SITE INFORMATION

Report Type: Work Plan 1RP-4974

General Site Information:						
Site:	**ARU Tank Battery**					
Company:	**Grand Banks Energy Co**					
Section, Township and Range	**Unit F**	**Sec. 11**	**T 16S**	**R 32E**		
Lease Number:	**API No. 30-025-00386**					
County:	**Lea County**					
GPS:	**32.939420° N**			**103.738051° W**		
Surface Owner:	State					
Mineral Owner:						
Directions:	From intersection of HWY 82 and 249 travel east on HWY 82 for 1.6 mi, turn north onto Mendel Rd for 4.60 mi, turn east onto Patterson Rd and continue for 0.85 mi to location.					

Release Data:	
Date Released:	10/28/2017
Type Release:	Oil & Produced Water
Source of Contamination:	Flare
Fluid Released:	50 bbls
Fluids Recovered:	0 bbls

Official Communication:			
Name:	Denise Jones		Ike Tavarez
Company:	Grand Banks Energy Co.		Tetra Tech
Address:	10 Desta Dr, Ste 300E		4000 N. Big Spring
			Ste 401
City:	Midland Texas, 79705		Midland, Texas
Phone number:	(432) 620-9181		(432) 687-8110
Fax:			
Email:	djones@cambrianmgmt.com		Ike.Tavarez@tetratech.com

Ranking Criteria		
Depth to Groundwater:	***Ranking Score***	***Site Data***
<50 ft	20	
50-99 ft	10	
>100 ft.	***0***	*275'*
WellHead Protection:	***Ranking Score***	***Site Data***
Water Source <1,000 ft., Private <200 ft.	*20*	
Water Source >1,000 ft., Private >200 ft.	***0***	*0*
Surface Body of Water:	***Ranking Score***	***Site Data***
<200 ft.	*20*	
200 ft - 1,000 ft.	10	
>1,000 ft.	***0***	*0*
Total Ranking Score:	***0***	

Acceptable Soil RRAL (mg/kg)		
Benzene	***Total BTEX***	***TPH***
10	50	5,000

TETRA TECH

APPROVED
By Olivia Yu at 8:06 am, Jun 20, 2018

NMOCD approves of the preliminary delineation for 1RP-4887 & 1RP-4974. The proposed delineation/remediation for T-3 and T-7 area is also approved. Confirmation sidewall and bottom samples are required. Any deferred areas must be identified with GPS coordinates.

May 29, 2018

Ms. Olivia Yu
Environmental Engineer Specialist
Oil Conservation Division, District 1
1625 North French Drive
Hobbs, New Mexico 88240

Re: Work Plan for the Grand Banks Energy Co., ARU Tank Battery, Unit F, Section 11, Township 16 South, Range 32 East, Lea County, New Mexico. 1RP-4974.

Ms. Yu:

Tetra Tech, Inc. (Tetra Tech) was contacted by Cambrian Management (Cambrian) on behalf of Grand Banks Energy Co. (Grand Banks) to evaluate and assess a release that occurred at the ARU Tank Battery, Unit F, Section 11, Township 16 South, Range 32 East, Lea County, New Mexico (Site). The spill site coordinates are N 32.939420º, W 103.738051º. The site location is shown on Figures 1 and 2.

Background

According to the State of New Mexico C-141 Initial Report, the release was discovered on October 28, 2017, and released approximately fifty (50) barrels of produced water and oil at the flare stack. None of the fluids were recovered. The release impacted the pad area, migrated onto the access road and into the adjacent pasture. The spill area measured approximately 130' x 310'. The initial C-141 form is included in Appendix A.

Groundwater

Two (2) water wells are listed within Section 11 on the New Mexico Office of the State Engineer's (NMOSE) database with reported depths to groundwater ranging of 220' and 275' below ground surface. The nearest well is located approximately 435 feet northwest of the site and has a reported depth to groundwater of 275' below surface. According to the Chevron Texaco Groundwater Trend map, the average depth to groundwater in this area is greater than 200' below surface. The groundwater data is shown in Appendix B.

Tetra Tech
4000 North Big Spring, Suite 401, Midland, TX 79705
Tel 432.682.4559 Fax 432.682.3946 www.tetratech.com

Regulatory

A risk-based evaluation was performed for the Site in accordance with the New Mexico Oil Conservation Division (NMOCD) Guidelines for Remediation of Leaks, Spills and Releases, dated August 13, 1993. The guidelines require a risk-based evaluation of the site to determine recommended remedial action levels (RRAL) for benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) and total petroleum hydrocarbons (TPH) in soil. The proposed RRAL for benzene was determined to be 10 parts per million (ppm) or milligrams per kilogram (mg/kg) and 50 ppm for total BTEX (sum of benzene, toluene, ethylbenzene, and xylene). Based upon the depth to groundwater, the proposed RRAL for TPH is 5,000 mg/kg.

Soil Assessment and Analytical Results

On April 3, 2018, Tetra Tech personnel were onsite to evaluate and sample the release area. A total of seven (7) backhoe trenches (T-1 through T-7) were installed to sample the release area to total depths ranging from 2.0' to 12.0' below surface. An underground Plains pipeline is located east of the spill area along the spill footprint. A trench was not installed in the area due to safety concerns. Selected samples were analyzed for TPH analysis by EPA method 8015 modified, BTEX by EPA Method 8021B and chloride by EPA method 300.0. Copies of laboratory analysis and chain-of-custody documentation are included in Appendix D. The sampling results are summarized in Table 1. The trench locations are shown on Figure 3.

TPH

Referring to Table 1, the area of trench (T-1) did not show any TPH concentrations above the RRAL. The areas of trenches (T-2 and T-4) showed a shallow impact to the soils, with elevated concentrations at 0-1' of 28,800 mg/kg and 78,700 mg/kg. The TPH concentrations then declined to below the RRAL at 2.0' below surface with concentrations of 253 mg/kg (T-2) and 1,480 mg/kg (T-4).

The areas of trenches (T-5 and T-6) showed TPH highs of 34,200 mg/kg and 54,800 mg/kg at 0-1 before declining to below the RRAL at 3.0 and 4.0', respectively. The areas of trenches (T-3 and T-7) were not vertically defined and showed TPH concentrations with bottom trench concentrations of 6,830 mg/kg at 2.0' and 5,590 mg/kg at 10.0' below surface, respectively. Deeper samples were not collected due to a dense formation in the area.

Benzene and Total BTEX

None of the samples analyzed showed benzene concentrations above the RRAL. However, the total BTEX concentrations above the 50 mg/kg RRAL was detected in the shallow soils. The areas of trenches (T-1, T-2, T-3, T-4, T-5 and T-7) showed total BTEX highs of 67.4 mg/kg, 114 mg/kg, 694 mg/kg, 61.5 mg/kg, 985 mg/kg, and 1,090 mg/kg at 0-1' below surface. The BTEX concentrations in these areas declined with depth to below 50 mg/kg at 2.0' below surface. The area of trench (T-6) showed a deeper impact with BTEX concentrations of 447 mg/kg at 2.0' and 92.2 mg/kg at 3.0', before declining to 0.230 mg/kg at 4.0' below surface.

Chlorides

The chloride concentrations detected did not show a significant impact to the soils. The area of trench (T-5) showed chloride concentrations of 748 mg/kg at 0-1' and 808 mg/kg at 2.0', which then declined with depth to 530 mg/kg at 3.0' below surface. None of the other samples collected showed chloride concentrations above the 600 mg/kg threshold.

Work Plan

Based on the laboratory results, Grand Banks proposes to remove the impacted material as highlighted (green) in Table 1 and shown on Figure 4. To remove the soil exceeding the RRAL, the areas of trenches (T-1 through and T-5) will be excavated to approximately 1.0' to 3.0' below surface. The area of trench (T-6) will be excavated to between 3.0' to 4.0' and the area of trench (T-7) will be excavated to 10.0' below surface.

Deeper samples will be collected during the excavation activities in order to vertically define the impact in the areas of trenches (T-3 and T-7). Based on the results, these areas will be excavated to the appropriate depth to remove all soils with TPH concentrations exceeding the 5,000 mg/kg RRAL. The impacted soil around the Plains Pipeline will be removed to the maximum extent practicable. However, the some of the impact around the line may be deferred if it's a safety concern. Once the areas are excavated to the appropriate depths, the areas will be backfilled with clean material to surface grade. All of the excavated material will be transported offsite for proper disposal.

The proposed excavation depths may not be reached due to wall cave ins and safety concerns for onsite personnel. In addition, impacted soil around oil and gas equipment, structures or lines may not be feasible or practicable to be removed due to safely concerns for onsite personnel. As such, Grand Banks will excavate the impacted soils to the maximum extent practicable.

Revegetation Plan

The backfilled areas in the pasture will be seeded in June 2018 in order to coincide with the rainy season in Southeastern New Mexico to aid in revegetation. Based on the soils at the site, the NMSLO Shallow (SH) Sites Seed Mixture will be used for seeding and will be planted in the amount specified in the pounds pure live seed (PLS) per acre. The seed mixture will be spread by a drill equipped with a depth regulator or a hand-held broadcaster and raked. If a hand-held broadcaster is used for dispersal, the pounds pure live seed per acre will be doubled.

Site inspections will be performed to assess the revegetation progress and evaluate the site for the presence of primary or secondary noxious weeds. If noxious weeds are identified, the NMSLO will be contacted to determine an effective method for eradication. If the site does not show revegetation after one growing season, the area will be reseeded as appropriate. The NMSLO seed mixture details and corresponding pounds pure live seed per acre are included in Appendix C.

TETRA TECH

Conclusion

Upon completion, a final report detailing the remediation activities will be submitted to the NMOCD. If you have any questions or comments concerning the assessment or the proposed remediation activities for this site, please call at (432) 682-4559.

