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WILLIAMS AIR FORCE BASE

Site LF004 Landfill Remedial Action

BCT Conference Call
15 August 2019

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ED_005025_00010924-00001

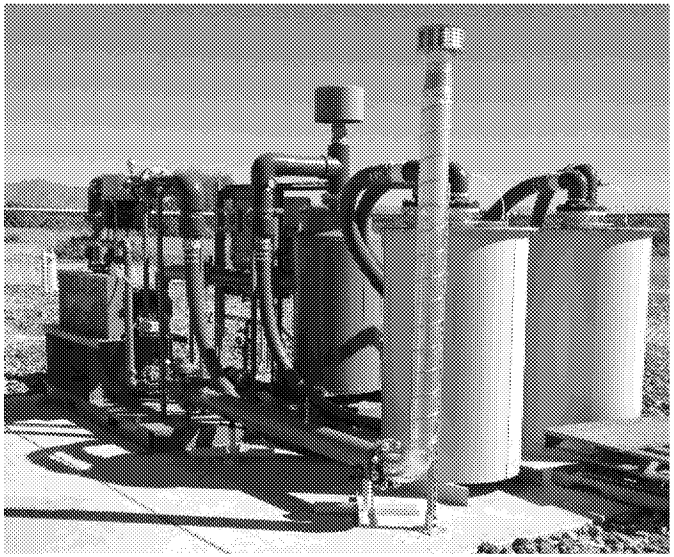
LF004 Recent and Upcoming Activities

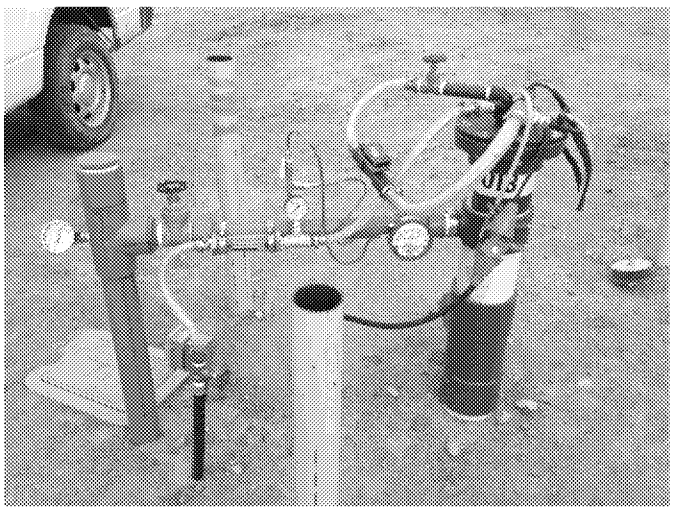
- Post remediation soil gas sampling is complete
- Preliminary PDB groundwater sampling results for May 2019 have been received and are undergoing data validation
- Draft annual landfill inspection report submitted 17 Jun 2019
- Oxidant field screening scheduled in Aug 2019

ED_005025_00010924-00002

Site LF004
LF01-W17 Area IWAS System Update

- **Preliminary May 2019 PDB results indicate all monitoring wells below the TCE MCL with the exception of LF01-W17S (9.0 µg/l) and LF01-W30M (12 µg/l)**
- **Previous 2018 PDB for LF01-W17S (May 4.2 µg/l and Nov 6.4 µg/l) and LF01-W30M (May 4.9 µg/l and Nov 1.5 µg/l)**
- **Residual oxidant measured in May 2019 (0.06 mg/l at W17S; 0.1 mg/l at W30M) remains to degrade residual PCE concentrations.**
- **Monitoring wells upgradient and downgradient of LF01-W17S and LF01-W30M are below TCE MCL**





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Site LF004
Southern Area SVE and Oxidant Injection

- Preliminary May PDB results indicate only two PCE MCL exceedances: W19S at 8.1 µg/l (dup 9.1 µg/l), W24S at 10 µg/l. Previous 2018 PDB results for W19S (May 2.8 µg/l and Nov 6.6 µg/l) and W24S (May 7.9 µg/l and Nov 13 µg/l).
- Residual oxidant measured in May 2019 (0.1 mg/l at W19; 0.7 mg/l at W24) remains to degrade residual PCE concentrations.
- Upgradient wells in the vicinity of W19S and downgradient wells in the vicinity of W24S are below the PCE MCL

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Site FT002
Fire Training Area Remedial Action

BCT Conference Call
15 August 2019

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Site FT002 Update

- AF approved keeping the DEUR in place Nov 2018
- AF will prepare Explanation of Significant Differences (ESD) document to add the land use control to the ROD
- Report is being revised in accordance with the responses to comments. Responses to EPA and ADEQ comments on Remedial Action Completion Report under final AF review
- If necessary, a technical conference call with regulatory agencies to resolve comments can be scheduled

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Site SS017

Old Pesticide/Paint Shop

BCT Conference Call

15 August 2019

Preliminary Groundwater Monitoring Summary

- Dieldrin exceeded the EPA RSL of 0.0018 µg/L in 3 wells:
  - MW02 (0.087 µg/L) (previous sample 0.049 µg/L; 0.038 µg/L)
  - MW03 (0.024 µg/L) (previous sample 0.020 µg/L)
  - MW04 (0.0038 µg/L) (previous sample 0.0039 µg/L)
- Aldrin did not exceed the EPA RSL of 0.00092 µg/L in any wells (0.00077 µg/L MDL)
- Chlordane did not exceeded the EPA RSL of 0.02 µg/L in any wells: (0.0038 µg/L MDL)
- Heptachlor was detected in MW-4 and MW-14 at 0.0040 µg/L and 0.0055 µg/L, respectively, which are below the EPA MCL (0.4 µg/L) and above the EPA RSL of (0.0014 µg/L)

Site SS017 Groundwater Monitoring Update Path Forward

- Aug 2018 data summary report submitted 12 Apr 2019 is under regulatory review
- Nov (Annual) 2018 groundwater report submitted 18 Apr 2019. Reissued hard copy reports on 30 Apr 2019. Report is under regulatory review.
- Contract modification for 2019/2020 groundwater completed
- 2019 quarterly sampling scheduled for late August

Parcel K-1-2 Property Transfer

- Draft FOST and SEBS issued 30 November 2018
- ADEQ comments received 3 and 7 January 2019
- Draft final FOST and SEBS including RTC to ADEQ comments posted for public comment. Comment period end 25 Mar 2019; no comments received.
- EPA comments received 11 Mar 2019
- Draft final FOST and SEBS issued to ASU for coordination
- FOST was issued for regulatory concurrence 23 Jul 2019 with follow up email 9 Aug 2019
- Final FOST to be routed for AF signature after regulatory concurrence
- Draft DEUR and assignment package to be prepared

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Site ST035
Former Building 760

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15 August 2019

ST035 Update

- SVE system and enclosure decommissioning completed in July. ASU has indicated that the concrete pad, walls, and fencing will be retained for use by facilities management.
- Procurement of monitoring well abandonment in progress. Well abandonment tentatively scheduled in the Aug-Sep 2019 time frame.

Partial Deletion

BCT Conference Call
15 August 2019

PARTIAL DELETION UPDATE

- Draft table and figure submitted for regulatory review on 29 Sep 2014
- Comments received by ADEQ during Sep 2014 BCT meeting addressed in follow on email. No comments received from EPA.
- Deletion on hold during SS017 and ST012 informal disputes
- Final deletion tables and figure ready for submittal and provided to BCT in April 2019 BCT meeting
- Draft NOIPD submittal under AF review
- Draft NOIPD submittal for ADEQ/EPA review scheduled for Aug 2019

ED_005025_00010924-00014

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Site ST012

Former Liquid Fuel Storage Area

BCT Conference Call

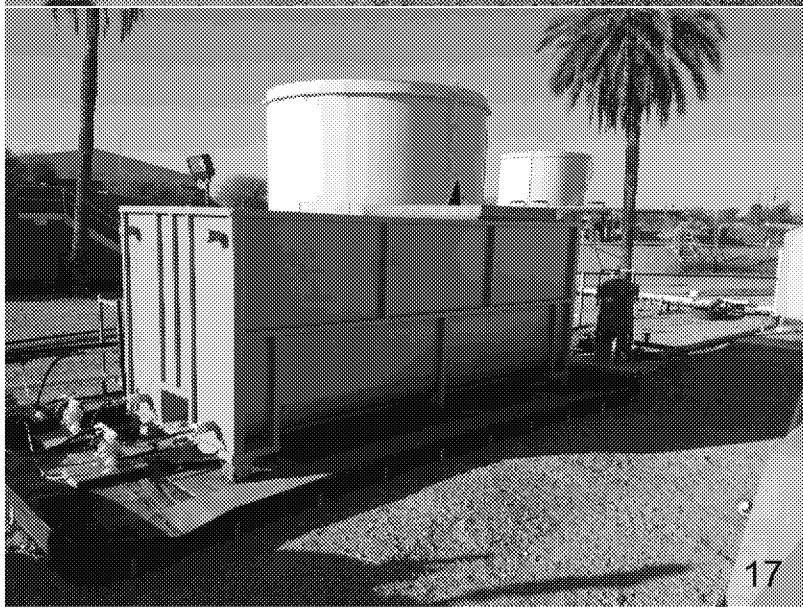
15 August 2019

Site ST012 Outline

- Summary of activities since Jul BCT call
- Update on SVE system (JP-4 equivalent of methane)
- LNAPL removal update
- Updated on benzene and sulfate concentrations
- Pilot study extraction/injection update
- Additional monitoring wells
- Path forward

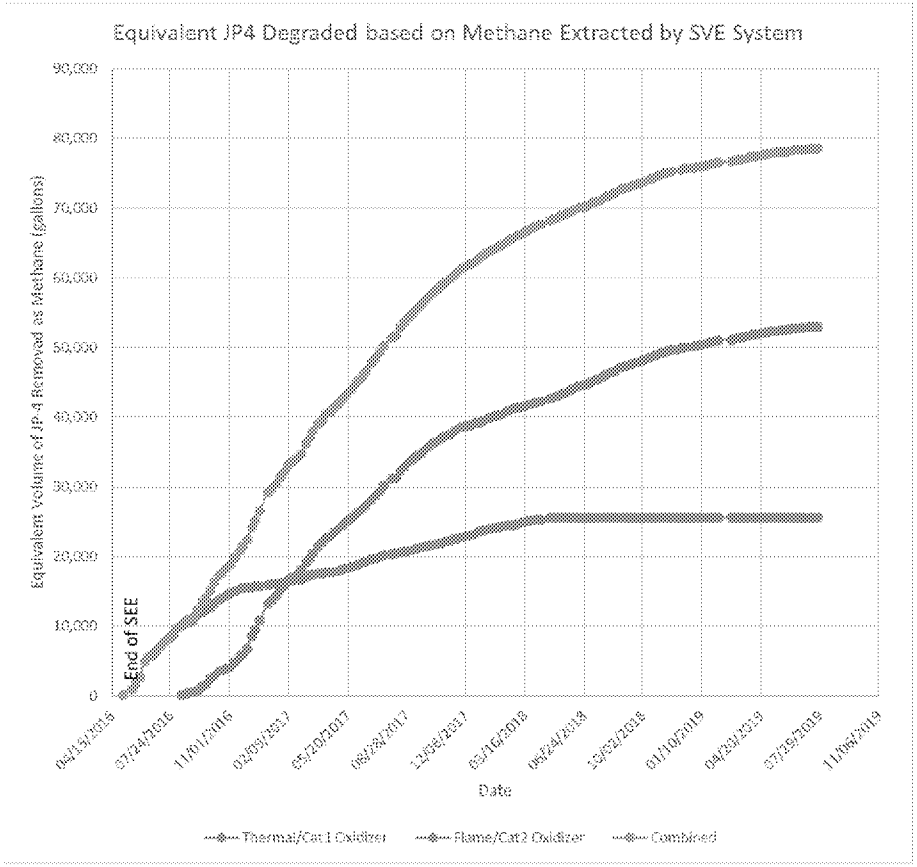
Site ST012 Activities Since July

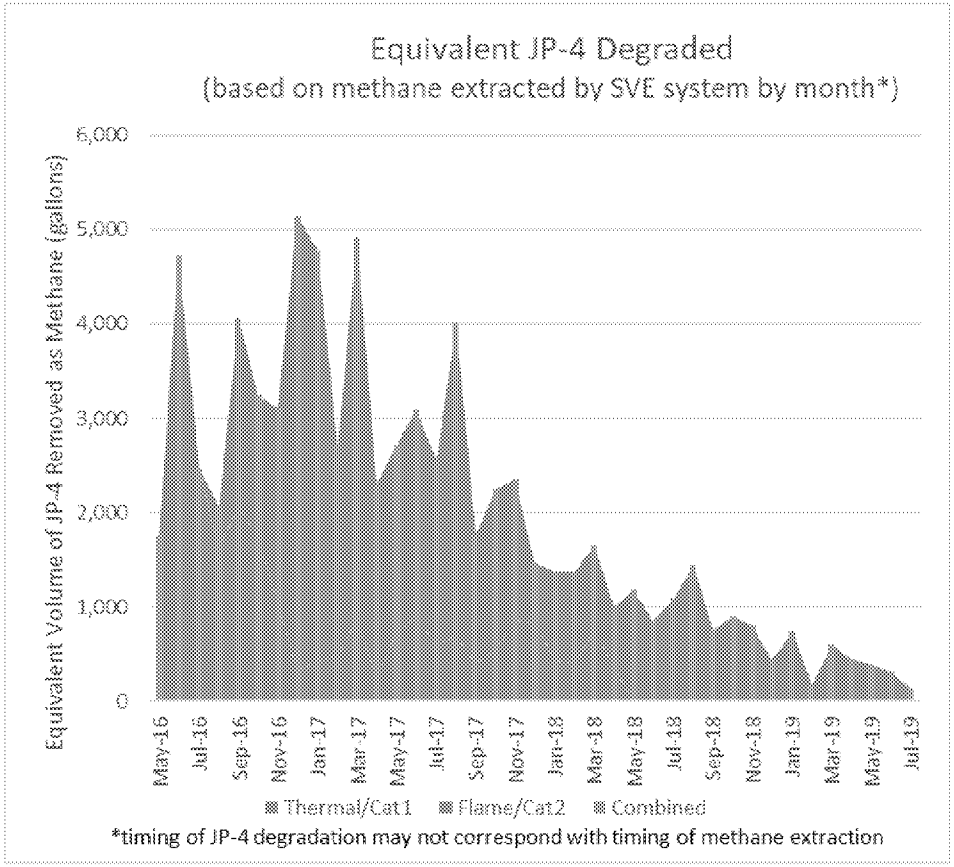
- **Continued SVE operation**
- **LNAPL screening in select wells**
- **Operation of Extraction and Treatment**
  - **Pump Maintenance**
    - Pump in UWBZ28/LSZ51 moved to UWBZ25 (per Field Variance Memo [FVM] 7)
    - Pump installed in LSZ43 (per FVM7)
    - Pump in LSZ12 pulled, wiring repaired and reinstalled
- **Sodium sulfate injections (detail on later slides)**
  - **Spill of treated water from the sodium sulfate Pre-Mix Tank occurred on 6 August 2019**



