Pressure, psi
D = Depth, ft
HH = Hydrostatic Head, psi
0.052 = Conversion Factor, dim
FW = Fluid Weight, lbs/gal
SIP = Surface Injection Pressure, psi
ΔP_p = Pipe Friction, psi

NOMENCLATURE

BPM	Barrels per Minute
BWPD	Barrels Water per Day
CIBP	Cast Iron Bridge Plug
FG	Fracture Gradient, psi/ft
Ft	Feet
MASIP	Maximum Allowable Surface Injection Pressure, psi
Psi	pounds per square inch
P&A	Plug and Abandonment
SWD	Salt Water Disposal
TD	Total Depth, ft

GENERAL

All data used in this study were obtained through verbal communication or written documents received from JMC, Denham Energy, and the non-confidential files of Syfan Engineering, LLC. A current field inspection of the properties was not made in connection with the preparation of this report. In addition, the potential environmental liabilities attendant to ownership and/or operation of the leases operated by Jay Management Company LLC has not been addressed in this report.

In evaluating the information at our disposal related to this report, we have excluded from our consideration all matters which require a legal or accounting interpretation or any interpretation other than those of an engineering or geologic nature. In assessing the conclusions expressed in this report pertaining to all aspects of petroleum engineering evaluations, especially pertaining to injection into the San Andres reservoir, there are uncertainties inherent in the interpretation of engineering data, and such conclusions represent only professional judgments.

Data and worksheets used in the preparation of this evaluation will be maintained in our files in Fort Worth, TX and will be available for inspection by anyone having proper authorization by IJMC.

This report was prepared solely for the use of the party to whom it is addressed and any disclosure by said party of this report and/or the contents thereof shall be solely the responsibility of said party and shall in no way constitute any representation of any kind whatsoever of the undersigned with respect to matters being addressed.

ENGINEERING DISCLAIMER

Interpretations, research, analysis, recommendations, advise or interpretational data ("Interpretations and Recommendations") furnished by Syfan Engineering, LLC ("Contractor") hereunder are opinions based upon inferences, from measurements, empirical relationships and assumptions, and industry practice, which inferences, assumptions and practices are not infallible, and with respect to which professional geologists, engineers, drilling consultants, and analysts may differ. Accordingly, Contractor does not warrant the accuracy, correctness, or completeness of any such Interpretations and Recommendations, or that Jay Management Company's ("Company") reliance and/or any third party's reliance on such Interpretations and Recommendations will accomplish any particular results. Company assumes full responsibility for the use of such Interpretations and Recommendations and for all decisions based thereon (including without limitation decisions based on any oil and gas evaluation, injection study, production forecasts, reservoir simulation studies, and reserve estimates, furnished by Contractor to Company hereunder), and hereby releases and indemnifies Contractor from any claims, damages, and losses arising out of the use of such Interpretations and Recommendations.

Without limiting the generality of the foregoing, Company acknowledges that the engineering analyses, injection analyses, production analyses, production forecasts, and/or reserve estimates furnished by Contractor are based strictly on technical judgments. The accuracy of any engineering analyses, injection analyses, production analyses, production forecasts, and/or reserve estimates are a function of the quality of data available and of engineering and geological interpretations. All engineering analyses, injection analyses, production analyses, production forecasts and reserve estimates furnished by Contractor are believed reasonable based on the data available to Contractor at the time of their generation. Company acknowledges that Contractor cannot and does not guarantee the accuracy of any such interpretations, forecasts, and/or estimates, and hereby releases and indemnifies Contractor from any claims, damages, and losses arising out of the use of any such analyses, interpretations, forecasts, and/or estimates. Company accepts and assumes the risks from the use of all such analyses, interpretations, forecasts, and/or estimates with the understanding that additional data received by Contractor and/or future reservoir performance subsequent to the date of any such interpretations, forecasts, and/or estimates may justify their revision, either up or down.

Syfan Engineering, LLC sincerely appreciates the opportunity to serve you and Jay Management Company. We look forward to the opportunity to work with you again in future. If you have any questions regarding the information contained in this report, please contact me at the address or phone numbers listed on this letterhead.

Best Regards,

Frank E. Syfan, Jr., PE
Registered Professional Engineer – TX 65255

2/23/2018

TIMBERWOLF ENVIRONMENTAL

1920 W. Villa Maria, Ste. 205
Bryan, Texas 77807
979.324.2139
www.teamtimberwolf.com

October 23, 2018

Michael McMillan
New Mexico Oil Conservation Division
Engineering Bureau
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

Re: Water Well Resources and Water Quality Report
G.S. State No. 1 Permit
Jay Management Company
Bagley North Oil Field, Lea County, New Mexico
Timberwolf Environmental Project No.: ISR-180051

Dear Mr. McMillan:

At the request of Jay Management Company (Jay Management), Timberwolf Environmental, LLC (Timberwolf) conducted a receptor survey and groundwater sampling event for the G.S. State No. 1 Permit (Site). The Site is located in the Bagley North Oil Field, approximately 20.3 miles northwest of Tatum, Lea County, New Mexico (Figure 1).

The New Mexico OCD requested two (2) water wells within a one-mile radius of the Site to be sampled and analyzed as part of the authorization to inject permit application. The receptor survey conducted by Timberwolf included a one-mile radius public records water well search and a one-mile radius ground reconnaissance. The well search and ground reconnaissance are documented below. The Site location is shown on the attached topographic map and aerial image (Figures 2 and 3).

Water Well Search

Timberwolf contracted with Banks Environmental Data ("Banks") to conduct a water well search within a one-mile radius from the Site. A copy of the Banks report is attached. Eleven (11) wells were identified in the public records search; results are summarized in Table 1 (below) and shown in Figure 4.

Table 1. Findings of Public Records Search – One-Mile Radius

Well Name	Well ID	GPS Coordinate*	Well Type	Status	Depth (ft)
Unnamed	1	33.37947° N / 103.63554° W	Development of Natural Resource	Sealed	130
Unnamed	2	33.37856° N / 103.63879° W	Development of Natural Resource	Plugged	105
Unnamed	3	33.37650° N / 103.63468° W	Agriculture	Active	130
Unnamed	4	33.38131° N / 103.62726° W	Other	Plugged	--
Unnamed	5	33.37857° N / 103.62582° W	Development of Natural Resource	Sealed	115
Unnamed	6	33.38946° N / 103.63016° W	Development of Natural Resource	Active	75
Unnamed	7	33.37495° N / 103.62581° W	Development of Natural Resource	Plugged	90
Unnamed	8	33.38939° N / 103.62633° W	Other	Plugged	--
Unnamed	9	33.37405° N / 103.62691° W	Development of Natural Resource	Plugged	100
Unnamed	10	33.37673° N / 103.62362° W	Development of Natural Resource	Plugged	80
Unnamed	11	33.38289° N / 103.61968° W	--	Active	--

*Coordinates in North America Datum (NAD) 83
ft - feet
-- – not applicable

Ground Reconnaissance

On 03/12/18, Timberwolf performed ground reconnaissance to identify potential water wells to sample within a one-mile radius of the Site as specified by the New Mexico Oil Conservation Division (NMOCD). Timberwolf identified six (6) water wells within a one-mile radius of the Site; two (2) water wells were welded shut (i.e. sealed), three (3) water wells were active and used for agriculture.

Findings of the ground reconnaissance are summarized in Table 2 and shown in Figure 4.

Table 2. Findings of Ground Reconnaissance – One-Mile Radius

Well Name	Well ID	GPS Coordinate*	Well Type	Status	Depth (ft)
Unnamed	1	33.37947° N / 103.63554° W	Rig Supply	Sealed	130
Unnamed	3	33.37650° N / 103.63468° W	Agriculture	Active	130
Unnamed	5	33.37857° N / 103.62582° W	Rig Supply	Sealed	115
Unnamed	6	33.38946° N / 103.63016° W	Agriculture	Active	75
Unnamed	11	33.38289° N / 103.61968° W	Agriculture	Active	--

*Coordinates in North America Datum (NAD) 83
-- – not applicable
ft - feet

No other active or plugged water wells within a one-mile radius of the Site were located during the ground reconnaissance. These wells are presumed to be plugged and abandoned or geographically misrepresented in the public records.

Collection and Analysis of Water Well No. 3

Timberwolf collected a groundwater sample from one (1) water well within a one-mile radius of the Site. No other water wells were sampled due to: the inability to sample wells without dismantling surface equipment.

Timberwolf sampled the water well identified in Tables 1 and 2 and Figure 4 as Water Well No. 3. The well is equipped with a windmill and pump. The sample was collected directly out of the discharge pipe while the windmill was actively producing water.

The sample was collected directly into laboratory provided containers and submitted for laboratory analysis, including: total petroleum hydrocarbons (TPH); benzene, toluene, ethylbenzene, and xylenes (BTEX); total dissolved solids (TDS); electrical conductivity (EC); pH; Resource Conservation Recovery Act (RCRA) 8 metals (arsenic, barium, cadmium, chromium, lead, selenium, silver, and mercury); cations, (calcium, magnesium, sodium, potassium); anions (chloride, sulfate, carbonate, and bicarbonate). Analytical methods are documented on the attached laboratory report. Analytical results are summarized in the attached table.

Conclusions

Public records were reviewed to identify water wells in the vicinity of the Site. The review revealed:

- Eleven (11) water wells within a one-mile radius of the Site

The one-mile ground reconnaissance identified the following:

- Two (2) sealed water wells
- Three (3) active agriculture water wells, three of which were completed into cattle troughs and inaccessible
- Six (6) plugged and abandoned water wells

Analytical results of groundwater collected from the Water Well No. 3 revealed:

- Concentrations of petroleum hydrocarbons (i.e., TPH, BTEX) were below EPA or NMOCD criteria
- Concentrations of RCRA 8 metals were below EPA primary drinking water standards
- Concentrations of TDS exceeded EPA secondary drinking water standards, however:
    - Concentrations of chloride were below EPA criteria
    - Concentrations of sulfate were below EPA criteria
- Groundwater from Water Well No. 3 is considered fresh and suitable for human consumption

Analytical results are shown in the attached Table B-2 and in the attached laboratory report.

If you have any questions regarding this letter please do not hesitate to contact us.