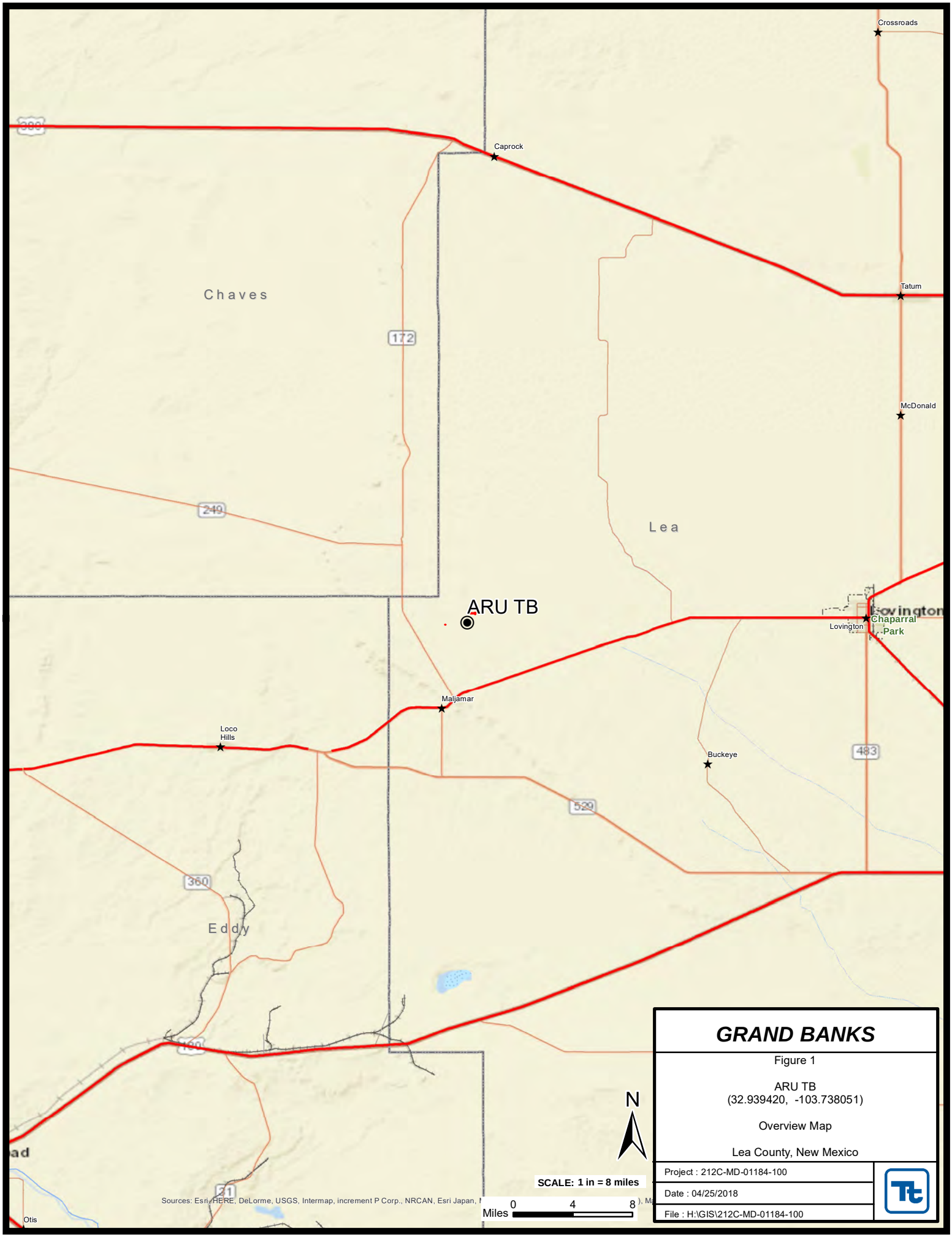
Respectfully submitted,
TETRA TECH

Clair Gonzales,
Project Manager

Ike Tavarez,
Senior Project Manager, P.G.

cc: Ryan Mann - SLO
Andy Rickard – Cambrian

Figures



GRAND BANKS

Figure 1

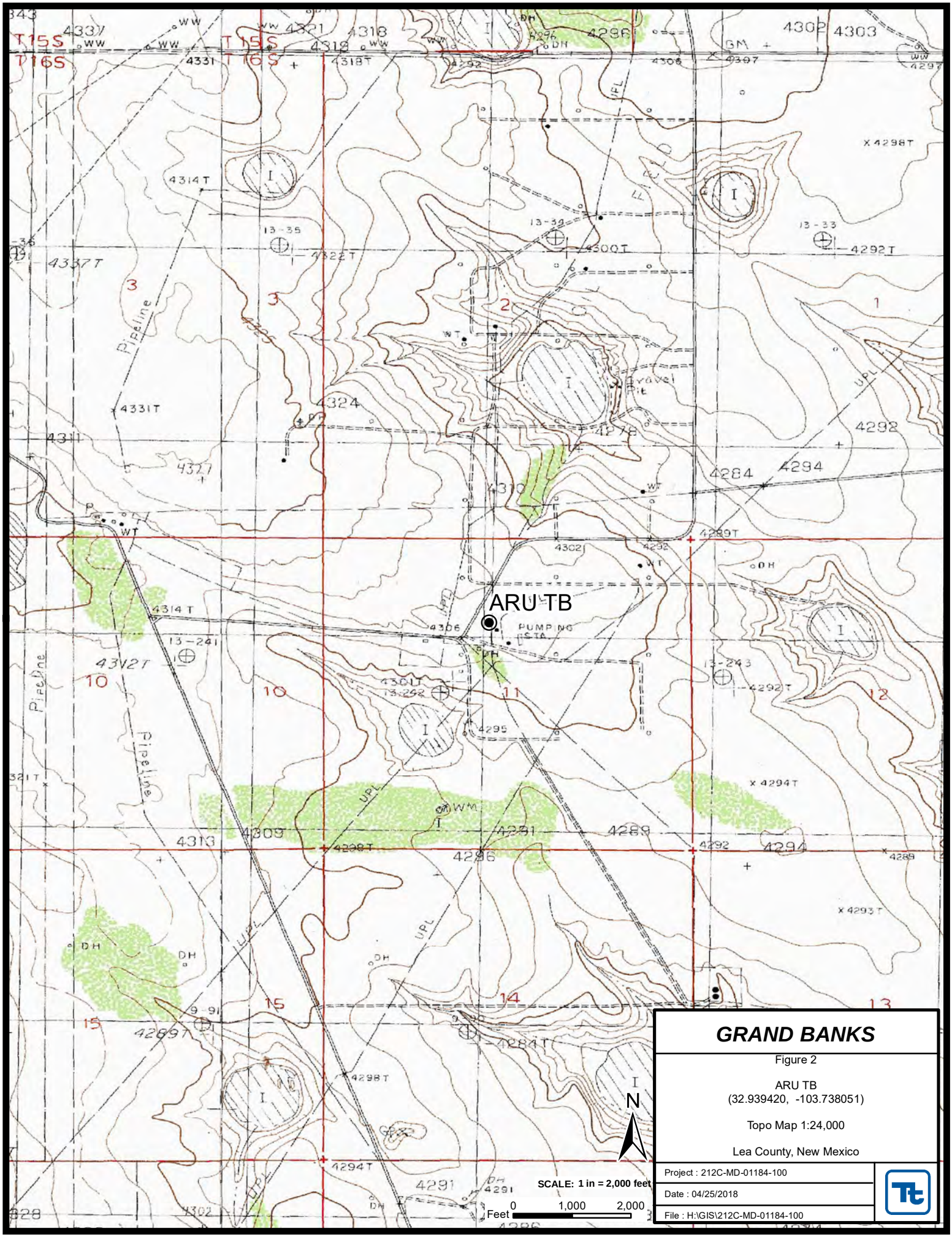
ARU TB
(32.939420, -103.738051)

Overview Map

Lea County, New Mexico

Project : 212C-MD-01184-100	
Date : 04/25/2018	
File : H:\GIS\212C-MD-01184-100	

Mapped By: Isabel Marmolejo



GRAND BANKS

Figure 2

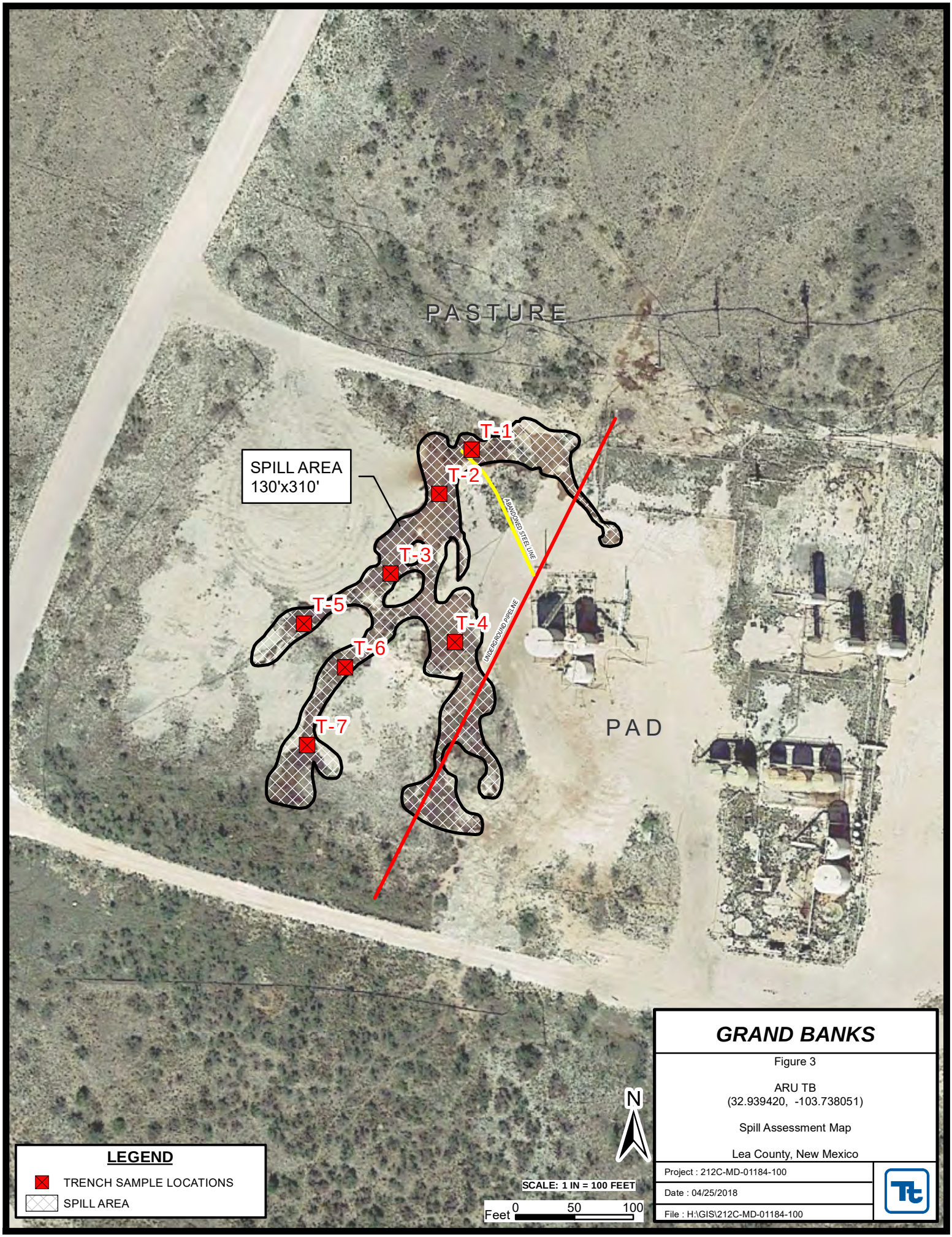
ARU TB
(32.939420, -103.738051)