JP-4 Degradation Based on Methane Removed with SVE

Site ST012 SVE System Equivalent JP-4 Degradation Based on Methane Removed





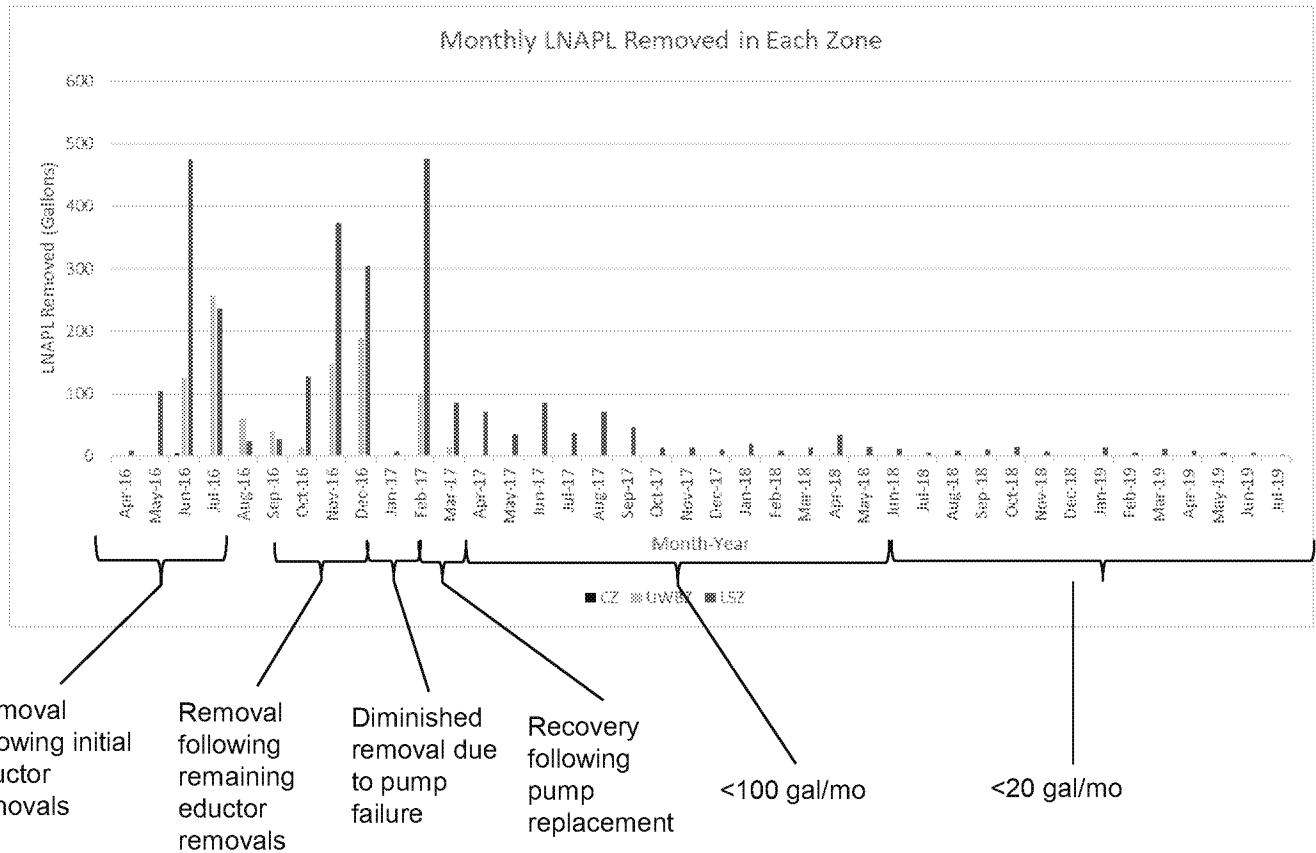
- Estimates through 25 Jul 2019
- Estimated JP-4 degradation as methane is in addition to JP-4 removal reported for SVE
- Thermal/Cat1 oxidizer changed from SVE to groundwater treatment end of Apr 2018
- Flame oxidizer treating combined SVE and air stripper intermittently in Nov 2018 – Jan 2019
- Flame oxidizer replaced by catalytic oxidizer (Cat2) 7 Feb to 26 Feb 2019

LNAPL Removal Update (through 11 Jul)

ED_005025_00010924-00020

ST012 LNAPL Removal Summary

- CZ – 7 gallons of LNAPL removed. None since Nov 2016
- UWBZ - 963 gallons of LNAPL removed. None since Apr update.
- LSZ - 2,843 gallons of LNAPL removed. 2 gallons removed since Jul update (LSZ36).



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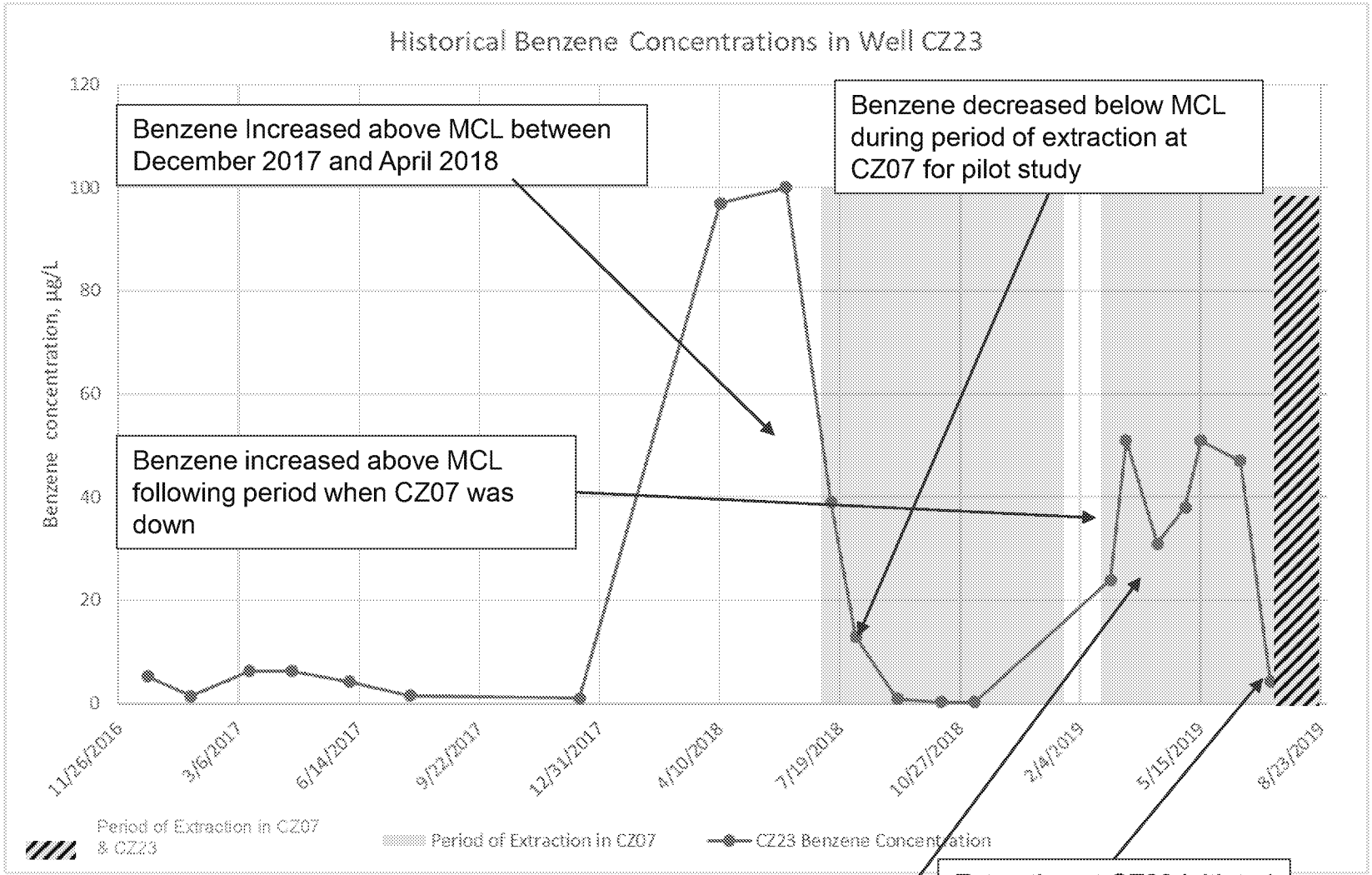
Update on Benzene Concentration in ST012-CZ23 (includes preliminary results from 12 July 2019)

ED_005025_00010924-00022

CZ23 Sampling Summary



Benzene concentration has fluctuated from ~30 to 50 µg/L since restoration of pumping from CZ07

Extraction at CZ23 initiated 11 Jul 2019. Latest sample collected 12 Jul 2019 4.4 µg/L

ED_005025_00010924-00023

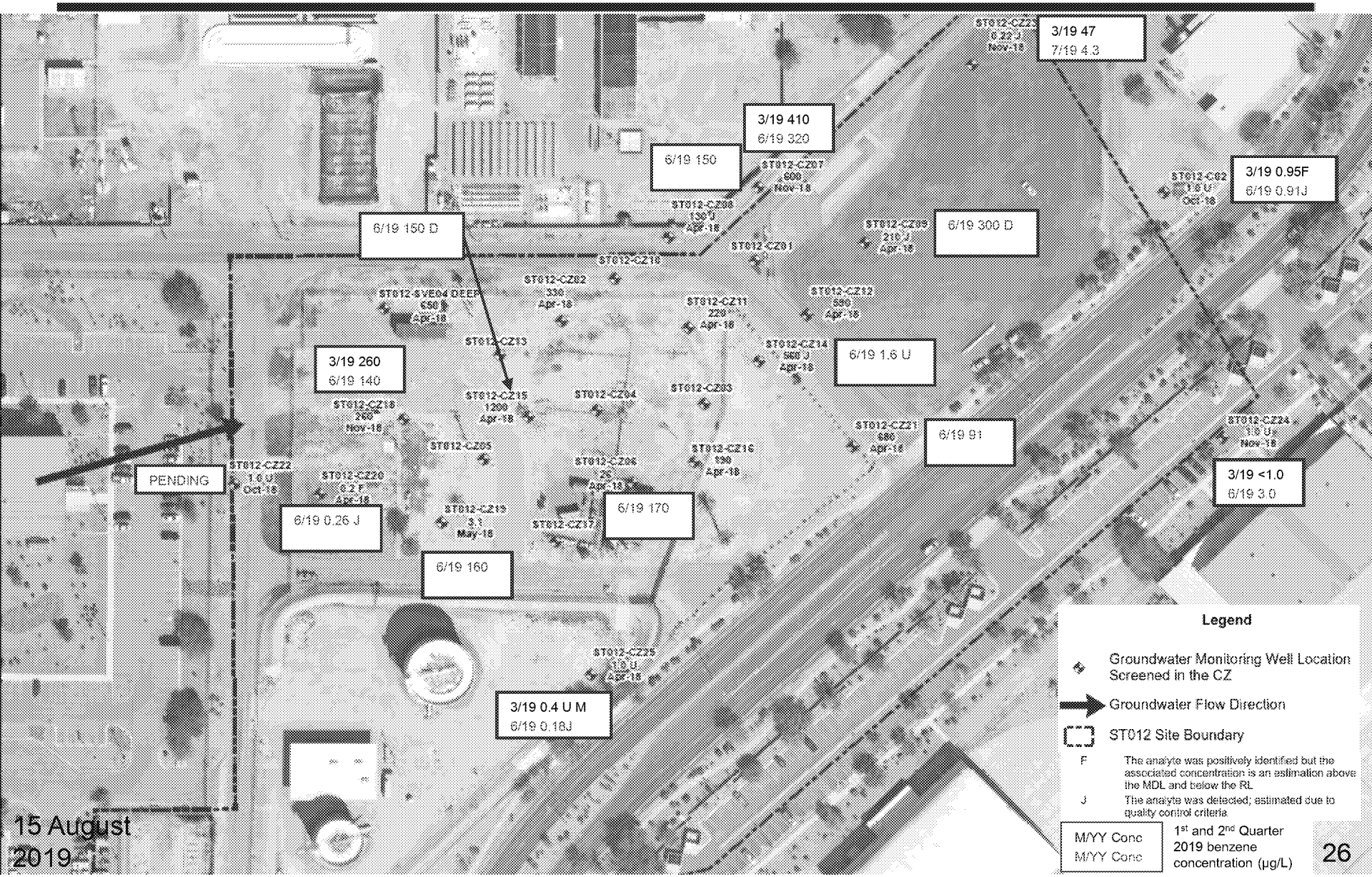
Updated Preliminary Second Quarter Groundwater Sampling Results

