Site Characterization Report & Soil Closure Request

COG Operating, LLC
Glacier Fed Com #001H
Eddy County, New Mexico
Unit Letter H, Section 16, Township 26 South, Range 25 East
Latitude 32.04431 North, Longitude 104.39409 West
NMOCD Reference No. 2RP-5568

Prepared By:

Etech Environmental & Safety Solutions, Inc.
3100 Plains Highway
Lovington, New Mexico 88260

Lance Crenshaw

Joel W. Lowry

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District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources Department

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

Form C-141
Revised August 24, 2018
Submit to appropriate OCD District office

Incident ID	
District RP	
Facility ID	
Application ID	

Release Notification

Responsible Party

Responsible Party	OGRID
Contact Name	Contact Telephone
Contact email	Incident # *(assigned by OCD)*
Contact mailing address	

Location of Release Source

Latitude _____ Longitude _____
(NAD 83 in decimal degrees to 5 decimal places)

Site Name	Site Type
Date Release Discovered	API# *(if applicable)*

Unit Letter	Section	Township	Range	County

Surface Owner: ☐ State ☐ Federal ☐ Tribal ☐ Private (*Name:* _____)

Nature and Volume of Release

Material(s) Released (Select all that apply and attach calculations or specific justification for the volumes provided below)

☐ Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
☐ Produced Water	Volume Released (bbls)	Volume Recovered (bbls)
	Is the concentration of dissolved chloride in the produced water >10,000 mg/l?	☐ Yes ☐ No
☐ Condensate	Volume Released (bbls)	Volume Recovered (bbls)
☐ Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
☐ Other (describe)	Volume/Weight Released (provide units)	Volume/Weight Recovered (provide units)
Cause of Release		

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

Was this a major release as defined by 19.15.29.7(A) NMAC? ☐ Yes ☐ No	If YES, for what reason(s) does the responsible party consider this a major release?
If YES, was immediate notice given to the OCD? By whom? To whom? When and by what means (phone, email, etc)?	

Initial Response

The responsible party must undertake the following actions immediately unless they could create a safety hazard that would result in injury

☐ The source of the release has been stopped.
☐ The impacted area has been secured to protect human health and the environment.
☐ Released materials have been contained via the use of berms or dikes, absorbent pads, or other containment devices.
☐ All free liquids and recoverable materials have been removed and managed appropriately.

If all the actions described above have not been undertaken, explain why:

Per 19.15.29.8 B. (4) NMAC the responsible party may commence remediation immediately after discovery of a release. If remediation has begun, please attach a narrative of actions to date. If remedial efforts have been successfully completed or if the release occurred within a lined containment area (see 19.15.29.11(A)(5)(a) NMAC), please attach all information needed for closure evaluation.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: _____ Title: _____

Signature: DeLinn Grant _____ Date: _____

email: _____ Telephone: _____

OCD Only

Received by: _____ Date: _____

Incident ID	
District RP	
Facility ID	
Application ID	

Site Assessment/Characterization

This information must be provided to the appropriate district office no later than 90 days after the release discovery date.

What is the shallowest depth to groundwater beneath the area affected by the release?	31 Ft (ft bgs)
Did this release impact groundwater or surface water?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	☐ Yes ☑ No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark)?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of an occupied permanent residence, school, hospital, institution, or church?	☐ Yes ☑ No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	☐ Yes ☑ No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	☐ Yes ☑ No
Are the lateral extents of the release within incorporated municipal boundaries or within a defined municipal fresh water well field?	☐ Yes ☑ No
Are the lateral extents of the release within 300 feet of a wetland?	☐ Yes ☑ No
Are the lateral extents of the release overlying a subsurface mine?	☐ Yes ☑ No
Are the lateral extents of the release overlying an unstable area such as karst geology?	☑ Yes ☐ No
Are the lateral extents of the release within a 100-year floodplain?	☐ Yes ☑ No
Did the release impact areas **not** on an exploration, development, production, or storage site?	☑ Yes ☐ No

Attach a comprehensive report (electronic submittals in .pdf format are preferred) demonstrating the lateral and vertical extents of soil contamination associated with the release have been determined. Refer to 19.15.29.11 NMAC for specifics.

Characterization Report Checklist: ***Each of the following items must be included in the report.***

- ☑ Scaled site map showing impacted area, surface features, subsurface features, delineation points, and monitoring wells.
- ☑ Field data
- ☑ Data table of soil contaminant concentration data
- ☑ Depth to water determination
- ☑ Determination of water sources and significant watercourses within ½-mile of the lateral extents of the release
- ☑ Boring or excavation logs
- ☑ Photographs including date and GIS information
- ☑ Topographic/Aerial maps
- ☑ Laboratory data including chain of custody

If the site characterization report does not include completed efforts at remediation of the release, the report must include a proposed remediation plan. That plan must include the estimated volume of material to be remediated, the proposed remediation technique, proposed sampling plan and methods, anticipated timelines for beginning and completing the remediation. The closure criteria for a release are contained in Table 1 of 19.15.29.12 NMAC, however, use of the table is modified by site- and release-specific parameters.

State of New Mexico
Oil Conservation Division

Incident ID	
District RP	
Facility ID	
Application ID	

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Printed Name: Ike Tavarez Title: Senior HSE Specialist

Signature: Date: 4/21/2020

email: itavarez@concho.com Telephone: 432-685-2573

OCD Only

Received by: Date:

Incident ID	
District RP	
Facility ID	
Application ID	

Closure

The responsible party must attach information demonstrating they have complied with all applicable closure requirements and any conditions or directives of the OCD. This demonstration should be in the form of a comprehensive report (electronic submittals in .pdf format are preferred) including a scaled site map, sampling diagrams, relevant field notes, photographs of any excavation prior to backfilling, laboratory data including chain of custody documents of final sampling, and a narrative of the remedial activities. Refer to 19.15.29.12 NMAC.

Closure Report Attachment Checklist: ***Each of the following items must be included in the closure report.***

☑ A scaled site and sampling diagram as described in 19.15.29.11 NMAC

☐ Photographs of the remediated site prior to backfill or photos of the liner integrity if applicable (Note: appropriate OCD District office must be notified 2 days prior to liner inspection) NA

☑ Laboratory analyses of final sampling (Note: appropriate ODC District office must be notified 2 days prior to final sampling)

☐ Description of remediation activities NA

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to OCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the OCD does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to groundwater, surface water, human health or the environment. In addition, OCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations. The responsible party acknowledges they must substantially restore, reclaim, and re-vegetate the impacted surface area to the conditions that existed prior to the release or their final land use in accordance with 19.15.29.13 NMAC including notification to the OCD when reclamation and re-vegetation are complete.

Printed Name: Ike Tavarez Title: Senior HSE Specialist

Signature:  Date: 4/21/2020

email: itavarez@concho.com Telephone: 432-485-2573

OCD Only

Received by: _____ Date: _____

Closure approval by the OCD does not relieve the responsible party of liability should their operations have failed to adequately investigate and remediate contamination that poses a threat to groundwater, surface water, human health, or the environment nor does not relieve the responsible party of compliance with any other federal, state, or local laws and/or regulations.

Closure Approved by: _____ Date: _____

Printed Name: _____ Title: _____

1.0 PROJECT INFORMATION

Etech Environmental & Safety Solutions, Inc. (Etech), on behalf of COG Operating, LLC, has prepared this Site Characterization Report & Soil Closure Request for the Release Site known as the Glacier Fed Com #001H. Details of the release are summarized below:

Location of Release Source

Latitude: 32.04431 Longitude: -104.39409

Provided GPS are in WGS84 format.