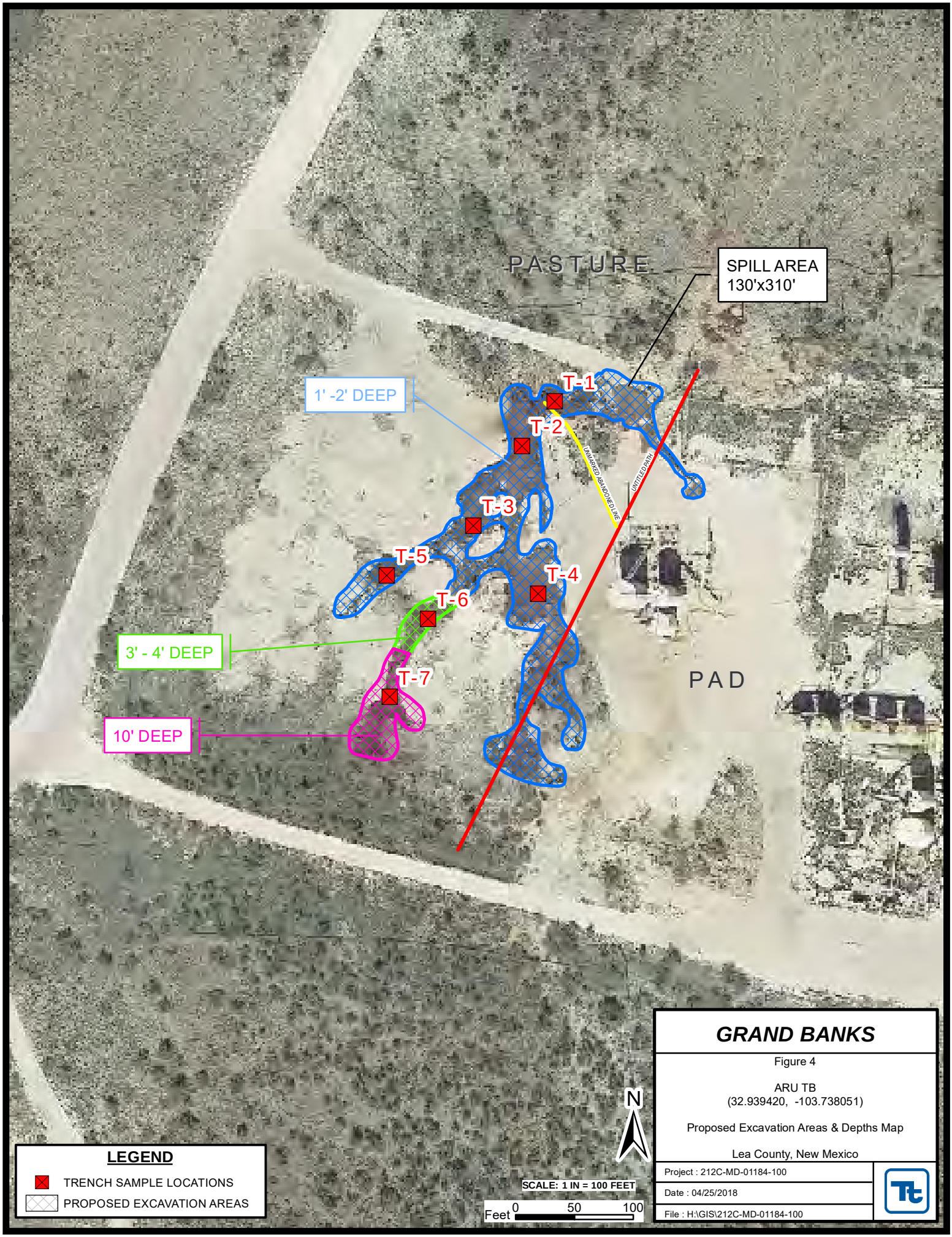
Topo Map 1:24,000

Lea County, New Mexico

Project : 212C-MD-01184-100	
Date : 04/25/2018	
File : H:\GIS\212C-MD-01184-100	

Mapped By: Isabel Marmolejo


PASTURE
PAD
SPILL AREA
130'x310'
T-1
T-2
T-3
T-4
T-5
T-6
T-7
ABANDONED STEEL LINE
UNDERGROUND PIPELINE
N
SCALE: 1 IN = 100 FEET
Feet 0 50 100
LEGEND
TRENCH SAMPLE LOCATIONS
SPILL AREA
GRAND BANKS
Figure 3
ARU TB
(32.939420, -103.738051)
Spill Assessment Map
Lea County, New Mexico
Project : 212C-MD-01184-100
Date : 04/25/2018
File : H:\GIS\212C-MD-01184-100
Mapped By: Isabel Marmolejo



GRAND BANKS

Figure 4

ARU TB
(32.939420, -103.738051)

Proposed Excavation Areas & Depths Map

Lea County, New Mexico

Project : 212C-MD-01184-100

Date : 04/25/2018

File : H:\GIS\212C-MD-01184-100

Mapped By: Isabel Marmolejo

Tables

Table 1
Grand Banks Energy
ARU Tank Battery
Lea County, New Mexico

Sample ID	Sample Date	Sample Depth (ft)	Soil Status		TPH (mg/kg)				Benzene (mg/kg)	Toluene (mg/kg)	Ethlybenzene (mg/kg)	Xylene (mg/kg)	Total BTEX (mg/kg)	Chloride (mg/kg)
			In-Situ	Removed	C6-C10	C10-C28	C28-C35	Total						
T-1	4/3/2018	0-1	X		960	3,080	171.0	4,210	1.27	9.83	13.4	42.9	**67.4**	81.0
	"	2	X		<15.0	177	<15.0	177	<0.00200	<0.00200	<0.00200	0.00866	0.00866	7.85
T-2	4/3/2018	0-1	X		5,910	22,700	189	**28,800**	0.891	15.5	6.42	90.7	**114**	459
	"	2	X		<15.0	253	<15.0	253	<0.00201	<0.00201	<0.00201	0.0114	0.0114	590
T-3	4/3/2018	0-1	X		6,290	15,000	441	**21,700**	7.37	121	33.2	532	**694**	418
	"	2	X		569	6,050	208.0	**6,830**	<0.0998	2.66	2.00	29.6	34.3	292
T-4	4/3/2018	0-1	X		2,460	74,100	2,180	**78,700**	<0.201	2.84	1.79	56.9	**61.5**	489
	"	2	X		36.0	1,390	49.0	1,480	<0.00202	<0.00202	<0.00202	0.0145	0.0145	127
T-5	4/3/2018	0-1	X		11,900	22,100	183.0	**34,200**	7.46	170	46.6	761	**985**	**748**
	"	2	X		256	4,940	163	**5,360**	0.00684	0.0678	0.0243	0.262	0.361	**808**
	"	3	X		196	2,860	83.5	3,140	-	-	-	-	-	530
T-6	4/3/2018	0-1	X		11,300	43,000	456	**54,800**	<0.504	2.64	5.56	31.4	39.6	199
	"	2	X		8,180	15,700	430	**24,300**	7.11	13.1	33.8	393	**447**	178
	"	3	X		903	13,300	321	**14,500**	1.09	12.0	4.52	74.6	**92.2**	83.7
	"	4	X		23.4	2,190	78.5	4,900	<0.0101	0.0121	<0.0101	0.218	0.230	67.1
	"	6	X		-	-	-	-	-	-	-	-	-	54.1
	"	8	X		-	-	-	-	-	-	-	-	-	<4.96
	"	10	X		-	-	-	-	-	-	-	-	-	<4.98
	"	12	X		-	-	-	-	-	-	-	-	-	5.01
T-7	4/3/2018	0-1	X		18,900	32,800	714	**52,400**	9.58	197	48.1	836	**1,090**	571
	"	2	X		1,200	24,800	218	**26,200**	0.0432	0.145	0.0139	0.775	0.977	257
	"	4	X		266	19,900	231	**20,400**	-	-	-	-	-	61.9
	"	6	X		188	10,800	295	**11,300**	-	-	-	-	-	14.8
	"	10	X		635	4,940	19.6	**5,590**	-	-	-	-	-	<4.96

(-) Not Analyzed

Photos

Grand Banks Energy
ARU Tank Battery
Lea County, New Mexico

View North – Area of T-1

View West – Area of T-2

Grand Banks Energy
ARU Tank Battery
Lea County, New Mexico

View South – Area of T-3

View South – Area of T-4

Grand Banks Energy
ARU Tank Battery
Lea County, New Mexico

View Southwest – Area of T-5

View South – Area of T-6

Grand Banks Energy
ARU Tank Battery
Lea County, New Mexico

View North – Area of T-7

Appendix A

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

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

Form C-141
Revised April 3, 2017

Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notification and Corrective Action

OPERATOR

☑ Initial Report ☐ Final Report

Name of Company Cambrian Management, Ltd.	Contact Mike Anthony
Address P.O. Box 272, Midland, TX 79702	Telephone No. (432)631-4398
Facility Name ARU Tank Battery	Facility Type P&E

Surface Owner State	Mineral Owner State	API No. 30-025-00386

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	11	16S	32E					Lea

Latitude 32.939420 Longitude -103.738051 NAD83

NATURE OF RELEASE

Type of Release Produced water & crude oil	Volume of Release 50 bbls	Volume Recovered 0 bbls
Source of Release Flare Stack	Date and Hour of Occurrence Unknown	Date and Hour of Discovery 10/28/2017
Was Immediate Notice Given? ☐ Yes ☑ No ☐ Not Required	If YES, To Whom? N/A	
By Whom? N/A	Date and Hour N/A	
Was a Watercourse Reached? ☐ Yes ☑ No	If YES, Volume Impacting the Watercourse.	

RECEIVED
By Olivia Yu at 2:22 pm, Feb 22, 2018

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

Spill caused by loss of gas pressure on storage vessels. System pressure was stabilized during initial response activities.

Describe Area Affected and Cleanup Action Taken.*

The release impacted an area of the tank battery pad, access road, and adjacent pasture measuring approximately 23,500 square feet. The release may have commingled with an unrelated historical release (or releases) that occurred prior to operation of the site by Cambrian Management. Remediation of the impacted areas will be conducted in accordance with NMOCD and NMSLO guidelines.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD 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 NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD 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.

Signature: Denise Jones

Printed Name: Denise Jones

Title: Regulatory Analyst

E-mail Address: djones@cambrianmgmt.com

Date: 2/6/2018 Phone: (432) 620-9181

OIL CONSERVATION DIVISION

Approved by Environmental Specialist: BJ

Approval Date: 2/22/2018 Expiration Date:

Conditions of Approval: see attached directive

Attached ☑

* Attach Additional Sheets If Necessary

1RP-4974

nOY1805352581

pOY1805353055

Appendix B

Water Well Data
Average Depth to Groundwater (ft)
Grand Banks Energy - ARU Tank Battery
Lea County, New Mexico

15 South 31 East

6	5	4	3	2	1
7	8	9 280	10	11 264	12
18	17	16	15	14	13
19	20 67	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

15 South 32 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

16 South 31 East

6	5	4	3	2 290	1
7	8	9	10	11	12 288
18	17	16	15	14 113 314	13 299
19	20	21	22	23	24
30	29	28	27	26	25
31 290	32	33	34	35	36

16 South 32 East

6	5	4	3 65	2 275	1 265
7	8	9 248	10	11 275	12 215
18	17	16 221	15	14	13 215
19 220	20	21 210	22	23 210	24
30	29	28	27	26 243	25
31	32	33	34	35	36 260

16 South 33 East

6	5 180	4 150	3 130	2 148	1 142
7	8 200	9	10 182	11	12 142
18	17 182	16 180	15 175	14 143	13 110
19	20	21	22	23 120	24
30 191	29	28 190	27 130	26 143	25 120
31 190	32 168	33	34 160	35	36

17 South 31 East

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34 271	35	36

17 South 32 East

6	5	4 82	3 175	2 179 60	1 200
7	8	9	10 132	11 70 88	12 120
18	17	16	15	14	13
19	20	21	22	23	24
30 180 dry	29	28 81	27	26	25
31	32	33	34	35	36

Maljamar

17 South 33 East

6 90	5	4	3 155	2 158	1 150
7 167	8 173	9 161	10	11	12
18 188	17 180	16	15	14	13 165
19	20 190	21	22	23 115	24
30 69	29 60	28	27	26	25
31	32	33 120	34	35 155	36

88 New Mexico State Engineers Well Reports

105 USGS Well Reports

90 Geology and Groundwater Conditions in Southern Lea, County, NM (Report 6)

Geology and Groundwater Resources of Eddy County, NM (Report 3)

34 NMOCD - Groundwater Data

123 Tetra Tech installed temporary wells and field water level

143 NMOCD Groundwater map well location

New Mexico Office of the State Engineer

Water Column/Average Depth to Water

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

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

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

(NAD83 UTM in meters)

(In feet)

