February 20, 2023

Stephen H. Lee, Director
Louisiana Department of Natural Resources
Injection and Mining Division
617 N. 3rd Street
Baton Rouge, Louisiana 70802

Re: Response to 1st Supplement to Compliance Order No. IMD 2022-027
Eagle US 2, LLC – Well 6X (SN 57788) & Well 7B (SN 67270)

Dear Mr. Lee,

This response letter is submitted on behalf of Eagle US 2, LLC ("Westlake") who received the 1st Supplement to Compliance Order No. IMD 2022-027 on January 19, 2023. The order listed certain findings of fact, and orders requiring a response by February 20, 2023.

Orders:

1. Eagle is ordered as soon as possible but not later than thirty (30) days to submit the following work plans:
    a. A plan to investigate any impacts to the Underground Source of Drinking Water ("USDW") and surrounding surface waters,
    b. Safety and emergency response plans including but not limited to incident procedures for timely verbal and written notification to all adjacent and potentially impacted landowners, dome operators, and applicable local, state and federal agencies,
    c. A plan to conduct a geomechanical analysis of the salt dome,
    d. A plan to generate a failure analysis report in the event of cavern destabilization,
    e. A plan to acquire, process, and evaluate 3-D seismic data covering the area of investigation, and
    f. A plan to install micro seismic monitoring in and about the area of investigation including an early detection and advance warning notification system.
2. Eagle is ordered as soon as possible but not later than thirty (30) days to update the existing subsidence monitoring plan to incorporate enhanced measures to monitor historical and current subsidence trends on the dome.
3. Eagle is ordered as soon as possible but within seven (7) days to collect samples at all observed oil, gas, or brine expressions at the surface. Eagle must expeditiously perform constituent sample analyses on all collected samples.
4. Eagle is ordered as soon as possible but within seven (7) days to request

access from Yellow Rock to collect oil samples from the tubing and annulus of Serial Number 110159, Fee SWD No. S-7. Eagle must perform an isotopic and constituent analysis on these samples and compare them to a similar analysis for the oil collected from PPG 007B.

5. The Commissioner of Conservation reserves the right to require further investigative and remediation actions as may be deemed necessary.
6. The Commissioner reserves the right, pursuant to La R.S. 30:1 et seq., more specifically La R.S. 30:18(A)(6), to levy additional civil penalties or other sanctions as provided by law.

Responses to Applicable Orders:

1. The following plans have been developed:
    a. See *Attachment A* for a plan to investigate any impacts to the USDW and surrounding surface waters.
    b. See *Attachment B* for the Westlake emergency response plan, which was also previously submitted to the LDNR on January 25, 2023.
    c. See *Attachment C* for a plan to conduct a geomechanical analysis of the salt dome.
    d. See *Attachment D* for a plan to develop a failure analysis report.
    e. See *Attachment E* for a plan to acquire, process, and evaluate 3-D seismic.
    f. See *Attachment F* for plan to install micro seismic monitoring.
2. See *Attachment G* for the updated subsidence monitoring plan including enhanced monitoring measures.
3. Within the 7-day deadline, Westlake collected samples of all observed oil, gas, and brine expressions at surface. Since that time, additional samples have been taken as well. Details about the sampling are presented in *Attachment A*.
4. Within the 7-day deadline, Westlake collected samples from the tubing and annulus of Yellowrock operated well Fee SWD No. S-7 (Serial No. 110159). Details about the sampling are presented in *Attachment A*.

If there are any questions, please contact Josh Bradley (Westlake US 2, LLC) or Coleman Hale (Lonquist & Co., LLC).

Sincerely,

R. Coleman Hale
Vice President
Lonquist & Co., LLC

ATTACHMENT A

Environmental Resources Management
Plan for USDW/Surface Water Impacts & Monitoring

ERM

840 West Sam Houston Pkwy N
Suite 600
Houston, Texas
77024-4613

Telephone: +1 281 600 1000
Fax: +1 281 520 4625

www.erm.com

Via Email

20 February 2023

Mr. Stephen H. Lee, PG, Esq.
Director, Injection and Mining Division
Office of Conservation
Louisiana Department of Natural Resources
617 North Third Street, LaSalle Building
Baton Rouge, Louisiana 70802

Reference: 0677804

Subject: Groundwater and Surface Water Investigation Work Plan
First Supplement to Compliance Order No. IMD 2022-027
Westlake US 2, LLC
Sulphur Dome
Calcasieu Parish, Louisiana

Dear Mr. Lee:

Environmental Resources Management (ERM), on behalf of Westlake US 2, LLC (Westlake), is pleased to provide this Work Plan in response to the January 19, 2023 Louisiana Department of Natural Resources (LDNR) Office of Conservation's First Supplement to Compliance Order No. IMD 2022-027. This Work Plan addresses the plans to investigate any potential impacts to the Underground Source of Drinking water (USDW) in the vicinity of the Sulphur salt dome, as well as any potential impacts to surrounding surface waters.

1. SITE SETTING

The Sulphur salt dome is located approximately 2 miles northwest of the city of Sulphur Louisiana (Figure 1). Economic production of minerals (sulfur, oil and gas, and brine) from within and surrounding the salt dome has been occurring since the early 1900s and continues to the present. The salt dome cap rock is encountered between approximately 600 to 1,000 feet below ground surface (bgs) (Figure 2), with the salt encountered at approximately 1,500 feet bgs (Figure 3). Current brine production is occurring within salt caverns at depths generally greater than 2,000 feet bgs (Figure 4).

The Chicot Aquifer underlies the site and surrounding area and is used for industrial, irrigation, domestic, and municipal purposes. Numerous water wells are present in the vicinity of the salt dome (Figure 5). Water supply for brine production is from the 500-foot sand of the Chicot Aquifer. The deepest active water well within a 2-mile radius of the salt dome is well ID 019-582, operated by Westlake for brine production, which is installed to a depth of 609 feet. The city of Sulphur utilizes as many as seven water wells for public supply, all of which are screened in the 500-foot sand of the Chicot Aquifer and located approximately 2.5 miles to the southeast of the Sulphur salt dome.

The majority of the salt dome lies within LDEQ surface water drainage basin subsegment 031001, Bayou Choupique from headwater to Intercoastal Waterway (Figure 6). The eastern portion of the dome lies with subsegment 030901, Bayou d'Inde from headwater to Calcasieu River. Due to the estuarine environment of these subsegments, there are no surface water numerical criteria for chloride, sulfate, or total dissolved solids (TDS) within these subsegments.

2. WORK PLAN

This plan addresses Requirement 1.a.of the Supplement to the Order, which requires Westlake to submit "*a plan to investigate any impacts to the Underground Source of Drinking Water ("USDW") and surrounding surface waters*".

2.1 USDW Evaluation

A preliminary evaluation of the USDW was conducted using data publicly available on the LDNR's SONRIS database. Based on this preliminary evaluation, the USDW is shallower directly over the salt dome and deepens with distance from the dome. Understanding the depth to the top of the USDW and the groundwater uses in the vicinity of the dome is critical to identifying and evaluating potential groundwater impacts. ERM has developed a plan to evaluate and better define the depth to the top of the USDW directly over the dome and outside the footprint of the dome and to assess if hypothetical events at the dome could affect groundwater quality within the aquifer.

2.2 Water Well Sampling

ERM proposes to utilize active water wells within the vicinity of the salt dome to monitor groundwater quality (Figure 7). Westlake currently utilizes four water wells southwest of the salt dome, with a fifth well installed but not currently operational. Photographs of the Westlake water wells are provided in Attachment 1. There are also four deep observation wells, installed and owned by Boardwalk Pipelines (Boardwalk), on the southeastern flank of the dome. The active water wells and observation wells are well-positioned to monitor the groundwater between the salt dome and other wells/groundwater users to the southwest and southeast. Samples were collected from the four Westlake water wells on January 26, 2023; data from that sampling event are summarized on Table 1. The results from this initial sampling event will serve as a baseline dataset for subsequent monitoring. For reference, the results of a brine sample collected from Brine Well 6X on January 25, 2023, are also included on Table 1. Final laboratory reports received to date are provided in Attachment 2.

Requests have been made to Boardwalk for access to the four deep observation wells. Once access has been granted, ERM will inspect/evaluate each well to determine the viability of using these wells for monitoring and/or sampling. The condition of these wells is unknown; however, discussions with personnel involved in the installation of these wells indicates they were not installed or constructed using materials and procedures typically used in the installation of environmental monitoring wells. The wells were constructed of oilfield well casing and were not completed with typical slotted well screens. Instead, wells were perforated at variable target intervals. We have not been able to determine in the wells were developed; therefore, drilling residuals could still be present. Once access to the wells is granted, ERM will perform modified slug tests to determine that the wells exhibit a good hydraulic connection with the portion of the Chicot Aquifer in which they were perforated. If the slug test results demonstrate a good hydraulic connection with the Chicot Aquifer, an attempt will be made to develop the wells by purging. Water

level elevation data from these wells may provide valuable information regarding the capture zone from pumping of the Westlake water wells. Samples may be collected from the Boardwalk observation wells with the understanding that they were not installed or intended to be used as environmental sampling points.

Quarterly sampling of the five Westlake wells is proposed for 2023, followed by semi-annual sampling for two additional years. The Boardwalk wells may be sampled, if access can be obtained and it is determined that samples representative of the Chicot Aquifer can be collected. Samples will be analyzed by a Louisiana accredited environmental laboratory for analysis of the following parameters:

- Metals (As, Ba, Cd, Ca, Cr, Fe, Pb, Mg, Mn, Hg, K, Se, Ag, Na, Sr, Zn),
- Chloride, Bromide,
- Bicarbonate, Carbonate
- Sulfate, Sulfide, Hydrogen Sulfide,
- Total Dissolved Solids (TDS),
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), and
- Total Petroleum Hydrocarbon (TPH) fractions

Samples will also be collected for dissolved gases and submitted to Isotech, a Stratum Reservoir company, for isotopic evaluation.

2.3 Water Well Survey

ERM proposes to conduct a water well survey within a one-mile radius of the salt dome. It is important to identify users of groundwater nearest to the dome. The water well survey will consist of a letter survey mailed to property owners, followed by a visual inspection and face-to-face follow-up visit, as necessary. Owners of any unregistered water wells identified will be asked to register the wells with LDNR.

2.4 Capture Zone Analysis

The four active Westlake water wells are pumping a total of approximately 2,000 gallons per minute (gpm) from the 500-foot sand of the Chicot Aquifer (i.e., approximately 2.9 million gallons per day) for brine production. This large-scale pumping is likely inducing a hydraulic gradient causing groundwater to flow toward the wells. However, the extent of the influence of pumping in the vicinity of the salt dome and the influence of pumping occurring by other operators is unknown. ERM proposes to evaluate the capture zone of the wells in the vicinity of the salt dome to better understand the potential migration pathways in the event that site-related constituents were to be detected within the usable portions of the Chicot Aquifer. The capture zone will be evaluated using MODFLOW, MODPATH, and MT3DMS, which are industry standard software packages for evaluating groundwater flow and transport.

2.5 Surface Water Sampling

The surface water in the vicinity of the salt dome is generally isolated with little or no connection to other surface waters within the drainage basin (Figure 8). “Bubble sites” have been observed in and around the well pads, and within a pond centrally located above the salt dome (“the central pond”). The waters where bubbles have been observed are isolated and do not have any connection to surrounding water bodies. The majority of the surface water bodies are shallow. The central pond was measured at <1 inch at the Central Pond sample location and approximately 6 feet deep, following a heavy rainstorm, at CP BS 3. Photographs of the surface water sampling areas are provided in Attachment 1. Final laboratory reports received to date are provided in Attachment 2.

Samples from seven bubble sites have been collected, and the data (if final laboratory reports have been received) are summarized on Table 2. One location adjacent to the PPG 22 Brine Well exhibited visible sheen and oil accumulation at the bubble site. A berm has been built around that location to isolate it from the central pond and from the other surface water bodies. Samples from two other bubble site locations (Brine Well 7A BS, and 110159 BS) were collected from standing water within a well pad as a result of recent rain events.

ERM proposes to sample the bubble site locations quarterly for the first year or until the bubbles are no longer observed. Samples will also be collected as soon as possible if new bubble sites are identified. Three additional samples will be collected from the central pond (Figure 9) quarterly for the first year, then semi-annually for one additional year. Samples will be submitted to a Louisiana accredited environmental laboratory for analysis of the following parameters:

- Metals (As, Ba, Cd, Ca, Cr, Fe, Pb, Mg, Mn, Hg, K, Se, Ag, Na, Sr, Zn),
- Chloride, Bromide,
- Bicarbonate, Carbonate
- Sulfate, Sulfide, Hydrogen Sulfide,
- Total Dissolved Solids (TDS),
- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX), and
- Total Petroleum Hydrocarbon (TPH) fractions

At active bubbles sites, samples will also be collected for dissolved gases and sent to Isotech, a Stratum Reservoir company, for isotopic evaluation.