Sincerely,
Timberwolf Environmental, LLC

Morgan Vizi
Project Scientist

Jim Foster
President

Attachments: Figures
Banks Water Well Report
Laboratory Report

Cc: Amir Sanker, Jay Management Company

Tables

Table B-2. Fresh Water Sample Results
G.S. State No. 001 Permit
Jay Management Company
Bagley North Oil Field, Lea County, New Mexico

Sample ID	Sample Date	TPH (mg/L)	Volatile Organic Compounds (mg/L)				Anions (mg/L)				Cations (mg/L)				General Water Quality Parameters			Dissolved Metals (mg/L)							
			B	T	E	X	Cl	SO_4	CO_3	BiCarb	Na	Ca	Mg	K	pH	Sp. Cond.	TDS	As	Ba	Cd	Cr	Pb	Se	Ag	Hg
															S.U.	mmhos/cm	mg/L								
3 G.S. State	03/13/18	< 0.71	< 0.00018	< 0.00020	< 0.00020	< 0.00037	120	130	< 20	130	41[B]	110	14	2.1	7.7[HF]	860	690	0.0055[J]	0.06	< 0.00028	< 0.0016	< 0.0022	0.0071[J]	< 0.0013	< 0.000082
Regulatory Limits		--	**0.01** [3]	**0.75** [3]	**0.75** [3]	**0.62** [3]	**250** [2]	**250** [2]	--	--	--	--	--	--	**6.5 - 8.5** [2]	--	**500** [2]	**0.01** [1]	**2.0** [1]	**0.005** [1]	**0.1** [1]	**0.015** [1]	**0.05** [1]	**0.10** [2]	**0.002** [1]

[1] EPA Primary Drinking Water Standards
[2] EPA Secondary Drinking Water Standards
[3] NMOCD standards from Title 20 NMAC § 6.2
[J] - analyte detected below quantation limit
[H] - sample prepped or analyzed beyond specified holding time
[b] - analyte detected in blank
mg/L - milligrams per liter
-- - no applicable limit

s.u. - Standard units
Sp. Cond. - Specific conductance
mmhos/cm - millimhos per centimeter
ohm-m - ohms per meter
TDS - total dissolved solids
TSS - total suspended solids
NTU - Nephelometric turbidity unit
- concentration exceeds recommended action level

CO_2 - carbon dioxide
Cl - Chloride
SO_4 - Sulfate
CO_3 - Carbonate
BiCarb - Bicarbonate
Na - Sodium
Ca - Calcium
Mg - Magnesium

As - arsenic
Ba - barium
Cd - cadmium
Cr - chromium
Pb - lead
Se - selenium
Ag - silver
Hg - mercury

Figures

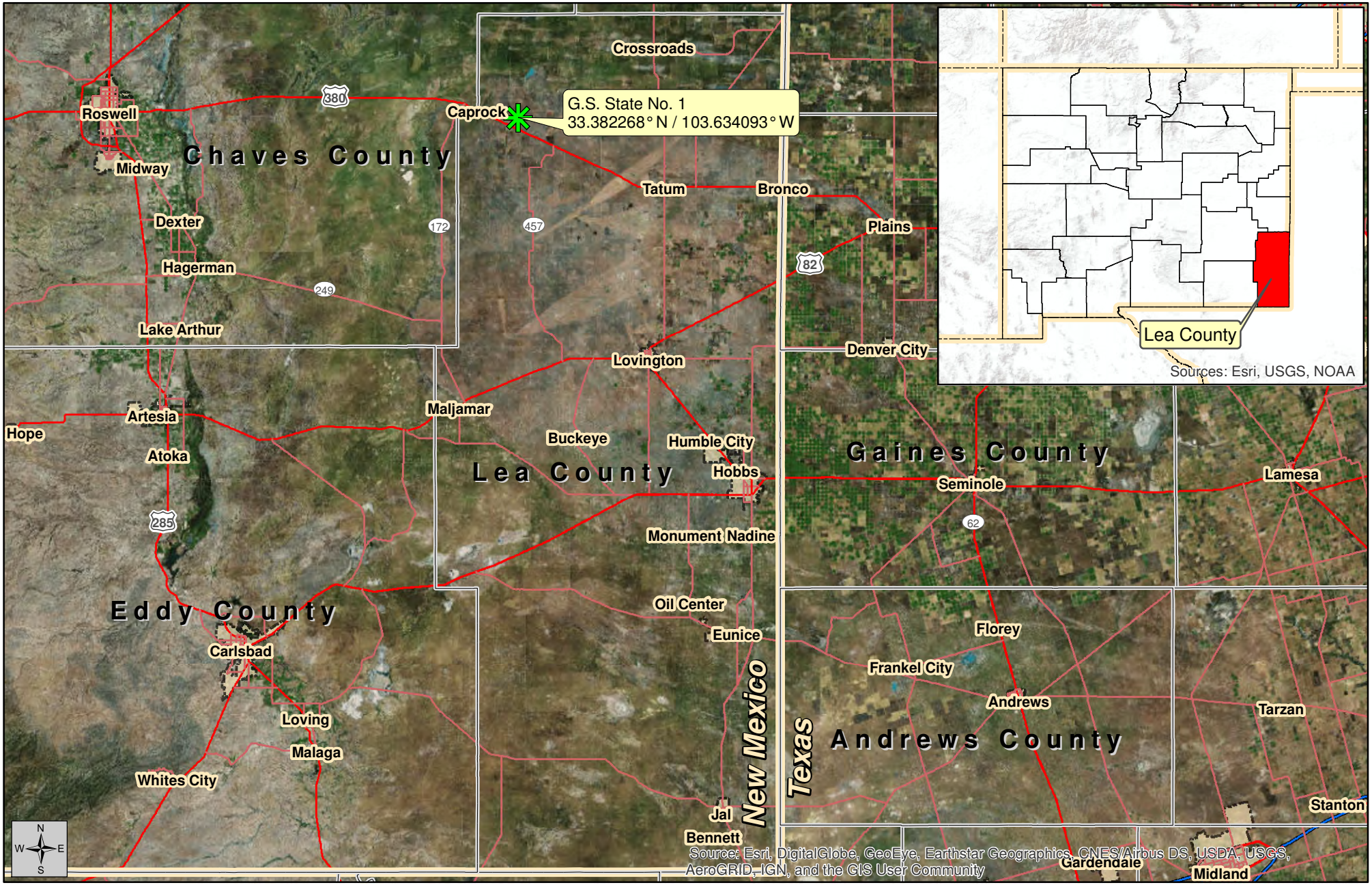


Figure 1
Site Location Map

Water Well Resources and Water Quality Report

Survey Date:
March 12, 2018

TIMBERWOLF ENVIRONMENTAL

1:1,250,000

0 20 40 60 80 100 120 Miles

Created By:
Russell Greer
October 22, 2018
TE Project No.: ISR-180051

GS State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: USGS
Quads: Caprock, Lane Salt Lake, Soldier Hill, Dallas Store
Vector Source: TE

Site

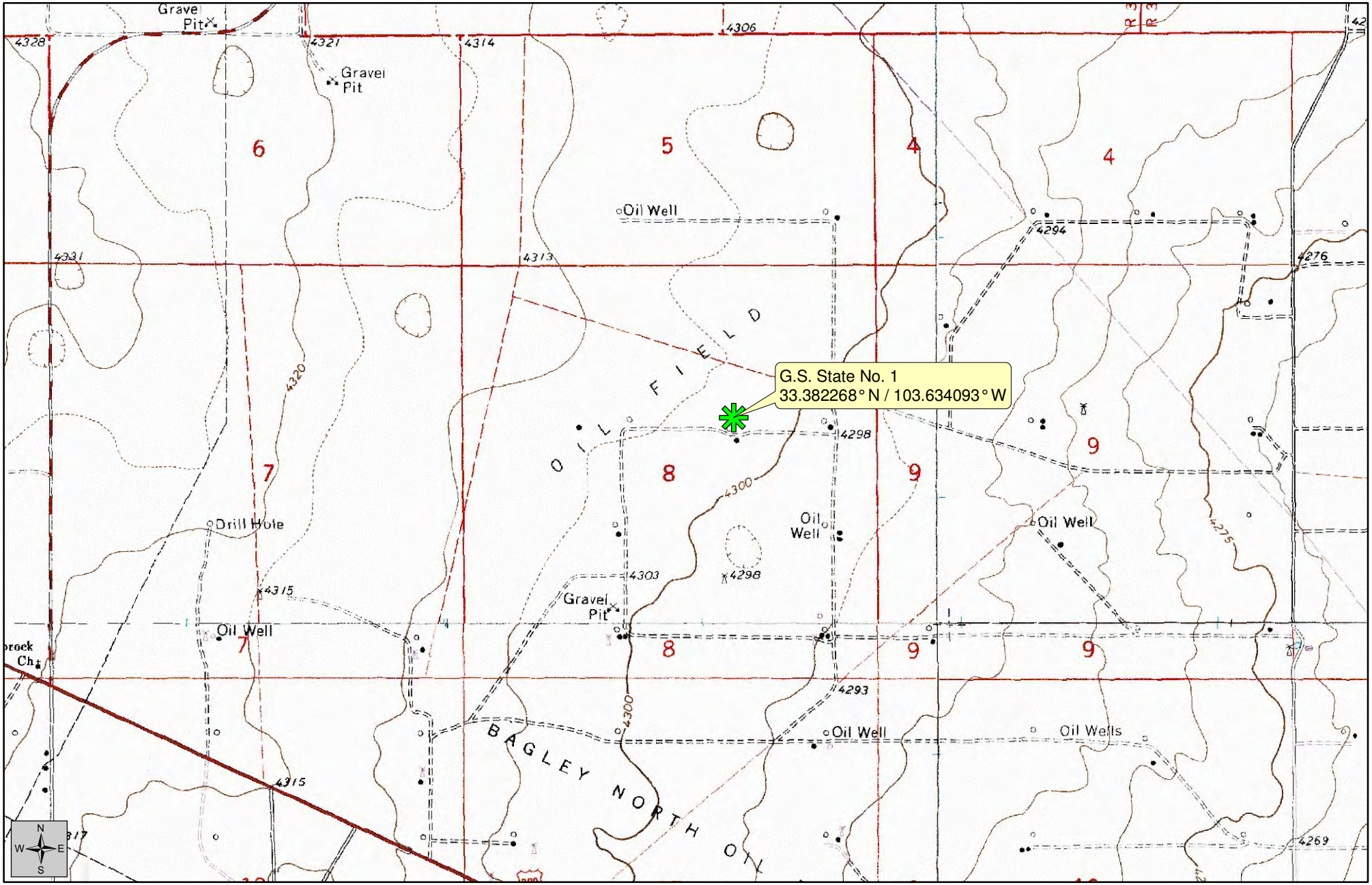


Figure 2 TopographicMap	**Water Well Resources and Water Quality Report**	**Survey Date:** **March 12, 2018**