POD Number	Code	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
L 02381		L	LE		3	1	13	16S	32E	619086	3643515*	308	215	93
L 02434		L	LE				01	16S	32E	619661	3646531*	337		
L 02449		L	LE				01	16S	32E	619661	3646531*	330	265	65
L 02467		L	LE		1	4	02	16S	32E	618250	3646322*	328	275	53
L 02617		L	LE		4	4	02	16S	32E	618656	3645924*	322	270	52
L 02752		L	LE		1	3	26	16S	32E	617521	3639880*	324	280	44
L 02846		L	LE	4	2	1	11	16S	32E	617956	3645413*	328	275	53
L 02846	R	L	LE	4	2	1	11	16S	32E	617956	3645413*	328	275	53
L 02847		L	LE	1	4	2	11	16S	32E	618564	3645219*	317	220	97
L 02847	R	L	LE	1	4	2	11	16S	32E	618564	3645219*	317	220	97
L 02954		L	LE		2	4	03	16S	32E	617043	3646310*	120	65	55
L 02993		L	LE	3	3	2	15	16S	32E	616572	3643391*	100		
L 03405		L	LE	1	1	2	25	16S	32E	619824	3640790	298	190	108
L 03587		L	LE	1	2	4	35	16S	32E	618647	3638383*	282	210	72
L 03587 S		L	LE	3	4	2	35	16S	32E	618642	3638586*	269	215	54
L 03587 S2		L	LE		2	2	35	16S	32E	618738	3639089*	299	192	107
L 03587 S4		L	LE	1	4	4	26	16S	32E	618632	3639590*	289	220	69
L 03631		L	LE		1	2	02	16S	32E	618240	3647126*	315	250	65
L 04737 POD3		L	LE		3	3	36	16S	32E	619048	3637777	304	214	90
L 04930		L	LE			1	23	16S	32E	617698	3642092*	307	210	97
L 05494		L	LE				36	16S	32E	619758	3638489*	303	200	103
L 06400		L	LE	1	3	3	36	16S	32E	619054	3637985*	330		
L 06557		L	LE		1	4	21	16S	32E	615089	3641466*	295	210	85
L 06807		L	LE	1	4	4	09	16S	32E	615356	3644383*	290	248	42
L 07823		L	LE	2	2	2	16	16S	32E	615561	3643981*	269	247	22
L 08084		L	LE	1	1	1	16	16S	32E	614157	3643970*	317	260	57
L 08084 POD4		L	LE			2	26	16S	32E	618522	3640492*	303	233	70
L 08084 POD5		L	LE	4	1	4	26	16S	32E	618425	3639788*	296	165	131
L 08084 S3		L	LE			2	26	16S	32E	618522	3640492*	305	205	100
L 08241		L	LE		4	4	02	16S	32E	618656	3645924*	316		
L 10204		L	LE	4	2	2	04	16S	32E	615524	3646993*	319		
L 10205		L	LE		4	1	08	16S	32E	613038	3645066*	330		
L 11189		L	LE	1	1	4	04	16S	32E	614932	3646391*	350		

Average Depth to Water:	**224 feet**
Minimum Depth:	**65 feet**
Maximum Depth:	**280 feet**

Record Count: 33

PLSS Search:

Township: 16S **Range:** 32E

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

4/25/18 12:42 PM

WATER COLUMN/ AVERAGE DEPTH TO WATER

Appendix C

Lea County, New Mexico

KO—Kimbrough gravelly loam, dry, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2tw43
Elevation: 2,500 to 4,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 180 to 220 days
Farmland classification: Not prime farmland

Map Unit Composition

Kimbrough, dry, and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kimbrough, Dry

Setting

Landform: Playa rims, plains
Down-slope shape: Convex, linear
Across-slope shape: Concave, linear
Parent material: Loamy eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 3 inches: gravelly loam
Bw - 3 to 10 inches: loam
Bkkm1 - 10 to 16 inches: cemented material
Bkkm2 - 16 to 80 inches: cemented material

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 4 to 18 inches to petrocalcic
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.01 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 95 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 1.0
Available water storage in profile: Very low (about 1.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: D
Ecological site: Very Shallow 12-17" PZ (R077DY049TX)
Hydric soil rating: No

Minor Components

Eunice
Percent of map unit: 10 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Convex
Ecological site: Very Shallow 12-17" PZ (R077DY049TX)
Hydric soil rating: No

Spraberry
Percent of map unit: 6 percent
Landform: Plains, playa rims
Down-slope shape: Linear, convex
Across-slope shape: Linear
Ecological site: Very Shallow 12-17" PZ (R077DY049TX)
Hydric soil rating: No

Kenhill
Percent of map unit: 4 percent
Landform: Plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Clay Loam 12-17" PZ (R077DY038TX)
Hydric soil rating: No

Data Source Information

Soil Survey Area: Lea County, New Mexico
Survey Area Data: Version 14, Sep 10, 2017

NMSLO Seed Mix — Shallow (SH)

SHALLOW (SH) SITES SEED MIXTURE:

COMMON NAME	VARIETY	APPLICATION RATE (PLS/Acre)	DRILL BOX
Grasses:			
Sideoats grama	Vaughn, El Reno	4.0	F
Blue grama	Lovington, Hachita	3.0	D
Little bluestem	Pastura, Cimmaron	1.5	F
Green sprangletop	VNS, Southern	1.0	D
Plains bristlegrass	VNS, Southern	1.0	D
Forbs:			
Firewheel (*Gaillardia*)	VNS, Southern	1.0	D
Shrubs:			
Fourwing saltbush	Marana, Santa Rita	1.0	D
Common winterfat	VNS, Southern	0.5	F
	Total PLS/acre	**13.0**	

S = Small seed drill box, D = Standard seed drill box, F = Fluffy seed drill box
VNS = Variety Not Stated, PLS = Pure Live Seed

- Seed mixes should be provided in bags separating seed types into the three categories: small (S), standard (D) and fluffy (F).
- VNS, Southern – Seed should be from a southern latitude collection of this species.
- Double seed application rate for broadcast or hydroseeding.
- If one species is not available, contact the SLO for an approved substitute; alternatively the SLO may require other species proportionately increased.
- Additional information on these seed species can be found on the USDA Plants Database website at http://plants.usda.gov.

Appendix D

Appendix D

Analytical Report 581424

for

Tetra Tech- Midland

Project Manager: Ike Tavarez

Grand Banks-ARU Tank Battery

TBD

18-APR-18

Collected By: Client

1211 W. Florida Ave, Midland TX 79701

Xenco-Houston (EPA Lab Code: TX00122):
Texas (T104704215-18-24), Arizona (AZ0765), Florida (E871002-24), Louisiana (03054)
Oklahoma (2017-142)

Xenco-Dallas (EPA Lab Code: TX01468):
Texas (T104704295-17-16), Arizona (AZ0809), Arkansas (17-063-0)

Xenco-El Paso (EPA Lab Code: TX00127): Texas (T104704221-17-12)
Xenco-Lubbock (EPA Lab Code: TX00139): Texas (T104704219-17-16)
Xenco-Odessa (EPA Lab Code: TX00158): Texas (T104704400-18-14)
Xenco-San Antonio (EPA Lab Code: TNI02385): Texas (T104704534-17-3)
Xenco Phoenix (EPA Lab Code: AZ00901): Arizona (AZ0757)
Xenco-Phoenix Mobile (EPA Lab Code: AZ00901): Arizona (AZM757)
Xenco-Atlanta (LELAP Lab ID #04176)
Xenco-Tampa: Florida (E87429)
Xenco-Lakeland: Florida (E84098)

18-APR-18

Project Manager: **Ike Tavarez**
Tetra Tech- Midland
4000 N. Big Spring Suite 401
Midland, TX 79705

Reference: XENCO Report No(s): **581424**
Grand Banks-ARU Tank Battery
Project Address: Lea County NM

Ike Tavarez:

We are reporting to you the results of the analyses performed on the samples received under the project name referenced above and identified with the XENCO Report Number(s) 581424. All results being reported under this Report Number apply to the samples analyzed and properly identified with a Laboratory ID number. Subcontracted analyses are identified in this report with either the NELAC certification number of the subcontract lab in the analyst ID field, or the complete subcontracted report attached to this report.

Unless otherwise noted in a Case Narrative, all data reported in this Analytical Report are in compliance with NELAC standards. The uncertainty of measurement associated with the results of analysis reported is available upon request. Should insufficient sample be provided to the laboratory to meet the method and NELAC Matrix Duplicate and Matrix Spike requirements, then the data will be analyzed, evaluated and reported using all other available quality control measures.

The validity and integrity of this report will remain intact as long as it is accompanied by this letter and reproduced in full, unless written approval is granted by XENCO Laboratories. This report will be filed for at least 5 years in our archives after which time it will be destroyed without further notice, unless otherwise arranged with you. The samples received, and described as recorded in Report No. 581424 will be filed for 45 days, and after that time they will be properly disposed without further notice, unless otherwise arranged with you. We reserve the right to return to you any unused samples, extracts or solutions related to them if we consider so necessary (e.g., samples identified as hazardous waste, sample sizes exceeding analytical standard practices, controlled substances under regulated protocols, etc).

We thank you for selecting XENCO Laboratories to serve your analytical needs. If you have any questions concerning this report, please feel free to contact us at any time.

Respectfully,

Kelsey Brooks
Project Manager

Sample Cross Reference 581424

Tetra Tech- Midland, Midland, TX

Grand Banks-ARU Tank Battery

Sample Id	Matrix	Date Collected	Sample Depth	Lab Sample Id
T-1 0-1	S	04-03-18 00:00		581424-001
T-1 2	S	04-03-18 00:00		581424-002
T-2 0-1	S	04-03-18 00:00		581424-003
T-2 2	S	04-03-18 00:00		581424-004
T-3 0-1	S	04-03-18 00:00		581424-005
T-3 2	S	04-03-18 00:00		581424-006
T-4 0-1	S	04-03-18 00:00		581424-007
T-4 2	S	04-03-18 00:00		581424-008
T-5 0-1	S	04-03-18 00:00		581424-009
T-5 2	S	04-03-18 00:00		581424-010
T-5 3	S	04-03-18 00:00		581424-011
T-6 0-1	S	04-03-18 00:00		581424-012
T-6 2	S	04-03-18 00:00		581424-013
T-6 3	S	04-03-18 00:00		581424-014
T-6 4	S	04-03-18 00:00		581424-015
T-6 6	S	04-03-18 00:00		581424-016
T-6 8	S	04-03-18 00:00		581424-017
T-6 10	S	04-03-18 00:00		581424-018
T-6 12	S	04-03-18 00:00		581424-019
T-7 0-1	S	04-03-18 00:00		581424-020
T-7 2	S	04-03-18 00:00		581424-021
T-7 4	S	04-03-18 00:00		581424-022
T-7 6	S	04-03-18 00:00		581424-023
T-7 10	S	04-03-18 00:00		581424-025
T-7 8	S	04-03-18 00:00		Not Analyzed

Sample receipt non conformances and comments:

Sample 024 T-7 8 disregarded per Clair Gonzales E-mail 04/05/18-- KB

Sample receipt non conformances and comments per sample:

None

Analytical non conformances and comments:

Batch: LBA-3046073 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3046194 Inorganic Anions by EPA 300/300.1
Lab Sample ID 581424-017 was randomly selected for Matrix Spike/Matrix Spike Duplicate (MS/MSD). Chloride recovered below QC limits in the Matrix Spike. Outlier/s are due to possible matrix interference. Samples in the analytical batch are: 581424-007, -008, -009, -010, -011, -012, -013, -014, -015, -016, -017, -018, -019, -020, -021, -022, -023, -025.
The Laboratory Control Sample for Chloride is within laboratory Control Limits, therefore the data was accepted.

Batch: LBA-3046223 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3046232 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3046466 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Batch: LBA-3046657 BTEX by EPA 8021B
Soil samples were not received in Terracore kits and therefore were prepared by method 5030.

