HEALTH, SAFETY, ENVIRONMENTAL AND REMEDIATION WEEKLY REPORT
Williams AFB ST012

Site No.: 910-11-10001

Week Ending 17 June 2016

I. SITE SUBCONTRACTOR SUMMARY

Company	Sat	Sun	Mon	Tue	Wed	Thu	Fri
Amec Foster Wheeler			X	X	X	X	X
Terra Therm	X		X	X	X	X	X
MP Environmental			X	X	X	X	X
Yellow Jacket			X	X	X	X	X
Trafficade				X	X		
American Fence					X	X	

II. SCHEDULE / SITE ACTIVITIES REVIEW

A. SEE Demolition

- Shipping of eductor skids
- Removal of switch gear panels
- Continued spooling and removal of wiring
- Opened cell phone lot on 6/16
  1. Jersey barriers removed from site
  2. Fence line moved to contain EBR system only
  3. Gate removed from Ulysses

B. Well Drilling and Development

- Well installation:
  1. CZ22/UWBZ35
  2. UWBZ36
- Well development:
  1. LSZ30

C. EBR Construction

- Equalization tank moved from LF004 to ST012
- Staging equipment on equipment pad (former eductor pad)
- New 600-gallon NAPL tank connected

III. SVE OPERATING DATA

Destruction Efficiency/Mass Removal Summary

The destruction efficiency and mass removal calculations are tabulated below. A correction factor was applied to PID readings based on available analytical data and corresponding PID data. This factor is updated each time new analytical data is available.

Date Period Began	Date Period Ended	Days in Period	Time Catalytic Oxidizer Operated	Catalytic Oxidizer Uptime	Date of Influent Laboratory TPH Result	Influent Concentration (PID)	Influent Concentration (Adjusted PID)	Effluent Concentration (PID)	Effluent Concentration (Adjusted PID)	Calculated Destruction Efficiency[a]	Flowrate into Oxidizer (End of Period)	Estimated VOC Mass Removed[b]	Average Daily Removal Rate[b]	Estimated VOC Mass Released to Atmosphere[b]	Average VOC Mass Released to Atmosphere[b]
---	---	days	hrs	%		ppmv	mg/m^3	ppmv	mg/m^3	%	scfm	lbs/period	lbs/day	lbs/period	lbs/day
4/7/2016	4/15/2016	9	112	52%	3/11/2016	560	78,951	4.6	4.17	99.99%	1,396	46,243	5,138	2	0.27
4/15/2016	4/21/2016	7	147	88%	3/11/2016	342	48,216	1.0	0.91	100.00%	1,571	41,700	5,957	0.8	0.11
4/21/2016	4/29/2016	9	188	87%	4/25/2016	296	18,000	2.6	2.36	99.99%	1,396	17,697	1,966	2.3	0.26
4/29/2016	5/5/2016	7	130	77%	4/25/2016	179	10,885	1.6	1.45	99.99%	1,396	7,400	1,057	1.0	0.14
5/5/2016	5/20/2016	16	323	84%	4/25/2016	394	23,959	0.5	0.45	100.00%	1,047	30,354	1,897	0.6	0.04
5/20/2016	5/26/2016	7	146	87%	4/25/2016	699	42,507	42.2	38.27	99.91%	698	16,228	2,318	14.6	2.09
5/26/2016	6/2/2016	8	166	86%	4/25/2016	340	20,676	62.2	56.41	99.73%	698	8,975	1,122	24.5	3.06
6/2/2016	6/10/2016	9	164	76%	4/25/2016	679	41,291	1.2	1.09	100.00%	1,309	33,206	3,690	0.9	0.10
6/10/2016	6/17/2016	8	167	87%	4/25/2016	462	28,095	12.7	11.52	99.96%	1,047	18,402	2,300	7.5	0.94