2.6 Surface Water Profile

ERM proposes to complete surface water profiling within the central pond. The profiling will consist of taking measurements of pH, Specific Conductivity (SC), Oxidation Reduction Potential (ORP), and temperature within the water column. Measurements will be made using a handheld meter while water is pumped at 1-foot depth intervals. The profiling will occur quarterly for the first year, and then semi-annually for one additional year.

3. REPONSES TO ADDITIONAL ORDER REQUIREMENTS

Westlake has also responded to additional requirements contained in the First Supplement to Compliance Order IMD 2022-027 not specifically included in this Work Plan.

Order 3 – Eagle is ordered as soon as possible but within seven (7) days to collect samples at all observed oil, gas, or brine expressions at the surface. Eagle must expeditiously perform constituent sample analyses on all collected samples.

Samples have been collected from all observed bubble sites and sheen within 7 days of the initial observation. Additional samples will be collected within 7 days if new surface expressions are identified. No brine surface expressions have been observed.

Order 4 – Eagle is ordered as soon as possible but within (7) days to request access from Yellow Rock to collect oil samples from the tubing and tubing annulus of Serial Number 110159, Fee SWD No. S-7. Eagle must perform an isotopic and constituent analysis on these samples to compare them to a similar analysis for the oil collected from PPG 007B.

ERM obtained a sample of tubing oil from well Serial Number 110159 on January 26, 2023. The sample was sent to NewFields in Rockland, Massachusetts for environmental forensic analysis. An attempt was made to collect any other liquids from the well, but no other liquids were produced. Oil samples were also collected from the Westlake oil storage stock tank and the 7B cavern (via transfer pump and Brine Well 20). These oil samples, along with the sheen collected at the Brine Well 22 bubble site, were submitted to NewFields for environmental forensic analysis.

4. SCHEDULE AND REPORTING

ERM has already implemented groundwater, surface water, brine and oil sampling with the assistance of Westlake personnel. The proposed schedule of sampling and reporting described herein is as follows:

4.1 Groundwater

- Sample Westlake production water wells – April, July, October 2023, January and July 2024 and 2025
- Sample deep observation wells – 7 days following approval from Boardwalk, then sampled quarterly with the water wells

Following each quarterly event, ERM will provide a brief summary report to LDNR including a discussion of observations, data trends, laboratory reports, and recommendations, as necessary.

Within 60-days of LDNR approval of this work plan, ERM will prepare a detailed evaluation of the USDW, water wells users in the vicinity of the dome, and capture zone analysis. A review of the sampling activities, data evaluations, findings, and recommendations will also be included.

4.2 Surface water

- Surface water sampling – April, July, October 2023, January and July 2024
- Surface water profiling – April, July, October 2023, January and July 2024

The results of the sampling event will be provided within 30-day of receipt of the final analytical data reports.

Following each quarterly event, ERM will provide a brief summary report to LDNR including a discussion of observations, data trends, laboratory reports, and recommendations, as necessary.

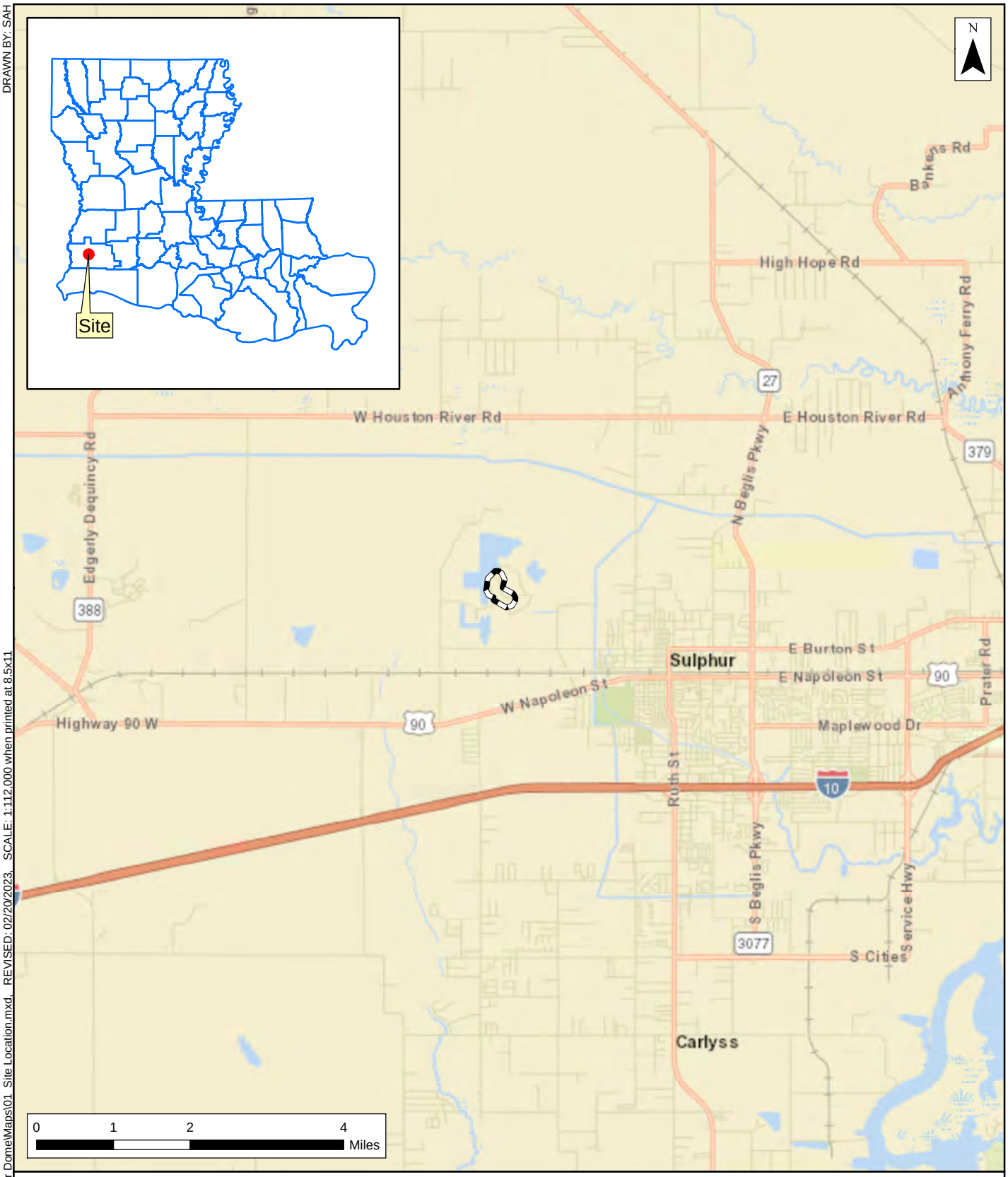
Should you have any questions or wish to discuss our proposed plan, please contact us.

Sincerely,

Scott A. Himes, P.G.
Senior Consultant, Hydrogeology

David C. Upthegrove, P.G.
Partner

FIGURES



Legend

Westlake Property

Figure 1
Site Location
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
World Street Map via ArcGIS online.

Environmental Resources Management
www.erm.com

Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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REVISED: 02/20/2023

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Westlake Property

Figure 2
Cap Rock Contours
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
200-ft contour interval.
2021 Aerial imagery via USGS Earth Explorer (NAIP).

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Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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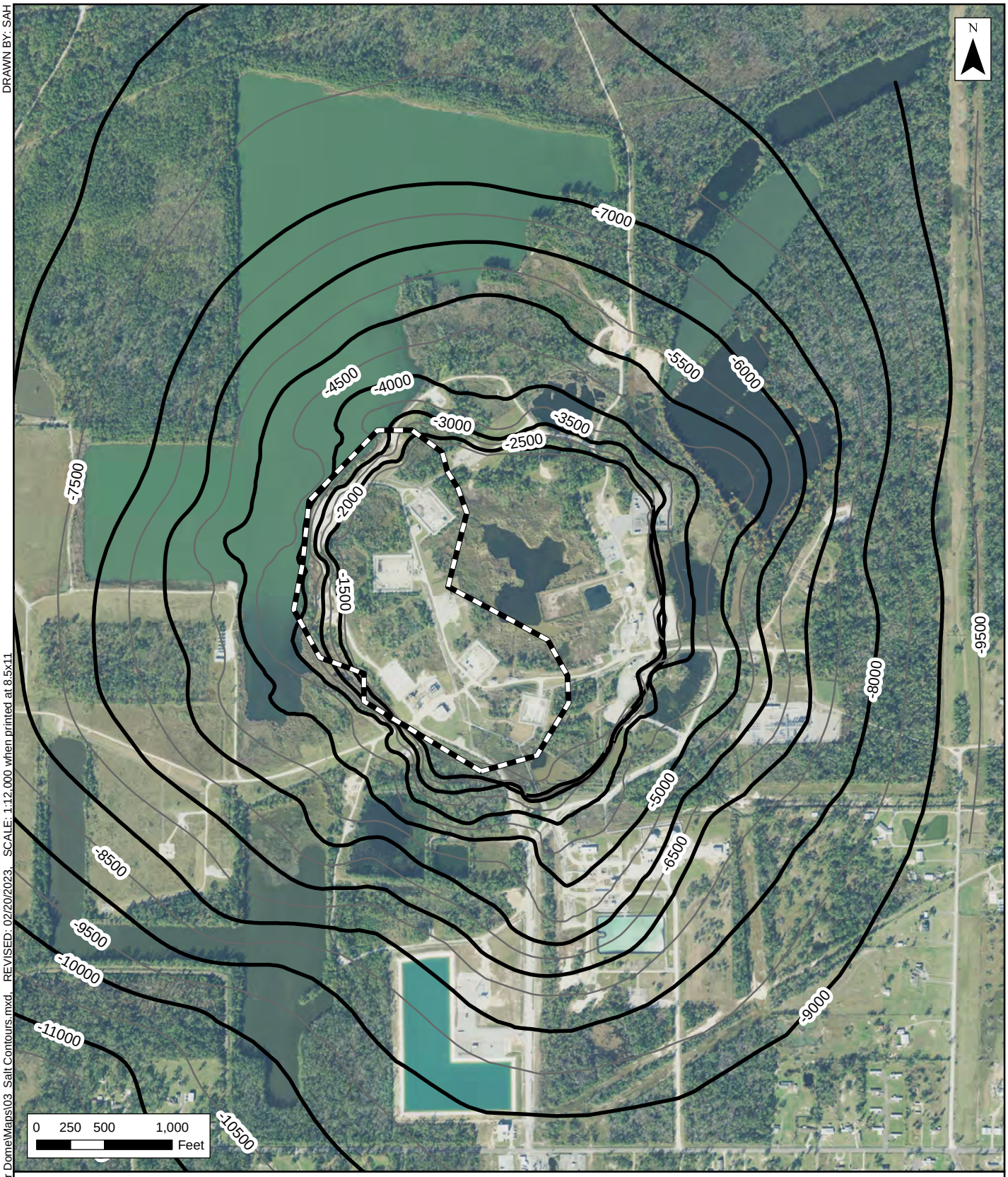

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Westlake Property

Figure 3
Salt Contours
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
500-ft contour interval.
2021 Aerial imagery via USGS Earth Explorer (NAIP).