Site Name:	Glacier Fed Com #001H	Site Type:	Flowline
Date Release Discovered:	7/22/2019	API # (if applicable):	N/A

Unit Letter	Section	Township	Range	County
H	16	26S	25E	Eddy

Surface Owner: [X] State [ ] Federal [ ] Tribal [ ] Private (Name _____)

Nature and Volume of Release

[ ] Crude Oil	Volume Released (bbls)	Volume Recovered (bbls)
[X] Produced Water	Volume Released (bbls) 10	Volume Recovered (bbls) 0
	Is the concentration of total dissolved solids (TDS) in the produced water > 10,000 mg/L?	[X] Yes [ ] No [ ] N/A
[ ] Condensate	Volume Released (bbls)	Volume Recovered (bbls)
[ ] Natural Gas	Volume Released (Mcf)	Volume Recovered (Mcf)
[ ] Other (describe)	Volume/Weight Released	Volume/Weight Recovered

Cause of Release and Affected Area:
The release was caused by a lightning strike, causing a fire resulting in a hole in the flowline. The release was inferred to have affected an area measuring approximately 4,200 sq. ft. within the pasture on the east side of

Initial Response

- [X] The source of the release has been stopped.
- [X] The impacted area has been secured to protect human health and the environment.
- [X] Release materials have been contained via the use of berms or dikes, absorbent pad, or other containment devices
- [X] All free liquids and recoverable materials have been removed and managed appropriately.

Previously submitted portions of the NMOCD Form C-141 are available on the NMOCD Imaging System.

2.0 SITE CHARACTERIZATION

A search of groundwater databases maintained by the New Mexico Office of the State Engineer (NMOSE) and United States Geological Survey (USGS) was conducted in an effort to determine the horizontal distance to known water sources within a half mile radius of the Release Site. Probable groundwater depth was determined using data generated by numeric models based on available water well data and published information. Depth to groundwater information is provided as Appendix A.

What is the shallowest depth to groundwater beneath the area affected by the release?	~31 Ft.
Did the release impact groundwater or surface water?	[ ] Yes [X] No
Are the lateral extents of the release within 300 feet of a continuously flowing watercourse or any other significant watercourse?	[ ] Yes [X] No
Are the lateral extents of the release within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark?	[ ] Yes [X] No
Are the lateral extents of the release within 300 feet of any occupied permanent residence, school, hospital, institution or church?	[ ] Yes [X] No
Are the lateral extents of the release within 500 horizontal feet of a spring or a private domestic fresh water well used by less than five households for domestic or stock watering purposes?	[ ] Yes [X] No
Are the lateral extents of the release within 1000 feet of any other fresh water well or spring?	[ ] Yes [X] No
Are the lateral extents of the release within the incorporated municipal boundaries or within a defined municipal fresh water well field?	[ ] Yes [X] No
Are the lateral extents of the release within 300 feet of a wetland?	[ ] Yes [X] No
Are the lateral extents of the release overlying a subsurface mine?	[ ] Yes [X] No
Are the lateral extents of the release overlying an unstable area such as karst geology?	[X] Yes [ ] No
Are the lateral extents of the release within a 100-year floodplain?	[ ] Yes [X] No
Did the release impact areas not on an exploration, development, production or storage site?	[X] Yes [ ] No

NMOCD Siting Criteria data was gathered from available resources including Bureau of Land Management (BLM) shapefiles; topographic maps; NMOSE and USGS databases; and aerial imagery. The results are depicted on Figures 1 & 2.

3.0 CLOSURE CRITERIA FOR SOILS IMPACTED BY A RELEASE

Based on the volume and nature of the release, inferred depth to groundwater and NMOCD Siting Criteria, the NMOCD Closure Criteria for the Site is as follows:

Closure Criteria for Soil Impacted by a Release			
Probable Depth to Groundwater	**Constituent**	**Method**	**Limit**
~31 Ft.	Chloride	EPA 300.0 or SM4500 Cl B	600 mg/kg
	TPH (GRO + DRO + MRO)	EPA SW-846 Method 8015M Ext	100 mg/kg
	DRO + GRO	EPA SW-846 Method 8015M	N/A mg/kg
	BTEX	EPA SW-846 Methods 8021b or 8260b	50 mg/kg
	Benzene	EPA SW-846 Methods 8021b or 8260b	10 mg/kg

4.0 REMEDIATION ACTIVITIES SUMMARY

On December 18, 2019, Etech conducted an initial site assessment. During the initial site assessment, a series of hand-augered soil bores (were advanced within the release margins in an effort to characterize impacts from the release and determine the vertical extent, if any. In addition, hand-augered soil bores were advanced at the inferred edges of the affected area in an effort to determine the horizontal extent of soil impacts. During the advancement of the hand-augered soil bores, field soil samples were collected and field-screened for the presence of chloride concentrations utilizing a Hach Quantab ® chloride test kit. A "Site & Sample Location Map" is provided as Figure 3. Field data and soil profile logs, if applicable, are provided as Appendix B.

Based on field observations and field test data, **fourteen (14)** confirmation soil samples (NH@Surface, NH@1, EH@Surface, EH@1, SH@Surface, SH@1, WH@Surface, WH@1, SP1@Surface, SP1@1, SP1@2, SP2@Surface, SP2@1, and SP2@2) were submitted to the laboratory for analysis of BTEX, TPH and/or Chloride. Laboratory analytical results indicated soil was not affected above the NMOCD Closure Criteria and/or NMOCD Reclamation Standard. A "Soil Chemistry Table" is provided as Table 1. Laboratory Analytical Reports are provided in Appendix C.

Based on laboratory analytical data, soil within the affected area has not been impacted above NMOCD Closure Criteria and/or NMOCD Reclamation Standard. Based on those results soil has not been excavated from the affected area.

5.0 RESTORATION, RECLAMATION AND RE-VEGETATION PLAN

Laboratory analytical results from soil samples collected during the initial release assessment indicated remediation was not required, therefore the affected area was left in-situ and not altered. Vegetation within the affected area will be monitored and may be reseeded with an agency-approved seed mixture free of noxious weeds during the first favorable growing season following closure of the site, if necessary.

6.0 SOIL CLOSURE REQUEST

Delineation activities were conducted in accordance with applicable NMOCD Regulations. Laboratory analytical from the collected soil samples indicated soil in the affected area was not impacted above the NMOCD Closure Criteria and/or NMOCD Reclamation Standard. Laboratory analytical results from confirmation soil samples indicate concentrations of BTEX, TPH and chloride was below the NMOCD Closure Criteria and/or NMOCD Reclamation Standard in each of the submitted soil samples.

Based on laboratory analytical results and field activities conducted to date, Etech recommends COG Operating, LLC provide copies of this Remediation Summary and Soil Closure Request to the appropriate agencies and request closure be granted to the Glacier Fed Com #001H Site.

7.0 LIMITATIONS

Etech Environmental & Safety Solutions, Inc., has prepared this Site Characterization Report & Soil Closure Request to the best of its ability. No other warranty, expressed or implied, is made or intended. Etech has examined and relied upon documents reference in the report and on oral statements made by certain individuals. Basis has not conducted an independent examination of the facts contained in referenced materials and statements. Etech has presumed the genuineness of these documents and statements and that the information provided therein is true and accurate. Etech has prepared the report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Etech notes that the facts and conditions referenced in this report may change over time, and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

This report has been prepared for the benefit of COG Operating, LLC. Use of the information contained in this report is prohibited within the consent of Etech and/or COG Operating, LLC.