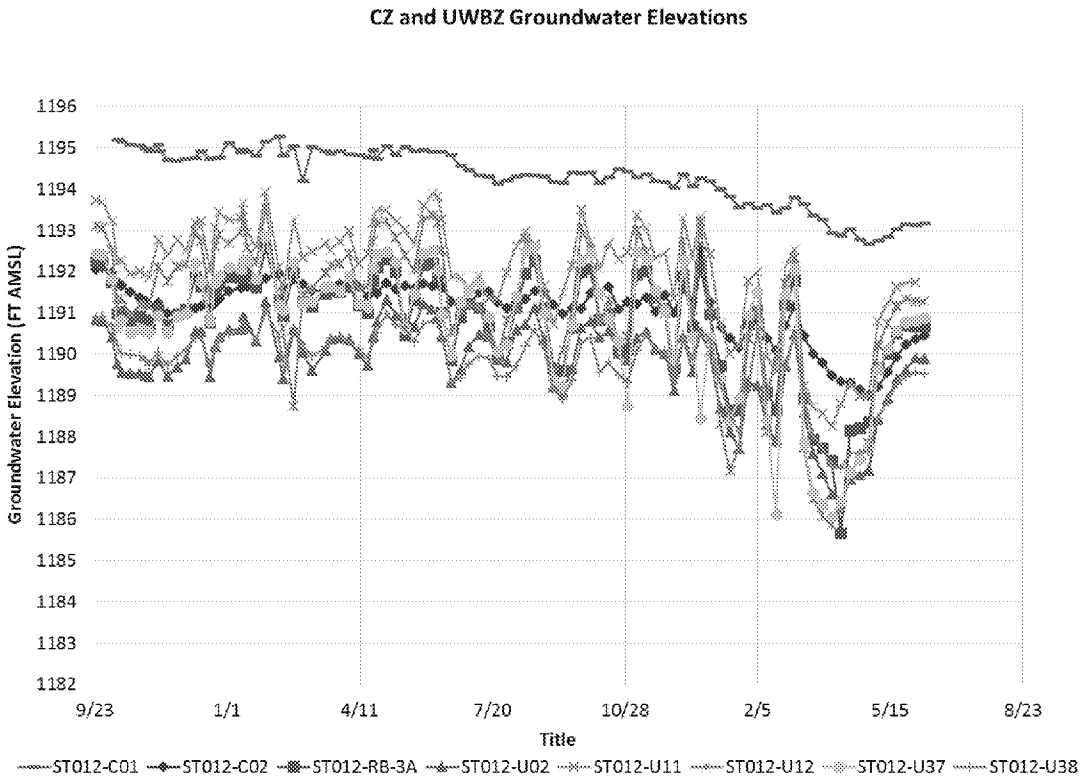
Notes:
% - percent
hrs - hours
JP-4 - jet petroleum fuel grade four
lbs - pounds
ppmv - parts per million by volume
scfm - standard cubic feet per minute
TPH - total petroleum hydrocarbons
PID - photoionization detector
SVE - soil vapor compound
VOC - volative organic compound
(a) Calculated destruction efficiencies are calculated using a single sampling event for each quarter, not using the average influent and effluent results.

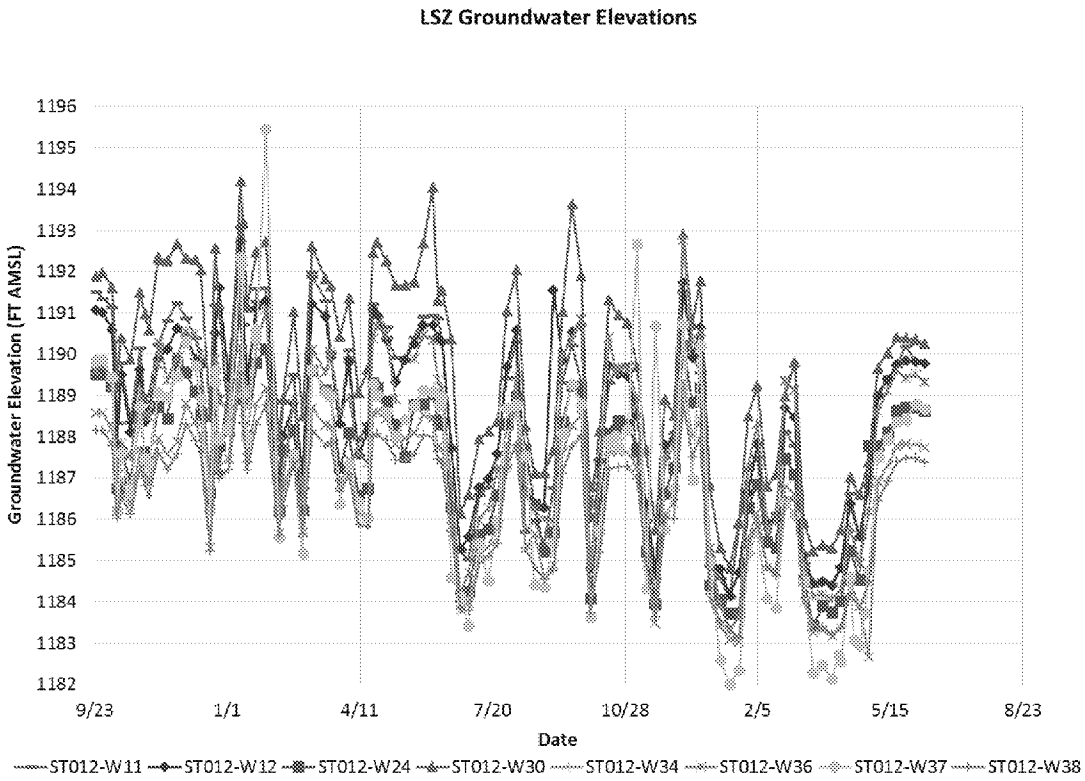
(b) Mass and volumes are calculated based on laboratory data for TPH reported as JP-4. As has been the basis for previous calculations at ST012, the average molecular weight of TPH as JP-4 is assumed equivalent to xylene (106.168 grams per mole). The assumed liquid density of the fuel is 6.57 lbs per gallon.