Certificate of Analysis Summary 581424

Tetra Tech- Midland, Midland, TX

Project Name: Grand Banks-ARU Tank Battery

Project Id: TBD
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Thu Apr-05-18 10:05 am
Report Date: 18-APR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	581424-001		581424-002		581424-003		581424-004		581424-005		581424-006	
	Field Id:	T-1 0-1		T-1 2		T-2 0-1		T-2 2		T-3 0-1		T-3 2	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00	
BTEX by EPA 8021B	***Extracted:***	Apr-06-18 16:50		Apr-06-18 16:50		Apr-06-18 16:50		Apr-06-18 16:50		Apr-10-18 08:00		Apr-06-18 16:50	
	Analyzed:	Apr-07-18 00:04		Apr-06-18 22:49		Apr-07-18 02:55		Apr-06-18 23:08		Apr-10-18 18:28		Apr-07-18 03:51	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Benzene		1.27	0.201	<0.00200	0.00200	0.891	0.198	<0.00201	0.00201	7.37	1.01	<0.0998	0.0998
Toluene		9.83	0.201	<0.00200	0.00200	15.5	0.198	<0.00201	0.00201	121	1.01	2.66	0.0998
Ethylbenzene		13.4	0.201	<0.00200	0.00200	6.42	0.198	<0.00201	0.00201	33.2	1.01	2.00	0.0998
m,p-Xylenes		30.5	0.402	0.00634	0.00401	64.1	0.396	0.00769	0.00402	386	2.02	20.8	0.200
o-Xylene		12.4	0.201	0.00232	0.00200	26.6	0.198	0.00371	0.00201	146	1.01	8.81	0.0998
Total Xylenes		42.9	0.201	0.00866	0.00200	90.7	0.198	0.0114	0.00201	532	1.01	29.6	0.0998
Total BTEX		67.4	0.201	0.00866	0.00200	114	0.198	0.0114	0.00201	694	1.01	34.3	0.0998
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-09-18 10:30		Apr-09-18 10:30		Apr-09-18 10:30		Apr-09-18 10:30		Apr-09-18 10:30		Apr-09-18 10:30	
	Analyzed:	Apr-09-18 14:12		Apr-09-18 14:17		Apr-09-18 14:22		Apr-09-18 14:28		Apr-09-18 14:33		Apr-09-18 14:38	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		81.0	4.97	7.85	4.95	459	4.98	590	5.00	418	5.00	292	4.95
TPH By SW8015 Mod	***Extracted:***	Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00	
	Analyzed:	Apr-07-18 23:23		Apr-07-18 23:49		Apr-07-18 00:15		Apr-07-18 00:42		Apr-07-18 01:07		Apr-07-18 02:24	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		960	74.9	<15.0	15.0	5910	74.8	<15.0	15.0	6290	149	569	74.9
Diesel Range Organics (DRO)		3080	74.9	177	15.0	22700	74.8	253	15.0	15000	149	6050	74.9
Oil Range Hydrocarbons (ORO)		171	74.9	<15.0	15.0	189	74.8	<15.0	15.0	441	149	208	74.9
Total TPH		4210	74.9	177	15.0	28800	74.8	253	15.0	21700	149	6830	74.9

Certificate of Analysis Summary 581424

Tetra Tech- Midland, Midland, TX

Project Name: Grand Banks-ARU Tank Battery

Project Id: TBD
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Thu Apr-05-18 10:05 am
Report Date: 18-APR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	581424-007		581424-008		581424-009		581424-010		581424-011		581424-012	
	Field Id:	T-4 0-1		T-4 2		T-5 0-1		T-5 2		T-5 3		T-6 0-1	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00	
BTEX by EPA 8021B	***Extracted:***	Apr-06-18 16:50		Apr-06-18 16:50		Apr-10-18 08:00		Apr-06-18 16:50				Apr-09-18 17:00	
	Analyzed:	Apr-07-18 04:10		Apr-06-18 23:25		Apr-10-18 13:15		Apr-07-18 00:23				Apr-10-18 04:26	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL			mg/kg	RL
Benzene		<0.201	0.201	<0.00202	0.00202	7.46	1.99	0.00684	0.00200			<0.504	0.504
Toluene		2.84	0.201	<0.00202	0.00202	170	1.99	0.0678	0.00200			2.64	0.504
Ethylbenzene		1.79	0.201	<0.00202	0.00202	46.6	1.99	0.0243	0.00200			5.56	0.504
m,p-Xylenes		39.2	0.402	0.0100	0.00403	546	3.98	0.188	0.00401			22.2	1.01
o-Xylene		17.7	0.201	0.00454	0.00202	215	1.99	0.0743	0.00200			9.19	0.504
Total Xylenes		56.9	0.201	0.0145	0.00202	761	1.99	0.262	0.00200			31.4	0.504
Total BTEX		61.5	0.201	0.0145	0.00202	985	1.99	0.361	0.00200			39.6	0.504
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00	
	Analyzed:	Apr-09-18 17:35		Apr-09-18 17:58		Apr-09-18 18:03		Apr-09-18 18:08		Apr-09-18 18:14		Apr-09-18 18:30	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		489	4.99	127	4.97	748	24.8	808	4.99	530	4.95	199	4.95
TPH By SW8015 Mod	***Extracted:***	Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00		Apr-06-18 17:00		Apr-11-18 10:00		Apr-06-18 17:00	
	Analyzed:	Apr-07-18 09:21		Apr-07-18 03:17		Apr-07-18 03:44		Apr-07-18 04:11		Apr-11-18 22:08		Apr-07-18 09:47	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)		2460	749	36.0	15.0	11900	75.0	256	74.9	196	15.0	11300	150
Diesel Range Organics (DRO)		74100	749	1390	15.0	22100	75.0	4940	74.9	2860	15.0	43000	150
Oil Range Hydrocarbons (ORO)		2180	749	49.0	15.0	183	75.0	163	74.9	83.5	15.0	456	150
Total TPH		78700	749	1480	15.0	34200	75.0	5360	74.9	3140	15.0	54800	150

Certificate of Analysis Summary 581424

Tetra Tech- Midland, Midland, TX

Project Name: Grand Banks-ARU Tank Battery

Project Id: TBD
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Thu Apr-05-18 10:05 am
Report Date: 18-APR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	581424-013		581424-014		581424-015		581424-016		581424-017		581424-018	
	Field Id:	T-6 2		T-6 3		T-6 4		T-6 6		T-6 8		T-6 10	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00	
BTEX by EPA 8021B	***Extracted:***	Apr-10-18 08:00		Apr-12-18 08:00		Apr-13-18 08:00							
	Analyzed:	Apr-10-18 14:13		Apr-12-18 11:42		Apr-13-18 16:26							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Benzene		7.11	2.00	1.09	1.00	<0.0101	0.0101						
Toluene		13.1	2.00	12.0	1.00	0.0121	0.0101						
Ethylbenzene		33.8	2.00	4.52	1.00	<0.0101	0.0101						
m,p-Xylenes		349	4.01	50.3	2.00	0.126	0.0202						
o-Xylene		43.5	2.00	24.3	1.00	0.0921	0.0101						
Total Xylenes		393	2.00	74.6	1.00	0.218	0.0101						
Total BTEX		447	2.00	92.2	1.00	0.230	0.0101						
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00	
	Analyzed:	Apr-09-18 18:35		Apr-09-18 18:40		Apr-09-18 18:45		Apr-09-18 18:51		Apr-09-18 18:56		Apr-09-18 19:12	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		178	25.0	83.7	5.00	67.1	5.00	54.1	4.95	<4.96	4.96	<4.98	4.98
TPH By SW8015 Mod	***Extracted:***	Apr-06-18 17:00		Apr-11-18 10:00		Apr-14-18 09:00							
	Analyzed:	Apr-07-18 05:05		Apr-11-18 22:34		Apr-15-18 09:38							
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL						
Gasoline Range Hydrocarbons (GRO)		8180	150	903	74.9	23.4	15.0						
Diesel Range Organics (DRO)		15700	150	13300	74.9	2190	15.0						
Oil Range Hydrocarbons (ORO)		430	150	321	74.9	78.5	15.0						
Total TPH		24300	150	14500	74.9	4900	15.0						

Houston - Dallas - San Antonio - Atlanta - Tampa - Boca Raton - Latin America - Odessa - Corpus Christi

Version: 1.%

Kelsey Brooks
Project Manager

Certificate of Analysis Summary 581424

Tetra Tech- Midland, Midland, TX

Project Name: Grand Banks-ARU Tank Battery

Project Id: TBD
Contact: Ike Tavarez
Project Location: Lea County NM

Date Received in Lab: Thu Apr-05-18 10:05 am
Report Date: 18-APR-18
Project Manager: Kelsey Brooks

Analysis Requested													
	Lab Id:	581424-019		581424-020		581424-021		581424-022		581424-023		581424-025	
	Field Id:	T-6 12		T-7 0-1		T-7 2		T-7 4		T-7 6		T-7 10	
	Depth:												
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	Sampled:	Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00		Apr-03-18 00:00	
BTEX by EPA 8021B	***Extracted:***			Apr-10-18 08:00		Apr-09-18 17:00							
	Analyzed:			Apr-10-18 18:09		Apr-10-18 01:34							
	Units/RL:			mg/kg	RL	mg/kg	RL						
Benzene				9.58	1.99	0.0432	0.00200						
Toluene				197	1.99	0.145	0.00200						
Ethylbenzene				48.1	1.99	0.0139	0.00200						
m,p-Xylenes				585	3.98	0.607	0.00401						
o-Xylene				251	1.99	0.168	0.00200						
Total Xylenes				836	1.99	0.775	0.00200						
Total BTEX				1090	1.99	0.977	0.00200						
Inorganic Anions by EPA 300/300.1	***Extracted:***	Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00		Apr-09-18 17:00	
	Analyzed:	Apr-09-18 19:17		Apr-09-18 19:33		Apr-09-18 19:38		Apr-09-18 19:44		Apr-09-18 19:49		Apr-09-18 19:54	
	Units/RL:	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Chloride		5.01	4.96	571	4.95	257	5.00	61.9	4.99	14.8	5.00	<4.96	4.96
TPH By SW8015 Mod	***Extracted:***			Apr-06-18 17:00		Apr-06-18 17:00		Apr-11-18 10:00		Apr-14-18 09:00		Apr-16-18 16:00	
	Analyzed:			Apr-07-18 10:12		Apr-07-18 05:59		Apr-11-18 23:01		Apr-14-18 17:06		Apr-17-18 11:08	
	Units/RL:			mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL	mg/kg	RL
Gasoline Range Hydrocarbons (GRO)				18900	150	1200	74.7	266	74.9	188	74.9	635	15.0
Diesel Range Organics (DRO)				32800	150	24800	74.7	19900	74.9	10800	74.9	4940	15.0
Oil Range Hydrocarbons (ORO)				714	150	218	74.7	231	74.9	295	74.9	19.6	15.0
Total TPH				52400	150	26200	74.7	20400	74.9	11300	74.9	5590	15.0

Flagging Criteria

X In our quality control review of the data a QC deficiency was observed and flagged as noted. MS/MSD recoveries were found to be outside of the laboratory control limits due to possible matrix /chemical interference, or a concentration of target analyte high enough to affect the recovery of the spike concentration. This condition could also affect the relative percent difference in the MS/MSD.

B A target analyte or common laboratory contaminant was identified in the method blank. Its presence indicates possible field or laboratory contamination.

D The sample(s) were diluted due to targets detected over the highest point of the calibration curve, or due to matrix interference. Dilution factors are included in the final results. The result is from a diluted sample.

E The data exceeds the upper calibration limit; therefore, the concentration is reported as estimated.

F RPD exceeded lab control limits.

J The target analyte was positively identified below the quantitation limit and above the detection limit.

U Analyte was not detected.

L The LCS data for this analytical batch was reported below the laboratory control limits for this analyte. The department supervisor and QA Director reviewed data. The samples were either reanalyzed or flagged as estimated concentrations.

H The LCS data for this analytical batch was reported above the laboratory control limits. Supporting QC Data were reviewed by the Department Supervisor and QA Director. Data were determined to be valid for reporting.

K Sample analyzed outside of recommended hold time.

JN A combination of the "N" and the "J" qualifier. The analysis indicates that the analyte is "tentatively identified" and the associated numerical value may not be consistent with the amount actually present in the environmental sample.

** Surrogate recovered outside laboratory control limit.

BRL Below Reporting Limit.