TIMBERWOLF ENVIRONMENTAL

1:24,000

0 0.5 1 1.5 2 Miles

Created By:
Russell Greer
October 22, 2018
TE Project No.: ISR-180051

GS State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: USGS
Quads: Caprock, Lane Salt Lake, Soldier Hill, Dallas Store
Vector Source: TE

Site

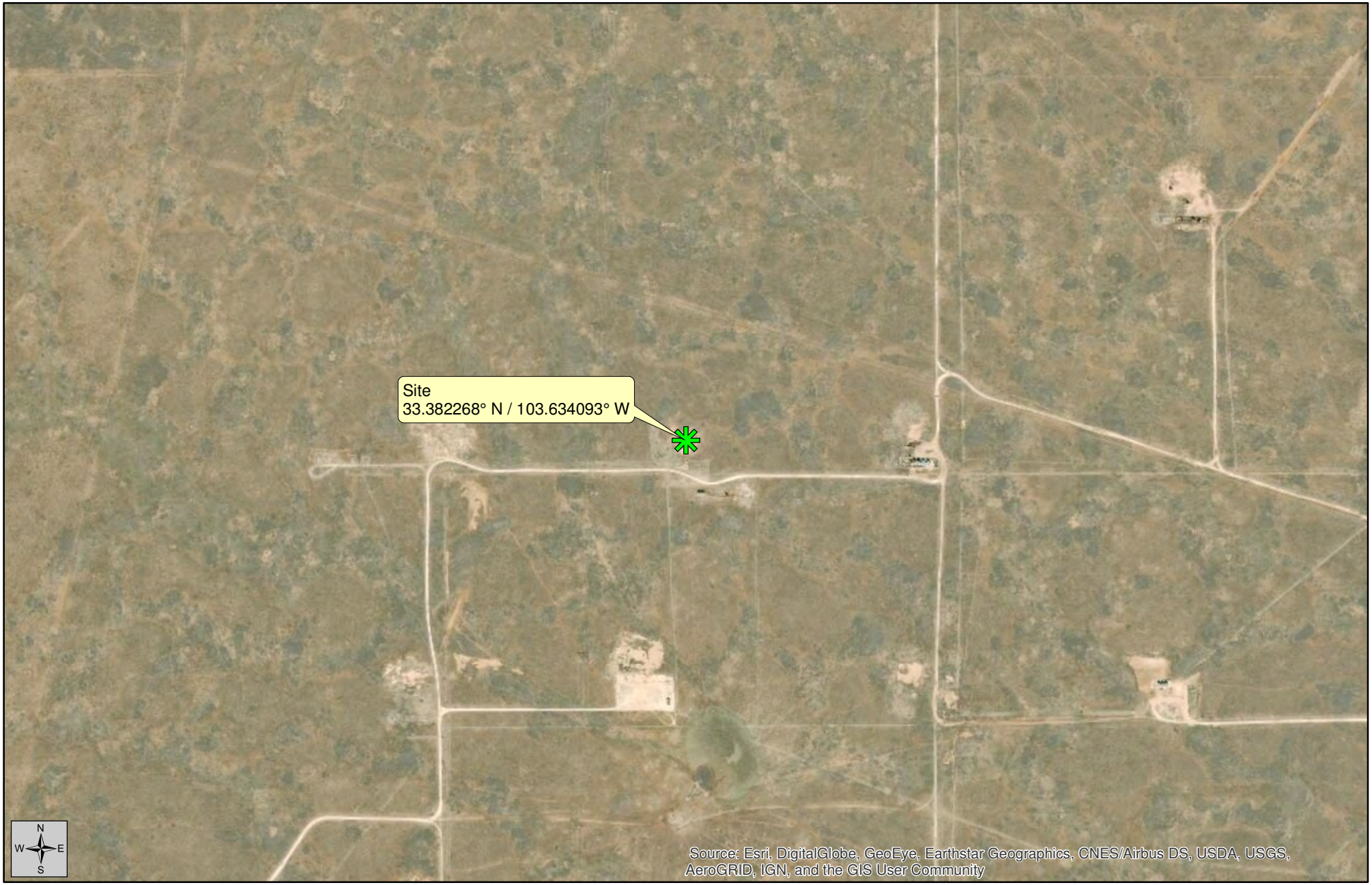


Figure 3
Aerial Map

Water Well Resources and Water Quality Report

Survey Date:
March 12, 2018

1:10,000

0 0.25 0.5 0.75 1 Miles

TIMBERWOLF ENVIRONMENTAL

Created By:
Russell Greer
October 22, 2018
TE Project No.: ISR-180051

GS State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

Site

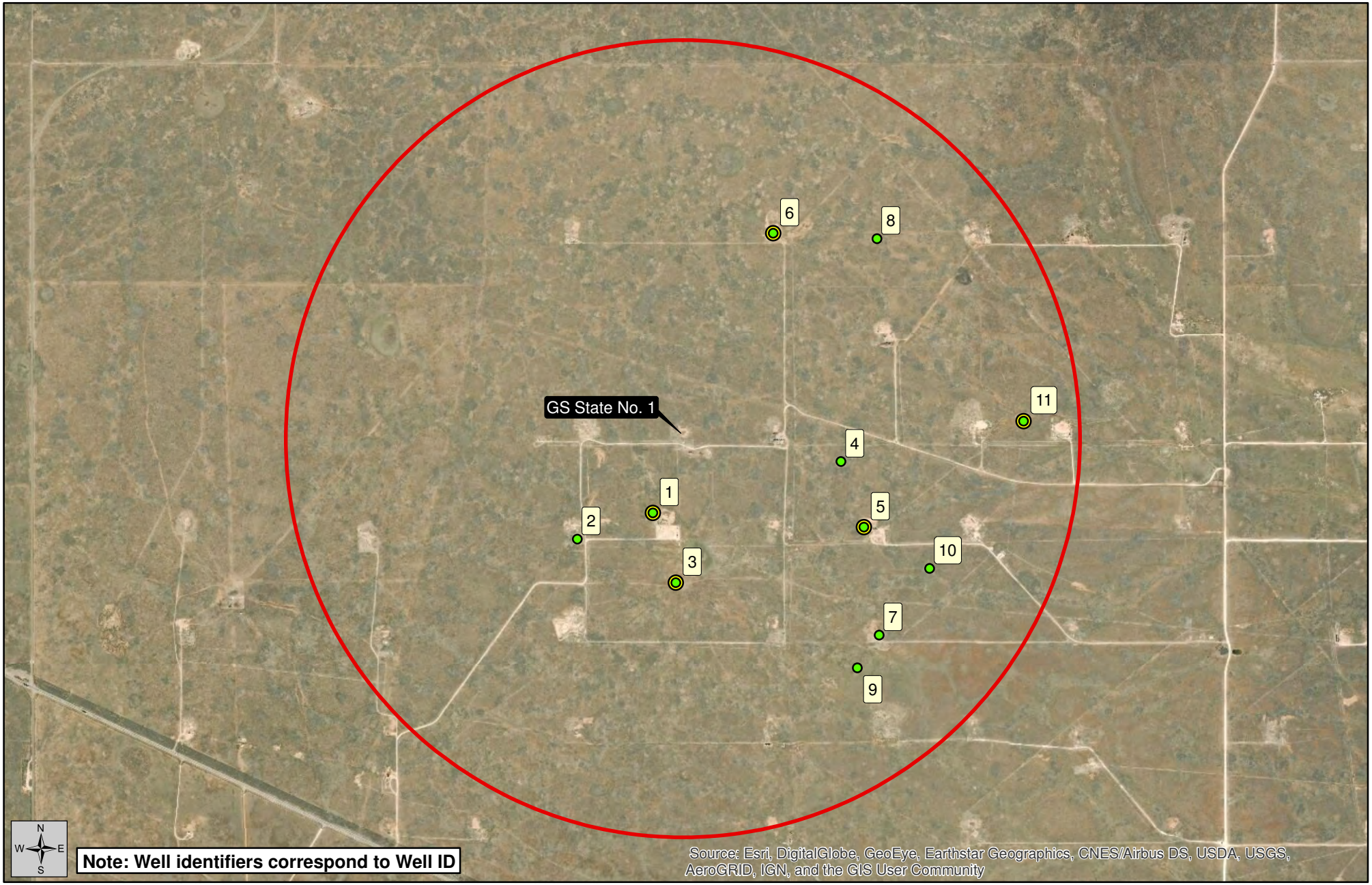


Figure 4
Water Well Location Map

Water Well Resources and Water Quality Report

Survey Date:
March 12, 2018

TIMBERWOLF ENVIRONMENTAL

1:25,000

0 0.5 1 1.5 2 2.5 Miles

Created By:
Russell Greer
October 22, 2018
TE Project No.: ISR-180051

GS State No. 1
Jay Management, LLC
Bagley North Oil Field, Lea County, New Mexico

Datum: NAD83
Imagery Source: ESRI
Vector Source: TE

- Water Well (Located by Timberwolf)
- Water Well (Located by Banks)
- 1 Mile Radius from State OG SWD

Banks Water Well Report

Prepared for:

TIMBERWOLF ENVIRONMENTAL
1920 West Villa maria Road, STE 305-2
Bryan, TX 77507

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP

Water Well Report

GS State No. 1

NM

ES-129325

Thursday, October 18, 2018

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 331 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Table of Contents

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 331 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Geographic Summary

Location
NM

Coordinates	
Longitude & Latitude in Degrees Minutes Seconds	-103° 38' 3", 33° 22' 55"
Longitude & Latitude in Decimal Degrees	-103.634155°, 33.38195°
X and Y in UTM	627043.72, 3694464.57 (Zone 13)

