Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site ST012

Former Liquid Fuel Storage Area

BCT Meeting

27 February 2020

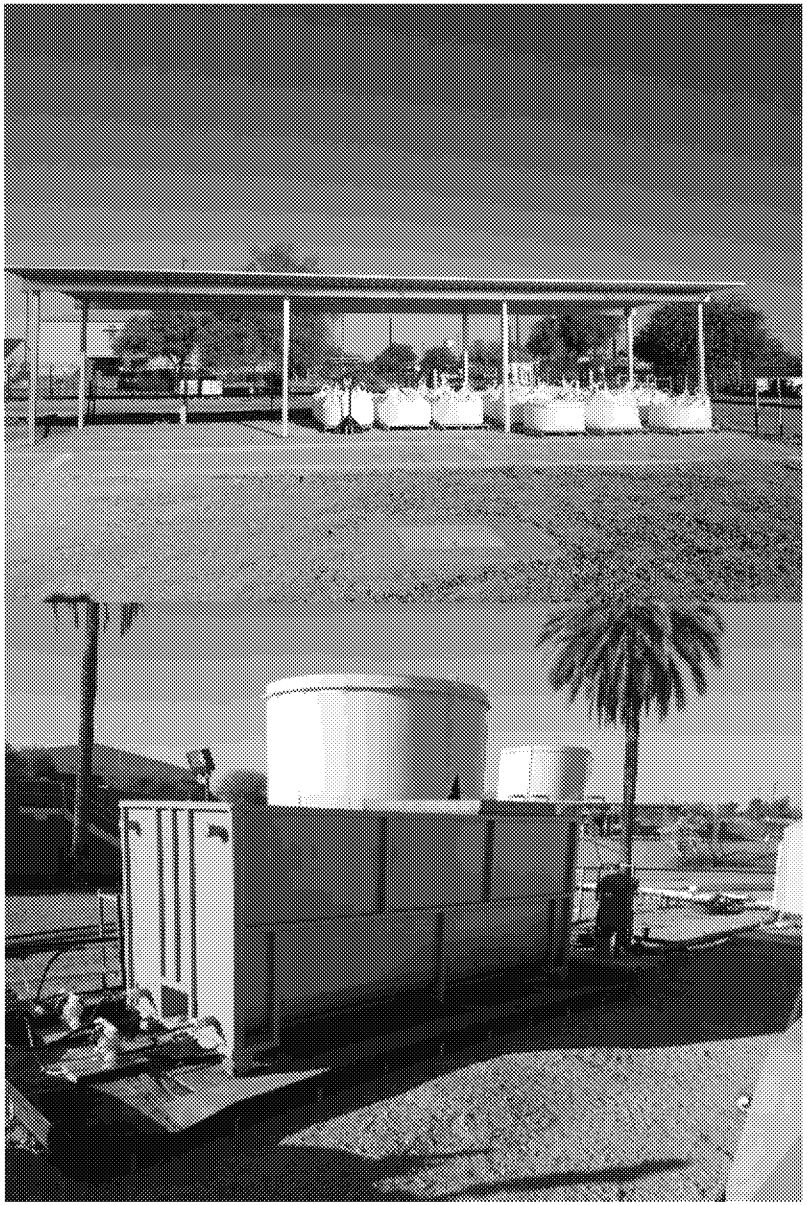
Site ST012 Outline

- Summary of activities since Jan BCT call
- Quarterly (Q4) Update on SVE system
- SVE Rebound Analysis
- LNAPL removal update
- Updated on benzene and sulfate concentrations
- Update on biological testing (SIP)
- Pilot study extraction/injection update
- Path forward

ED_005025_00009794-00002

Site ST012 Activities Since Jan

- SVE Rebound Monitoring (shut down end of Dec)
- SVE blower variable frequency drive repaired
- LNAPL screening in select wells
- Pump Repairs
  - CZ21 shut down
  - UWBZ21 limited pumping due to high temperatures
  - UWBZ22 pneumatic pump plugging
  - UWBZ30 continues to pump
  - Pump reinstalled in LSZ37 – Run for ~3 weeks
- Preparations for and deployment of BioTraps for stable isotope probe (SIP) (detail on later slide)
- Sodium sulfate injections



ED_005025_00009794-00003

SVE Update

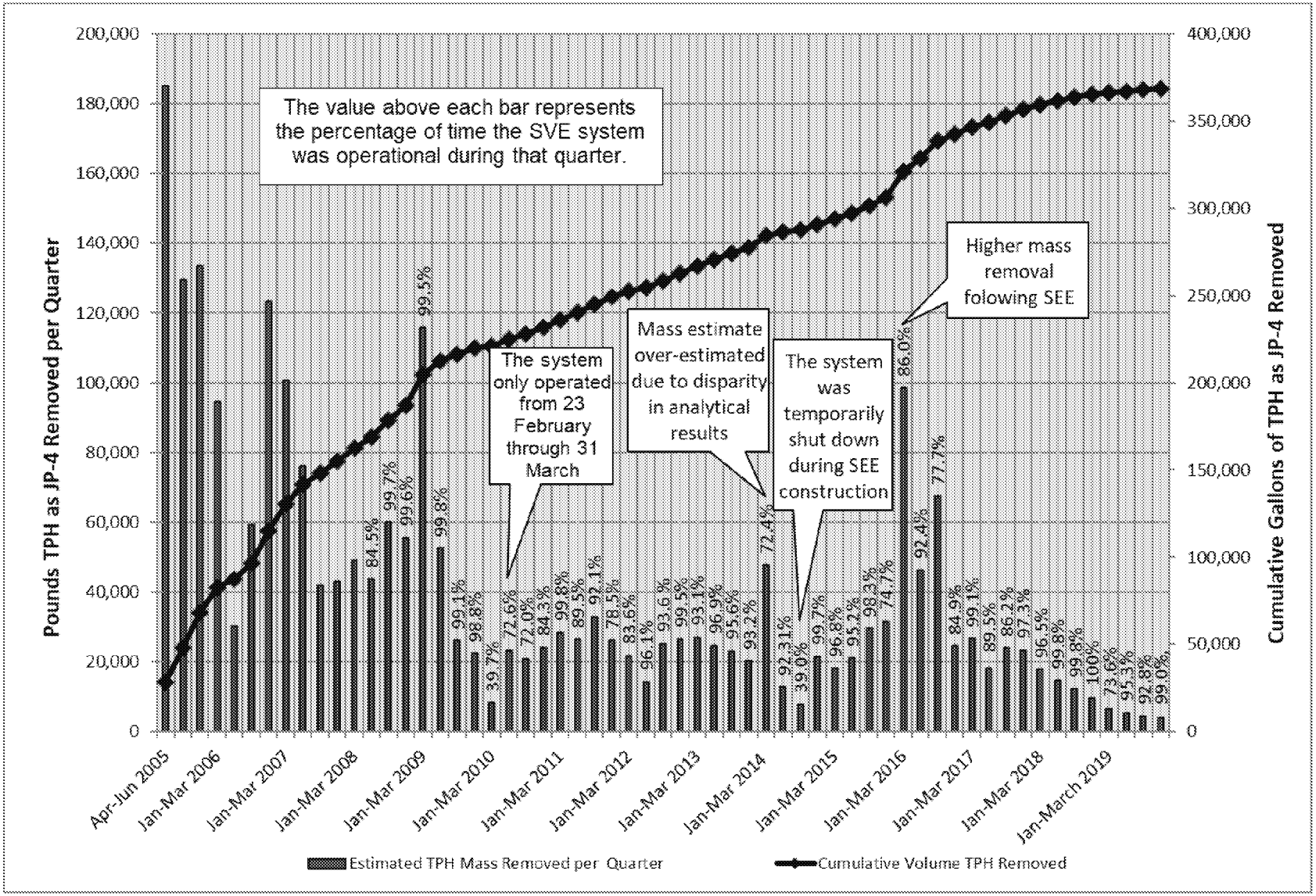
ED_005025_00009794-00004

Site ST012 SVE System Update

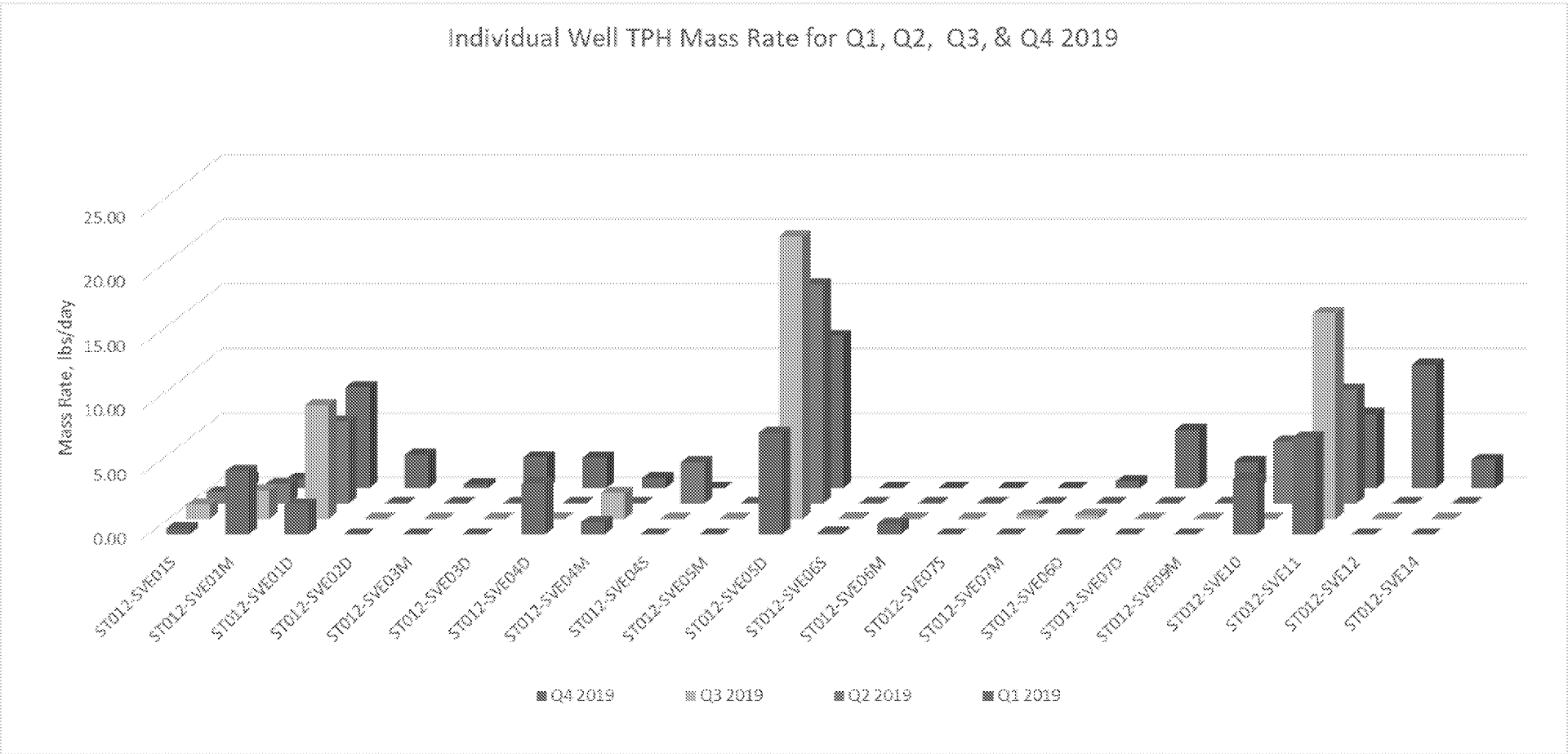
- **Oct – Dec 2019**
  - **98.96% operational uptime CAT2**
  - **Total petroleum hydrocarbon (TPH) removed – 4,458 pounds or 679 gallons**

ED_005025_00009794-00005

Site ST012 SVE System Performance



Site ST012 SVE System Performance



*Sulfate injection pipe installed in SVE04D and flow meter removed. Flow rate averaged based on wellhead vacuum.

Site ST012 SVE System Performance

Mass removal rates highest in a couple of deep and one middle interval

3.94/0.93/X

X/X/X

X/X/X

X/X/X

X

7.45

4.22

X/X/7.85

X/X/X

X/0.81/X

X

X

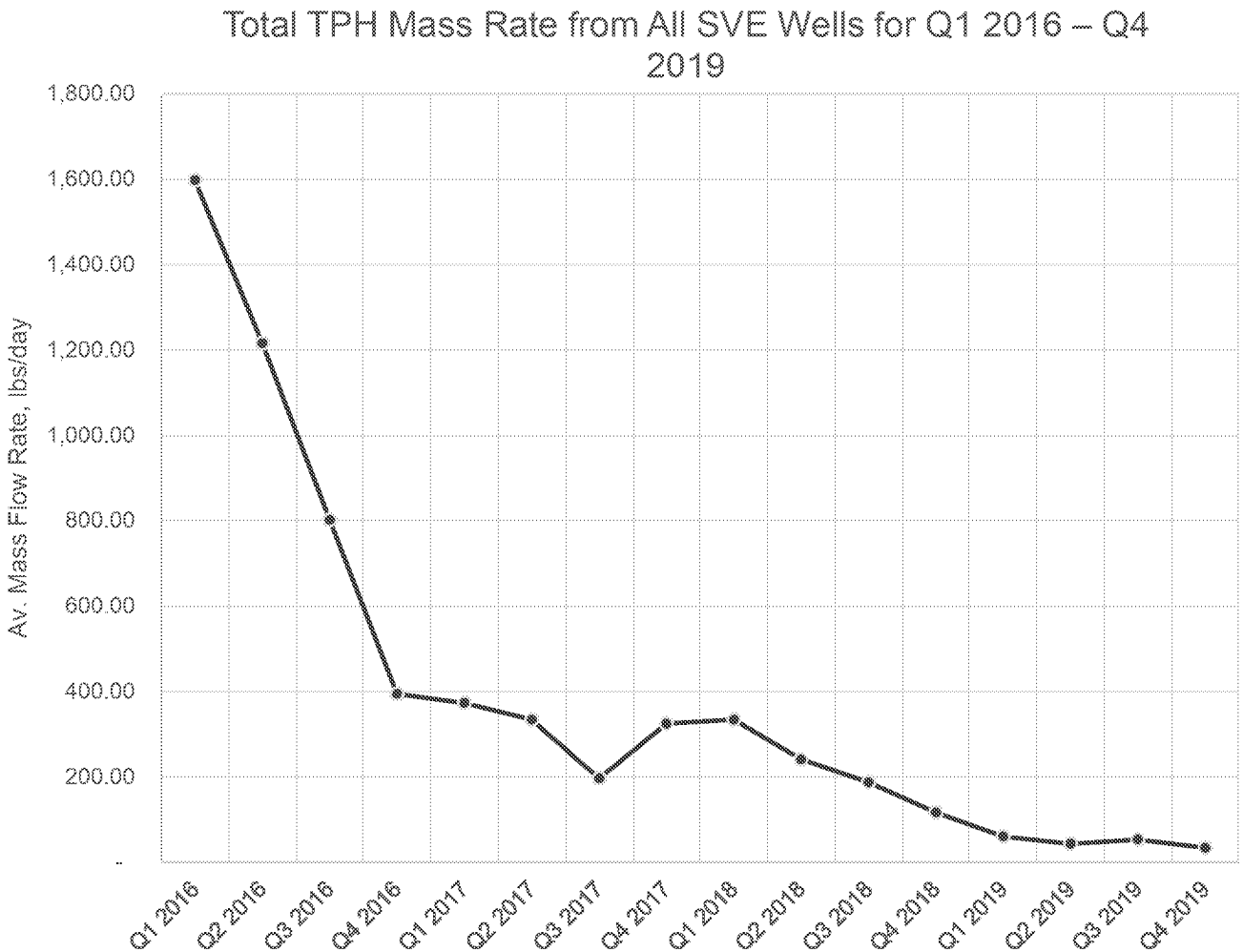
0.14/X/X

ST012-LSZ59
ST012-UWBZ40
ST012-LSZ53
ST012-CZ23
ST012-W36
ST012-LSZ58
ST012-LSZ44
ST012-W34
ST012-U02
ST012-C02
ST012-LSZ43
ST012-W12
ST012-U12
ST012-LSZ51/ST012-UWBZ28
ST012-SVE09
ST012-SVE08
ST012-W30
ST012-SVE04
ST012-SVE03
ST012-TMP15/SVE14
ST012-TMP05/SVE11
ST012-SVE01
ST012-SVE02
ST012-TMP04/SVE10
ST012-LSZ50
ST012-LSZ55
ST012-SVE05
ST012-SVE07
ST012-TMP12/SVE12
ST012-TMP13/SVE13
ST012-CZ21
ST012-CZ24/ST012-UWBZ36
ST012-UWBZ30
ST012-CZ22/ST012-UWBZ35
ST012-LSZ49
ST012-SVE06
ST012-UWBZ31
ST012-LSZ57
ST012-U11
ST012-W11
ST012-LSZ48/ST012-UWBZ33
ST012-LSZ45
ST012-LSZ47/ST012-UWBZ32
ST012-CZ25
ST012-W37
ST012-U37
ST012-UWBZ39
ST012-LSZ56
ST012-LSZ60
ST012-LSZ46
ST012-LSZ52
Tweet St
Ulysses Ave
U.S. Army Reserve Center
Oxidizer
FlameOx
Sassaman Rd
Legend
Soil Vapor Extraction Well Location (Installed in 2013/2014)
Nested Soil Vapor Extraction Well Location
Decommissioned Nested Vapor Monitoring Point Location
Groundwater Monitoring Well Location
Decommissioned Groundwater Monitoring Well Location
Fence Line
ST012 Site Boundary
S/M/D Average Mass Flow Rate (lbs/d) in shallow/medium/deep intervals
X Interval Closed or Venting Throughout the Period