8.0 DISTRIBUTION

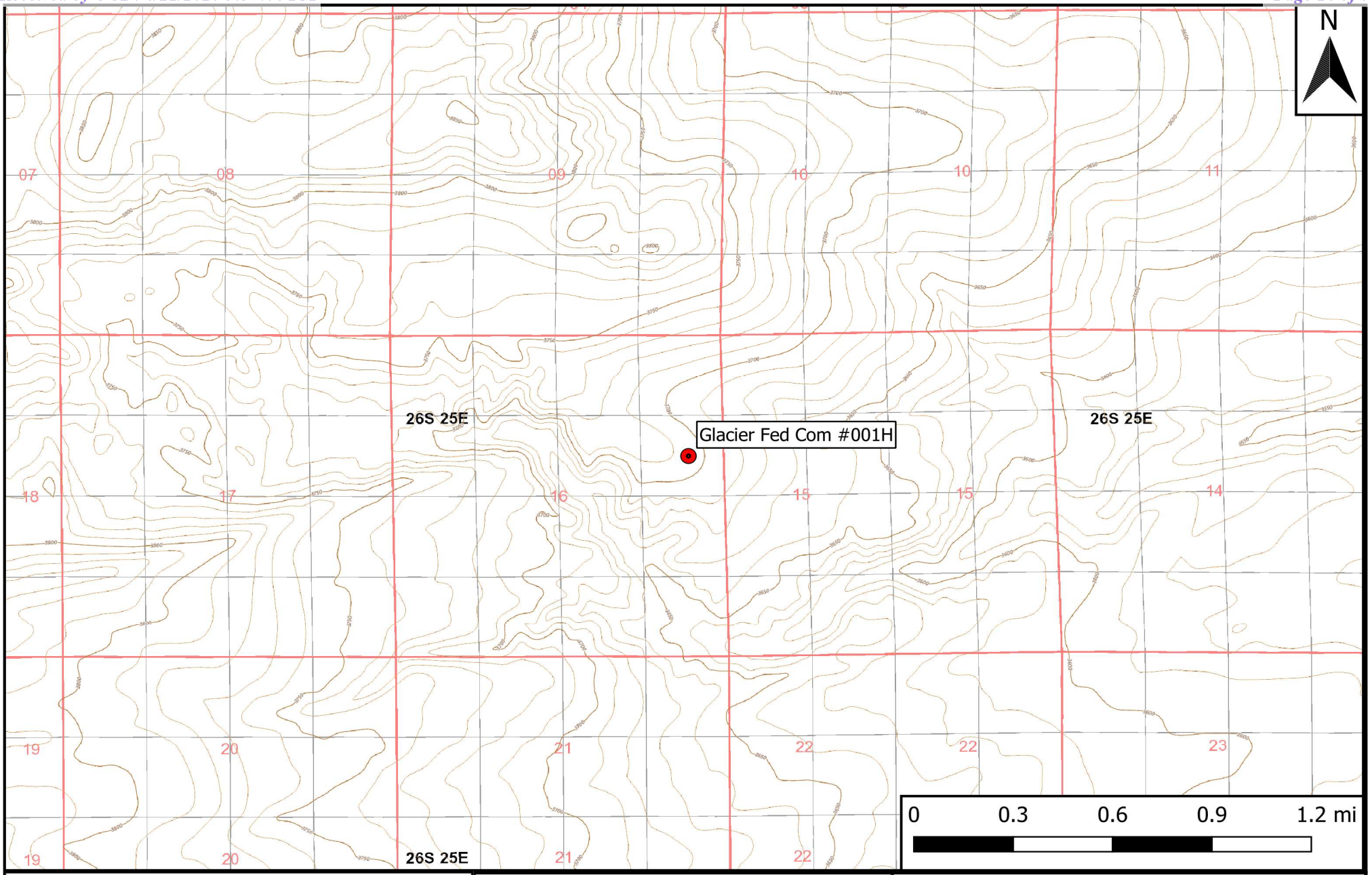
COG Operating, LLC
600 West Illinois Avenue
Midland, TX 79701

New Mexico Energy, Minerals and Natural Resources Department
Oil Conservation Division, District 2
811 S. First Street
Artesia, NM 88210

Hobbs Field Office
New Mexico State Land Office
2827 North Dal Paso Street
Suite 117
Hobbs, NM 88240

(Electronic Submission)

Figure 1
Topographic Map



Legend

- Site Location

Figure 1

Topographic Map

COG Operating, LLC

Glacier Fed Com #001H

GPS: 32.04431, -104.39409

Lea County

eTECH Environmental & Safety Solutions, Inc.