RL Reporting Limit

MDL Method Detection Limit **SDL** Sample Detection Limit **LOD** Limit of Detection

PQL Practical Quantitation Limit **MQL** Method Quantitation Limit **LOQ** Limit of Quantitation

DL Method Detection Limit

NC Non-Calculable

SMP Client Sample **BLK** Method Blank

BKS/LCS Blank Spike/Laboratory Control Sample **BKSD/LCSD** Blank Spike Duplicate/Laboratory Control Sample Duplicate

MD/SD Method Duplicate/Sample Duplicate **MS** Matrix Spike **MSD:** Matrix Spike Duplicate

+ NELAC certification not offered for this compound.

* (Next to analyte name or method description) = Outside XENCO's scope of NELAC accreditation

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046073 **Sample:** 581424-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 22:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	70-130	
4-Bromofluorobenzene	0.0245	0.0300	82	70-130	

Lab Batch #: 3046073 **Sample:** 581424-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 23:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0263	0.0300	88	70-130	
4-Bromofluorobenzene	0.0238	0.0300	79	70-130	

Lab Batch #: 3046073 **Sample:** 581424-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 23:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0276	0.0300	92	70-130	
4-Bromofluorobenzene	0.0247	0.0300	82	70-130	

Lab Batch #: 3046073 **Sample:** 581424-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 00:04

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0303	0.0300	101	70-130	
4-Bromofluorobenzene	0.0357	0.0300	119	70-130	

Lab Batch #: 3046082 **Sample:** 581424-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 00:15

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	96.8	99.7	97	70-135	
o-Terphenyl	64.2	49.9	129	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046073 **Sample:** 581424-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 00:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0218	0.0300	73	70-130	
4-Bromofluorobenzene	0.0343	0.0300	114	70-130	

Lab Batch #: 3046082 **Sample:** 581424-004 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 00:42

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	106	99.9	106	70-135	
o-Terphenyl	55.0	50.0	110	70-135	

Lab Batch #: 3046082 **Sample:** 581424-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 01:07

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	127	99.6	128	70-135	
o-Terphenyl	45.4	49.8	91	70-135	

Lab Batch #: 3046082 **Sample:** 581424-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 02:24

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	99.9	114	70-135	
o-Terphenyl	43.9	50.0	88	70-135	

Lab Batch #: 3046073 **Sample:** 581424-003 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 02:55

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0229	0.0300	76	70-130	
4-Bromofluorobenzene	0.0348	0.0300	116	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046082 **Sample:** 581424-008 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 03:17

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	99.7	102	70-135	
o-Terphenyl	60.3	49.9	121	70-135	

Lab Batch #: 3046082 **Sample:** 581424-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 03:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	94.2	100	94	70-135	
o-Terphenyl	64.0	50.0	128	70-135	

Lab Batch #: 3046073 **Sample:** 581424-006 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 03:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0275	0.0300	92	70-130	
4-Bromofluorobenzene	0.0353	0.0300	118	70-130	

Lab Batch #: 3046073 **Sample:** 581424-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 04:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0267	0.0300	89	70-130	
4-Bromofluorobenzene	0.0337	0.0300	112	70-130	

Lab Batch #: 3046082 **Sample:** 581424-010 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 04:11

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	109	99.9	109	70-135	
o-Terphenyl	64.8	50.0	130	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046082 **Sample:** 581424-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 05:05

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.8	108	70-135	
o-Terphenyl	45.8	49.9	92	70-135	

Lab Batch #: 3046082 **Sample:** 581424-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 05:59

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	129	99.6	130	70-135	
o-Terphenyl	44.3	49.8	89	70-135	

Lab Batch #: 3046082 **Sample:** 581424-007 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 09:21

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	99.9	119	70-135	
o-Terphenyl	43.0	50.0	86	70-135	

Lab Batch #: 3046082 **Sample:** 581424-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 09:47

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	98.0	99.8	98	70-135	
o-Terphenyl	52.4	49.9	105	70-135	

Lab Batch #: 3046082 **Sample:** 581424-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 10:12

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	100	115	70-135	
o-Terphenyl	41.3	50.0	83	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046082 **Sample:** 581424-001 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 23:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	125	99.8	125	70-135	
o-Terphenyl	64.7	49.9	130	70-135	

Lab Batch #: 3046082 **Sample:** 581424-002 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/07/18 23:49

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	103	99.7	103	70-135	
o-Terphenyl	49.8	49.9	100	70-135	

Lab Batch #: 3046223 **Sample:** 581424-021 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 01:34

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0240	0.0300	80	70-130	
4-Bromofluorobenzene	0.0287	0.0300	96	70-130	

Lab Batch #: 3046223 **Sample:** 581424-012 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 04:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0269	0.0300	90	70-130	
4-Bromofluorobenzene	0.0372	0.0300	124	70-130	

Lab Batch #: 3046232 **Sample:** 581424-009 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 13:15

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0324	0.0300	108	70-130	
4-Bromofluorobenzene	0.0329	0.0300	110	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046232 **Sample:** 581424-013 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 14:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0272	0.0300	91	70-130	
4-Bromofluorobenzene	0.0275	0.0300	92	70-130	

Lab Batch #: 3046232 **Sample:** 581424-020 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 18:09

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0309	0.0300	103	70-130	
4-Bromofluorobenzene	0.0279	0.0300	93	70-130	

Lab Batch #: 3046232 **Sample:** 581424-005 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 18:28

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0231	0.0300	77	70-130	
4-Bromofluorobenzene	0.0319	0.0300	106	70-130	

Lab Batch #: 3046456 **Sample:** 581424-011 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/11/18 22:08

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	110	99.7	110	70-135	
o-Terphenyl	55.4	49.9	111	70-135	

Lab Batch #: 3046456 **Sample:** 581424-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/11/18 22:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	115	99.8	115	70-135	
o-Terphenyl	57.4	49.9	115	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046456 **Sample:** 581424-022 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/11/18 23:01

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	112	99.9	112	70-135	
o-Terphenyl	53.9	50.0	108	70-135	

Lab Batch #: 3046466 **Sample:** 581424-014 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/12/18 11:42

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	70-130	
4-Bromofluorobenzene	0.0342	0.0300	114	70-130	

Lab Batch #: 3046657 **Sample:** 581424-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/13/18 16:26

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0250	0.0300	83	70-130	
4-Bromofluorobenzene	0.0235	0.0300	78	70-130	

Lab Batch #: 3046716 **Sample:** 581424-023 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/18 17:06

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	105	99.9	105	70-135	
o-Terphenyl	54.7	50.0	109	70-135	

Lab Batch #: 3046716 **Sample:** 581424-015 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/15/18 09:38

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	100	111	70-135	
o-Terphenyl	57.8	50.0	116	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046890 **Sample:** 581424-025 / SMP **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/18 11:08

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	99.8	123	70-135	
o-Terphenyl	63.0	49.9	126	70-135	

Lab Batch #: 3046082 **Sample:** 7642258-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 19:03

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	100	104	70-135	
o-Terphenyl	52.6	50.0	105	70-135	

Lab Batch #: 3046073 **Sample:** 7642269-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 21:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0278	0.0300	93	70-130	
4-Bromofluorobenzene	0.0223	0.0300	74	70-130	

Lab Batch #: 3046223 **Sample:** 7642314-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/09/18 22:23

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0265	0.0300	88	70-130	
4-Bromofluorobenzene	0.0229	0.0300	76	70-130	

Lab Batch #: 3046232 **Sample:** 7642361-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/10/18 10:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0252	0.0300	84	70-130	
4-Bromofluorobenzene	0.0243	0.0300	81	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046456 **Sample:** 7642442-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/11/18 11:06

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	93.3	100	93	70-135	
o-Terphenyl	48.2	50.0	96	70-135	

Lab Batch #: 3046466 **Sample:** 7642499-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/12/18 09:51

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0300	0.0300	100	70-130	
4-Bromofluorobenzene	0.0242	0.0300	81	70-130	

Lab Batch #: 3046657 **Sample:** 7642623-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/13/18 12:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0280	0.0300	93	70-130	
4-Bromofluorobenzene	0.0216	0.0300	72	70-130	

Lab Batch #: 3046716 **Sample:** 7642660-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/18 10:32

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	102	100	102	70-135	
o-Terphenyl	51.8	50.0	104	70-135	

Lab Batch #: 3046890 **Sample:** 7642747-1-BLK / BLK **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/16/18 23:30

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	104	100	104	70-135	
o-Terphenyl	52.3	50.0	105	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046073 **Sample:** 7642269-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 19:18

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0285	0.0300	95	70-130	
4-Bromofluorobenzene	0.0260	0.0300	87	70-130	

Lab Batch #: 3046082 **Sample:** 7642258-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 19:30

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	100	119	70-135	
o-Terphenyl	57.4	50.0	115	70-135	

Lab Batch #: 3046223 **Sample:** 7642314-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/09/18 20:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0308	0.0300	103	70-130	
4-Bromofluorobenzene	0.0279	0.0300	93	70-130	

Lab Batch #: 3046232 **Sample:** 7642361-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/10/18 08:10

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0317	0.0300	106	70-130	

Lab Batch #: 3046456 **Sample:** 7642442-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/11/18 11:34

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	100	113	70-135	
o-Terphenyl	55.6	50.0	111	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046466 **Sample:** 7642499-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/12/18 07:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0303	0.0300	101	70-130	

Lab Batch #: 3046657 **Sample:** 7642623-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/13/18 09:54

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	70-130	
4-Bromofluorobenzene	0.0296	0.0300	99	70-130	

Lab Batch #: 3046716 **Sample:** 7642660-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/18 10:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	53.7	50.0	107	70-135	

Lab Batch #: 3046890 **Sample:** 7642747-1-BKS / BKS **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/16/18 23:57

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	100	111	70-135	
o-Terphenyl	55.9	50.0	112	70-135	

Lab Batch #: 3046073 **Sample:** 7642269-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 19:37

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0285	0.0300	95	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046082 **Sample:** 7642258-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/06/18 19:56

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	119	100	119	70-135	
o-Terphenyl	56.8	50.0	114	70-135	

Lab Batch #: 3046223 **Sample:** 7642314-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/09/18 20:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0310	0.0300	103	70-130	
4-Bromofluorobenzene	0.0304	0.0300	101	70-130	

Lab Batch #: 3046232 **Sample:** 7642361-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/10/18 08:30

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0281	0.0300	94	70-130	
4-Bromofluorobenzene	0.0307	0.0300	102	70-130	

Lab Batch #: 3046456 **Sample:** 7642442-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/11/18 12:02

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	114	100	114	70-135	
o-Terphenyl	54.2	50.0	108	70-135	

Lab Batch #: 3046466 **Sample:** 7642499-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/12/18 08:13

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0298	0.0300	99	70-130	
4-Bromofluorobenzene	0.0299	0.0300	100	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046657 **Sample:** 7642623-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/13/18 10:14

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0277	0.0300	92	70-130	
4-Bromofluorobenzene	0.0273	0.0300	91	70-130	

Lab Batch #: 3046716 **Sample:** 7642660-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/14/18 11:23

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	100	108	70-135	
o-Terphenyl	54.5	50.0	109	70-135	

Lab Batch #: 3046890 **Sample:** 7642747-1-BSD / BSD **Batch:** 1 **Matrix:** Solid

Units: mg/kg **Date Analyzed:** 04/17/18 00:24

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	123	100	123	70-135	
o-Terphenyl	60.1	50.0	120	70-135	

Lab Batch #: 3046073 **Sample:** 581330-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 19:57

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0302	0.0300	101	70-130	
4-Bromofluorobenzene	0.0272	0.0300	91	70-130	

Lab Batch #: 3046082 **Sample:** 581430-003 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 21:41

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	108	99.8	108	70-135	
o-Terphenyl	52.8	49.9	106	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,

Project ID: TBD

Lab Batch #: 3046223 **Sample:** 581425-012 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/09/18 21:06