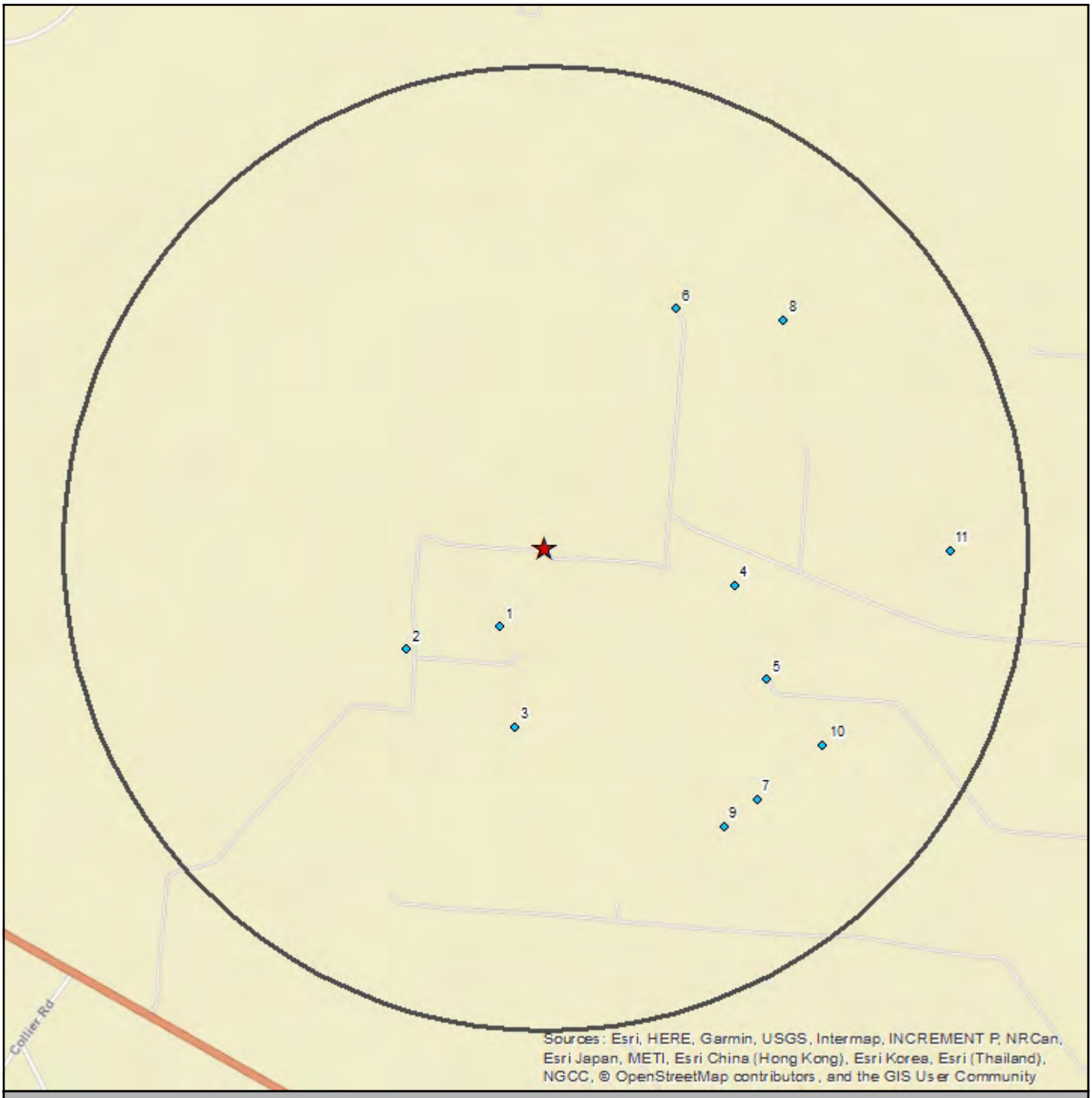
Elevation
NA

Zip Codes Searched	
Search Distance	**Zip Codes (historical zip codes included)**
Target Property	88213, 88114, 88116, 88201, 88230, 88232, 88260, 88267
1 mile	88213, 88114, 88116, 88201, 88230, 88232, 88260, 88267

Topos Searched	
Search Distance	**Topo Name**
Target Property	Caprock (1985)
1 mile	Caprock (1985), Soldier Hill (1985), Lane Salt Lake (1985), Dallas Store (1985)

Banks Environmental Data, Inc. - 1601 Rio Grande, Ste. 331 - Austin, TX 78701 - 800.531.5255 P - 512.478.1433 F
www.banksenvdata.com

Summary Map - 1 Mile Radius



GS State No. 1

Well
Well Cluster
Target Property
Search Buffer

0' 1000' 2000'

1 : 19,000

1 inch = 0.300 miles
1 inch = 1583 feet
1 centimeter = 0.190 kilometers
1 centimeter = 190 meters

N

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

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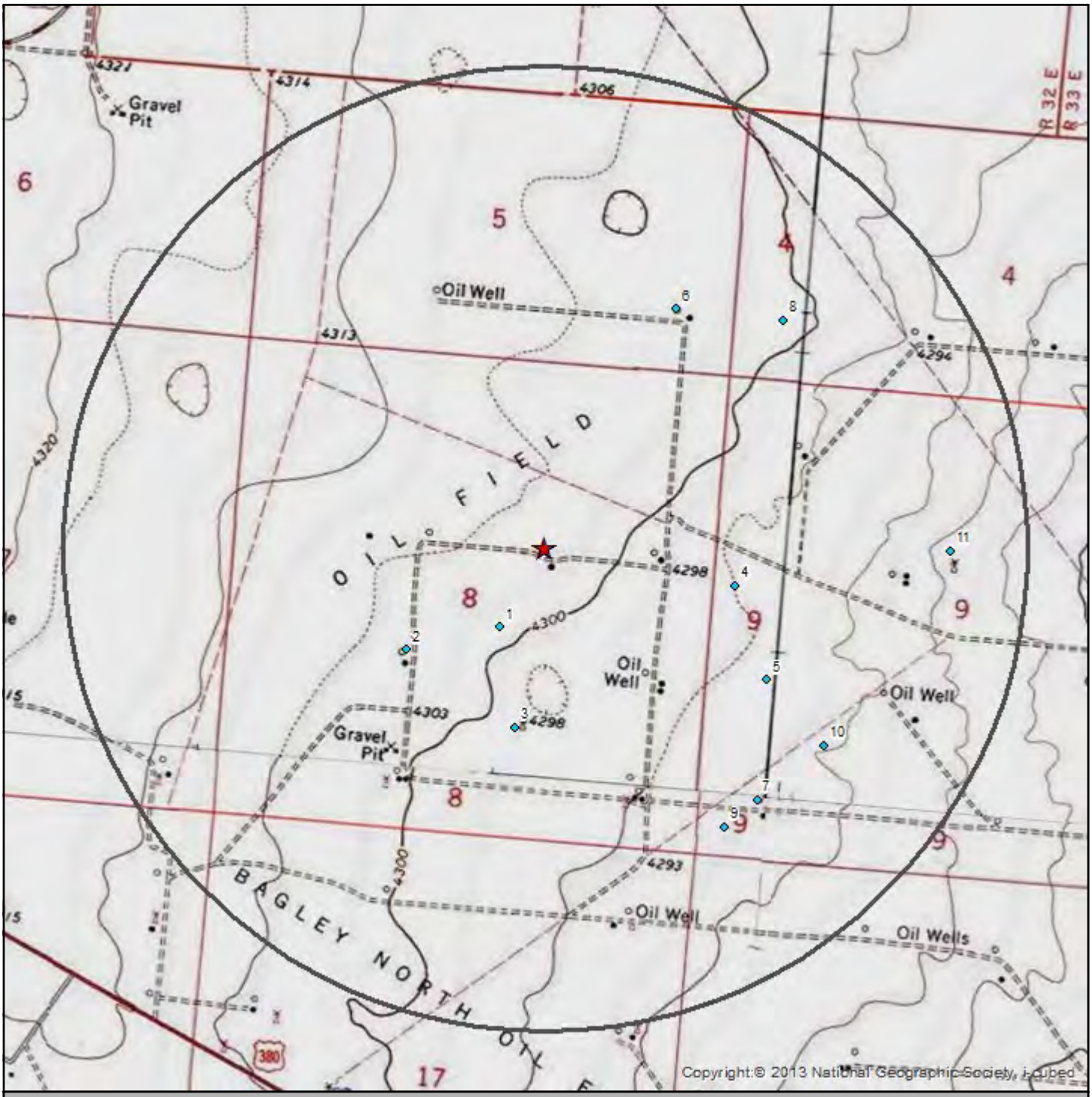
Topographic Overlay Map - 1 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



GS State No. 1

Well
Well Cluster
Target Property
Search Buffer

Target Property Quad Name(s)
Caprock (1985)

0' 1000' 2000'

1 : 19,000
1 inch = 0.300 miles
1 inch = 1583 feet

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

N

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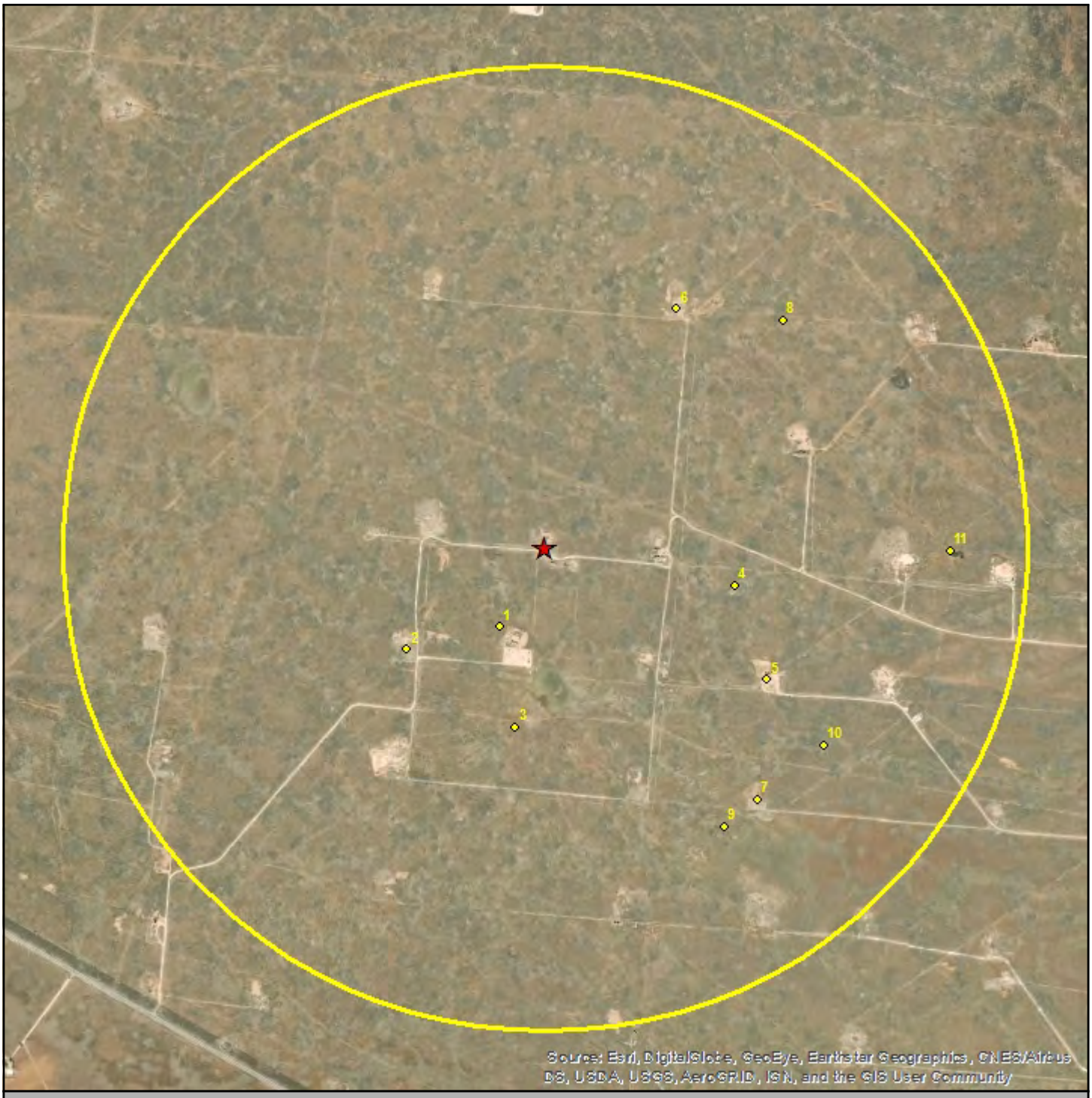
Current Imagery Overlay Map - 1 Mile Radius