IV. GROUNDWATER ELEVATION MONITORING

A. Perimeter groundwater elevation differences (measured in feet) adjusted for regional groundwater table increase

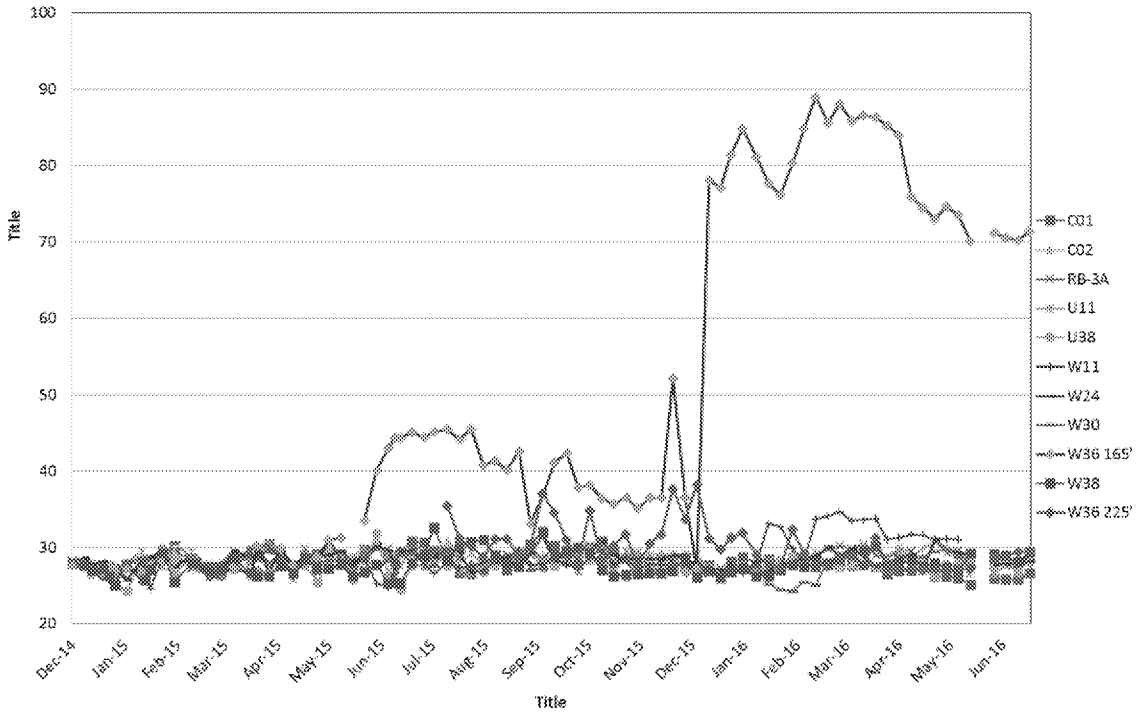
Monitoring Well	5/27/2016		6/3/2016		6/10/2016		6/17/2016	
	Change from Baseline	Change from Previous	Change from Baseline	Change from Previous	Change from Baseline	Change from Previous	Change from Baseline	Change from Previous
CZ/UWBZ Wells								
ST012-C01	-2.11	0.15	-2.13	0.01	-2.09	0.07	-2.08	0.04
ST012-C02	-1.80	0.34	-1.68	0.15	-1.60	0.11	-1.50	0.13
UWBZ Wells								
ST012-RB-3A	-1.57	0.22	-1.58	0.02	-1.59	0.02	-1.57	0.05
ST012-U02	-1.21	0.27	-0.93	0.31	-0.95	0.01	-0.87	0.11
ST012-U11	-2.01	0.12	-2.00	0.04	-1.98	0.05	-2.60	0.00
ST012-U12	-1.76	0.21	-1.83	-0.04	-1.82	0.04	-1.81	0.04
ST012-U37	-1.66	0.23	-1.61	0.08	-1.57	0.07	-1.50	0.10
ST012-U38	-1.41	0.23	-1.33	0.11	-1.37	-0.01	-1.31	0.09
LSZ Wells								
ST012-W11	-1.31	0.52	-1.69	-0.35	-1.30	0.42	-2.60	0.00
ST012-W12	-1.24	0.09	-1.25	0.02	-1.29	-0.01	-1.30	0.02
ST012-W24	-0.80	0.11	-0.81	0.02	-0.89	-0.05	-1.00	-0.08
ST012-W30	-1.50	0.01	-1.53	0.00	-1.63	-0.07	-1.65	0.00
ST012-W34	-0.74	0.09	-0.76	0.01	-0.82	-0.03	-0.83	0.02
ST012-W36	-0.18	-0.14	-0.11	0.10	-0.27	-0.13	-0.25	0.05
ST012-W37	-1.45	0.06	-1.05	0.43	-1.18	-0.10	-1.18	0.03
ST012-W38	-0.66	0.12	-0.65	0.04	-0.77	-0.09	-0.76	0.04




LSZ Groundwater Elevations
Groundwater Elevation (FT AMSL)
1196
1195
1194
1193
1192
1191
1190
1189
1188
1187
1186
1185
1184
1183
1182
9/23
1/1
4/11
7/20
10/28
2/5
5/15
8/23
Date
ST012-W11
ST012-W12
ST012-W24
ST012-W30
ST012-W34
ST012-W36
ST012-W37
ST012-W38

V. SUBSURFACE TEMPERATURE MONITORING

A. Perimeter Monitoring Well Temperatures



VI. SEE WELL TEMPERATURE MONITORING

The following wells used during SEE were monitored for vertical temperature profile. The table lists the high temperature and the average temperature across the profile. Wells included on this table are anticipated to be used for baseline sampling or EBR extraction activities. Any additional wells that are monitored in future weeks will be included on this table.

