



September 7, 2018

Mike Bratcher & Maria Pruett

NMOCD District 2

811 S. First St

Artesia, NM 88210

Re: Closure Report

XTO – Poker Lake Unit 078

NMOCD Reference #: 2RP-3980

Mr. Mike Bratcher & Ms. Maria Pruett:

RXSoil, Inc. is pleased to submit the Closure Report summarizing the on-site soil remediation of produced water and crude oil impacted soil at the Poker Lake Unit (“PLU”) 078 site located in Eddy County, New Mexico.

Sincerely,

A handwritten signature in black ink, appearing to read "Jace Caraway".

Jace Caraway
Chief Operating Officer
RXSoil, Inc.
(940) 210-2051

A handwritten signature in black ink, appearing to read "Zach Robbins".

Zach Robbins
Technical and Engineering Analyst
RXSoil, Inc.
(210) 400-7645

Table of Contents

I.	Introduction.....	3
II.	Regulatory Guidelines	3
III.	Delineation Report	4
IV.	Soil Remediation Activity.....	4
V.	Conclusions.....	5

Figures

1.	Vicinity Map.....	6
2.	Spill Map	7
3.	Hydrology Map	8
4.	Depth to Groundwater Map.....	9
5.	Project Images	10

Appendix

A.	C-141, Release Notification and Corrective Action Document	13
B.	Water Column/Average Depth to Water	15
C.	Delineation Report	
	i. Map	18
	ii. Summary Table.....	19
D.	Excavation Report	
	i. Treatment Cell Map.....	21
	ii. Cell A Shelf Area Map	22
	iii. Flare Stack Area Map.....	23
	iv. Summary Table.....	24
E.	Remediation Report	
	i. Cell A	
	1. Testing Summary Table	28
	2. Sample Map.....	29
	ii. Cell B	
	1. Testing Summary Table	30
	2. Sample Map.....	31
	iii. Cell C	
	1. Testing Summary Table	32
	2. Sample Map.....	33
	iv. Cell D	
	1. Testing Summary Table	34
	2. Sample Map.....	35

I. Introduction

On behalf of XTO Energy, RXSoil, Inc. has prepared this closure report that describes the remedial action of 2RP-3980 at Poker Lake Unit ("PLU") 078 (32.194685, -103.828119), API No. 30-015-27536.

Poker Lake Unit 078 is located in Unit Letter A, Section 25, Township 24S, Range 30E (see "Vicinity Map", *Figure 1*). The C-141 (*Appendix A*), approved November 9, 2016, indicates a storm on November 3 knocked out power to the battery, causing water system tanks to overfill. It was reported that 2,525 barrels of produced water and 130 barrels of oil were released (See "Spill Map", *Figure 2*), and that 2,080 barrels of produced water and 130 barrels of oil were recovered during the initial response. The initial response also included using a dozer to scrape off surface contamination and create piles of this contaminated material to prevent further horizontal spreading of affected areas.

II. Regulatory Guidelines

The New Mexico Water Rights Reporting System indicates the only water source data point within 2,500 meters of the release shows depth to ground water of 400 feet (*Appendix B*). This well is approximately 1.5 miles west of the release (see *Figure 3*). An Eddy County Depth to Ground Water map (*Figure 4*, dated February 2005) signifies depths between 350 and 375 feet. This is evidence that the depth to ground water is greater than 100 feet, scoring zero (0) for that section.

The site is also greater than 1,000 feet from all water sources and any surface water, as shown in the NM OCD Oil and Gas Map with the Hydrology Layer in *Figure 3*.

The ranking score for this site's threat to public health, ground water and environment therefore is zero (0).

Depth to Ground Water:			
(Vertical distance from contaminants to seasonal high water elevation of groundwater)	Less than 50 feet	20 points	
	50 feet to 99 feet	10 points	
	>100 feet	0 points	X
Wellhead Protection Area:			
(Less than 200 feet from a private domestic water source; or less than 1000 feet from all other water sources)	Yes	20 points	
	No	0 points	X
Distance to Surface Water:			
(Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet	20 points	
	200 feet to 1000 feet	10 points	
	>1000 feet	0 points	X
RANKING SCORE (TOTAL POINTS)			0

The target cleanup levels are determined using the *Guidelines for Remediation of Leaks, Spills and Releases* published by the NMOCD (August 13, 1993). The Recommended Remediation Action Levels (RRAL) for the associated classification are **10** parts per million (ppm) benzene, **50** ppm combined benzene, toluene, ethyl benzene, and total xylenes (BTEX), **5,000** ppm total petroleum hydrocarbons (TPH) and **600** ppm chlorides.

Post-remediation discrete confirmation samples were collected and properly packaged, preserved

and transported to Cardinal Laboratories in Hobbs, NM to be analyzed for BTEX (Method 8021), TPH (Method 8015) and chloride (Method 4500).

III. Delineation Report

RXSoil contracted Atkins Engineering Associates to conduct vertical delineation by drilling four bore holes throughout the impacted regions. Field screenings were taken throughout the process and drilling continued until there was 10' vertical depth of chloride readings less than or equal to 600 ppm.

Samples were tested by Cardinal Laboratories in Hobbs, NM. A delineation map and summary table of results can be found in *Appendix C*, while the full laboratory report can be found in *Appendix F*.

Horizontal delineation was conducted during excavation. This process is outlined in **Section IV**.

IV. Soil Remediation Activity

The remediation of this release was combined with the remediation of nearby 2RP-3503 (PLU 139). Impacted material from PLU 139 was excavated to a depth of 4' and replaced with clean material from an area adjacent to PLU 078. The verification that all material was clean is described in more detail in the Closure Report for 2RP-3503, submitted May 11, 2018.

RXSoil excavated four treatment cells with a depth of 4' at PLU 078 for in-situ remediation of soil impacted by produced water and crude oil. Sidewall samples were collected along the outer edges of treatment cells to guide excavation. Excavation occurred until field screenings tested below threshold for chlorides. Bottom samples were also collected throughout the excavation area. Sidewall and bottom samples were transferred on ice and tested by Cardinal Laboratories.

During the initial response to the release, a pile of contaminated material was contained to one area near the flare stack. A small area around this pile was determined to be above threshold for chlorides. Excavation occurred in this area to a depth of 4' until all sidewalls tested below limit. Two bottom samples were collected from this area as well. All final samples were field screened for chlorides and sent on ice to Cardinal Laboratories in Hobbs, NM for chloride, TPH and BTEX testing.

Maps of all sidewall and bottom samples, as well as the summary table of all excavation results can be seen in *Appendix D*.

Polyliner was placed on the bottom and sides of the treatment cell area, as demarcated on the Treatment Cell Map in *Appendix D*, to contain treatment. Bottom samples in the flare area at 4' depth tested above RRAL for chlorides and polyliner was placed on the subsurface before backfill with clean material. After impacted material was placed into the treatment cells, a proprietary delivery system was installed to apply RXSoil chemicals for remediation of the soil. At no point did contaminated material come into contact with clean soil following excavation.

A proprietary blend of chemicals and microbial agents was applied to extract the contaminants. Chemicals used in the process were all collected in sump areas, located in a corner of each of the four cells, and properly disposed of.

Samples were collected throughout the treatment process to monitor progress. Upon completion of remediation in each cell, closure samples were collected at various depths throughout the treatment cells. These samples were put on ice, field screened, and a portion of these were transported to Cardinal Laboratories for chloride, TPH and BTEX testing. Remediation continued until all treatment samples tested below thresholds, as listed in **Section II**.

A full remediation report can be found as *Appendix E*. This includes a summary table and sample maps for each cell.

All corresponding lab reports are in the attachment *Lab Report Compilation for 2RP-3980*.

