Air Force Civil Engineer Center

FORMER
WILLIAMS AIR FORCE BASE

Site LF004 Landfill Remedial Action

BCT Conference Call
19 March 2020

Battle Ready…Built Right!

ED_005025_00009027-00001

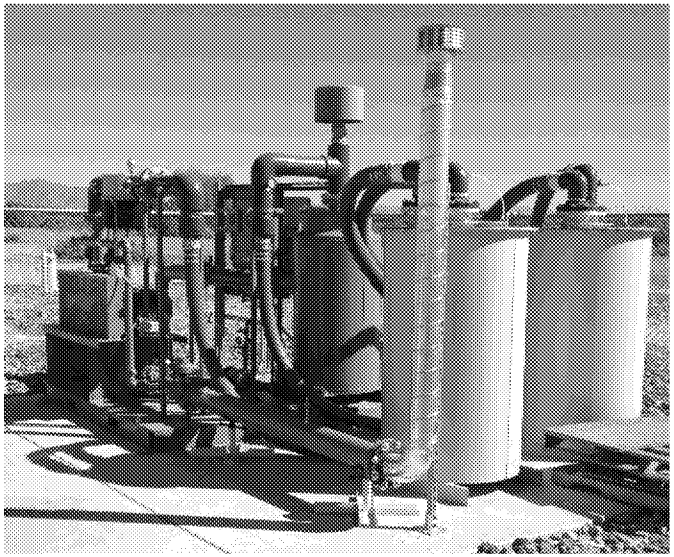
LF004 Recent and Upcoming Activities

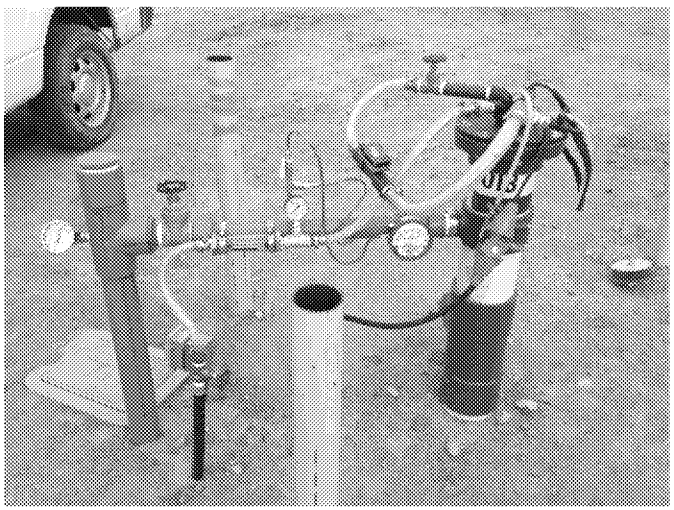
- Draft 2019 landfill inspection report under AF review
- Technical memo describing decommissioning of SVE and IWAS treatment system complete. SVE and well decommissioning documents will be submitted to EPA and ADEQ.

ED_005025_00009027-00002

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**
- **PDB sampling event scheduled in Apr-May 2020**





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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), 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
- PDB sampling event scheduled in Apr-May 2020

ED_005025_00009027-00004

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Site FT002
Fire Training Area Remedial Action

BCT Conference Call
19 March 2020

Site FT002 Update

- AF approved keeping the DEUR in place Nov 2018
- Draft Explanation of Significant Differences (ESD) document to add the land use control to the ROD is under AF review
- 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

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Site SS017

Old Pesticide/Paint Shop

BCT Conference Call

19 March 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. Response to comments and final report in preparation.
- Annual (Nov) 2018 groundwater report submitted 18 Apr 2019. Reissued hard copy reports on 30 Apr 2019. ADEQ comments received on 10 Feb 2020. Response to comments and final report in preparation.
- Draft Q2 (Jun) 2019 data summary report submitted 30 Dec 2019. ADEQ comments received on 10 Feb 2020. Response to comments and final report in preparation.
- Draft Q3 (Aug) 2019 data summary report submitted 31 Dec 2019. ADEQ comments received on 10 Feb 2020. Response to comments and final report in preparation.
- Draft Q4 (Nov) 2019 annual report under AF review

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
- ADEQ concurrence previously received. EPA concurrence letter received 19 Dec 2019
- Final FOST to be routed for AF signature
- Draft DEUR and assignment package to be prepared

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WILLIAMS AIR FORCE BASE

Site ST012

Former Liquid Fuel Storage Area

BCT Call

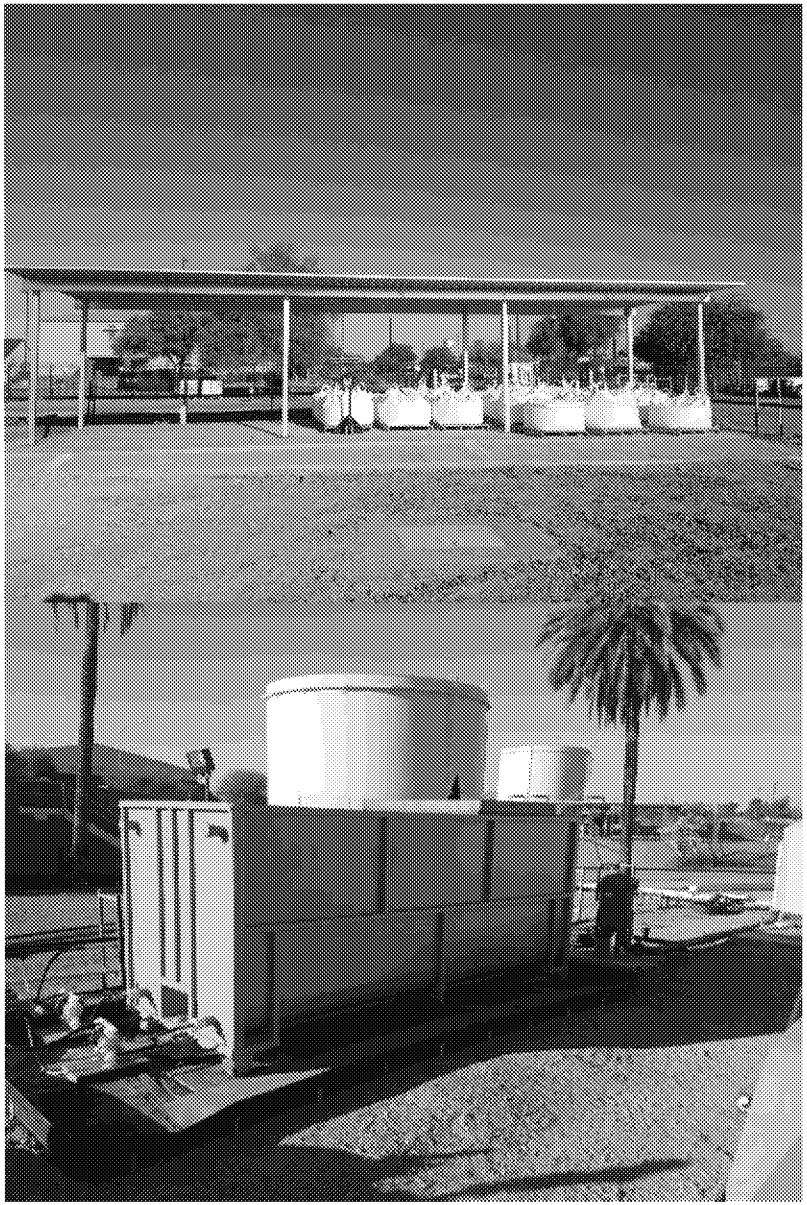
19 March 2020

Site ST012 Outline

- Summary of activities since Feb BCT meeting
- SVE Rebound Analysis Update
- SVE Re-start Plan
- LNAPL removal update
- Updated on benzene and sulfate concentrations
- Pilot study extraction/injection update
- Path forward

Site ST012 Activities Since Feb

- SVE Rebound Monitoring
- LNAPL screening in select wells
- Pump Repairs
  - UWBZ21 continued with limited pumping due to high temperatures
  - UWBZ22 pneumatic pump plugging
  - UWBZ30 continues to pump
  - CZ23 Pump failed, believed to be a motor issue, scheduling repair
- Sodium sulfate injections



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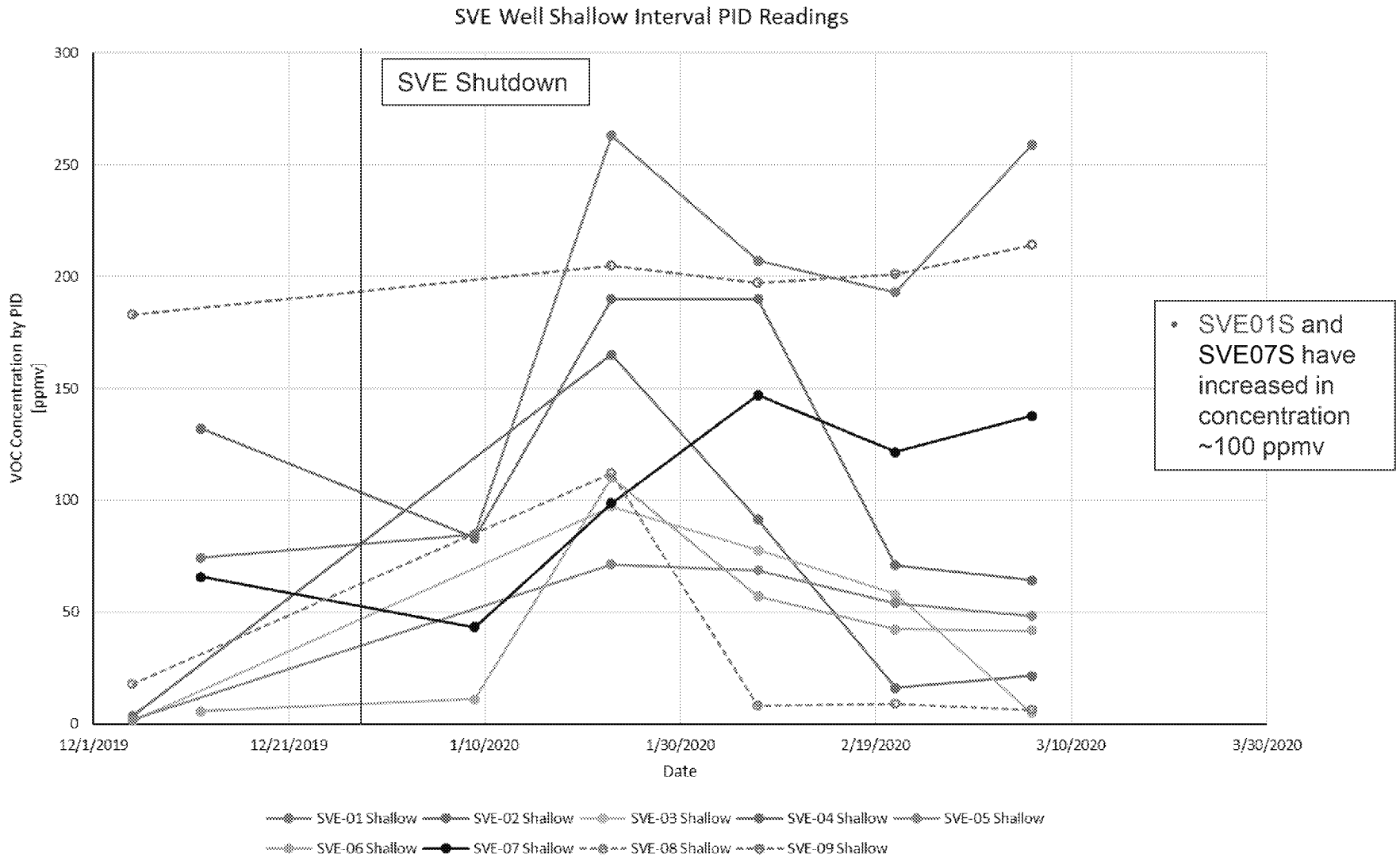
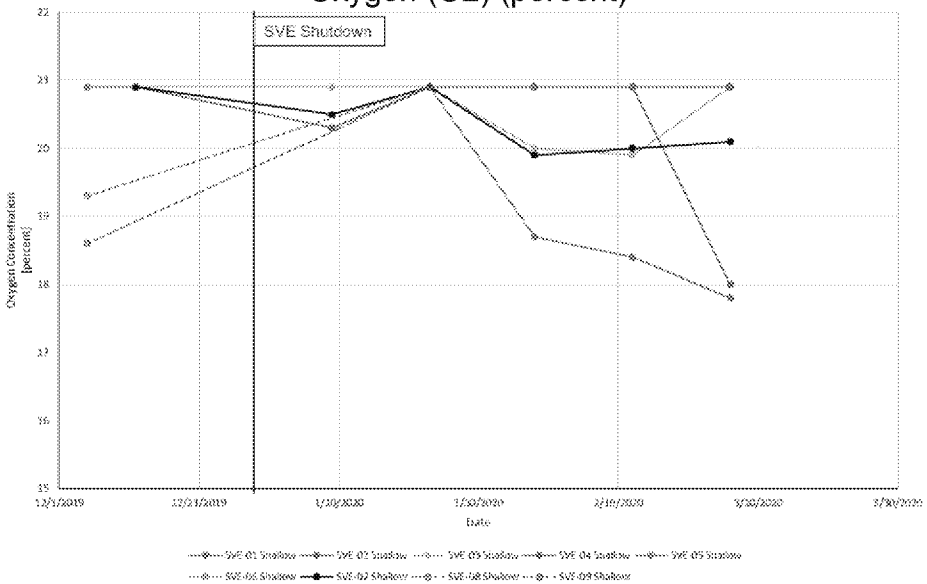
SVE Rebound Analysis Update

Site ST012 SVE System Rebound Study
Shallow Interval Zone (PID)

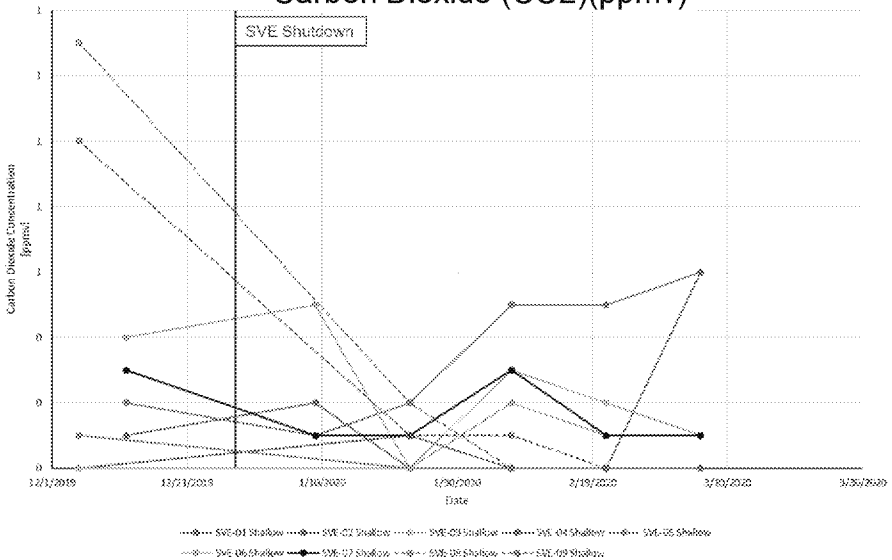


Site ST012 SVE System Rebound Study Shallow Interval Zone (O2, CO2, & CH4)