ED_005025_00010924-00024

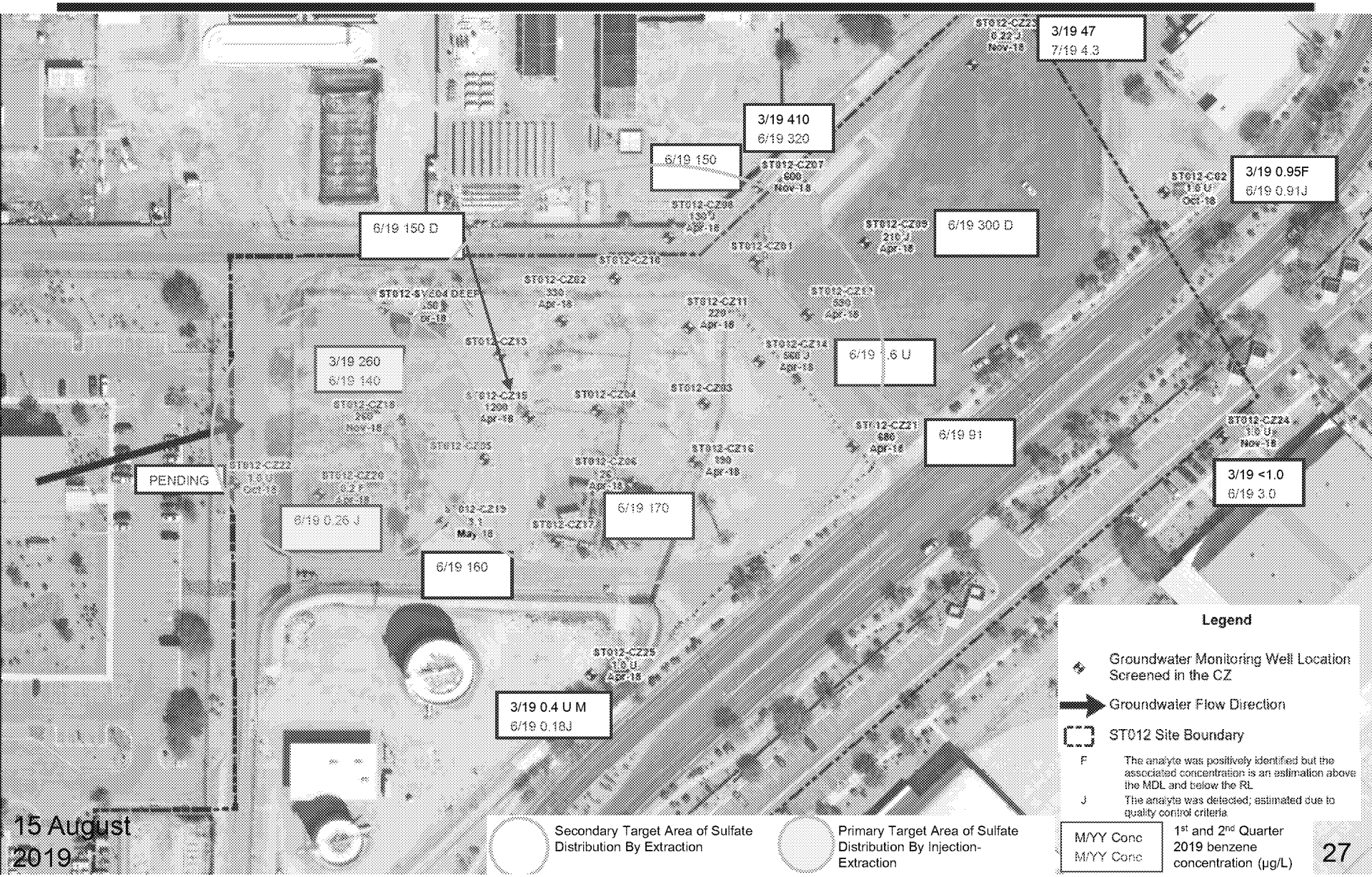
Sampling Summary

- **Sampling included:**
  - Extraction Wells
  - Injection Wells (where injections took place)
  - Monitoring Wells (in areas where injections took place)
  - Perimeter Wells
- **General Observations**
  - Increase in benzene at perimeter well UWBZ38 slightly above MCL
  - Highest sulfate increases in western (upgradient) LSZ. Some sulfate increases in western UWBZ.

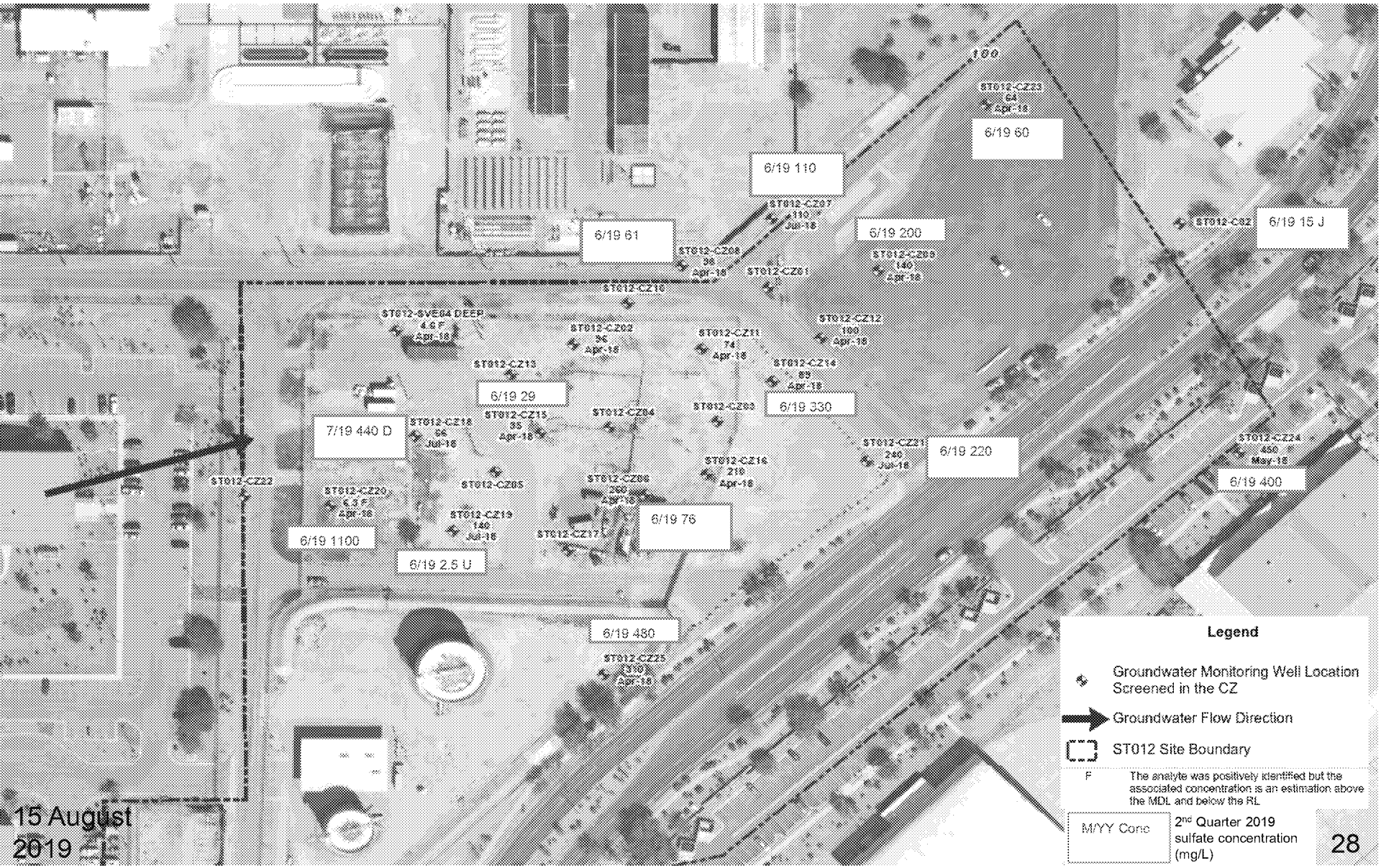
Site ST012 Benzene (µg/L) in CZ



Site ST012 Benzene (µg/L) in CZ



Site ST012 Sulfate (mg/L) in CZ



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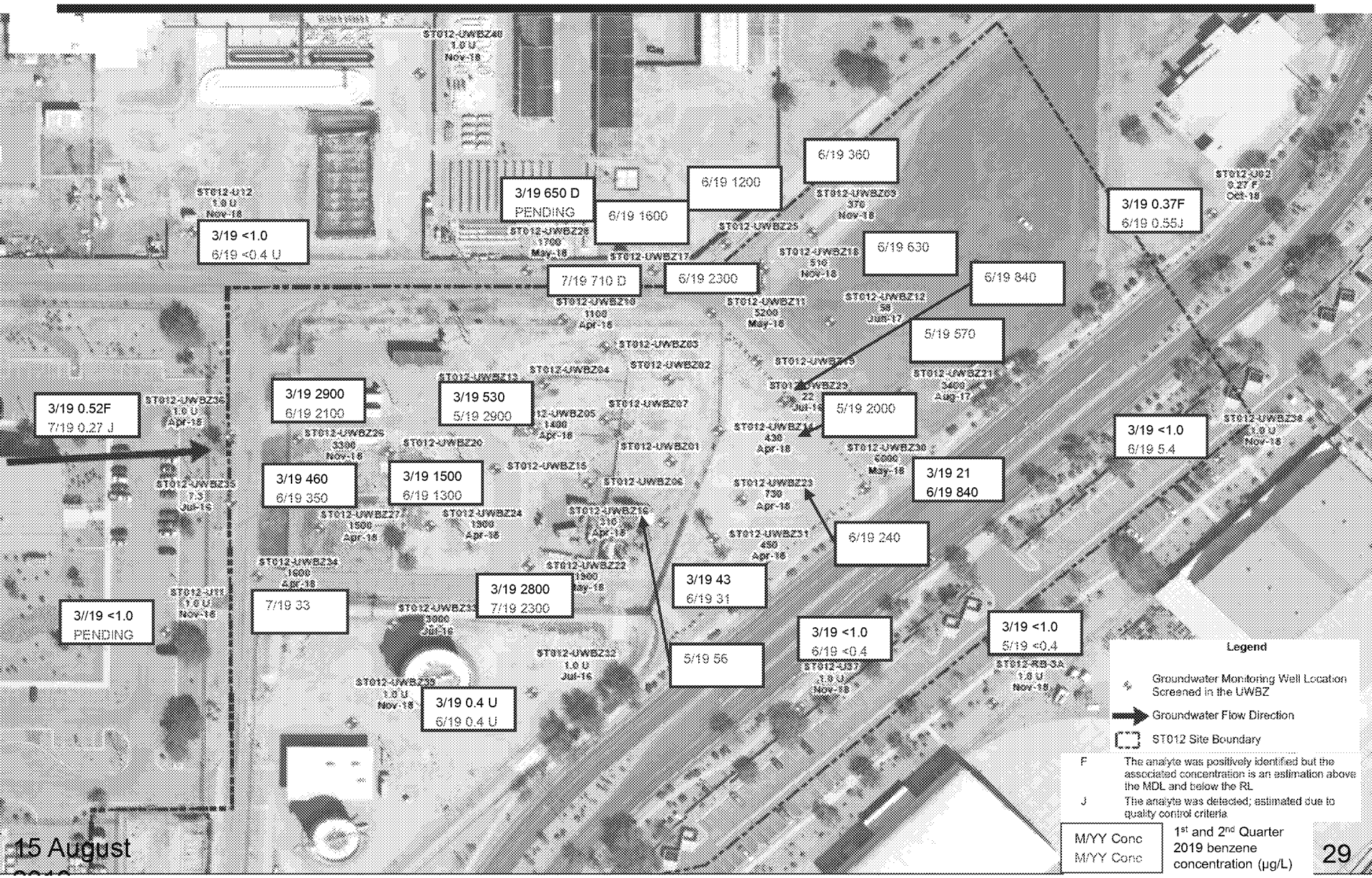
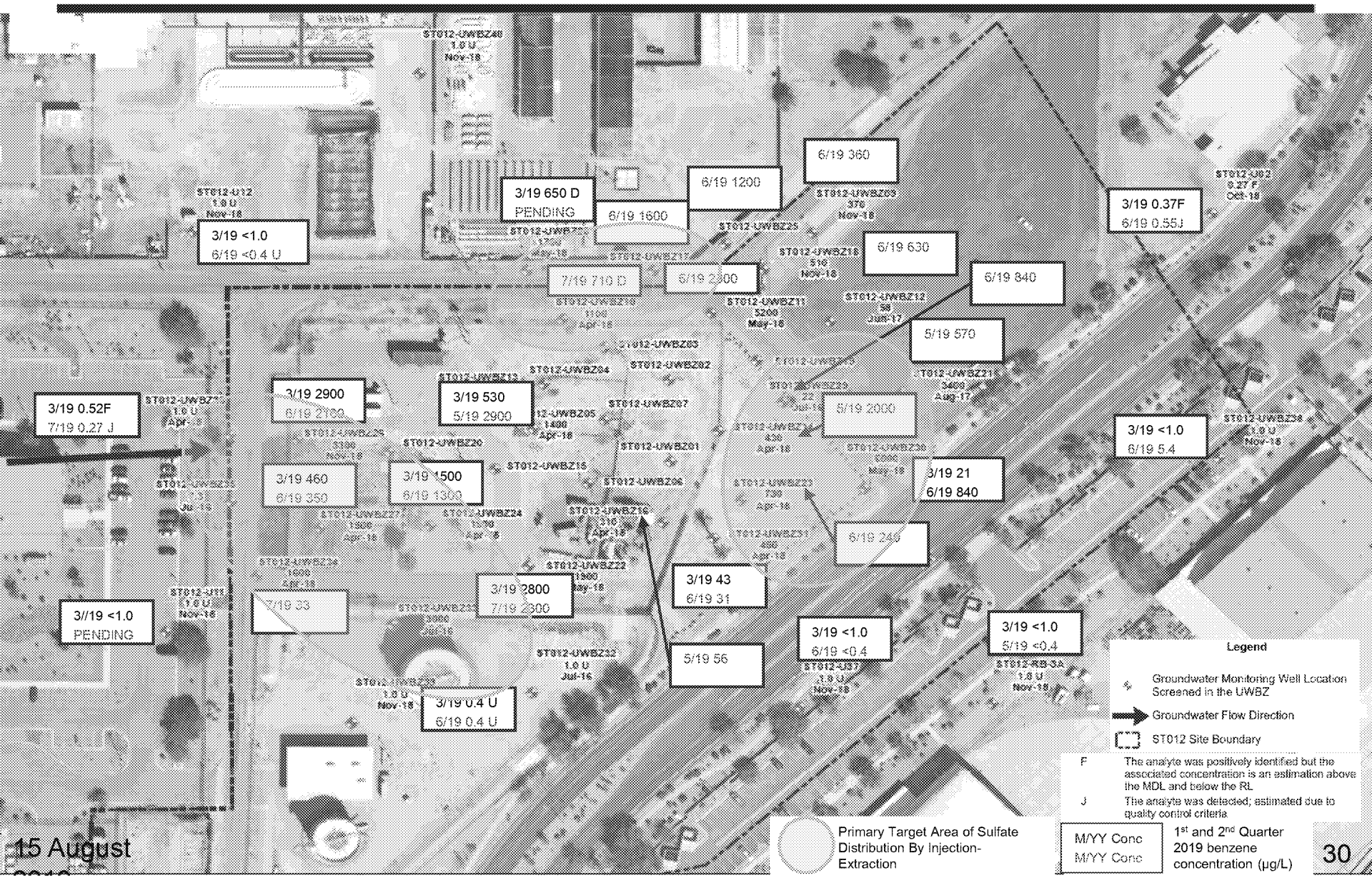
Site ST012 Benzene (µg/L) in UWBZ