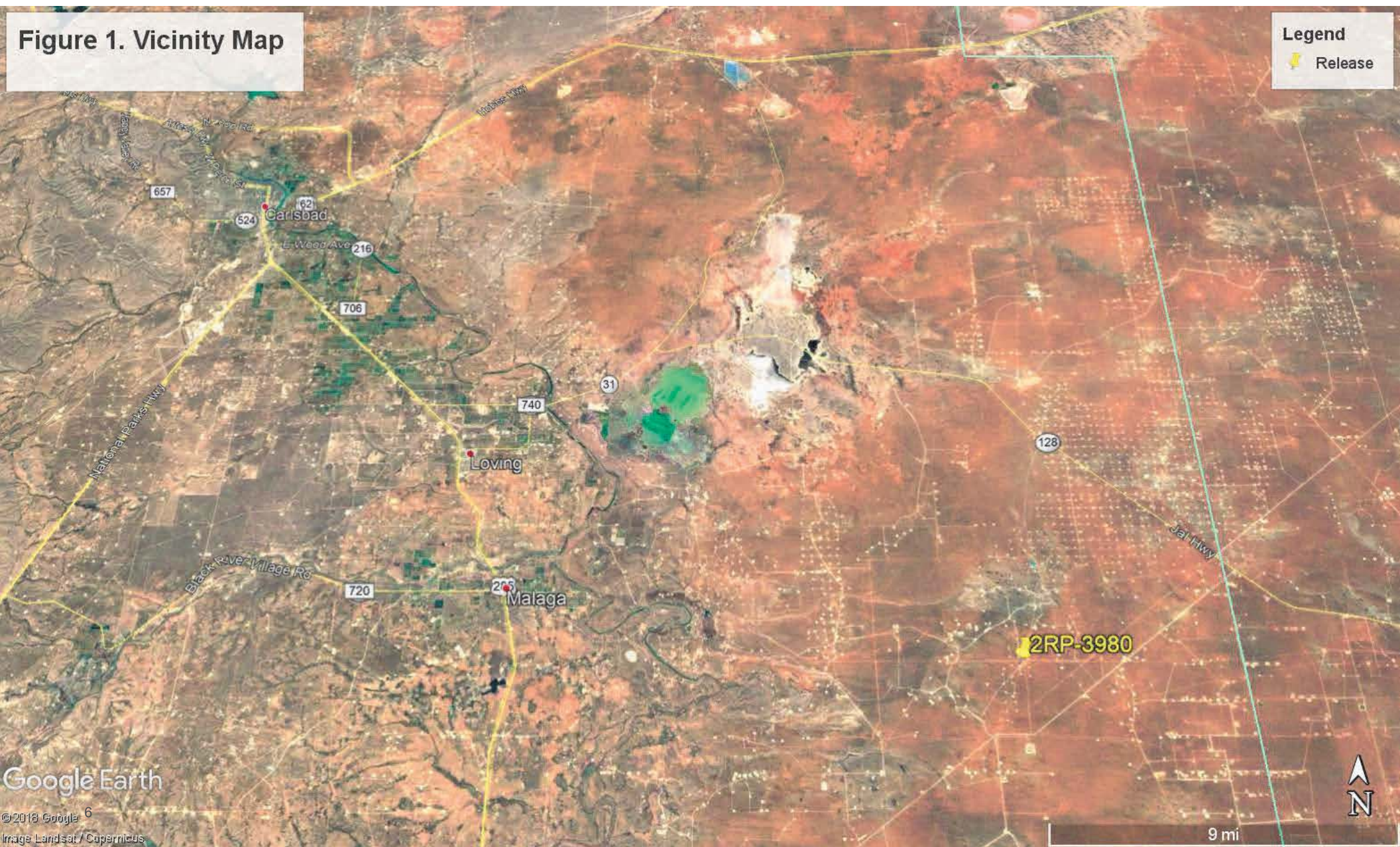
V. Conclusions

The area was contoured to the surrounding surface landscape and hydroseeded with BLM #2 seed mix as directed by the New Mexico Bureau of Land Management (“BLM”).

RXSoil is pleased to submit this Closure Report on behalf of XTO to the NMOCD. Laboratory results show all excavation and final confirmation tests of chloride, BTEX and TPH concentrations to be below thresholds set by the NMOCD.

RXSoil is recommending no further action be taken in the remediation of the release 2RP-3980.

Figure 1. Vicinity Map

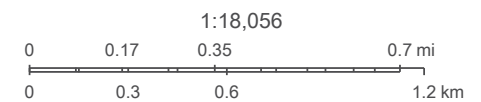
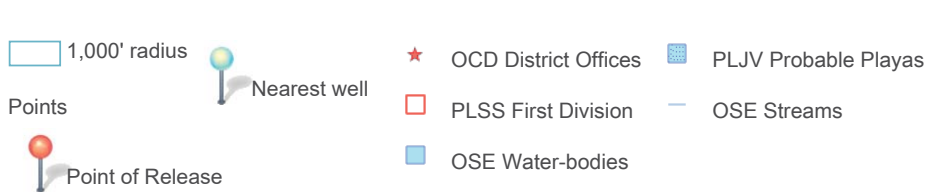
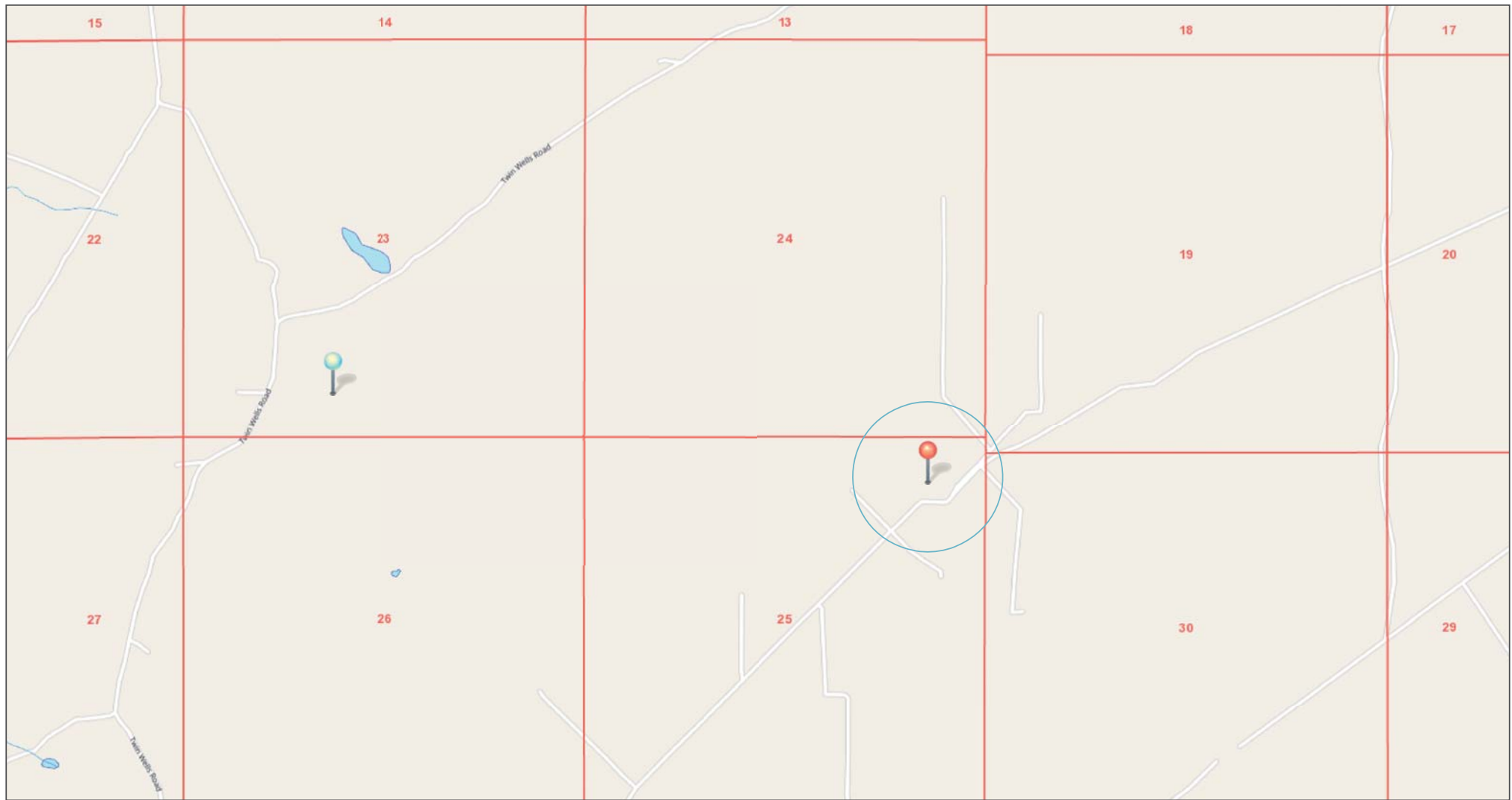


Legend
Release

Figure 2. Spill Map

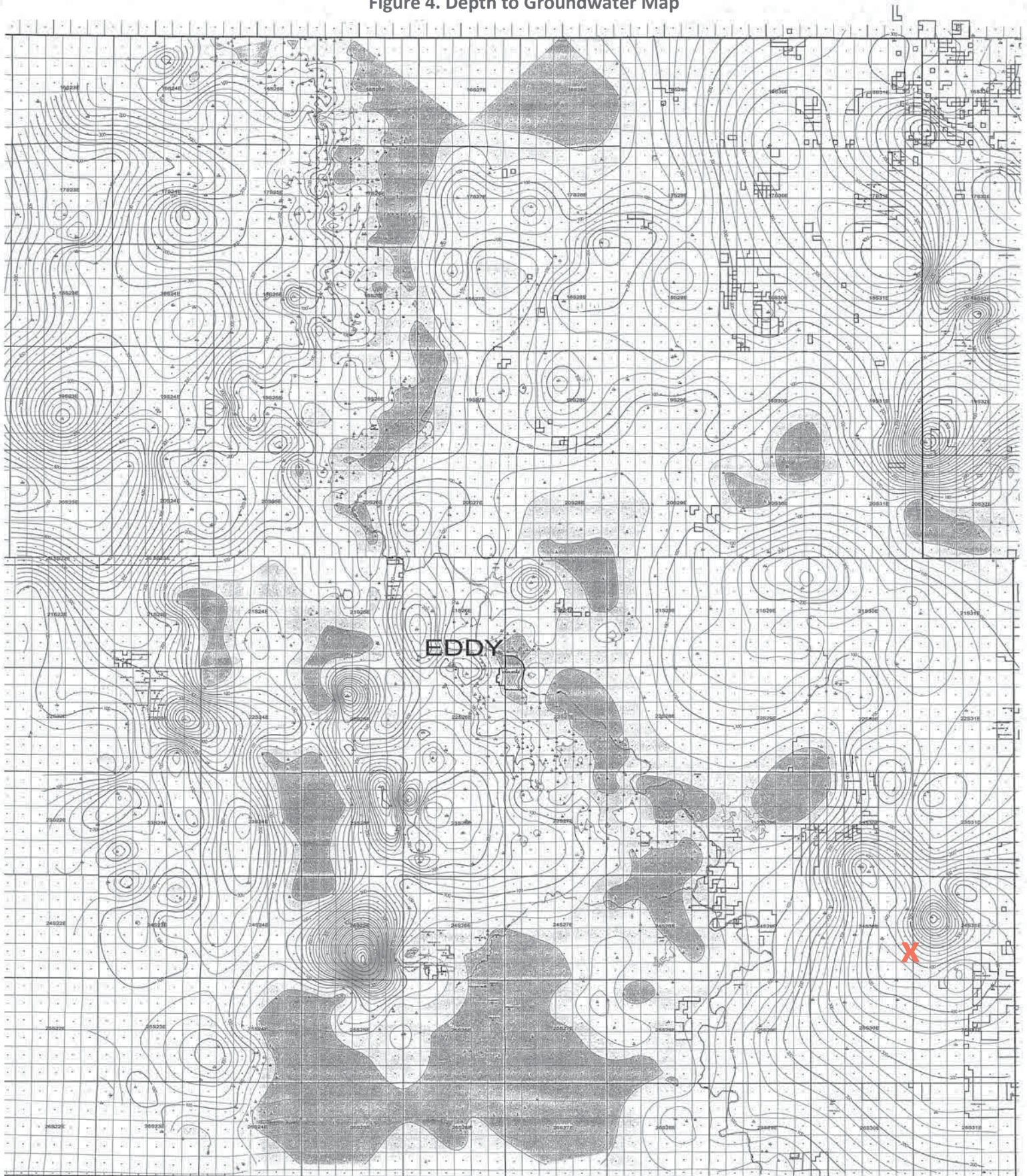


Figure 3. Hydrology Map



© OpenStreetMap (and) contributors, CC-BY-SA, OCD, BLM

Figure 4. Depth to Groundwater Map



x - Release Location

ChevronTexaco	
Eddy Co. Depth To Ground Water	
Water Wells	
Facilities	
Mapa Contorno	20000
Scale 1:100000	