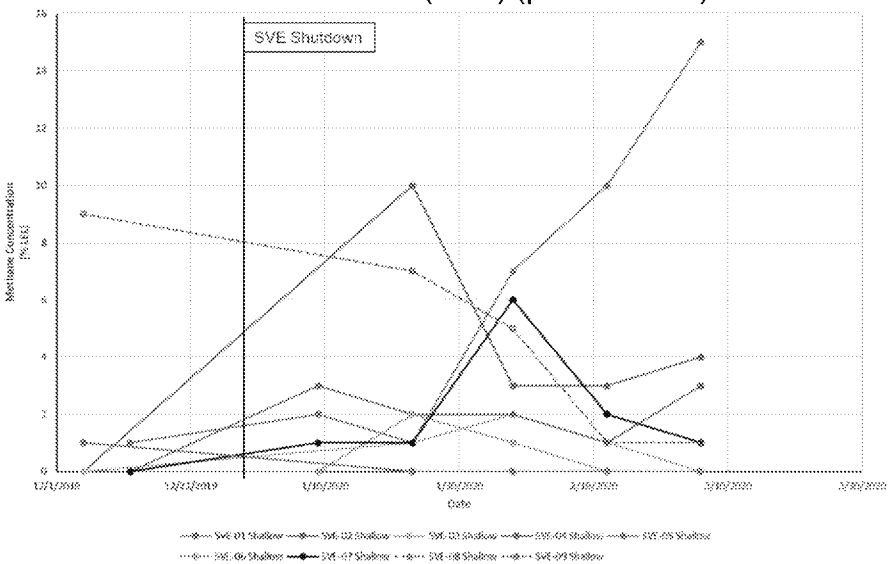
Oxygen (O2) (percent)



Carbon Dioxide (CO2)(ppmv)

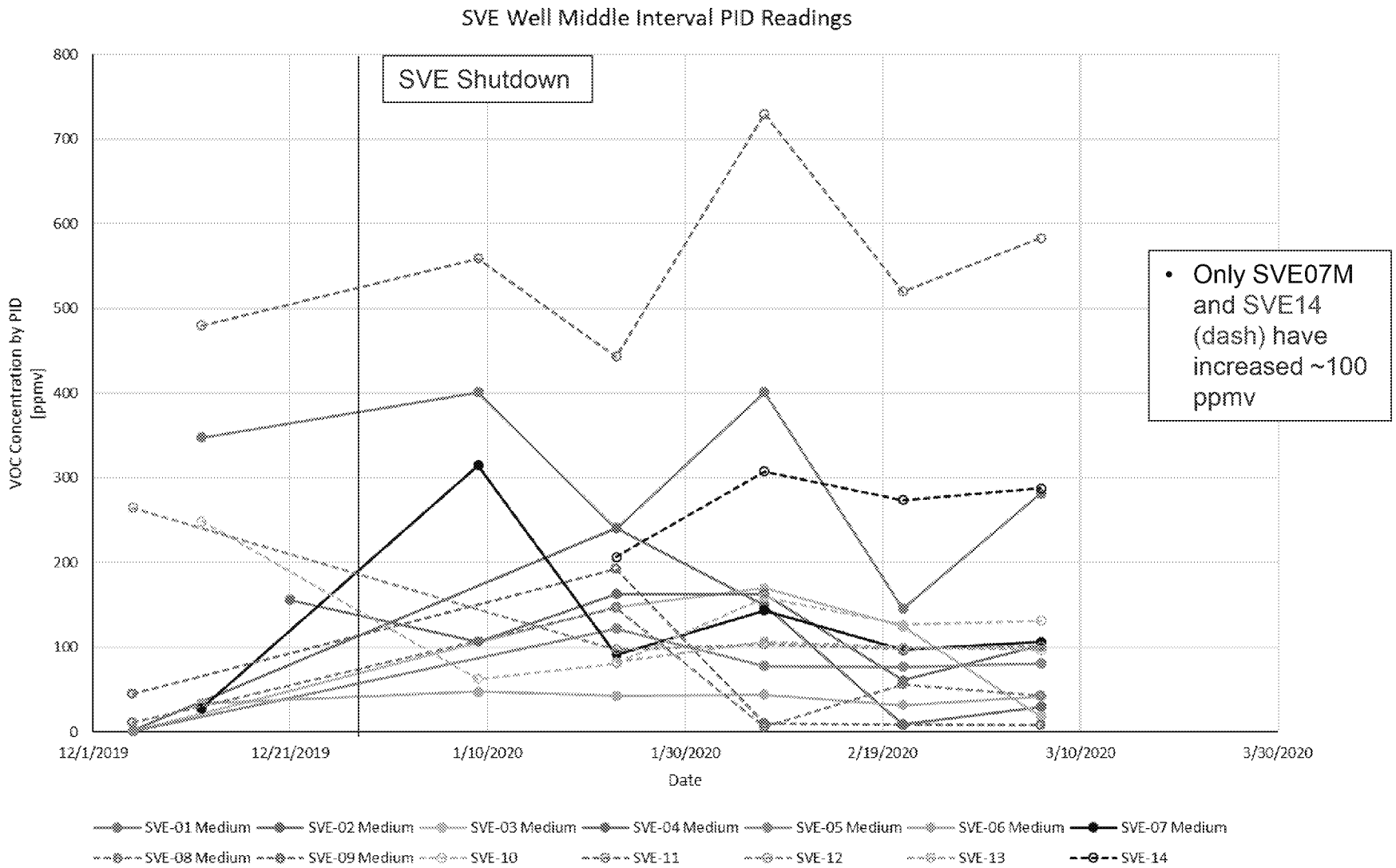


Methane (CH4) (percent LEL)



- Likely biological activity noted in SVE01S (O2 decreased, CO2 and CH4 increased)
- Potential (recent) indication of aerobic biological activity in SVE04S (O2 decreased and CO2 increased)

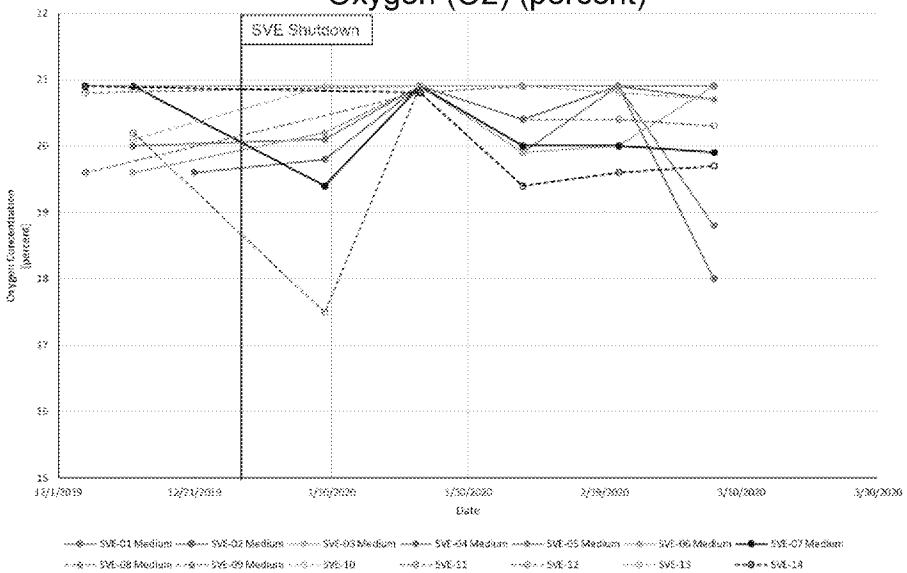
Site ST012 SVE System Rebound Study
Middle Interval Zone (PID)



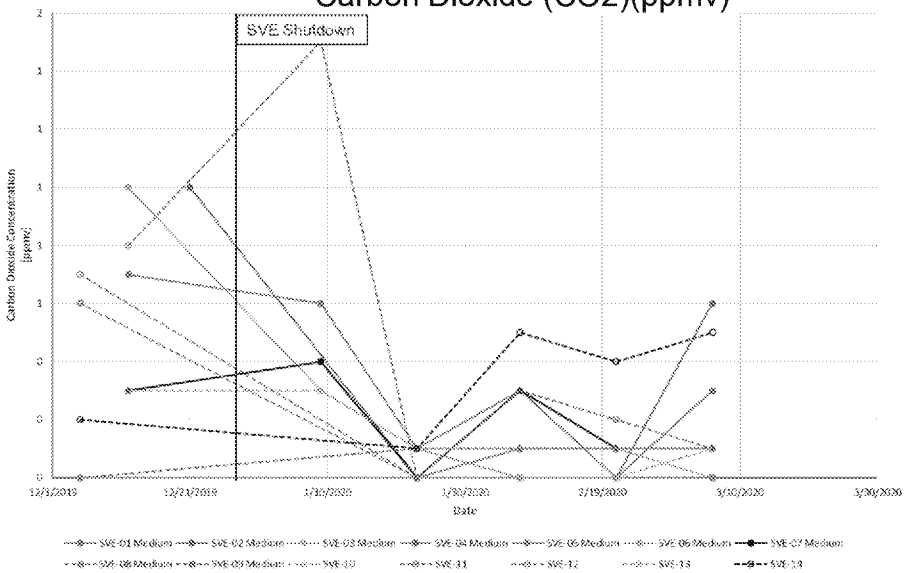
- Only SVE07M and SVE14 (dash) have increased ~100 ppmv

Site ST012 SVE System Rebound Study Middle Interval Zone (O2, CO2, CH4)

SVOxygen (O2) (percent)

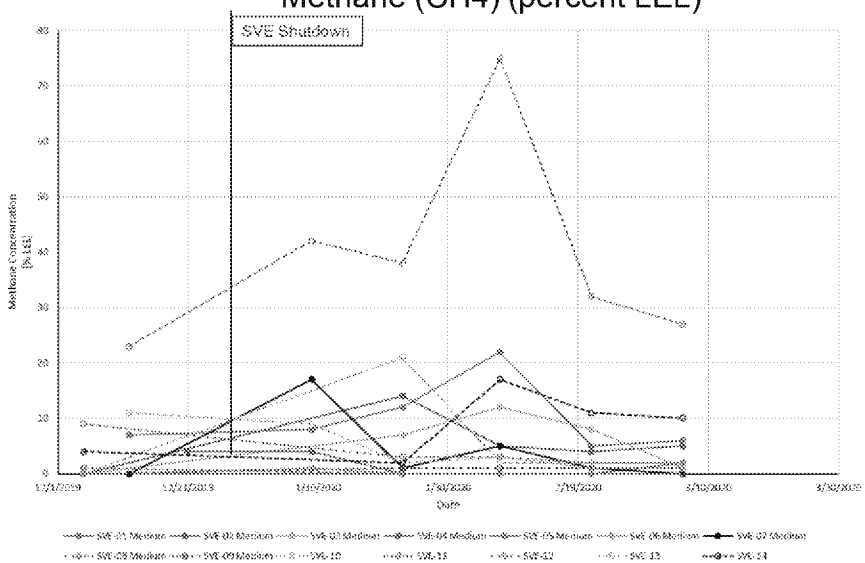


Carbon Dioxide (CO2)(ppmv)

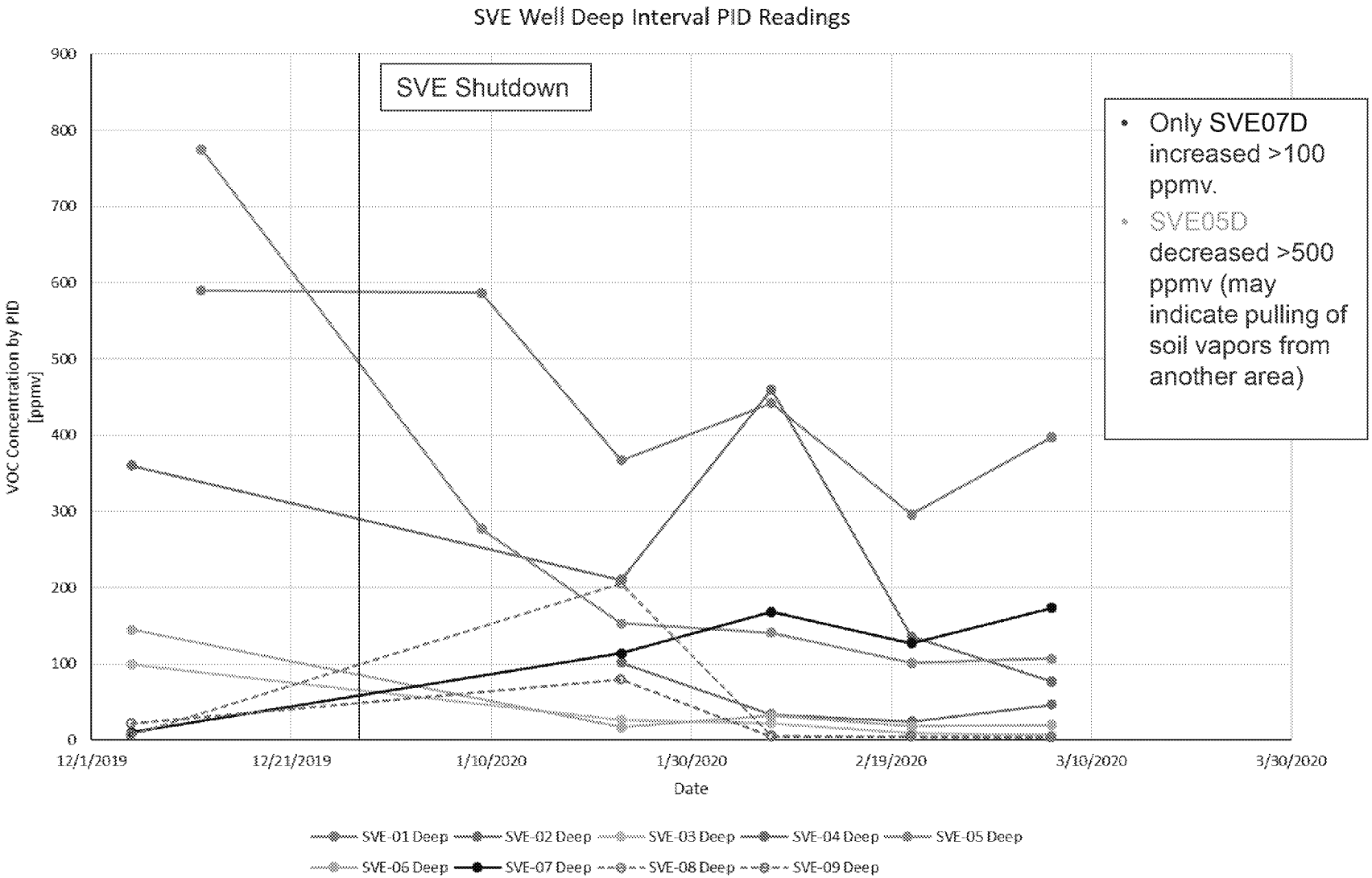


- Potential recent increases in biological activity noted in SVE01M and SVE04M (O2 decrease and CO2 increase)
- General CO2 decrease during rebound study
- Generally little change in CH4 during rebound study
- SVE14 (dash) notably higher CH4 than other wells