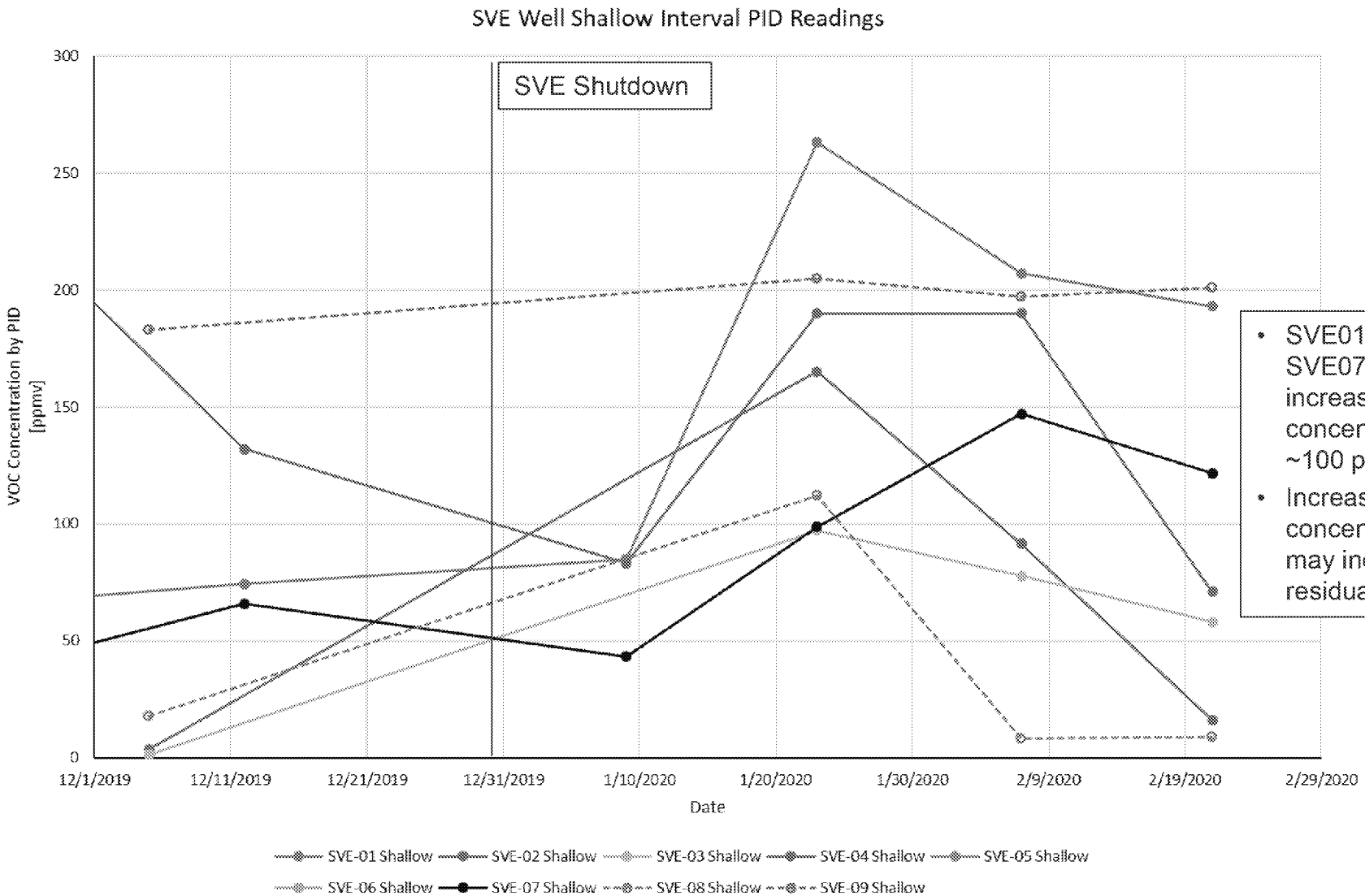
SVE well open to venting

ED_005025_00009794-00008

Site ST012 SVE System Performance

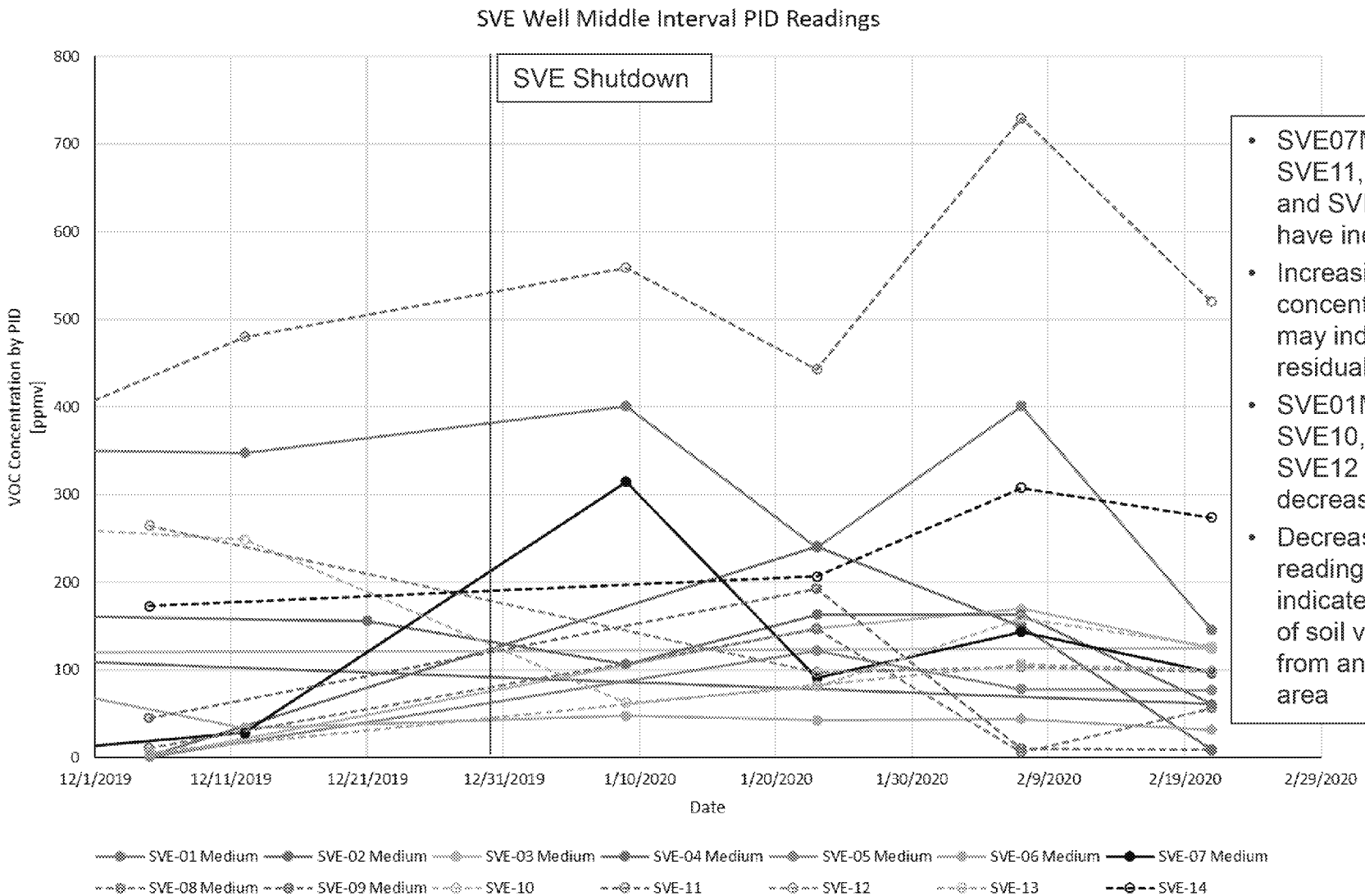


Site ST012 SVE System Rebound Study
Shallow Interval Zone



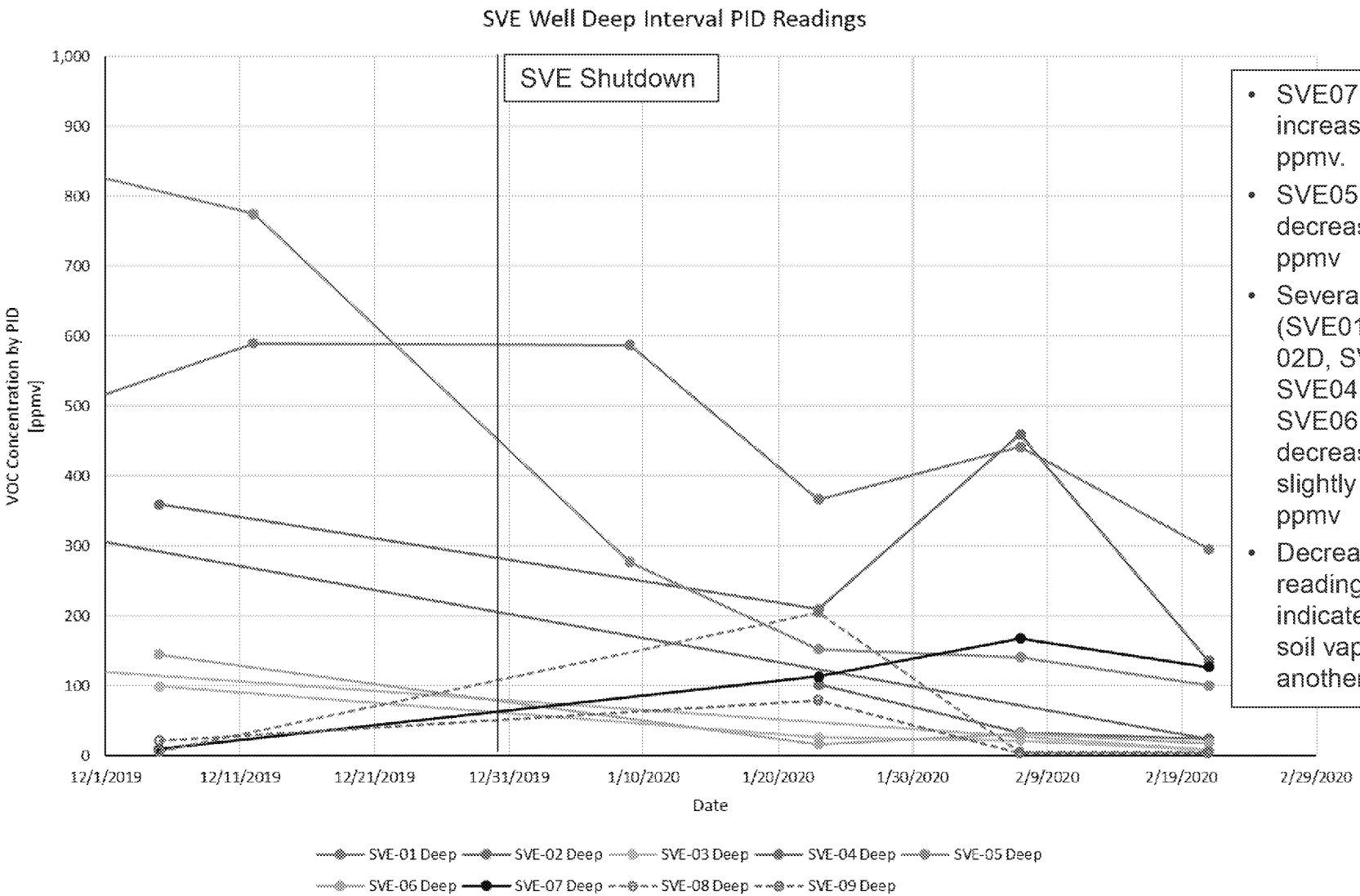
- SVE01S and SVE07S have increased in concentration ~100 ppmv
- Increasing concentrations may indicate residual in area

Site ST012 SVE System Rebound Study
Middle Interval Zone



- SVE07M, SVE11, SVE13, and SVE14 have increased
- Increasing concentrations may indicate residual in area
- SVE01M, SVE10, and SVE12 may be decreasing
- Decreasing readings may indicate pulling of soil vapors from another area

Site ST012 SVE System Rebound Study
Deep Interval Zone



- SVE07D increased >100 ppmv.
- SVE05D decreased >500 ppmv
- Several wells (SVE01D, SVE 02D, SVE03D, SVE04D, SVE06D) decreased slightly ~100-200 ppmv
- Decreasing readings may indicate pulling of soil vapors from another area

SVE Rebound Study Locations

Location of significant (~500 ppmv) decreasing PID readings (deep)

Location of increasing PID readings (shallow, middle, and deep)

Legend

- Soil Vapor Extraction Well Location (Installed in 2013/2014)
- Nested Soil Vapor Extraction Well Location
- Decommissioned Nested Vapor Monitoring Point Location
- Groundwater Monitoring Well Location
- Decommissioned Groundwater Monitoring Well Location
- Fence Line
- ST012 Site Boundary

SVE well open to venting

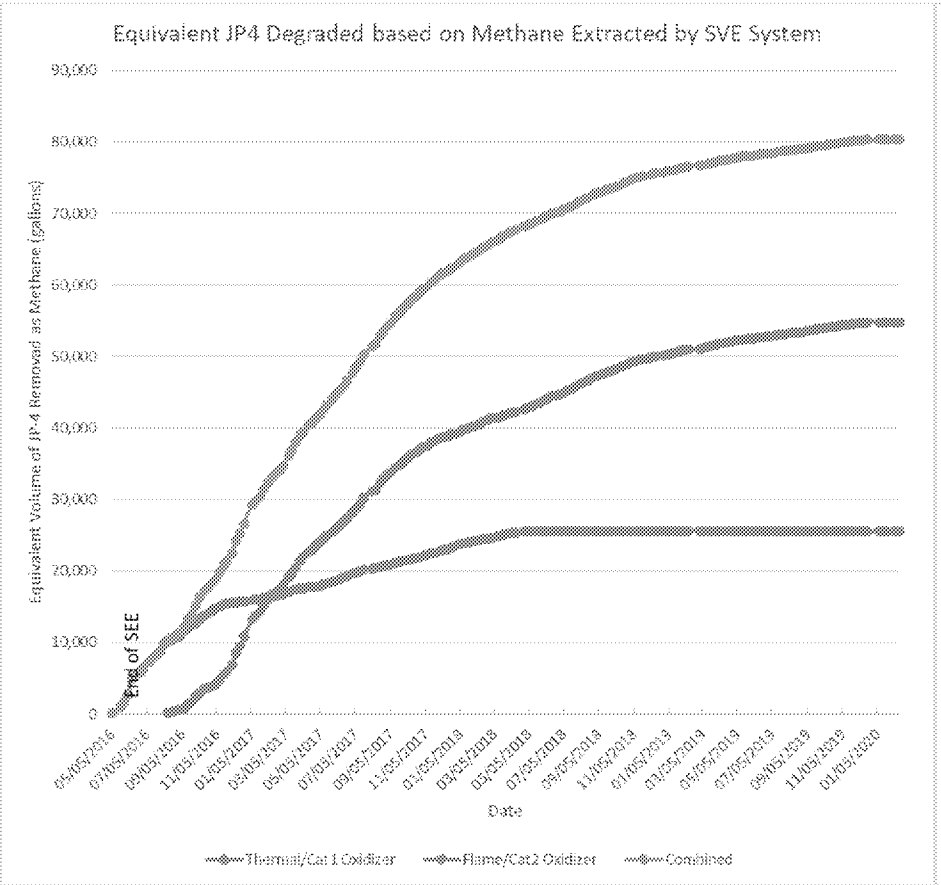
SVE Rebound Study Summary

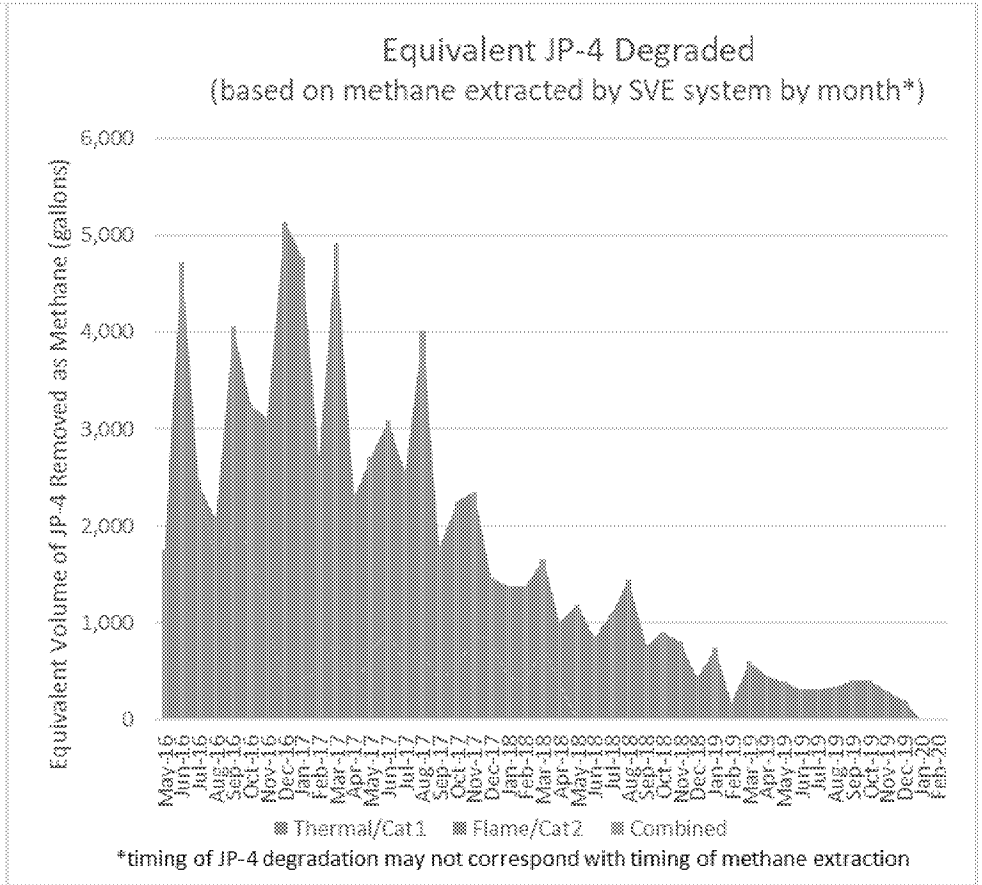
- System shut down 27 Dec 2019 due to blower VFD issue. Wells closed. PID rebound monitoring initiated.
- At most locations there are no clear increasing or decreasing trends
- Limited rebound observed across multiple intervals in SVE07S/M/D:
  - Increases are generally small (100-200 ppmv)
  - May indicate some residual source in proximity to these wells where removal rates are diffusion-limited
- Decreasing concentrations observed in SVE05D
  - May indicate this well has been pulling contamination to it from a remote location and that the immediate area around SVE05D is less contaminated than the remote location
- Recommendations:
  - Collecting one more round of PID screening
  - Evaluate potential changes in operating extraction/venting wells
  - Restart and collect lab samples at extraction points at startup