Figure 5. Project Images

Nov. 14th, 2016 – Drone shot overview



Nov. 14th, 2016 – Pile of dozed impacted material



Figure 5. Project Images

Jan. 16th, 2018 – Excavation to 4'



June 25th, 2018 – Post-remediation



Figure 5. Project Images

June 26th, 2018 – Post-hydroseeding



July 31st, 2018 – Growth present



APPENDIX A

C-141, RELEASE NOTIFICATION AND CORRECTIVE ACTION DOCUMENT

NM OIL CONSERVATION

ARTESIA DISTRICT

NOV 08 2016

Form C-141
Revised August 8, 2011

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

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

RECEIVED

Release Notification and Corrective Action

NAB1631435420 **OPERATOR** ☒ Initial Report ☐ Final Report

Name of Company: BOPCO, L.P. 200737	Contact: Bradley Blevins
Address: 522 W. Mermod, Suite 704 Carlsbad, N.M. 88220	Telephone No. 575-887-7329
Facility Name: Poker Lake Unit 78	Facility Type: Exploration and Production
Surface Owner: Federal	Mineral Owner: API No. 30-015-27536

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
A	25	24S	30E	660		660		Eddy

Latitude: 32.194685 Longitude: 103.828119

NATURE OF RELEASE

Type of Release: Crude Oil/ Produced Water	Volume of Release: 2525 barrels PW 130 barrels Oil	Volume Recovered: 2080 PW Recovered 130 barrels Oil recovered
Source of Release: Power failure at the battery causing PW system tanks to overflow, filling and overflowing containment.	Date and Hour of Occurrence: 11-3-16 @ 12:32am	Date and Hour of Discovery 11-3-16 @ 7:00am
Was Immediate Notice Given? ☒ Yes ☐ No ☐ Not Required	If YES, To Whom? Mike Bratcher, Heather Patterson, Jim Amos via email	
By Whom? Bradley Blevins	Date and Hour: 11-3-16 @ 12:37pm	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

BOPCO EHS was notified of a release that occurred at the PLU 78, storms in the area knocked out power to the battery causing water system tanks to fill and run over. The fluid filled the containment and overflowed to the ground surface. Vacuum trucks were called to the location and recovered 2210 barrels from the containment and ground surface combined.

Describe Area Affected and Cleanup Action Taken.*

Vacuum trucks were called to the location and recovered 2210 barrels from the containment and ground surface combined. An initial response crew was dispatched to the site and began scraping up the saturated surface soil.

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: <u>Bradley Blevins</u>		OIL CONSERVATION DIVISION	
Printed Name: Bradley Blevins		Signed By: <u>Mike Bratcher</u> Approved by Environmental Specialist:	
Title: Assistant Remediation Foreman		Approval Date: <u>11/9/16</u>	Expiration Date: <u>N/A</u>
E-mail Address: bblevins@basspet.com		Conditions of Approval:	Attached ☒
Date: <u>11-8-16</u> Phone: 432-214-3704			

* Attach Additional Sheets If Necessary

2RP-3480

APPENDIX B

WATER COLUMN/AVERAGE DEPTH TO WATER



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	Distance	DepthWell	DepthWater	Water Column
C_03558 POD1		CUB	ED	1	2	2	25	24S	30E	610412	3562651	57	20	0	20
C_03558 POD2		CUB	ED	1	2	2	25	24S	30E	610412	3562651	57	20	0	20
C_03558 POD3		CUB	ED	1	2	2	25	24S	30E	610412	3562651	57	25	0	25
C_03558 POD4		CUB	ED	1	2	2	25	24S	30E	610412	3562651	57	25	0	25
C_03558 POD5		CUB	ED	1	2	2	25	24S	30E	610412	3562651	57	30	0	30
C_03702 POD1		CUB	ED	4	1	4	24	24S	30E	610092	3563204	692	20		
C_02781		CUB	ED	4	3	2	23	24S	30E	608535	3563657*	2187	624		
C_02782		CUB	ED	4	3	2	23	24S	30E	608535	3563657*	2187	808		
C_02780		CUB	ED	2	3	2	23	24S	30E	608535	3563857*	2288	505		
C_02110		CUB	ED		4	3	23	24S	30E	608036	3562950*	2445	600	400	200
Average Depth to Water:														66 feet	
Minimum Depth:														0 feet	
Maximum Depth:														400 feet	

Record Count: 10

UTMNAD83 Radius Search (in meters):