WELL ID	EBR USE	Date Monitored	High Temperature (°F)(1)	Average Temperature (°F)(2)
CZ11	None	5/20/2016	186.4	124.9
CZ12	Injection	5/13/2016	195.4	115.2
CZ14	Injection	5/17/2016	203.4	97.2
CZ16	Injection	5/17/2016	198.9	105.0
UWBZ10	Extraction	5/20/2016	216.1	114.8
UWBZ21	Injection	5/17/2016	180.7	89.8
UWBZ22	Extraction	5/19/2016	168.4	96.8
UWBZ23	Injection	5/17/2016	196.3	88.7
UWBZ27	Extraction	5/20/2016	181.8	96.3
LSZ09	Extraction	5/26/2016	177.8	131.7
LSZ11	Extraction	5/19/2016	158.1	104.0
LSZ12	Extraction	5/18/2016	161.4	88.4
LSZ14	Extraction	5/17/2016	186.1	99.6
LSZ17	Extraction	5/20/2016	213.1	95.4
LSZ23	Extraction	5/26/2016	178.9	124.1
LSZ26	Extraction	5/16/2016	190.9	113.0
LSZ28	Extraction	5/20/2016	125.8	113.2
LSZ29	Extraction	5/17/2016	178.9	102.2
LSZ34	Sampling	5/17/2016	181.8	94.4
LSZ36	Extraction	5/18/2016	176.0	93.5
LSZ37	Extraction	5/20/2016	168.1	98.5
LSZ38	Extraction	5/13/2016	109.4	102.7
LSZ39	Extraction	5/19/2016	97.2	88.1

Note:

(1) High temperature corresponds to the maximum temperature in the well casing below the water table.

(2) Average temperature corresponds to the average temperature in the well casing, based on 10 ft measurements from the top of casing to the first measurement in the water table. Subsequent water measurements were excluded to remove bias based on significantly higher temperatures in the groundwater.

VII. LNAPL MONITORING

A. Perimeter LNAPL Thickness (ft)

Monitoring Well	5/27/2016			6/3/2016			6/10/2016			6/11/2016		
	Before bailing/ pumping	After Bailing/ pumping	Weekly Gallons Removed	Before bailing/ pumping	After Bailing/ pumping	Weekly Gallons Removed	Before bailing/ pumping	After Bailing/ pumping	Weekly Gallons Removed	Before bailing/ pumping	After Bailing/ pumping	Weekly Gallons Removed
CZ/UWBZ Wells												
ST012-C01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-C02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UWBZ Wells												
ST012-U02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-U11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-U12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-U37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-U38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-RB-3A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LSZ Wells												
ST012-W11	0.00	0.00	0.00	1.61	1.61	0.00	0.00	0.00	0.00	1.40	1.40	0.00
ST012-W12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W37	4.22	4.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ST012-W38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

B. SEE Injection/Extraction Well LNAPL Screening

Well ID	Date Pump Pulled	Screened for NAPL (Y/N)	Bailer Used	NAPL Initially Present (Y/N)(1)
CZ10	5/23/2016			
CZ11	5/20/2016	Y	SS	Y
CZ12	5/17/2016	Y	SS	Y
CZ14	5/17/2016	Y	SS	Y
CZ15	5/24/2016			
CZ16	5/18/2016	Y	SS	Y
CZ18	5/26/2016	Y	SS	Y
CZ19	5/26/2016	Y	SS	Y
CZ20	5/24/2016			
UWBZ02	5/27/2016			
UWBZ10	5/20/2016	Y	SS	Y
UWBZ19	5/27/2016			
UWBZ21	5/17/2016	Y	SS	Y
UWBZ22	5/19/2016	Y	SS	Y
UWBZ23	5/17/2016	Y	SS	Y
UWBZ26	5/26/2016			
UWBZ27	5/20/2016	Y	SS	Y
LSZ09	---	Y	SS	Y
LSZ11	5/19/2016	Y	SS	Y
LSZ12	5/18/2016	Y	SS	Y
LSZ14	5/18/2016	Y	SS	Y
LSZ17	5/24/2016	Y	SS	Y
LSZ23	---	Y	SS	Y
LSZ26	---	Y	SS	Y
LSZ28	5/23/2016	Y	SS	Y
LSZ29	5/18/2016	Y	SS	Y
LSZ31	5/23/2016			
LSZ32	5/27/2016			
LSZ34	5/17/2016	Y	SS	Y
LSZ36	5/18/2016	Y	SS	Y
LSZ37	5/20/2016	Y	SS	Y
LSZ38	5/19/2016	Y	SS	Y
LSZ39	5/19/2016	Y	SS	Y

Notes:
--- = Not applicable. Wells were steam injection wells and did not have eductor pump piping.
SS = stainless steel
PTFE = Teflon
(1) Due to temperatures, LNAPL observations were made with a stainless steel bailer which limits observation to a qualitative Yes/No on presence of floating layer. This method does not allow for definitive differentiation of bioemulsions from true NAPL. NAPL or bioemulsions present may have been present in the well through much of SEE operations if the layer remained above the eductor pump intake. All wells will be assessed by removal of floating layers and subsequent monitoring with Teflon bailers in hot areas to allow evaluation of potential flowable LNAPL.