Drafted: mag Checked: jwl Date: 12/30/19

Figure 2
Aerial Proximity Map

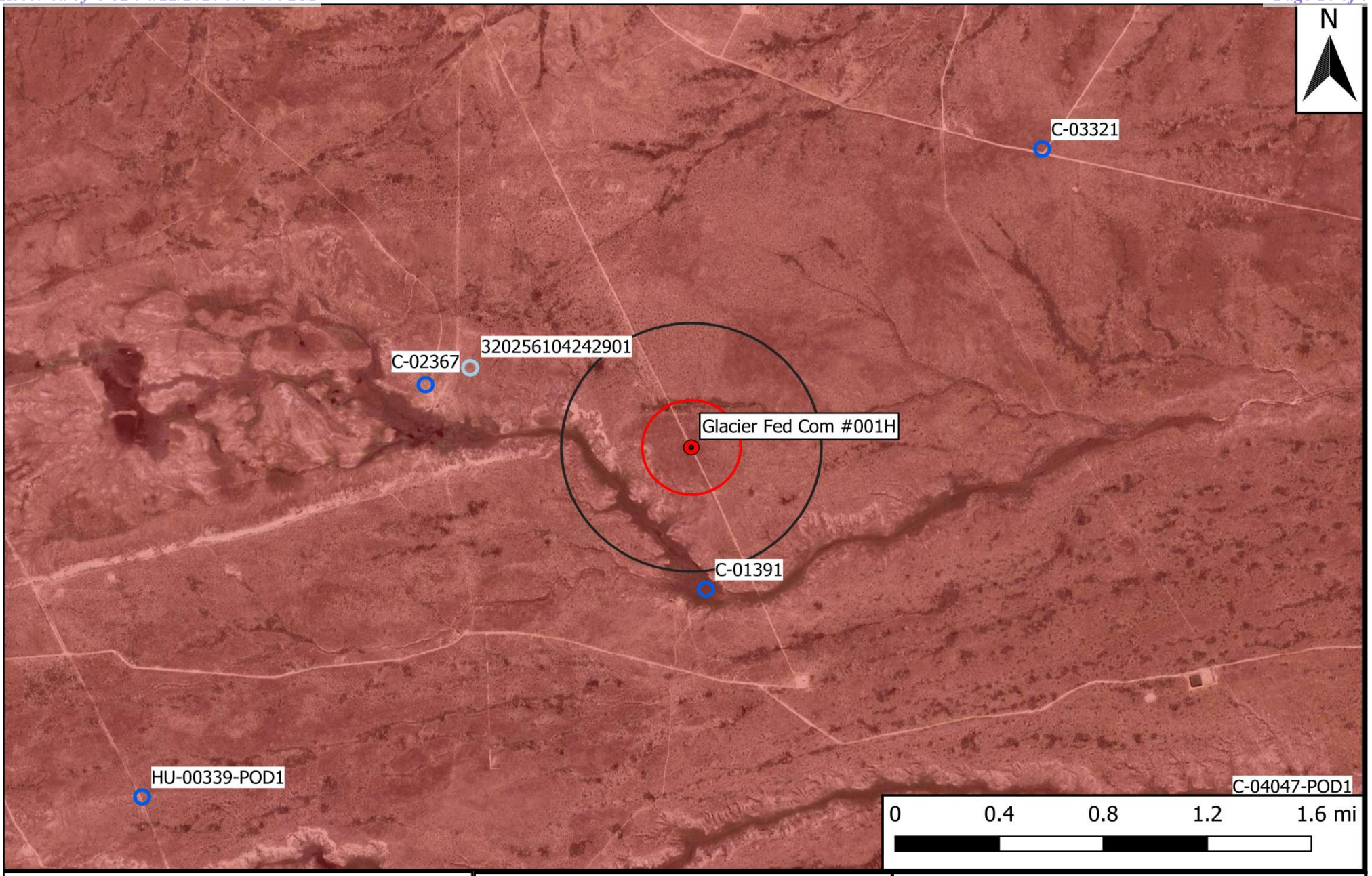


Figure 2

Aerial Map

COG Operating, LLC

Glacier Fed Com #001H

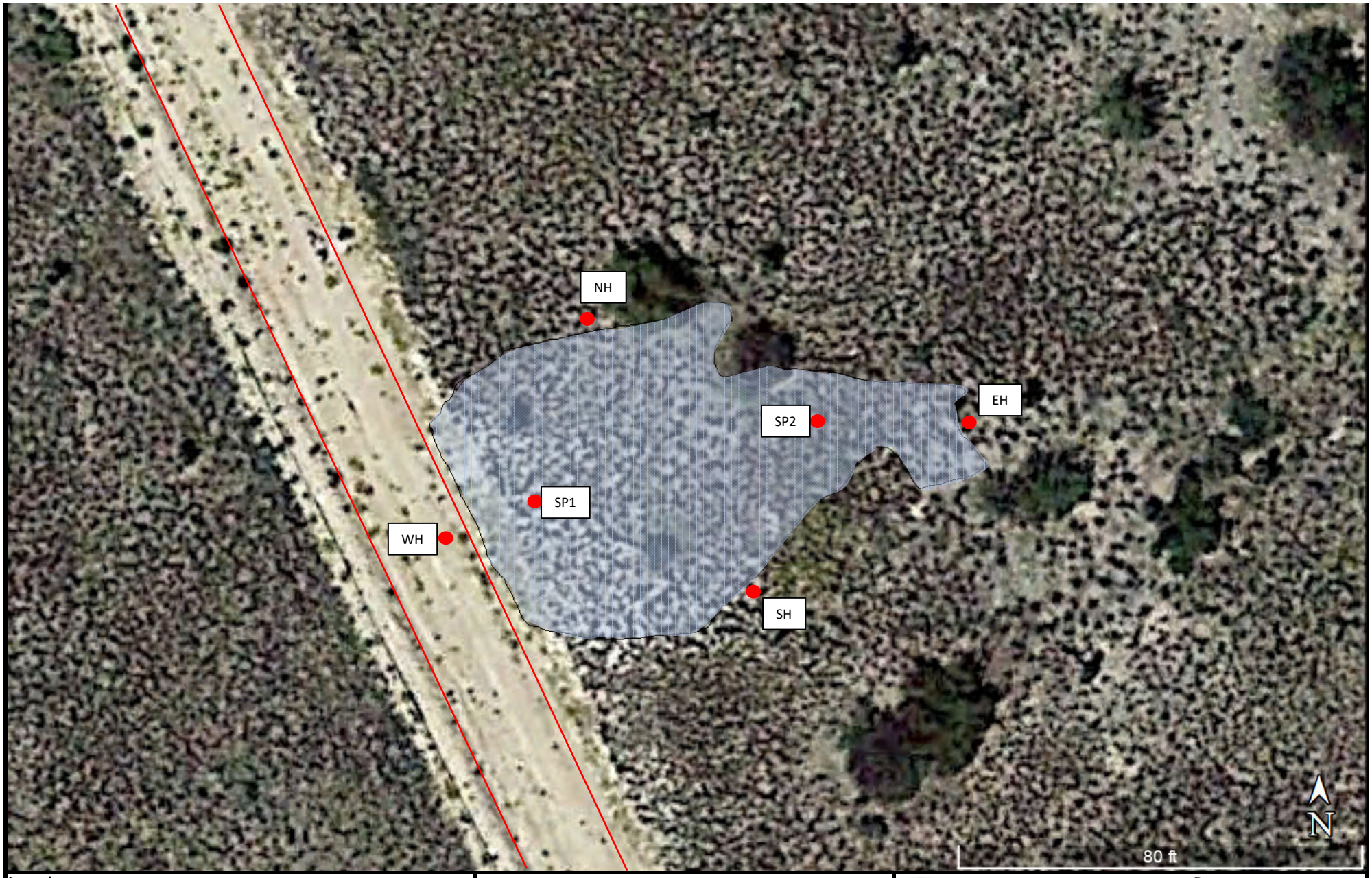
GPS: 32.04431, -104.39409

Lea County

eTECH Environmental & Safety Solutions, Inc.

Drafted: mag Checked: jwl Date: 12/30/19

Figure 3
Site and Sample Location Map



Legend:

- Sample Point
- Affected Area
- Buried Pipeline

Figure 3

Site and Sample Location Map

COG Operating, LLC

Glacier Fed Com #001H

GPS: 32.04431, -104.39409

Eddy County

eTECH Environmental & Safety Solutions, Inc.

Drafted: Checked: jwl Date: 1/3/20

Table 1
Concentrations of BTEX, TPH, and/or Chloride in Soil

TABLE 1
CONCENTRATIONS OF BENZENE, BTEX TPH AND CHLORIDE IN SOIL
COG Operating, LLC
Glacier Fed Com #001H
NMOCD Ref. #: 2RP-5568