Easting (X): 610459.21

Northing (Y): 3562617.42

Radius: 2500

*UTM location was derived from PLSS - see Help

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

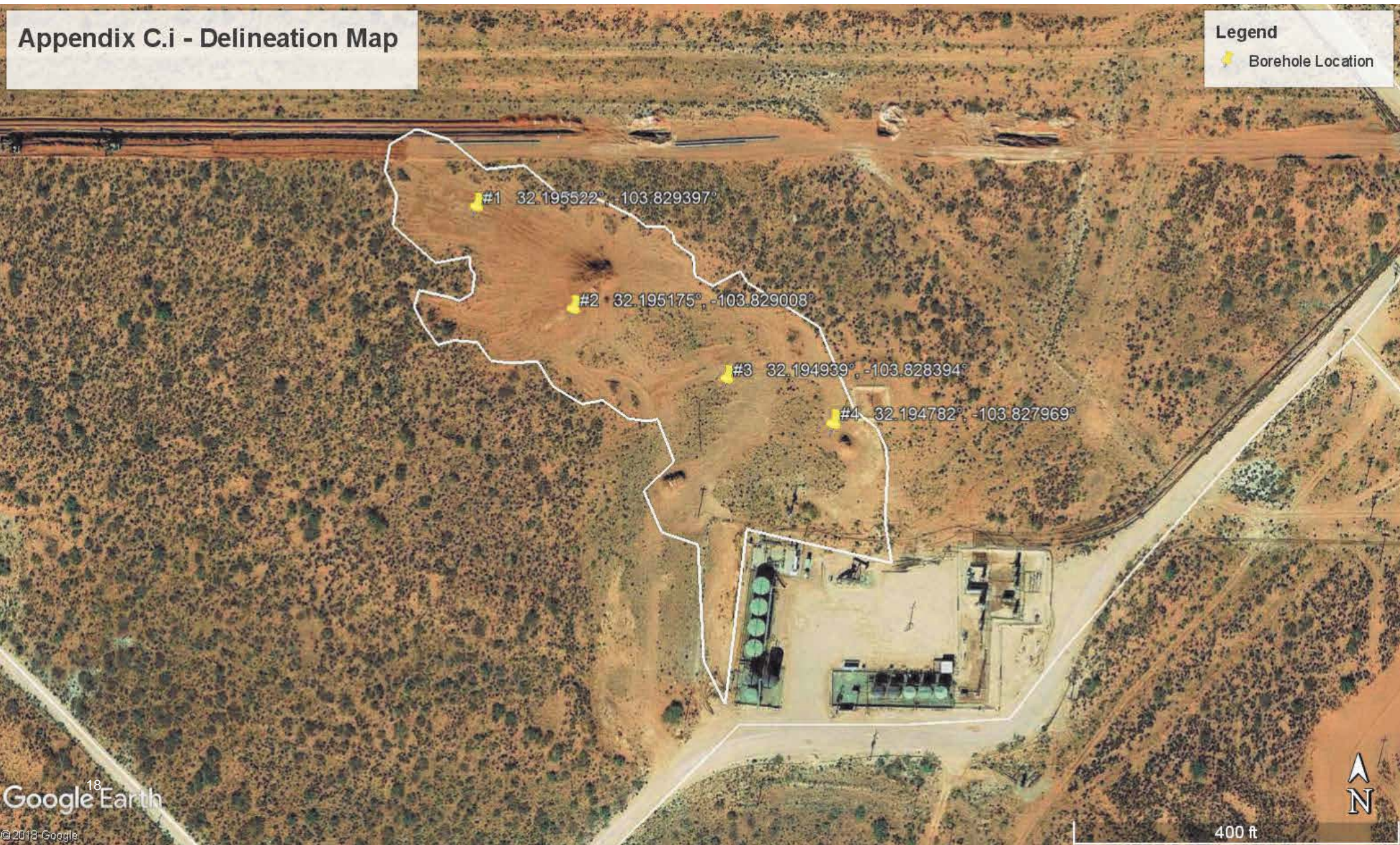
APPENDIX C

DELINEATION REPORT

Appendix C.i - Delineation Map

Legend

 Borehole Location



PLU 078 Delineation Summary Table							
Sample Date: 12/05/2017			Submittal Date: 12/06/2017		Laboratory: Cardinal Laboratories		
Borehole	Depth (ft)	Lab ID Sample	Chloride		Benzene	BTEX	TPH
			Field Screening	Method 4500	8021B		8015M
1	1	078 BH 1.1'	-	2600	<0.050	<0.300	720
1	2	078 BH 1.2'	-	2320	<0.050	<0.300	1107
1	3	078 BH 1.3'	-	1920	<0.050	<0.300	1032
1	4-6	078 BH 1.4-6'	ND	32	<0.050	<0.300	<30
1	9-11	078 BH 1.9-11'	ND	32	<0.050	<0.300	<30
1	19-21	078 BH 1.19-21'	ND	112	<0.050	<0.300	<30
2	1	078 BH 2.1'	1784	2400	<0.050	<0.300	1100
2	2	078 BH 2.2'	-	304	<0.050	<0.300	178
2	3	078 BH 2.3'	-	1680	<0.050	<0.300	<30
2	4-6	078 BH 2.4-6'	-	8260	<0.050	<0.300	<30
2	9-11	078 BH 2.9-11'	-	176	<0.050	<0.300	<30
2	19-21	078 BH 2.19-21'	-	144	<0.050	<0.300	<30
3	1	078 BH 3.1'	2964	3880	<0.050	<0.300	2529
3	2	078 BH 3.2'	7380	5760	<0.050	<0.300	2033
3	3	078 BH 3.3'	-	7200	<0.050	<0.300	1327
3	4-6	078 BH 3.4-6'	2716	5120	<0.050	<0.300	11.4
3	9-11	078 BH 3.9-11'	128	144	<0.050	<0.300	<30
3	19-21	078 BH 3.19-21'	-	224	<0.050	<0.300	<30
4	1	078 BH 4.1'	-	1410	<0.050	0.268	4486
4	2	078 BH 4.2'	-	3600	<0.050	0.307	4045
4	3	078 BH 4.3'	3520	4720	<0.050	<0.300	1628
4	4-6	078 BH 4.4-6'	ND	96	<0.050	<0.300	14
4	9-11	078 BH 4.9-11'	ND	32	<0.050	<0.300	<30
4	19-21	078 BH 4.19-21'	-	576	<0.050	<0.300	<30
-	-	PILE #1	4512	4400	<0.050	<0.300	13348
-	-	PILE #2	-	4530	<0.050	<0.300	14173
-	-	FLAME PILE #3	4512	4880	<0.050	1.18	3252
NMOCD Thresholds				600	10	50	5000

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

Submitted 12/19/2017

APPENDIX D

EXCAVATION REPORT

Excavation - Treatment Cell Area Map

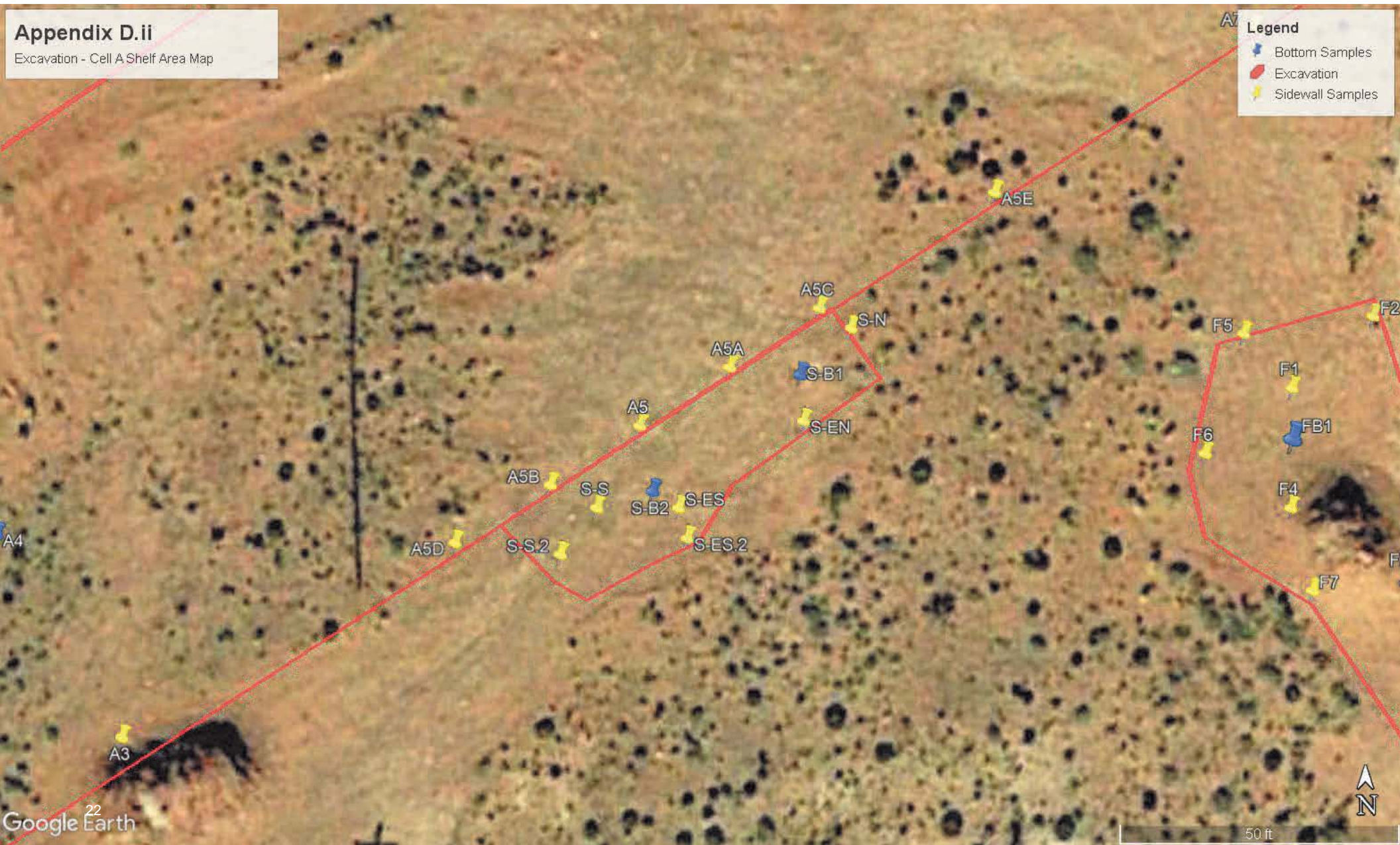
- Bottom Samples
- Excavation
- Sidewall Samples

100 ft

AN

Appendix D.ii

Excavation - Cell A Shelf Area Map



Appendix D.iii

Excavation - Flare Stack Area Map

Legend

- Bottom Samples
- Excavation
- Sidewall Samples



Appendix D.iv: Excavation Report									(1/3)
						Laboratory: Cardinal Laboratories			
Cell	Map ID	Lab ID Sample	Sidewall or Bottom	Sample Date	Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
A	A1	SPA 1.2	Sidewall	2/12/2018	ND	144	<0.050	<0.300	<30
A	A2	SPA 2.4	Sidewall	2/12/2018	ND	80.0	<0.050	<0.300	<30
A	A3	SPA 3.4	Sidewall	2/12/2018	204	304	<0.050	<0.300	79.3
A	A4	SPA 4.4	Bottom	2/12/2018	-	512	<0.050	<0.300	12.2
A	A5	SPA 5.2	Sidewall	2/12/2018	10,000+	13,300	<0.050	<0.300	<30
A	A5A	-	Sidewall	2/12/2018	600+	-	-	-	-
A	A5B	-	Sidewall	2/12/2018	600+	-	-	-	-
A	A5C	-	Sidewall	2/12/2018	600+	-	-	-	-
Shelf	S-N	SHF - N	Sidewall	5/10/2018	ND	48.0	<0.050	<0.300	<30
Shelf	S-EN	SHF - E - N	Sidewall	5/10/2018	ND	32.0	<0.050	<0.300	<30
Shelf	S-ES	SHF - E - S	Sidewall	5/10/2018	2,040	-	-	-	-
Shelf	S-ES.2	SHF - E - S.2	Sidewall	5/10/2018	ND	80.0	<0.050	<0.300	<30
Shelf	S-S	SHF - S	Sidewall	5/10/2018	508	-	-	-	-
Shelf	S-S.2	SHF - S.2	Sidewall	5/10/2018	508	640	<0.050	<0.300	<30
Shelf	S-B1	SHF - B1	Bottom	5/10/2018	508	736	<0.050	<0.300	<30
Shelf	S-B2	SHF - B2	Bottom	5/10/2018	3,232	944	<0.050	<0.300	<30
A	A5E	SPA 5E-2	Sidewall	2/10/2018	ND	128	<0.050	<0.300	<30
A	A5D	SPA 5D-2	Sidewall	2/10/2018	260	368	<0.050	<0.300	<30
A	A6	SPA 6.4	Bottom	2/12/2018	-	400	<0.050	<0.300	<30
A	A7	SPA 7.4	Sidewall	2/12/2018	ND	16.0	<0.050	<0.300	<30
A	A8	SPA 8.4	Sidewall	2/12/2018	ND	32.0	<0.050	<0.300	<30
A	A9	SPA 9.2	Sidewall	2/12/2018	ND	48.0	<0.050	<0.300	<30
B	B1.5	B1.078 SP 5	Sidewall	1/17/2018	ND	16.0	-	-	<30
B	B1.6	B1.078 SP 6	Sidewall	1/17/2018	ND	16.0	-	-	<30
NMOC thresholds					600	600	10	50	5000