Site ST012 Benzene (µg/L) in UWBZ



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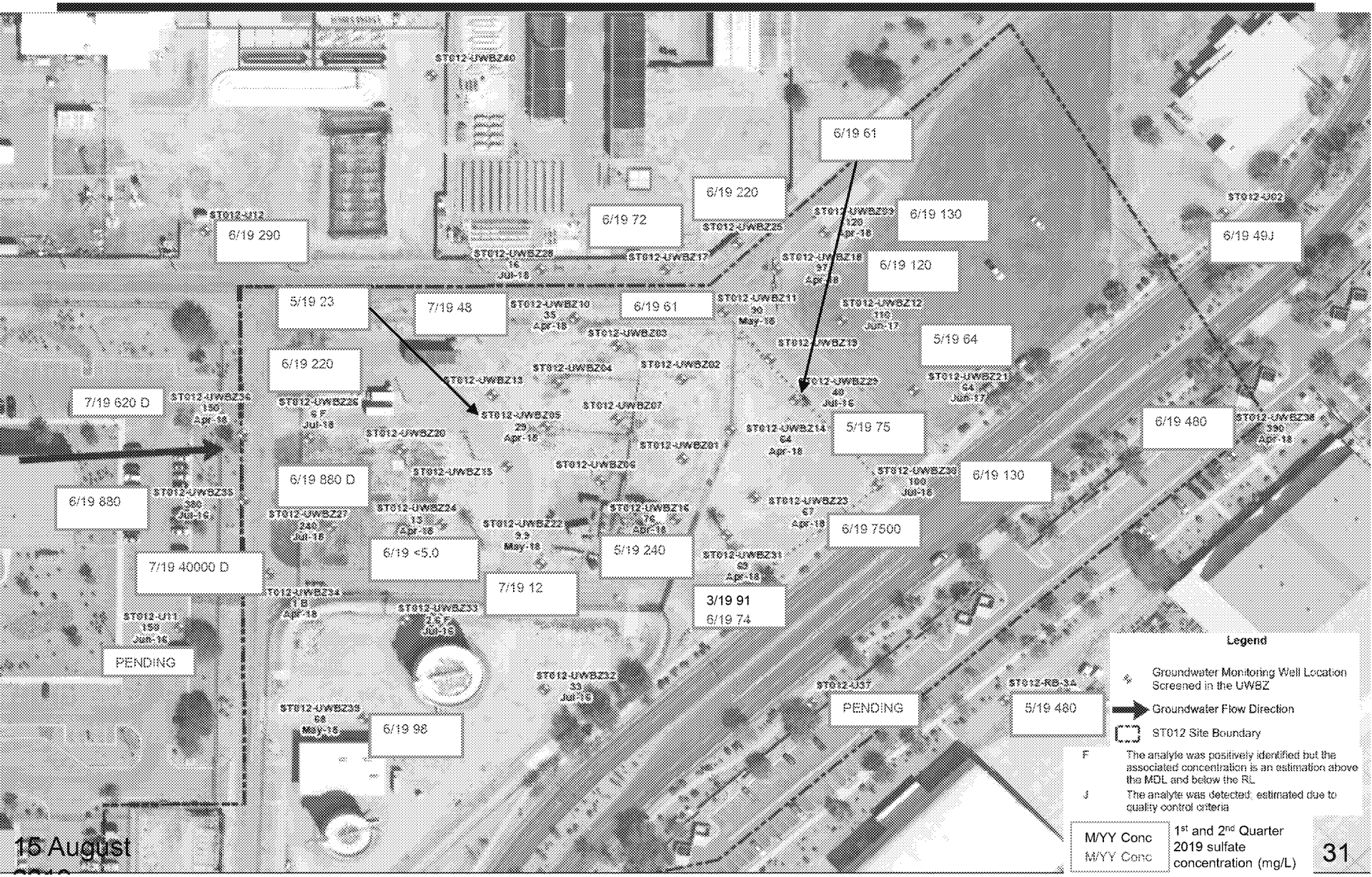
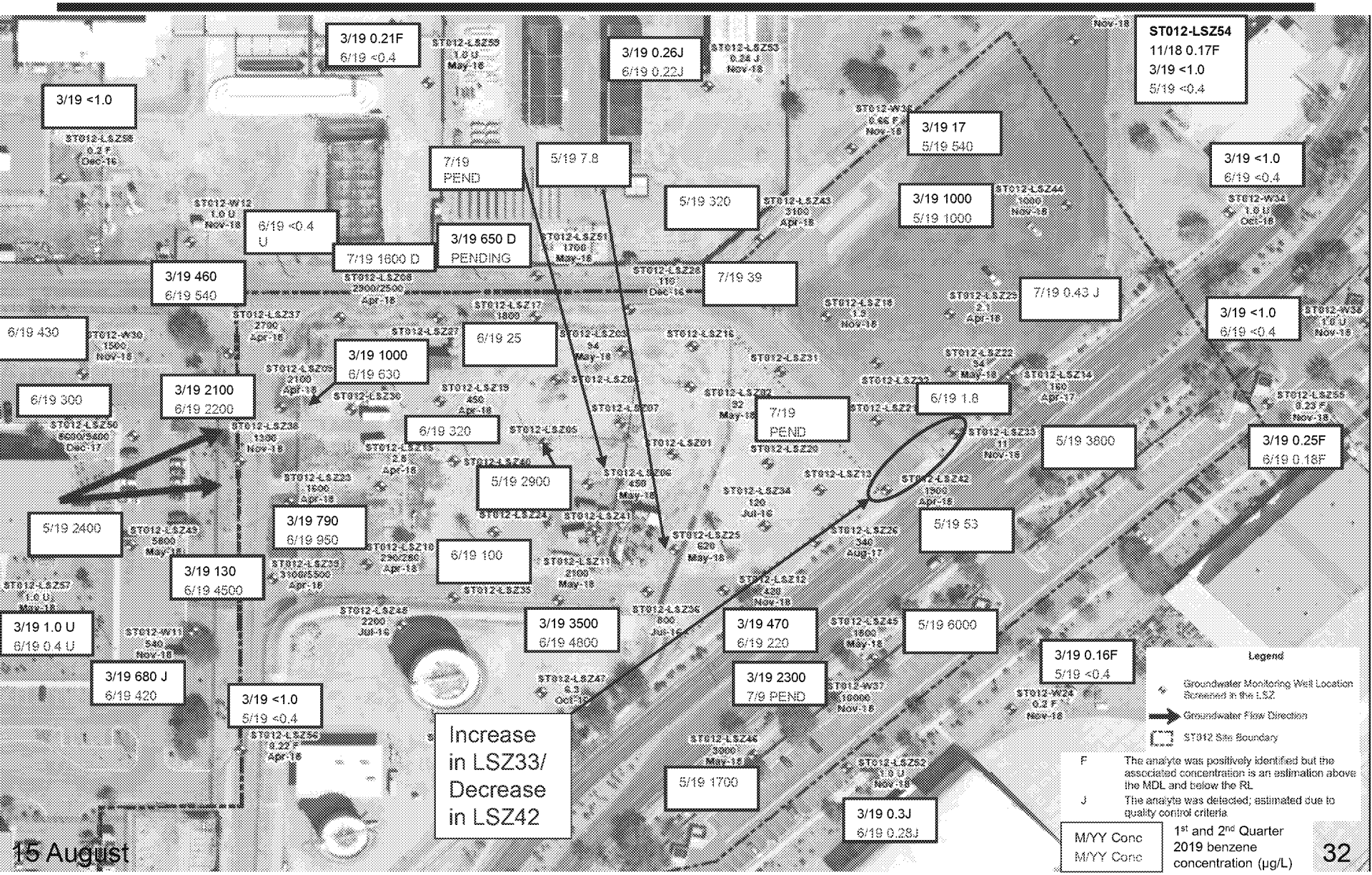
Site ST012 Sulfate (mg/L) in UWBZ



Site ST012 Benzene (µg/L) in LSZ



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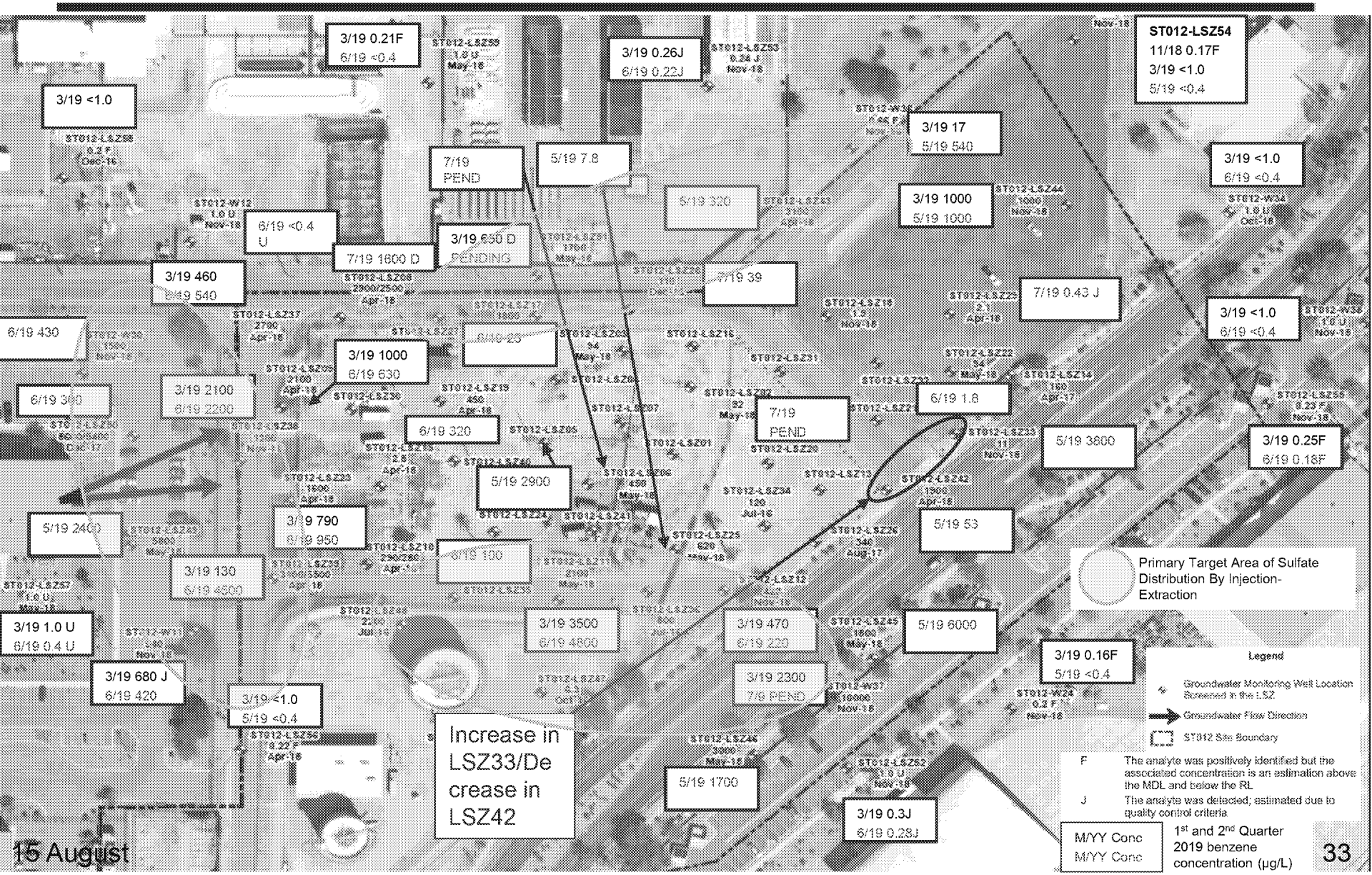
Site ST012 Benzene (µg/L) in LSZ