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Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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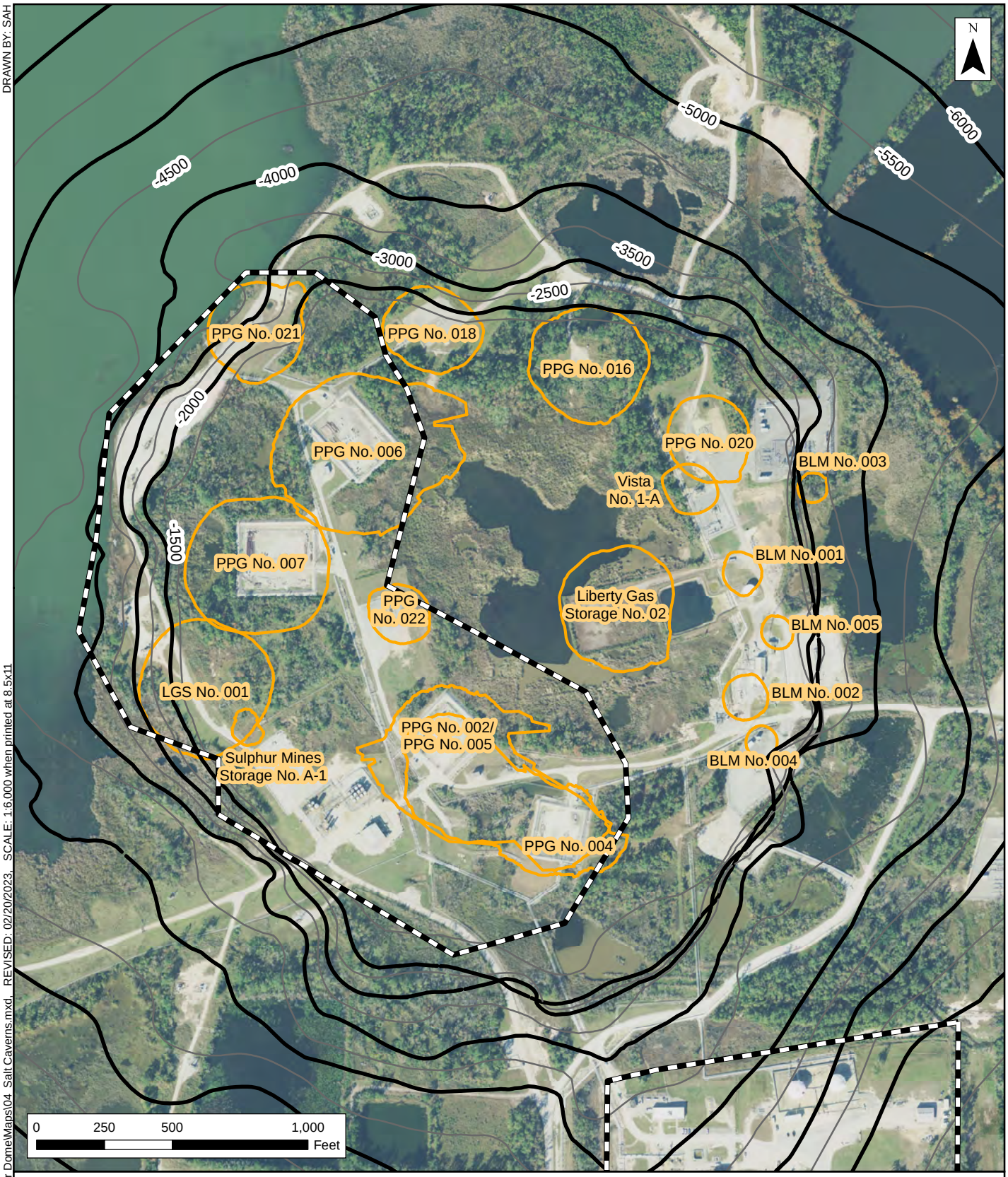

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- Cavern Extent Outline (2-18-2020)
- Westlake Property

Figure 4
Salt Caverns
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
500-ft salt contour interval.
2021 Aerial imagery via USGS Earth Explorer (NAIP).

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Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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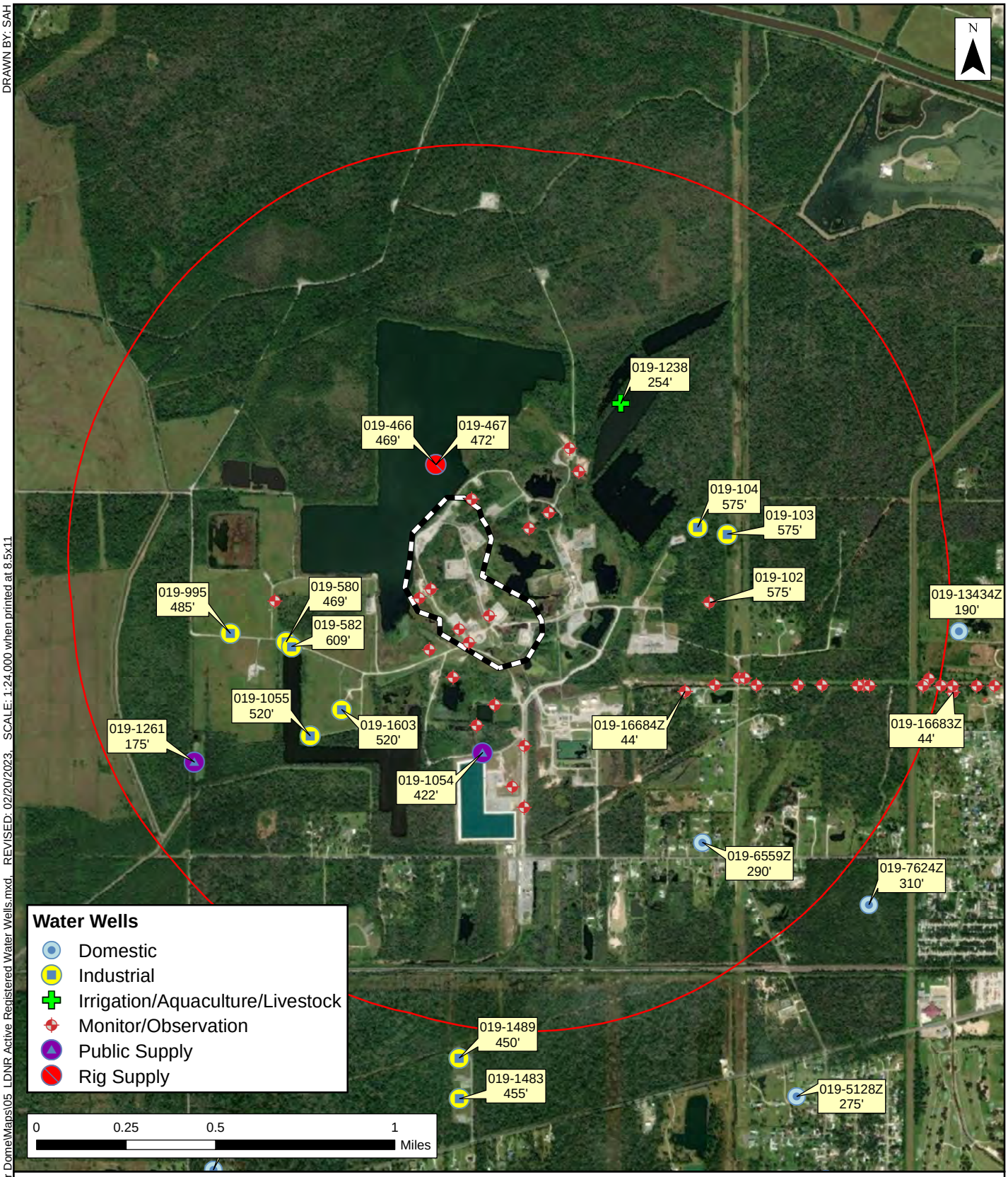

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Salt Dome 1-mile Radius

Westlake Property

Figure 5

LDNR Active Registered Water Wells (1-mile radius)

Sulphur Dome

Westlake US 2, LLC

Calcasieu Parish, Lousiana

Notes:
Only active wells shown.
Shallow Monitoring wells (<30') not labeled.
2021 Aerial imagery via USGS Earth Explorer (NAIP).

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Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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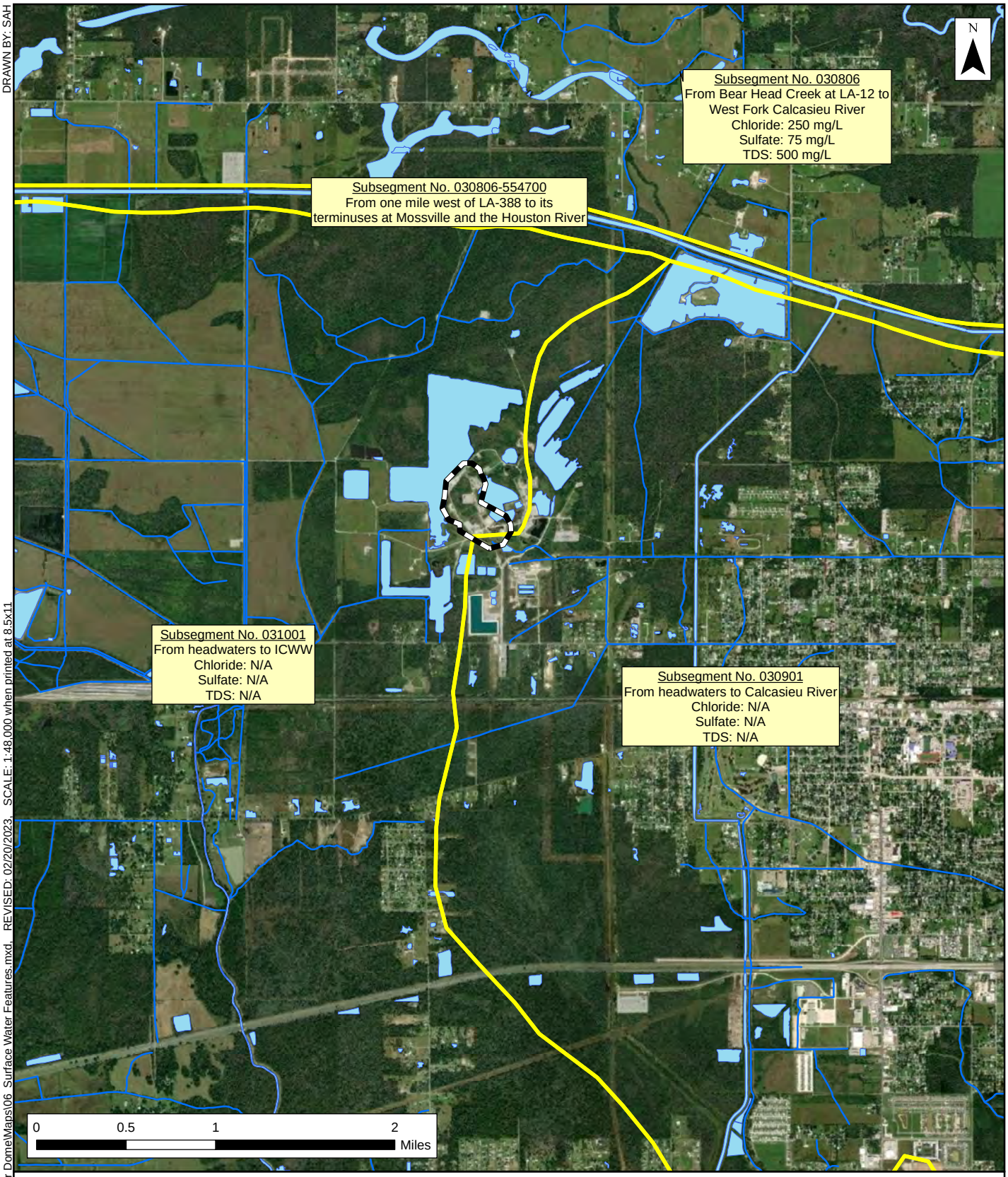

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Legend

- Westlake Property
- Major Water Body
- Minor Waterbody

Figure 6
Surface Water Features
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
Surface water features via NHD.
World Street Map via ArcGIS online.

Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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- Active Water Well
- Non-Operational Water Well
- Boardwalk Observation Well
- Westlake Property

Figure 7
Known Active Water Well Locations
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
2021 Aerial imagery via USGS Earth Explorer (NAIP).

Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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- Surface Water Sample Location
- Bubble Site Water Sample Location
- Sheen Sample Location
- Westlake Property
- Major Water Body
- Minor Waterbody

Figure 8
Surface Water Sampling Locations
Sulphur Dome
Westlake US 2, LLC
Calcasieu Parish, Lousiana

Notes:
Surface water features via NHD.
World Street Map via ArcGIS online.