BANKS ENVIRONMENTAL DATA
A DIVISION OF THE BANKS GROUP



GS State No. 1

Well
Well Cluster
Target Property
Search Buffer

0' 1000' 2000'

1 : 19,000

1 inch = 0.300 miles
1 inch = 1583 feet
1 centimeter = 0.190 kilometers
1 centimeter = 190 meters

N

Lambert Conformal Conic Projection
1983 North American Datum
First Standard Parallel: 33 0' 00" North
Second Standard Parallel: 45 0' 00" North
Central Meridian: 96 0' 00" West
Latitude of Origin: 39 0' 00" North

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Water Well Details

Map ID	Source ID	Dataset	Owner of Well	Type of Well	Depth Drilled	Completion Date	Longitude	Latitude	Elevation	Driller's Logs
1	L-10567	NM WW	YATES PETROLEUM	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	130	6/3/1996	-103.635535	33.379471	NA	N/A
2	L-06249	NM WW	M G F DRILLING COMPANY	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	105	12/24/1967	-103.638785	33.37856	NA	N/A
3	USGS-332217103375701	WW USGS	USGS	Not Reported	130	N/A	-103.634677	33.376496	NA	N/A
4	L-14417-POD1	NM WW	PEARCE TRUST	Other	0	N/A	-103.627259	33.381305	NA	N/A
5	L-10225	NM WW	NORTON DRILLING	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	115	10/14/1991	-103.62582	33.37857	NA	N/A
6	L-12920-POD1	NM WW	MCVAY DRILLING COMPANY	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	75	5/18/1967	-103.630164	33.389459	NA	N/A
7	L-06235	NM WW	CACTUS DRILLING CORP	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	90	11/6/1967	-103.625813	33.374945	NA	N/A
8	L-14416-POD1	NM WW	PEARCE TRUST	Other	0	N/A	-103.626328	33.389386	NA	N/A
9	L-06242	NM WW	SHARP DRILLING COMPANY	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	100	11/13/1967	-103.626913	33.374046	NA	N/A
10	L-06139	NM WW	FORSTER DRILLING COMPANY	72-12-1 PROSPECTING OR DEVELOPMENT OF NATURAL RESOURCE	80	5/5/1967	-103.623624	33.376733	NA	N/A
11	USGS-332252103370401	WW USGS	USGS	Not Reported	0	N/A	-103.619676	33.382885	NA	N/A

Well Summary

Water Well Dataset	# of Wells
NM WW	9
WW USGS	2
Total Count	**11**

Dataset Descriptions and Sources

Dataset	Source	Dataset Description	Update Schedule	Data Requested	Data Obtained	Data Updated	Source Updated
NM WW - New Mexico Water Wells	New Mexico Office of the State Engineer	This WATERS dataset contains all groundwater records and water rights applications compiled by New Mexico Office of the State Engineer (OSE). OSE is in the process of digitizing all records, all wells have not yet been plotted.	Quarterly	10/17/2018	10/17/2018	10/18/2018	04/01/2018
NM WW HIST - New Mexico Historical Water Wells	New Mexico Office of the State Engineer	This dataset contains all groundwater records found at the New Mexico Office of the State Engineer Water Rights Division district office. Groundwater rights are administered and filed at the district level: Albuquerque (District I), Roswell (District II),		N/A	N/A	N/A	N/A
WW USGS - USGS Water Wells	U.S. Geological Survey	This dataset contains groundwater well records from the U.S. Geological Survey.	Semi-annually	06/06/2018	06/06/2018	06/10/2018	06/06/2018

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Disclaimer

The Banks Environmental Data Water Well Report was prepared from existing state water well databases and/or additional file data/records research conducted at the state agency and the U.S. Geological Survey. Banks Environmental Data has performed a thorough and diligent search of all groundwater well information provided and recorded. All mapped locations are based on information obtained from the source. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the actual driller. It may be possible that some water well schedules and logs have never been submitted to the regulatory authority by the water driller and, thus, may explain the possible unaccountability of privately drilled wells. It is uncertain if the above listing provides 100% of the existing wells within the area of review. Therefore, Banks Environmental Data cannot fully guarantee the accuracy of the data or well location(s) of those maps and records maintained by the regulatory authorities.

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www.banksenvdata.com

Laboratory Report

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Houston
6310 Rothway Street
Houston, TX 77040
Tel: (713)690-4444

TestAmerica Job ID: 600-162845-1
Client Project/Site: 180006 - State OG SWD
Revision: 1

For:
Timberwolf Environmental LLC
1920 W. Vill Maria
Suite 305-2 Box 205
Bryan, Texas 77807

Attn: Accounts Payable

Dean A. Joiner

Authorized for release by:
10/22/2018 3:19:08 PM

Dean Joiner, Project Manager II
(713)690-4444
dean.joiner@testamericainc.com

Table of Contents

Case Narrative

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Job ID: 600-162845-1

Laboratory: TestAmerica Houston

Narrative

Job Narrative
600-162845-1

Comments
This report was revised on 10-22-18 updating the client sample id for TA sample # 600-162845-1 as requested by the client via e-mail.

Receipt
The samples were received on 3/14/2018 9:23 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method(s) 6010B: The serial dilution performed for the following sample associated with batch 234414 was outside control limits for Potassium at 20% recovery: (600-162845-A-1-E SD)

Method(s) 6010B: The method blank for Prep Batch 234286 contained Sodium above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Industrial Hygiene
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Method Summary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL HOU
TX 1005	Texas - Total Petroleum Hydrocarbon (GC)	TCEQ	TAL HOU
300.0	Anions, Ion Chromatography	MCAWW	TAL HOU
6010B	Inductively Coupled Plasma - Atomic Emission Spectrometry	SW846	TAL HOU
7470A	Mercury in Liquid Waste (Manual Cold Vapor Technique)	SW846	TAL HOU
2320B-1997	Alkalinity, Total - SM Online, 2011	SM-Online	TAL HOU
9040B	pH	SW846	TAL HOU
9050A	Conductivity, Specific Conductance	SW846	TAL HOU
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL HOU
3010A	Acid Digestion of Aqueous Samples and Extracts for Total Metals	SW846	TAL HOU
5030B	Purge and Trap	SW846	TAL HOU
7470A	Mercury in Liquid Waste (Manual Cold Vapor Technique)/Preparation	SW846	TAL HOU
FILTRATION	Sample Filtration	None	TAL HOU
TX_1005_W_Prep	Extraction - Texas Total petroleum Hyrdocarbons	TCEQ	TAL HOU

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SM-Online = Standard Methods Online
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TCEQ = Texas Commission of Environmental Quality

Laboratory References:

TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Sample Summary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
600-162845-1	G.S. State 3 WW	Water	03/13/18 08:40	03/14/18 09:23
600-162845-2	State NBN 7 WW	Water	03/13/18 09:00	03/14/18 09:23

Client Sample ID: G.S. State 3 WW

Date Collected: 03/13/18 08:40
Date Received: 03/14/18 09:23

Lab Sample ID: 600-162845-1

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00018	U	0.0010	0.00018	mg/L			03/15/18 15:34	1
Ethylbenzene	0.00021	U	0.0010	0.00021	mg/L			03/15/18 15:34	1
Toluene	0.00020	U	0.0010	0.00020	mg/L			03/15/18 15:34	1
Xylenes, Total	0.00037	U	0.0020	0.00037	mg/L			03/15/18 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*50 - 134*		*03/15/18 15:34*	*1*
Dibromofluoromethane	*115*		*62 - 130*		*03/15/18 15:34*	*1*
Toluene-d8 (Surr)	*118*		*70 - 130*		*03/15/18 15:34*	*1*
4-Bromofluorobenzene	*119*		*67 - 139*		*03/15/18 15:34*	*1*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	0.71	U	1.7	0.71	mg/L		03/16/18 11:02	03/17/18 00:04	1
>C12-C28	0.82	U	1.7	0.82	mg/L		03/16/18 11:02	03/17/18 00:04	1
>C28-C35	0.82	U	1.7	0.82	mg/L		03/16/18 11:02	03/17/18 00:04	1
C6-C35	0.71	U	1.7	0.71	mg/L		03/16/18 11:02	03/17/18 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*90*		*70 - 130*	*03/16/18 11:02*	*03/17/18 00:04*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**120**		10	1.3	mg/L			03/16/18 14:12	25
Sulfate	**130**		13	2.4	mg/L			03/16/18 14:12	25

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry - Dissolved

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0055**	**J**	0.010	0.0029	mg/L		03/19/18 13:06	03/20/18 12:30	1
Barium	**0.060**		0.020	0.00053	mg/L		03/19/18 13:06	03/20/18 12:30	1
Cadmium	0.00028	U	0.0050	0.00028	mg/L		03/19/18 13:06	03/20/18 12:30	1
Calcium	**110**		1.0	0.024	mg/L		03/19/18 13:06	03/20/18 12:30	1
Chromium	0.0016	U	0.010	0.0016	mg/L		03/19/18 13:06	03/20/18 12:30	1
Lead	0.0022	U	0.010	0.0022	mg/L		03/19/18 13:06	03/20/18 12:30	1
Magnesium	**14**		1.0	0.056	mg/L		03/19/18 13:06	03/20/18 12:30	1
Potassium	**2.1**		1.0	0.037	mg/L		03/19/18 13:06	03/20/18 12:30	1
Selenium	**0.0071**	**J**	0.040	0.0029	mg/L		03/19/18 13:06	03/20/18 12:30	1
Silver	0.0013	U	0.010	0.0013	mg/L		03/19/18 13:06	03/20/18 12:30	1
Sodium	**41**	**B**	1.0	0.021	mg/L		03/19/18 13:06	03/20/18 14:29	1