ED_005025_00009794-00014

JP-4 Degradation Based on Methane Removed with SVE

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



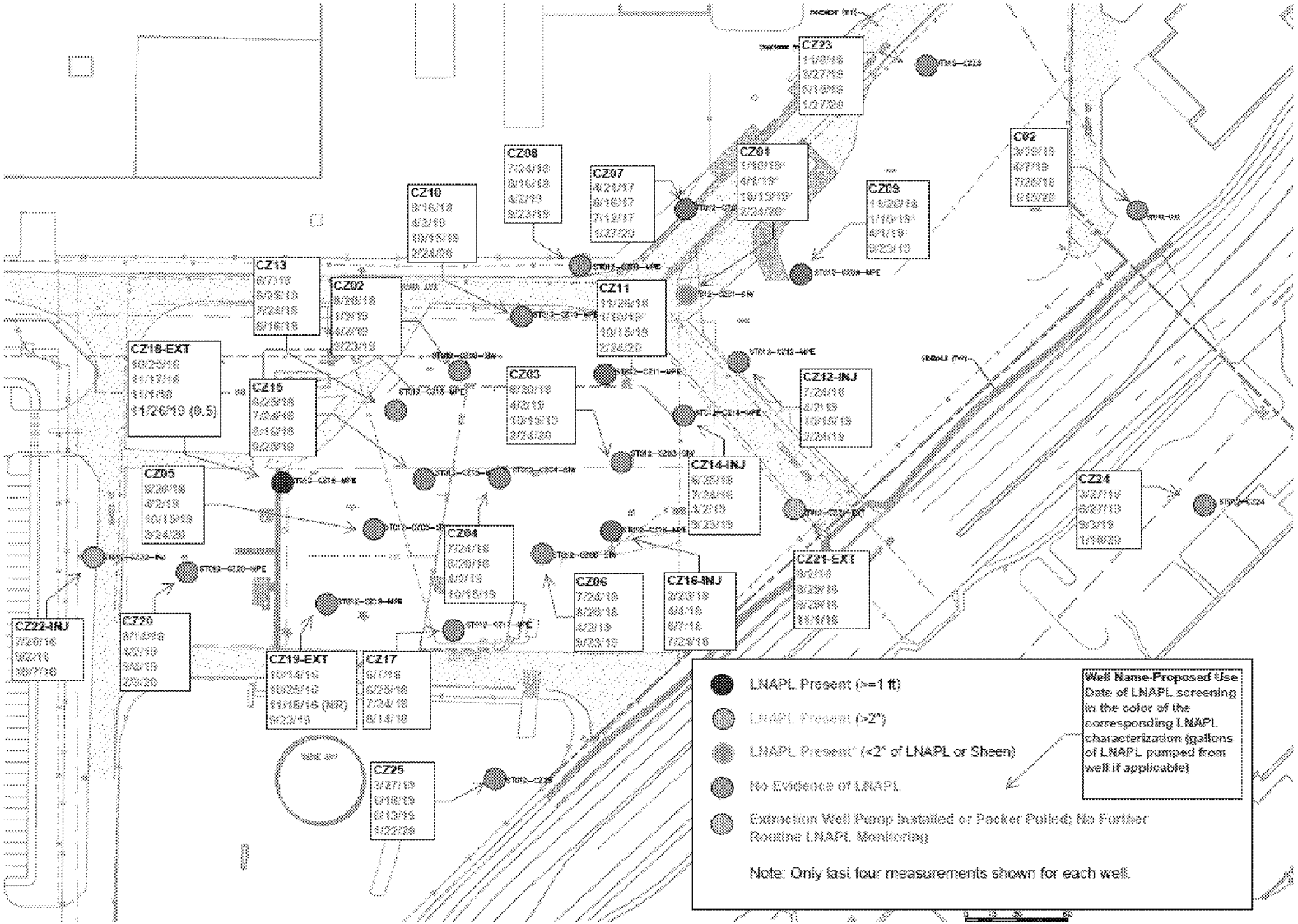


- Estimates through 13 Feb 2020
- Estimated JP-4 degradation as methane is in addition to JP-4 removal reported for SVE
- Thermal/Cat1 oxidizer changed from SVE to groundwater treatment end of Apr 2018 (low methane concentrations recently observed but attributed to vapor bleed through closed valve from SVE)
- 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 24 Feb)