Methane (CH4) (percent LEL)



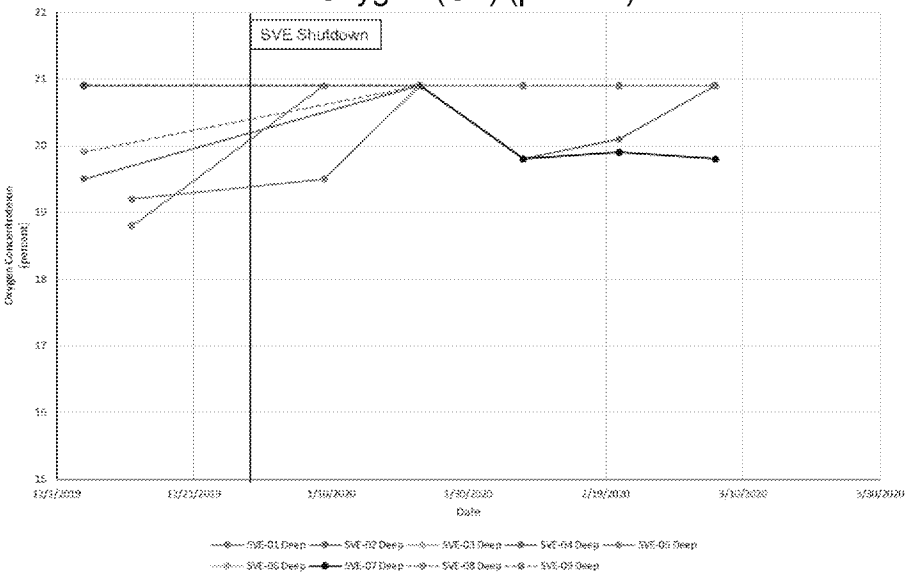
Site ST012 SVE System Rebound Study
Deep Interval Zone (PID)



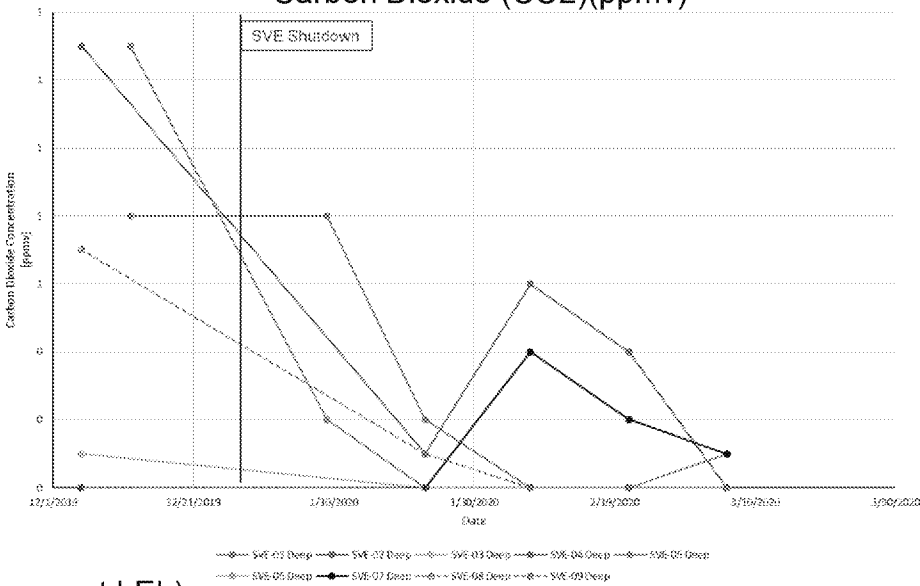
- Only SVE07D increased >100 ppmv.
- SVE05D decreased >500 ppmv (may indicate pulling of soil vapors from another area)

Site ST012 SVE System Rebound Study Deep Interval Zone (O2, CO2, CH4)

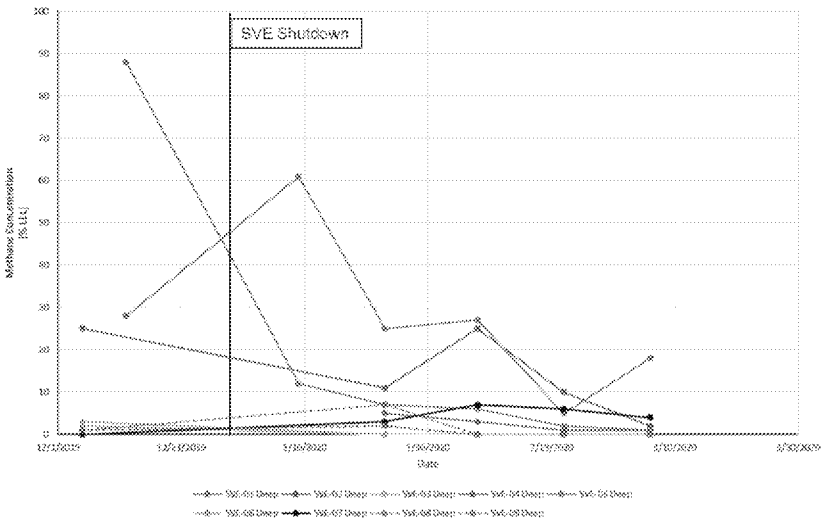
Oxygen (O2) (percent)



Carbon Dioxide (CO2)(ppmv)

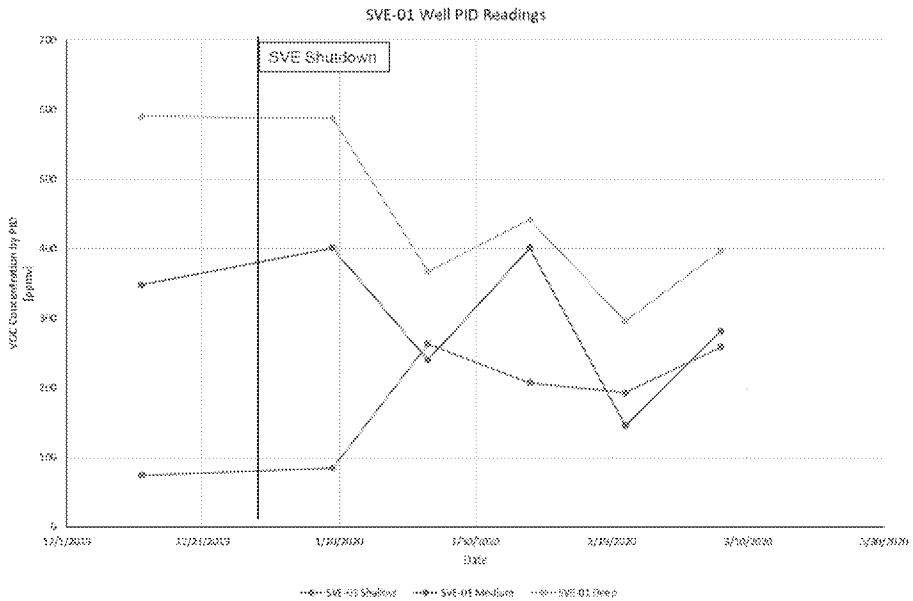


Methane (CH4) (percent LEL)



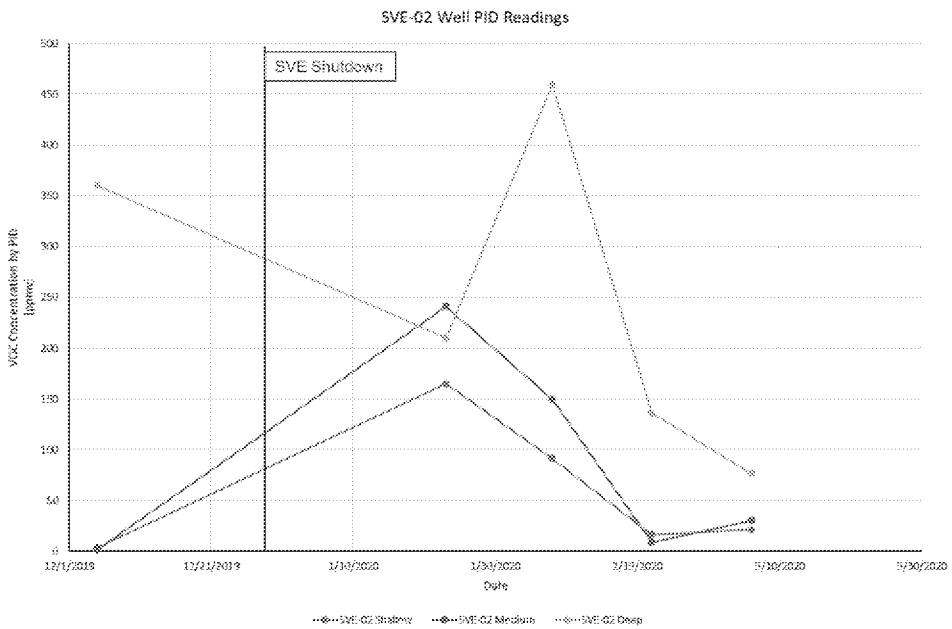
- O2 generally increased except for SVE07D
- Generally decreasing CO2 and CH4 in several wells (slight increase in CH4 at SVE07D)

Site ST012 SVE System Rebound Study
Vertical Evaluation

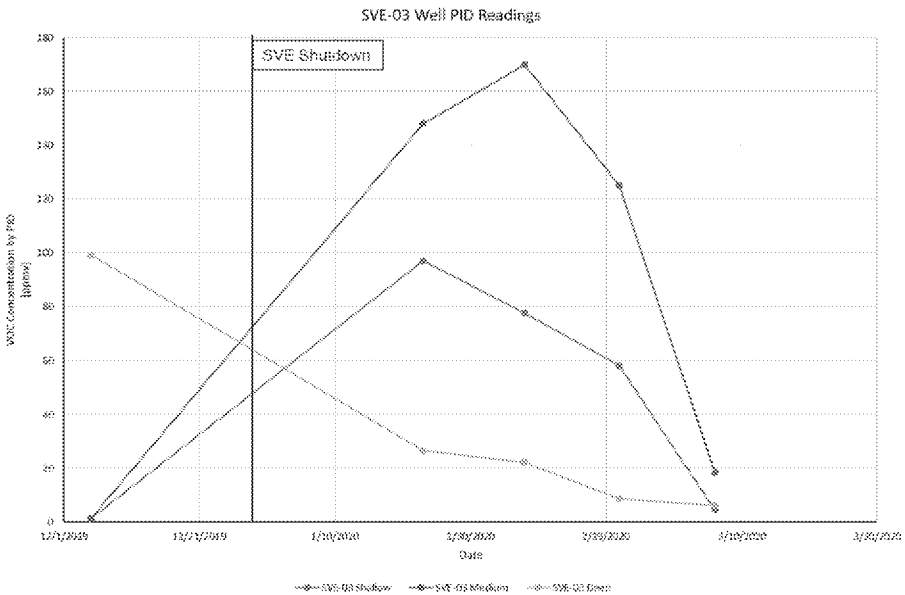


SVE01
- Increase in shallow
- No change or decrease in middle and deep

SVE02
- Initial temporary increase in shallow and middle, but no long-term change
- Decrease in deep

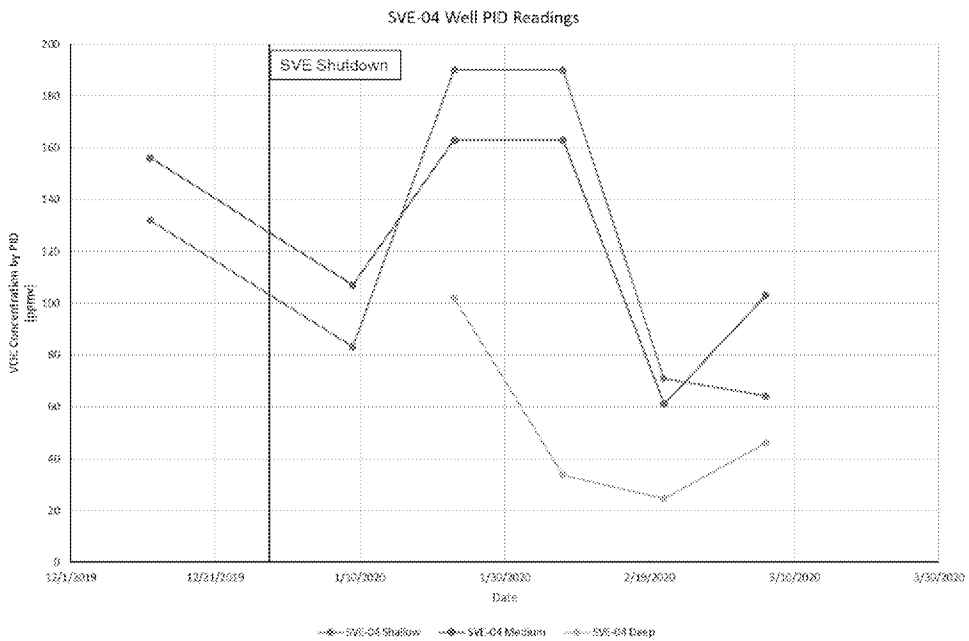


Site ST012 SVE System Rebound Study
Vertical Evaluation

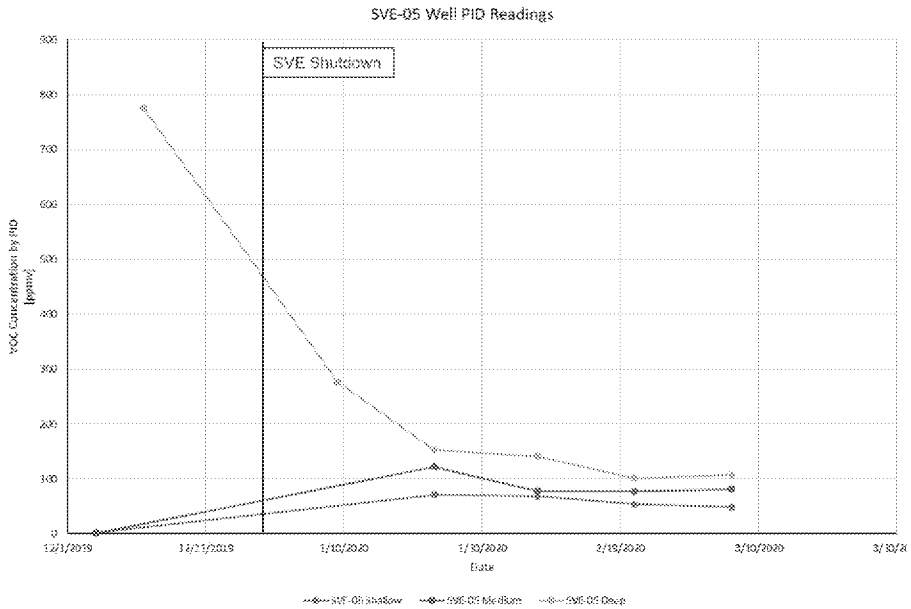


SVE03
- Initial temporary increase in shallow and middle, but no long-term change
- Decrease in deep