All results reported in mg/kg (milligrams per kilogram)

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

Green indicates excavation continued beyond that sidewall

Appendix D.iv: Excavation Report									(2/3)
						Laboratory: Cardinal Laboratories			
Cell	Map ID	Lab ID Sample	Sidewall or Bottom	Sample Date	Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
B	B2.9	B2.078 SP 9	Sidewall	1/13/2018	ND	48.0	-	-	<30
B	B3.9	B3.078 SP 9	Bottom	1/22/2018	ND	80.0	-	-	<30
B	B3.12	B3.078 SP 12	Sidewall	1/22/2018	ND	176	-	-	110
B	B3.15	B3.078 SP 15	Sidewall	1/22/2018	ND	32.0	-	-	<30
B	B3.18	B3.078 SP 18	Sidewall	1/22/2018	ND	32.0	-	-	<30
C	C1	SPC 1.2	Sidewall	2/16/2018	128	96.0	<0.050	<0.300	<30
C	C2	SPC 2.2	Sidewall	2/16/2018	128	80.0	<0.050	<0.300	<30
C	C3	SPC 3.4	Bottom	2/16/2018	3,824	3,600	<0.050	<0.300	322
C	C4	SPC 4.4	Bottom	2/16/2018	796	592	<0.050	<0.300	186
C	C5	SPC 5.2	Sidewall	2/16/2018	ND	32.0	<0.050	<0.300	<30
C	C6	SPC 6.2	Sidewall	2/16/2018	ND	<16.0	<0.050	<0.300	<30
C	C7	SPC 7.4	Bottom	2/16/2018	680	592	<0.050	<0.300	33.4
C	C8	SPC 8.4	Bottom	2/16/2018	860	1,220	<0.050	<0.300	100
D	D1	D. 078 SP1 - NW	Sidewall	2/3/2018	ND	-	-	-	-
D	D2	D. 078 SP2 - NW	Sidewall	2/3/2018	ND	64.0	<0.050	<0.300	<30
D	D3	D. 078 SP3 - NW	Sidewall	2/3/2018	1,312	-	-	-	-
D	D3.2	D. 078 SP3.2 - NW	Sidewall	2/3/2018	ND	-	-	-	-
D	D4	D. 078 SP4 - NW	Sidewall	2/3/2018	ND	32.0	<0.050	<0.300	<30
D	D5	D. 078 SP5 - NW	Sidewall	2/3/2018	ND	-	-	-	-
D	D6	D. 078 SP6 - WW	Sidewall	2/3/2018	ND	32.0	<0.050	<0.300	<30
D	D7	D. 078 SP7 - SW	Sidewall	2/3/2018	ND	-	-	-	-
D	D8	D. 078 SP8 - SW	Sidewall	2/3/2018	ND	16.0	<0.050	<0.300	<30
D	D9	D. 078 SP9 - SW	Sidewall	2/3/2018	ND	-	-	-	-
D	D10	D. 078 SP10 - SW	Sidewall	2/3/2018	ND	-	-	-	-
NMOCD Thresholds					600	600	10	50	5000

All results reported in mg/kg (milligrams per kilogram)

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

Green indicates excavation continued beyond that sidewall

Appendix D.iv: Excavation Report									(3/3)
					Laboratory: Cardinal Laboratories				
Cell	Map ID	Lab ID Sample	Sidewall or Bottom	Sample Date	Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
D	D17	D. 078 SP17 - B	Bottom	2/3/2018	ND	-	-	-	-
D	D18	D. 078 SP18 - B	Bottom	2/3/2018	ND	32.0	<0.050	<0.300	<30
FLR	F1	FLR 1	Sidewall	5/10/2018	844	-	-	-	-
FLR	F2	FLR 2	Sidewall	5/10/2018	124	544	<0.050	<0.300	<30
FLR	F3	FLR 3	Sidewall	5/10/2018	ND	48	<0.050	<0.300	<30
FLR	F4	FLR 4	Sidewall	5/10/2018	2,032	-	-	-	-
FLR	F5	FLR 5	Sidewall	5/10/2018	144	176	<0.050	<0.300	<30
FLR	F6	FLR 6	Sidewall	5/10/2018	224	240	<0.050	<0.300	11.7
FLR	F7	FLR 7	Sidewall	5/10/2018	292	448	<0.050	<0.300	<30
FLR	F8	FLR 8	Sidewall	5/10/2018	ND	32	<0.050	<0.300	<30
FLR	FB1	FLR B1	Bottom	5/10/2018	292	1250	<0.050	<0.300	<30
FLR	FB2	FLR B2	Bottom	5/10/2018	292	432	<0.050	<0.300	<30
NMOCD Thresholds					600	600	10	50	5000

All results reported in mg/kg (milligrams per kilogram)

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

Green indicates excavation continued beyond that sidewall

APPENDIX E

REMEDIATION REPORT

Appendix E.i.1: Cell A Remediation Sampling									
					Laboratory: Cardinal Laboratories				
Cell	Location	Depth	Lab ID Sample	Sample Date	Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
A	A	4	A:SP A-4'	4/26/2018	128	80	<0.050	<0.300	<30
A	A	S	A:SP A-S'	4/26/2018	ND	-	-	-	-
A	B	2	A:SP B-2'	4/26/2018	ND	32	<0.050	<0.300	72.9
A	B	3	A:SP B-3'	4/26/2018	128	-	-	-	-
A	C	3	A:SP C-3'	4/26/2018	ND	48	<0.050	<0.300	<30
A	C	1	A:SP C-1'	4/26/2018	ND	-	-	-	-
A	D	2	A:SP D-2'	4/26/2018	ND	48	<0.050	<0.300	13.2
A	D	3	A:SP D-3'	4/26/2018	ND	-	-	-	-
A	E	4	A:SP E-4'	4/26/2018	ND	32	<0.050	<0.300	<30
A	E	S	A:SP E-S'	4/26/2018	328	-	-	-	-
A	F	2	A:SP F-2'	4/26/2018	ND	16	<0.050	<0.300	17.7
A	F	3	A:SP F-3'	4/26/2018	ND	-	-	-	-
A	G	3	A:SP G-3'	4/26/2018	ND	32	<0.050	<0.300	<30
A	G	1	A:SP G-1'	4/26/2018	4,512	-	-	-	-
A	G	1	A:SP G-1'	4/29/2018	328	-	-	-	-
A	H	2	A:SP H-2'	4/26/2018	ND	48	<0.050	<0.300	57.0
A	H	4	A:SP H-4'	4/26/2018	ND	-	-	-	-
A	I	3	A:SP I-3'	4/26/2018	ND	320	<0.050	<0.300	22.4
A	I	2	A:SP I-2'	4/26/2018	204	-	-	-	-
A	J	2	A:SP J-2'	4/26/2018	ND	64	<0.050	<0.300	67.2
A	J	S	A:SP J-S'	4/26/2018	ND	-	-	-	-
A	K	1	A:SP K-1'	4/26/2018	176	64	<0.050	<0.300	38.0
A	K	3	A:SP K-3'	4/26/2018	ND	-	-	-	-
A	L	4	A:SP L-4'	4/26/2018	ND	272	<0.050	<0.300	18.2
A	L	S	A:SP L-S'	4/26/2018	1,752	-	-	-	-
A	L	S	A:SP L-S'	4/29/2018	ND	-	-	-	-
A	M	1	A:SP M-1'	4/26/2018	ND	32	<0.050	<0.300	<30
A	M	3	A:SP M-3'	4/26/2018	ND	-	-	-	-
A	N	4	A:SP N-4'	4/26/2018	ND	48	<0.050	<0.300	<30
A	N	S	A:SP N-S'	4/26/2018	ND	-	-	-	-
A	O	1	A:SP O-1'	4/26/2018	ND	96	<0.050	<0.300	141
A	O	3	A:SP O-3'	4/26/2018	128	-	-	-	-
A	P	S	A:SP P-S'	4/26/2018	ND	-	-	-	-
A	P	2	A:SP P-2'	4/26/2018	ND	-	-	-	-
A	Q	1	A:SP Q-1'	4/26/2018	328	-	-	-	-
A	Q	3	A:SP Q-3'	4/26/2018	ND	-	-	-	-
A	R	2	A:SP R-2'	4/26/2018	ND	-	-	-	-
A	R	4	A:SP R-4'	4/26/2018	ND	-	-	-	-
A	S	3	A:SP S-3'	4/26/2018	ND	-	-	-	-
A	S	1	A:SP S-1'	4/26/2018	ND	-	-	-	-
A	T	4	A:SP T-4'	4/26/2018	ND	-	-	-	-
A	T	1	A:SP T-1'	4/26/2018	ND	-	-	-	-
A	U	S	A:SP U-S'	4/26/2018	ND	-	-	-	-
A	U	2	A:SP U-2'	4/26/2018	ND	-	-	-	-
A	V	1	A:SP V-1'	4/26/2018	152	-	-	-	-
A	V	3	A:SP V-3'	4/26/2018	ND	-	-	-	-
A	W	2	A:SP W-2'	4/26/2018	292	-	-	-	-
A	W	4	A:SP W-4'	4/26/2018	ND	-	-	-	-
NMOCD Thresholds					600	600	10	50	5000