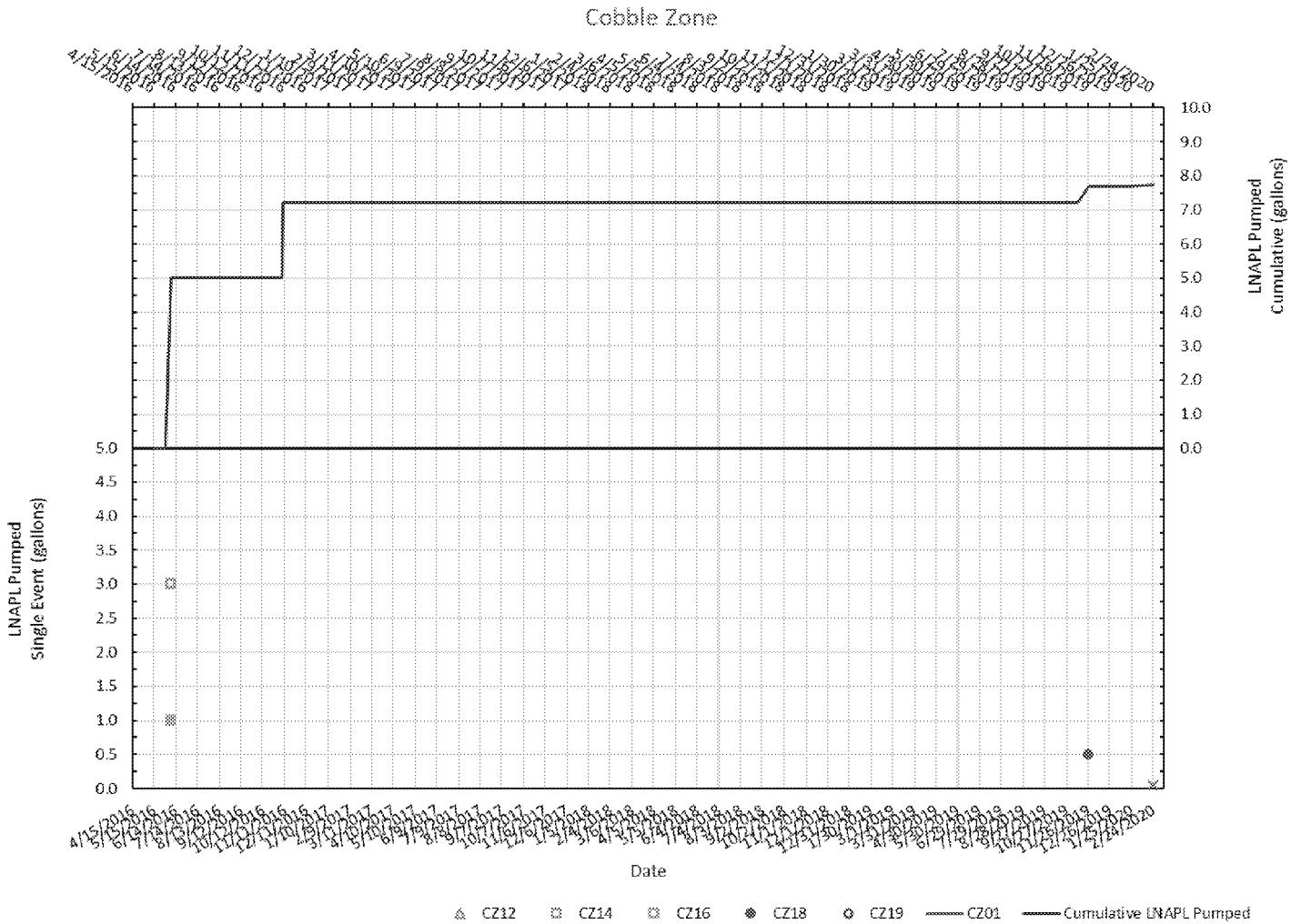
ED_005025_00009794-00017

LNAPL Monitoring/Removal Status
Cobble Zone



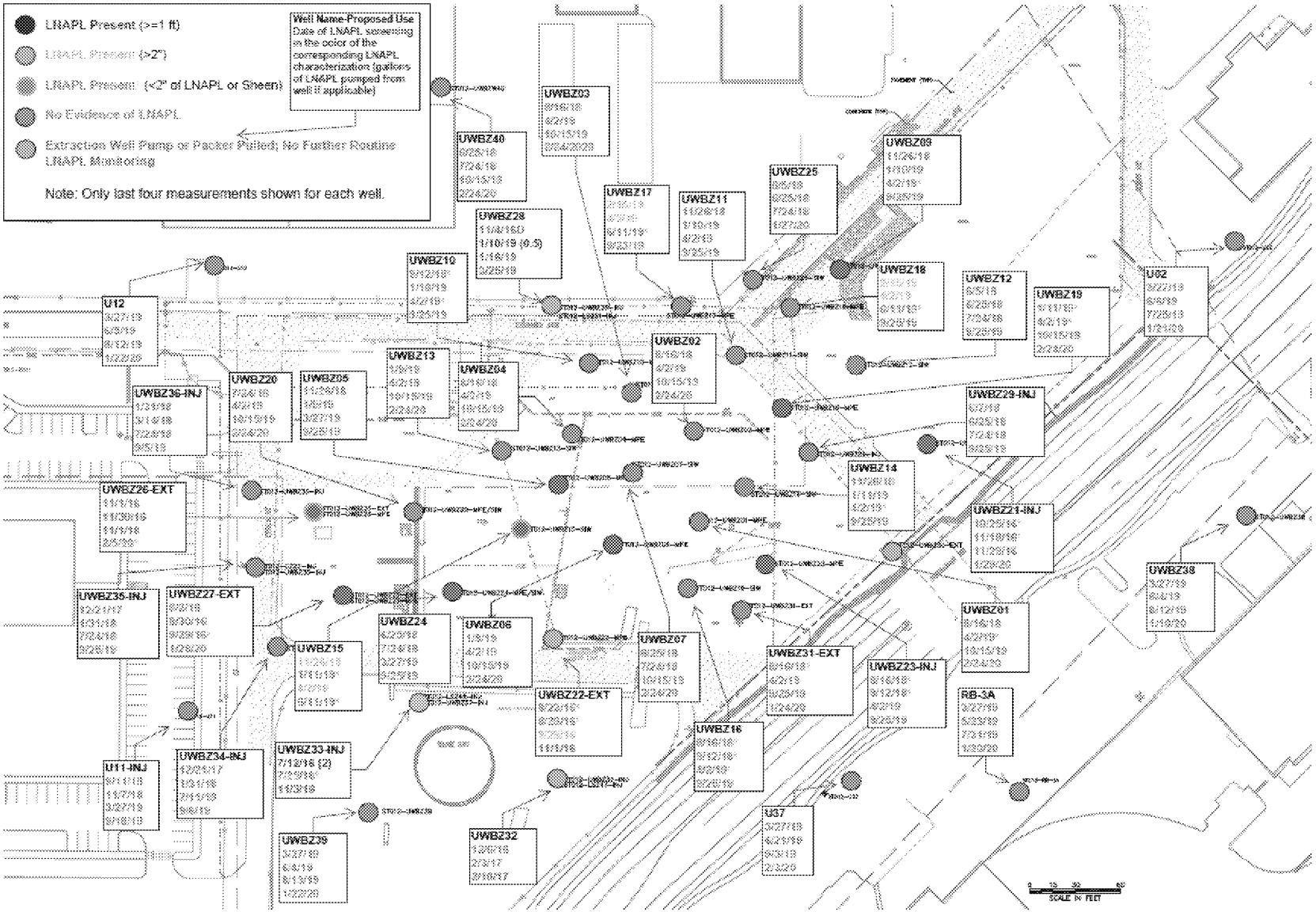
ED_005025_00009794-00018

LNAPL Monitoring/Removal Status
Cobble Zone



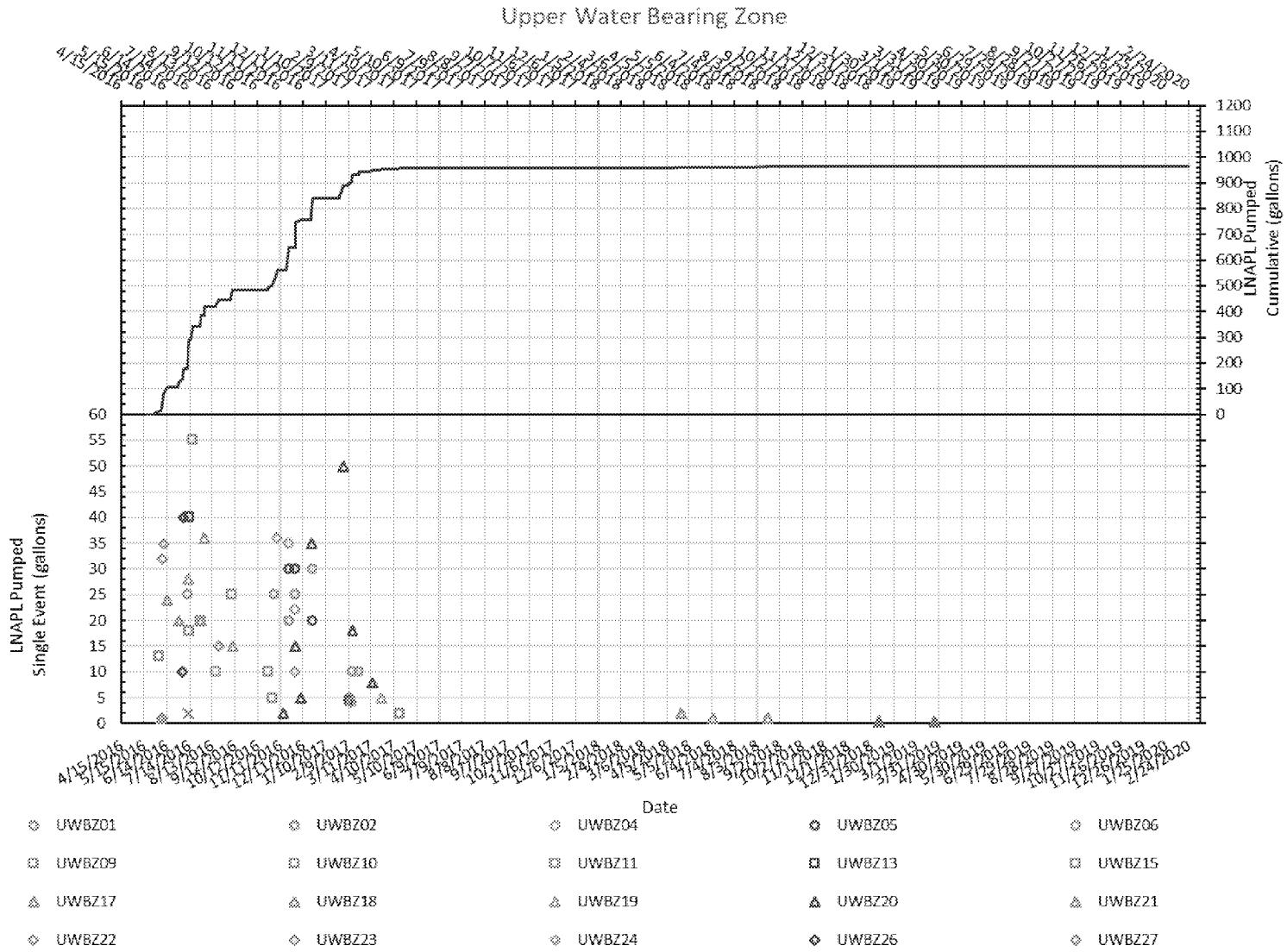
ED_005025_00009794-00019

LNAPL Monitoring/Removal Status
Upper Water Bearing Zone

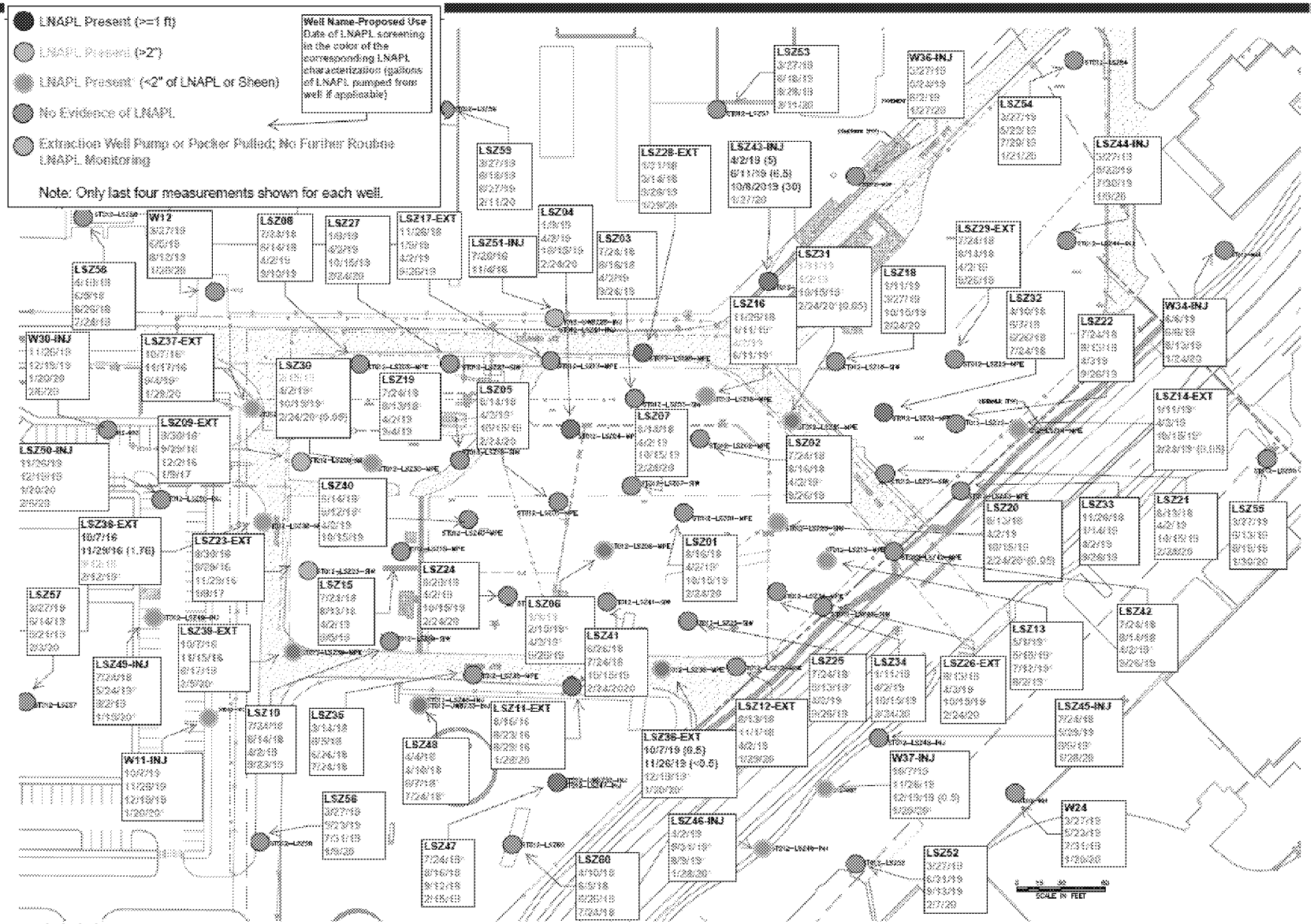


ED_005025_00009794-00020

LNAPL Monitoring/Removal Status
Upper Water Bearing Zone

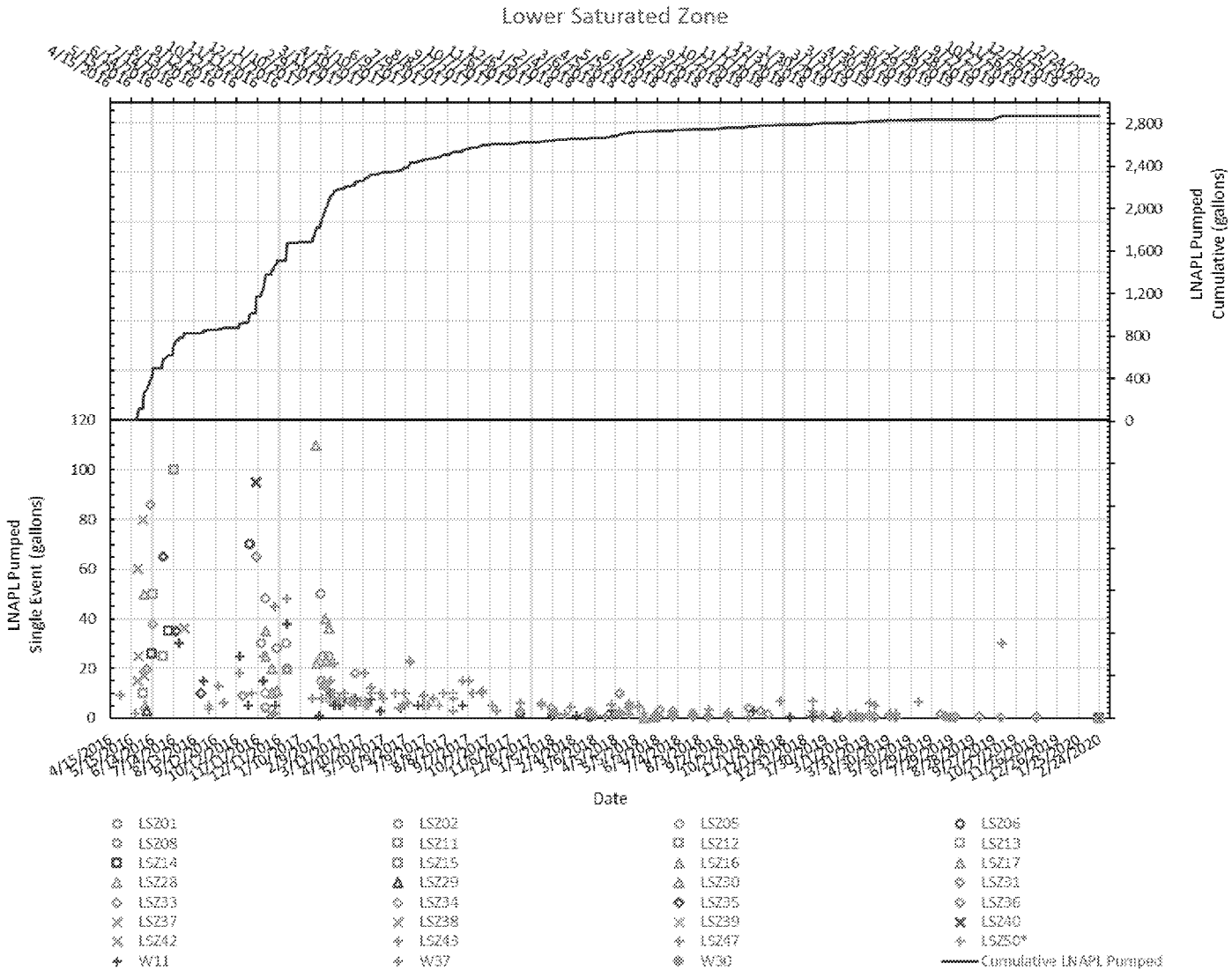


LNAPL Monitoring/Removal Status Lower Saturated Zone



ED_005025_00009794-00022

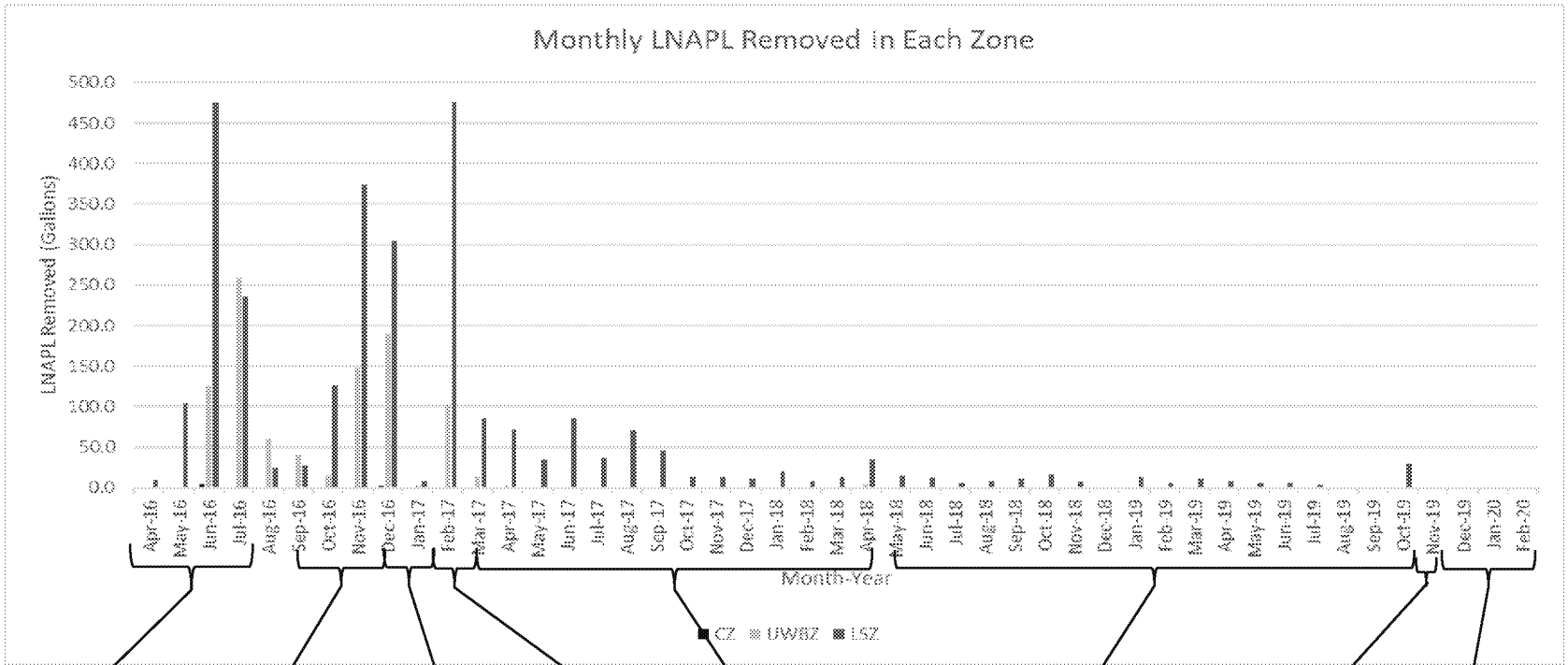
LNAPL Monitoring/Removal Lower Saturated Zone



ED_005025_00009794-00023

ST012 LNAPL Removal Summary

- CZ – 7.75 gallons of LNAPL removed. 0.05 gallons removed since Nov 2019 (CZ01)
- UWBZ – 963 gallons of LNAPL removed. None since Apr 2019 update.
- LSZ – 2,874 gallons of LNAPL removed. 0.2 gallons removed since Jan 2020 (LSZ14, LSZ20, LSZ30, and LSZ31; 0.05 Gal each)



Removal following initial eductor removals

Removal following remaining eductor removals

Diminished removal due to pump failure

Recovery following pump replacement

<100 gal/mo

<20 gal/mo

30 gal from LSZ43 during pump maintenance

<1 gal/mo

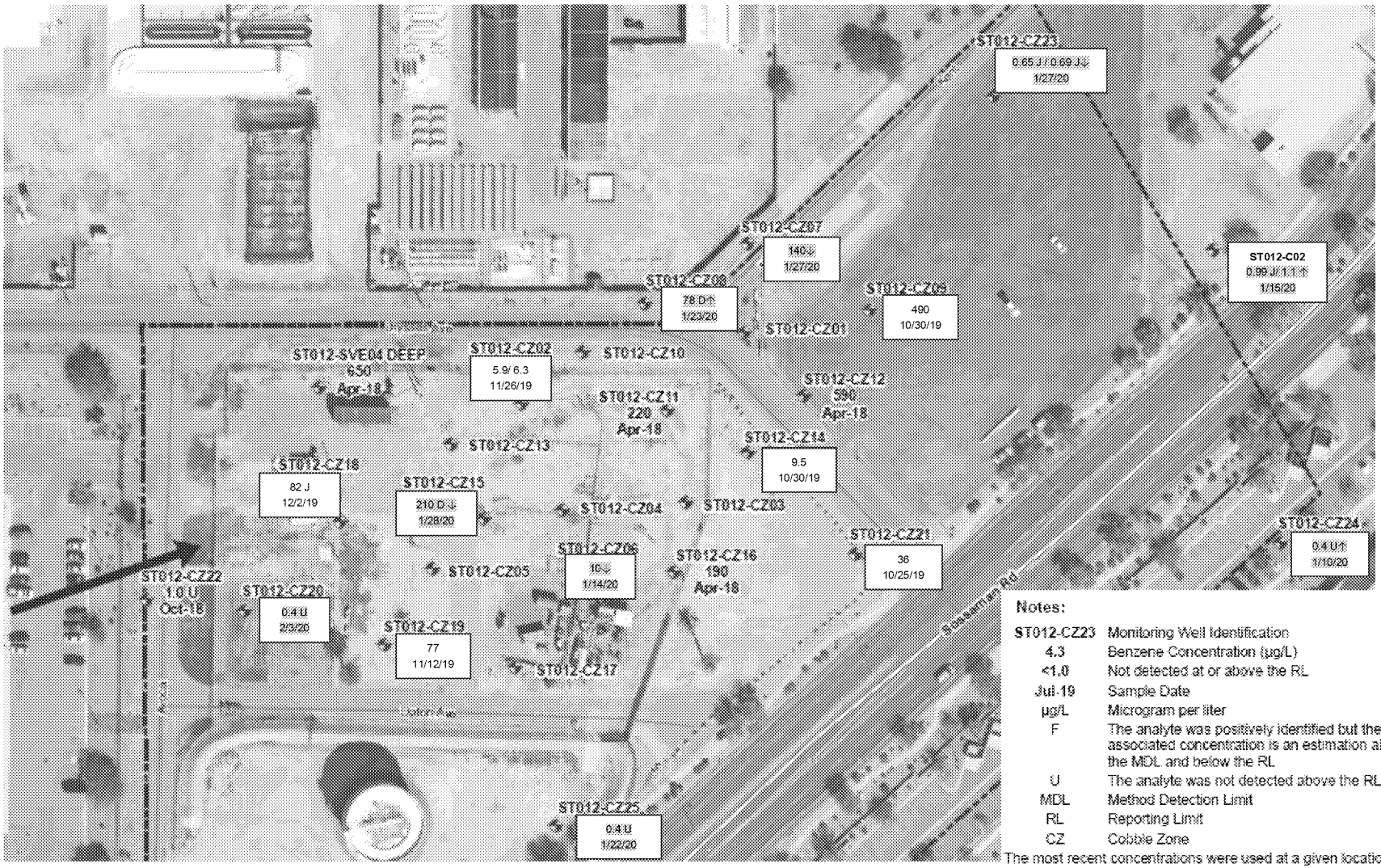
Preliminary First Quarter Groundwater Sampling Results

ED_005025_00009794-00025

Sampling Summary

- **Sampling includes:**
  - Extraction Wells
  - Injection Wells (where injections took place)
  - Monitoring Wells (in areas where injections took place)
  - Perimeter Wells
- **General Observations**
  - Benzene at perimeter well LSZ54 not detected in 22 Jan 2020 sample
  - Benzene at perimeter well U02 < 1 µg/L in 22 Jan 2020 sample