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0301	0.0300	100	70-130	
4-Bromofluorobenzene	0.0373	0.0300	124	70-130	

Lab Batch #: 3046232 **Sample:** 581763-004 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 08:49

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0305	0.0300	102	70-130	
4-Bromofluorobenzene	0.0333	0.0300	111	70-130	

Lab Batch #: 3046456 **Sample:** 581765-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/11/18 12:58

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	116	99.7	116	70-135	
o-Terphenyl	55.7	49.9	112	70-135	

Lab Batch #: 3046466 **Sample:** 581958-010 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/12/18 08:32

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0304	0.0300	101	70-130	
4-Bromofluorobenzene	0.0297	0.0300	99	70-130	

Lab Batch #: 3046657 **Sample:** 581958-024 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/13/18 11:12

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	70-130	
4-Bromofluorobenzene	0.0305	0.0300	102	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046716 **Sample:** 582192-003 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/18 13:09

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.8	111	70-135	
o-Terphenyl	52.8	49.9	106	70-135	

Lab Batch #: 3046890 **Sample:** 582461-001 S / MS **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/17/18 01:18

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.7	111	70-135	
o-Terphenyl	54.1	49.9	108	70-135	

Lab Batch #: 3046082 **Sample:** 581430-003 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/06/18 22:06

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	99.8	113	70-135	
o-Terphenyl	52.9	49.9	106	70-135	

Lab Batch #: 3046073 **Sample:** 581330-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/09/18 10:29

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0261	0.0300	87	70-130	
4-Bromofluorobenzene	0.0292	0.0300	97	70-130	

Lab Batch #: 3046223 **Sample:** 581425-012 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/09/18 21:25

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0270	0.0300	90	70-130	
4-Bromofluorobenzene	0.0333	0.0300	111	70-130	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424, **Project ID:** TBD

Lab Batch #: 3046232 **Sample:** 581763-004 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/10/18 09:08

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0323	0.0300	108	70-130	
4-Bromofluorobenzene	0.0334	0.0300	111	70-130	

Lab Batch #: 3046456 **Sample:** 581765-001 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/11/18 13:27

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	111	99.9	111	70-135	
o-Terphenyl	53.7	50.0	107	70-135	

Lab Batch #: 3046466 **Sample:** 581958-010 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/12/18 08:52

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0322	0.0300	107	70-130	
4-Bromofluorobenzene	0.0311	0.0300	104	70-130	

Lab Batch #: 3046657 **Sample:** 581958-024 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/13/18 11:31

SURROGATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1,4-Difluorobenzene	0.0292	0.0300	97	70-130	
4-Bromofluorobenzene	0.0289	0.0300	96	70-130	

Lab Batch #: 3046716 **Sample:** 582192-003 SD / MSD **Batch:** 1 **Matrix:** Soil

Units: mg/kg **Date Analyzed:** 04/14/18 13:35

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	99.8	113	70-135	
o-Terphenyl	54.2	49.9	109	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

Form 2 - Surrogate Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Orders : 581424,
Project ID: TBD
Lab Batch #: 3046890 **Sample:** 582461-001 SD / MSD **Batch:** 1 **Matrix:** Soil
Units: mg/kg **Date Analyzed:** 04/17/18 01:44

SURROGATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Amount Found [A]	True Amount [B]	Recovery %R [D]	Control Limits %R	Flags
1-Chlorooctane	113	99.8	113	70-135	
o-Terphenyl	54.7	49.9	110	70-135	

* Surrogate outside of Laboratory QC limits
** Surrogates outside limits; data and surrogates confirmed by reanalysis
*** Poor recoveries due to dilution
Surrogate Recovery [D] = 100 * A / B
All results are based on MDL and validated for QC purposes.

BS / BSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order #: 581424 **Project ID:** TBD

Analyst: ALJ **Date Prepared:** 04/06/2018 **Date Analyzed:** 04/06/2018

Lab Batch ID: 3046073 **Sample:** 7642269-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.101	0.106	105	0.100	0.120	120	12	70-130	35	
Toluene	<0.00201	0.101	0.101	100	0.100	0.116	116	14	70-130	35	
Ethylbenzene	<0.00201	0.101	0.0994	98	0.100	0.113	113	13	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.206	102	0.200	0.233	117	12	70-130	35	
o-Xylene	<0.00201	0.101	0.103	102	0.100	0.118	118	14	70-130	35	

Analyst: ALJ **Date Prepared:** 04/09/2018 **Date Analyzed:** 04/09/2018

Lab Batch ID: 3046223 **Sample:** 7642314-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.109	109	0.101	0.114	113	4	70-130	35	
Toluene	<0.00200	0.100	0.103	103	0.101	0.108	107	5	70-130	35	
Ethylbenzene	<0.00200	0.100	0.103	103	0.101	0.109	108	6	70-130	35	
m,p-Xylenes	<0.00401	0.200	0.211	106	0.201	0.226	112	7	70-130	35	
o-Xylene	<0.00200	0.100	0.107	107	0.101	0.113	112	5	70-130	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Version: 1.%

BS / BSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order #: 581424 **Project ID:** TBD

Analyst: ALJ **Date Prepared:** 04/10/2018 **Date Analyzed:** 04/10/2018

Lab Batch ID: 3046232 **Sample:** 7642361-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00198	0.0990	0.118	119	0.0994	0.116	117	2	70-130	35	
Toluene	<0.00198	0.0990	0.115	116	0.0994	0.111	112	4	70-130	35	
Ethylbenzene	<0.00198	0.0990	0.115	116	0.0994	0.112	113	3	70-130	35	
m,p-Xylenes	<0.00396	0.198	0.240	121	0.199	0.230	116	4	70-130	35	
o-Xylene	<0.00198	0.0990	0.119	120	0.0994	0.115	116	3	70-130	35	

Analyst: ALJ **Date Prepared:** 04/12/2018 **Date Analyzed:** 04/12/2018

Lab Batch ID: 3046466 **Sample:** 7642499-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00201	0.101	0.108	107	0.101	0.108	107	0	70-130	35	
Toluene	<0.00201	0.101	0.103	102	0.101	0.104	103	1	70-130	35	
Ethylbenzene	<0.00201	0.101	0.103	102	0.101	0.103	102	0	70-130	35	
m,p-Xylenes	<0.00402	0.201	0.211	105	0.202	0.209	103	1	70-130	35	
o-Xylene	<0.00201	0.101	0.108	107	0.101	0.106	105	2	70-130	35	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Version: 1.%

BS / BSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order #: 581424 **Project ID:** TBD

Analyst: ALJ **Date Prepared:** 04/13/2018 **Date Analyzed:** 04/13/2018

Lab Batch ID: 3046657 **Sample:** 7642623-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.108	107	0.100	0.102	102	6	70-130	35	
Toluene	<0.00202	0.101	0.104	103	0.100	0.0991	99	5	70-130	35	
Ethylbenzene	<0.00202	0.101	0.106	105	0.100	0.0999	100	6	70-130	35	
m,p-Xylenes	<0.00403	0.202	0.216	107	0.200	0.204	102	6	70-130	35	
o-Xylene	<0.00202	0.101	0.109	108	0.100	0.103	103	6	70-130	35	

Analyst: OJS **Date Prepared:** 04/09/2018 **Date Analyzed:** 04/09/2018

Lab Batch ID: 3046113 **Sample:** 7642283-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	237	95	250	235	94	1	90-110	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Version: 1.%

BS / BSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order #: 581424 **Project ID:** TBD

Analyst: SCM **Date Prepared:** 04/09/2018 **Date Analyzed:** 04/09/2018

Lab Batch ID: 3046194 **Sample:** 7642302-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<5.00	250	248	99	250	240	96	3	90-110	20	

Analyst: ARM **Date Prepared:** 04/06/2018 **Date Analyzed:** 04/06/2018

Lab Batch ID: 3046082 **Sample:** 7642258-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1060	106	1000	1050	105	1	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1100	110	1000	1080	108	2	70-135	20	

Analyst: ARM **Date Prepared:** 04/11/2018 **Date Analyzed:** 04/11/2018

Lab Batch ID: 3046456 **Sample:** 7642442-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1030	103	1000	1020	102	1	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1050	105	1000	1070	107	2	70-135	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Version: 1.%

BS / BSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order #: 581424 **Project ID:** TBD

Analyst: ARM **Date Prepared:** 04/14/2018 **Date Analyzed:** 04/14/2018

Lab Batch ID: 3046716 **Sample:** 7642660-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	950	95	1000	980	98	3	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	951	95	1000	993	99	4	70-135	20	

Analyst: ARM **Date Prepared:** 04/16/2018 **Date Analyzed:** 04/16/2018

Lab Batch ID: 3046890 **Sample:** 7642747-1-BKS **Batch #:** 1 **Matrix:** Solid

Units: mg/kg

BLANK /BLANK SPIKE / BLANK SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Blank Sample Result [A]	Spike Added [B]	Blank Spike Result [C]	Blank Spike %R [D]	Spike Added [E]	Blank Spike Duplicate Result [F]	Blk. Spk Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	1000	1020	102	1000	1080	108	6	70-135	20	
Diesel Range Organics (DRO)	<15.0	1000	1040	104	1000	1100	110	6	70-135	20	

Relative Percent Difference RPD = 200*|(C-F)/(C+F)|
Blank Spike Recovery [D] = 100*(C)/[B]
Blank Spike Duplicate Recovery [G] = 100*(F)/[E]
All results are based on MDL and Validated for QC Purposes

Version: 1.%

Form 3 - MS / MSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order # : 581424 **Project ID:** TBD

Lab Batch ID: 3046073 **QC- Sample ID:** 581330-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/06/2018 **Date Prepared:** 04/06/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00202	0.101	0.105	104	0.100	0.0954	95	10	70-130	35	
Toluene	<0.00202	0.101	0.0989	98	0.100	0.0923	92	7	70-130	35	
Ethylbenzene	<0.00202	0.101	0.0966	96	0.100	0.0893	89	8	70-130	35	
m,p-Xylenes	<0.00403	0.202	0.197	98	0.201	0.183	91	7	70-130	35	
o-Xylene	<0.00202	0.101	0.0986	98	0.100	0.0897	90	9	70-130	35	

Lab Batch ID: 3046223 **QC- Sample ID:** 581425-012 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/09/2018 **Date Prepared:** 04/09/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0833	83	0.100	0.0710	71	16	70-130	35	
Toluene	<0.00200	0.0998	0.0642	64	0.100	0.0559	56	14	70-130	35	X
Ethylbenzene	0.00420	0.0998	0.0571	53	0.100	0.0492	45	15	70-130	35	X
m,p-Xylenes	0.0221	0.200	0.107	42	0.200	0.0927	35	14	70-130	35	X
o-Xylene	0.00906	0.0998	0.0512	42	0.100	0.0447	36	14	70-130	35	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order # : 581424 **Project ID:** TBD

Lab Batch ID: 3046232 **QC- Sample ID:** 581763-004 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/10/2018 **Date Prepared:** 04/10/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.100	0.0887	89	0.101	0.107	106	19	70-130	35	
Toluene	<0.00200	0.100	0.0819	82	0.101	0.101	100	21	70-130	35	
Ethylbenzene	<0.00200	0.100	0.0764	76	0.101	0.100	99	27	70-130	35	
m,p-Xylenes	<0.00401	0.200	0.157	79	0.202	0.205	101	27	70-130	35	
o-Xylene	<0.00200	0.100	0.0787	79	0.101	0.103	102	27	70-130	35	