Method: 7470A - Mercury in Liquid Waste (Manual Cold Vapor Technique) - Dissolved

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000082	U	0.00020	0.000082	mg/L		03/19/18 11:46	03/19/18 14:20	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**130**		20	20	mg/L			03/19/18 14:26	1
Carbonate Alkalinity as CaCO3	20	U	20	20	mg/L			03/19/18 14:26	1
pH	**7.7**	**HF**	0.01	0.01	SU			03/19/18 12:49	1
Specific Conductance	**860**		2.0	2.0	umhos/cm			03/19/18 15:45	1
Total Dissolved Solids	**690**		10	10	mg/L			03/15/18 15:09	1

Client Sample Results

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Client Sample ID: State NBN 7 WW

Date Collected: 03/13/18 09:00
Date Received: 03/14/18 09:23

Lab Sample ID: 600-162845-2

Matrix: Water

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00018	U	0.0010	0.00018	mg/L			03/15/18 15:58	1
Ethylbenzene	0.00021	U	0.0010	0.00021	mg/L			03/15/18 15:58	1
Toluene	0.00020	U	0.0010	0.00020	mg/L			03/15/18 15:58	1
Xylenes, Total	0.00037	U	0.0020	0.00037	mg/L			03/15/18 15:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*50 - 134*		*03/15/18 15:58*	*1*
Dibromofluoromethane	*107*		*62 - 130*		*03/15/18 15:58*	*1*
Toluene-d8 (Surr)	*119*		*70 - 130*		*03/15/18 15:58*	*1*
4-Bromofluorobenzene	*122*		*67 - 139*		*03/15/18 15:58*	*1*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	0.74	U	1.8	0.74	mg/L		03/16/18 11:02	03/17/18 00:37	1
>C12-C28	0.86	U	1.8	0.86	mg/L		03/16/18 11:02	03/17/18 00:37	1
>C28-C35	0.86	U	1.8	0.86	mg/L		03/16/18 11:02	03/17/18 00:37	1
C6-C35	0.74	U	1.8	0.74	mg/L		03/16/18 11:02	03/17/18 00:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*96*		*70 - 130*	*03/16/18 11:02*	*03/17/18 00:37*	*1*

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**51**		10	1.3	mg/L			03/16/18 14:48	25
Sulfate	**200**		13	2.4	mg/L			03/16/18 14:48	25

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry - Dissolved

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0052**	**J**	0.010	0.0029	mg/L		03/19/18 13:06	03/20/18 12:36	1
Barium	**0.031**		0.020	0.00053	mg/L		03/19/18 13:06	03/20/18 12:36	1
Cadmium	0.00028	U	0.0050	0.00028	mg/L		03/19/18 13:06	03/20/18 12:36	1
Calcium	**94**		1.0	0.024	mg/L		03/19/18 13:06	03/20/18 12:36	1
Chromium	0.0016	U	0.010	0.0016	mg/L		03/19/18 13:06	03/20/18 12:36	1
Lead	0.0022	U	0.010	0.0022	mg/L		03/19/18 13:06	03/20/18 12:36	1
Magnesium	**13**		1.0	0.056	mg/L		03/19/18 13:06	03/20/18 12:36	1
Potassium	**2.6**		1.0	0.037	mg/L		03/19/18 13:06	03/20/18 12:36	1
Selenium	**0.0048**	**J**	0.040	0.0029	mg/L		03/19/18 13:06	03/20/18 12:36	1
Silver	0.0013	U	0.010	0.0013	mg/L		03/19/18 13:06	03/20/18 12:36	1
Sodium	**64**	**B**	1.0	0.021	mg/L		03/19/18 13:06	03/20/18 14:42	1

Method: 7470A - Mercury in Liquid Waste (Manual Cold Vapor Technique) - Dissolved

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000082	U	0.00020	0.000082	mg/L		03/19/18 12:45	03/19/18 14:26	1

General Chemistry

Analyte	Result	Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**160**		20	20	mg/L			03/19/18 14:33	1
Carbonate Alkalinity as CaCO3	20	U	20	20	mg/L			03/19/18 14:33	1
pH	**7.9**	**HF**	0.01	0.01	SU			03/19/18 12:56	1
Specific Conductance	**850**		2.0	2.0	umhos/cm			03/19/18 15:45	1
Total Dissolved Solids	**650**		10	10	mg/L			03/15/18 15:09	1

Definitions/Glossary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

GC Semi VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

HPLC/IC

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

General Chemistry

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Surrogate Summary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	DBFM	TOL	BFB
Lab Sample ID	Client Sample ID	(50-134)	(62-130)	(70-130)	(67-139)
600-162845-1	G.S. State 3 WW	119	115	118	119
600-162845-2	State NBN 7 WW	119	107	119	122
LCS 600-234104/3	Lab Control Sample	123	110	112	120
LCSD 600-234104/4	Lab Control Sample Dup	127	111	112	120
MB 600-234104/6	Method Blank	115	109	117	116

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
DBFM = Dibromofluoromethane
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTPH
Lab Sample ID	Client Sample ID	(70-130)
600-162845-1	G.S. State 3 WW	90
600-162845-2	State NBN 7 WW	96
LCS 600-234200/2-A	Lab Control Sample	98
LCSD 600-234200/3-A	Lab Control Sample Dup	95
MB 600-234200/1-A	Method Blank	93

Surrogate Legend

OTPH = o-Terphenyl

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 600-234104/6
Matrix: Water
Analysis Batch: 234104

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00018	U	0.0010	0.00018	mg/L			03/15/18 13:04	1
Ethylbenzene	0.00021	U	0.0010	0.00021	mg/L			03/15/18 13:04	1
Toluene	0.00020	U	0.0010	0.00020	mg/L			03/15/18 13:04	1
Xylenes, Total	0.00037	U	0.0020	0.00037	mg/L			03/15/18 13:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*50 - 134*		*03/15/18 13:04*	*1*
Dibromofluoromethane	*109*		*62 - 130*		*03/15/18 13:04*	*1*
Toluene-d8 (Surr)	*117*		*70 - 130*		*03/15/18 13:04*	*1*
4-Bromofluorobenzene	*116*		*67 - 139*		*03/15/18 13:04*	*1*

Lab Sample ID: LCS 600-234104/3
Matrix: Water
Analysis Batch: 234104

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			0.0100	0.0120		mg/L		120	70 - 130		
Ethylbenzene			0.0100	0.0124		mg/L		124	70 - 130		
Toluene			0.0100	0.0123		mg/L		123	70 - 130		
Xylenes, Total			0.0200	0.0249		mg/L		125	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*123*		*50 - 134*
Dibromofluoromethane	*110*		*62 - 130*
Toluene-d8 (Surr)	*112*		*70 - 130*
4-Bromofluorobenzene	*120*		*67 - 139*

Lab Sample ID: LCSD 600-234104/4
Matrix: Water
Analysis Batch: 234104

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene			0.0100	0.0118		mg/L		118	70 - 130	2	20
Ethylbenzene			0.0100	0.0122		mg/L		122	70 - 130	2	20
Toluene			0.0100	0.0120		mg/L		120	70 - 130	3	20
Xylenes, Total			0.0200	0.0244		mg/L		122	70 - 130	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*127*		*50 - 134*
Dibromofluoromethane	*111*		*62 - 130*
Toluene-d8 (Surr)	*112*		*70 - 130*
4-Bromofluorobenzene	*120*		*67 - 139*

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Lab Sample ID: MB 600-234200/1-A
Matrix: Water
Analysis Batch: 234211

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 234200

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
C6-C12	0.83	U	2.0	0.83	mg/L		03/16/18 11:02	03/16/18 22:27	1
>C12-C28	0.96	U	2.0	0.96	mg/L		03/16/18 11:02	03/16/18 22:27	1
>C28-C35	0.96	U	2.0	0.96	mg/L		03/16/18 11:02	03/16/18 22:27	1
C6-C35	0.83	U	2.0	0.83	mg/L		03/16/18 11:02	03/16/18 22:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*93*		*70 - 130*	*03/16/18 11:02*	*03/16/18 22:27*	*1*

Lab Sample ID: LCS 600-234200/2-A
Matrix: Water
Analysis Batch: 234211

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 234200

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
C6-C12	33.3	27.3		mg/L		82	75 - 125
>C12-C28	33.3	35.7		mg/L		107	75 - 125
C6-C35	66.7	63.0		mg/L		95	75 - 125

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*98*		*70 - 130*

Lab Sample ID: LCSD 600-234200/3-A
Matrix: Water
Analysis Batch: 234211

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 234200

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C6-C12	33.3	26.6		mg/L		80	75 - 125	2	20
>C12-C28	33.3	36.3		mg/L		109	75 - 125	2	20
C6-C35	66.7	62.9		mg/L		94	75 - 125	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*95*		*70 - 130*

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 600-234198/4
Matrix: Water
Analysis Batch: 234198

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.053	U	0.40	0.053	mg/L			03/16/18 12:24	1
Sulfate	0.096	U	0.50	0.096	mg/L			03/16/18 12:24	1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 600-234198/5
Matrix: Water
Analysis Batch: 234198

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	20.0	19.1		mg/L		96	90 - 110
Sulfate	20.0	19.7		mg/L		98	90 - 110

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry

Lab Sample ID: MB 600-234286/1-C
Matrix: Water
Analysis Batch: 234414

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 234323

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0029	U	0.010	0.0029	mg/L		03/19/18 13:06	03/20/18 12:26	1
Barium	0.00053	U	0.020	0.00053	mg/L		03/19/18 13:06	03/20/18 12:26	1
Cadmium	0.00028	U	0.0050	0.00028	mg/L		03/19/18 13:06	03/20/18 12:26	1
Calcium	0.024	U	1.0	0.024	mg/L		03/19/18 13:06	03/20/18 12:26	1
Chromium	0.0016	U	0.010	0.0016	mg/L		03/19/18 13:06	03/20/18 12:26	1
Lead	0.0022	U	0.010	0.0022	mg/L		03/19/18 13:06	03/20/18 12:26	1
Magnesium	0.056	U	1.0	0.056	mg/L		03/19/18 13:06	03/20/18 12:26	1
Potassium	0.037	U	1.0	0.037	mg/L		03/19/18 13:06	03/20/18 12:26	1
Selenium	0.0029	U	0.040	0.0029	mg/L		03/19/18 13:06	03/20/18 12:26	1
Silver	0.0013	U	0.010	0.0013	mg/L		03/19/18 13:06	03/20/18 12:26	1