SVE04
- Small decrease in all three depth intervals

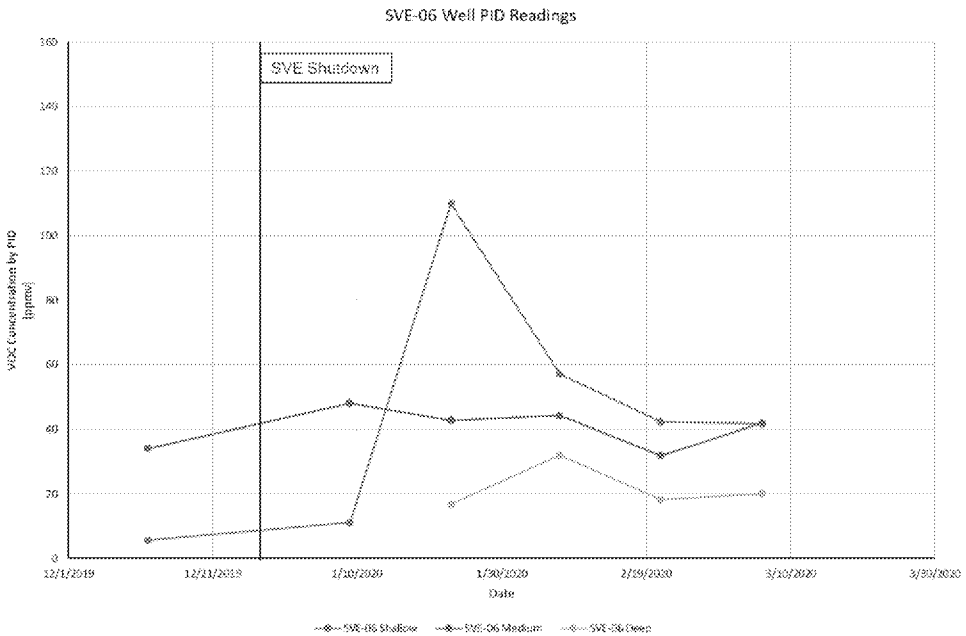


Site ST012 SVE System Rebound Study
Vertical Evaluation

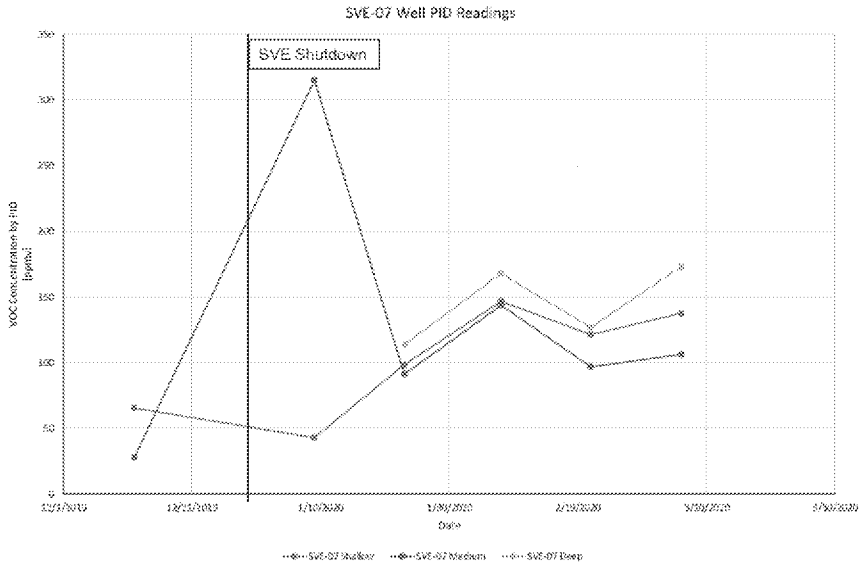


SVE05
- Slight increase in shallow and middle
- Decrease in deep

SVE06
- Slight increase in shallow
- No change in middle and deep

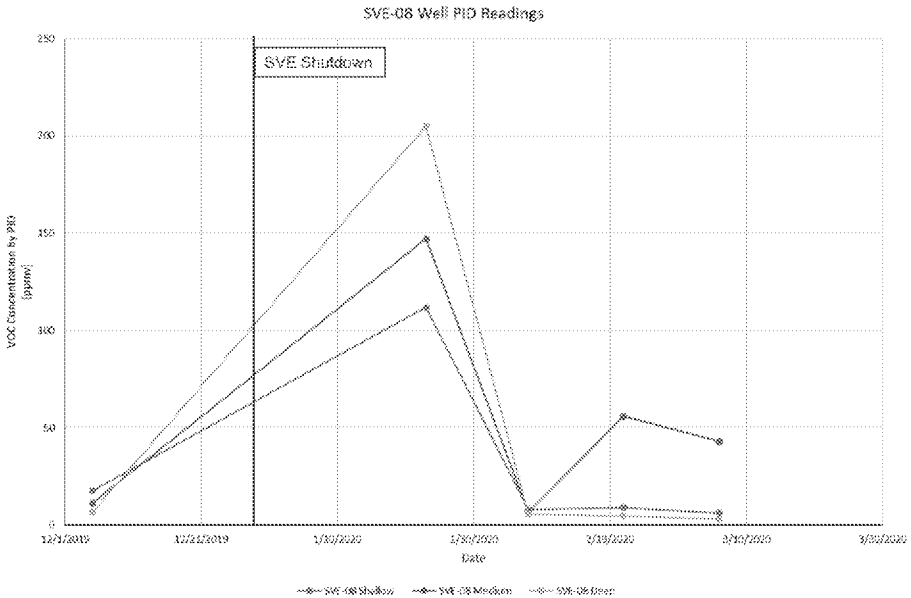


Site ST012 SVE System Rebound Study
Vertical Evaluation



SVE08
- Initial increase in all three depth intervals but no long-term change

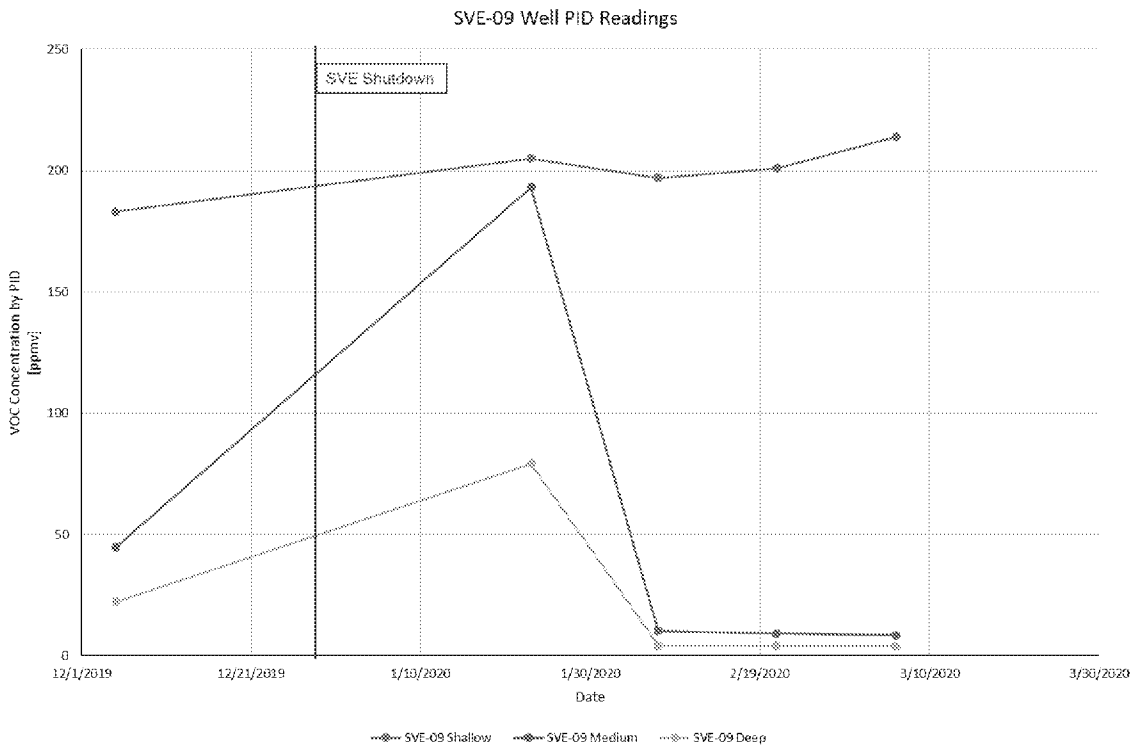
SVE07
- Increase in all three depth intervals



Site ST012 SVE System Rebound Study
Vertical Evaluation

SVE09

- Initial increase in middle and deep but decreased overall
- No change in shallow



SVE Re-Start Plan

Site ST012 SVE System Restart Shallow Zone

Rebound Notes:

- SVE01S – PID increase and indications of bioactivity
- SVE07S – PID increase
- SVE04S – Possible bioactivity late in rebound monitoring

Shallow Re-Start Plan

- Open SVE09S (higher PID reading than most shallow wells)
- Extract at SVE01S and vent SVE07S and SVE03S
- Rotate monthly between extraction at SVE01S, SVE03S, and SVE07S with the other two wells venting
- Close other wells

- Inner circle indicates pre-rebound test operation
- Outer, larger circle indicates revised operation

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 — Average Mass Flow Rate (lbs/d) in shallow interval
- X — Interval Closed Throughout the Period

SVE well closed | SVE well open to extraction | SVE well open to venting

Site ST012 SVE System Restart Middle Zone

Rebound Notes:

- SVE11 – highest PID readings
- SVE07M – PID increase
- SVE01M and SVE04M – Recent signs of potential bioactivity
- SVE14 – PID increase and notably higher CH4 than other wells

Middle Re-Start Plan

- Extract at SVE02M and vent at SVE11. Rotate monthly.
- Extract at SVE03M and SVE14. Vent at SVE01M, SVE04M, and SVE07M
- Close SVE05M, SVE06M, and SVE10
- Vent at SVE13 (also for potential effect in deep zone)

ST012-LSZ53
ST012-W36
ST012-LSZ43
ST012-SVE09
ST012-SVE08
ST012-W30
ST012-SVE04
ST012-SVE03
ST012-TMP15/SVE14
ST012-TMP05/SVE11
ST012-SVE01
ST012-UPE01
ST012-SVE02
ST012-UWBZ29
ST012-TMP04/SVE10
ST012-UWBZ36
ST012-LSZ50
ST012-SVE05
ST012-SVE07
ST012-TMP12/SVE12
ST012-TMP13/SVE13
ST012-CZ21
ST012-CZ24/ST012-UWBZ36
ST012-UWBZ30
U.S. Army Reserve Center
ST012-CZ22/ST012-UWBZ35
ST012-LSZ49
ST012-SVE06
ST012-UWBZ34
ST012-UWBZ31
Oxidizer
FlameOx
ST012-LSZ57
ST012-U11
ST012-W11
ST012-LSZ48/ST012-UWBZ33
Sossaman Rd
ST012-LSZ45
ST012-LSZ47/ST012-UWBZ32
ST012-CZ25
ST012-W37
ST012-U37
ST012-UWBZ39
ST012-LSZ56
ST012-LSZ60
ST012-LSZ46
ST012-LSZ52

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
- M — Average Mass Flow Rate (lbs/d) in medium interval
- X — Interval Closed Throughout the Period

- Inner circle indicates pre-rebound test operation
- Outer, larger circle indicates revised operation

SVE well closed | SVE well open to extraction | SVE well open to venting

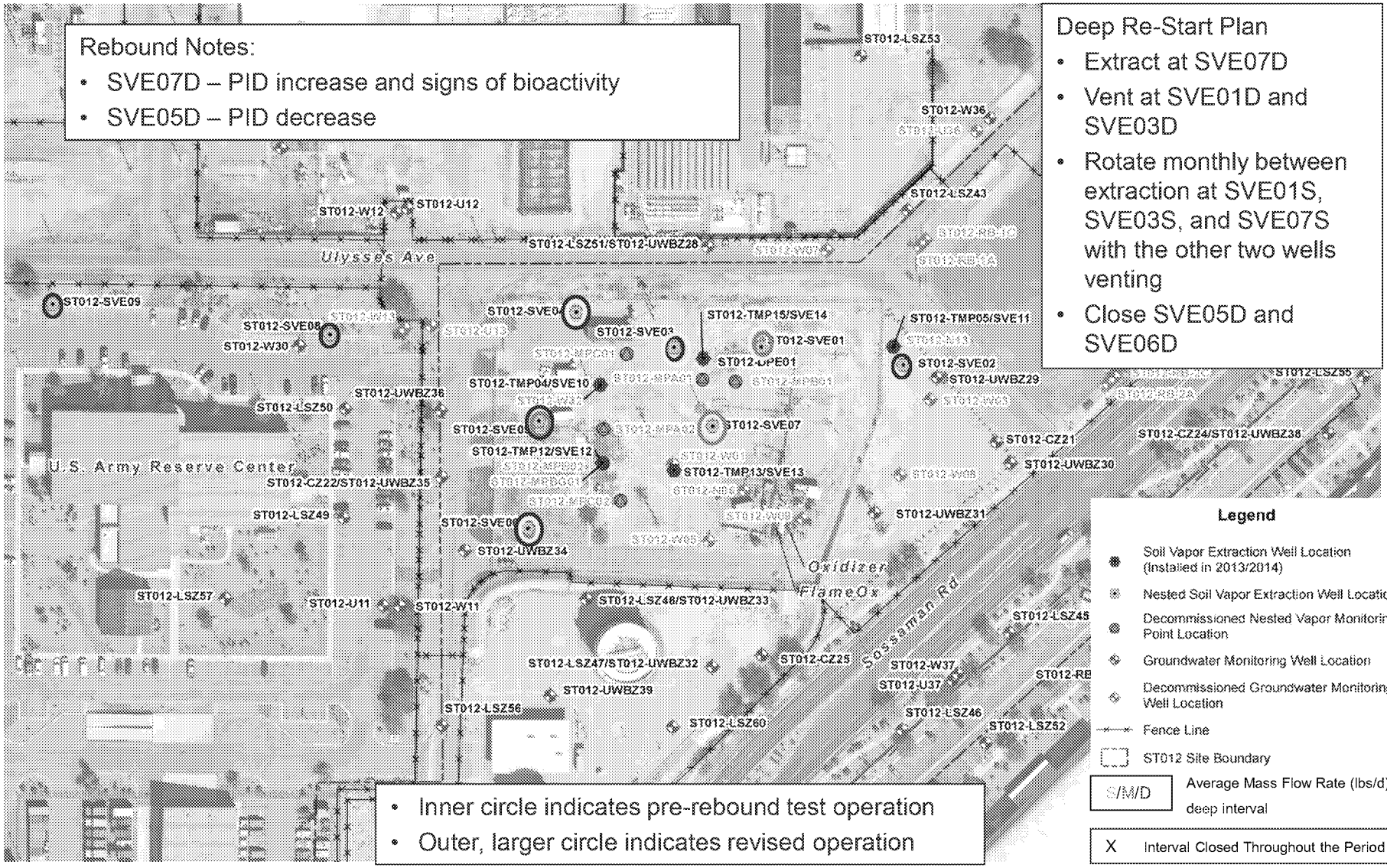
Site ST012 SVE System Restart Deep Zone

Rebound Notes:

- SVE07D – PID increase and signs of bioactivity
- SVE05D – PID decrease

Deep Re-Start Plan

- Extract at SVE07D
- Vent at SVE01D and SVE03D
- Rotate monthly between extraction at SVE01S, SVE03S, and SVE07S with the other two wells venting
- Close SVE05D and SVE06D