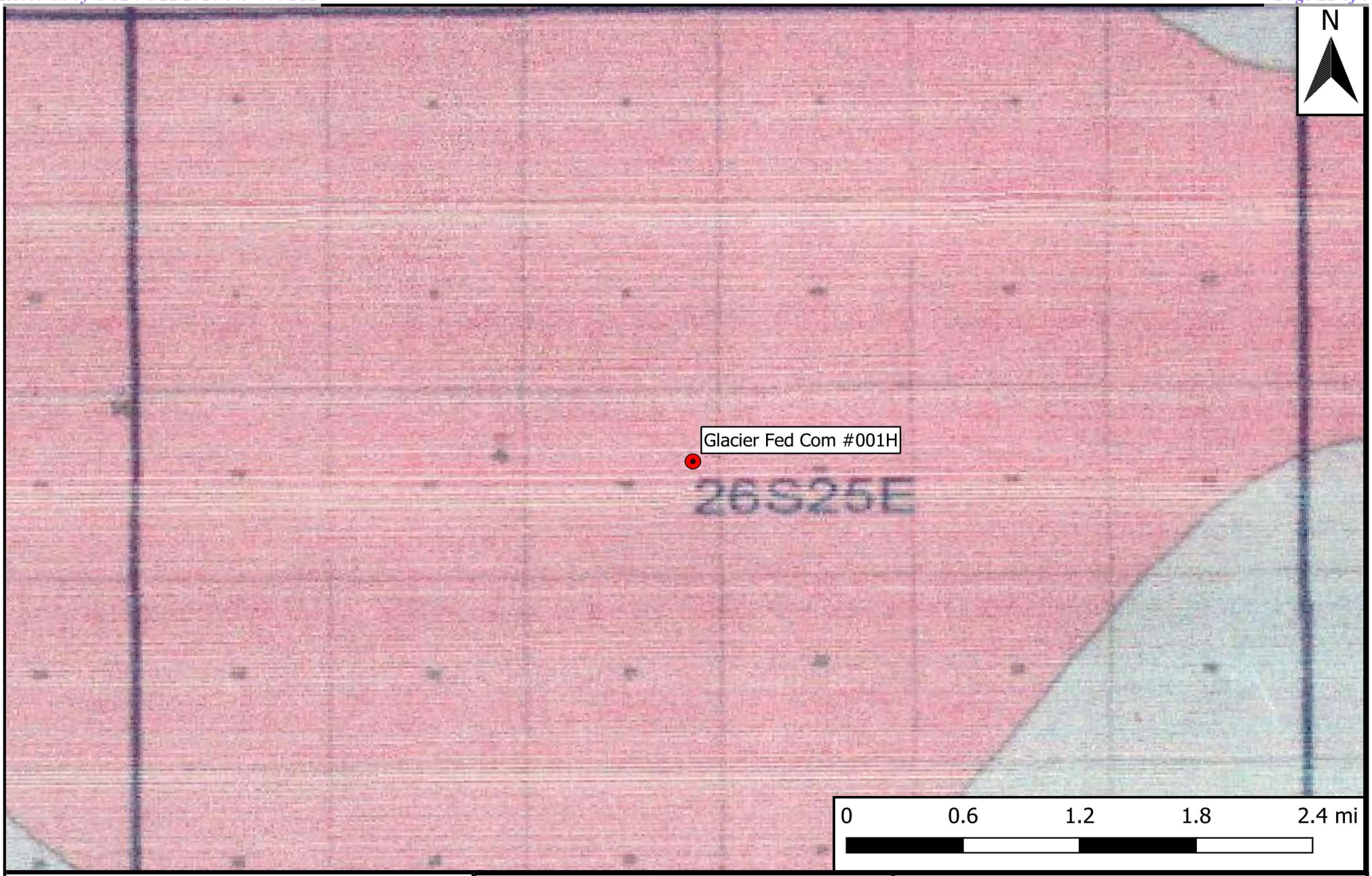
Sample ID	Date	Depth	Soil Status	SW 846 8021B		SW 846 8015M Ext.					4500 Cl
				Benzene (mg/kg)	BTEX (mg/kg)	GRO C_6-C_{10} (mg/kg)	DRO C_{10}-C_{28} (mg/kg)	GRO + DRO C_6-C_{28} (mg/kg)	ORO C_{28}-C_{36} (mg/kg)	TPH C_6-C_{36} (mg/kg)	Chloride (mg/kg)
NH@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32.0
NH@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
EH@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
EH@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
SH@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
SH@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	192
WH@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32.0
WH@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	16.0
SP1@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
SP1@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	32.0
SP1@2	12/18/2019	2'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
SP2@Surface	12/18/2019	0	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	<16.0
SP2@1	12/18/2019	1'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	96.0
SP2@2	12/18/2019	2'	In-Situ	<0.050	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	128
Closure Criteria				**10**	**50**	**-**	**-**	**N/A**	**-**	**100**	**600**

NOTES:

- =

Bold text denotes a concentration that exceeds the NMOCD Closure Criteria

Appendix A
Depth to Groundwater Information



Legend

Site Location

Figure 4

Inferred Depth to Groundwater Trend Map

COG Operating, LLC

Glacier Fed Com #001H

GPS: 32.04431, -104.39409

Lea County

eTECH Environmental & Safety Solutions, Inc.

Drafted: mag Checked: jwl Date: 12/30/19

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

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

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

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
C 02367	CUB	ED		2	2	17	26S	25E	555560	3545912*	1693	30	40	-10
C 03321	C	ED	4	1	1	11	26S	25E	559375	3547431	2900	150	23	127

Average Depth to Water: **31 feet**

Minimum Depth: **23 feet**

Maximum Depth: **40 feet**

Record Count: 2

UTMNAD83 Radius Search (in meters):

Easting (X): 557204.37 **Northing (Y):** 3545507.63 **Radius:** 3220

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

New Mexico Office of the State Engineer

Point of Diversion Summary

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters)

Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	C 03321	4	1	1	11	26S	25E	559375	3547431

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

Driller Name:

Drill Start Date: 02/06/2007 **Drill Finish Date:** 02/08/2007 **Plug Date:**

Log File Date: 04/30/2007 **PCW Rcv Date:** **Source:** Shallow

Pump Type: **Pipe Discharge Size:** **Estimated Yield:** 1 GPM

Casing Size: 5.00 **Depth Well:** 150 feet **Depth Water:** 23 feet

Water Bearing Stratifications:	Top	Bottom	Description
	60	150	Shallow Alluvium/Basin Fill

Casing Perforations:	Top	Bottom
	110	150

New Mexico Office of the State Engineer

Point of Diversion Summary

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters)

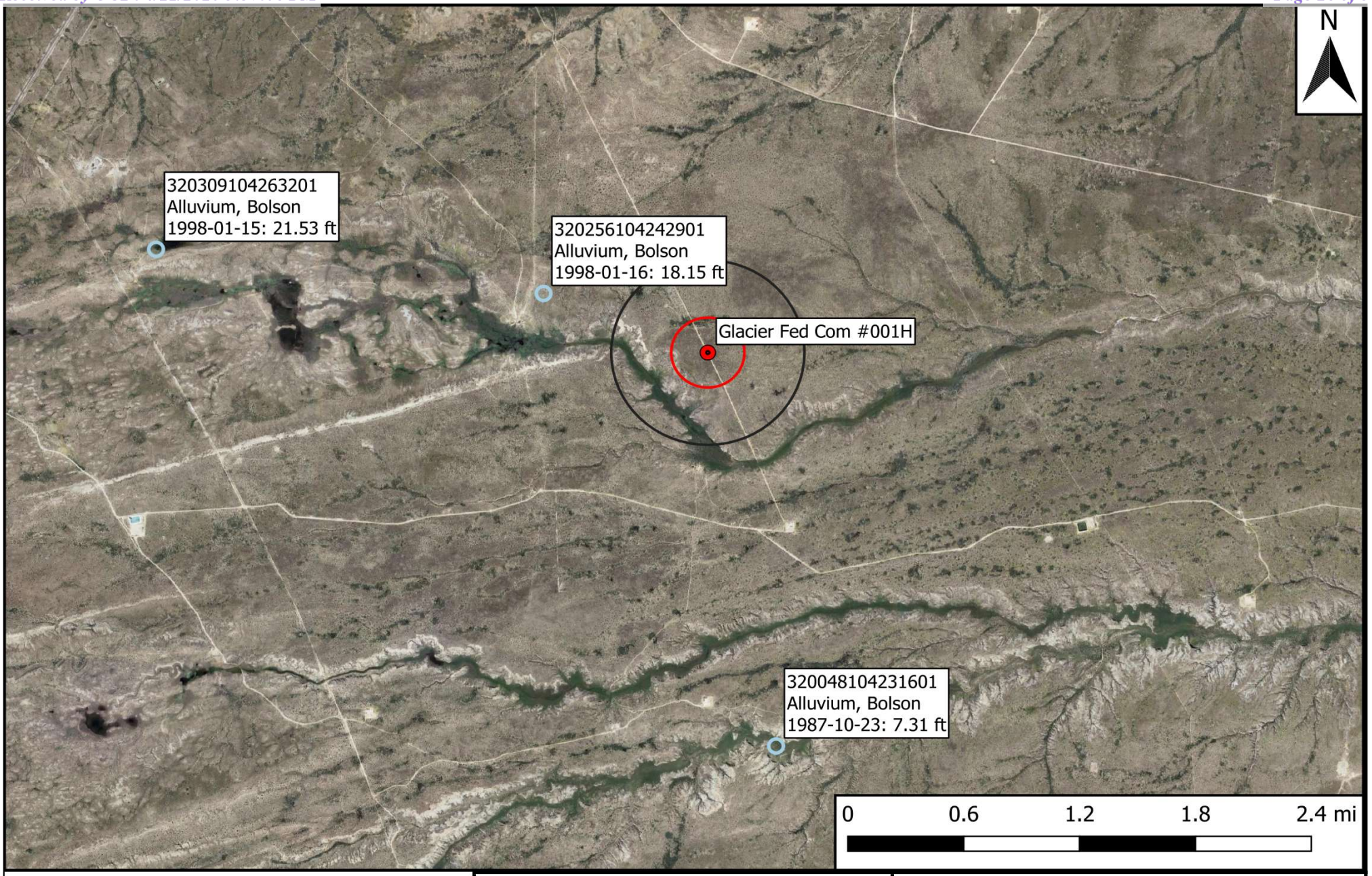
Well Tag	POD Number	Q64	Q16	Q4	Sec	Tws	Rng	X	Y
	C 02367		2	2	17	26S	25E	555560	3545912*