Lab Sample ID: MB 600-234286/1-C
Matrix: Water
Analysis Batch: 234414

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 234323

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Sodium	0.0928	J	1.0	0.021	mg/L		03/19/18 13:06	03/20/18 14:25	1

Lab Sample ID: LCS 600-234286/2-B
Matrix: Water
Analysis Batch: 234414

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	1.01		mg/L		101	80 - 120
Barium	1.00	1.00		mg/L		100	80 - 120
Cadmium	0.500	0.504		mg/L		101	80 - 120
Calcium	10.0	9.83		mg/L		98	80 - 120
Chromium	1.00	0.992		mg/L		99	80 - 120
Lead	1.00	0.991		mg/L		99	80 - 120
Magnesium	10.0	9.91		mg/L		99	80 - 120
Potassium	10.0	9.96		mg/L		100	80 - 120
Selenium	1.00	1.01		mg/L		101	80 - 120
Silver	0.500	0.500		mg/L		100	80 - 120

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry (Continued)

Lab Sample ID: LCS 600-234286/2-B
Matrix: Water
Analysis Batch: 234414

Client Sample ID: Lab Control Sample
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	10.0	9.99		mg/L		100	80 - 120

Lab Sample ID: 600-162845-1 MS
Matrix: Water
Analysis Batch: 234414

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0055	J	1.00	1.04		mg/L		103	75 - 125
Barium	0.060		1.00	1.06		mg/L		100	75 - 125
Cadmium	0.00028	U	0.500	0.515		mg/L		103	75 - 125
Calcium	110		10.0	117	4	mg/L		111	75 - 125
Chromium	0.0016	U	1.00	0.980		mg/L		98	75 - 125
Lead	0.0022	U	1.00	0.992		mg/L		99	75 - 125
Magnesium	14		10.0	23.8		mg/L		99	75 - 125
Potassium	2.1		10.0	12.2		mg/L		101	75 - 125
Selenium	0.0071	J	1.00	1.05		mg/L		104	75 - 125
Silver	0.0013	U	0.500	0.516		mg/L		103	75 - 125

Lab Sample ID: 600-162845-1 MS
Matrix: Water
Analysis Batch: 234414

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sodium	41	B	10.0	51.4	4	mg/L		100	75 - 125

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234414

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	0.0055	J	0.00420	J F5	mg/L		27	20
Barium	0.060		0.0601		mg/L		1	20
Cadmium	0.00028	U	0.00028	U	mg/L		NC	20
Calcium	110		106		mg/L		0	20
Chromium	0.0016	U	0.0016	U	mg/L		NC	20
Lead	0.0022	U	0.0022	U	mg/L		NC	20
Magnesium	14		14.0		mg/L		0.6	20
Potassium	2.1		2.14		mg/L		0.5	20
Selenium	0.0071	J	0.00310	J F5	mg/L		78	20
Silver	0.0013	U	0.0013	U	mg/L		NC	20

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234414

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234323

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Sodium	41	B	41.1		mg/L		0.7	20

Method: 7470A - Mercury in Liquid Waste (Manual Cold Vapor Technique)

Lab Sample ID: MB 600-234317/7-A
Matrix: Water
Analysis Batch: 234325

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 234317

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000082	U	0.00020	0.000082	mg/L		03/19/18 11:46	03/19/18 13:02	1

Lab Sample ID: LCS 600-234317/8-A
Matrix: Water
Analysis Batch: 234325

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 234317

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00300	0.00297		mg/L		99	70 - 130

Lab Sample ID: MB 600-234286/1-B
Matrix: Water
Analysis Batch: 234325

Client Sample ID: Method Blank
Prep Type: Dissolved
Prep Batch: 234317

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000082	U	0.00020	0.000082	mg/L		03/19/18 11:46	03/19/18 14:18	1

Lab Sample ID: 600-162845-1 MS
Matrix: Water
Analysis Batch: 234325

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234317

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.000082	U	0.00300	0.00303		mg/L		101	75 - 125

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234325

Client Sample ID: G.S. State 3 WW
Prep Type: Dissolved
Prep Batch: 234317

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.000082	U	0.000082	U	mg/L		NC	20

Method: 2320B-1997 - Alkalinity, Total - SM Online, 2011

Lab Sample ID: MB 600-234340/2
Matrix: Water
Analysis Batch: 234340

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	20	U	20	20	mg/L			03/19/18 13:41	1
Carbonate Alkalinity as CaCO3	20	U	20	20	mg/L			03/19/18 13:41	1

Method: 9040B - pH

Lab Sample ID: LCS 600-234341/1
Matrix: Water
Analysis Batch: 234341

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		101	99 - 101

Method: 9040B - pH (Continued)

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234341

Client Sample ID: G.S. State 3 WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.7	HF		7.8		SU				1	1

Method: 9050A - Conductivity, Specific Conductance

Lab Sample ID: MB 600-234342/1
Matrix: Water
Analysis Batch: 234342

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	2.0	U	2.0	2.0	umhos/cm			03/19/18 15:45	1

Lab Sample ID: LCS 600-234342/2
Matrix: Water
Analysis Batch: 234342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Specific Conductance			10.0	9.96		umhos/cm		100	90 - 110		

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234342

Client Sample ID: G.S. State 3 WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Specific Conductance	860			863		umhos/cm				0.1	20

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 600-234145/1
Matrix: Water
Analysis Batch: 234145

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	MQL (Adj)	SDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	10	U	10	10	mg/L			03/15/18 15:09	1

Lab Sample ID: LCS 600-234145/2
Matrix: Water
Analysis Batch: 234145

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Dissolved Solids			1800	1650		mg/L		92	90 - 110		

Lab Sample ID: 600-162845-1 DU
Matrix: Water
Analysis Batch: 234145

Client Sample ID: G.S. State 3 WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	690			661		mg/L				4	10

Unadjusted Detection Limits

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	MQL	MDL	Units	Method
Benzene	0.0010	0.00018	mg/L	8260B
Ethylbenzene	0.0010	0.00021	mg/L	8260B
Toluene	0.0010	0.00020	mg/L	8260B
Xylenes, Total	0.0020	0.00037	mg/L	8260B

Method: TX 1005 - Texas - Total Petroleum Hydrocarbon (GC)

Prep: TX_1005_W_Prep

Analyte	MQL	MDL	Units	Method
>C12-C28	2.0	0.96	mg/L	TX 1005
>C28-C35	2.0	0.96	mg/L	TX 1005
C6-C12	2.0	0.83	mg/L	TX 1005
C6-C35	2.0	0.83	mg/L	TX 1005

Method: 300.0 - Anions, Ion Chromatography

Analyte	MQL	MDL	Units	Method
Chloride	0.40	0.053	mg/L	300.0
Sulfate	0.50	0.096	mg/L	300.0

Method: 6010B - Inductively Coupled Plasma - Atomic Emission Spectrometry - Dissolved

Prep: 3010A

Analyte	MQL	MDL	Units	Method
Arsenic	0.010	0.0029	mg/L	6010B
Barium	0.020	0.00053	mg/L	6010B
Cadmium	0.0050	0.00028	mg/L	6010B
Calcium	1.0	0.024	mg/L	6010B
Chromium	0.010	0.0016	mg/L	6010B
Lead	0.010	0.0022	mg/L	6010B
Magnesium	1.0	0.056	mg/L	6010B
Potassium	1.0	0.037	mg/L	6010B
Selenium	0.040	0.0029	mg/L	6010B
Silver	0.010	0.0013	mg/L	6010B
Sodium	1.0	0.021	mg/L	6010B

Method: 7470A - Mercury in Liquid Waste (Manual Cold Vapor Technique) - Dissolved

Prep: 7470A

Analyte	MQL	MDL	Units	Method
Mercury	0.00020	0.000082	mg/L	7470A

General Chemistry

Analyte	MQL	MDL	Units	Method
Bicarbonate Alkalinity as CaCO3	20	20	mg/L	2320B-1997
Carbonate Alkalinity as CaCO3	20	20	mg/L	2320B-1997
pH	0.01	0.01	SU	9040B
Specific Conductance	2.0	2.0	umhos/cm	9050A
Total Dissolved Solids	10	10	mg/L	SM 2540C

QC Association Summary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

GC/MS VOA

Analysis Batch: 234104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	8260B	
600-162845-2	State NBN 7 WW	Total/NA	Water	8260B	
MB 600-234104/6	Method Blank	Total/NA	Water	8260B	
LCS 600-234104/3	Lab Control Sample	Total/NA	Water	8260B	
LCSD 600-234104/4	Lab Control Sample Dup	Total/NA	Water	8260B	

GC Semi VOA

Prep Batch: 234200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	TX_1005_W_Prep	
600-162845-2	State NBN 7 WW	Total/NA	Water	TX_1005_W_Prep	
MB 600-234200/1-A	Method Blank	Total/NA	Water	TX_1005_W_Prep	
LCS 600-234200/2-A	Lab Control Sample	Total/NA	Water	TX_1005_W_Prep	
LCSD 600-234200/3-A	Lab Control Sample Dup	Total/NA	Water	TX_1005_W_Prep	

Analysis Batch: 234211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	TX 1005	234200
600-162845-2	State NBN 7 WW	Total/NA	Water	TX 1005	234200
MB 600-234200/1-A	Method Blank	Total/NA	Water	TX 1005	234200
LCS 600-234200/2-A	Lab Control Sample	Total/NA	Water	TX 1005	234200
LCSD 600-234200/3-A	Lab Control Sample Dup	Total/NA	Water	TX 1005	234200

HPLC/IC

Analysis Batch: 234198

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	300.0	
600-162845-2	State NBN 7 WW	Total/NA	Water	300.0	
MB 600-234198/4	Method Blank	Total/NA	Water	300.0	
LCS 600-234198/5	Lab Control Sample	Total/NA	Water	300.0	