Source: ESRI - ArcGIS Online; NAD 1983 UTM Zone 15N

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TABLES

TABLE 1
Groundwater Data Summary
Sulphur Dome
Calcasieu Parish, Louisiana

Sample ID	019-580	019-582	019-995	019-1055	6X Brine
Sample Date	1/26/23	1/26/23	1/26/23	1/26/23	1/25/23
Sample Interval (ft)	469'	609'	485'	520'	Brine
Sampler	ERM	ERM	ERM	ERM	ERM
Constituent Zone	**Groundwater**				**Brine**
Total Metals (mg/L)					
Arsenic	0.000477 J	0.000812 J	0.000762 J	0.000419 J	0.0300 J
Barium	**0.23**	**0.239**	**0.214**	**0.265**	**0.220**
Cadmium	<0.0002	<0.0002	<0.0002	<0.0002	<0.01
Calcium	**26.8**	**25.5**	**26.4**	**28.7**	**722**
Chromium	<0.0004	<0.0004	<0.0004	<0.0004	**0.243**
Iron	**5.12**	**4.03**	**0.821**	**3.81**	**25.7**
Lead	0.00144 J	<0.0006	<0.0006	<0.0006	<0.03
Magnesium	**8.03**	**7.81**	**8.02**	**8.66**	8.16 J
Manganese	**0.412**	**0.417**	**0.388**	**0.42**	**0.953**
Mercury	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003
Potassium	**2.93**	**2.94**	**3.00**	**3.10**	**14.4**
Selenium	<0.0011	<0.0011	<0.0011	0.00114 J	<0.0550
Silver	<0.0002	<0.0002	<0.0002	<0.0002	<0.01
Sodium	**31.9**	**28.0**	**29.9**	**34.4**	**100,000**
Strontium	**0.246**	**0.240**	**0.241**	**0.262**	**2.66**
Zinc	**0.0147**	**0.0107**	**0.00426**	**0.00993**	**0.481**
Anions/Water Quality Parameters					
Bicarbonate Alkalinity (mg/L CaCO3)	**200**	**180**	**258**	**250**	**159**
Bromide	0.0992 J	0.0860 J	0.0931 J	0.0982 J	<3
Carbonate Alkalinity (mg/L CaCO3)	<5	<5	<5	<5	<5
Chloride	**35.7**	**23.4**	**28.7**	**38.3**	**213,000**
Sulfate	**2.91**	**4.11**	**3.63**	**3.51**	**1,380**
Total Dissolved Solids (TDS)	**236**	**212**	**226**	**244**	**239,000**
Sulfides					
Hydrogen Sulfide	<0.5	<0.5	<0.5	<0.5	<0.5
Sulfide	<1	<1	<1	<1	<1
Volatile Organic Compounds					
Benzene	<0.0002	<0.0002	<0.0002	<0.0002	**0.170**
Ethylbenzene	<0.0003	<0.0003	<0.0003	<0.0003	0.0075 J
Toluene	<0.0002	<0.0002	<0.0002	<0.0002	**0.110**
m,p-Xylene	<0.0005	<0.0005	<0.0005	<0.0005	0.013 J
o-Xylene	<0.0003	<0.0003	<0.0003	<0.0003	0.0091 J
Xylenes, Total	<0.0003	<0.0003	<0.0003	<0.0003	**0.022**
TPH Fractions					
Aliphatics >C6-C8	<0.01	<0.01	<0.01	<0.01	**0.0997**
Aliphatics >C8-C10	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	<0.001	<0.001	<0.001	<0.001	<0.001
Aliphatics >C12-C16	<0.002	<0.002	<0.002	<0.002	<0.002
Aliphatics >C16-C35	<0.008	<0.008	<0.008	<0.008	<0.008
Aromatics >C8-C10	<0.01	<0.01	<0.01	<0.01	**0.0284**
Aromatics >C10-C12	<0.001	<0.001	<0.001	<0.001	<0.001
Aromatics >C12-C16	<0.004	<0.004	<0.004	<0.004	<0.004
Aromatics >C16-C21	<0.003	<0.003	<0.003	<0.003	<0.003
Aromatics >C21-C35	<0.009	<0.009	<0.009	<0.009	<0.009

NOTES:

J - Estimated Value reported below the detection limit.
< - Not Detected at the reporting limit shown.
Bolded values detected in the sample.

TABLE 2
Surface Water Data Summary
Sulphur Dome
Calcasieu Parish, Louisiana

Sample ID	Brine Well 22 BS	Brine Well 7A BS	CP BS 1	CP BS 2	CP BS 3	110159-BS	Brine Pond 4 BS	Culvert	Central Pond
Sample Date	1/25/23	1/25/23	1/30/23	1/30/23	1/30/23	2/10/23	2/10/23	1/25/23	1/25/23
Sample Interval (ft)	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Sampler	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM
Constituent / Zone	Bubble Site (Surface Water)							Surface Water	
Total Metals (mg/L)									
Arsenic	0.00149 J	0.000767 J	0.000862 J	0.000868 J	0.000769 J	IP	IP	0.00141 J	0.00192 J
Barium	**0.300**	**0.232**	**0.160**	**0.367**	**0.155**	IP	IP	**0.0832**	**0.146**
Cadmium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	IP	IP	<0.0002	<0.0004
Calcium	**71.2**	**24.5**	**75.3**	**64.2**	**77.7**	IP	IP	**58.2**	**149**
Chromium	0.000847 J	0.000474 J	<0.0004	<0.0004	<0.0004	IP	IP	0.00101 J	0.00458 J
Iron	**1.14**	0.0406 J	0.132 J	0.0258 J	0.125 J	IP	IP	**0.207**	**2.07**
Lead	**0.00208**	<0.0006	<0.0006	<0.0006	<0.0006	IP	IP	<0.0006	<0.00120
Magnesium	**19.8**	**1.54**	**15.0**	**12.6**	**15.0**	IP	IP	**5.44**	**37.8**
Manganese	**0.797**	**0.0215**	**0.266**	**0.458**	**0.232**	IP	IP	**0.00934**	**0.847**
Mercury	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	IP	IP	<0.00003	<0.00003
Potassium	**2.57**	**1.02**	**2.90**	**2.58**	**2.83**	IP	IP	**2.86**	**3.22**
Selenium	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	IP	IP	<0.0011	<0.00220
Silver	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	IP	IP	<0.0002	<0.0004
Sodium	**156**	**8.45**	**174**	**166**	**19.1**	IP	IP	**158**	**1,080**
Strontium	**0.619**	**0.167**	**0.556**	**0.482**	**0.578**	IP	IP	**0.341**	**0.941**
Zinc	**0.00857**	**0.0466**	**0.00452**	0.00213 J	**0.00748**	IP	IP	**0.0153**	**0.0258**
Anions/Water Quality Parameters									
Bicarbonate Alkalinity (mg/L CaCO3)	**269**	**159**	**241**	**238**	**245**	IP	IP	**210**	**495**
Bromide	<0.03	<0.03	<0.03	<0.03	<0.03	IP	IP	<0.03	<0.0600
Carbonate Alkalinity (mg/L CaCO3)	<5	<5	<5	<5	<5	IP	IP	<5	<5
Chloride	**317**	**6.45**	**308**	**296**	**343**	IP	IP	**215**	**2,090**
Sulfate	**45.2**	**2.97**	**113**	**111**	**135**	IP	IP	**92.1**	**183**
Total Dissolved Solids (TDS)	**676**	**320**	**80.0**	**512**	**892**	IP	IP	**498**	**3,600**
Sulfides									
Hydrogen Sulfide	<0.5	<0.5	<0.5	<0.5	<0.5	IP	IP	<0.5	<0.5
Sulfide	<1	<1	<1	<1	<1	IP	IP	<1	<1
Volatile Organic Compounds									
Benzene	**0.00120**	0.00034 J	<0.0002	<0.0002	<0.0002	IP	IP	<0.0002	<0.0002
Ethylbenzene	<0.0003	**0.00180**	<0.0003	<0.0003	<0.0003	IP	IP	<0.0003	<0.0003
Toluene	0.00079 J	0.00055 J	<0.0002	<0.0002	<0.0002	IP	IP	<0.0002	<0.0002
m,p-Xylene	<0.0005	0.0020 J	<0.0005	<0.0005	<0.0005	IP	IP	<0.0005	<0.0005
o-Xylene	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	IP	IP	<0.0003	<0.0003
Xylenes, Total	<0.0003	**0.00200**	<0.0003	<0.0003	<0.0003	IP	IP	<0.0003	<0.0003
TPH Fractions									
Aliphatics >C6-C8	<0.01	<0.01	<0.01	<0.01	<0.01	IP	IP	<0.01	<0.01
Aliphatics >C8-C10	<0.01	<0.01	<0.01	<0.01	<0.01	IP	IP	<0.01	<0.01
Aliphatics >C10-C12	<0.001	<0.001	<0.001	<0.001	<0.001	IP	IP	<0.001	<0.001
Aliphatics >C12-C16	**0.0746**	<0.002	<0.002	<0.002	<0.002	IP	IP	<0.002	<0.002
Aliphatics >C16-C35	**0.249**	<0.008	<0.008	<0.008	<0.008	IP	IP	<0.008	<0.008
Aromatics >C8-C10	<0.01	**0.0285**	<0.01	<0.01	<0.01	IP	IP	<0.01	<0.01
Aromatics >C10-C12	<0.001	<0.001	<0.001	<0.001	<0.001	IP	IP	<0.001	<0.001
Aromatics >C12-C16	**0.0417**	<0.004	<0.004	<0.004	<0.004	IP	IP	<0.004	<0.004
Aromatics >C16-C21	**0.121**	<0.003	<0.003	<0.003	<0.003	IP	IP	<0.003	<0.003
Aromatics >C21-C35	<0.009	<0.009	<0.009	<0.009	<0.009	IP	IP	<0.009	<0.009

NOTES:

J - Estimated Value reported below the detection limit.
< - Not Detected at the reporting limit shown.
Bolded values detected in the sample.
IP - In Progress

ATTACHMENT 1: PHOTO LOG

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
1	Jan 25, 2023

Direction Photo Taken:
N74ºW (286º)

Coordinates:
30.253057ºN; 93.413276ºW

Photo ID:
2023-01-25-11-43-29.jpg

Description:
Brine Well 22 bubble site and sheen sample location

Photo Taken By:
Scott Himes

Photo No.	Date:
2	Jan 25, 2023

Direction Photo Taken:
N64ºW (296º)

Coordinates:
30.253072ºN; 93.413269ºW

Photo ID:
2023-01-25-12-01-28.jpg

Description:
Brine Well 22 bubble site and sheen sample location

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
3	Jan 25, 2023

Direction Photo Taken:
N84ºE (84º)

Coordinates:
30.253078ºN; 93.413405ºW

Photo ID:
2023-01-25-12-07-01.jpg

Description:
Brine Well 22 bubble site and sheen sample location

Photo Taken By:
Scott Himes

Photo No.	Date:
4	Jan 25, 2023

Direction Photo Taken:
N53ºW (307º)

Coordinates:
30.254842ºN; 93.414069ºW

Photo ID:
2023-01-25-13-01-37.jpg

Description:
6X Brine well

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
5	Jan 25, 2023

Direction Photo Taken:
S78ºW (258º)

Coordinates:
30.25487ºN; 93.413973ºW

Photo ID:
2023-01-25-13-32-30.jpg

Description:
6X Brine Well

Photo Taken By:
Scott Himes

Photo No.	Date:
6	Jan 25, 2023

Direction Photo Taken:
N (0º)

Coordinates:
30.253407ºN; 93.415105ºW

Photo ID:
2023-01-25-13-45-12.jpg

Description:
Brine Well 7A bubble site sample location

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
7	Jan 25, 2023

Direction Photo Taken:
N34ºW (326º)

Coordinates:
30.253404ºN; 93.415059ºW

Photo ID:
2023-01-25-13-45-37.jpg

Description:
Brine Well 7A bubble site sample location

Photo Taken By:
Scott Himes

Photo No.	Date:
8	Jan 25, 2023

Direction Photo Taken:
N78ºE (78º)

Coordinates:
30.254765ºN; 93.409999ºW

Photo ID:
2023-01-25-15-32-49.jpg

Description:
Brine Well 20

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
9	Jan 25, 2023

Direction Photo Taken:
S71ºE (109º)

Coordinates:
30.254765ºN; 93.409984ºW

Photo ID:
2023-01-25-15-33-03.jpg

Description:
Oil transfer pump – transferring oil from 7B to 20 (oil sample collection location)

Photo Taken By:
Scott Himes

Photo No.	Date:
10	Jan 25, 2023

Direction Photo Taken:
N27ºW (333º)

Coordinates:
30.253136ºN; 93.40941ºW

Photo ID:
2023-01-25-15-37-47.jpg

Description:
Stock tank oil collection location

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
11	Jan 25, 2023

Direction Photo Taken:
N29ºW (331º)

Coordinates:
30.252985ºN; 93.40927ºW

Photo ID:
2023-01-25-15-38-12.jpg

Description:
Stock tank oil storage

Photo Taken By:
Scott Himes

Photo No.	Date:
12	Jan 25, 2023

Direction Photo Taken:
N31ºW (329º)

Coordinates:
30.252983ºN; 93.409269ºW

Photo ID:
2023-01-25-15-38-25.jpg

Description:
Stock tank oil storage

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
13	Jan 25, 2023

Direction Photo Taken:
S79ºW (259º)

Coordinates:
30.25356ºN; 93.409653ºW

Photo ID:
2023-01-25-16-07-25.jpg

Description:
Culvert with central pond in background

Photo Taken By:
Scott Himes

Photo No.	Date:
14	Jan 25, 2023

Direction Photo Taken:
N87ºE (87º)

Coordinates:
30.253589ºN; 93.409876ºW

Photo ID:
2023-01-25-16-08-30.jpg

Description:
Culvert sample location with pig catcher in background

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
15	Jan 25, 2023

Direction Photo Taken:
N13ºE (13º)

Coordinates:
30.253591ºN; 93.409885ºW

Photo ID:
2023-01-25-16-08-56.jpg

Description:
Boardwalk Brine Well 1 from culvert.