Driller License: **Driller Company:**

Driller Name: UNKNOWN

Drill Start Date:		**Drill Finish Date:**	12/31/1959	**Plug Date:**	
Log File Date:		**PCW Rcv Date:**		**Source:**	
Pump Type:		**Pipe Discharge Size:**		**Estimated Yield:**	10 GPM
Casing Size:	3.00	**Depth Well:**	30 feet	**Depth Water:**	40 feet

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



Legend
- Site Location
- Well - USGS
- 0.5 Mi Radius
- 1000 Ft Radius

Figure 5
USGS Well Proximity Map
COG Operating, LLC
Glacier Fed Com #001H
GPS: 32.04431, -104.39409
Lea County

eTECH Environmental & Safety Solutions, Inc.

Drafted: mag Checked: jwl Date: 12/30/19

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

Click to hideNews Bulletins

- Introducing The Next Generation of USGS Water Data for the Nation
- Full News

Groundwater levels for the Nation

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 320048104231601

Minimum number of levels = 1
Save file of selected sites to local disk for future upload

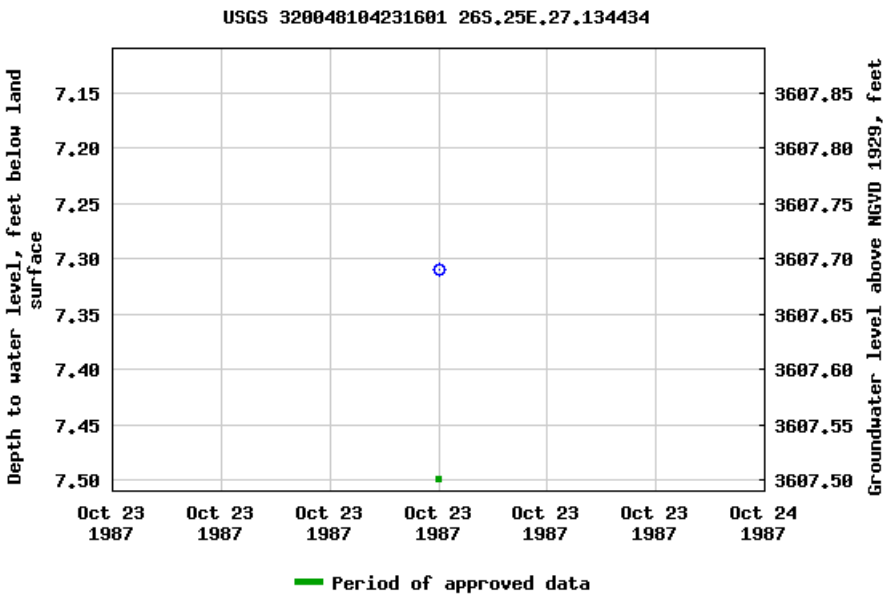
USGS 320048104231601 26S.25E.27.134434

Available data for this site | Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°00'48", Longitude 104°23'16" NAD27
Land-surface elevation 3,615.00 feet above NGVD29
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
Feedback on this web site
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U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2019-12-30 14:55:30 EST
0.56 0.47 nadww01

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

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Groundwater levels for the Nation

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 320256104242901

Minimum number of levels = 1
Save file of selected sites to local disk for future upload

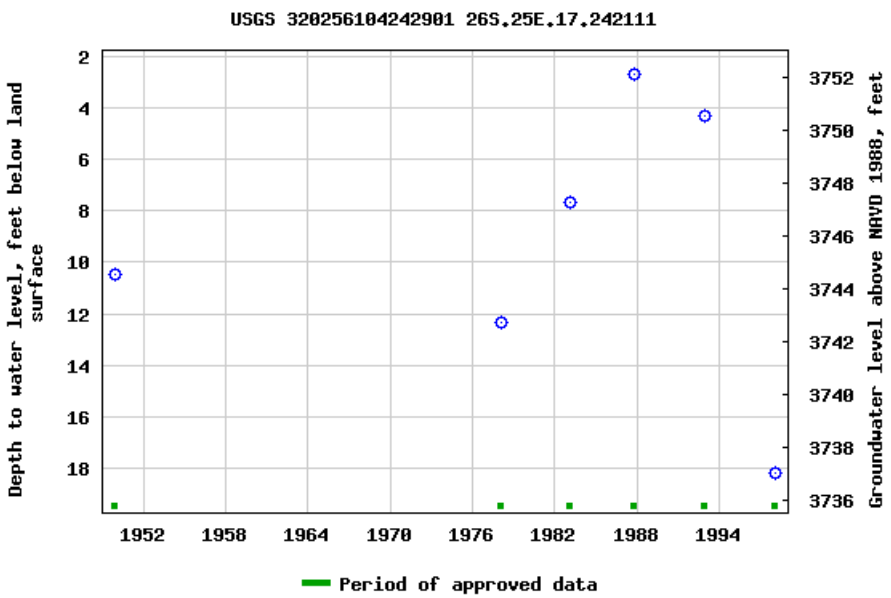
USGS 320256104242901 26S.25E.17.242111

Available data for this site | Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°02'56", Longitude 104°24'29" NAD27
Land-surface elevation 3,755 feet above NAVD88
The depth of the well is 22 feet below land surface.
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
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U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2019-12-30 14:55:31 EST
0.62 0.45 nadww01

National Water Information System: Web Interface

USGS Water Resources

Data Category: Groundwater | Geographic Area: United States | GO

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Groundwater levels for the Nation

Search Results -- 1 sites found

Agency code = usgs
site_no list =
- 320309104263201

Minimum number of levels = 1
Save file of selected sites to local disk for future upload

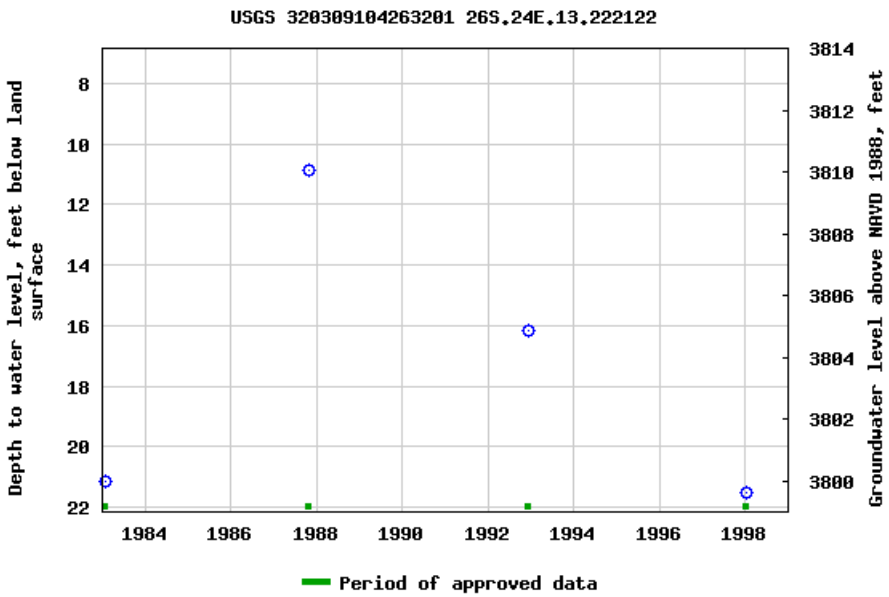
USGS 320309104263201 26S.24E.13.222122

Available data for this site | Groundwater: Field measurements | GO

Eddy County, New Mexico
Hydrologic Unit Code 13060011
Latitude 32°03'09", Longitude 104°26'32" NAD27
Land-surface elevation 3,821 feet above NAVD88
This well is completed in the Alluvium, Bolson Deposits and Other Surface Deposits (110AVMB) local aquifer.