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

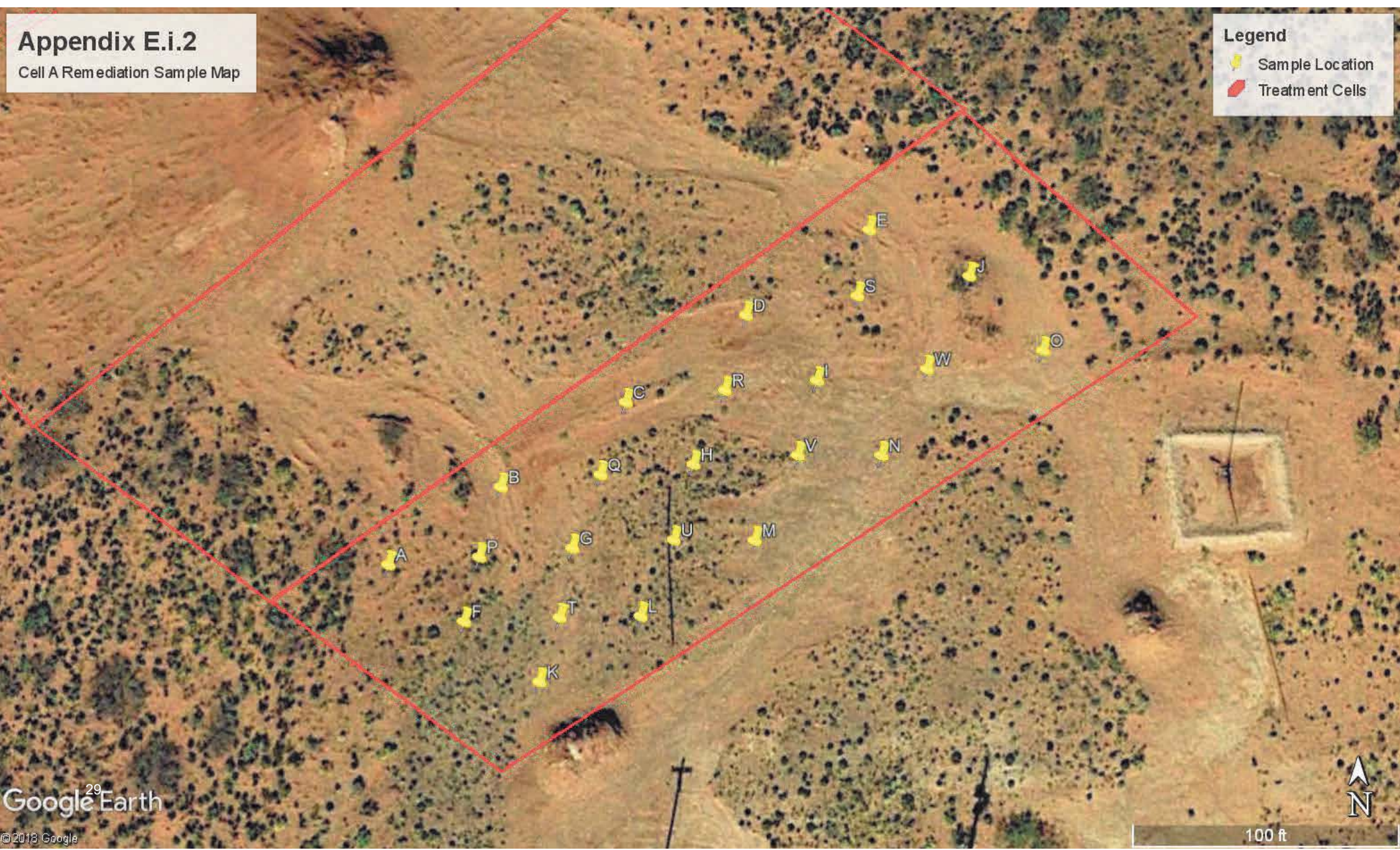
Green indicates remediation continued, see following sample

Appendix E.i.2

Cell A Remediation Sample Map

Legend

-  Sample Location
-  Treatment Cells



Appendix E.ii.1: Cell B Remediation Sampling									
Cell	Location	Depth	Lab ID Sample	Sample Date	Laboratory: Cardinal Laboratories				
					Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
B	A	4	B:SP A-4'	5/6/2018	ND	80	<0.050	<0.300	<30
B	A	5	B:SP A-S'	5/6/2018	ND	-	-	-	-
B	B	2	B:SP B-2'	5/6/2018	168	240	<0.050	<0.300	23.8
B	B	3	B:SP B-3'	5/6/2018	290	-	-	-	-
B	C	3	B:SP C-3'	5/6/2018	ND	-	-	-	-
B	C	1	B:SP C-1'	5/6/2018	224	176	<0.050	<0.300	586
B	D	2	B:SP D-2'	5/6/2018	844	-	-	-	-
B	D	2	B:SP D-2'	5/8/2018	1,136	-	-	-	-
B	D	2	B:SP D-2'	5/9/2018	144	192	<0.050	<0.300	<30
B	D	3	B:SP D-3'	5/6/2018	1,520	-	-	-	-
B	D	3	B:SP D-3'	5/8/2018	1,312	-	-	-	-
B	D	3	B:SP D-3'	5/9/2018	144	240	<0.050	<0.300	<30
B	E	4	B:SP E-4'	5/6/2018	292	368	<0.050	<0.300	16.7
B	E	5	B:SP E-S'	5/6/2018	356	-	-	-	-
B	F	2	B:SP F-2'	5/6/2018	ND	64	<0.050	<0.300	<30
B	F	3	B:SP F-3'	5/6/2018	196	-	-	-	-
B	G	3	B:SP G-3'	5/6/2018	ND	32	<0.050	<0.300	163
B	G	1	B:SP G-1'	5/6/2018	ND	-	-	-	-
B	H	2	B:SP H-2'	5/6/2018	ND	32	<0.050	<0.300	<30
B	H	4	B:SP H-4'	5/6/2018	ND	-	-	-	-
B	I	3	B:SP I-3'	5/6/2018	168	176	<0.050	<0.300	82
B	I	1	B:SP I-1'	5/6/2018	ND	-	-	-	-
B	J	2	B:SP J-2'	5/6/2018	ND	32	<0.050	<0.300	<30
B	J	5	B:SP J-S'	5/6/2018	ND	-	-	-	-
B	K	1	B:SP K-1'	5/6/2018	ND	32	<0.050	<0.300	<30
B	K	3	B:SP K-3'	5/6/2018	ND	-	-	-	-
B	L	4	B:SP L-4'	5/6/2018	224	272	<0.050	<0.300	<30
B	L	5	B:SP L-S'	5/6/2018	396	-	-	-	-
B	M	1	B:SP M-1'	5/6/2018	ND	48	<0.050	<0.300	<30
B	M	3	B:SP M-3'	5/6/2018	ND	-	-	-	-
B	N	4	B:SP N-4'	5/6/2018	1,220	-	-	-	-
B	N	4	B:SP N-4'	5/8/2018	ND	32	<0.050	<0.300	195
B	N	5	B:SP N-S'	5/6/2018	144	-	-	-	-
B	O	1	B:SP O-1'	5/6/2018	ND	32	<0.050	<0.300	<30
B	O	3	B:SP O-3'	5/6/2018	ND	-	-	-	-
B	P	5	B:SP P-S'	5/6/2018	144	-	-	-	-
B	P	2	B:SP P-2'	5/6/2018	120	-	-	-	-
B	Q	1	B:SP Q-1'	5/6/2018	ND	-	-	-	-
B	Q	3	B:SP Q-3'	5/6/2018	ND	-	-	-	-
B	R	2	B:SP R-2'	5/6/2018	ND	-	-	-	-
B	R	4	B:SP R-4'	5/6/2018	ND	-	-	-	-
B	S	1	B:SP S-1'	5/6/2018	ND	-	-	-	-
B	S	3	B:SP S-3'	5/6/2018	ND	-	-	-	-
B	T	4	B:SP T-4'	5/6/2018	ND	-	-	-	-
B	T	2	B:SP T-2'	5/6/2018	ND	-	-	-	-
B	U	5	B:SP U-S'	5/6/2018	ND	-	-	-	-
B	U	2	B:SP U-2'	5/6/2018	ND	-	-	-	-
B	V	1	B:SP V-1'	5/6/2018	ND	-	-	-	-
B	V	3	B:SP V-3'	5/6/2018	124	-	-	-	-
B	W	2	B:SP W-2'	5/6/2018	ND	-	-	-	-
B	W	4	B:SP W-4'	5/6/2018	ND	-	-	-	-
NMOCD Thresholds					600	600	10	50	5000