Photo Taken By:
Scott Himes

Photo No.	Date:
16	Jan 25, 2023

Direction Photo Taken:
N (0º)

Coordinates:
30.253548ºN; 93.410115ºW

Photo ID:
2023-01-25-16-10-04.jpg

Description:
Central pond sample location

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
17	Jan 26, 2023

Direction Photo Taken:
N34ºE (34º)

Coordinates:
30.250147ºN; 93.413535ºW

Photo ID:
2023-01-26-07-37-51.jpg

Description:
SN 110159

Photo Taken By:
Scott Himes

Photo No.	Date:
18	Jan 26, 2023

Direction Photo Taken:
N18ºE (18º)

Coordinates:
30.246739ºN; 93.421668ºW

Photo ID:
2023-01-26-07-52-46.jpg

Description:
WW # 19 (019-1055)

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
19	Jan 26, 2023

Direction Photo Taken:
S26ºE (154º)

Coordinates:
30.250421ºN; 93.422586ºW

Photo ID:
2023-01-26-08-22-23.jpg

Description:
WW #13 (019-582)

Photo Taken By:
Scott Himes

Photo No.	Date:
20	Jan 26, 2023

Direction Photo Taken:
N76ºW (284º)

Coordinates:
30.250551ºN; 93.422766ºW

Photo ID:
2023-01-26-08-29-23.jpg

Description:
WW #11 (019-580)

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
21	Jan 26, 2023

Direction Photo Taken:
N32ºE (32º)

Coordinates:
30.250892ºN; 93.425607ºW

Photo ID:
2023-01-26-09-23-54.jpg

Description:
WW #12 (019-995)

Photo Taken By:
Scott Himes

Photo No.	Date:
22	Jan 26, 2023

Direction Photo Taken:
S6ºW (186º)

Coordinates:
30.248171ºN; 93.42008ºW

Photo ID:
2023-01-26-09-44-27.jpg

Description:
WW #40 (019-1603)

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
23	Jan 26, 2023

Direction Photo Taken:
N25ºE (25º)

Coordinates:
30.247773ºN; 93.420209ºW

Photo ID:
2023-01-26-09-45-57.jpg

Description:
WW #40 (019-1603)

Photo Taken By:
Scott Himes

Photo No.	Date:
24	Jan 26, 2023

Direction Photo Taken:
N69ºE (69º)

Coordinates:
30.247838ºN; 93.420247ºW

Photo ID:
2023-01-26-09-49-44.jpg

Description:
WW #40 (019-1603) access port.

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
25	Jan 30, 2023

Direction Photo Taken:
S75ºW (255º)

Coordinates:
30.253243ºN; 93.412588ºW

Photo ID:
2023-01-30-10-37-27.jpg

Description:
Central Pond Bubble Site 1 (CP BS 1)

Photo Taken By:
Scott Himes

Photo No.	Date:
26	Jan 30, 2023

Direction Photo Taken:
N32ºW (328º)

Coordinates:
30.25355ºN; 93.412269ºW

Photo ID:
2023-01-30-11-22-23.jpg

Description:
Central Pond Bubble Site 2 (CP BS 12)

Photo Taken By:
Scott Himes

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
27	Jan 30, 2023

Direction Photo Taken:
N59ºW (301º)

Coordinates:
30.254178ºN; 93.412639ºW

Photo ID:
2023-01-30-12-09-25.jpg

Description:
Central Pond Bubble Site 3 (CP BS 3)

Photo Taken By:
Scott Himes

Photo No.	Date:
28	Feb 10, 2023

Direction Photo Taken:
N16ºE (16º)

Coordinates:
30.250156ºN; 93.413447ºW

Photo ID:
IMG_5822.JPG

Description:
SN 110159 Bubble Site

Photo Taken By:
David Sanguinetti

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.:
Westlake US 2, LLC	Sulphur Louisiana	0677804

Photo No.	Date:
29	Feb 10, 2023

Direction Photo Taken:
N67ºE (67º)

Coordinates:
30.250139ºN; 93.413419ºW

Photo ID:
IMG_5826.JPG

Description:
SN 110159 Bubble Site

Photo Taken By:
David Sanguinetti

Photo No.	Date:
30	Feb 10, 2023

Direction Photo Taken:
S11ºW (191º)

Coordinates:
30.251336ºN; 93.411711ºW

Photo ID:
IMG_5827.JPG

Description:
Brine Pond 4 Bubble Site

Photo Taken By:
David Sanguinetti

ATTACHMENT 2: LABORATORY REPORTS

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 09, 2023

Scott Himes
Environmental Resources Mgmt.
CityCentre Four
840 W. Sam Houston Pkwy., Suite 600
Houston, TX 77024

Work Order: **HS23011349**

Laboratory Results for: **Sulphur Dome**

Dear Scott Himes,

ALS Environmental received 9 sample(s) on Jan 26, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Bernadette A. Fini
Project Manager

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Work Order: HS23011349

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23011349-01	Brine Well 22 BS	Water		25-Jan-2023 12:30	26-Jan-2023 16:13	☐
HS23011349-02	6X Brine	Water		25-Jan-2023 13:30	26-Jan-2023 16:13	☐
HS23011349-03	Brine Well 7A BS	Water		25-Jan-2023 14:10	26-Jan-2023 16:13	☐
HS23011349-04	Culvert	Water		25-Jan-2023 16:00	26-Jan-2023 16:13	☐
HS23011349-05	Central Pond	Water		25-Jan-2023 16:30	26-Jan-2023 16:13	☐
HS23011349-06	019-1055	Water		26-Jan-2023 08:00	26-Jan-2023 16:13	☐
HS23011349-07	019-582	Water		26-Jan-2023 08:30	26-Jan-2023 16:13	☐
HS23011349-08	019-580	Water		26-Jan-2023 09:10	26-Jan-2023 16:13	☐
HS23011349-09	019-995	Water		26-Jan-2023 09:45	26-Jan-2023 16:13	☐

Client: Environmental Resources Mgmt. **CASE NARRATIVE**
Project: Sulphur Dome
Work Order: HS23011349

GC Semivolatiles by Method MA EPH

Batch ID: 189091

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GC Volatiles by Method MA VPH

Batch ID: R427008,R427011

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R426800

Sample ID: 6X Brine (HS23011349-02)

• Lowest practical dilution due to sample matrix and/or high concentration of non-target analyte(s).

Metals by Method SW7470A

Batch ID: 189499

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 189475

Sample ID: 6X Brine (HS23011349-02)

• Sample ran at a 50X dilution due to high concentration of Sodium.

Sample ID: Central Pond (HS23011349-05)

• Sample ran at a 2X dilution due to high concentration of Sodium.

Sample ID: HS23011253-02MS

• MS and MSD are for an unrelated sample

WetChemistry by Method SM2320B

Batch ID: R427613,R427664

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R427665

Sample ID: CCV-R427665

• CCV marginally failed high, samples bracketed with this CCV were re-analyzed and confimed. Therefore reporting the results from this run.

WetChemistry by Method E376.1

Batch ID: R427662

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Environmental Resources Mgmt. **CASE NARRATIVE**
Project: Sulphur Dome
Work Order: HS23011349

WetChemistry by Method SW9056

Batch ID: R427323

Sample ID: 6X Brine (HS23011349-02)

• The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Bromide)

Sample ID: Central Pond (HS23011349-05)

• The reporting limit is elevated due to dilution for high concentrations of non-target analytes. (Bromide)

WetChemistry by Method M2540C

Batch ID: R427041,R427164

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SM4500 S2-F

Batch ID: R426965

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Brine Well 22 BS
Collection Date: 25-Jan-2023 12:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene	**1.2**		**0.20**	**1.0**	**ug/L**	1	28-Jan-2023 14:18
Ethylbenzene	U		0.30	1.0	ug/L	1	28-Jan-2023 14:18
m,p-Xylene	U		0.50	2.0	ug/L	1	28-Jan-2023 14:18
o-Xylene	U		0.30	1.0	ug/L	1	28-Jan-2023 14:18
Toluene	**0.79**	J	**0.20**	**1.0**	**ug/L**	1	28-Jan-2023 14:18
Xylenes, Total	U		0.30	1.0	ug/L	1	28-Jan-2023 14:18
Surr: 1,2-Dichloroethane-d4	*97.8*			*70-126*	*%REC*	*1*	*28-Jan-2023 14:18*
Surr: 4-Bromofluorobenzene	*99.0*			*77-113*	*%REC*	*1*	*28-Jan-2023 14:18*
Surr: Dibromofluoromethane	*97.7*			*77-123*	*%REC*	*1*	*28-Jan-2023 14:18*
Surr: Toluene-d8	*100*			*82-127*	*%REC*	*1*	*28-Jan-2023 14:18*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8	U		0.0100	0.0100	mg/L	1	01-Feb-2023 11:42
Aliphatics >C8 - C10	U		0.0100	0.0100	mg/L	1	01-Feb-2023 11:42
Aromatics >C8 - C10	U		0.0100	0.0100	mg/L	1	01-Feb-2023 11:42
Surr: 2,5-Dibromotoluene (Aliphatic)	*122*			*70-130*	*%REC*	*1*	*01-Feb-2023 11:42*
Surr: 2,5-Dibromotoluene (Aromatic)	*123*			*70-130*	*%REC*	*1*	*01-Feb-2023 11:42*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 21:48
Aliphatics >C12 - C16	**0.0746**		**0.00200**	**0.00200**	**mg/L**	1	01-Feb-2023 21:48
Aliphatics >C16 - C35	**0.249**		**0.00800**	**0.00800**	**mg/L**	1	01-Feb-2023 21:48
Aromatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 21:48
Aromatics >C12 - C16	**0.0417**		**0.00400**	**0.00400**	**mg/L**	1	01-Feb-2023 21:48
Aromatics >C16 - C21	**0.121**		**0.00300**	**0.00300**	**mg/L**	1	01-Feb-2023 21:48
Aromatics >C21 - C35	U		0.00900	0.00900	mg/L	1	01-Feb-2023 21:48
Surr: 1-Chlorooctadecane	*75.8*			*40-140*	*%REC*	*1*	*01-Feb-2023 21:48*
Surr: 2-Bromonaphthalene	*99.6*			*40-140*	*%REC*	*1*	*01-Feb-2023 21:48*
Surr: 2-Fluorobiphenyl	*89.5*			*40-140*	*%REC*	*1*	*01-Feb-2023 21:48*
Surr: o-Terphenyl	*80.2*			*40-140*	*%REC*	*1*	*01-Feb-2023 21:48*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Brine Well 22 BS
Collection Date: 25-Jan-2023 12:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.00149**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 16:50
Barium	**0.300**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 16:50
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 16:50
Calcium	**71.2**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 16:50
Chromium	**0.000847**	J	**0.000400**	**0.00400**	**mg/L**	1	08-Feb-2023 16:50
Iron	**1.14**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 16:50
Lead	**0.00208**		**0.000600**	**0.00200**	**mg/L**	1	08-Feb-2023 16:50
Magnesium	**19.8**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 16:50
Manganese	**0.797**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 16:50
Potassium	**2.57**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 16:50
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 16:50
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 16:50
Sodium	**156**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 16:50
Strontium	**0.619**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 16:50
Zinc	**0.00857**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 16:50
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 16:31
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**676**		**5.00**	**10.0**	**mg/L**	1	31-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**269**		**5.00**	**5.00**	**mg/L**	1	08-Feb-2023 19:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	08-Feb-2023 19:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	04-Feb-2023 10:49
Chloride	**317**		**2.00**	**5.00**	**mg/L**	10	04-Feb-2023 10:55
Sulfate	**45.2**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 10:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 6X Brine
Collection Date: 25-Jan-2023 13:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene	**170**		**2.0**	**10**	**ug/L**	10	28-Jan-2023 19:20
Ethylbenzene	**7.5**	J	**3.0**	**10**	**ug/L**	10	28-Jan-2023 19:20
m,p-Xylene	**13**	J	**5.0**	**20**	**ug/L**	10	28-Jan-2023 19:20
o-Xylene	**9.1**	J	**3.0**	**10**	**ug/L**	10	28-Jan-2023 19:20
Toluene	**110**		**2.0**	**10**	**ug/L**	10	28-Jan-2023 19:20
Xylenes, Total	**22**		**3.0**	**10**	**ug/L**	10	28-Jan-2023 19:20
Surr: 1,2-Dichloroethane-d4	*101*			*70-126*	*%REC*	*10*	*28-Jan-2023 19:20*
Surr: 4-Bromofluorobenzene	*98.5*			*77-113*	*%REC*	*10*	*28-Jan-2023 19:20*
Surr: Dibromofluoromethane	*99.3*			*77-123*	*%REC*	*10*	*28-Jan-2023 19:20*
Surr: Toluene-d8	*99.6*			*82-127*	*%REC*	*10*	*28-Jan-2023 19:20*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8	**0.0997**		**0.0100**	**0.0100**	**mg/L**	1	01-Feb-2023 12:20
Aliphatics >C8 - C10	U		0.0100	0.0100	mg/L	1	01-Feb-2023 12:20
Aromatics >C8 - C10	**0.0284**		**0.0100**	**0.0100**	**mg/L**	1	01-Feb-2023 12:20
Surr: 2,5-Dibromotoluene (Aliphatic)	*104*			*70-130*	*%REC*	*1*	*01-Feb-2023 12:20*
Surr: 2,5-Dibromotoluene (Aromatic)	*114*			*70-130*	*%REC*	*1*	*01-Feb-2023 12:20*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 23:23
Aliphatics >C12 - C16	U		0.00200	0.00200	mg/L	1	01-Feb-2023 23:23
Aliphatics >C16 - C35	U		0.00800	0.00800	mg/L	1	01-Feb-2023 23:23
Aromatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 23:23
Aromatics >C12 - C16	U		0.00400	0.00400	mg/L	1	01-Feb-2023 23:23
Aromatics >C16 - C21	U		0.00300	0.00300	mg/L	1	01-Feb-2023 23:23
Aromatics >C21 - C35	U		0.00900	0.00900	mg/L	1	01-Feb-2023 23:23
Surr: 1-Chlorooctadecane	*80.9*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:23*
Surr: 2-Bromonaphthalene	*92.8*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:23*
Surr: 2-Fluorobiphenyl	*84.3*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:23*
Surr: o-Terphenyl	*70.9*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:23*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 6X Brine
Collection Date: 25-Jan-2023 13:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.0300**	J	**0.0200**	**0.100**	**mg/L**	50	08-Feb-2023 17:42
Barium	**0.220**		**0.0950**	**0.200**	**mg/L**	50	08-Feb-2023 17:42
Cadmium	U		0.0100	0.100	mg/L	50	08-Feb-2023 17:42
Calcium	**722**		**1.70**	**25.0**	**mg/L**	50	08-Feb-2023 17:42
Chromium	**0.243**		**0.0200**	**0.200**	**mg/L**	50	08-Feb-2023 17:42
Iron	**25.7**		**0.600**	**10.0**	**mg/L**	50	08-Feb-2023 17:42
Lead	U		0.0300	0.100	mg/L	50	08-Feb-2023 17:42
Magnesium	**8.16**	J	**0.500**	**10.0**	**mg/L**	50	08-Feb-2023 17:42
Manganese	**0.953**		**0.0350**	**0.250**	**mg/L**	50	08-Feb-2023 17:42
Potassium	**14.4**		**0.900**	**10.0**	**mg/L**	50	08-Feb-2023 17:42
Selenium	U		0.0550	0.100	mg/L	50	08-Feb-2023 17:42
Silver	U		0.0100	0.100	mg/L	50	08-Feb-2023 17:42
Sodium	**100,000**		**70.0**	**1000**	**mg/L**	5000	08-Feb-2023 17:57
Strontium	**2.66**		**0.0100**	**0.250**	**mg/L**	50	08-Feb-2023 17:42
Zinc	**0.481**		**0.100**	**0.200**	**mg/L**	50	08-Feb-2023 17:42
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 16:33
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**239,000**		**5.00**	**10.0**	**mg/L**	1	31-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**159**		**5.00**	**5.00**	**mg/L**	1	08-Feb-2023 19:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	08-Feb-2023 19:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		3.00	10.0	mg/L	100	04-Feb-2023 11:24
Chloride	**213,000**		**1000**	**2500**	**mg/L**	5000	04-Feb-2023 11:30
Sulfate	**1,380**		**20.0**	**50.0**	**mg/L**	100	04-Feb-2023 11:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Brine Well 7A BS
Collection Date: 25-Jan-2023 14:10