Output formats

Table of data
Tab-separated data
Graph of data
Reselect period



Breaks in the plot represent a gap of at least one year between field measurements.
Download a presentation-quality graph

Questions about sites/data?
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U.S. Department of the Interior | U.S. Geological Survey

Title: Groundwater for USA: Water Levels
URL: https://nwis.waterdata.usgs.gov/nwis/gwlevels?

Page Contact Information: USGS Water Data Support Team
Page Last Modified: 2019-12-30 14:55:32 EST
0.5 0.46 nadww01

Appendix B
Field Data and Soil Profile Logs

eTECH Environmental & Safety Solutions, Inc.

Sample Log

Date: 12/18/19

Project: Glacier Fed Com #001H

Project Number: 11569 Latitude: 32.04431 Longitude: -104.39409

Sample ID	PID/Odor	Chloride Conc.	GPS
NW@surface		124 11:00	
NW@1'		148 11:15	
EW@surface		124 11:30	
EW@1'		124 11:45	
SW@surface		124 12:00	
SW@1'		196 12:15	
WW@surface		148 12:30	
WW@1'		196 12:45	
SP1@1'		148 1:00	
SP1@2'		248 1:15	
SP2@1'		220 1:30	
SP2@2'		124 1:45	
SP1@surface		196 2:01	
SP2@surface		148 2:19	

Sample Point = SP #1 @ ## etc

Floor = FL #1 etc

Sidewall = SW #1 etc

Test Trench = TT #1 @ ##

Refusal = SP #1 @ 4'-R

Soil Intended to be Deferred = SP #1 @ 4' In-Situ

Resamples= SP #1 @ 5b or SW #1b

Stockpile = Stockpile #1

GPS Sample Points, Center of Comp Areas

eTECH Environmental & Safety Solutions, Inc.

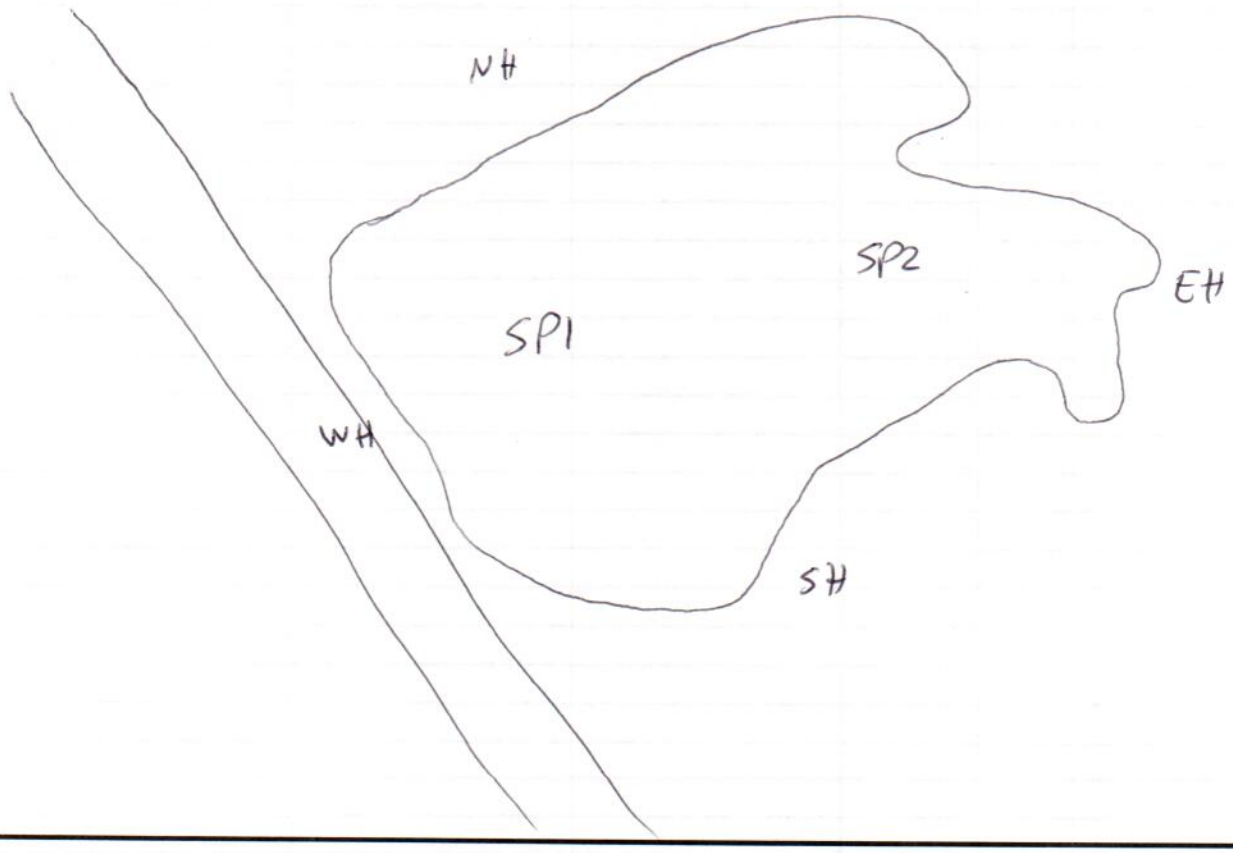
Initial Release Assessment Form

Date: 12/18/19

Project: Glacier Fed Com #001H Clean Up Level: 0

Project Number: 11569 Latitude: 32.04431 Longitude: -104.39409

Site Diagram



Notes: Complete IRA, collect samples in the release area and field test collect samples outside realease area and field test. Delineate release area to <600 chlorides. Photogonph site

~Length: 100 ~Width: 63' ~Area: 4000 ~Depth:

	Yes	No
3-4 Representative Pictures of the Affected Area including sample locations?	☒	☐
Necessary Samples Field Screened and on Ice?	☒	☐
Sample and Field Screen Data Entered on Sample Log?	☒	☐
Was horizontal and vertical delineation achieved?	☒	☐

eTECH Environmental & Safety Solutions, Inc.