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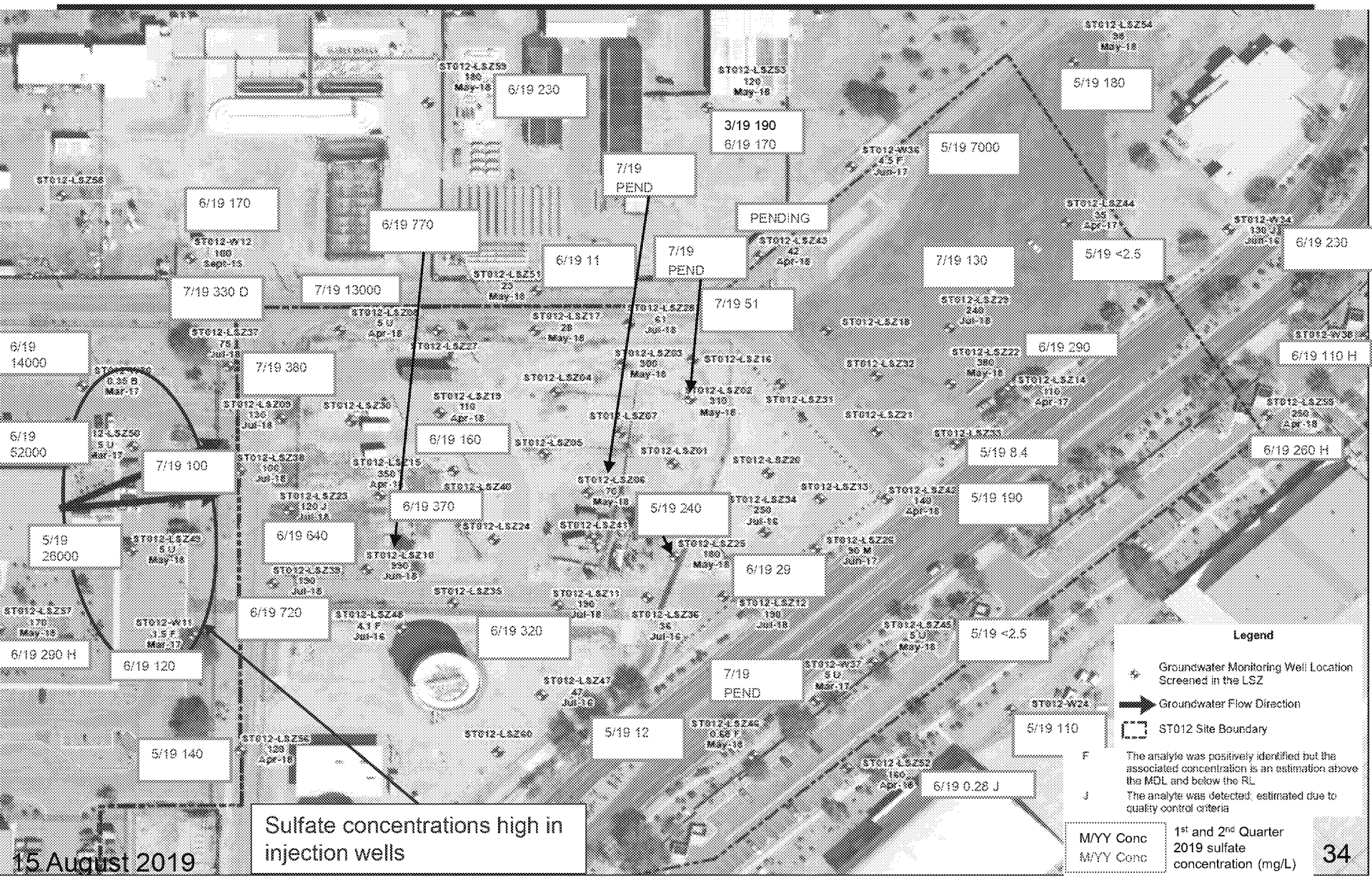
Site ST012 Sulfate (mg/L) in LSZ



Sulfate concentrations high in injection wells

Pilot Study Injection/Extraction Update

Site ST012 Extraction System Performance

Extraction Well	Recent Instantaneous Measured Extraction Rate gpm	Calculated Average Extraction Rate in Period gpm	Maximum Temperature °F	Most Recent Temperature °F	Cumulative Extraction gallons	Note
ST012-CZ07	6.6	6.6	175	142	3,359,073	
ST012-CZ18	7.1	8.2	136	126	2,442,144	
ST012-CZ19						Eliminated as an extraction well by FVM#7
ST012-CZ21	0.7		150	141	345,597	Totalizer reading suspect
ST012-CZ23	4		98	97	38,993	
CZ Subtotal					6,185,808	
ST012-UWBZ21		0.0	162	48	591,263	Pneumatic pump
ST012-UWBZ22	0.7	0.0	146	120	419,604	Totalizer reading suspect
ST012-UWBZ26	5.1	2.3	133	120	2,281,965	
ST012-UWBZ27			128	94	129,197	Extraction stopped due to sulfate presence
ST012-UWBZ30		0.0	172	108	1,397,199	Pneumatic pump, pumping intermittently
UWBZ Subototal*					6,087,661	
ST012-LSZ09		0.0	140	98	2,057,442	
ST012-LSZ11	13.7	11.0	139	100	2,241,033	Flow meter troubleshooting
ST012-LSZ12	4.8	4.6	130	108	1,441,515	
ST012-LSZ23	8.6	4.9	113	94	3,434,480	
ST012-LSZ28			162		18,899	Eliminated as an extraction well by FVM#7
ST012-LSZ29			>170		17	Eliminated as an extraction well by FVM#7
ST012-LSZ37	12.7	12.4	132	91	5,090,014	
ST012-LSZ38	8.8	0.5 **	160	90	763,350	
ST012-LSZ39			92	78	1,250,933	Extraction stopped due to sulfate presence
ST012-UWBZ28/LSZ51	6.9	6.9	146	128	2,536,868	
LSZ Subtotal*					17,566,116	
Total of Wells		57.3			29,839,585	
Treatment System		38.7			20,334,589	

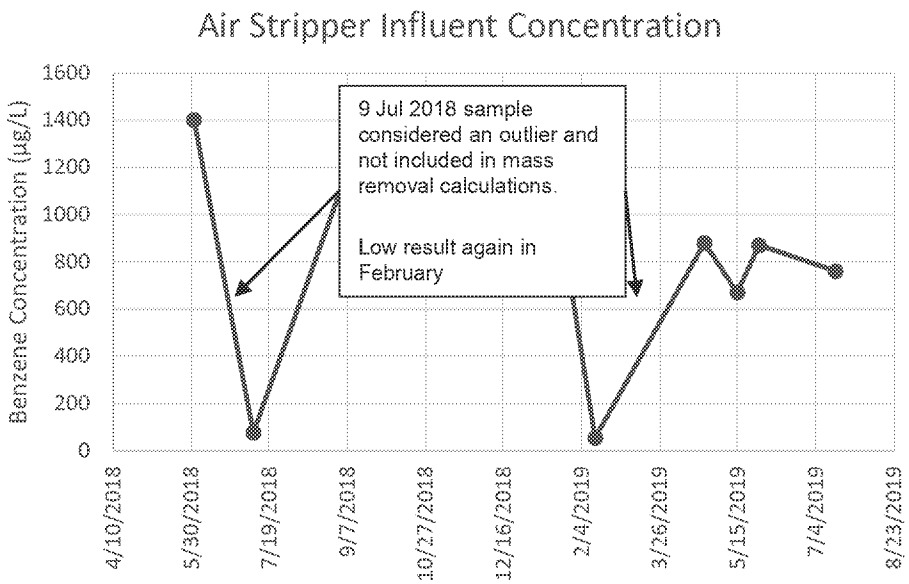
Data is preliminary

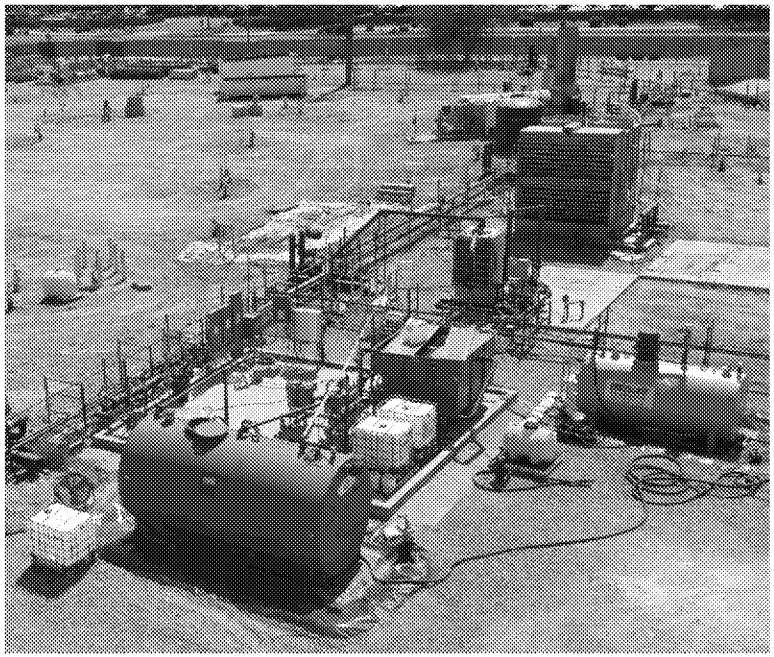
* Includes 1/2 of ST012-UWBZ28/LSZ51

**Totalizer not consistently recording, average value biased low

Site ST012 Extraction System Performance

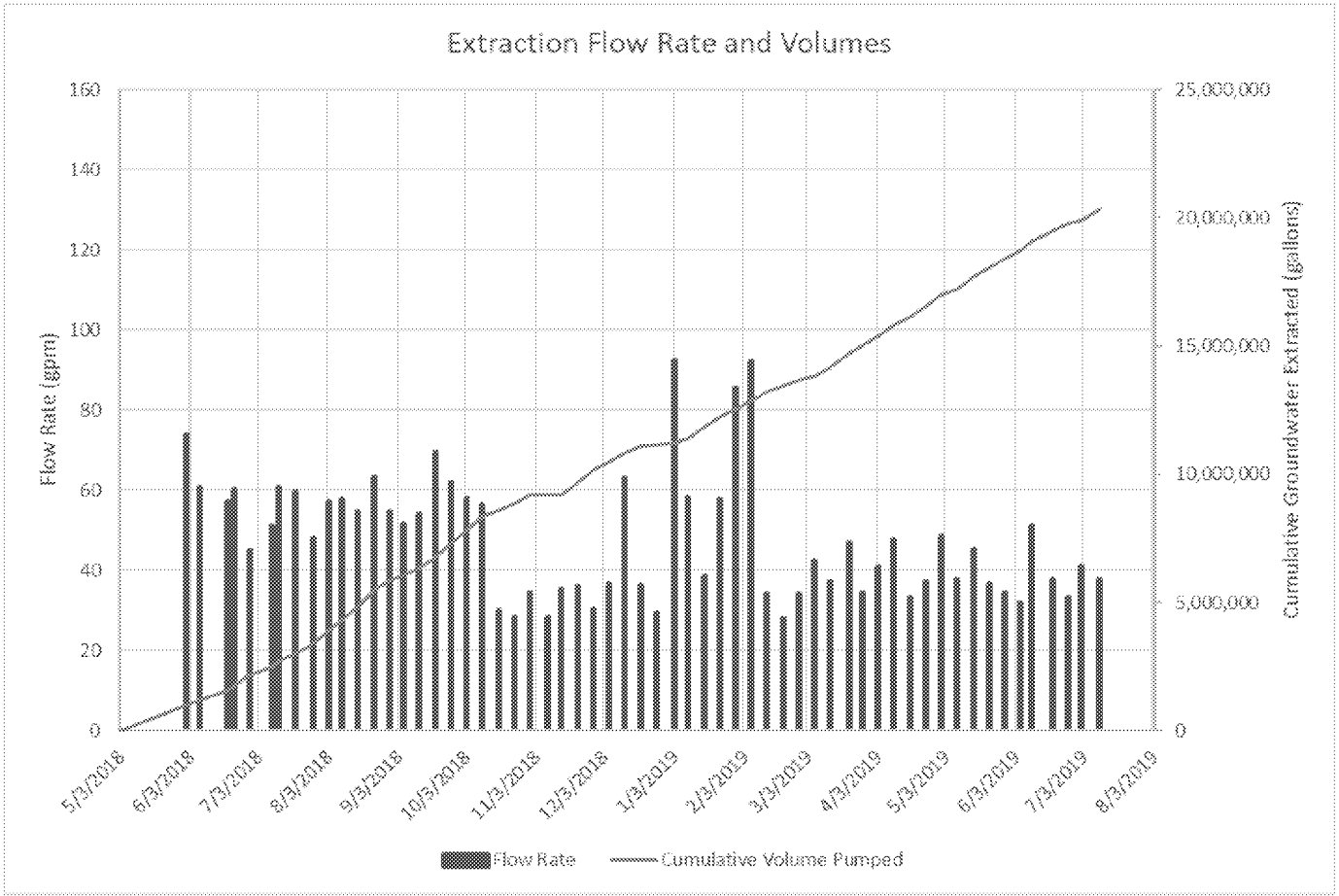
- No LNAPL has been recovered since extraction started up
- All extraction pumps operating
- Extraction at CZ23 added
- Benzene air stripper influent at 760 µg/L for July sample