BOLD results indicate results above RRAL

- indicates tests were not ran

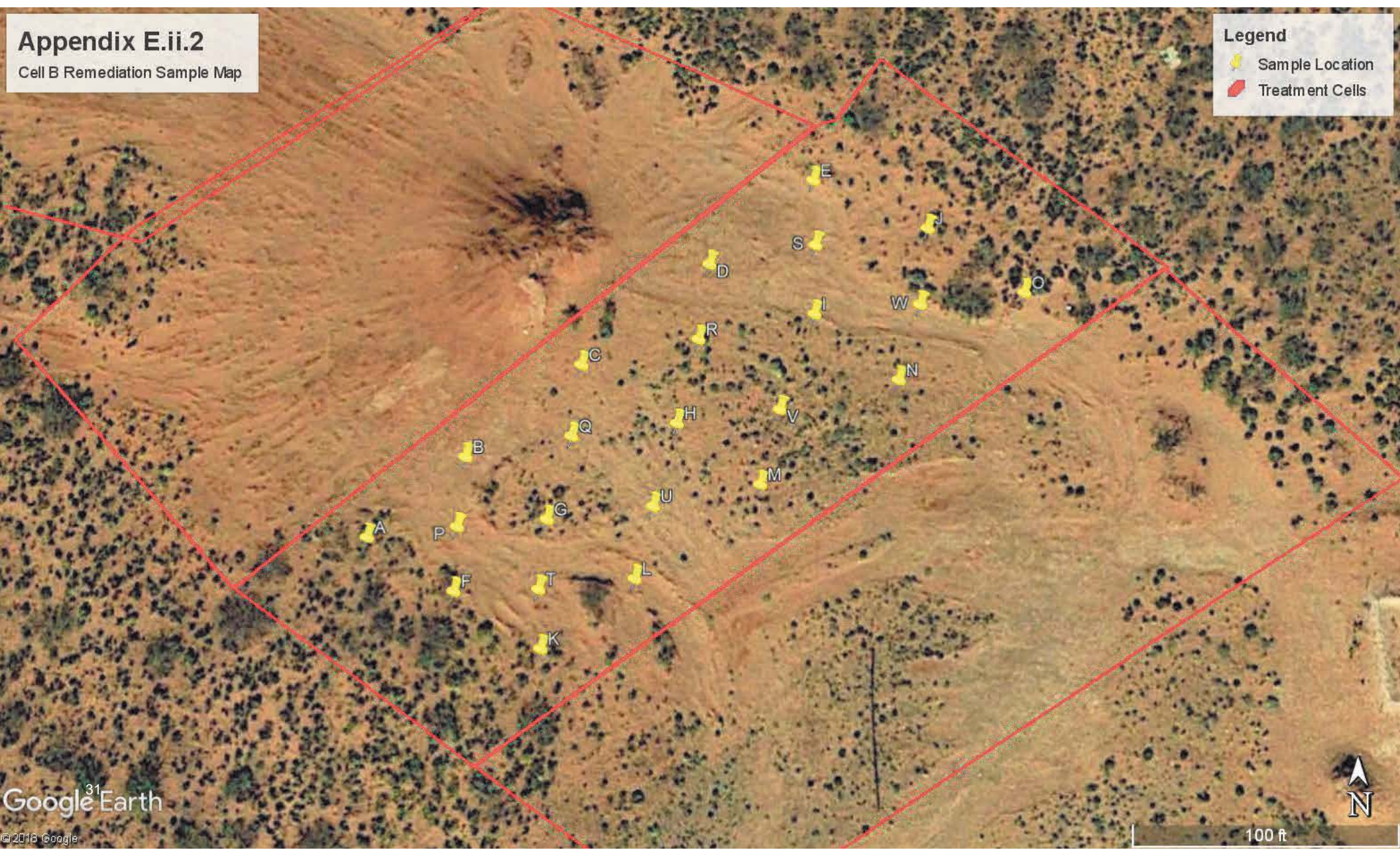
"ND" indicates a non-detectable result, below testing limits

Green indicates remediation continued, see following sample

Appendix E.ii.2
Cell B Remediation Sample Map

Legend

-  Sample Location
-  Treatment Cells



Appendix E.iii.1: Cell C Remediation Sampling										
Cell	Location	Depth	Lab ID Sample	Sample Date	Laboratory: Cardinal Laboratories					
					Chloride		Benzene	BTEX	TPH	
					Field Screening	Method 4500	8021B		8015M	
C	A	4	C:SP A-4'	5/17/2018	ND	48.0	<0.050	<0.300	12.7	
C	A	5	C:SP A-5'	5/17/2018	ND	-	-	-	-	
C	B	2	C:SP B-2'	5/17/2018	ND	80.0	<0.050	<0.300	14.8	
C	B	3	C:SP B-3'	5/17/2018	320	-	-	-	-	
C	C	3	C:SP C-3'	5/17/2018	ND	32.0	<0.050	<0.300	11.1	
C	C	1	C:SP C-1'	5/17/2018	ND	-	-	-	-	
C	D	2	C:SP D-2'	5/17/2018	320	368	<0.050	<0.300	<30	
C	D	3	C:SP D-3'	5/17/2018	ND	-	-	-	-	
C	E	4	C:SP E-4'	5/17/2018	ND	80.0	<0.050	<0.300	<30	
C	E	5	C:SP E-5'	5/17/2018	172	-	-	-	-	
C	F	2	C:SP F-2'	5/17/2018	836	1200	<0.050	<0.300	200	
C	F	2	C:SP F-2'	5/25/2018	ND	64.0	-	-	-	
C	F	3	C:SP F-3'	5/17/2018	776	-	-	-	-	
C	F	3	C:SP F-3'	8/8/2018	ND	16.0	-	-	-	
C	G	3	C:SP G-3'	5/17/2018	968	1200	<0.050	<0.300	197	
C	G	3	C:SP G-3'	5/25/2018	ND	128	-	-	-	
C	G	1	C:SP G-1'	5/17/2018	776	-	-	-	-	
C	G	1	C:SP G-1'	8/8/2018	144	80.0				
C	H	2	C:SP H-2'	5/17/2018	776	1260	<0.050	<0.300	234	
C	H	2	C:SP H-2'	5/25/2018	ND	80.0	-	-	-	
C	H	4	C:SP H-4'	5/17/2018	776	864	<0.050	<0.300	28.8	
C	H	4	C:SP H-4'	8/8/2018	ND	96.0	-	-	-	
C	I	3	C:SP I-3'	5/17/2018	836	-	-	-	-	
C	I	3	C:SP I-3'	5/25/2018	ND	32.0	-	-	-	
C	I	1	C:SP I-1'	5/17/2018	1188	-	-	-	-	
C	I	1	C:SP I-1'	8/8/2018	144	208	-	-	-	
C	J	2	C:SP J-2'	5/17/2018	ND	32.0	<0.050	<0.300	<30	
C	J	5	C:SP J-5'	5/17/2018	ND	-	-	-	-	
C	K	1	C:SP K-1'	5/17/2018	1112	960	<0.050	<0.300	78.4	
C	K	1	C:SP K-1'	5/25/2018	ND	80.0	-	-	-	
C	K	3	C:SP K-3'	5/17/2018	1452	-	-	-	-	
C	K	3	C:SP K-3'	8/8/2018	ND	64.0	-	-	-	
C	L	4	C:SP L-4'	5/17/2018	ND	64.0	<0.050	<0.300	139	
C	L	5	C:SP L-5'	5/17/2018	1660	-	-	-	-	
C	L	5	C:SP L-5'	5/25/2018	ND	-	-	-	-	
C	M	1	C:SP M-1'	5/17/2018	1660	1570	<0.050	<0.300	207	
C	M	1	C:SP M-1'	5/25/2018	ND	48.0	-	-	-	
C	M	3	C:SP M-3'	5/17/2018	1552	-	-	-	-	
C	M	3	C:SP M-3'	8/8/2018	144	48.0	-	-	-	
C	N	4	C:SP N-4'	5/17/2018	ND	48.0	<0.050	<0.300	15.4	
C	N	5	C:SP N-5'	5/17/2018	776	-	-	-	-	
C	N	5	C:SP N-5'	5/25/2018	ND	-	-	-	-	
C	O	1	C:SP O-1'	5/17/2018	292	496	<0.050	<0.300	13.0	
C	O	3	C:SP O-3'	5/17/2018	ND	-	-	-	-	
C	P	5	C:SP P-5'	5/17/2018	ND	-	-	-	-	
C	P	2	C:SP P-2'	5/17/2018	ND	-	-	-	-	
C	Q	1	C:SP Q-1'	5/17/2018	ND	-	-	-	-	
C	Q	3	C:SP Q-3'	5/17/2018	ND	-	-	-	-	
C	R	2	C:SP R-2'	5/17/2018	ND	-	-	-	-	
C	R	4	C:SP R-4'	5/17/2018	332	-	-	-	-	
C	S	1	C:SP S-1'	5/17/2018	ND	-	-	-	-	
C	S	3	C:SP S-3'	5/17/2018	ND	-	-	-	-	
C	T	4	C:SP T-4'	5/17/2018	252	-	-	-	-	
C	T	1	C:SP T-1'	5/17/2018	ND	-	-	-	-	
C	U	5	C:SP U-5'	5/17/2018	556	-	-	-	-	
C	U	5	C:SP U-5'	5/25/2018	ND	-	-	-	-	
C	U	2	C:SP U-2'	5/17/2018	196	-	-	-	-	
C	V	1	C:SP V-1'	5/17/2018	556	-	-	-	-	
C	V	3	C:SP V-3'	5/17/2018	ND	-	-	-	-	
C	W	2	C:SP W-2'	5/17/2018	1112	-	-	-	-	
C	W	2	C:SP W-2'	5/25/2018	ND	-	-	-	-	
C	W	4	C:SP W-4'	5/17/2018	168	-	-	-	-	
NMOC Thresholds					600	600	10	50	5000	