- Inner circle indicates pre-rebound test operation
- Outer, larger circle indicates revised operation

SVE well closed | SVE well open to extraction | SVE well open to venting

Supplemental SVE Re-Start Plan

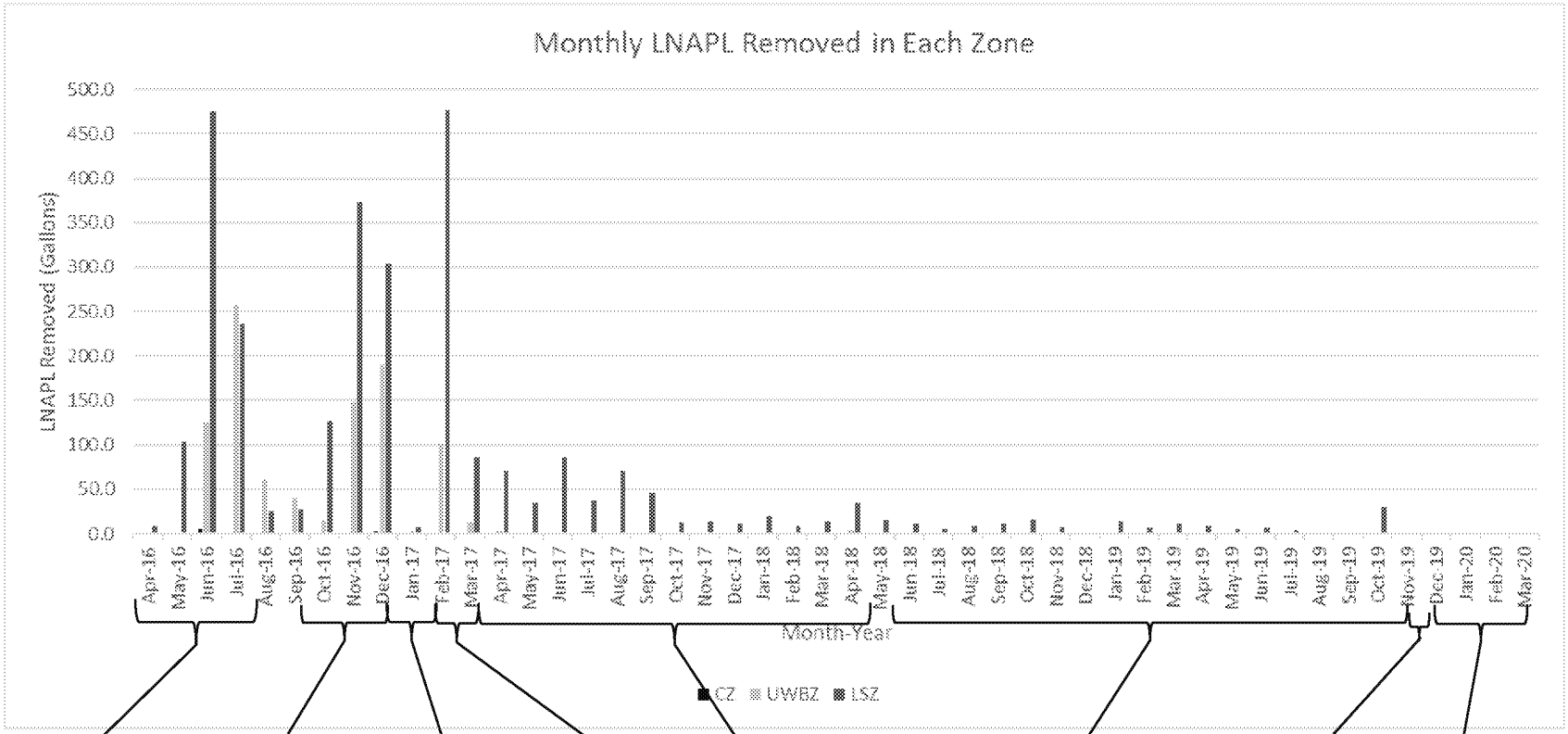
Well	Previous Status	Proposed Status	Rationale
SVE01S	Extract	Extract	Rebound noted
SVE02S	Vent	Closed	No signs of rebound
SVE03S	Vent	Vent	Vent to 1S
SVE04S	Extract	Closed	Limited signs of rebound
SVE05S	Vent	Closed	No signs of rebound
SVE06S	Extract	Closed	No signs of rebound
SVE07S	Extract	Vent	Rebound noted
SVE08S	Closed	Closed	No signs of rebound
SVE09S	Closed	Extract	Highest PID readings in shallow are at SVE09S
SVE01M	Extract	Vent	Vent to 3M/14
SVE02M	Vent	Extract	Extract close to 11
SVE03M	Vent	Extract	Extract in center
SVE04M	Extract	Vent	Vent to 3M/14
SVE05M	Vent	Close	No signs of rebound
SVE06M	Extract	Close	No signs of rebound
SVE07M	Extract	Vent	Vent to 3M/14
SVE08M	Closed	Closed	No signs of rebound
SVE09M	Closed	Closed	No signs of rebound
SVE10	Extract	Closed	No signs of rebound
SVE11	Extract	Vent	Vent to 2M
SVE12	Closed	Closed	No signs of rebound
SVE13	Vent	Vent	Vent to 2M/3M and to deep zone (7D)
SVE14	Closed	Extract	Rebound and highest methane concentrations
SVE01D	Extract	Vent	Vent to 7D
SVE02D	Closed	Closed	No signs of rebound
SVE03D	Closed	Vent	Vent to 7D
SVE04D	Vent	Close	No signs of rebound
SVE05D	Extract	Close	No signs of rebound
SVE06D	Closed	Close	No signs of rebound
SVE07D	Vent	Extract	PID rebound and indications of biological activity
SVE08D	Closed	Closed	No signs of rebound
SVE09D	Closed	Closed	No signs of rebound

LNAPL Removal Update (through 24 Feb)

ED_005025_00009027-00030

ST012 LNAPL Removal Summary

- CZ – 7.75 gallons of LNAPL removed. None since Feb 2020
- UWBZ – 963 gallons of LNAPL removed. None since Apr 2019
- LSZ – 2,874 gallons of LNAPL removed. None since Feb 2020



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

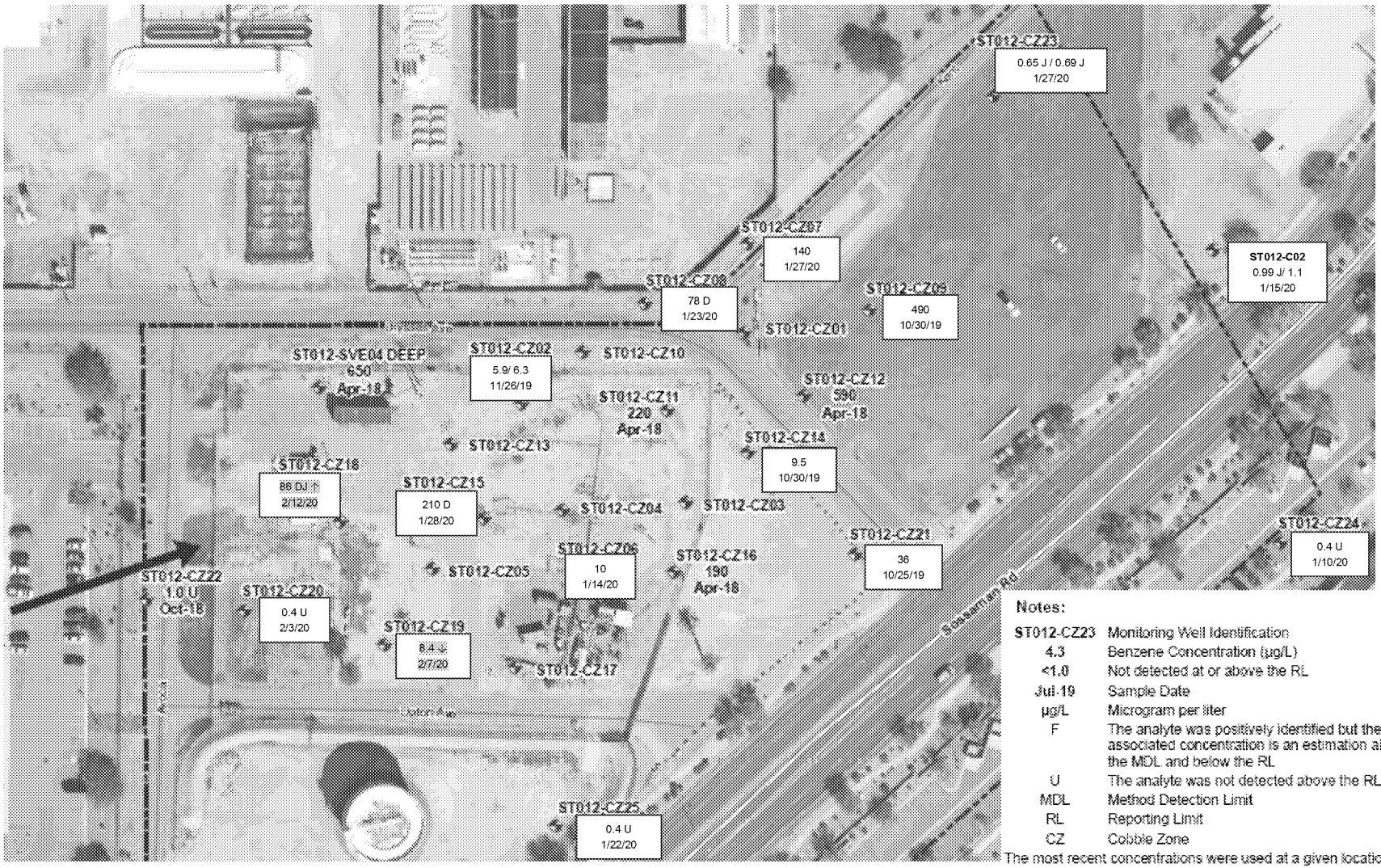
ED_005025_00009027-00032

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 24 Feb 2020 sample
  - Benzene at perimeter well U02 < 1 µg/L in 21 Feb 2020 sample

ED_005025_00009027-00033

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



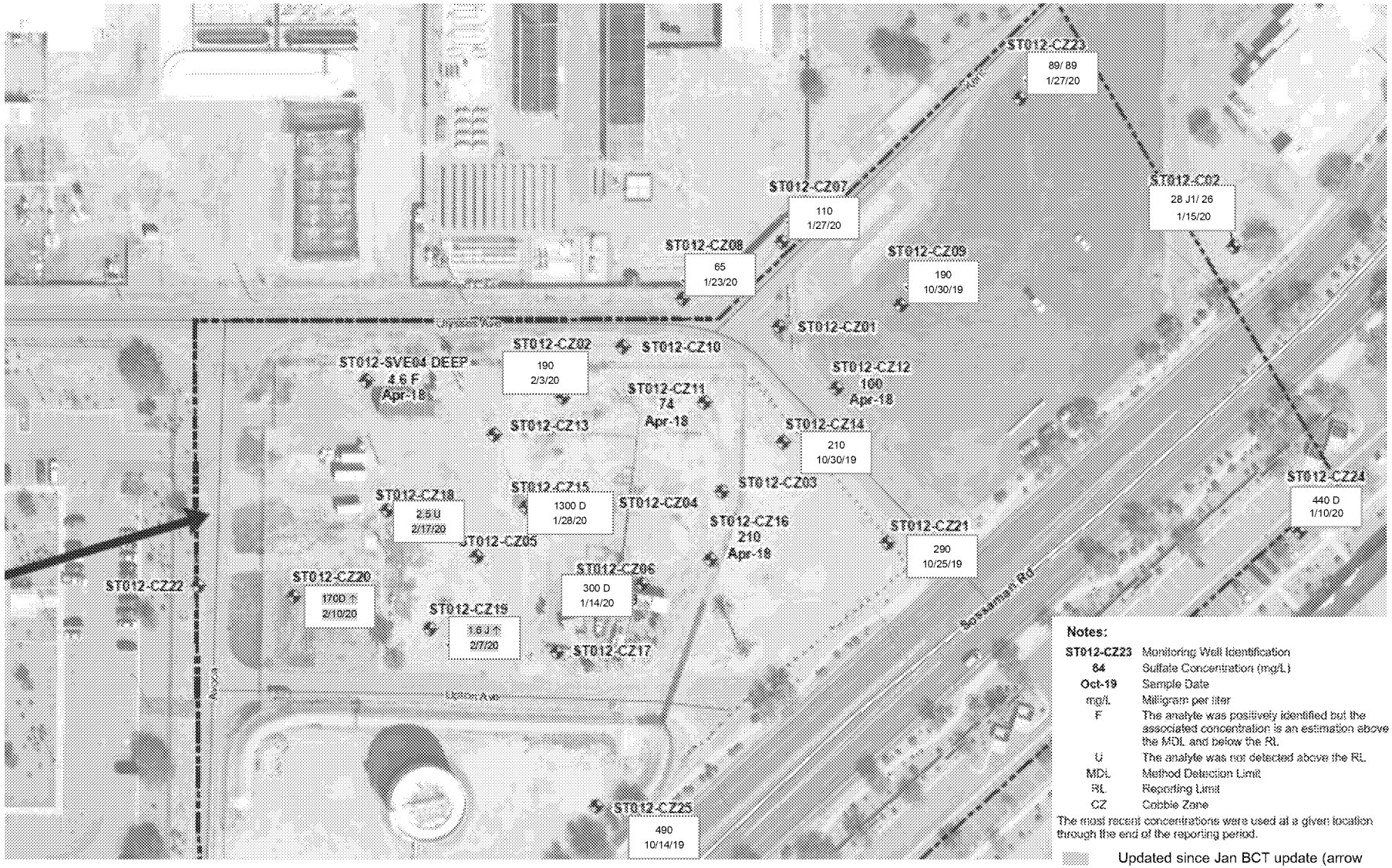
Notes:

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.