Site ST012 Extraction System Performance

- **Overall Extraction Rates and Cumulative Volume Extracted**



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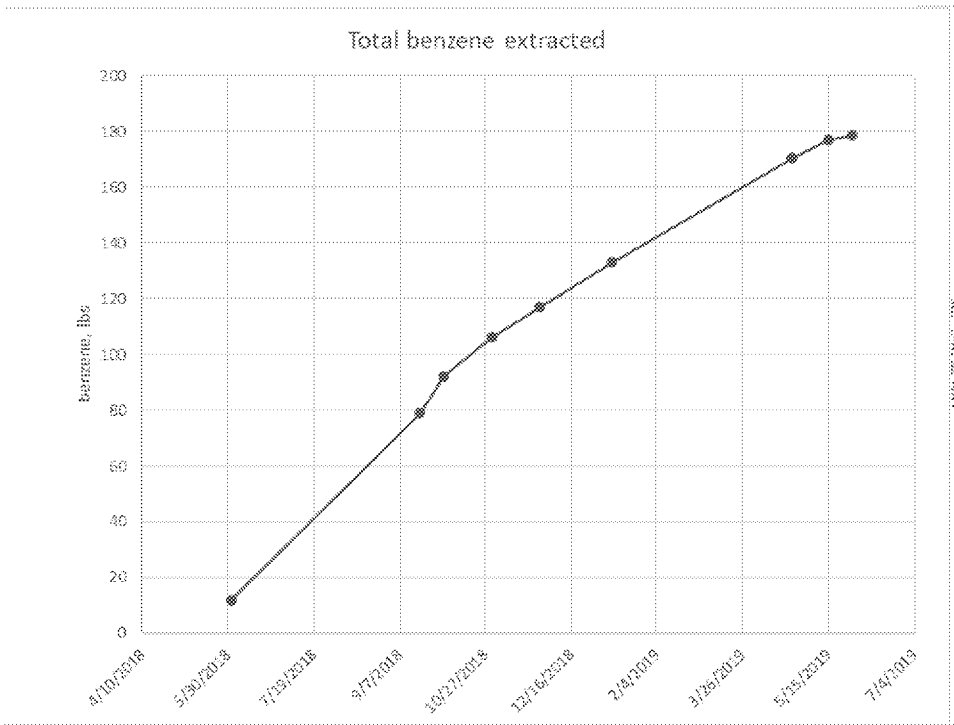
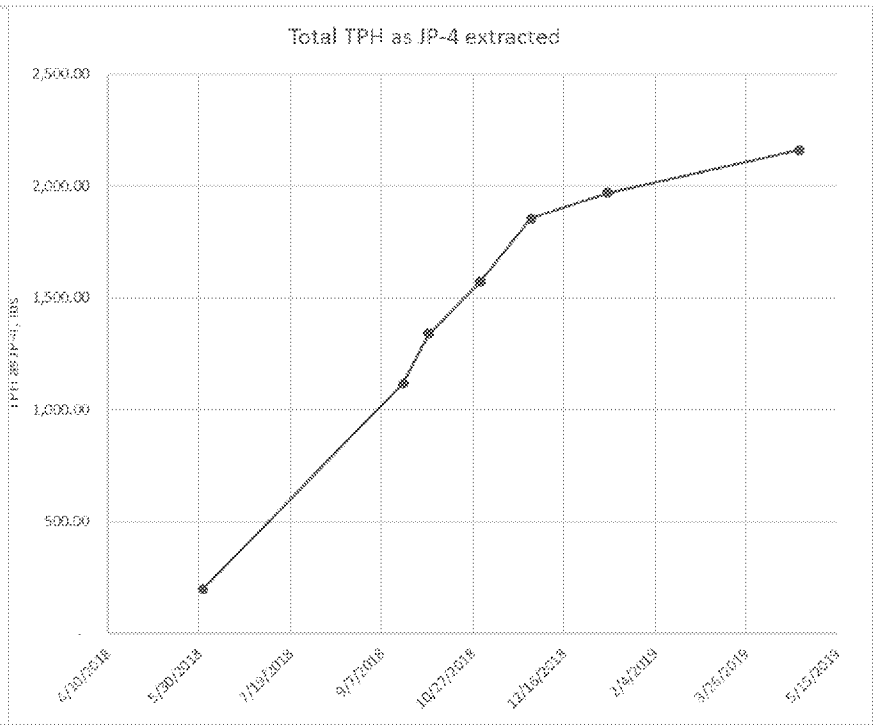
Site ST012 Extraction System Performance

- **Estimated Mass Removal by Extraction**
- **TPH analytical results for July sample are pending**

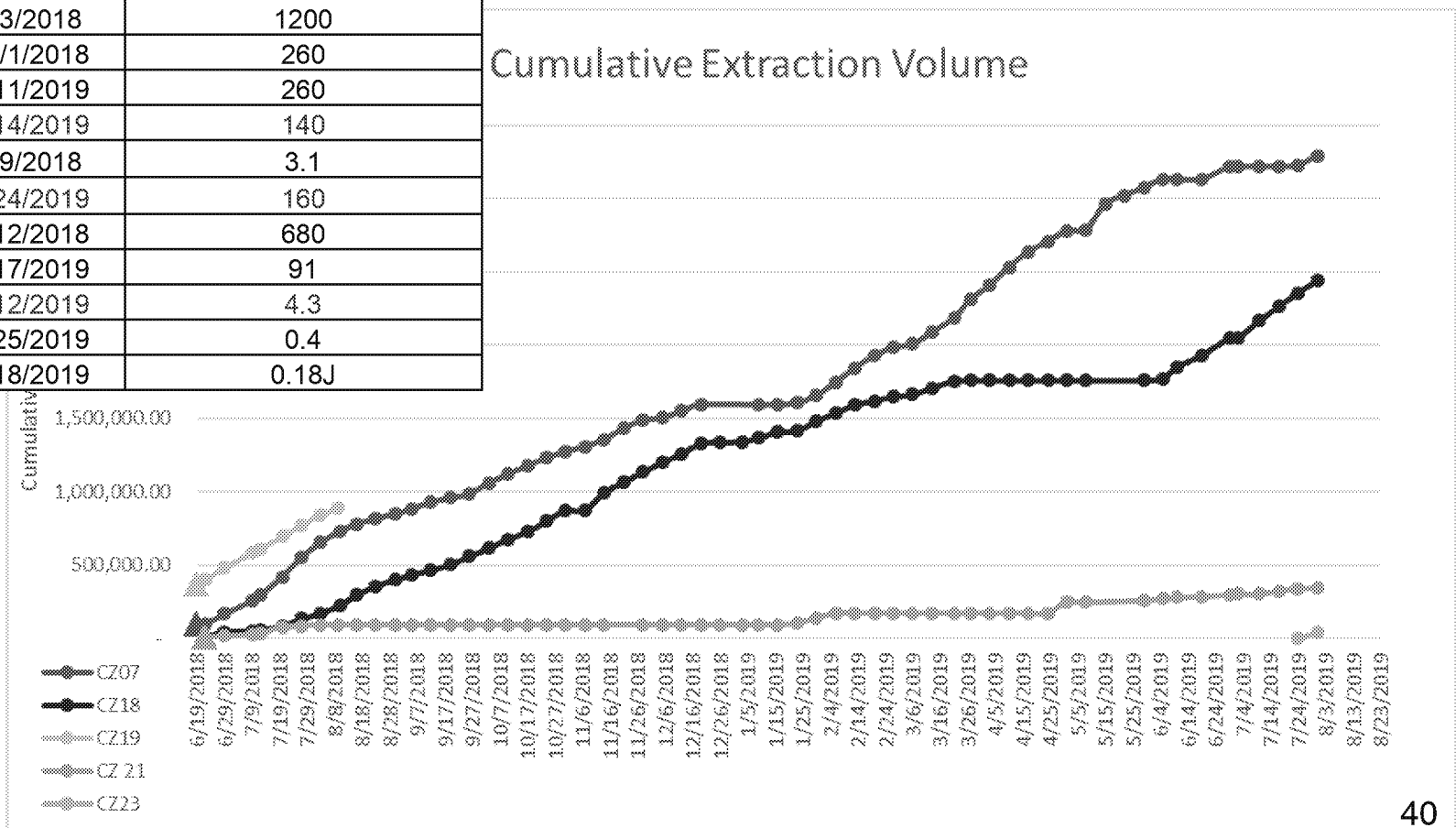




Cumulative Extraction Volume and Analytical Data by Well - Cobble Zone

Well ID	Date Sampled	Benzene Concentration, µg/L
ST012-CZ07	4/30/2018	230
	11/1/2018	600
	2/11/2019	410
	6/18/2019	320
ST012-CZ18	4/3/2018	1200
	11/1/2018	260
	2/11/2019	260
	6/14/2019	140
ST012-CZ19	5/9/2018	3.1
	6/24/2019	160
ST012-CZ21	4/12/2018	680
	6/17/2019	91
ST012-CZ23	7/12/2019	4.3
ST012-CZ25	3/25/2019	0.4
	6/18/2019	0.18J

- Most recent baseline and operating (when available) benzene analytical result listed (Jun/Jul 2019 added)



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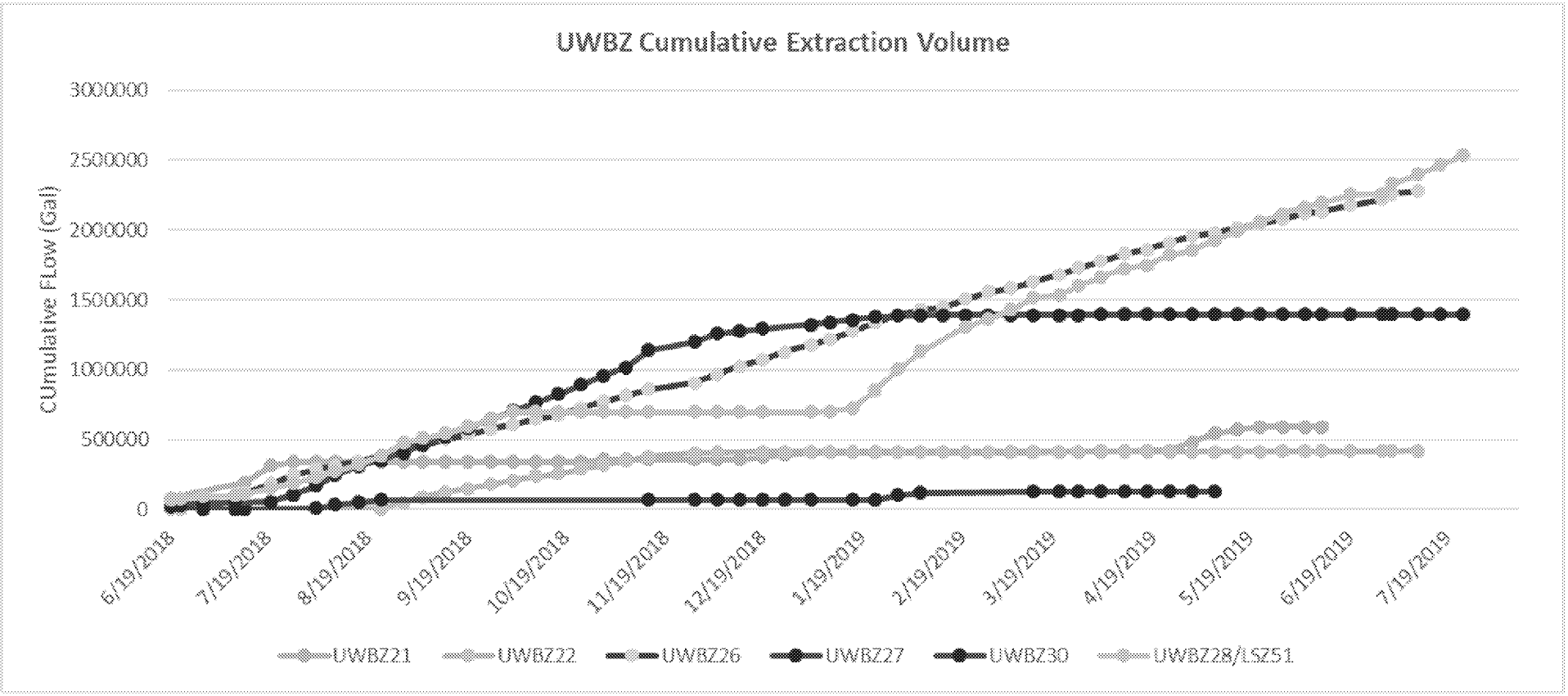
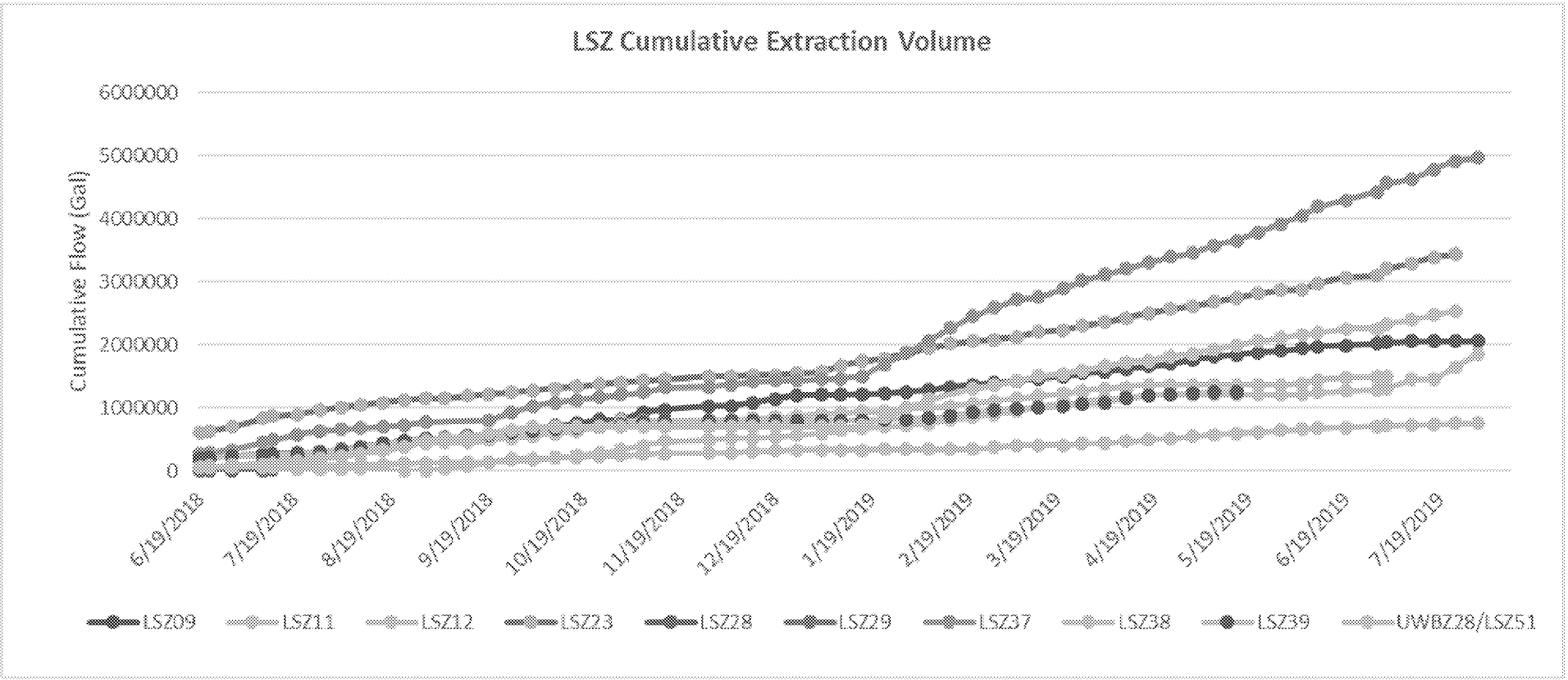
Cumulative Extraction Volume and Analytical Data by Well - Upper Water Bearing Zone



Cumulative Extraction Volume and Analytical Data by Well - Upper Water Bearing Zone