C. LNAPL Bailing

The following table summarizes the bailing and monitoring performed at LNAPL screened wells. Any additional wells that are monitored in future weeks will be included on this table:

Well	Date	NAPL Present (Y/N)	Bailed (Y/N)	NAPL Remaining (Y/N)	Able to Use Interface Probe? (Y/N)	Depth to Product (ft. bgs)	Depth to Water (ft. bgs)	NAPL Thickness (ft.)[1]	LNAPL REMOVED (Gallons)
CZ12	6/7/2016	Y	Y	N	N	~149	NA	NA	1
CZ14	6/7/2016	Y	Y	N	N	~148	NA	NA	3
CZ16	6/7/2016	Y	Y	N	N	~151	NA	NA	1
CZ18	6/15/2016	N	N	N	N	NA	~149	NA	---
UWBZ10	6/3/2016	Y	Y	N	N	~143	NA	NA	13
UWBZ19	6/6/2016	Y	Y	N	N	~150	NA	NA	1
UWBZ21	6/14/2016	Y	Y	N	N	~148	NA	NA	24
UWBZ22	6/8/2016	Y	Y	N	N	~149	NA	NA	1
UWBZ23	6/9/2016	Y	Y	N	N	~148	NA	NA	35
UWBZ27	6/8/2016	Y	Y	N	N	~143	NA	NA	32
LSZ11	6/1/2016	Y	Y	N	N	NA	NA	NA	10
LSZ12	6/14/2016	Y	Y	N	N	NA	NA	NA	50
LSZ14	6/13/2016	Y	Y	N	N	~144	NA	NA	26
LSZ17	6/2/2016	Y	Y	N	N	~130	NA	NA	50
LSZ23	6/20/2016	N	N	N	N	~151	NA	NA	---
LSZ26	6/14/2016	N	N	N	N	NA	~149	NA	---
LSZ28	6/3/2016	Y	Y	N	N	~146	NA	NA	5
LSZ29	6/6/2016	Y	Y	Y	N	~142	NA	NA	3
LSZ31	6/6/2016	Y	Y	N	N	~151	NA	NA	20
LSZ34	6/14/2016	Y	Y	N	N	~148	NA	NA	38
LSZ36	6/10/2016	Y	Y	N	N	~144	NA	NA	86
LSZ37	5/23/2016	Y	N	Y	Y	138.40	185.80	47.40	---
	5/24/2016	Y	Y	Y	Y	145.09	161.65	16.56 [2]	60
	5/25/2016	Y	Y	Y	Y	148.55	149.60	1.05 [2]	25
	5/25/2016	Y	N	Y	Y	148.45	149.51	1.06	---
	5/26/2016	Y	N	Y	Y	148.46	149.50	1.04	---
	5/26/2016	Y	N	Y	Y	148.42	149.54	1.12	---
	5/27/2016	Y	N	Y	Y	148.31	149.50	1.19	---
	5/31/2016	Y	N	N	Y	148.31	149.49	1.18	---
	6/2/2016	Y	Y	Y	Y	149.12	150.11	0.99 [2]	17
	6/3/2016	Y	N	Y	Y	148.66	148.70	0.04	---
LSZ38	5/23/2016	Y	N	Y	Y	145.33	156.19	10.86	---
	5/24/2016	Y	Y	Y	Y	148.50	149.58	1.08 [2]	15
	5/25/2016	Y	N	Y	Y	148.55	149.70	1.15	---

Well	Date	NAPL Present (Y/N)	Bailed (Y/N)	NAPL Remaining (Y/N)	Able to Use Interface Probe? (Y/N)	Depth to Product (ft. bgs)	Depth to Water (ft. bgs)	NAPL Thickness (ft.)(1)	LNAPL REMOVED (Gallons)
	5/25/2016	Y	N	Y	Y	148.47	149.66	1.19	---
	5/26/2016	Y	N	Y	Y	148.51	149.76	1.25	---
	5/26/2016	Y	N	Y	Y	148.42	149.61	1.19	---
	5/27/2016	Y	N	Y	Y	148.34	149.58	1.24	---
	5/31/2016	Y	N	Y	Y	148.33	149.61	1.28	---
	6/3/2016	Y	N	Y	Y	148.41	149.62	1.21	---
LSZ39	5/23/2016	Y	N	Y	Y	135.78	191.02	55.24	---
	5/26/2016	Y	N	Y	Y	135.91	191.20	55.29	---
	6/1/2016	Y	Y	Y	Y	135.85	190.80	54.95	---
	6/1/2016	Y	Y	Y	Y	150.16	152.45	2.29	80
	6/1/2016	Y	Y	Y	Y	148.49	150.82	2.33	---
	6/1/2016	Y	N	Y	Y	148.71	151.09	2.38	---
	6/3/2016	Y	N	Y	Y	148.71	151.11	2.40	---
LSZ49	6/14/2016	N	N	N	Y	NA	145.67	NA	---
LSZ50	6/14/2016	N	N	N	Y	NA	145.26	NA	---

Notes:

(1) NAPL thickness measured before bailing/pumping, unless indicated with a note. N/A indicates that thickness could not be measured due to high temperatures.