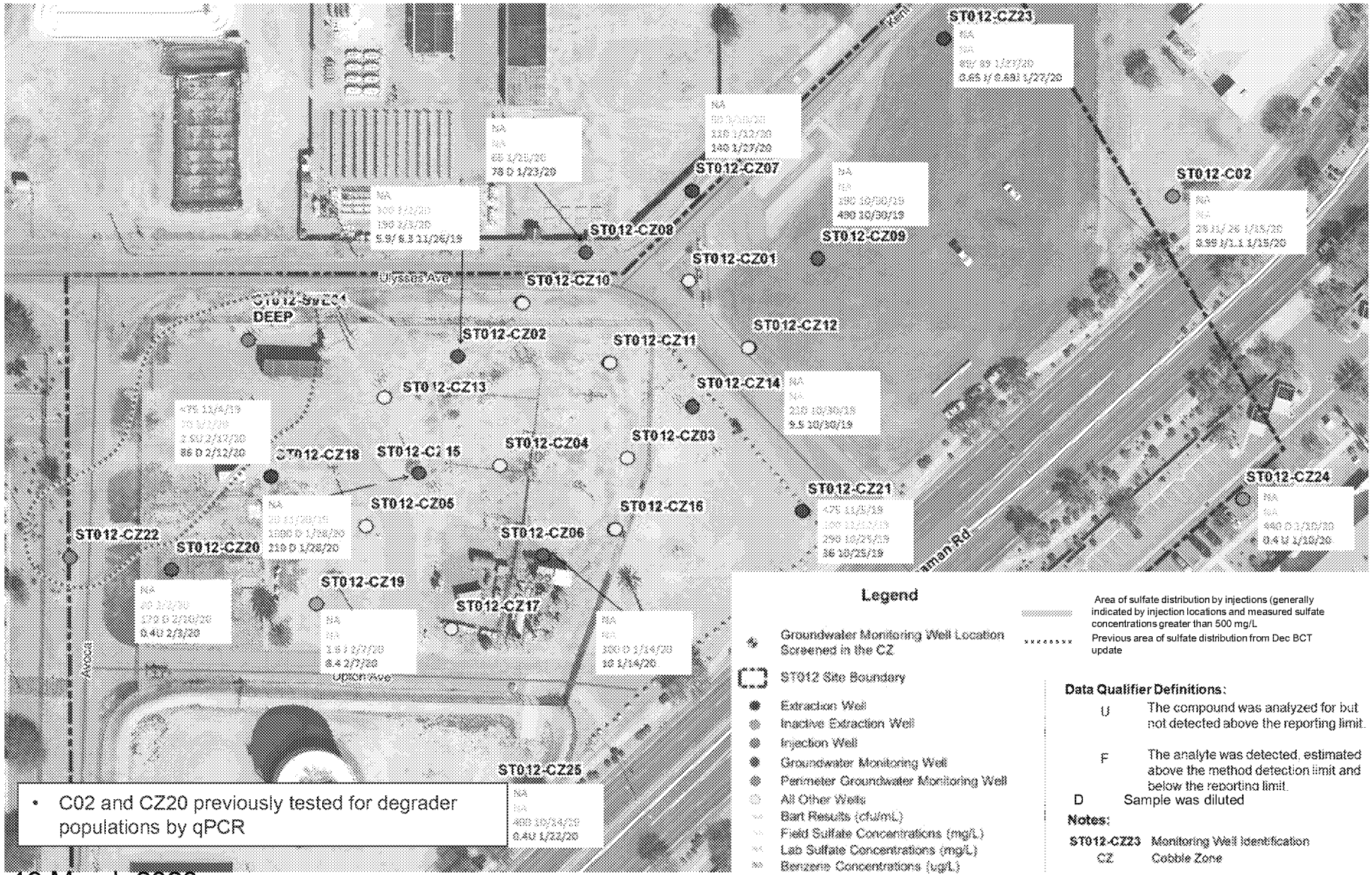
	Updated since Jan BCT update (arrow indicates direction of change from previous result)
D	Sample was diluted

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

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

- U02 benzene in 21 Feb 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-UWBZ26 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 0.68 J 2/21/20
ST012-UWBZ18 1600 D 1/21/20
ST012-U03 0.4U 1/23/20
ST012-UWBZ11 2900 D 2/11/20
ST012-UWBZ10 320 D 2/18/20
ST012-UWBZ12 1100 D 2/18/20
ST012-UWBZ03
ST012-UWBZ19
ST012-UWBZ04
ST012-UWBZ02
ST012-UWBZ29 680 8/7/19
ST012-UWBZ21 570 May-19
ST012-UWBZ13
ST012-UWBZ36 0.86 J 2/20/20
ST012-UWBZ05 410 D 1/9/20
ST012-UWBZ07
ST012-UWBZ14 130 D 1/15/20
ST012-UWBZ38 0.4U 1/10/20
ST012-UWBZ20
ST012-UWBZ30 1000 10/25/19
ST012-UWBZ25 630 D 2/5/20
ST012-UWBZ35 573 Jul-16
ST012-UWBZ15
ST012-UWBZ01
ST012-UWBZ06
ST012-UWBZ23 170 D 2/11/20
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 1/24/20
ST012-UWBZ34 91 2/20/20
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:

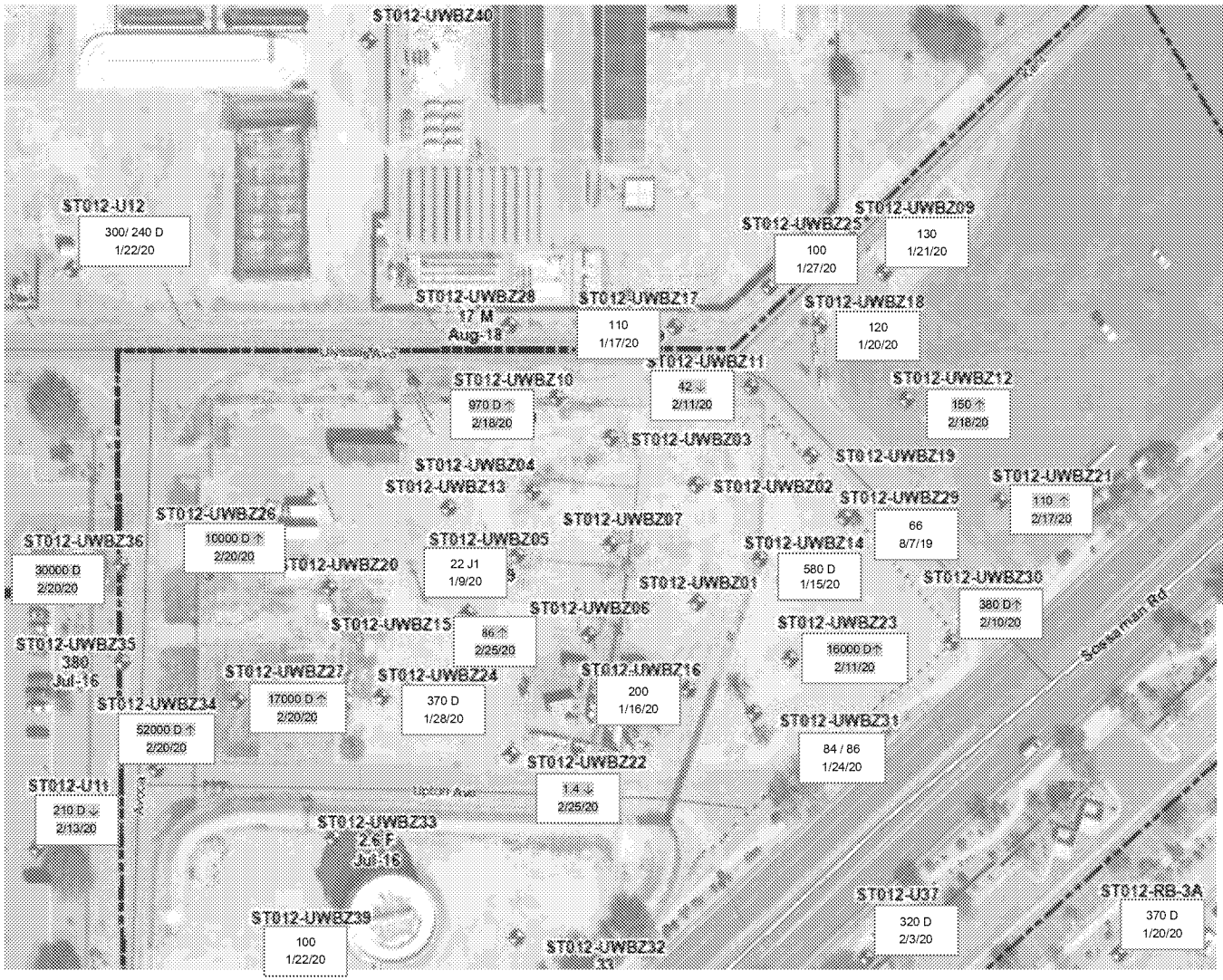
ST012-UWBZ33	Monitoring Well Identification
3000	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Jul-16	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
J	The analyte was detected; 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 Sulfate (mg/L) in UWBZ for Q1 2020



Notes:

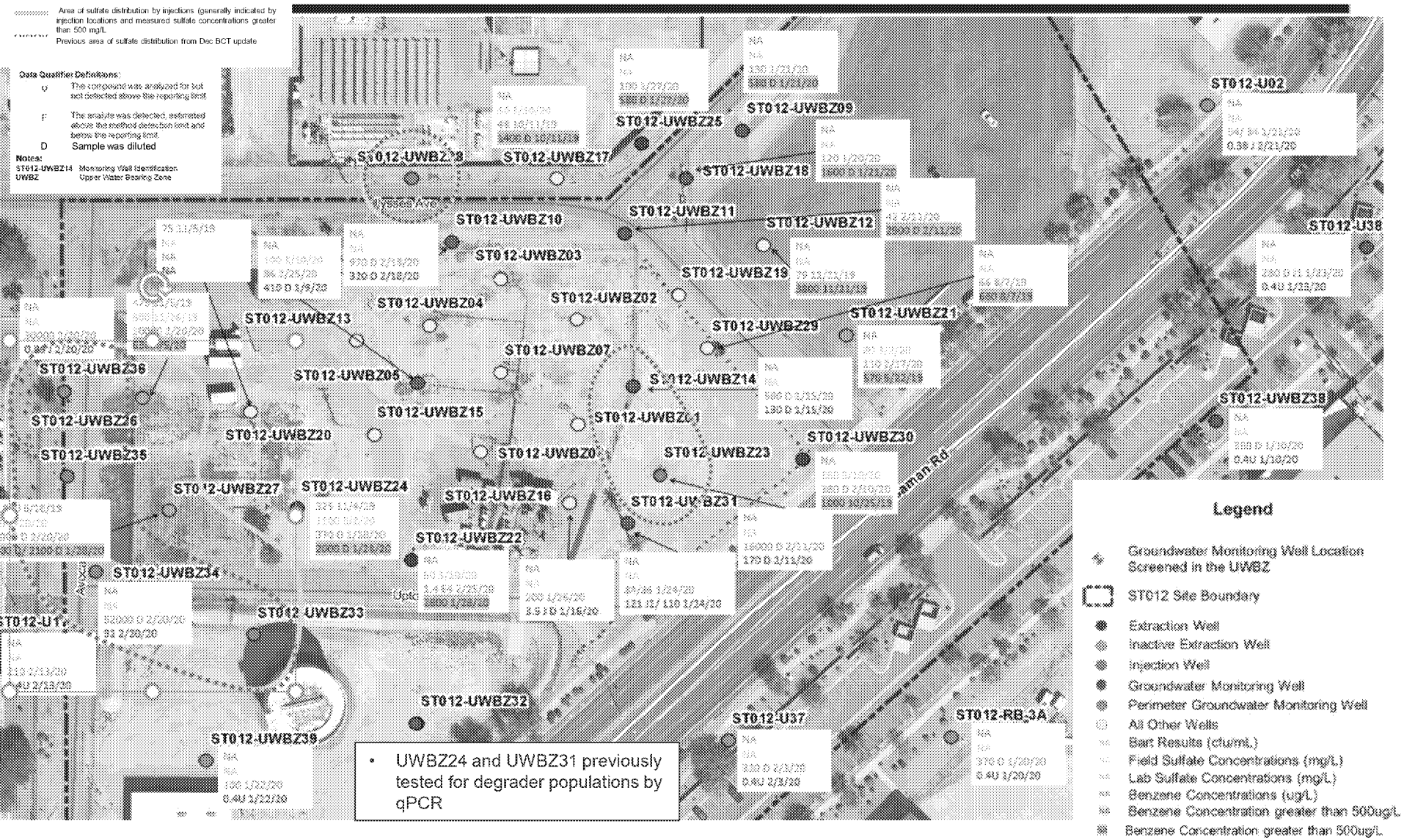
ST012-UWBZ33	Monitoring Well Identification
2.6 F	Sulfate Concentration (mg/L)
Jul-16	Sample Date
mg/L	Milligram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
U	The analyte was not detected above the RL
M	Manual Integrated Compound
MDL	Method Detection Limit
RL	Reporting Limit
UWBZ	Upper Water Bearing 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



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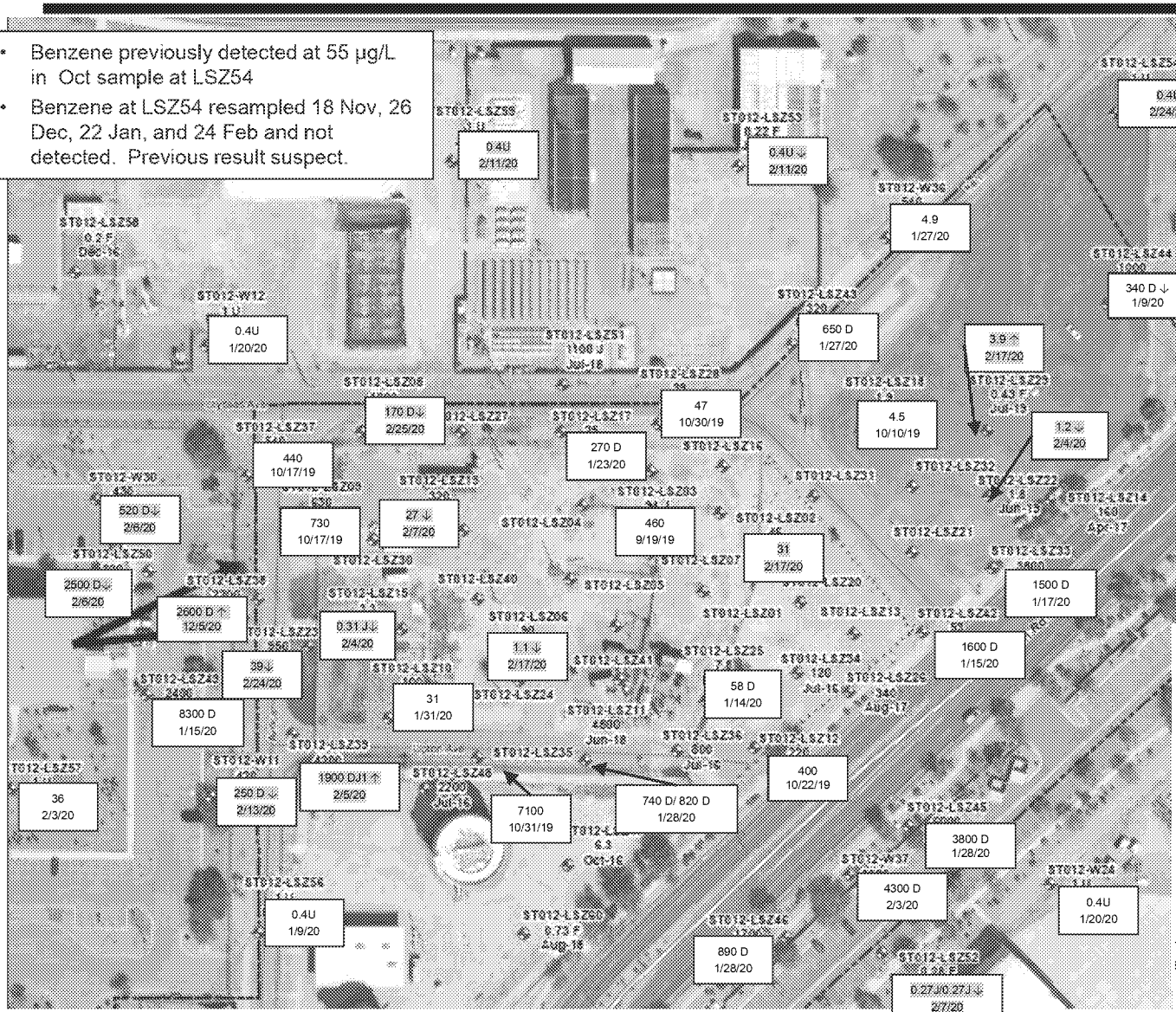
Site ST012 Benzene (µg/L) in LSZ for Q1 2020

- Benzene previously detected at 55 µg/L in Oct sample at LSZ54
- Benzene at LSZ54 resampled 18 Nov, 26 Dec, 22 Jan, and 24 Feb and not detected. Previous result suspect.