Well ID	Date Sampled	Benzene Concentration, µg/L
ST012-UWBZ14	5/23/2019	2000
ST012-UWBZ21	8/9/2017	3400
	5/22/2019	570
ST012-UWBZ22	5/9/2018	1900
	2/11/2019	2800
	7/11/2019	2300
ST012-UWBZ26	4/3/2018	3500
	4/3/2018	3700
	2/12/2019	2900
	6/14/2019	2100
ST012-UWBZ27	4/3/2018	1500
	2/12/2019	460
	6/14/2019	350
ST012-UWBZ28/LSZ51	5/9/2018	1700
	3/25/2019	650
ST012-UWBZ30	5/9/2018	6000
	2/13/2019	21
	6/14/2019	840
ST012-UWBZ39	3/25/19	0.4
	6/4/2019	0.4

Cumulative Extraction Volume by Well
Lower Saturated Zone



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Analytical Data by Extraction Well
Lower Saturated Zone

Well ID	Date Sampled	Benzene Concentration, µg/L
ST012-LSZ09	4/3/2018	2100
	2/12/2019	1000
	6/14/2019	630D
ST012-LSZ11	5/9/2018	2100
	2/12/2019	3500
	6/18/2019	4800D
ST012-LSZ12	5/9/2018	1400
	11/1/2018	420
	2/12/2019	470
	6/19/2019	220
ST012-LSZ23	4/3/2018	1600
	2/12/2019	790
	6/14/2019	950
ST012-LSZ28	12/1/2016	110
	7/11/2019	39
ST012-LSZ29	4/10/2018	2.1
	7/12/2019	0.43J
ST012-LSZ33	5/30/2019	3800
ST012-LSZ37	4/12/2018	2700
	2/12/2019	460
	6/14/2019	540
ST012-LSZ38	4/3/2018	3000
	11/1/2018	1300
	2/12/2019	2100
	6/14/2019	2200
ST012-LSZ39	4/12/2018	3100/5500
	2/12/2019	130
	6/17/2019	4500
ST012-LSZ43	5/24/2019	320
ST012-LSZ49	5/24/2019	2400
ST012-UWBZ28/LSZ51	5/9/2018	1700
	3/25/2019	650
ST012-LSZ53	3/25/2019	0.26
	6/18/2019	0.22J
ST012-LSZ56	5/23/2019	0.4

Site ST012 Injection Progress

- Injections continued in Jun-Jul
- 260 tons injected through 18 Jul 2019 (322 tons planned through subphase 2)
- 15 tons injected since last update (slowed by Army Reserve Center training)
- Subphase 2 injections nearly complete
- Initiating subphase 3 injections soon

Date	Volume (gallons)	Number of Bags of Sulfate Added	Calculated Na2SO4 Conc. g/L	Calculated SO4 Conc. g/L	Locations(% of volume if multiple locations)
7/15/2019	6,000	3	113	76	CZ22 (3 tons)
7/16/2019	8,000	4	113	76	UWBZ23 (3.7 tons)
7/17/2019	8,000	4	113	76	UWBZ23 (6.3 tons)
7/18/2019	8,000	4	113	76	SVE04D (0.4 tons)

Note:

1. blue text indicates subphase 2 injections.

Site ST012 Sulfate Field Screening

Date	Sulfate Concentration (mg/L)																						
	CZ02 Field	CZ07 Field	CZ18 Field	CZ20 Field	CZ21 Field	UWBZ15 Field	UWBZ21 Field	UWBZ22 Field	UWBZ24 Field	UWBZ26 Field	UWBZ27 Field	UWBZ28/LSZ51 Field	UWBZ30 Field	LSZ09 Field	LSZ10 Field	LSZ11 Field	LSZ12 Field	LSZ23 Field	LSZ35 Field	LSZ37 Field	LSZ38 Field	LSZ39 Field	LSZ47 Field
12/17/2018	---	---		---	---	---	---	*30*	---	---	*15*	---	---	---	---	---	---	---	---	---	---	---	---
12/21/2018	---	---		---	---	---	---	*45*	---	---	*30*	---	---	---	---	---	---	---	---	---	---	---	---
12/26/2018	---	---		---	---	---	---	146	---	---	>150	---	---	---	---	---	---	---	---	---	---	---	---
1/15/2019	---	---		---	---	---	---	45	---	---	71	---	---	---	---	---	---	---	---	---	---	---	---
1/18/2019	---	---		---	---	---	---	40	---	---	57	---	---	---	---	---	---	---	---	---	---	---	---
1/21/2019	---	---		---	---	---	---	38	---	---	66	---	---	---	---	---	---	---	---	---	---	---	---
1/24/2019	---	---		---	---	---	---	41	---	---	48	---	---	---	---	---	---	---	---	---	---	---	---
1/25/2019	---	---		---	---	---	---	250	---	---	50	---	---	---	---	---	---	---	---	---	---	---	---
1/28/2019	---	---		---	---	---	---	10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/29/2019	---	---		---	---	---	---	35	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1/31/2019	---	---		---	---	---	---	89	---	22	---	---	---	---	---	---	---	---	---	---	---	---	---
2/1/2019	---	---		---	---	---	---	57	---	9	---	---	---	---	---	---	---	---	---	---	---	---	---
2/5/2019	---	---		---	---	---	---	37	---	25	---	---	---	---	---	---	---	---	---	---	---	---	---
2/11/2019	---	---		---	---	---	---	37	---	10	54	---	---	---	---	---	---	---	---	---	---	---	---
2/15/2019	---	---		---	---	---	---	36	---	12	48	---	---	---	---	---	---	---	---	---	---	---	---
2/18/2019	---	---		---	---	---	---	40	---	16	---	---	---	---	---	---	---	---	---	---	---	---	---
2/22/2019	---	---		---	---	---	---	---	---	22	---	---	---	---	---	---	---	---	---	---	---	---	---
2/25/2019	---	---		---	---	---	---	---	---	38	---	---	---	---	---	---	---	---	---	---	---	---	---
3/1/2019	---	---		---	---	---	---	---	---	66	94	---	---	---	---	---	---	---	---	---	---	---	---
3/4/2019	---	---		---	---	---	---	---	---	67	112	---	---	---	---	---	---	---	---	---	---	---	---
3/8/2019	---	---		---	---	---	---	---	---	104	---	---	---	---	---	---	---	---	---	---	---	---	---
3/11/2019	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
3/15/2019	---	---		---	---	---	---	---	---	101	119	---	---	---	---	---	---	---	---	---	---	---	---
3/20/2019	---	---		---	---	---	---	---	---	---	97	---	---	---	---	---	---	---	---	---	---	---	---
3/29/2019	---	---		---	---	---	---	---	---	99	350	---	---	---	---	---	---	---	---	---	---	850	---
4/8/2019	---	---		---	---	---	---	---	---	81	297	---	---	---	---	---	---	---	---	---	---	153	---
4/16/2019	---	---		---	---	---	---	---	---	150	520	---	---	---	---	---	---	---	---	---	---	210	---
4/23/2019	---	---		---	---	---	---	---	---	---	1240	6	---	---	---	---	---	---	---	---	20	1220	---
4/26/2019	---	---		---	---	---	---	---	---	---	570	18	---	---	---	---	---	---	---	---	70	1230	---
5/1/2019	---	---		---	---	---	---	---	---	---	1310	12	---	---	---	---	---	---	---	---	77	1180	630
5/8/2019	---	---		---	26	---	---	---	---	---	720	---	---	---	---	---	---	---	---	---	---	1440	---
5/13/2019	1	11		0	---	4	7	---	1	17	---	1	10	20	90	4	21	---	59	---	12	---	---
5/15/2019	---	---		---	---	---	---	---	---	---	1430	---	---	---	---	---	---	---	---	---	---	1425	---
5/16/2019	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/22/2019	---	---		---	---	---	---	---	---	---	1430	0	---	---	---	160	---	---	---	170		1430	---
5/29/2019	10	60		0	230	10	30	---	10	270	3000	20	110	3000	1810	90	30	610	0	200	130	1430	---
6/5/2019	---	80		---	280	180	---	0	---	160	1240	---	180	320	830	100	---	630	0	290	100	---	0
6/11/2019	0	---		0	230	---	30	---	0	280	---	0	120	320	830	---	0	740	---	410	150	1430	---
6/13/2019	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
6/18/2019	---	110		---	250	10	---	20	---	280	1380	---	120	570	1820	250	---	670	10	400	240	---	
6/25/2019	100	---		80	240	---	610	---	0	370	---	0	110	450	860	---	10	630	---	200	90	90	---
6/26/2019	---	---		---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
7/2/2019	---	140		---	180		---	270	---	550	1220	---	150	470	870	230	---	540	40	370	350	---	0
7/9/2019	100	---		510	600	---	540	---	0	640	---	10	150	450	870	---	200	750	---	420	350	1320	---
7/16/2019	---	10		---	250	0	---	0	---	540	290	---	100	220	820	280	---	630	10	430	430	---	0
7/23/2019	90	---	1000	430	210	---	480	---	0	630	---	10	270	200	790	---	200	590	---	390	410	1150	---
7/30/2019	---	10		---	230	60	---	0	---	630	900	---	240	310	740	170	---	600	40	400	400	---	0

CZ07 — Screening location is and extraction location

CZ20 — Screening location is a monitoring well

UWBZ27 extraction shut down

LSZ39 extraction shut down

Site ST012 Sulfate Field Screening

- CZ20 – recent result shows potential sulfate from injections at CZ22
- CZ21 – one recent result (9 Jul) shows potential sulfate from injections but other results are consistent with background at that well
- UWBZ26 - recent result shows potential sulfate from injections at UWBZ35 and UWBZ36. Considering extraction shut down
- LSZ09 – had indications of sulfate from injections but recently decreasing
- LSZ10 – downgradient of LSZ39 where extraction was stopped
- LSZ11 and LSZ12 – increasing sulfate but still within range of the aquifer background
- LSZ23, LSZ38, LSZ39 - recent results shows potential sulfate from injections at LSZ49 and LSZ50. Considering extraction shut down

Additional Monitoring Wells Summary

- Based on EPA and ADEQ comments a revised evaluation and location markup was provided by AF to regulatory agencies on 8 Apr 2019 as a scope of work for well installation
- ADEQ comment letter issued 16 Apr 2019; EPA/ADEQ comment letter issued 15 May 2019
- 8 Apr 2019 figures and updated AFCEC feedback provided in subsequent slides
- Formal RFP under final AF review before submittal to contractor
- Negotiation and award tentatively scheduled for completion in September 2019
- Monitoring well installation tentatively scheduled to begin in mid-Oct 2019

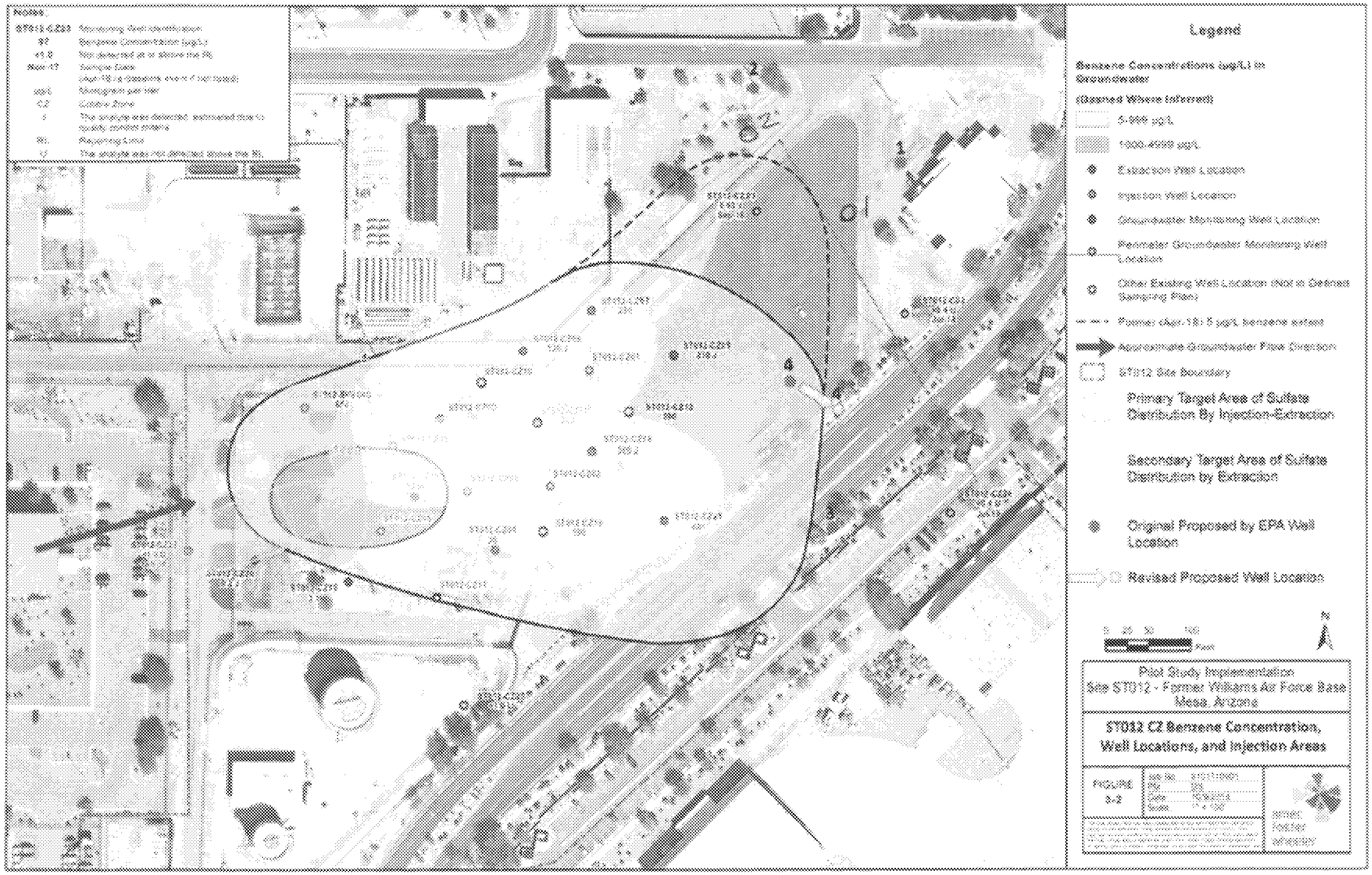
Additional Monitoring Well Update

Evaluation of Potential Additional CZ Monitoring wells

Location Proposed by EPA	Location Description	Primary Purpose based on Call/Discussion	AFCEC Plan	EPA Priority	AFCEC Feedback
CZ Location 1	E of CZ23 See figure (ink location)	Containment monitoring beyond CZ23	Planned for initial mobilization	High	CZ Locations 1 and 2 are related to previous benzene detections at CZ23. Extraction at CZ07 was implemented and is ongoing to address the CZ23 area.
CZ Location 2	N of CZ023, see figure (ink location)	Containment monitoring beyond CZ23 and downgradient of LSZ53 area where boring had mixed results	Planned for initial mobilization	Medium	See feedback for CZ location 1. Relative to location 1 this location is in a cross-gradient position relative to CZ23, and as such, AF concurs location 2 is a lower priority than location 1. Based on recent sample results from CZ23 prior to extraction at that well, AFCEC has added this location to the planned initial phase of well installation..
CZ Location 3	E of CZ21 (red dot)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at CZ41 and perimeter well CZ24.
CZ Location 4	E-SE of CZ09 (yellow dot)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between plume detections at CZ41 and perimeter well C02.