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene	**0.34**	J	**0.20**	**1.0**	**ug/L**	1	28-Jan-2023 14:39
Ethylbenzene	**1.8**		**0.30**	**1.0**	**ug/L**	1	28-Jan-2023 14:39
m,p-Xylene	**2.0**	J	**0.50**	**2.0**	**ug/L**	1	28-Jan-2023 14:39
o-Xylene	U		0.30	1.0	ug/L	1	28-Jan-2023 14:39
Toluene	**0.55**	J	**0.20**	**1.0**	**ug/L**	1	28-Jan-2023 14:39
Xylenes, Total	**2.0**		**0.30**	**1.0**	**ug/L**	1	28-Jan-2023 14:39
Surr: 1,2-Dichloroethane-d4	*99.6*			*70-126*	*%REC*	*1*	*28-Jan-2023 14:39*
Surr: 4-Bromofluorobenzene	*97.9*			*77-113*	*%REC*	*1*	*28-Jan-2023 14:39*
Surr: Dibromofluoromethane	*100*			*77-123*	*%REC*	*1*	*28-Jan-2023 14:39*
Surr: Toluene-d8	*98.7*			*82-127*	*%REC*	*1*	*28-Jan-2023 14:39*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8	U		0.0100	0.0100	mg/L	1	01-Feb-2023 12:58
Aliphatics >C8 - C10	U		0.0100	0.0100	mg/L	1	01-Feb-2023 12:58
Aromatics >C8 - C10	**0.0285**		**0.0100**	**0.0100**	**mg/L**	1	01-Feb-2023 12:58
Surr: 2,5-Dibromotoluene (Aliphatic)	*124*			*70-130*	*%REC*	*1*	*01-Feb-2023 12:58*
Surr: 2,5-Dibromotoluene (Aromatic)	*113*			*70-130*	*%REC*	*1*	*01-Feb-2023 12:58*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 23:55
Aliphatics >C12 - C16	U		0.00200	0.00200	mg/L	1	01-Feb-2023 23:55
Aliphatics >C16 - C35	U		0.00800	0.00800	mg/L	1	01-Feb-2023 23:55
Aromatics >C10 - C12	U		0.00100	0.00100	mg/L	1	01-Feb-2023 23:55
Aromatics >C12 - C16	U		0.00400	0.00400	mg/L	1	01-Feb-2023 23:55
Aromatics >C16 - C21	U		0.00300	0.00300	mg/L	1	01-Feb-2023 23:55
Aromatics >C21 - C35	U		0.00900	0.00900	mg/L	1	01-Feb-2023 23:55
Surr: 1-Chlorooctadecane	*72.2*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:55*
Surr: 2-Bromonaphthalene	*92.6*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:55*
Surr: 2-Fluorobiphenyl	*90.8*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:55*
Surr: o-Terphenyl	*81.3*			*40-140*	*%REC*	*1*	*01-Feb-2023 23:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Brine Well 7A BS
Collection Date: 25-Jan-2023 14:10

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.000767**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:16
Barium	**0.232**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:16
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:16
Calcium	**24.5**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:16
Chromium	**0.000474**	J	**0.000400**	**0.00400**	**mg/L**	1	08-Feb-2023 17:16
Iron	**0.0406**	J	**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:16
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2023 17:16
Magnesium	**1.54**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:16
Manganese	**0.0215**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:16
Potassium	**1.02**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:16
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 17:16
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:16
Sodium	**8.45**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:16
Strontium	**0.167**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:16
Zinc	**0.0466**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:16
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 16:35
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**320**		**5.00**	**10.0**	**mg/L**	1	31-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**159**		**5.00**	**5.00**	**mg/L**	1	08-Feb-2023 19:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	08-Feb-2023 19:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	04-Feb-2023 11:36
Chloride	**6.45**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 11:36
Sulfate	**2.97**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 11:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Culvert
Collection Date: 25-Jan-2023 16:00

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-04
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:01
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:01
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 15:01
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:01
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:01
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 15:01
Surr: 1,2-Dichloroethane-d4	*100.0*			*70-126*	*%REC*	*1*	*28-Jan-2023 15:01*
Surr: 4-Bromofluorobenzene	*95.9*			*77-113*	*%REC*	*1*	*28-Jan-2023 15:01*
Surr: Dibromofluoromethane	*97.7*			*77-123*	*%REC*	*1*	*28-Jan-2023 15:01*
Surr: Toluene-d8	*99.5*			*82-127*	*%REC*	*1*	*28-Jan-2023 15:01*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 13:37
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 13:37
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 13:37
Surr: 2,5-Dibromotoluene (Aliphatic)	*119*			*70-130*	*%REC*	*1*	*01-Feb-2023 13:37*
Surr: 2,5-Dibromotoluene (Aromatic)	*114*			*70-130*	*%REC*	*1*	*01-Feb-2023 13:37*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 00:26
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 00:26
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 00:26
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 00:26
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 00:26
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 00:26
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 00:26
Surr: 1-Chlorooctadecane	*66.2*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:26*
Surr: 2-Bromonaphthalene	*81.4*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:26*
Surr: 2-Fluorobiphenyl	*54.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:26*
Surr: o-Terphenyl	*62.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Culvert
Collection Date: 25-Jan-2023 16:00

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-04
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.00141**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:18
Barium	**0.0832**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:18
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:18
Calcium	**58.2**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:18
Chromium	**0.00101**	J	**0.000400**	**0.00400**	**mg/L**	1	08-Feb-2023 17:18
Iron	**0.207**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:18
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2023 17:18
Magnesium	**5.44**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:18
Manganese	**0.00934**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:18
Potassium	**2.86**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:18
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 17:18
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:18
Sodium	**158**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:18
Strontium	**0.341**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:18
Zinc	**0.0153**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:18
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 16:54
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**498**		**5.00**	**10.0**	**mg/L**	1	31-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**210**		**5.00**	**5.00**	**mg/L**	1	08-Feb-2023 19:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	08-Feb-2023 19:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	04-Feb-2023 11:41
Chloride	**215**		**2.00**	**5.00**	**mg/L**	10	04-Feb-2023 11:47
Sulfate	**92.1**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 11:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Central Pond
Collection Date: 25-Jan-2023 16:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-05
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:22
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:22
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 15:22
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:22
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:22
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 15:22
Surr: 1,2-Dichloroethane-d4	*99.8*			*70-126*	*%REC*	*1*	*28-Jan-2023 15:22*
Surr: 4-Bromofluorobenzene	*97.1*			*77-113*	*%REC*	*1*	*28-Jan-2023 15:22*
Surr: Dibromofluoromethane	*98.8*			*77-123*	*%REC*	*1*	*28-Jan-2023 15:22*
Surr: Toluene-d8	*100*			*82-127*	*%REC*	*1*	*28-Jan-2023 15:22*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:15
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:15
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:15
Surr: 2,5-Dibromotoluene (Aliphatic)	*122*			*70-130*	*%REC*	*1*	*01-Feb-2023 14:15*
Surr: 2,5-Dibromotoluene (Aromatic)	*123*			*70-130*	*%REC*	*1*	*01-Feb-2023 14:15*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 00:57
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 00:57
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 00:57
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 00:57
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 00:57
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 00:57
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 00:57
Surr: 1-Chlorooctadecane	*63.2*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:57*
Surr: 2-Bromonaphthalene	*100*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:57*
Surr: 2-Fluorobiphenyl	*104*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:57*
Surr: o-Terphenyl	*72.3*			*40-140*	*%REC*	*1*	*02-Feb-2023 00:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: Central Pond
Collection Date: 25-Jan-2023 16:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-05
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.00192**	J	**0.000800**	**0.00400**	**mg/L**	2	08-Feb-2023 17:52
Barium	**0.146**		**0.00380**	**0.00800**	**mg/L**	2	08-Feb-2023 17:52
Cadmium	U		0.000400	0.00400	mg/L	2	08-Feb-2023 17:52
Calcium	**149**		**0.0680**	**1.00**	**mg/L**	2	08-Feb-2023 17:52
Chromium	**0.00458**	J	**0.000800**	**0.00800**	**mg/L**	2	08-Feb-2023 17:52
Iron	**2.07**		**0.0240**	**0.400**	**mg/L**	2	08-Feb-2023 17:52
Lead	U		0.00120	0.00400	mg/L	2	08-Feb-2023 17:52
Magnesium	**37.8**		**0.0200**	**0.400**	**mg/L**	2	08-Feb-2023 17:52
Manganese	**0.847**		**0.00140**	**0.0100**	**mg/L**	2	08-Feb-2023 17:52
Potassium	**3.22**		**0.0360**	**0.400**	**mg/L**	2	08-Feb-2023 17:52
Selenium	U		0.00220	0.00400	mg/L	2	08-Feb-2023 17:52
Silver	U		0.000400	0.00400	mg/L	2	08-Feb-2023 17:52
Sodium	**1,080**		**0.280**	**4.00**	**mg/L**	20	08-Feb-2023 18:01
Strontium	**0.941**		**0.000400**	**0.0100**	**mg/L**	2	08-Feb-2023 17:52
Zinc	**0.0258**		**0.00400**	**0.00800**	**mg/L**	2	08-Feb-2023 17:52
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 17:08
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**3,600**		**5.00**	**10.0**	**mg/L**	1	31-Jan-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**495**		**5.00**	**5.00**	**mg/L**	1	08-Feb-2023 19:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	08-Feb-2023 19:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0600	0.200	mg/L	2	04-Feb-2023 11:53
Chloride	**2,090**		**8.00**	**20.0**	**mg/L**	40	04-Feb-2023 11:59
Sulfate	**183**		**0.400**	**1.00**	**mg/L**	2	04-Feb-2023 11:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-1055
Collection Date: 26-Jan-2023 08:00