Notes:

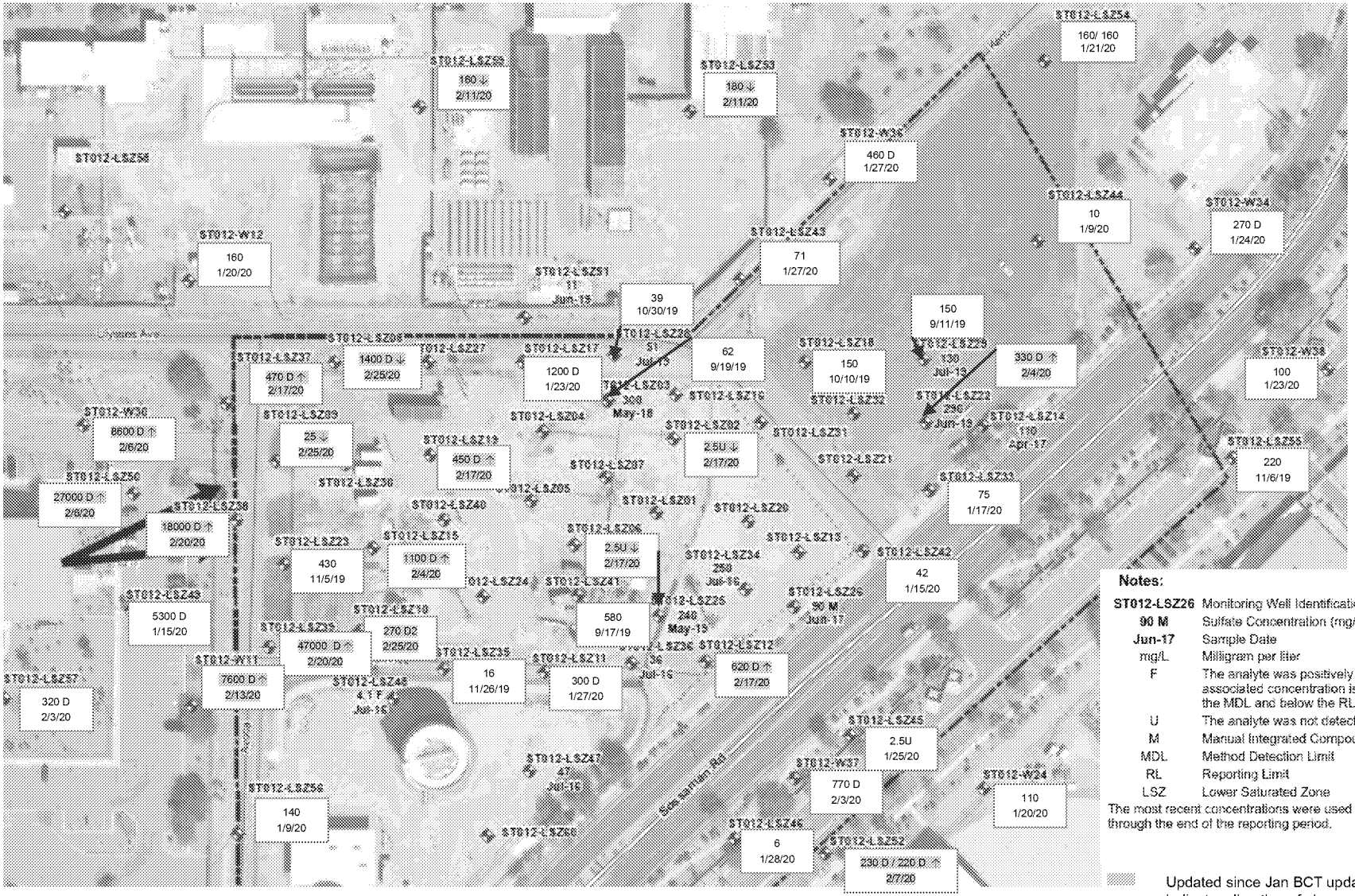
ST012-LSZ26	Monitoring Well Identification
340	Benzene Concentration (µg/L)
<1.0	Not detected at or above the RL
Aug-17	Sample Date
µg/L	Microgram per liter
F	The analyte was positively identified but the associated concentration is an estimation above the MDL and below the RL
J	The analyte was detected; 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



Notes:

ST012-LSZ26	Monitoring Well Identification
90 M	Sulfate Concentration (mg/L)
Jun-17	Sample Date
mg/L	Milligram 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
M	Manual Integrated Compound
MDL	Method Detection Limit
RL	Reporting Limit
LSZ	Lower Saturated Zone

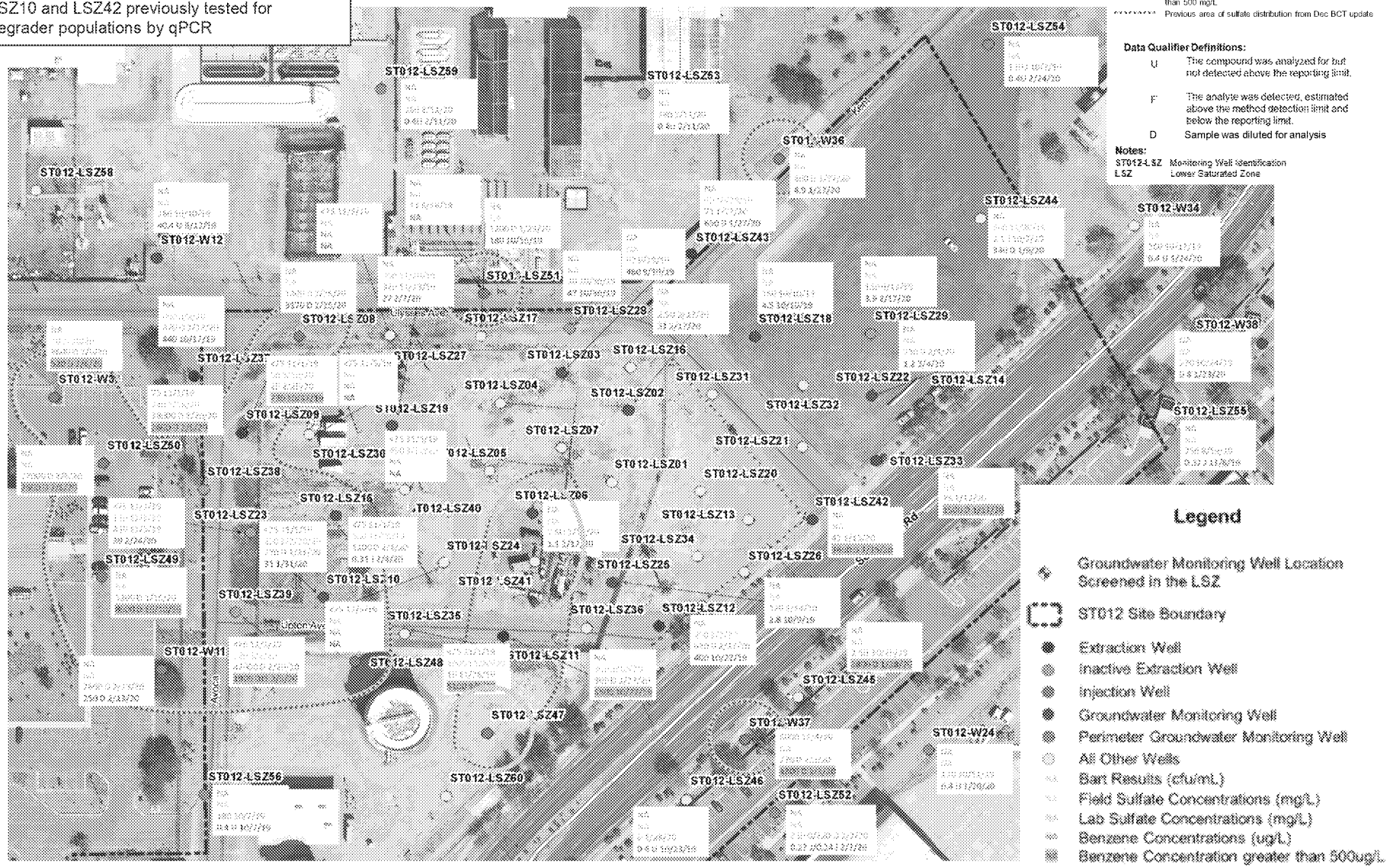
The most recent concentrations were used at a given location through the end of the reporting period.

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

D Sample was diluted

EBR Treatment Areas in LSZ for Q1 2020

- LSZ10 and LSZ42 previously tested for degrader populations by qPCR



Pilot Study Injection/Extraction Update

Site ST012 Extraction System Performance

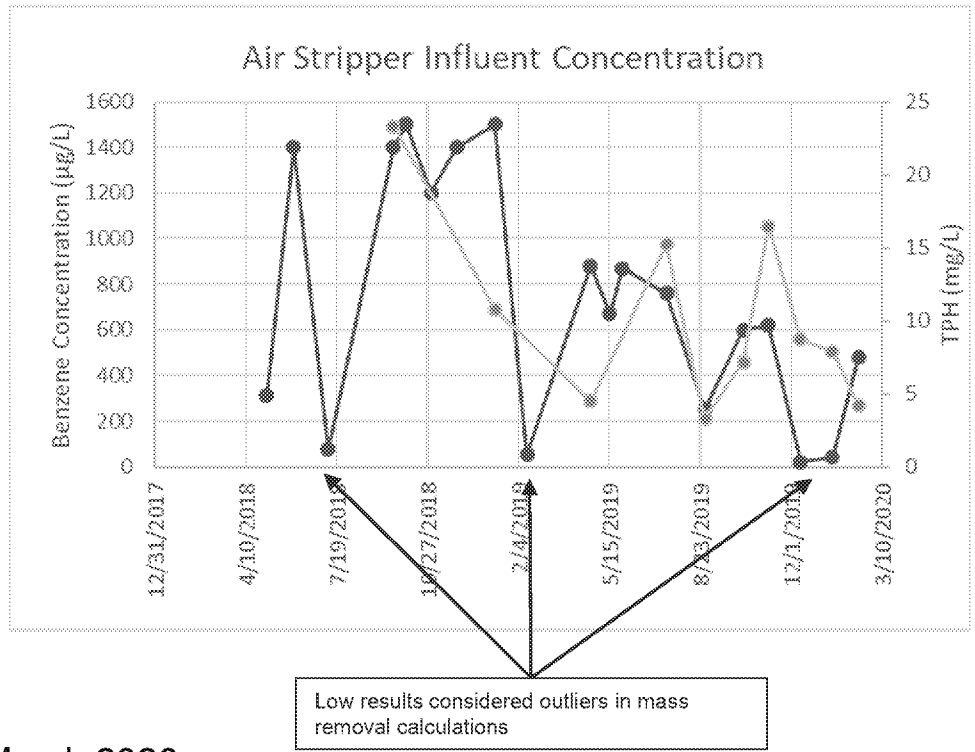
Extraction Well	Calculated Average Extraction Rate in Period gpm	Maximum Temperature Since May 2018 °F	Most Recent Temperature °F	Cumulative Extraction Since May 2018 gallons	Note
ST012-CZ07	5.8	175	141	5,041,464	
ST012-CZ18	Off	136	126	3,019,867	Extraction stopped due to sulfate presence (Oct 2019)
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	3.0	114	102	713,630	Motor recently failed
CZ Subtotal				9,227,460	
ST012-UWBZ21	17.9	170	156	616,891	Submersible installed but only runs for a few minutes/day (high temp)
ST012-UWBZ22	0.00	146	129	476,533	Pnuematic plugged, runs intermittently
ST012-UWBZ25	6.1	168	163	443,896	
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	11.9	172	162	2,088,638	Submersible installed
UWBZ Subototal*				7,433,112	
ST012-LSZ09	Off	140	130	2,748,461	Extraction stopped due to sulfate presence (Oct 2019)
ST012-LSZ11	5.4	139	96	3,691,515	
ST012-LSZ12	6.1	130	100	2,601,765	
ST012-LSZ23	Off	113	94	3,638,934	Extraction stopped due to sulfate presence (Aug 2019)
ST012-LSZ28	NA	162	142	21,865	Intermittent pumping for warm makeup water.
ST012-LSZ29	NA	>170		17	Eliminated as an extraction well by FVM#7
ST012-LSZ37	NA	132	90	6,706,323	Extraction stopped to avoid pulling sulfate from BioTrap locations
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	3.8	140	137	1,016,691	
ST012-UWBZ28/LSZ51	NA	146	128	2,536,868	Extraction stopped (Aug 2019), changed to injection end of subphase 2
W36	NA	81	81	386,615	Only used for make up water for sulfate mixing
LSZ Subtotal*				23,886,837	
Total of Wells	60.0			40,934,023	
Treatment System	55.4			32,903,349	