Site ST012 Benzene (µg/L) in CZ for Q1 2020



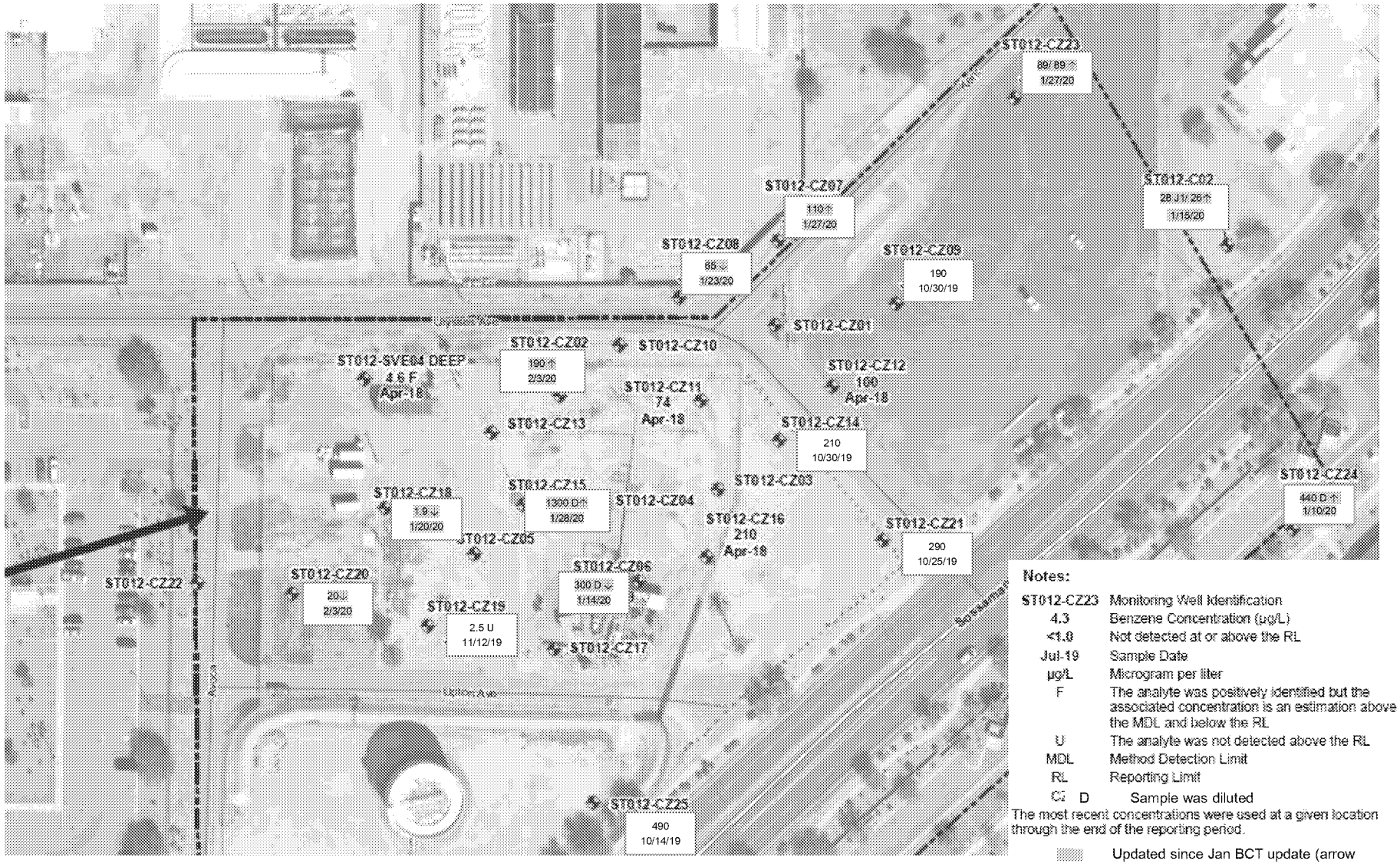
Notes:

ST012-CZ23	Monitoring Well Identification
4.3	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Jul-19	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
U	The analyte was not detected above the RL
MDL	Method Detection Limit
RL	Reporting Limit
CZ	Cobble Zone

The most recent concentrations were used at a given location through the end of the reporting period.

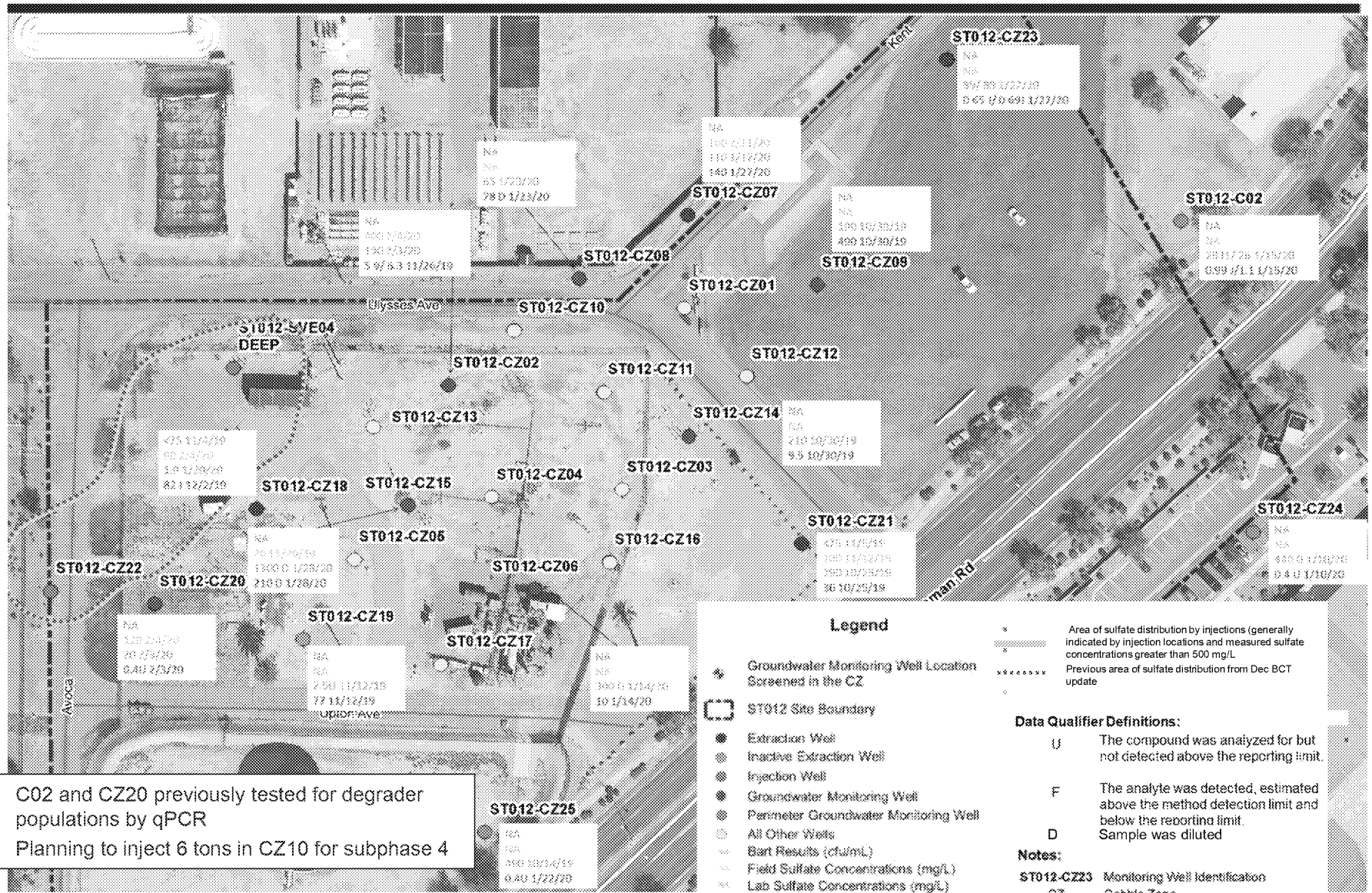
	Updated since Jan BCT update (arrow indicates direction of change from previous result)
D	Sample was diluted

Site ST012 Sulfate (mg/L) in CZ for Q1 2020



D Sample was diluted

EBR Treatment Area in CZ for Q1 2020



- C02 and CZ20 previously tested for degrader populations by qPCR
- Planning to inject 6 tons in CZ10 for subphase 4

Site ST012 Benzene (µg/L) in UWBZ for Q1 2020

- U02 benzene in 26 Dec and 21 Jan sample <1µg/L (was 41 µg/L in Oct sample and 39 µg/L in Nov sample)

ST012-UWBZ40 1.0 U Nov-16
ST012-U12 0.4 U/ 0.4 U 1/22/20
ST012-UWBZ28 1100 J Jul-19
ST012-UWBZ17 630 D↓ 1/17/20
ST012-UWBZ25 580 D↑ 1/27/20
ST012-UWBZ09 580 D↑ 1/21/20
ST012-U02 0.38 J/ 0.43 J↓ 1/21/20
ST012-UWBZ18 1600 D↓ 1/21/20
ST012-U03 0.4U 1/23/20
ST012-UWBZ11 2200 11/8/19
ST012-UWBZ10 440 11/27/19
ST012-UWBZ12 3800 11/21/19
ST012-UWBZ03
ST012-UWBZ19
ST012-UWBZ04
ST012-UWBZ02
ST012-UWBZ29 680 8/7/19
ST012-UWBZ21 570 May-19
ST012-UWBZ13
ST012-UWBZ36 0.52 F↓ 12/19/19
ST012-UWBZ05 410 D↓ 1/9/20
ST012-UWBZ07
ST012-UWBZ14 130 D↓ 1/15/20
ST012-UWBZ38 0.4 U↓ 1/10/20
ST012-UWBZ20
ST012-UWBZ30 1000 10/25/19
ST012-UWBZ26 2100 10/17/19
ST012-UWBZ15
ST012-UWBZ01
ST012-UWBZ35 573 Jul-16
ST012-UWBZ06
ST012-UWBZ23 390 11/8/19
ST012-UWBZ27 2500 D/ 2100 D↑ 1/28/20
ST012-UWBZ24 2000 D↑ 1/28/20
ST012-UWBZ16 3.5 J D↓ 1/16/20
ST012-UWBZ31 120 J1/ 110 J↑ 1/24/20
ST012-UWBZ34 34 12/2/19
ST012-UWBZ22 2800 D↓ 1/28/20
ST012-UWBZ33 2000 Jul-16
ST012-U11 0.4U 11/14/19
ST012-UWBZ32 1.0 U Jul-16
ST012-UWBZ39 0.4U 1/22/20
ST012-U37 0.4U 2/3/20
ST012-RB-3A 0.4U 1/20/20

Notes:

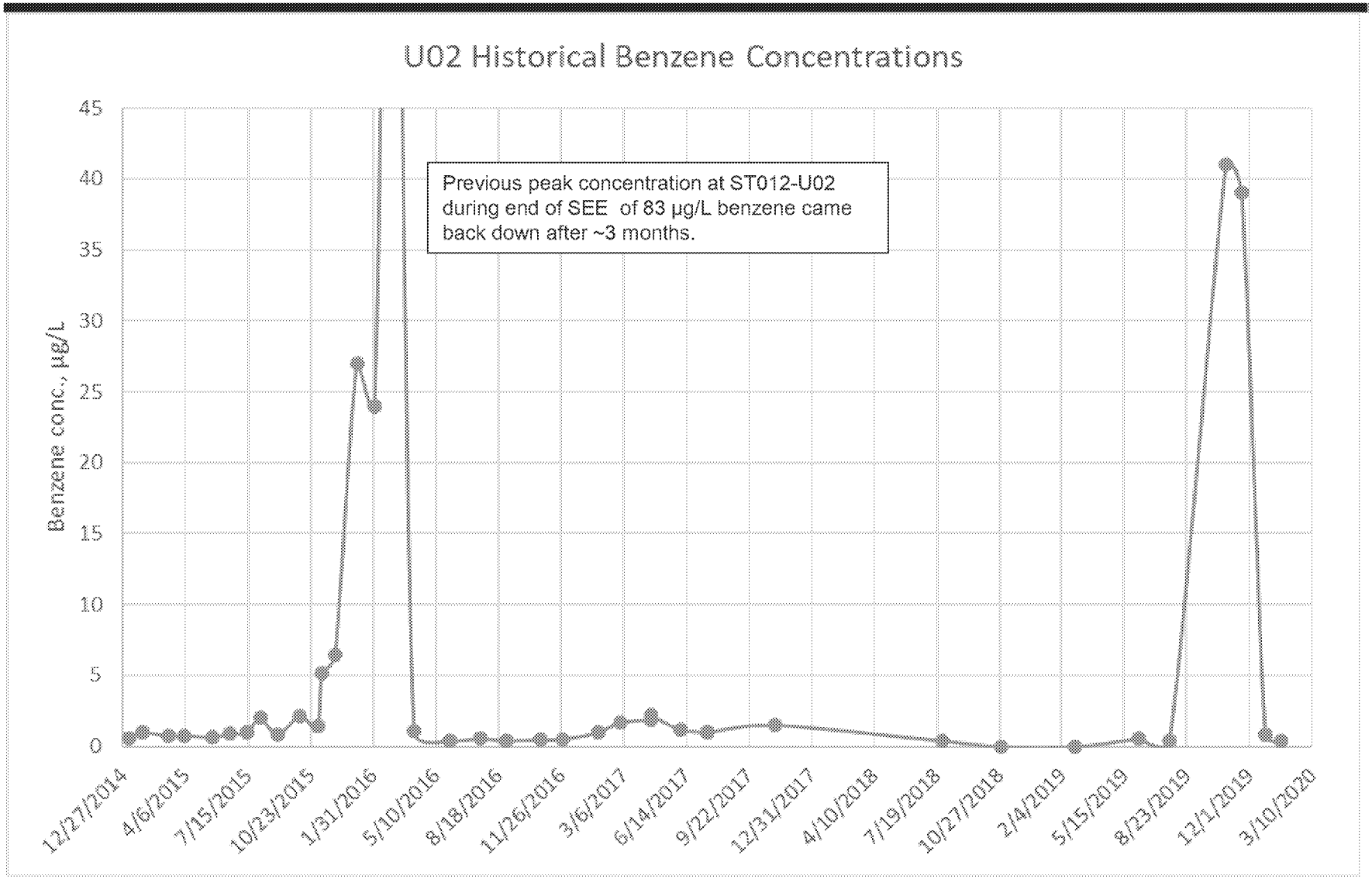
ST012-UWBZ33	Monitoring Well Identification
3000	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Jul-16	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
J	The analyte was detected; estimated due to quality control criteria
U	The analyte was not detected above the RL
MDL	Method Detection Limit
RL	Reporting Limit
UWBZ	Upper Water Bearing Zone

The most recent concentration was used at a given location through the end of the reporting period.

Updated since Jan BCT update (arrow indicates direction of change from previous result)

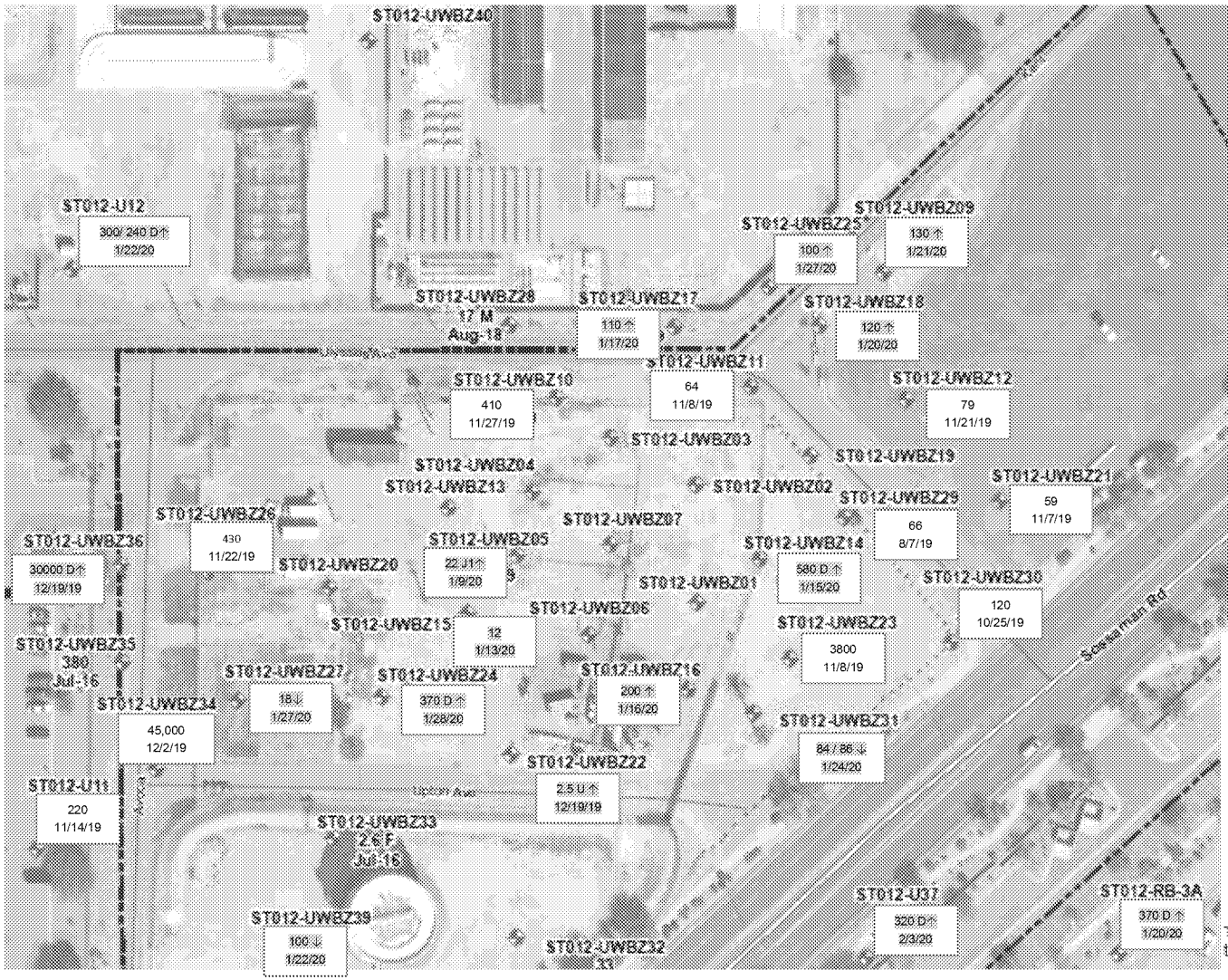
D Sample was diluted

Site ST012 U02 Historical Benzene Concentration



ED_005025_00009794-00031

Site ST012 Sulfate (mg/L) in UWBZ for Q1 2020



Notes:

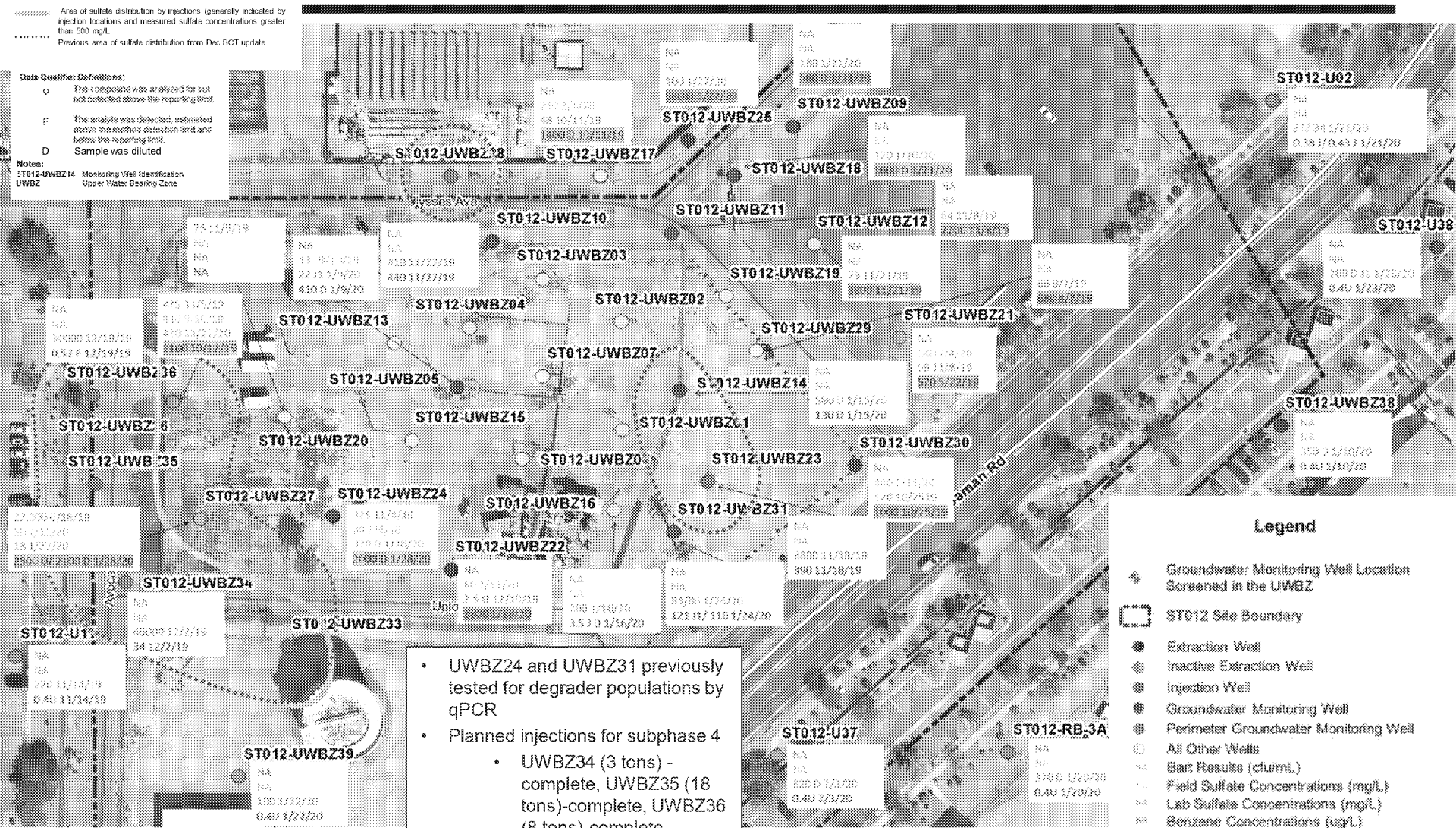
ST012-CZ23	Monitoring Well Identification
4.3	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Jul-19	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
U	The analyte was not detected above the RL
MDL	Method Detection Limit
RL	Reporting Limit
CZ	Cobble Zone

The most recent concentrations were used at a given location through the end of the reporting period.

Updated since Jan BCT update (arrow indicates direction of change from previous result)

D Sample was diluted

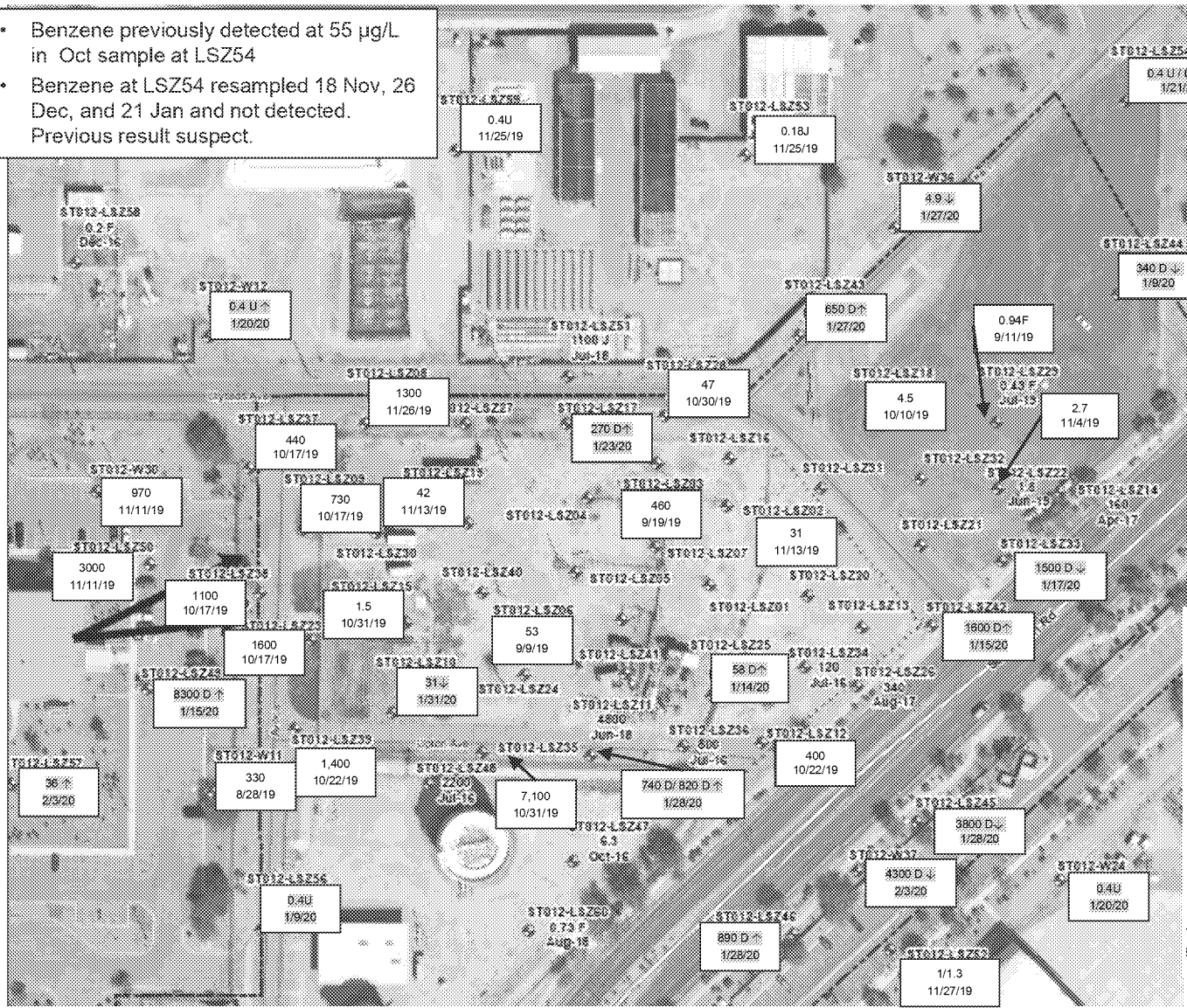
EBR Treatment Areas in UWBZ for Q1 2020



- UWBZ24 and UWBZ31 previously tested for degrader populations by qPCR
- Planned injections for subphase 4
  - UWBZ34 (3 tons) - complete, UWBZ35 (18 tons)-complete, UWBZ36 (8 tons)-complete
  - UWBZ17 (15 tons)
  - UWBZ23 (3 tons) – after improving pumping - complete

Site ST012 Benzene (mg/L) in LSZ for Q1 2020

- Benzene previously detected at 55 µg/L in Oct sample at LSZ54
- Benzene at LSZ54 resampled 18 Nov, 26 Dec, and 21 Jan and not detected. Previous result suspect.



Notes:

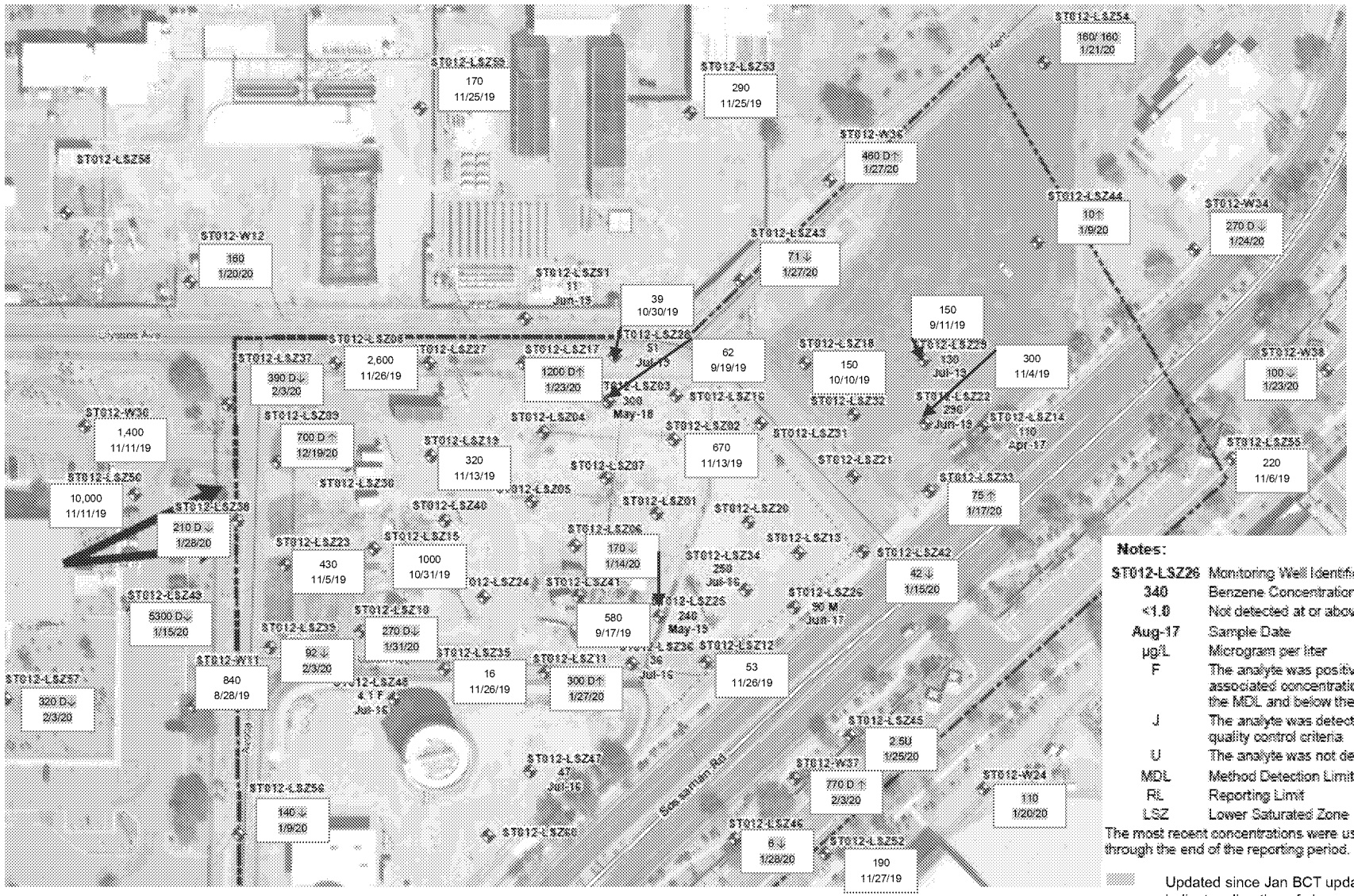
ST012-LSZ26	Monitoring Well Identification
340	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Aug-17	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
J	The analyte was detected; estimated due to quality control criteria
U	The analyte was not detected above the RL
MDL	Method Detection Limit
RL	Reporting Limit
LSZ	Lower Saturated Zone

The most recent concentrations were used at a given location through the end of the reporting period.

Updated since Jan BCT update (arrow indicates direction of change from previous result)

D Sample was diluted

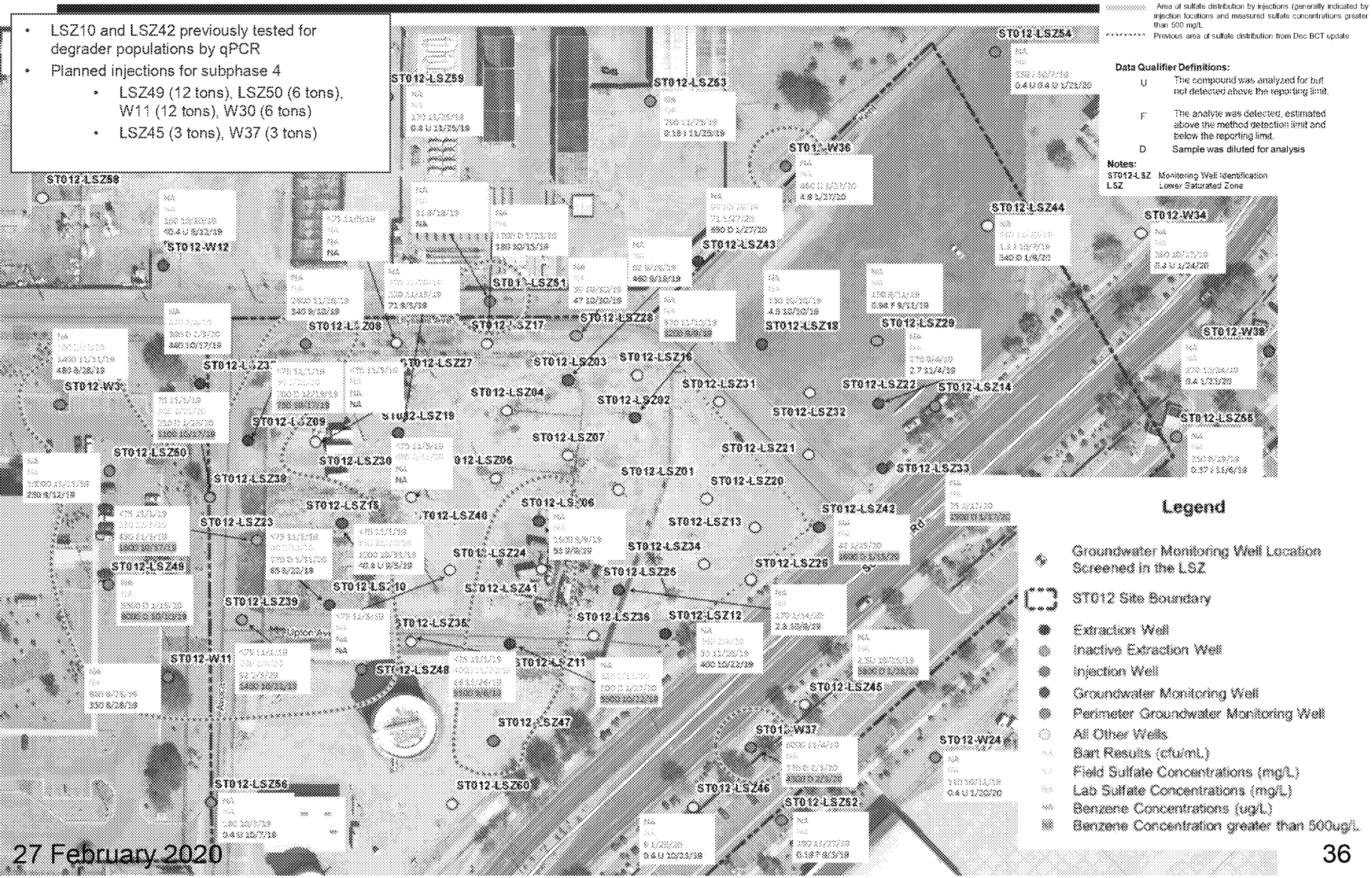
Site ST012 Sulfate (mg/L) in LSZ for Q1 2020