Metals

Filtration Batch: 234286

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Dissolved	Water	FILTRATION	
600-162845-2	State NBN 7 WW	Dissolved	Water	FILTRATION	
MB 600-234286/1-B	Method Blank	Dissolved	Water	FILTRATION	
MB 600-234286/1-C	Method Blank	Dissolved	Water	FILTRATION	
LCS 600-234286/2-B	Lab Control Sample	Dissolved	Water	FILTRATION	
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	FILTRATION	
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	FILTRATION	

Metals (Continued)

Prep Batch: 234317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Dissolved	Water	7470A	234286
600-162845-2	State NBN 7 WW	Dissolved	Water	7470A	234286
MB 600-234286/1-B	Method Blank	Dissolved	Water	7470A	234286
MB 600-234317/7-A	Method Blank	Total/NA	Water	7470A	
LCS 600-234317/8-A	Lab Control Sample	Total/NA	Water	7470A	
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	7470A	234286
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	7470A	234286

Prep Batch: 234323

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Dissolved	Water	3010A	234286
600-162845-2	State NBN 7 WW	Dissolved	Water	3010A	234286
MB 600-234286/1-C	Method Blank	Dissolved	Water	3010A	234286
LCS 600-234286/2-B	Lab Control Sample	Dissolved	Water	3010A	234286
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	3010A	234286
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	3010A	234286

Analysis Batch: 234325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Dissolved	Water	7470A	234317
600-162845-2	State NBN 7 WW	Dissolved	Water	7470A	234317
MB 600-234286/1-B	Method Blank	Dissolved	Water	7470A	234317
MB 600-234317/7-A	Method Blank	Total/NA	Water	7470A	234317
LCS 600-234317/8-A	Lab Control Sample	Total/NA	Water	7470A	234317
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	7470A	234317
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	7470A	234317

Analysis Batch: 234414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Dissolved	Water	6010B	234323
600-162845-1	G.S. State 3 WW	Dissolved	Water	6010B	234323
600-162845-2	State NBN 7 WW	Dissolved	Water	6010B	234323
600-162845-2	State NBN 7 WW	Dissolved	Water	6010B	234323
MB 600-234286/1-C	Method Blank	Dissolved	Water	6010B	234323
MB 600-234286/1-C	Method Blank	Dissolved	Water	6010B	234323
LCS 600-234286/2-B	Lab Control Sample	Dissolved	Water	6010B	234323
LCS 600-234286/2-B	Lab Control Sample	Dissolved	Water	6010B	234323
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	6010B	234323
600-162845-1 MS	G.S. State 3 WW	Dissolved	Water	6010B	234323
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	6010B	234323
600-162845-1 DU	G.S. State 3 WW	Dissolved	Water	6010B	234323

General Chemistry

Analysis Batch: 234145

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	SM 2540C	
600-162845-2	State NBN 7 WW	Total/NA	Water	SM 2540C	
MB 600-234145/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 600-234145/2	Lab Control Sample	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 234145 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1 DU	G.S. State 3 WW	Total/NA	Water	SM 2540C	

Analysis Batch: 234340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	2320B-1997	
600-162845-2	State NBN 7 WW	Total/NA	Water	2320B-1997	
MB 600-234340/2	Method Blank	Total/NA	Water	2320B-1997	
LCS 600-234340/3	Lab Control Sample	Total/NA	Water	2320B-1997	

Analysis Batch: 234341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	9040B	
600-162845-2	State NBN 7 WW	Total/NA	Water	9040B	
LCS 600-234341/1	Lab Control Sample	Total/NA	Water	9040B	
600-162845-1 DU	G.S. State 3 WW	Total/NA	Water	9040B	

Analysis Batch: 234342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
600-162845-1	G.S. State 3 WW	Total/NA	Water	9050A	
600-162845-2	State NBN 7 WW	Total/NA	Water	9050A	
MB 600-234342/1	Method Blank	Total/NA	Water	9050A	
LCS 600-234342/2	Lab Control Sample	Total/NA	Water	9050A	
600-162845-1 DU	G.S. State 3 WW	Total/NA	Water	9050A	

Lab Chronicle

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Client Sample ID: G.S. State 3 WW

Date Collected: 03/13/18 08:40
Date Received: 03/14/18 09:23

Lab Sample ID: 600-162845-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	20 mL	20 mL	234104	03/15/18 15:34	WS1	TAL HOU
Total/NA	Prep	TX_1005_W_Prep			35.3 mL	3.00 mL	234200	03/16/18 11:02	RJV	TAL HOU
Total/NA	Analysis	TX 1005		1			234211	03/17/18 00:04	PXS	TAL HOU
Total/NA	Analysis	300.0		25			234198	03/16/18 14:12	DAW	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	3010A			50 mL	50 mL	234323	03/19/18 13:06	DCL	TAL HOU
Dissolved	Analysis	6010B		1			234414	03/20/18 12:30	DCL	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	3010A			50 mL	50 mL	234323	03/19/18 13:06	DCL	TAL HOU
Dissolved	Analysis	6010B		1			234414	03/20/18 14:29	DCL	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	7470A			40 mL	40 mL	234317	03/19/18 11:46	TWR	TAL HOU
Dissolved	Analysis	7470A		1			234325	03/19/18 14:20	TWR	TAL HOU
Total/NA	Analysis	2320B-1997		1	50 mL	50 mL	234340	03/19/18 14:26	KRD	TAL HOU
Total/NA	Analysis	9040B		1			234341	03/19/18 12:49	KRD	TAL HOU
Total/NA	Analysis	9050A		1			234342	03/19/18 15:45	KRD	TAL HOU
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	234145	03/15/18 15:09	EC1	TAL HOU

Client Sample ID: State NBN 7 WW

Date Collected: 03/13/18 09:00
Date Received: 03/14/18 09:23

Lab Sample ID: 600-162845-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	20 mL	20 mL	234104	03/15/18 15:58	WS1	TAL HOU
Total/NA	Prep	TX_1005_W_Prep			33.5 mL	3.00 mL	234200	03/16/18 11:02	RJV	TAL HOU
Total/NA	Analysis	TX 1005		1			234211	03/17/18 00:37	PXS	TAL HOU
Total/NA	Analysis	300.0		25			234198	03/16/18 14:48	DAW	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	3010A			50 mL	50 mL	234323	03/19/18 13:06	DCL	TAL HOU
Dissolved	Analysis	6010B		1			234414	03/20/18 12:36	DCL	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	3010A			50 mL	50 mL	234323	03/19/18 13:06	DCL	TAL HOU
Dissolved	Analysis	6010B		1			234414	03/20/18 14:42	DCL	TAL HOU
Dissolved	Filtration	FILTRATION			1.0 mL	1.0 mL	234286	03/19/18 09:22	DCL	TAL HOU
Dissolved	Prep	7470A			40 mL	40 mL	234317	03/19/18 12:45	TWR	TAL HOU
Dissolved	Analysis	7470A		1			234325	03/19/18 14:26	TWR	TAL HOU
Total/NA	Analysis	2320B-1997		1	50 mL	50 mL	234340	03/19/18 14:33	KRD	TAL HOU
Total/NA	Analysis	9040B		1			234341	03/19/18 12:56	KRD	TAL HOU
Total/NA	Analysis	9050A		1			234342	03/19/18 15:45	KRD	TAL HOU
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	234145	03/15/18 15:09	EC1	TAL HOU

Laboratory References:
TAL HOU = TestAmerica Houston, 6310 Rothway Street, Houston, TX 77040, TEL (713)690-4444

Accreditation/Certification Summary

Client: Timberwolf Environmental LLC
Project/Site: 180006 - State OG SWD

TestAmerica Job ID: 600-162845-1

Laboratory: TestAmerica Houston

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Texas	NELAP	6	T104704223-17-22	10-31-18

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
2320B-1997		Water	Bicarbonate Alkalinity as CaCO3
2320B-1997		Water	Carbonate Alkalinity as CaCO3

Chain of Custody Record

Temperature on Receipt ______

Drinking Water? Yes☐ No☐

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

Client	Project Manager	Date	Chain of Custody Number
Timberwolf Environmental	Dean Joiner		288138
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 **of** 1
~~12~~ 1920 W Villa Maria Ste 205			

City	State	Zip Code	Site Contact	Lab Contact
Bryan	TX	77807		
Project Name and Location (State)			**Carrier/Waybill Number**	
180016 - State OG SWD				
Contract/Purchase Order/Quote No.				

Analysis (Attach list if more space is needed)

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Matrix: Aqueous	Matrix: Sed	Matrix: Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	BTEX	TPH	~~TPH~~	RCRA8 (Lab Filtered)	EC	pH	TDS	Sol.cat	Ca,Mg,Na,K	Sol Anions	Cl,SO4,CO3	Bicarb	Special Instructions/ Conditions of Receipt
State OG 7 WW	3/13/18	0840		X									X	X		X	X	X	X		X		X	X	
State NBN 7 WW	3/13/18	0900		X									X	X		X	X	X	X		X		X	X	
																									*3 Day

600-162845 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other ~~Standard~~ 3 Days

QC Requirements (Specify)

1. Relinquished By	Date	Time	1. Received By	Date	Time
[signature]	3/14/18	0923	[signature]	3/14/18	923
2. Relinquished By	**Date**	**Time**	**2. Received By**	**Date**	**Time**
3. Relinquished By	**Date**	**Time**	**3. Received By**	**Date**	**Time**

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

TestAmerica Houston

Sample Receipt Ch

Loc: 600
162845

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

'18 MAR 14 9:23

ceived:

JOB NUMBER: 845 CLIENT: Timbar wolf

UNPACKED BY: RD CARRIER/DRIVER: Client

Custody Seal Present: ☐ YES ☒ NO Number of Coolers Received: 1

Cooler ID	Temp Blank	Trip Blank	Observed Temp (°C)	Therm ID	Them CF	Corrected Temp (°C)
R/W	Y / N	Y / N	0.6	676	+0.3	0.9
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				
	Y / N	Y / N				

RD 3/14/18

CF = correction factor

Samples received on ice? ☒ YES ☐ NO

LABORATORY PRESERVATION OF SAMPLES REQUIRED: ☒ NO ☐ YES

Base samples are>pH 12: ☐ YES ☐ NO Acid preserved are<pH 2: ☒ YES ☐ NO

pH paper Lot # HC730269

VOA headspace acceptable (5-6mm): ☒ YES ☐ NO ☐ NA

	YES	NO
Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?	X	

COMMENTS:

RD 3/14/18

Login Sample Receipt Checklist

Client: Timberwolf Environmental LLC

Job Number: 600-162845-1

Login Number: 162845
List Number: 1
Creator: Crafton, Tommie S

List Source: TestAmerica Houston

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.9°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.