Notes:
Initial mobilization to address high priority locations. Medium and lower priorities will be revisited at a later date to confirm locations considering available monitoring data. Locations and priority will continue to be evaluated as additional site data is received.
Yellow highlight – 4 wells recommended for inclusion in first well installation mobilization.

Potential Additional CZ Monitoring Wells

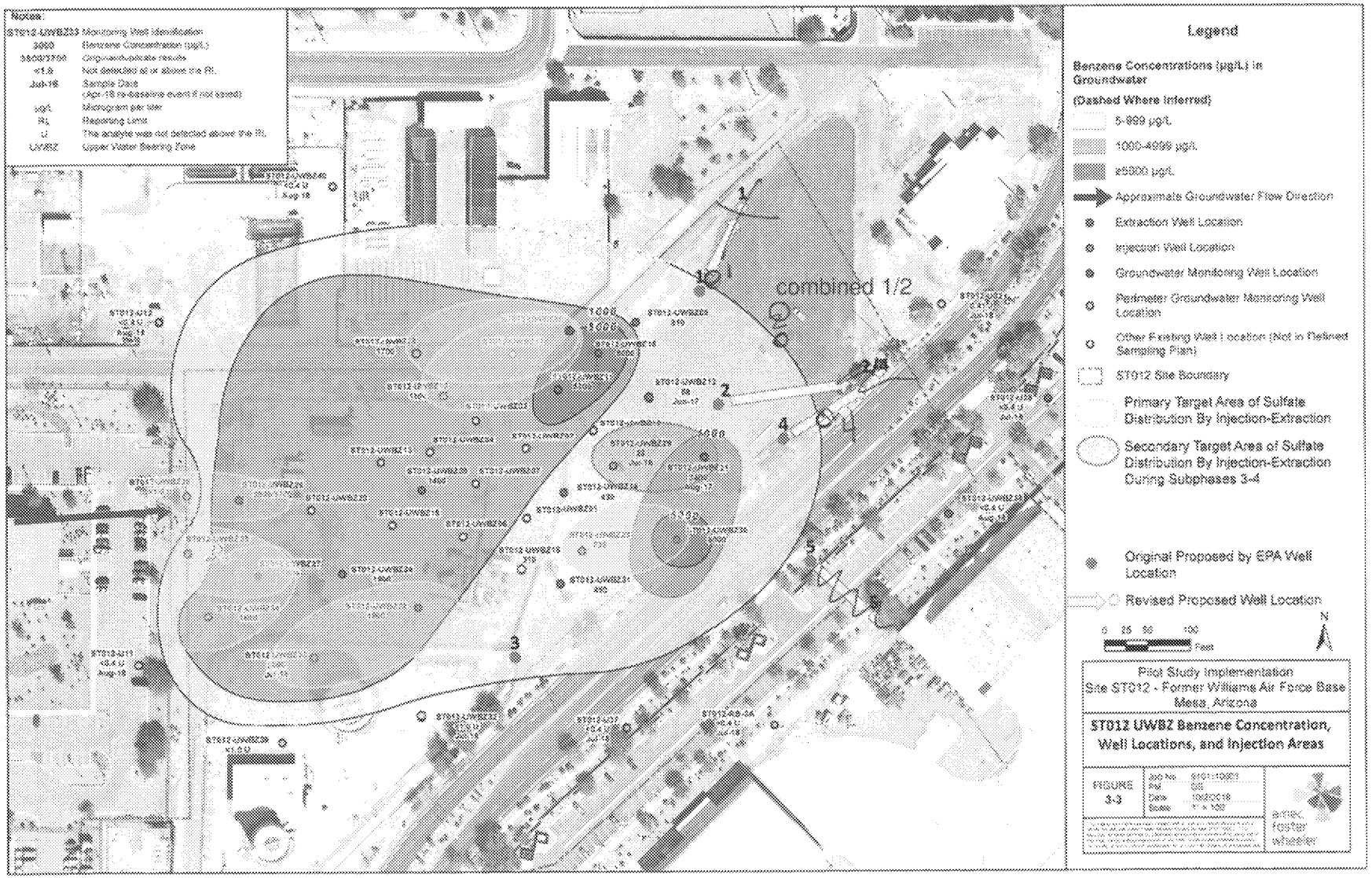


Evaluation of Potential Additional UWBZ Monitoring Wells

Location Proposed by EPA	Location Description	Primary Purpose based on Call/Discussion	AFCEC Plan	EPA Priority	AFCEC Feedback
UWBZ Location 1	E of UWBZ09 (red circle combined location)	Containment Monitoring beyond UWBZ09	Planned for initial mobilization combined location	High	UWBZ location 1 is in an area further northward than existing perimeter well (U02), but high concentrations at this end of the 5000-ug/L contour are constrained by relatively lower concentrations at UWBZ09. This location is biased north of the flow path from the center of the 5000 ug/L contour; **AF recommends an initial well between proposed locations 1 and 2 downgradient of highest concentrations.**
UWBZ Location 2	E -NE of UWBZ12 (red circle combined location)	Earlier detection of VOC or sulfate displacement from injections	Planned for Assessment based on EBR monitoring	Medium	Concur this location as proposed is lower priority as it is further from high concentration detections. However based on results from location 1, a step out to the north or northeast may be appropriate in the future..
UWBZ Location 3	NE of UWBZ32	Earlier detection of VOC or sulfate displacement from injections	Planned for Assessment based on EBR monitoring	Lower	Concur this location is lower priority.
UWBZ Location 4	E of UWBZ21 (ink location)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at UWBZ21 and perimeter wells U02 and U38.
UWBZ Location 5	E of UWBZ30 (red dot)	Containment Monitoring beyond UWBZ30	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at UWBZ30 and perimeter wells UWBZ38.

Notes:
Initial mobilization to address high priority locations. Medium and lower priorities will be revisited at a later date to confirm locations considering available monitoring data. Locations and priority will continue to be evaluated as additional site data is received.
Yellow highlight – 3 wells recommended for inclusion in first well installation mobilization.

Potential Additional UWBZ Monitoring Wells

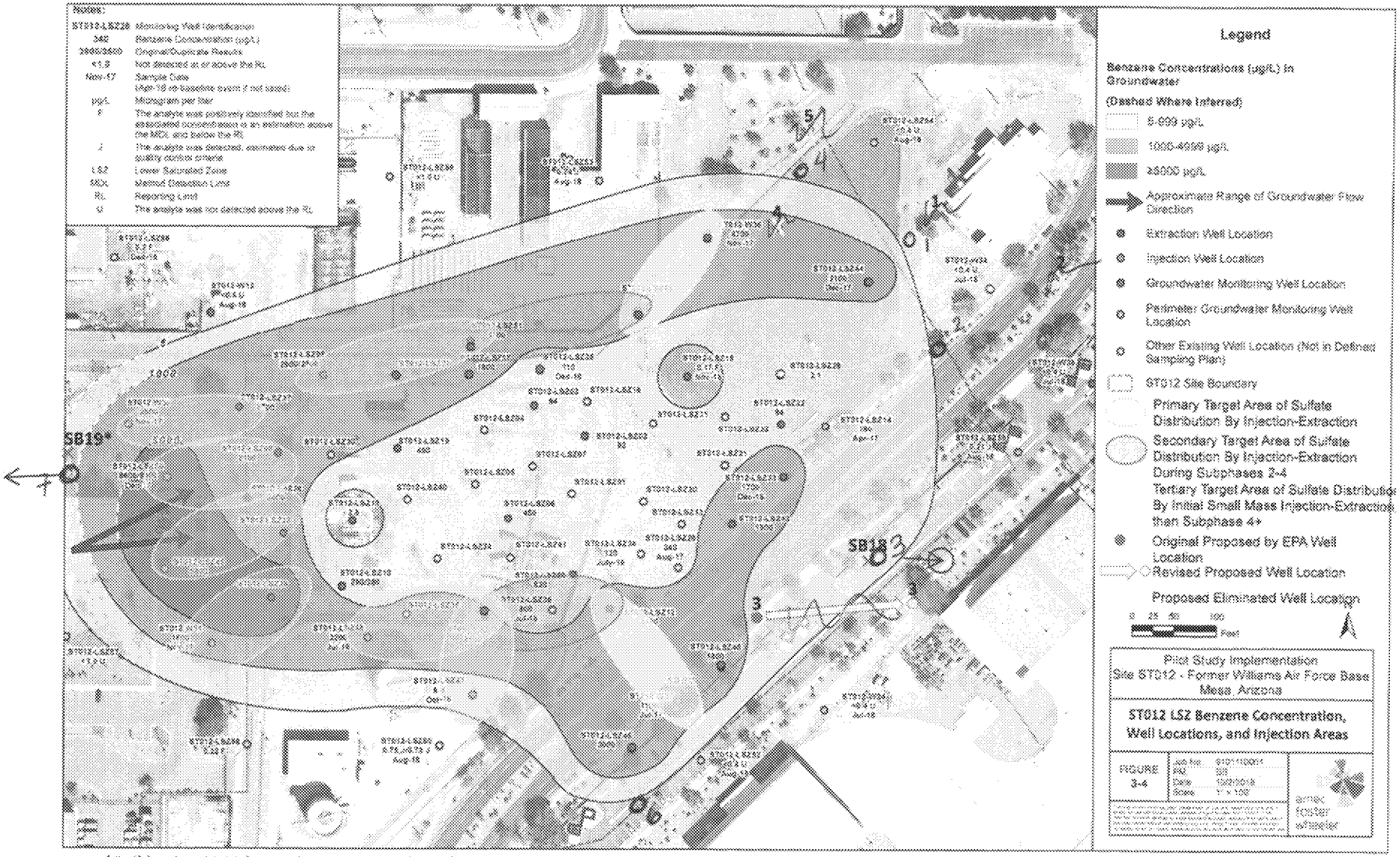


Evaluation of Potential Additional LSZ Monitoring Wells

Location Proposed by EPA	Location Description	Primary Purpose based on Call/Discussion	AFCEC Plan	EPA Priority	AFCEC Feedback
LSZ Location 1 (original red dot)	NE of LSZ44	Containment monitoring in gap between W34 and LSZ54 (Moved closer to 5 ppb line per ADEQ)	Planned for initial mobilization	High	Concur this is one of the highest priority locations. **AF prefers location as originally proposed** if goal is to define plume boundary; the 5 ug/L contour can reasonably be interpreted to be further east as it passes LSZ44, so there is risk of seeing significant detections at the ink location.
LSZ Location 2	E of LSZ29	Plume displacement, containment monitoring	Planned for Assessment based on EBR monitoring	Medium	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of the benzene plume margin between plume detections and three existing perimeter wells.
LSZ Location 3	Between W24 and LSZ55 (red circle)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	**AF prefers moving well outside the plume (east of SB18) if goal is to improve plume boundary definition**. Co-location with SB18 is expected to be within the plume. Note: revised locations are no longer co-located with UBWZ location 5.
LSZ Location 4	NE of W36 (ink location)	Earlier detection of VOC or sulfate displacement from injections	Planned for initial mobilization	High	Acknowledge EPA priority. This location is a step in for perimeter monitoring to refine definition of benzene plume extent between detections at W36 and perimeter well LSZ54.
LSZ Location 5	NE of W36	Combined with location 4	LSZ Location 4 now addresses this area	Eliminate	AF concurs with eliminating location 5 given current proposed location 4.
LSZ Location 6	S of LSZ46	discussed on call to address potential characterization gap	Planned for Assessment based on LSZ52 results	Lower	**AF proposes this location be deferred contingent on continued monitoring at LSZ52.** Note per EPA and State comments this location would also provide more information on LNAPL and dissolved COCs in vicinity of LSZ46
LSZ Location 7	W of W30 and SB19	discussed on call to address potential characterization in area of SB19	Will be considered for second mobilization	Medium	**AF prefers location 7 be moved west** 50 – 100 to be near SB19 if objective is to define extent.

Notes:
Initial mobilization to address high priority locations. Medium and lower priorities will be revisited at a later date to confirm locations considering available monitoring data. Locations and priority will continue to be evaluated as additional site data is received.
Yellow highlight – 3 wells recommended for inclusion in first well installation mobilization. Grey highlight – 1 well proposed for elimination.

Potential Additional LSZ Monitoring Wells



*Soil boring SB19 located approximately 50 feet west of location shown, out of figure view

Site ST012 Path Forward Aug-Sep

- Continued SVE operation
- Continue pump repairs
- Pilot Study Implementation
  - Continue mixing sulfate batches and inject according to plan (FVM7) Phase 1 subphase 3 injections with the modifications previously presented plus:
    - Shut down extraction at UWBZ26, LSZ23, LSZ37, and LSZ38
    - Shut down extraction at CZ18 upon confirmation of sulfate concentration
    - Inject 3 tons into LSZ21 (upgradient of LSZ33 that had 3,800 µg/L benzene) during subphase 3

Air Force Civil Engineer Center

BCT GENERAL UPDATE

BCT Conference Call

15 August 2019

Air Force Civil Engineer Center

2019 BCT MEETINGS/CONFERENCE CALLS SCHEDULE DELIVERABLE TRACKING

BCT Conference Call

15 August 2019

ACTION ITEMS

BCT Conference Call
15 August 2019