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-06
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:44
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:44
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 15:44
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 15:44
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 15:44
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 15:44
Surr: 1,2-Dichloroethane-d4	*98.2*			*70-126*	*%REC*	*1*	*28-Jan-2023 15:44*
Surr: 4-Bromofluorobenzene	*97.4*			*77-113*	*%REC*	*1*	*28-Jan-2023 15:44*
Surr: Dibromofluoromethane	*97.0*			*77-123*	*%REC*	*1*	*28-Jan-2023 15:44*
Surr: Toluene-d8	*99.2*			*82-127*	*%REC*	*1*	*28-Jan-2023 15:44*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:53
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:53
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 14:53
Surr: 2,5-Dibromotoluene (Aliphatic)	*124*			*70-130*	*%REC*	*1*	*01-Feb-2023 14:53*
Surr: 2,5-Dibromotoluene (Aromatic)	*120*			*70-130*	*%REC*	*1*	*01-Feb-2023 14:53*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 01:29
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 01:29
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 01:29
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 01:29
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 01:29
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 01:29
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 01:29
Surr: 1-Chlorooctadecane	*82.8*			*40-140*	*%REC*	*1*	*02-Feb-2023 01:29*
Surr: 2-Bromonaphthalene	*91.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 01:29*
Surr: 2-Fluorobiphenyl	*92.2*			*40-140*	*%REC*	*1*	*02-Feb-2023 01:29*
Surr: o-Terphenyl	*72.2*			*40-140*	*%REC*	*1*	*02-Feb-2023 01:29*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-1055
Collection Date: 26-Jan-2023 08:00

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-06
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.000419**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:22
Barium	**0.265**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:22
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:22
Calcium	**28.7**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:22
Chromium	U		0.000400	0.00400	mg/L	1	08-Feb-2023 17:22
Iron	**3.81**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:22
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2023 17:22
Magnesium	**8.66**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:22
Manganese	**0.420**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:22
Potassium	**3.10**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:22
Selenium	**0.00114**	J	**0.00110**	**0.00200**	**mg/L**	1	08-Feb-2023 17:22
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:22
Sodium	**34.4**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:22
Strontium	**0.262**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:22
Zinc	**0.00993**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:22
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 16:58
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**244**		**5.00**	**10.0**	**mg/L**	1	01-Feb-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**250**		**5.00**	**5.00**	**mg/L**	1	07-Feb-2023 17:45
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	07-Feb-2023 17:45
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	**0.0982**	J	**0.0300**	**0.100**	**mg/L**	1	04-Feb-2023 12:05
Chloride	**38.3**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:05
Sulfate	**3.51**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-582
Collection Date: 26-Jan-2023 08:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-07
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:05
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:05
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 16:05
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:05
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:05
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 16:05
Surr: 1,2-Dichloroethane-d4	*100*			*70-126*	*%REC*	*1*	*28-Jan-2023 16:05*
Surr: 4-Bromofluorobenzene	*96.9*			*77-113*	*%REC*	*1*	*28-Jan-2023 16:05*
Surr: Dibromofluoromethane	*98.2*			*77-123*	*%REC*	*1*	*28-Jan-2023 16:05*
Surr: Toluene-d8	*98.7*			*82-127*	*%REC*	*1*	*28-Jan-2023 16:05*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 15:31
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 15:31
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 15:31
Surr: 2,5-Dibromotoluene (Aliphatic)	*124*			*70-130*	*%REC*	*1*	*01-Feb-2023 15:31*
Surr: 2,5-Dibromotoluene (Aromatic)	*118*			*70-130*	*%REC*	*1*	*01-Feb-2023 15:31*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 02:00
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 02:00
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 02:00
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 02:00
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 02:00
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 02:00
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 02:00
Surr: 1-Chlorooctadecane	*71.6*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:00*
Surr: 2-Bromonaphthalene	*95.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:00*
Surr: 2-Fluorobiphenyl	*98.7*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:00*
Surr: o-Terphenyl	*66.5*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:00*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-582
Collection Date: 26-Jan-2023 08:30

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-07
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.000812**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:24
Barium	**0.239**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:24
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:24
Calcium	**25.5**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:24
Chromium	U		0.000400	0.00400	mg/L	1	08-Feb-2023 17:24
Iron	**4.03**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:24
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2023 17:24
Magnesium	**7.81**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:24
Manganese	**0.417**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:24
Potassium	**2.94**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:24
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 17:24
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:24
Sodium	**28.0**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:24
Strontium	**0.240**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:24
Zinc	**0.0107**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:24
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 17:10
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**212**		**5.00**	**10.0**	**mg/L**	1	01-Feb-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**180**		**5.00**	**5.00**	**mg/L**	1	07-Feb-2023 17:45
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	07-Feb-2023 17:45
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	**0.0860**	J	**0.0300**	**0.100**	**mg/L**	1	04-Feb-2023 12:10
Chloride	**23.4**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:10
Sulfate	**4.11**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-580
Collection Date: 26-Jan-2023 09:10

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-08
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:26
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:26
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 16:26
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:26
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:26
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 16:26
Surr: 1,2-Dichloroethane-d4	*99.5*			*70-126*	*%REC*	*1*	*28-Jan-2023 16:26*
Surr: 4-Bromofluorobenzene	*96.0*			*77-113*	*%REC*	*1*	*28-Jan-2023 16:26*
Surr: Dibromofluoromethane	*98.5*			*77-123*	*%REC*	*1*	*28-Jan-2023 16:26*
Surr: Toluene-d8	*100*			*82-127*	*%REC*	*1*	*28-Jan-2023 16:26*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:09
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:09
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:09
Surr: 2,5-Dibromotoluene (Aliphatic)	*127*			*70-130*	*%REC*	*1*	*01-Feb-2023 16:09*
Surr: 2,5-Dibromotoluene (Aromatic)	*123*			*70-130*	*%REC*	*1*	*01-Feb-2023 16:09*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 02:32
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 02:32
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 02:32
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 02:32
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 02:32
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 02:32
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 02:32
Surr: 1-Chlorooctadecane	*79.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:32*
Surr: 2-Bromonaphthalene	*93.1*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:32*
Surr: 2-Fluorobiphenyl	*104*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:32*
Surr: o-Terphenyl	*75.7*			*40-140*	*%REC*	*1*	*02-Feb-2023 02:32*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-580
Collection Date: 26-Jan-2023 09:10

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-08
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.000477**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:26
Barium	**0.230**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:26
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:26
Calcium	**26.8**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:26
Chromium	U		0.000400	0.00400	mg/L	1	08-Feb-2023 17:26
Iron	**5.12**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:26
Lead	**0.00144**	J	**0.000600**	**0.00200**	**mg/L**	1	08-Feb-2023 17:26
Magnesium	**8.03**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:26
Manganese	**0.412**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:26
Potassium	**2.93**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:26
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 17:26
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:26
Sodium	**31.9**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:26
Strontium	**0.246**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:26
Zinc	**0.0147**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:26
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 17:12
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**236**		**5.00**	**10.0**	**mg/L**	1	01-Feb-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**200**		**5.00**	**5.00**	**mg/L**	1	07-Feb-2023 17:45
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	07-Feb-2023 17:45
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	**0.0992**	J	**0.0300**	**0.100**	**mg/L**	1	04-Feb-2023 12:16
Chloride	**35.7**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:16
Sulfate	**2.91**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-995
Collection Date: 26-Jan-2023 09:45

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-09
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:48
Ethylbenzene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:48
m,p-Xylene		U	0.50	2.0	ug/L	1	28-Jan-2023 16:48
o-Xylene		U	0.30	1.0	ug/L	1	28-Jan-2023 16:48
Toluene		U	0.20	1.0	ug/L	1	28-Jan-2023 16:48
Xylenes, Total		U	0.30	1.0	ug/L	1	28-Jan-2023 16:48
Surr: 1,2-Dichloroethane-d4	*97.5*			*70-126*	*%REC*	*1*	*28-Jan-2023 16:48*
Surr: 4-Bromofluorobenzene	*96.1*			*77-113*	*%REC*	*1*	*28-Jan-2023 16:48*
Surr: Dibromofluoromethane	*95.5*			*77-123*	*%REC*	*1*	*28-Jan-2023 16:48*
Surr: Toluene-d8	*99.4*			*82-127*	*%REC*	*1*	*28-Jan-2023 16:48*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: FT
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:48
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:48
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	01-Feb-2023 16:48
Surr: 2,5-Dibromotoluene (Aliphatic)	*124*			*70-130*	*%REC*	*1*	*01-Feb-2023 16:48*
Surr: 2,5-Dibromotoluene (Aromatic)	*112*			*70-130*	*%REC*	*1*	*01-Feb-2023 16:48*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 31-Jan-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 03:03
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	02-Feb-2023 03:03
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	02-Feb-2023 03:03
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	02-Feb-2023 03:03
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	02-Feb-2023 03:03
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	02-Feb-2023 03:03
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	02-Feb-2023 03:03
Surr: 1-Chlorooctadecane	*70.2*			*40-140*	*%REC*	*1*	*02-Feb-2023 03:03*
Surr: 2-Bromonaphthalene	*87.5*			*40-140*	*%REC*	*1*	*02-Feb-2023 03:03*
Surr: 2-Fluorobiphenyl	*50.6*			*40-140*	*%REC*	*1*	*02-Feb-2023 03:03*
Surr: o-Terphenyl	*73.9*			*40-140*	*%REC*	*1*	*02-Feb-2023 03:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: 019-995
Collection Date: 26-Jan-2023 09:45

ANALYTICAL REPORT
WorkOrder:HS23011349
Lab ID:HS23011349-09
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 08-Feb-2023		Analyst: JC
Arsenic	**0.000762**	J	**0.000400**	**0.00200**	**mg/L**	1	08-Feb-2023 17:28
Barium	**0.214**		**0.00190**	**0.00400**	**mg/L**	1	08-Feb-2023 17:28
Cadmium	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:28
Calcium	**26.4**		**0.0340**	**0.500**	**mg/L**	1	08-Feb-2023 17:28
Chromium	U		0.000400	0.00400	mg/L	1	08-Feb-2023 17:28
Iron	**0.821**		**0.0120**	**0.200**	**mg/L**	1	08-Feb-2023 17:28
Lead	U		0.000600	0.00200	mg/L	1	08-Feb-2023 17:28
Magnesium	**8.02**		**0.0100**	**0.200**	**mg/L**	1	08-Feb-2023 17:28
Manganese	**0.388**		**0.000700**	**0.00500**	**mg/L**	1	08-Feb-2023 17:28
Potassium	**3.00**		**0.0180**	**0.200**	**mg/L**	1	08-Feb-2023 17:28
Selenium	U		0.00110	0.00200	mg/L	1	08-Feb-2023 17:28
Silver	U		0.000200	0.00200	mg/L	1	08-Feb-2023 17:28
Sodium	**29.9**		**0.0140**	**0.200**	**mg/L**	1	08-Feb-2023 17:28
Strontium	**0.241**		**0.000200**	**0.00500**	**mg/L**	1	08-Feb-2023 17:28
Zinc	**0.00426**		**0.00200**	**0.00400**	**mg/L**	1	08-Feb-2023 17:28
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 08-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	08-Feb-2023 17:14
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	31-Jan-2023 10:38
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**226**		**5.00**	**10.0**	**mg/L**	1	01-Feb-2023 10:30
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**258**		**5.00**	**5.00**	**mg/L**	1	07-Feb-2023 17:45
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	07-Feb-2023 17:45
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	31-Jan-2023 15:38
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	**0.0931**	J	**0.0300**	**0.100**	**mg/L**	1	04-Feb-2023 12:51
Chloride	**28.7**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:51
Sulfate	**3.63**		**0.200**	**0.500**	**mg/L**	1	04-Feb-2023 12:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

Batch ID: 189091 **Start Date:** 31 Jan 2023 06:30 **End Date:** 31 Jan 2023 12:30
Method: MA EPH EXTRACTION-FRACTIONATION **Prep Code:** MA EPH_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011349-01	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-02	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-03	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-04	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-05	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-06	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-07	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-08	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011349-09	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2

Batch ID: 189475 **Start Date:** 08 Feb 2023 09:30 **End Date:** 08 Feb 2023 13:30
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011349-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-05		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-06		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-07		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-08		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-09		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 189499 **Start Date:** 08 Feb 2023 10:00 **End Date:** 08 Feb 2023 13:00
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011349-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-03		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-04		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-05		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-06		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-07		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-08		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011349-09		10 (mL)	10 (mL)	1	120 plastic HNO3