D Sample was diluted

EBR Treatment Areas in LSZ for Q1 2020

- LSZ10 and LSZ42 previously tested for degrader populations by qPCR
- Planned injections for subphase 4
  - LSZ49 (12 tons), LSZ50 (6 tons), W11 (12 tons), W30 (6 tons)
  - LSZ45 (3 tons), W37 (3 tons)



Site ST012 Biological Testing

- Decision reached during Jan BCT call to complete stable isotope probe (SIP) tests in wells UWBZ26, UWBZ27, LSZ38, and LSZ39
- Wells were prepared for BioTrap® deployment by removing extractions pumps
- Performed sulfate screening analysis in late Jan
  - UWBZ27 – 18 mg/L
  - LSZ38 – 210 mg/L
  - LSZ39 – 130 mg/L
- Implemented a lower concentration injection in the four wells to recharge sulfate concentrations prior to BioTrap® deployment.
  - Injection concentration was 10 g/L
  - Target was 1 ton in each well
  - UWBZ27 and LSZ38 accepted injection solutions very slowly (possible sign of biofouling), UWBZ26 and LSZ39 accepted injection solutions at a reasonable rate
- BioTraps® deployed on 24 Feb 2020 (2 in each well)
  - UWBZ26 and UWBZ27 – 180 ft below top of casing
  - LSZ38 and LSZ39 - 225 ft below top of casing
- Plan to retrieve in five and eight weeks

Pilot Study Injection/Extraction Update

Site ST012 Extraction System Performance

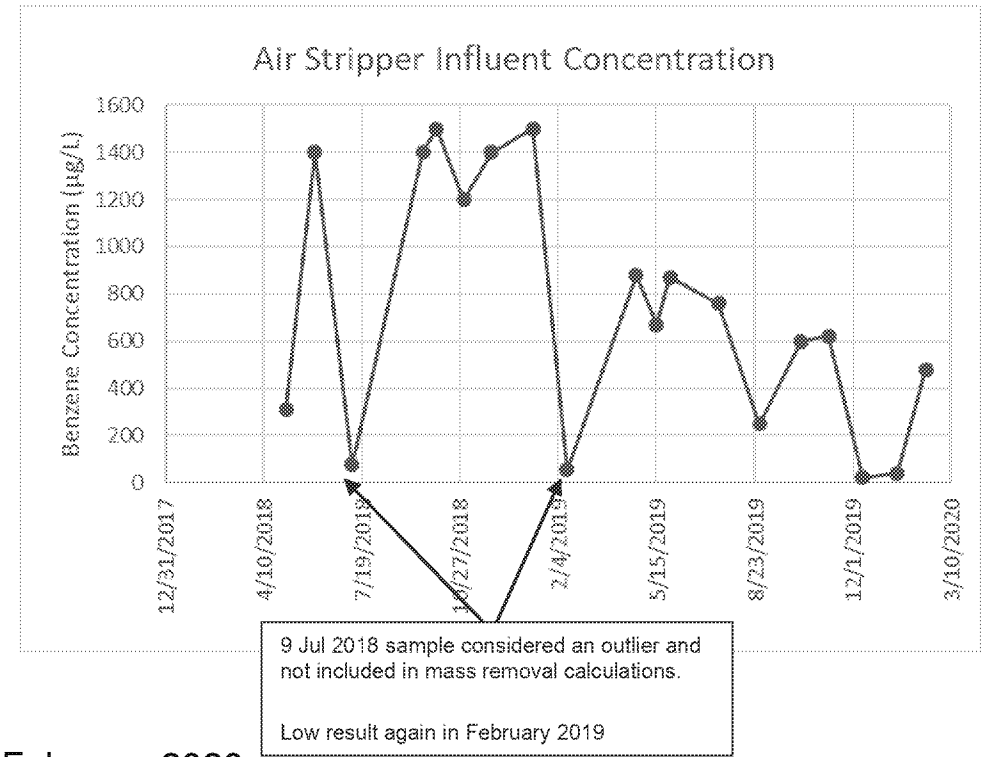
Extraction Well	Calculated Average Extraction Rate in Period gpm	Maximum Temperature Since May 2018 °F	Most Recent Temperature °F	Cumulative Extraction Since May 2018 gallons	Note
ST012-CZ07	6.2	175	141	4,923,427	
ST012-CZ18	Off	136	126	3,019,867	Extraction stopped due to sulfate presence (Oct 2019)
ST012-CZ19	NA		103		Eliminated as an extraction well by FVM#7
ST012-CZ21	0.0	150	115	452,498	Totalizer reading suspect. Pump shut down due to low concentrations.
ST012-CZ23	2.0	114	103	689,083	
CZ Subtotal				9,084,876	
ST012-UWBZ21	15.8	170	164	610,298	Submersible installed but only runs for a few minutes/day (high temp)
ST012-UWBZ22	0.00	146	131	476,303	Pnuematic plugged, runs intermittently
ST012-UWBZ25	6.8	168	164	321,610	
ST012-UWBZ26	Off	133	114	2,408,709	Extraction stopped due to sulfate presence (Sep 2019)
ST012-UWBZ27	Off	128	94	130,011	Extraction stopped due to sulfate presence (May 2019)
ST012-UWBZ30	12.5	172	161	1,903,328	Submersible installed
UWBZ Subototal*				7,118,692	
ST012-LSZ09	Off	140	130	2,748,461	Extraction stopped due to sulfate presence (Oct 2019)
ST012-LSZ11	6.5	139	99	3,469,018	
ST012-LSZ12	6.7	130	100	2,478,065	
ST012-LSZ23	Off	113	94	3,638,934	Extraction stopped due to sulfate presence (Aug 2019)
ST012-LSZ28	NA	162	152	20,529	Intermittent pumping for warm makeup water.
ST012-LSZ29	NA	>170		17	Eliminated as an extraction well by FVM#7
ST012-LSZ37	10.7	132	90	6,274,757	Ran for three weeks and then shut down again.
ST012-LSZ38	Off	160	90	941,898	Extraction stopped due to sulfate presence (Aug 2019)
ST012-LSZ39	Off	92	78	1,250,933	Extraction stopped due to sulfate presence (May 2019)
ST012-LSZ43	4.9	140	136	940,398	
ST012-UWBZ28/LSZ51	NA	146	128	2,536,868	Extraction stopped (Aug 2019), changed to injection end of subphase 2
W36	NA	80	80	155,733	Only used for make up water for sulfate mixing
LSZ Subtotal*				23,031,445	
Total of Wells	72.1			39,235,012	
Treatment System	55.4			31,906,570	

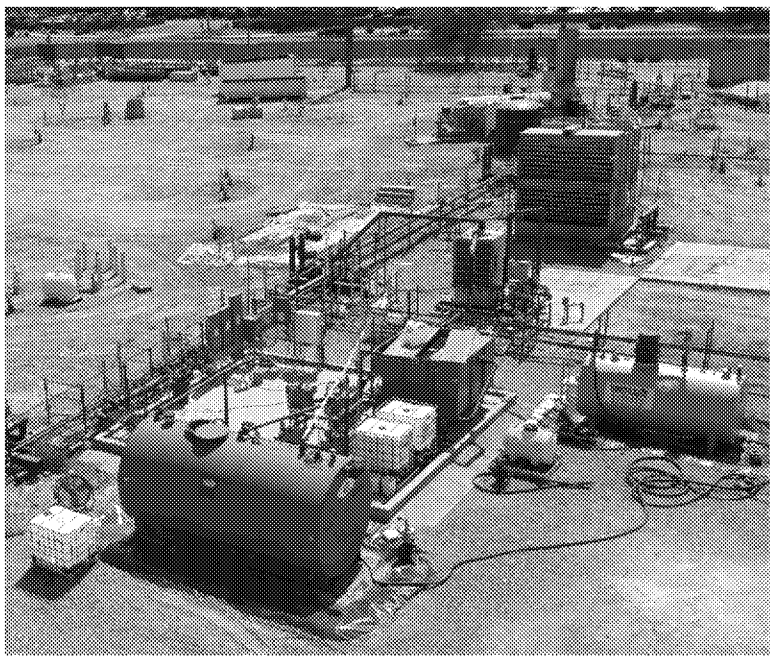
Data is preliminary

* Includes 1/2 of ST012-UWBZ28/LSZ51

Site ST012 Extraction System Performance

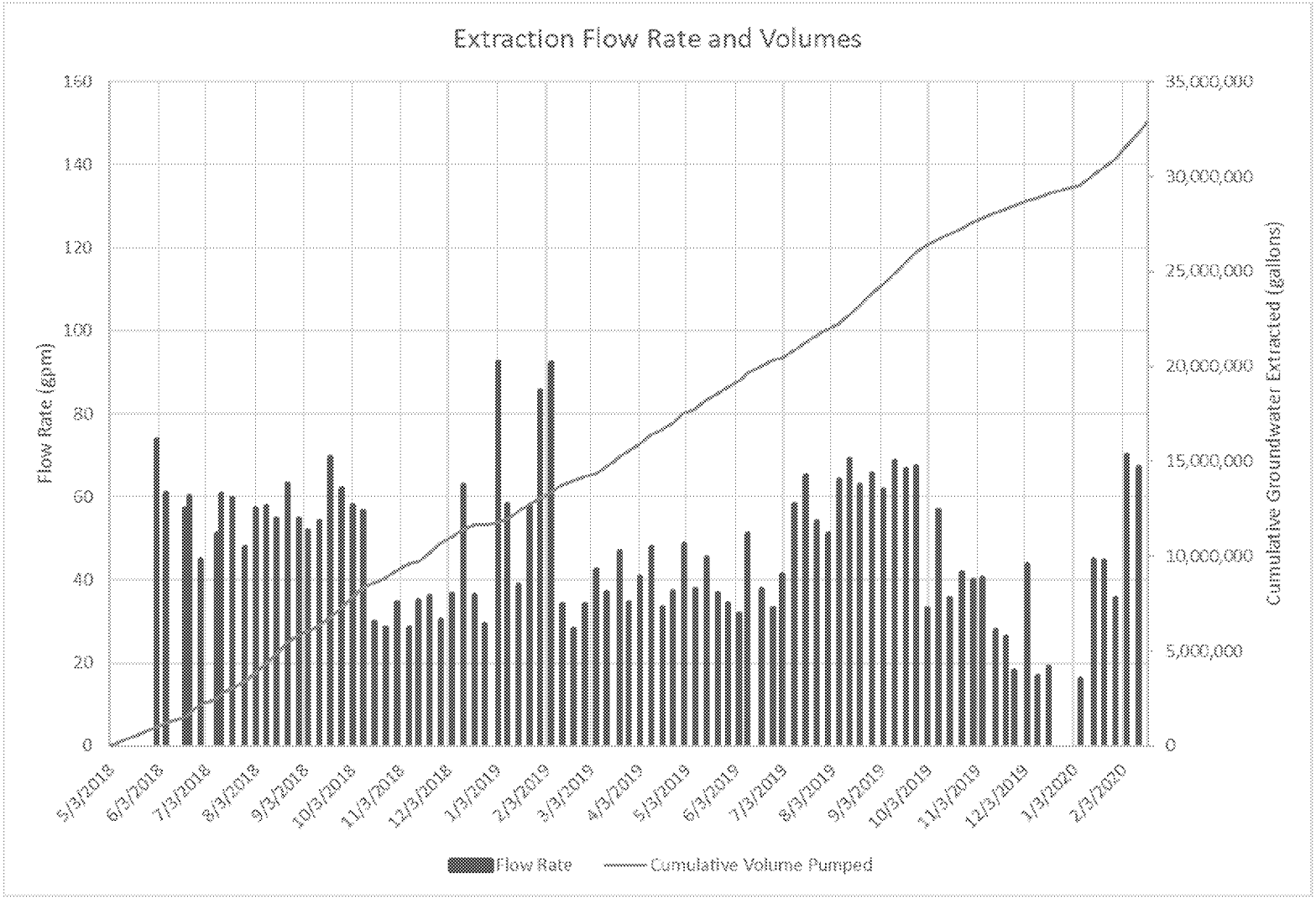
- No LNAPL has been recovered since extraction started up
- Extraction pumps UWBZ21 and UWBZ22 pumping intermittently
- CZ18, UWBZ26, UWBZ27, LSZ09, LSZ23, LSZ37, LSZ38, and LSZ39 turned off due to sulfate presence and SIP testing
- Benzene air stripper influent at 480 µg/L for February sample





Site ST012 Extraction System Performance

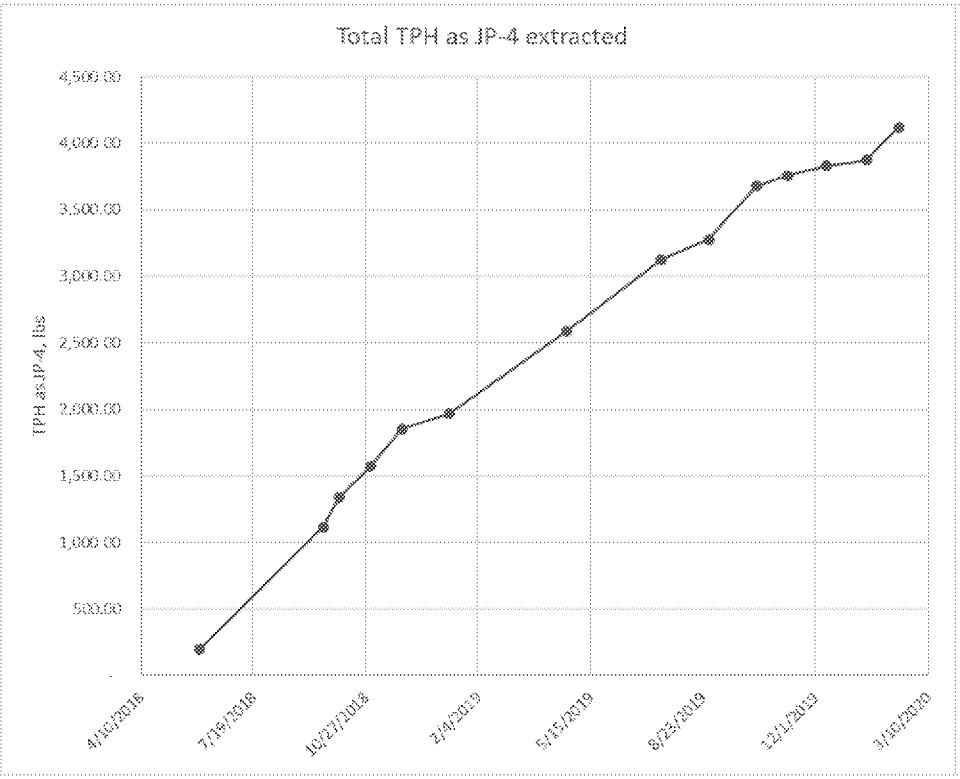
- **Overall Extraction Rates and Cumulative Volume Extracted**

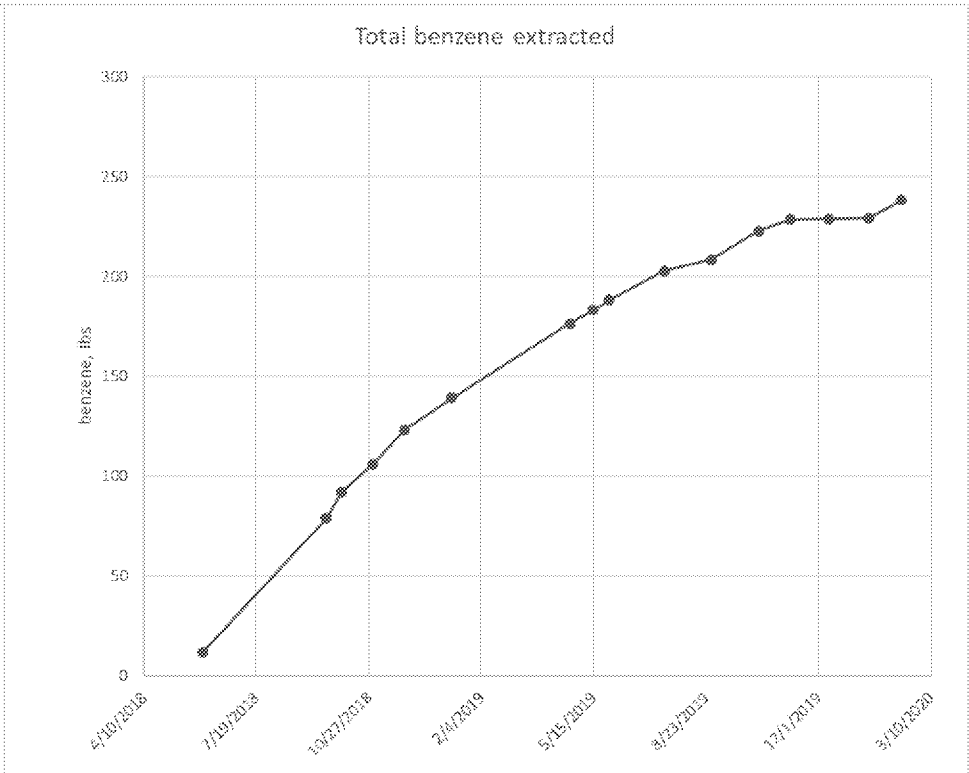


ED_005025_00009794-00041

Site ST012 Extraction System Performance

- **Estimated Mass Removal by Extraction**





Site ST012 Injection Progress

- **Subphase 4 injections continued in January**
- **~500 tons injected through 18 Feb 2020**
- **43 tons injected since last update**