Soil Profile

Date: 12/18/19

Project: Glacier Fed Com #001H

Project Number: 11569 Latitude: 32.04431 Longitude: -104.39409

Depth (ft. bgs)	Description
1	soft caliche
2	soft caliche
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
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Appendix C
Laboratory Analytical Reports

CARDINAL Laboratories

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

December 30, 2019

LANCE CRENSHAW

Etech Environmental & Safety Solutions

P.O. Box 301

Lovington, NM 88260

RE: GLACIER FED COM 1H

Enclosed are the results of analyses for samples received by the laboratory on 12/20/19 15:10.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-19-12. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: NH @ SURFACE (H904265-01)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/23/2019	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *93.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *94.9 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: NH @ 1 (H904265-02)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *95.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *97.7 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: EH @ SURFACE (H904265-03)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	416	104	400	0.00	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *81.0 %* *41-142*

Surrogate: 1-Chlorooctadecane *82.5 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: EH @ 1 (H904265-04)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *109 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *92.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *94.0 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SH @ SURFACE (H904265-05)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *111 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *98.3 %* *41-142*

Surrogate: 1-Chlorooctadecane *101 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SH @ 1 (H904265-06)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/26/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/26/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/26/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/26/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/26/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**192**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/24/2019	ND	212	106	200	0.968	
DRO >C10-C28*	<10.0	10.0	12/24/2019	ND	217	108	200	1.03	
EXT DRO >C28-C36	<10.0	10.0	12/24/2019	ND					

Surrogate: 1-Chlorooctane *95.6 %* *41-142*

Surrogate: 1-Chlorooctadecane *98.6 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: WH @ SURFACE (H904265-07)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *93.7 %* *41-142*

Surrogate: 1-Chlorooctadecane *94.6 %* *37.6-147*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: WH @ 1 (H904265-08)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**16.0**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *101 %* *41-142*

Surrogate: 1-Chlorooctadecane *101 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 1 @ 1 (H904265-09)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**32.0**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *98.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *98.9 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 1 @ 2 (H904265-10)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *90.5 %* *41-142*

Surrogate: 1-Chlorooctadecane *91.7 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 2 @ 1 (H904265-11)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**96.0**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *94.9 %* *41-142*

Surrogate: 1-Chlorooctadecane *96.2 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 2 @ 2 (H904265-12)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**128**	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *77.2 %* *41-142*

Surrogate: 1-Chlorooctadecane *76.7 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 1 @ SURFACE (H904265-13)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *98.4 %* *41-142*

Surrogate: 1-Chlorooctadecane *99.2 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

Etech Environmental & Safety Solutions
LANCE CRENSHAW
P.O. Box 301
Lovington NM, 88260
Fax To: (575) 396-1429

Received:	12/20/2019	Sampling Date:	12/18/2019
Reported:	12/30/2019	Sampling Type:	Soil
Project Name:	GLACIER FED COM 1H	Sampling Condition:	Cool & Intact
Project Number:	11569	Sample Received By:	Tamara Oldaker
Project Location:	COG - EDDY CO NM		

Sample ID: SP 2 @ SURFACE (H904265-14)

BTEX 8021B mg/kg Analyzed By: ms

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	12/27/2019	ND	2.00	99.8	2.00	7.39	
Toluene*	<0.050	0.050	12/27/2019	ND	2.00	100	2.00	7.26	
Ethylbenzene*	<0.050	0.050	12/27/2019	ND	2.02	101	2.00	7.16	
Total Xylenes*	<0.150	0.150	12/27/2019	ND	5.99	99.9	6.00	6.43	
Total BTEX	<0.300	0.300	12/27/2019	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *73.3-129*

Chloride, SM4500Cl-B mg/kg Analyzed By: AC

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	12/23/2019	ND	400	100	400	3.92	

TPH 8015M mg/kg Analyzed By: MS

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10*	<10.0	10.0	12/26/2019	ND	210	105	200	1.11	
DRO >C10-C28*	<10.0	10.0	12/26/2019	ND	208	104	200	0.713	
EXT DRO >C28-C36	<10.0	10.0	12/26/2019	ND					

Surrogate: 1-Chlorooctane *93.0 %* *41-142*

Surrogate: 1-Chlorooctadecane *93.9 %* *37.6-147*

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Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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Notes and Definitions

QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C
	Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company Name:	COG Operating, LLC	BILL TO	
Project Manager:	Lance Crenshaw	P.O. #:	
Address:	3100 Plains HWY	Company:	
City:	Lovington State: NM Zip: 88260	Attn:	
Phone #:	575-396-2378 Fax #: 575-396-1429	Address:	
Project #:	11569 Project Owner: COG	City:	
Project Name:	Glacier Fed Com 1H	State: Zip:	
Project Location:	Eddy County	Phone #:	
Sampler Name:	Miguel Ramirez	Fax #:	

FOR LAB USE ONLY Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX: GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	PRESERV.: ACID/BASE:	ICE / COOL	OTHER:	SAMPLING: DATE	TIME	ANALYSIS REQUEST: Chloride	TPH	BTEX 8021
H904265																	
1	NH @ Surface	G	1			X					X		12.18.19	11:00	X	X	X
2	NH @ 1	G	1			X					X		12.18.19	11:15	X	X	X
3	EH @ Surface	G	1			X					X		12.18.19	11:30	X	X	X
4	EH @ 1	G	1			X					X		12.18.19	11:45	X	X	X
5	SH @ Surface	G	1			X					X		12.18.19	12:00	X	X	X
6	SH @ 1	G	1			X					X		12.18.19	12:15	X	X	X
7	WH @ Surface	G	1			X					X		12.18.19	12:30	X	X	X
8	WH @ 1	G	1			X					X		12.18.19	12:45	X	X	X
9	SP1 @ 1	G	1			X					X		12.18.19	1:00	X	X	X
10	SP1 @ 2	G	1			X					X		12.18.19	1:15	X	X	X

Relinquished By:	Date: 12-20-19	Received By:	Phone Result: ☐ Yes ☐ No Add'l Phone #:
	Time: 1510		Fax Result: ☐ Yes ☐ No Add'l Fax #:
Relinquished By:	Date:	Received By:	REMARKS: email results to
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other: -1.9°C #197 Corrected -1.5°C

Sample Condition: Cool ☐ Yes ☐ No Intact ☐ Yes ☐ No

CHECKED BY: (Initials) TR

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476

FORM-006 R 2.0

CARDINAL Laboratories

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

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name:	COG Operating, LLC	BILL TO	
Project Manager:	Jance Crenshaw	P.O. #:	
Address:	3100 Plains Hwy	Company:	
City:	Lovington State: NM Zip: 88260	Attn:	
Phone #:	575-396-0378 Fax #: 575-396-1429	Address:	
Project #:	11569 Project Owner: COG	City:	
Project Name:	Glacier Fed com 1H	State: Zip:	
Project Location:	Eddy County	Phone #:	
Sampler Name:	Miguel Ramirez	Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST		
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :	DATE	TIME	Chloride	TPH	BTEX 8021
H904265																	
11	SP2 @ 1	G	1			X					X		12-18-19	1:30	X	X	X
12	SP2 @ 2	G	1			X					X		12-18-19	1:45	X	X	X
13	SP1 @ Surface	G	1			X					X		12-18-19	2:00	X	X	X
14	SP2 @ Surface	G	1			X					X		12-18-19	2:15	X	X	X

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

Relinquished By:	Date: 12-20-19	Received By:	
	Time: 7510		
Relinquished By:	Date:	Received By:	
	Time:		

Delivered By: (Circle One) Sampler - UPS - Bus - Other: -1.9c #97 Corrected -1.5c

Sample Condition: Cool Yes / No; Intact Yes / No

CHECKED BY: (Initials) T.O.

Phone Result: ☐ Yes ☐ No Add'l Phone #:
Fax Result: ☐ Yes ☐ No Add'l Fax #:

REMARKS: email results to

† Cardinal cannot accept verbal changes. Please fax written changes to 575-393-2476

FORM-006 R 2.0

Appendix D
Photographic Log

Photographic Log

Dates: 12/18/2019 - 12/18/2019

Photo Number: #1 **Photo Direction:** North **Photo Description:** release area	

Photo Number: #2 **Photo Direction:** East **Photo Description:** release area	

Photographic Log

Dates: 12/18/2019 - 12/18/2019

Photo Number: #3 **Photo Direction:** East **Photo Description:** release area and sample location	

Photo Number: #4 **Photo Direction:** East **Photo Description:** release area and sample locations