Lab Batch ID: 3046466 **QC- Sample ID:** 581958-010 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/12/2018 **Date Prepared:** 04/12/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00199	0.0994	0.0878	88	0.0998	0.0932	93	6	70-130	35	
Toluene	<0.00199	0.0994	0.0814	82	0.0998	0.0833	83	2	70-130	35	
Ethylbenzene	<0.00199	0.0994	0.0725	73	0.0998	0.0746	75	3	70-130	35	
m,p-Xylenes	<0.00398	0.199	0.145	73	0.200	0.148	74	2	70-130	35	
o-Xylene	<0.00199	0.0994	0.0757	76	0.0998	0.0746	75	1	70-130	35	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order # : 581424 **Project ID:** TBD

Lab Batch ID: 3046657 **QC- Sample ID:** 581958-024 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/13/2018 **Date Prepared:** 04/13/2018 **Analyst:** ALJ

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

BTEX by EPA 8021B Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Benzene	<0.00200	0.0998	0.0947	95	0.100	0.0868	87	9	70-130	35	
Toluene	<0.00200	0.0998	0.0891	89	0.100	0.0816	82	9	70-130	35	
Ethylbenzene	<0.00200	0.0998	0.0880	88	0.100	0.0790	79	11	70-130	35	
m,p-Xylenes	<0.00399	0.200	0.179	90	0.200	0.159	80	12	70-130	35	
o-Xylene	<0.00200	0.0998	0.0902	90	0.100	0.0795	80	13	70-130	35	

Lab Batch ID: 3046113 **QC- Sample ID:** 581357-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/09/2018 **Date Prepared:** 04/09/2018 **Analyst:** OJS

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	10.5	250	249	95	250	243	93	2	90-110	20	

Lab Batch ID: 3046194 **QC- Sample ID:** 581424-007 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/09/2018 **Date Prepared:** 04/09/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	489	250	695	82	250	737	99	6	90-110	20	X

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order # : 581424 **Project ID:** TBD

Lab Batch ID: 3046194 **QC- Sample ID:** 581424-017 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/09/2018 **Date Prepared:** 04/09/2018 **Analyst:** SCM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

Inorganic Anions by EPA 300/300.1 Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Chloride	<4.96	248	243	98	248	253	102	4	90-110	20	

Lab Batch ID: 3046082 **QC- Sample ID:** 581430-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/06/2018 **Date Prepared:** 04/06/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	967	97	998	977	98	1	70-135	20	
Diesel Range Organics (DRO)	<15.0	998	1020	102	998	1020	102	0	70-135	20	

Lab Batch ID: 3046456 **QC- Sample ID:** 581765-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/11/2018 **Date Prepared:** 04/11/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	1020	102	999	973	97	5	70-135	20	
Diesel Range Organics (DRO)	<15.0	997	1060	106	999	1020	102	4	70-135	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Form 3 - MS / MSD Recoveries

Project Name: Grand Banks-ARU Tank Battery

Work Order # : 581424 **Project ID:** TBD

Lab Batch ID: 3046716 **QC- Sample ID:** 582192-003 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/14/2018 **Date Prepared:** 04/14/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	998	950	95	998	958	96	1	70-135	20	
Diesel Range Organics (DRO)	<15.0	998	977	98	998	993	99	2	70-135	20	

Lab Batch ID: 3046890 **QC- Sample ID:** 582461-001 S **Batch #:** 1 **Matrix:** Soil

Date Analyzed: 04/17/2018 **Date Prepared:** 04/16/2018 **Analyst:** ARM

Reporting Units: mg/kg

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY STUDY

TPH By SW8015 Mod Analytes	Parent Sample Result [A]	Spike Added [B]	Spiked Sample Result [C]	Spiked Sample %R [D]	Spike Added [E]	Duplicate Spiked Sample Result [F]	Spiked Dup. %R [G]	RPD %	Control Limits %R	Control Limits %RPD	Flag
Gasoline Range Hydrocarbons (GRO)	<15.0	997	1020	102	998	1020	102	0	70-135	20	
Diesel Range Organics (DRO)	<15.0	997	1050	105	998	1050	105	0	70-135	20	

Matrix Spike Percent Recovery [D] = 100*(C-A)/B
Relative Percent Difference RPD = 200*|(C-F)/(C+F)|

Matrix Spike Duplicate Percent Recovery [G] = 100*(F-A)/E

ND = Not Detected, J = Present Below Reporting Limit, B = Present in Blank, NR = Not Requested, I = Interference, NA = Not Applicable
N = See Narrative, EQL = Estimated Quantitation Limit, NC = Non Calculable - Sample amount is > 4 times the amount spiked.

Analysis Request of Chain of Custody Record

5901424

Page 1 of 3

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: Grand Banks	Site Manager: Ike Tavarez
Project Name: ARU Tank Battery	
Project Location: (county, state) Lea County, New Mexico	Project #: TBD
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco	Sampler Signature: Clair Gonzales

Comments: Run deeper samples if benzene exceeds 10 mg/kg or total BTEX exceeds 50 mg/kg. Run deeper samples if TPH exceeds 5,000 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Hold
	T-1 0-1	4/3/2018			X				X		1		X		X											X			
	T-1 2	04/03/18			X				X		1		X		X											X			
	T-2 0-1	04/03/18			X				X		1		X		X											X			
	T-2 2	04/03/18			X				X		1		X		X											X			
	T-3 0-1	04/03/18			X				X		1		X		X											X			
	T-3 2	04/03/18			X				X		1		X		X											X			
	T-4 0-1	04/03/18			X				X		1		X		X											X			
	T-4 2	04/03/18			X				X		1		X		X											X			
	T-5 0-1	04/03/18			X				X		1		X		X											X			
	T-5 2	04/03/18			X				X		1		X		X											X			

Relinquished by: Stanley Zuk	Date: 4-5-18	Time: 1015	Received by: [signature]
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

Date: 4/5/18 Time: 10:05

LAB USE ONLY

Sample Temperature

(Circle) HAND D

REMARKS: Standard

- RUSH: Same Day 24 hr 48 hr 72 hr
- Rush Charges Authorized
- Special Report Limits or TRRP Report

Temp: 8.4 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C) 8.4
Corrected Temp:

ORIGINAL COPY

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Analysis Request of Chain of Custody Record

5814424 Page 2 of 3

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland,Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: Grand Banks	Site Manager: Ike Tavarez
Project Name: ARU Tank Battery	
Project Location: (county, state) Lea County, New Mexico	Project #: TBD
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco	Sampler Signature: Clair Gonzales

Comments: Run deeper samples if benzene exceeds 10 mg/kg or total BTEX exceeds 50 mg/kg. Run deeper samples if TPH exceeds 5,000 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING YEAR: DATE	TIME	MATRIX WATER	SOIL		PRESERVATIVE METHOD HCL	HNO_3	ICE			# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)						Hold
	T-5 3	4/3/2018			X				X			1																X								
	T-6 0-1	04/03/18			X				X			1		X		X												X								
	T-6 2	04/03/18			X				X			1		X		X												X								
	T-6 3	04/03/18			X				X			1																X								
	T-6 4	04/03/18			X				X			1																X								
	T-6 6	04/03/18			X				X			1																X								
	T-6 8	04/03/18			X				X			1																X								
	T-6 10	04/03/18			X				X			1																X								
	T-6 12	04/03/18			X				X			1																X								
	T-7 0-1	04/03/18			X				X			1		X		X												X								

Relinquished by: Stanley Dark	Date: 4-5-18	Time: 1015	Received by: [illegible]
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

LAB USE ONLY

Sample Temperature

(Circle) HAND DELI

REMARKS: Standard

RUSH: Same Day 24 hr 48 hr 72 hr

Rush Charges Authorized

Special Report Limits or TRRP Report

Temp: 8.4 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C) 8.6

Corrected Temp:

ORIGINAL COPY

Final 1.002

Analysis Request of Chain of Custody Record

581424

Page 3 of 3

Tetra Tech, Inc.

4000 N. Big Spring Street, Ste
401 Midland, Texas 79705
Tel (432) 682-4559
Fax (432) 682-3946

Client Name: Grand Banks	Site Manager: Ike Tavarez
Project Name: ARU Tank Battery	
Project Location: (county, state) Lea County, New Mexico	Project #: TBD
Invoice to: Tetra Tech, Inc.	
Receiving Laboratory: Xenco	Sampler Signature: Clair Gonzales

Comments: Run deeper samples if benzene exceeds 10 mg/kg or total BTEX exceeds 50 mg/kg. Run deeper samples if TPH exceeds 5,000 mg/kg

ANALYSIS REQUEST (Circle or Specify Method No.)

LAB # (LAB USE ONLY)	SAMPLE IDENTIFICATION	SAMPLING DATE	SAMPLING TIME	MATRIX WATER	MATRIX SOIL	MATRIX	PRESERVATIVE METHOD HCL	PRESERVATIVE METHOD HNO_3	PRESERVATIVE METHOD ICE	PRESERVATIVE METHOD	# CONTAINERS	FILTERED (Y/N)	BTEX 8021B BTEX 8260B	TPH TX1005 (Ext to C35)	TPH 8015M (GRO - DRO - ORO)	PAH 8270C	Total Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	RCI	GC/MS Vol. 8260B / 624	GC/MS Semi. Vol. 8270C/625	PCB's 8082 / 608	NORM	PLM (Asbestos)	Chloride	Chloride Sulfate TDS	General Water Chemistry (see attached list)	Hold
	T-7 2	4/3/2018			X				X		1		X	X													X			
	T-7 4	04/03/18			X				X		1																X			
	T-7 6	04/03/18			X				X		1																X			
	T-7 8	04/03/18			X				X		1																X			
	T-7 10	04/03/18			X				X		1																X			

Relinquished by: Sterling Beeke	Date: 4-5-18	Time: 1015	Received by: [signature]
Relinquished by:	Date:	Time:	Received by:
Relinquished by:	Date:	Time:	Received by:

ORIGINAL COPY

LAB USE ONLY

Sample Temperature

(Circle) HAND DELIVER

REMARKS: Standard

- RUSH: Same Day 24 hr 48 hr 72 hr
- Rush Charges Authorized
- Special Report Limits or TRRP Report

Temp: 8.4 IR ID:R-8

CF:(0-6: -0.2°C)
(6-23: +0.2°C)

Corrected Temp: 8.6

Final 1.002

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XENCO Laboratories
Prelogin/Nonconformance Report- Sample Log-In

Client: Tetra Tech- Midland

Date/ Time Received: 04/05/2018 10:05:00 AM

Work Order #: 581424

Acceptable Temperature Range: 0 - 6 degC
Air and Metal samples Acceptable Range: Ambient

Temperature Measuring device used : R8

Sample Receipt Checklist		Comments
#1 *Temperature of cooler(s)?	8.6	
#2 *Shipping container in good condition?	**Yes**	
#3 *Samples received on ice?	**Yes**	
#4 *Custody Seals intact on shipping container/ cooler?	**N/A**	
#5 Custody Seals intact on sample bottles?	**N/A**	
#6*Custody Seals Signed and dated?	**N/A**	
#7 *Chain of Custody present?	**Yes**	
#8 Any missing/extra samples?	**Yes**	Missing Sample 024
#9 Chain of Custody signed when relinquished/ received?	**Yes**	
#10 Chain of Custody agrees with sample labels/matrix?	**Yes**	
#11 Container label(s) legible and intact?	**Yes**	
#12 Samples in proper container/ bottle?	**Yes**	
#13 Samples properly preserved?	**Yes**	
#14 Sample container(s) intact?	**Yes**	
#15 Sufficient sample amount for indicated test(s)?	**Yes**	
#16 All samples received within hold time?	**Yes**	
#17 Subcontract of sample(s)?	**N/A**	
#18 Water VOC samples have zero headspace?	**N/A**	

*** Must be completed for after-hours delivery of samples prior to placing in the refrigerator**

Analyst: PH Device/Lot#:

Checklist completed by: Brianna Teel Date: 04/05/2018
Brianna Teel

Checklist reviewed by: Jessica Kramer Date: 04/05/2018
Jessica Kramer