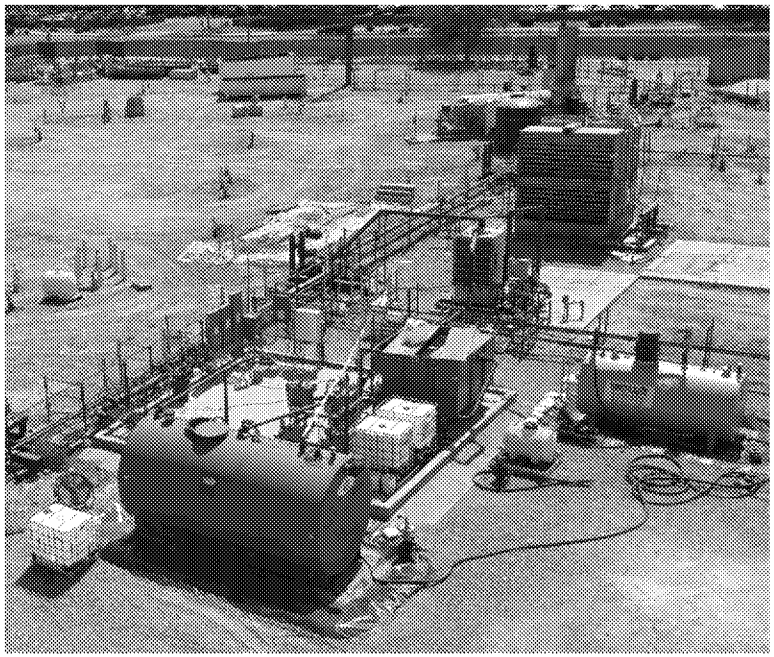
Data is preliminary

* Includes 1/2 of ST012-UWBZ28/LSZ51

Site ST012 Extraction System Performance

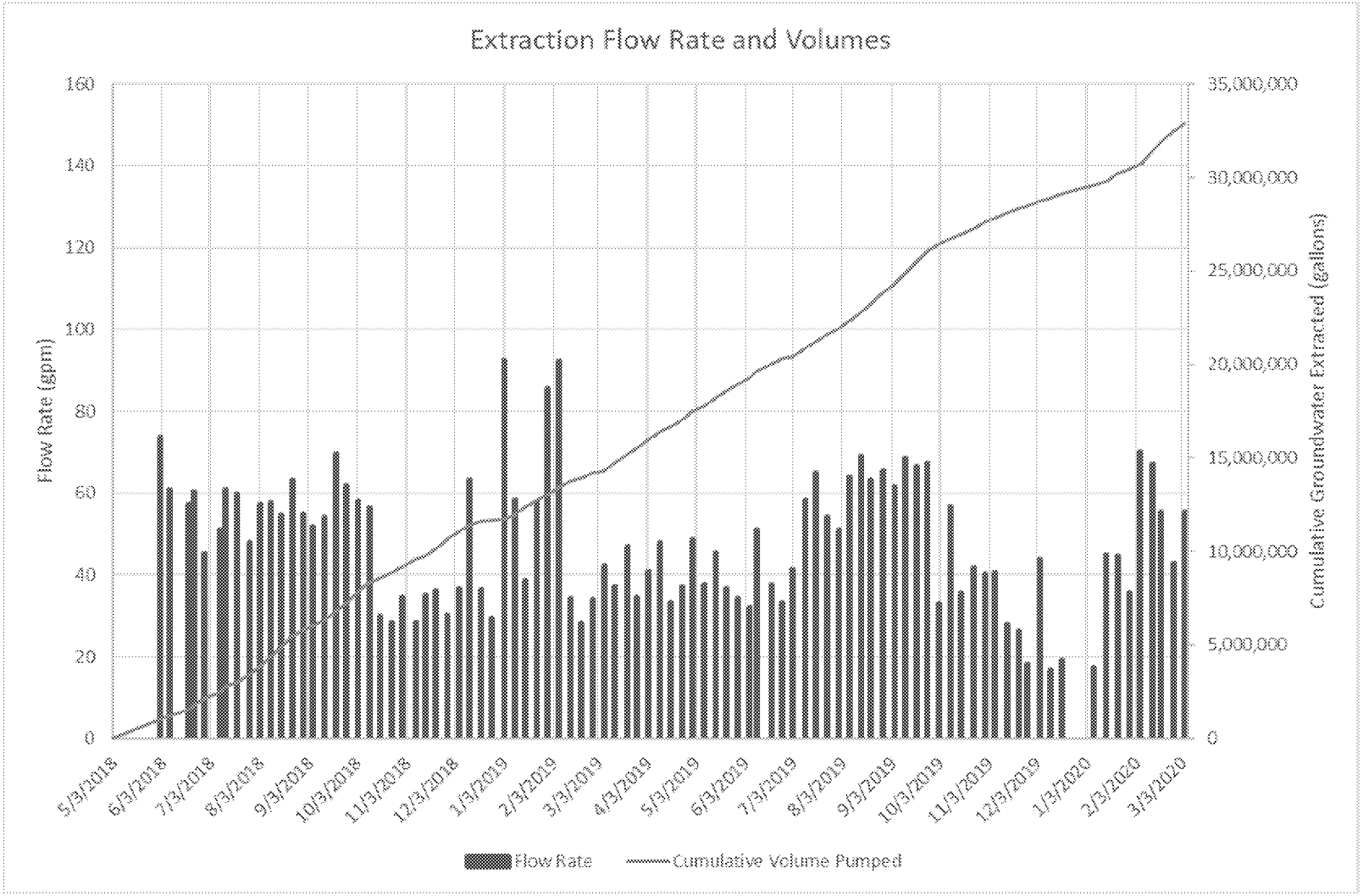
- No LNAPL has been recovered since extraction started up
- Extraction pumps UWBZ21 and UWBZ22 pumping intermittently
- CZ18, UWBZ26, UWBZ27, LSZ09, LSZ23, LSZ37, LSZ38, and LSZ39 turned off due to sulfate presence and SIP testing
- Benzene air stripper influent at 480 µg/L for February sample (March not yet available)





Site ST012 Extraction System Performance

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



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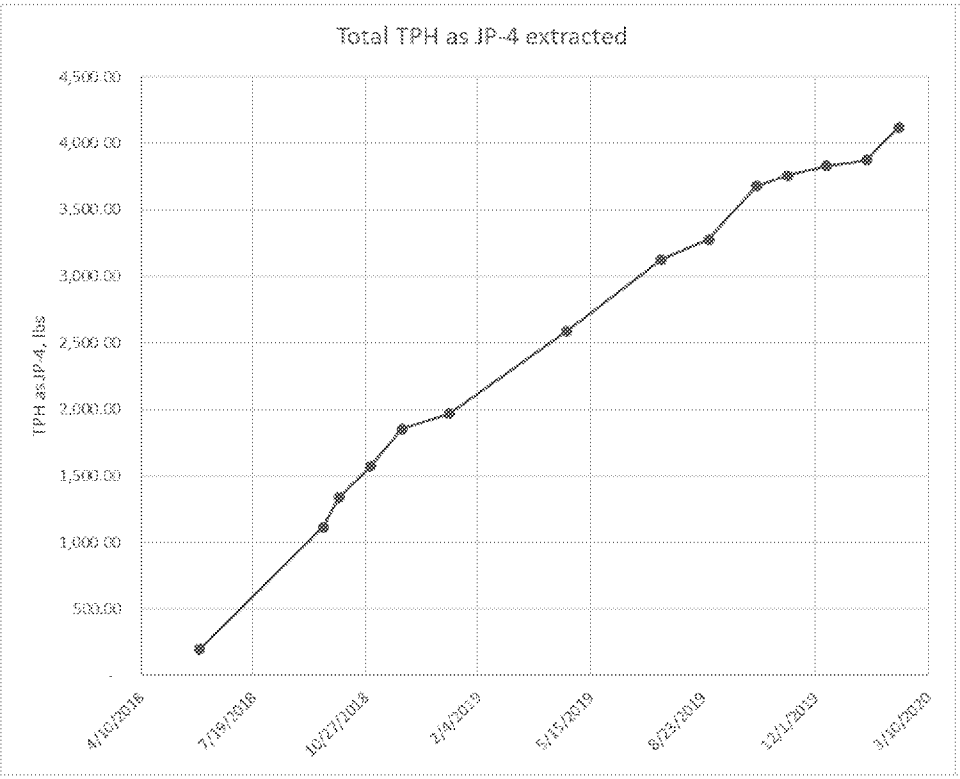
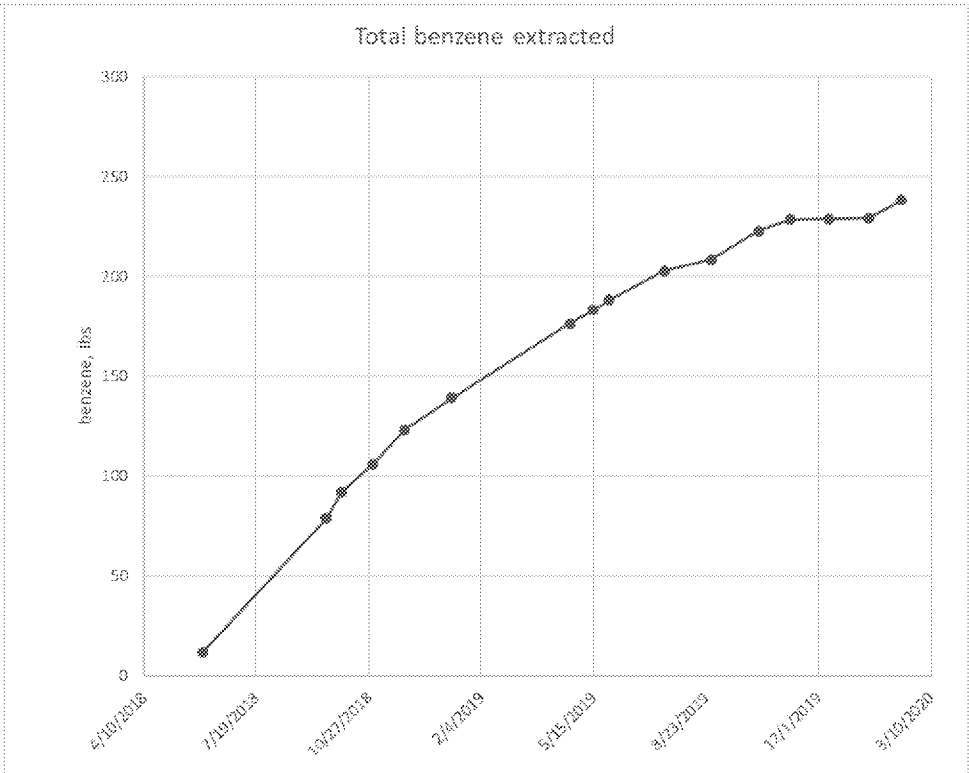
Site ST012 Extraction System Performance

- **Estimated Mass Removal by Extraction**





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Site ST012 Injection Progress

- Subphase 4 injections continued in March
- ~544 tons injected through 9 Mar 2020
- 44.7 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)
2/19/2020	8,000	4	113	76	UWBZ23 (4.1 tons)
2/20/2020	8,000	4	113	76	UWBZ35 (2.3 tons) LSZ49 (2.3 tons)
2/21/2020	8,000	4	113	76	LSZ49 (4.0)
2/24/2020	8,000	4	113	76	UWBZ23 (1.2 tons) LSZ49 (2.3 tons) W11 (0.5 tons)
2/25/2020	8,000	4	113	76	LSZ49 (2.6 tons) W11 (1.0 tons)
2/26/2020	8,000	4	113	76	LSZ49 (0.9 tons) W11 (2.8 tons)
2/27/2020	6,000	3	113	76	W37 (3.0 tons)
2/28/2020	6,000	3	113	76	W11 (0.8 tons) W45 (2.3 tons)
3/2/2020	6,000	3	113	76	W11 (2.7 tons)
3/4/2020	6,000	3	113	76	W11 (0.2 tons) LSZ50 (2.7 tons)
3/5/2020	8,000	4	113	76	W11 (1.2 tons) LSZ50 (2.1 tons) LSZ45 (0.7 tons)
3/6/2020	8,000	4	113	76	W11 (2.6 tons) LSZ50 (1.2 tons)
3/9/2020	2,000	1	113	76	W11 (1.2 tons)

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
10/22/2019	80	70	60	70	60	50	50	60	90	70	80	---	---	90	---
10/29/2019	90	80	80	100	100	110	80	70	80	100	120	---	90	80	0
11/5/2019	90	---	---	---	---	---	100	---	60	70	---	---	100	---	0
11/12/2019	---	---	---	---	---	---	--	80	---	100	110	---	---	130	---
11/20/2019	120	140	20	240	0	210	650	3000	380	OFF	100	---	20	0	700
11/26/2019	140	---	---	---	---	---	30	---	10	Off	---	---	Off	---	450
12/3/2019	---	---	---	---	---	---	--	100	---	off	130	---	---	10	---
12/10/2019	120	---	---	---	---	---	140	---	110	off	---	---	40	---	100
12/17/2019	---	---	---	---	---	---	--	100	140	off	140	---	---	40	---
1/8/2020	130	---	---	---	---	---	145	---	140	off	---	140	50	---	100
1/14/2020	---	---	---	---	---	---	--	130	---	off	20	---	---	Error00	---
1/21/2020	340	---	---	---	---	---	20	---	80	off	---	180	100	---	80
1/27/2020	---	---	---	---	---	---	--	120	---	off	50	---	---	100	---
2/4/2020	400	---	---	---	---	---	90	---	120	off	---	210	140	---	80
2/11/2020	---	---	---	---	---	---	--	100	---	Off	70	---	---	60	---
2/18/2020	300	---	---	---	---	---	80	---	100	off	---	100	100	---	1350
2/25/2020	---	---	---	---	---	---	--	60	---	off	130	50	---	30	---
3/2/2020	300	---	---	---	---	---	70	---	80	off	---	60	80	---	1200

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 Sulfate Field Screening

Date	Sulfate Concentration (mg/L)																			
	UWBZ26	UWBZ27	UWBZ28/ LSZ51	UWBZ30	LSZ09	LSZ10	LSZ11	LSZ12	LSZ15	LSZ19	LSZ23	LSZ35	LSZ37	LSZ38	LSZ39	LSZ40	LSZ43	LSZ44	LSZ47	W30
10/22/2019	70	130	---	90	90	120	100	---	100	120	80	---	80	140	---	90	90	70	0	100
10/29/2019	100	100	off	100	70	80	90	90	70	90	70	100	80	90	100	80	90	80	0	100
11/5/2019	110	---	off	70	90	90	---	70	---	---	90	---	230	60	80	60	---	---	---	---
11/12/2019	100	90	---	80	90	100		---	---	---	90	---	150	70	---	70	---	---	0	100
11/20/2019	600	480	OFF	OFF	790	470	120	2000	630	300	720	4000	400	2000	900	230	OFF	540	0	300
11/26/2019	500	---	off	off	650	350	---	600	---	---	off	---	530	460	---	90	---	---	---	100
12/3/2019	ERROR	350	---	off	320	370	360	---	---	---	130	---	60	1060	---	200	---	---	0	-
12/10/2019	off	---	off	off	700	350	---	470	---	---	off	---	100	800	460	570	---	---	---	
12/17/2019	off	300	---	off	310	370	200	---	---	---	off	---	120	750	---	550	---	---	0	130
1/8/2020	off	---	off	off	300	410	---	350	---	---	off	---	100	770	450	520	---	---	---	160
1/14/2020	off	40	---	off	80	330	370	---	---	---	off	---	20	450	---	124	---	---	0	
1/21/2020	off	---	off	off	30	340	---	460	---	---	z	---	70	320	230	680	---	---	---	---
1/27/2020	off	40	---	260	4000	310	3530	---	---	---	off	---	---	210	---	660	---	---	500	200
2/4/2020	off	---	off	---	400	300	---	360	---	---	off	---	420	370	200	150	---	---	---	---
2/11/2020	injecting	50	---	400	30	40	420	0	---	---	off	---	---	300	---	680	---	---	0	180
2/18/2020	off	---	off	----	50	80	---	220	---	---	off	---	430	240	160	500	---	---	---	---
2/25/2020	BioTrap	100	---	440	40	240	440	---	---	---	off	---	---	Bio Trap	---	700	---	---	0	80
3/2/2020	off	---	off	---	40	250	---	200	---	---	off	---	400	Bio Trap	120	600	---	---	---	---

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

- Restart SVE and sample select wells at restart
- Continue pump repairs
  - Repair motor in CZ23
  - Remove pump in CZ21 to facilitate sampling (pumping in CZ21 previously stopped)
- Pilot Study Implementation
  - Complete subphase 4 injections (one well remaining)
  - After five (March 30) and eight weeks (April 20) collect one set of BioTraps® at each well for SIP and QuantArray Petro analysis
  - Preparation of Pilot Study Implementation Report
  - Continue with sulfate screening and quarterly sampling

Air Force Civil Engineer Center

2020 BCT MEETINGS/CONFERENCE CALLS SCHEDULE DELIVERABLE TRACKING

BCT Conference Call

19 March 2020

BCT GENERAL UPDATE AND ACTION ITEMS

BCT Conference Call
19 March 2020