BOLD results indicate results above RRAL

- indicates tests were not ran

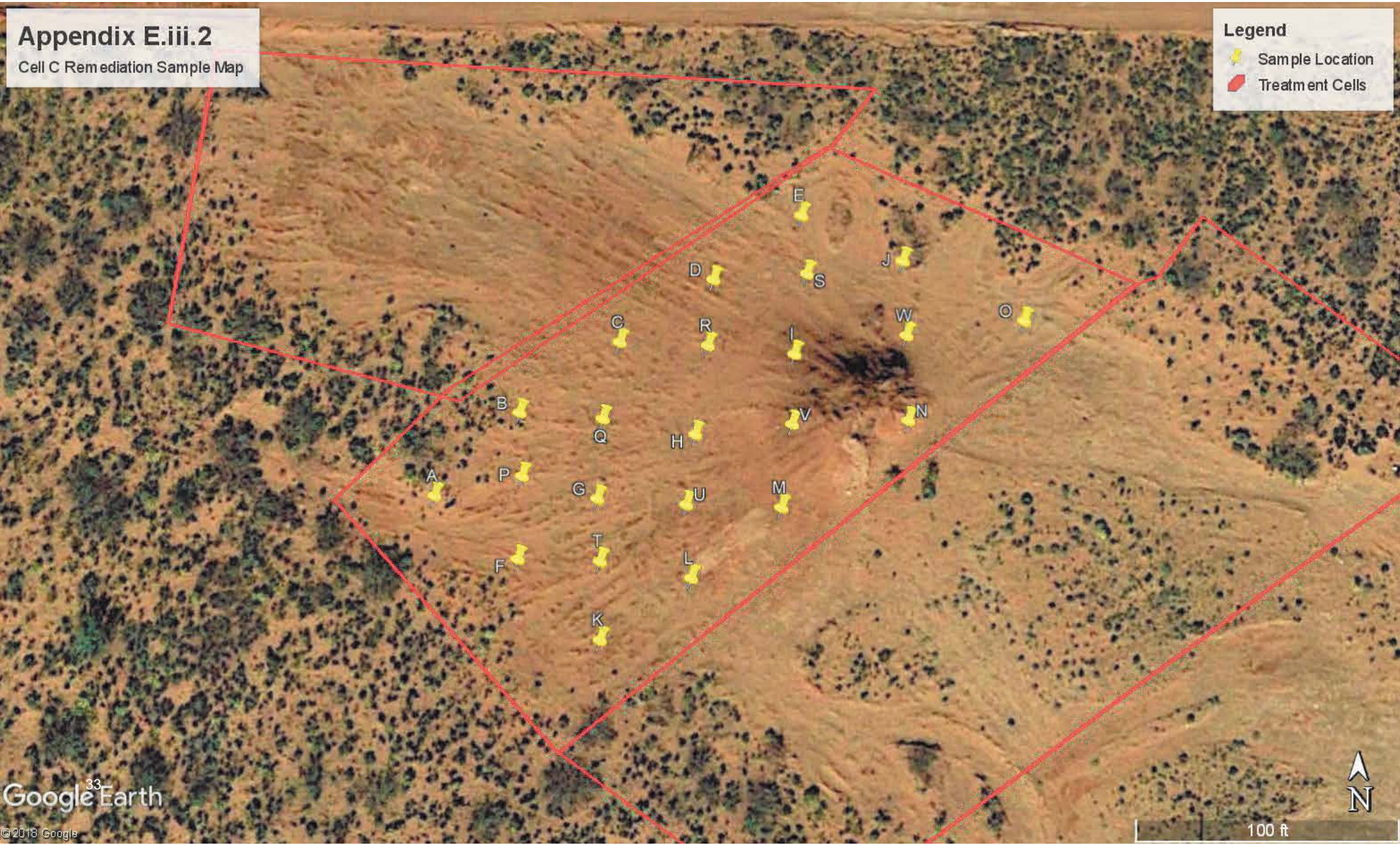
"ND" indicates a non-detectable result, below testing limits

Green indicates remediation continued, see following sample

Appendix E.iii.2
Cell C Remediation Sample Map

Legend

-  Sample Location
-  Treatment Cells



Appendix E.iv.1: Cell D Remediation Sampling									
					Laboratory: Cardinal Laboratories				
Cell	Location	Depth	Lab ID Sample	Sample Date	Chloride		Benzene	BTEX	TPH
					Field Screening	Method 4500	8021B		8015M
D	A	4	D:SP A-4'	5/25/2018	ND	-	-	-	-
D	A	5	D:SP A-5'	5/25/2018	124	112	<0.050	<0.300	<30
D	B	2	D:SP B-2'	5/25/2018	ND	-	-	-	-
D	B	1	D:SP B-1'	5/25/2018	ND	96	<0.050	<0.300	<30
D	C	2	D:SP C-2'	5/25/2018	ND	32	<0.050	<0.300	<30
D	C	3	D:SP C-3'	5/25/2018	ND	-	-	-	-
D	D	1	D:SP D-1'	5/25/2018	ND	-	-	-	-
D	D	3	D:SP D-3'	5/25/2018	ND	64	<0.050	<0.300	<30
D	E	1	D:SP E-1'	5/25/2018	ND	-	-	-	-
D	E	4	D:SP E-4'	5/25/2018	ND	48	<0.050	<0.300	<30
D	F	5	D:SP F-5'	5/25/2018	ND	32	<0.050	<0.300	<30
D	F	3	D:SP F-3'	5/25/2018	ND	-	-	-	-
D	G	1	D:SP G-1'	5/25/2018	ND	80	<0.050	<0.300	<30
D	G	2	D:SP G-2'	5/25/2018	ND	-	-	-	-
D	H	2	D:SP H-2'	5/25/2018	ND	-	-	-	-
D	H	3	D:SP H-3'	5/25/2018	ND	64	<0.050	<0.300	<30
D	I	5	D:SP I-5'	5/25/2018	ND	32	<0.050	<0.300	12.1
D	I	4	D:SP I-4'	5/25/2018	ND	-	-	-	-
D	J	1	D:SP J-1'	5/25/2018	ND	-	-	-	-
D	J	3	D:SP J-3'	5/25/2018	ND	-	-	-	-
D	K	2	D:SP K-2'	5/25/2018	ND	-	-	-	-
D	K	4	D:SP K-4'	5/25/2018	ND	-	-	-	-
D	L	5	D:SP L-5'	5/25/2018	ND	-	-	-	-
D	L	4	D:SP L-4'	5/25/2018	ND	-	-	-	-
D	M	1	D:SP M-1'	5/25/2018	ND	-	-	-	-
D	M	2	D:SP M-2'	5/25/2018	ND	-	-	-	-
D	N	2	D:SP N-2'	5/25/2018	ND	-	-	-	-
D	N	3	D:SP N-3'	5/25/2018	ND	-	-	-	-
D	O	1	D:SP O-1'	5/25/2018	ND	-	-	-	-
D	O	3	D:SP O-3'	5/25/2018	ND	-	-	-	-
NMOC Thresholds					600	600	10	50	5000

BOLD results indicate results above RRAL

- indicates tests were not ran

"ND" indicates a non-detectable result, below testing limits

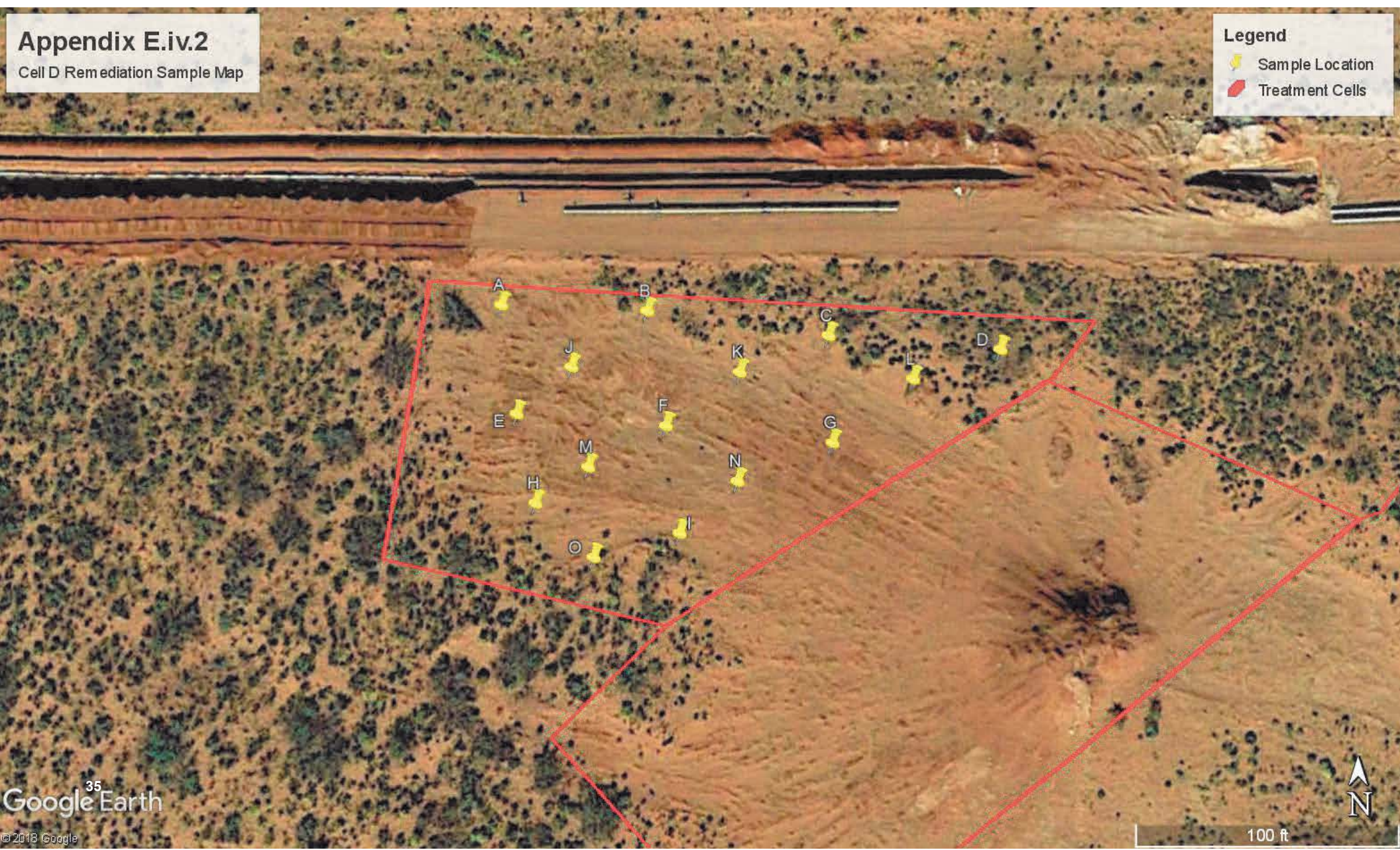
Green indicates remediation continued, see following sample

Appendix E.iv.2

Cell D Remediation Sample Map

Legend

-  Sample Location
-  Treatment Cells



END OF REPORT