(2) NAPL thickness measured after bailing/pumping.

VIII. WASTE GENERATION

Waste removal activities during this week:

- SEE demolition activities generated one rolloff bin of construction debris that was removed on 14 June 2016.
- SEE demolition activities generated one rolloff bin of steel that was removed on 17 June 2016.
- SEE demolition activities generated one rolloff bin of construction debris that was removed on 17 June 2016.

IX. TWO WEEK LOOK AHEAD

A. SEE Demolition

- Electrical wire spooling and removal
- Eductor piping removal from non-priority wells
- Removal of SEE heat exchangers, NAPL storage ASTs and thermal accelerators
- Removing unneeded pipe stands
- Continued process equipment cleaning

B. EBR Construction

- Construction of electrical and control mounting rack
- Electrical wiring along manifold piping
- Receive air stripper equipment
- Complete manifold connections in Zones 1,2,5, and 6

C. Well Drilling/Development

- Development of new and existing wells

D. Sampling Activities

- Pumping and bailing to remove NAPL from SEE wells
- Continued NAPL screening in SEE extraction and injection wells
- Baseline sampling of interior SEE wells

X. ATTACHMENTS

- Boring Logs:
  1. CZ22/UWBZ35
  2. UWBZ36

Project Name: ST012 EBR Drilling

Project Number: 9101110001.5310 02

Date:

Boring ID: CZ22/UWBZ35

Boring Location:	Logged By: Kyle Keegan
Elevation and Datum:	Project Manager: Gwen Minnick
Start Date: 6-14-16	Drilling Contractor: Yellow Jacket Drilling
Completion Date:	Drilling Method: Sonic
Total Depth: 185	Drilling Equipment: 6" Core Barrel, 8" Casing
Depth to Water: ~14.6'	Sampling Method: Continuous Core

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification, Description and Notes USCS Name Soil description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, color, moisture, odor, staining. Any additional descriptive information may be included in the soil description or notes.
0		0		SC	Clayey Sand @ 0' ~85% F-M-Gr Sand SR/SA ~15% Clay NC, NP, Red Brown, Sl. moist, No odor, No staining
5		0			
10		0			Note: @10' F-Gr Sand content increased
15		0			Note @14' Clay content increased
				SM	Silty Sand @16' ~70% F-Gr Sand ~30% silt NC, NP, Brown, Sl. moist, No odor, No staining
20		0			
				SC	Clayey Sand @22' ~80% ~~M-Gr SR/SA~~ Pred F-Gr ~20% Clay (Some silt) NC-WC, NP, Brown-red, Sl. moist, No odor, No staining
25		0			

Project Name: ST012 EBR Drilling

Project Number: 9101110001.5310.02

Date:

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Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
25		0			
30		0			Note: @31' Clay lens ~1'
				SM	Silty Sand @32' ~80% F-M-Gr Sand SR/SA ~20% Silt NC, NP, Brown, Sl moist, No odor, No stains Note: @35' Gravel content increased
35		0			
				ML	Silt with Sand @38' ~60% ~~F-Gr Sand~~ silt ~40% ~~silt~~ F-Gr Sand NC, NP-Low PI, Brown, Sl. moist, No odor, No stains
40		0			
				SM	Silty Sand @42' ~70% F-Gr Sand ~30% silt NC, NP, Brown, Sl. moist, No odor, No stains Note: @45' Clay + cementation increased
45		0			
				SC	Clayey Sand @46' ~65% F-Gr Sand ~35% Clay (some silt) NC, NP-Low PI, Red Brown, Sl. moist, No odor, No stains
50		0			

Project Name: ST012 EBR Drilling

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Project Number: 9101110001.5310.02

Date:

Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
50		0		CL	Clay @ 50'
					~80% Clay
					~20% F-Gr sand
					NC, Med PI, Brown-Red, Sl. moist, No odor, No stains
					Note: @ 52' Sand content increased
55		0			
60		0			Note: @ 60' Cementation increased
					Note: @ 62' Clay content increased
65		0			Note: @ 66' sand content increased
70		0			Note: @ 70' Cementation increased (see nodules)
				SM	Silty Sand @ 72'
					~65% F-Gr sand
					~35% Silt
75		0			NC, NP, Brown Sl. moist, No odor, No stains

Project Name: ST012 EBR Drilling

Project Number: 9101110001.5310.02

Date:

Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
75		0			Note: @76' well graded sand with silt lens w/
				CL	Clay with sand @78' ~70% Clay (some silt) ~30% F-Mgr sand SR/SA NC, Low-Med PI, Red Brown, Sl. moist, No odor, No staining
80		0			Note: @81' cementation increased Note: @82' sand content increased
85		0			
90		0		ML	Silt with sand @90' ~70% silt ~30% F-Gr sand NC, Low PI, Brown, Sl. moist, No odor, No strings
				SM	Silty Sand @94' 65% F-Gr Sand 35% silt NC, NP, Brown, Sl. moist, No odor, No strings Note: @96' Cementation increased
95		0			
				CL	Clay with Sand @98' ~75% Clay (some silt) ~25% F-Gr Sand NC, Med PI, Brown-red, Sl. moist, No odor, No strings
100					