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)
12/20/2019	---	0	113	76	LSZ48 (0.2) and W30 (0.5)
1/10/2020	4,000	2	113	76	UWBZ23 (0.1), UWBZ34 (0.7) and UWBZ36 (1.0)
1/13/2020	6,000	3	113	76	UWBZ23 (0.2 tons), UWBZ34 (0.4 tons), UWBZ36 (1.3 tons) and UWBZ35 (0.9 tons)
1/14/2020	6,000	3	113	76	UWBZ23 (0.2), UWBZ34 (1.2), UWBZ35 (0.9) and UWBZ36 (0.1)
1/16/2020	6,000	3	113	76	UWBZ23 (0.2 tons), UWBZ34 (1.1 tons), UWBZ35 (0.4 tons) and UWBZ36 (0.6 tons)
1/17/2020	6,000	3	113	76	UWBZ23 (0.5 tons), UWBZ34 (0.6 tons), UWBZ35 (0.6 tons) and UWBZ36 (1.0 tons)
1/20/2020	6,000	3	113	76	UWBZ23 (0.3 tons), UWBZ35 (0.5 tons) and UWBZ36 (1.7 tons)
1/21/2020	6,000	3	113	76	UWBZ23 (0.9), UWBZ35 (0.4) and UWBZ36 (1.5)
1/22/2020	6,000	3	113	76	UWBZ23 (0.1 tons), UWBZ35 (2.0 tons) and UWBZ36 (0.2 tons)
1/23/2020	6,000	3	113	76	UWBZ23 (0.8) and UWBZ35 (1.8)
1/24/2020	8,000	4	113	76	UWBZ23 (1.3 tons), UWBZ35 (2.0 tons) and UWBZ36 (0.9 tons)
1/27/2020	8,000	4	113	76	UWBZ23 (1.3 tons) and UWBZ35 (2.8 tons)
1/28/2020	8,000	4	113	76	UWBZ23 (1.1 tons) and UWBZ35 (2.7 tons)
1/29/2020	4,000	2	113	76	UWBZ23 (0.7 tons) and UWBZ35 (1.2 tons)
2/10/2020	16,000	1	14.9	10	UWBZ26 (0.37 tons), UWBZ27 (0.02 tons), LSZ38 (0.26 tons) and LSZ39 (0.24 tons)
2/11/2020	16,000	1	14.9	10	UWBZ26 (0.25 tons), UWBZ27 (0.19 tons), LSZ38 (0.17 tons), and LSZ39 (0.28 tons)
2/12/2020	16,000	1	14.9	10	UWBZ26 (0.15 tons), UWBZ27 (0.08 tons), LSZ38 (0.09 tons) and LSZ39 (0.24 tons)
2/13/2020	8,000	1	14.9	10	UWBZ26 (0.28 tons), UWBZ27 (0.02 tons), LSZ38 (0.05 tons), and LSZ39 (0.3 tons)
2/14/2020	0	0	14.9	10	UWBZ27 (0.42 tons) LSZ38 (0.02 tons)
2/17/2020	0	0	14.9	10	UWBZ27 (0.06 tons) LSZ38 (0.05 tons)
2/18/2020	8,000	4	113	76	UWBZ23 (3.6 tons)

Injections on days when volume mixed was zero used injection solution stored in frac tank.

Site ST012 Sulfate Field Screening

Date	Sulfate Concentration (mg/L)																																			
	CZ02	CZ03	CZ05	CZ10	CZ13	CZ16	CZ18	CZ07	CZ20	CZ21	UWBZ15	UWBZ17	UWBZ21	UWBZ22	UWBZ24	UWBZ26	UWBZ27	UWBZ28/LSZ51	UWBZ30	LSZ09	LSZ10	LSZ11	LSZ12	LSZ15	LSZ19	LSZ23	LSZ35	LSZ37	LSZ38	LSZ39	LSZ40	LSZ43	LSZ44	LSZ47	W30
5/1/2019	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	1110	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	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	1190	---	---	---	---	---	---			---	---	---	---	1425	---	---		---	
5/22/2019	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---	1450	0	---	---	---	160	---			---	---	170		1420	---	---		---	
5/29/2019	10	---	---	---	---	---	---	60	0	230	10	---	30	---	10	270	2000	20	110	2000	1010	90	30	---	---	610	0	200	130	1430	---	---		---	
6/5/2019	---	---	---	---	---	---	---	80	---	280	180	---	---	0	---	160	1240	---	180	320	930	100	---	---	---	630	0	290	100	---	---	---		0	
6/11/2019	0	---	---	---	---	---	---	---	0	230	---	---	30	---	0	280	---	0	120	320	830	---	0	---	---	740	---	410	150	1410	---	---		---	
6/18/2019	---	---	---	---	---	---	---	110	---	250	10	---	---	20	---	280	1080	---	120	570	1020	250	---	---	---	670	10	400	240	---	---	---		-	
6/25/2019	100	---	---	---	---	---	---	---	80	240	---	---	610	---	0	370	---	0	110	450	860	---	10	---	---	630	---	200	90	720	---	---		---	
7/2/2019	---	---	---	---	---	---	---	140	---	180	50	---	---	270	---	650	1270	---	150	470	920	230	---	---	---	540	40	370	130	---	---	---		0	
7/9/2019	100	---	---	---	---	---	---	---	510	600	---	---	540	---	0	640	---	10	150	450	870	---	200	---	---	750	---	420	350	1220	---	---	---	---	
7/16/2019	---	---	---	---	---	---	---	10	---	250	0	---	---	0	---	640	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	
8/6/2019	90	---	---	---	---	---	480	---	450	270	---	---	500	---	0	800	---	off	250	660	780	---	200	---	---	760	---	290	530	1200		---	---	---	
8/13/2019	---	---	---	---	---	---	---	0	---	200	40	---	---	0	---	580	1000	---	110	300	700	200	---	---	---	780	---	300	560	---		---	---	0	
8/20/2019	70	---	---	---	---	---	600	---	450	240	---	---	470	---	0	540	---	off	100	650	800	---	190	---	---	740	---	250	610	---		---	---	---	
8/27/2019	---	---	---	---	---	---	---	off	---	230	10	---	---	10	---	1370	900	---	130	560	720	340	---	---	---	690	---	290	750	---		---	---	0	
9/3/2019	0	---	---	---	---	---	280	---	0	210	---	---	60	---	0	710	---	off	110	560	670	---	210	---	---	870	---	200	1000	---		---	---	---	
9/10/2019	---	---	---	---	---	---	---	---	---	200	13	---	---	60	---	810	580	---	110	590	630	300	---	---	---	650	---	210	980	---		---	---	0	
9/17/2019	10	---	---	---	---	---	1030	---	0	250	---	---	1800	---	0	470	---	off	100	510	590	---	280	---	---	680	---	360	970	---		---	---	---	
9/24/2019	---	---	---	---	---	---	---	100	---	240	12	---	---	10	---	880	540	---	100	660	590	510	---	---	---	700	---	350	870	---		20	---	0	
10/1/2019	0	---	---	---	---	---	760	---	0	220	---	---	1700	---	0	830	---	off	90	670	600	---	300	---	---	550	---	300	750	---		20	---	---	
10/8/2019	---	---	---	---	---	---	---	40	---	260	30	---	---	0	---	820	600	---	80	710	570	400	---	---	---	720	---	340	1500	---		off	---	0	
10/17/2019	0	---	---	---	---	---	720	---	0	5000	---	---	1400	---	0	800	---	off	100	3000	560	---	300	---	---	3000	---	300	3000	---		4000	---	---	
10/22/2019	80	70	60	70	60	50	50	60	90	70	80	---	---	90	---	70	130	---	90	90	120	100	---	100	120	80	---	80	140	---	90	90	70	0	100
10/29/2019	90	80	80	100	100	110	80	70	80	100	120	---	90	80	0	100	100	off	100	70	80	90	90	70	90	70	100	80	90	100	80	90	80	0	100
11/5/2019	90	---	---	---	---	---	100	---	60	70	---	---	100	---	0	110	---	off	70	90	90	---	70	---	---	90	---	230	60	80	60	---	---	---	---
11/12/2019	---	---	---	---	---	---	---	80	---	100	110	---	---	130	---	100	90	---	80	90	100		---	---	---	90	---	150	70	---	70	---	---	0	100
11/20/2019	120	140	20	240	0	210	650	3000	380	OFF	100	---	20	0	700	600	480	OFF	OFF	790	470	120	2000	630	300	720	4000	400	2000	900	230	OFF	540	0	300
11/26/2019	140	---	---	---	---	---	30	---	10	Off	---	---	Off	---	450	500	---	off	off	650	350	---	600	---	---	off	---	530	460	---	90	---	---	---	100
12/3/2019	---	---	---	---	---	---	---	100	---	off	130	---	---	10	---	---	350	---	off	320	370	360	---	---	---	130	---	60	1060	---	200	---	---	0	-
12/10/2019	120	---	---	---	---	---	140	---	110	off	---	---	40	---	100	off	---	off	off	700	350	---	470	---	---	off	---	100	800	460	570	---	---	---	
12/17/2019	---	---	---	---	---	---	---	100	140	off	140	---	---	40	---	off	300	---	off	310	370	200	---	---	---	off	---	120	750	---	550	---	---	0	130
1/8/2020	130	---	---	---	---	---	145	---	140	off	---	140	50	---	100	off	---	off	off	300	410	---	350	---	---	off	---	100	770	450	520	---	---	---	160
1/14/2020	---	---	---	---	---	---	---	130	---	off	20	---	---	---	---	off	40	---	off	80	330	370	---	---	---	off	---	20	450	---	124	---	---	0	
1/21/2020	340	---	---	---	---	---	20	---	80	off	---	180	100	---	80	off	---	off	off	30	340	---	460	---	---	7	---	70	320	230	680	---	---	---	---
1/27/2020	---	---	---	---	---	---	---	120	---	off	50	---	---	100	---	off	40	---	260	4000	310	3530	---	---	---	off	---	---	210	---	660	---	---	500	200
2/4/2020	400	---	---	---	---	---	90	---	120	off	---	210	140	---	80	off	---	off	---	400	300	---	360	---	---	off	---	420	370	200	150	---	---	---	---
2/11/2020	---	---	---	---	---	---	---	100	---	Off	70	---	---	60	---	injecting	50	---	400	30	40	420	0	---	---	off	---	---	300	---	680	---	---	0	180

CZ07 — Screening location is an extraction location

CZ20 — Screening location is a monitoring well

CZ18, CZ21, UWBZ26, UWBZ27, UWBZ28/LSZ51, LSZ09, LSZ23, LSZ37, LSZ38 and LSZ39 extraction shut down.

Suspect field screening results in October and November not included

Sulfate concentrations in several wells decreasing

Site ST012 Path Forward Mar-Apr 2020

- Collect one more round of PID screening as part of SVE rebound study then restart and sample select wells at restart.
- Continue pump repairs
- Pilot Study Implementation
  - Return benzene sampling at U02 and LSZ54 to a quarterly basis.
  - Complete subphase 4 injections.
  - After five and eight weeks collect one set of BioTraps® at each well for SIP and QuantArray Petro analysis
  - Begin preparation of Pilot Study Implementation Report

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

PFOS/PFOA SI Update

BCT Meeting
27 February 2020

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site ST012

Former Liquid Fuel Storage Area

BCT Meeting

27 February 2020

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site LF004 Landfill Remedial Action

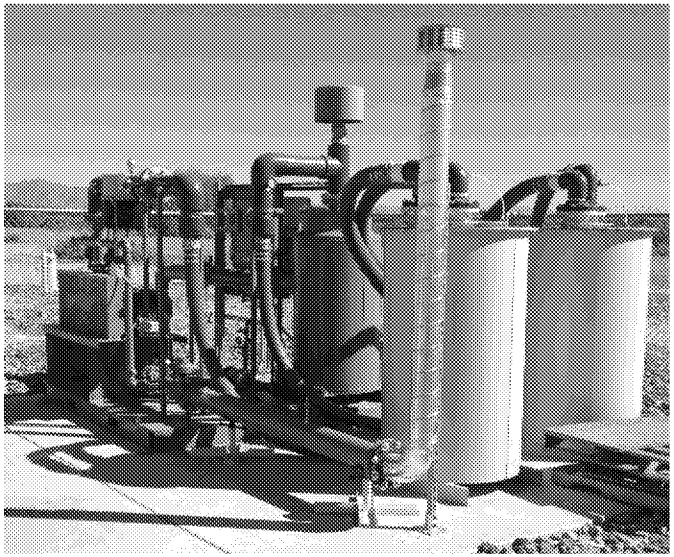
BCT Conference Call
27 February 2020

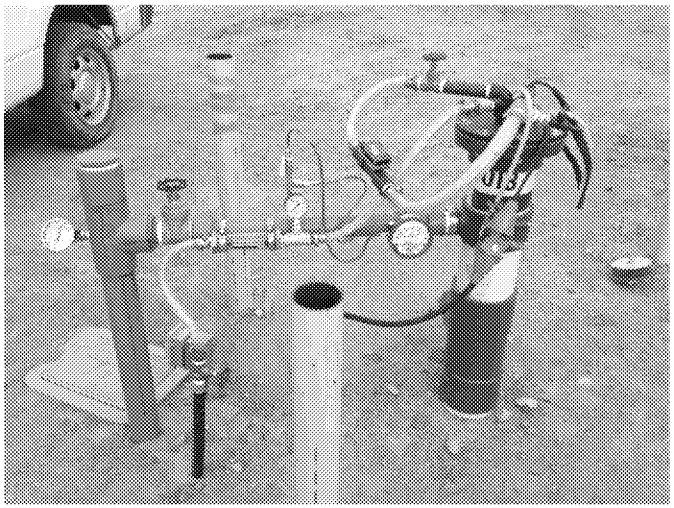
LF004 Recent and Upcoming Activities

- ADEQ concurrence on final 2018 annual landfill inspection report received 21 Feb 2020
- Draft 2019 landfill inspection report under AF review
- Technical memo describing decommissioning of SVE and IWAS treatment systems under final AF review. SVE and well decommissioning documents will be submitted to EPA and ADEQ.
- Validation of semi-annual (Nov 2019) analytical data complete

Site LF004
LF01-W17 Area IWAS System Update

- **Final November 2019 PDB results indicate all monitoring wells below the TCE MCL with the exception of LF01-W17S (7.9 µg/l) and LF01-W30M (10 µg/l)**
- **Previous May 2019 PDB for LF01-W17S (9 µg/l) and LF01-W30M (12 µg/l)**
- **Monitoring wells upgradient and downgradient of LF01-W17S and LF01-W30M are below TCE MCL**





Site LF004
Southern Area SVE and Oxidant Injection

- **Final November 2019 PDB results indicate only three PCE MCL exceedances: W19S at 7.8 µg/l (dup 8.2 µg/l), W19D 5.6 µg/l (dup 5.4 µg/l), and W24M at 6.2 µg/l (dup 5.4 µg/l). Previous May 2019 PDB results for W19S 8.1 µg/l (dup 9.1 µg/l), and W19D <1.0 µg/l and W24M 9.7 µg/l (dup 8.6 µg/l). .**
- **Upgradient wells in the vicinity of W19 and downgradient wells in the vicinity of W24 are below the PCE MCL**

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site FT002
Fire Training Area Remedial Action

BCT Conference Call
27 February 2020

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
- Revised Final Remedial Action Completion Report submitted 22 Nov 2019
- Received EPA comment letter on 31 Dec 2019. Received ADEQ comments on 12 Feb 2020. Response to comments under AF review.
- If necessary, a technical conference call with regulatory agencies to resolve comments can be scheduled

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site SS017

Old Pesticide/Paint Shop

BCT Conference Call

27 February 2020

Site SS017 Groundwater Monitoring Update

- Q3 (Aug) 2018 data summary report submitted 12 Apr 2019 under regulatory review. ADEQ comments received on 10 Feb 2020.
- Annual (Nov) 2018 groundwater report submitted 18 Apr 2019. Reissued hard copy reports on 30 Apr 2019. ADEQ comments received on 10 Feb 2020.
- Draft Q2 (Jun) 2019 data summary report submitted 30 Dec 2019. ADEQ comments received on 10 Feb 2020.
- Draft Q3 (Aug) 2019 data summary report submitted 31 Dec 2019. ADEQ comments received on 10 Feb 2020.
- ADEQ concurrence received on 19 Feb 2020 for Field Variance Memo #2
- Draft Q4 (Nov) 2019 annual report under AF review
- Q1 quarterly sampling (MW-02) completed

Parcel K-1-2 Property Transfer

- FOST (final version in track changes responding to EPA comments) was issued via email for regulatory concurrence 24 Jul 2019 with follow up email 9 Aug 2019
- FOST clean copy with all revisions, responses to comment and ADEQ requested changes issued 15 Oct 2019
- Final FOST to be routed for AF signature after regulatory concurrence
- Draft DEUR and assignment package to be prepared
- ADEQ concurrence previously received. EPA concurrence letter received 19 Dec 2019.

Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site ST035
Former Building 760

BCT Conference Call
27 February 2020

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.
- Well abandonment activities complete on 22 Oct 2019. Documentation of well abandonment submitted to AF, ADWR and ADEQ.

Air Force Civil Engineer Center

2020 BCT MEETINGS/CONFERENCE CALLS SCHEDULE DELIVERABLE TRACKING

BCT Conference Call

27 February 2020

BCT GENERAL UPDATE AND ACTION ITEMS

BCT Conference Call
27 February 2020