Project Name: ST012 EBR Drilling

Project Number: 9101110001.5310.02

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Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
100		1.7			
					Note: @104' Sand & silt content increased
105		1.1			Note: @106' Clay content increased
110		0			
				SM	Silty sand @111' ~75% F-M-Gr Sand SR/SA ~25% silt NC, NP, Brown, Sl. moist, No odor, No stains Note: @114' C-Gr sand content increased
115		0			Note: @116' SC lens ~3" Note: @117' Clay content increased Note: @118' SC Nodules
120					Note: @120' Clay content decreased
125		0			Note: @124' silt content increased

oject Name: ST012 EBR Drilling

oject Number: 9101110001.5310.02

ate:

Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
125		0			
				CL	Clay with Sand @ 126' ~75% Clay ~25% F-M-Gr Sand SR/SA NC, Med PI, Brown, Sl. moist, No odor, No stains
130		1.0		SC	Clayey Sand @ 130' ~70% F-M-Gr Sand SR/SA ~30% Clay NC, NP, Brown, Sl. moist, No odor, No stains
135		0.7			
140		0.0		SW-SM	Well Graded Sand with Silt & Gravel @ 140' ~75% F-C-Gr Sand SR/SA ~15% F-C-Gr Gravel SA/SR ~10% Silt NC, NP, Brown, Moist-wet, No odor, No stains
145		0.0			
				CL	Clay with Sand @ 147' ~65% Clay ~35% F-C-Gr Sand SR/SA NC, Low-Med PI, Red Brown, Moist, No odor, No stains
150					

Project Name: ST012 EBR Drilling

Project Number: 9101110001.5310.02

Date:

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Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
150		2.4		SW-SC	Well graded sand with clay & gravel @150' ~75% F-C-Gr Sand SR/SA ~15% F-C-Gr Gravel SR/SA ~10% Clay (some silt) NC, NP, Brown, Wet, No odor, No stains
155		2.7			
				CL	Clay @157' ~90% Clay ~10% F-C-Gr Sand MC, Med PI, Brown red, moist, No odor, No stains
160		3.7			Note: @161' Fuel odor begins Note: @164' sand content increased
165		31.4			Note: @166' Clayey sand lens Note: @168' Clay content increased (~100%) High PI
170	ST012-CZ22/LSZ35-170-061516-SO (DUP, MS, SD) 0835	1775	Red		
				SM	Silty Sand @ ~~175~~ 173' ~80% F-M-Gr Sand SR/SA ~20% Silt NC, NP, Grey-Brown, wet-moist, strong fuel odor, black staining
175		304			

oject Name: ST012 EBR Drilling

oject Number: 9101110001.5310.02

ate:

Boring ID: CZ22/UWBZ35

Depth Below Ground Surface (feet)	Sample ID	PID Reading (PPM)	LNAPL Test (Red, Pink, None)	USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
175					Note: @176' c-gr Gravel content increased
180		3.2			
185		3.0		CL	Clay @184' ~65% Clay ~35% F-C Gr Sand SR/SA NC (SC Nodules), Low-Med PI, Red Brown, Moist, No odor, No staining
					TD @186' 6-15-16
190					
195					
200					

Project Name: ST012 EBR Drilling

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Project Number: 910 M0001.5810.02

Boring ID: UWBZ 36

Date: 6/13/16

Boring Location: UWBZ 36	Logged By: Garrett Tabor
Elevation and Datum:	Project Manager:
Start Date: 6/13/16	Drilling Contractor: YJD
Completion Date: 6/14/16	Drilling Method: Sonic - mini
Total Depth: 190	Drilling Equipment: 9 1/2" casing ~~8" core~~ 8" core
Depth to Water: ~153	Sampling Method:

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification, Description and Notes USCS Name Soil description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, color, moisture, odor, staining. Any additional descriptive information may be included in the soil description or notes.
0					Disturbed by air knife
5					
10				SM	Silty Sand @ 10' 80% sand UF - M Grn SA/SK 15% silt 5% clay NC, NP to low PI, red-brown, dry, no odor no sta
15					
20					Note: 1" weakly cemented layer below 20'
25					

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Project Name: ST02 EBR Drilling

Project Number:

Boring ID: UWB236

Date: 6/13/16

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
25				SM	~~Silty Sand (SM)~~
					Note: 1" weakly cemented zone below 27'
30					
				SP-SM	Well graded Sand with Silt @ 32'
					90% sand VF-C Grn SA/SR
					10% silt
					NC, NPI, Brown, Dry, No odor No stain
35					
				SW	Well graded Sand with gravel @ 36'
					85% sand VF-C Grn SA/SR
					15% gravel F-C Grn SR
					NC, NPI, Brown-Gray, Dry, No odor No stain
40					
				SM	Silty Sand @ 42'
					80% sand VF-M Grn SA/SR
					20% silt
45					NC, NPI, Red-brown, dry, No odor No stain
					Note: moderately cemented @ 45' 3" zone
50					

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Project Name: STC12 EBR Drill

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Project Number:

Date: 6/13/16

Boring ID: UWBZ 36

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
50		1.5		SM	Silty Sand (con)
					Note: Below 52' 75% sand 20% silt 5% clay
62 65		1.5			
					Note: 58-60' Some coarse grain sand present
60		0.5		SC	clayey Sand with silt @ 60' 70% sand VF-M Orn SH/SR 20% clay 10% silt WC, Low Pl, dry, no stain, No odor, red-brown
					Note: 65-66' moderately cemented layer
65		0.5			Note: 67-68' moderately cemented layer
70		0.3			
75					

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Project Name: STOR EBR Drill

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Project Number:

Boring ID: UWBZ-36

Date: 6/13/16

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
75		1.0		SC	Clayey sand (con)
				SW	well graded sand @ 76'
					75% sand VF-C Grn SA/SR
					20% gravel F Grn SR
					5% silt
					NC, NP, Brown, Dry, No stain No odor
80		0.3		SC	Clayey Sand @ 90'
					75% sand VF-m Grn SA/SR
					25% clay
					WC, Low Pl. to mod Pl, Brown, moist, No odor
					No stain
85		0.1			Note: @ 85' moderately cemented zone
					Note: @85' moderately cemented zone
90		0.2			
				SW	well graded sand ~~c~~ with silt @ 94'
95		0.5			90% sand VF-C Grn SA/SR
					10% silt
					NC, NPl, Brown, dry, No stain No odor
				SC	~~Sand~~ clayey Sand @ 98'
					75% - sand VF-m Grn SA/SR
					25% - clay WC to MC, low to med Pl, dry
100					Red-brown No stain No odor

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Project Name: STRIP EBR Drill

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Project Number:

Date: 6/14/16

Boring ID: UWBZ 36

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
100		0.6		SC	Clayey Sand (con) Note: Below 101' 85% sand 15% clay Low pl
105		1.1			
				SW-SM	~~Silty~~ well graded sand with silt @ 108' 85% sand VF-C Grn SA/SR 10% silt 5% gravel F Grn SR/SR NC, NPI, Brown, Dry, No odor No stain
110		1.7			
115		1.2			
				SM	Silty Sand @ 117' 80% sand VF-m Grn SA/SR 20% silt NC, NPI, Brown, Dry, No odor, No stain
120		1.1			Note: 124'-125' strongly cemented layer
125					

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Project Name: STO12 EBR Drill

Project Number:

Date: 6/14/16

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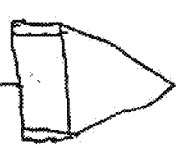
Boring ID: UWBZ 36

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
125		1.8		SW	Well graded sand @ 125' 90% sand VF-C Grn SA/SR 5% gravel F Grn SR 5% silt
				SC	NC, NPl, Brown, Dry, no odor no stain
130		1.8			Clayey Sand @ 127' 80% sand VF-M Grn/SA/SR 15% clay 5% silt NC, Low Pl, dry, Brown, no stain no odor
135		1.8			Note: 130'-133' weakly cemented layer
140		~~1.4~~ 1.4		SW	Well Graded sand with gravel @ 140' 85% - sand VF-C Grn SA/SR 15% - gravel
▽					NC to WC, NPl, Brown, No stain no odor, wet
					Note H2O hit @ ~143'
145		1.2			Note: 145'-146' clay layer ~1' thick then Back to well graded sand
					C-Grn sand  150'-152 weakly cemented caliche
150					

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Project Number:

Date: 6/14/16

Boring ID: UWBZ3C

Depth Below Ground Surface (feet)	Sample ID	PID		USCS	Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
150		0.6		SW	well graded sand with gravel (CDN) note: 150'-152' weakly cemented caliche confining coarse grain sand layer then WC caliche (see list page) Note: Moderate to strongly cemented zone 152.5-153'
				CH	Sandy Clay @ 153' 65% sand VF-m Grn SA/SR 35% clay WC ~~[illegible]~~ et, Med to High Pl, red-brown, wet, No stain, No odor
155		0.4			
					Note: Strongly cemented ~~168-168.5~~ et 168'-168.5'
160		0.4			
165		1.1			
170		2.1		SW-SM	well graded sand with ~~gravel~~ et silt 90% sand VF-C Grn SA/SR 10% silt NC, NPl, wet, Brown, no stain N
175					

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Date: 6/14/16 Boring ID: UWBZ 36

Depth Below Ground Surface (feet)	Sample ID				Soil Classification and Notes Name (USCS Symbol): color, moisture, material with description [i.e. % by weight, gradation, angularity] starting with largest percent, cementation, plasticity, odor, staining, any additional information
175		4.8		SW/SM	well graded sand with silt + (con gravel) Note: Below 175' 80% sand 10% silt 10% gravel F-C Grn SA/SR Note: 179.5'-180' strongly cemented Note: 176-180' occ cobble present ~2" diameter
180		1.7		SC	Clayey Sand @180' 75% - sand VF - M Grn SA/SR 25% - clay N ℄, Low Pl to Med Pl, Brown, wet No odor No stain
185		23.9			
190		290			mid odor Detected @190' LNAPL Test @ 190' Non Detect even w high PID TD @190'
195			ND		
200					

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