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 189091 (0)	**Test Name :** MASSACHUSETTS EPH R2.1, DEC 2019				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30		31 Jan 2023 07:00	01 Feb 2023 21:48	1
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30		31 Jan 2023 07:00	01 Feb 2023 21:48	1
HS23011349-02	6X Brine	25 Jan 2023 13:30		31 Jan 2023 07:00	01 Feb 2023 23:23	1
HS23011349-02	6X Brine	25 Jan 2023 13:30		31 Jan 2023 07:00	01 Feb 2023 23:23	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10		31 Jan 2023 07:00	01 Feb 2023 23:55	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10		31 Jan 2023 07:00	01 Feb 2023 23:55	1
HS23011349-04	Culvert	25 Jan 2023 16:00		31 Jan 2023 07:00	02 Feb 2023 00:26	1
HS23011349-04	Culvert	25 Jan 2023 16:00		31 Jan 2023 07:00	02 Feb 2023 00:26	1
HS23011349-05	Central Pond	25 Jan 2023 16:30		31 Jan 2023 07:00	02 Feb 2023 00:57	1
HS23011349-05	Central Pond	25 Jan 2023 16:30		31 Jan 2023 07:00	02 Feb 2023 00:57	1
HS23011349-06	019-1055	26 Jan 2023 08:00		31 Jan 2023 07:00	02 Feb 2023 01:29	1
HS23011349-06	019-1055	26 Jan 2023 08:00		31 Jan 2023 07:00	02 Feb 2023 01:29	1
HS23011349-07	019-582	26 Jan 2023 08:30		31 Jan 2023 07:00	02 Feb 2023 02:00	1
HS23011349-07	019-582	26 Jan 2023 08:30		31 Jan 2023 07:00	02 Feb 2023 02:00	1
HS23011349-08	019-580	26 Jan 2023 09:10		31 Jan 2023 07:00	02 Feb 2023 02:32	1
HS23011349-08	019-580	26 Jan 2023 09:10		31 Jan 2023 07:00	02 Feb 2023 02:32	1
HS23011349-09	019-995	26 Jan 2023 09:45		31 Jan 2023 07:00	02 Feb 2023 03:03	1
HS23011349-09	019-995	26 Jan 2023 09:45		31 Jan 2023 07:00	02 Feb 2023 03:03	1
Batch ID: 189475 (0)	**Test Name :** ICP-MS METALS BY SW6020A				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30		08 Feb 2023 09:30	08 Feb 2023 16:50	1
HS23011349-02	6X Brine	25 Jan 2023 13:30		08 Feb 2023 09:30	08 Feb 2023 17:57	5000
HS23011349-02	6X Brine	25 Jan 2023 13:30		08 Feb 2023 09:30	08 Feb 2023 17:42	50
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10		08 Feb 2023 09:30	08 Feb 2023 17:16	1
HS23011349-04	Culvert	25 Jan 2023 16:00		08 Feb 2023 09:30	08 Feb 2023 17:18	1
HS23011349-05	Central Pond	25 Jan 2023 16:30		08 Feb 2023 09:30	08 Feb 2023 18:01	20
HS23011349-05	Central Pond	25 Jan 2023 16:30		08 Feb 2023 09:30	08 Feb 2023 17:52	2
HS23011349-06	019-1055	26 Jan 2023 08:00		08 Feb 2023 09:30	08 Feb 2023 17:22	1
HS23011349-07	019-582	26 Jan 2023 08:30		08 Feb 2023 09:30	08 Feb 2023 17:24	1
HS23011349-08	019-580	26 Jan 2023 09:10		08 Feb 2023 09:30	08 Feb 2023 17:26	1
HS23011349-09	019-995	26 Jan 2023 09:45		08 Feb 2023 09:30	08 Feb 2023 17:28	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 189499 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30		08 Feb 2023 10:00	08 Feb 2023 16:31	1
HS23011349-02	6X Brine	25 Jan 2023 13:30		08 Feb 2023 10:00	08 Feb 2023 16:33	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10		08 Feb 2023 10:00	08 Feb 2023 16:35	1
HS23011349-04	Culvert	25 Jan 2023 16:00		08 Feb 2023 10:00	08 Feb 2023 16:54	1
HS23011349-05	Central Pond	25 Jan 2023 16:30		08 Feb 2023 10:00	08 Feb 2023 17:08	1
HS23011349-06	019-1055	26 Jan 2023 08:00		08 Feb 2023 10:00	08 Feb 2023 16:58	1
HS23011349-07	019-582	26 Jan 2023 08:30		08 Feb 2023 10:00	08 Feb 2023 17:10	1
HS23011349-08	019-580	26 Jan 2023 09:10		08 Feb 2023 10:00	08 Feb 2023 17:12	1
HS23011349-09	019-995	26 Jan 2023 09:45		08 Feb 2023 10:00	08 Feb 2023 17:14	1
Batch ID: R426800 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			28 Jan 2023 14:18	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			28 Jan 2023 19:20	10
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			28 Jan 2023 14:39	1
HS23011349-04	Culvert	25 Jan 2023 16:00			28 Jan 2023 15:01	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			28 Jan 2023 15:22	1
HS23011349-06	019-1055	26 Jan 2023 08:00			28 Jan 2023 15:44	1
HS23011349-07	019-582	26 Jan 2023 08:30			28 Jan 2023 16:05	1
HS23011349-08	019-580	26 Jan 2023 09:10			28 Jan 2023 16:26	1
HS23011349-09	019-995	26 Jan 2023 09:45			28 Jan 2023 16:48	1
Batch ID: R426965 (0)	**Test Name :** SULFIDE BY SM4500 S2-F-2011				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			31 Jan 2023 15:38	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			31 Jan 2023 15:38	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			31 Jan 2023 15:38	1
HS23011349-04	Culvert	25 Jan 2023 16:00			31 Jan 2023 15:38	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			31 Jan 2023 15:38	1
HS23011349-06	019-1055	26 Jan 2023 08:00			31 Jan 2023 15:38	1
HS23011349-07	019-582	26 Jan 2023 08:30			31 Jan 2023 15:38	1
HS23011349-08	019-580	26 Jan 2023 09:10			31 Jan 2023 15:38	1
HS23011349-09	019-995	26 Jan 2023 09:45			31 Jan 2023 15:38	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R427008 (0)	**Test Name :** MASSACHUSETTS VPH, FEB 2018, REV 2.1				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			01 Feb 2023 11:42	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			01 Feb 2023 12:20	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			01 Feb 2023 12:58	1
HS23011349-04	Culvert	25 Jan 2023 16:00			01 Feb 2023 13:37	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			01 Feb 2023 14:15	1
HS23011349-06	019-1055	26 Jan 2023 08:00			01 Feb 2023 14:53	1
HS23011349-07	019-582	26 Jan 2023 08:30			01 Feb 2023 15:31	1
HS23011349-08	019-580	26 Jan 2023 09:10			01 Feb 2023 16:09	1
HS23011349-09	019-995	26 Jan 2023 09:45			01 Feb 2023 16:48	1
Batch ID: R427011 (0)	**Test Name :** MASSACHUSETTS VPH, FEB 2018, REV 2.1				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			01 Feb 2023 11:42	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			01 Feb 2023 12:20	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			01 Feb 2023 12:58	1
HS23011349-04	Culvert	25 Jan 2023 16:00			01 Feb 2023 13:37	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			01 Feb 2023 14:15	1
HS23011349-06	019-1055	26 Jan 2023 08:00			01 Feb 2023 14:53	1
HS23011349-07	019-582	26 Jan 2023 08:30			01 Feb 2023 15:31	1
HS23011349-08	019-580	26 Jan 2023 09:10			01 Feb 2023 16:09	1
HS23011349-09	019-995	26 Jan 2023 09:45			01 Feb 2023 16:48	1
Batch ID: R427041 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			31 Jan 2023 10:30	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			31 Jan 2023 10:30	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			31 Jan 2023 10:30	1
HS23011349-04	Culvert	25 Jan 2023 16:00			31 Jan 2023 10:30	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			31 Jan 2023 10:30	1
Batch ID: R427164 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23011349-06	019-1055	26 Jan 2023 08:00			01 Feb 2023 10:30	1
HS23011349-07	019-582	26 Jan 2023 08:30			01 Feb 2023 10:30	1
HS23011349-08	019-580	26 Jan 2023 09:10			01 Feb 2023 10:30	1
HS23011349-09	019-995	26 Jan 2023 09:45			01 Feb 2023 10:30	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R427323 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			04 Feb 2023 10:55	10
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			04 Feb 2023 10:49	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			04 Feb 2023 11:30	5000
HS23011349-02	6X Brine	25 Jan 2023 13:30			04 Feb 2023 11:24	100
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			04 Feb 2023 11:36	1
HS23011349-04	Culvert	25 Jan 2023 16:00			04 Feb 2023 11:47	10
HS23011349-04	Culvert	25 Jan 2023 16:00			04 Feb 2023 11:41	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			04 Feb 2023 11:59	40
HS23011349-05	Central Pond	25 Jan 2023 16:30			04 Feb 2023 11:53	2
HS23011349-06	019-1055	26 Jan 2023 08:00			04 Feb 2023 12:05	1
HS23011349-07	019-582	26 Jan 2023 08:30			04 Feb 2023 12:10	1
HS23011349-08	019-580	26 Jan 2023 09:10			04 Feb 2023 12:16	1
HS23011349-09	019-995	26 Jan 2023 09:45			04 Feb 2023 12:51	1
Batch ID: R427613 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23011349-07	019-582	26 Jan 2023 08:30			07 Feb 2023 17:45	1
HS23011349-08	019-580	26 Jan 2023 09:10			07 Feb 2023 17:45	1
HS23011349-09	019-995	26 Jan 2023 09:45			07 Feb 2023 17:45	1
Batch ID: R427662 (0)	**Test Name :** HYDROGEN SULFIDE BY E376.1				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			31 Jan 2023 10:38	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			31 Jan 2023 10:38	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			31 Jan 2023 10:38	1
HS23011349-04	Culvert	25 Jan 2023 16:00			31 Jan 2023 10:38	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			31 Jan 2023 10:38	1
HS23011349-06	019-1055	26 Jan 2023 08:00			31 Jan 2023 10:38	1
HS23011349-07	019-582	26 Jan 2023 08:30			31 Jan 2023 10:38	1
HS23011349-08	019-580	26 Jan 2023 09:10			31 Jan 2023 10:38	1
HS23011349-09	019-995	26 Jan 2023 09:45			31 Jan 2023 10:38	1
Batch ID: R427664 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23011349-01	Brine Well 22 BS	25 Jan 2023 12:30			08 Feb 2023 19:49	1
HS23011349-02	6X Brine	25 Jan 2023 13:30			08 Feb 2023 19:49	1
HS23011349-03	Brine Well 7A BS	25 Jan 2023 14:10			08 Feb 2023 19:49	1
HS23011349-04	Culvert	25 Jan 2023 16:00			08 Feb 2023 19:49	1
HS23011349-05	Central Pond	25 Jan 2023 16:30			08 Feb 2023 19:49	1
Batch ID: R427665 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23011349-06	019-1055	26 Jan 2023 08:00			07 Feb 2023 17:45	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189091 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

MBLK Sample ID: **MBLK-189091** Units: **mg/L** Analysis Date: **01-Feb-2023 17:05**
Client ID: Run ID: **FID-7_427121** SeqNo: **7103461** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	U	0.00100								
Aliphatics >C12 - C16	U	0.00200								
Aliphatics >C16 - C35	U	0.00800								
Surr: 1-Chlorooctadecane	*0.02893*	*0*	*0.04*	*0*	*72.3*	*40 - 140*				

MBLK Sample ID: **MBLK-189091** Units: **mg/L** Analysis Date: **01-Feb-2023 17:05**
Client ID: Run ID: **FID-8_427109** SeqNo: **7103178** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	U	0.00100								
Aromatics >C12 - C16	U	0.00400								
Aromatics >C16 - C21	U	0.00300								
Aromatics >C21 - C35	U	0.00900								
Surr: 2-Bromonaphthalene	*0.02192*	*0*	*0.04*	*0*	*54.8*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.01714*	*0*	*0.04*	*0*	*42.8*	*40 - 140*				
Surr: o-Terphenyl	*0.02735*	*0*	*0.04*	*0*	*68.4*	*40 - 140*				

LCS Sample ID: **LCS-189091** Units: **mg/L** Analysis Date: **01-Feb-2023 17:36**
Client ID: Run ID: **FID-7_427121** SeqNo: **7103462** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.04844	0.00100	0.05	0	96.9	40 - 140				
Aliphatics >C12 - C16	0.1232	0.00200	0.1	0	123	40 - 140				
Aliphatics >C16 - C35	0.5322	0.00800	0.4	0	133	40 - 140				
Surr: 1-Chlorooctadecane	*0.0369*	*0*	*0.04*	*0*	*92.2*	*40 - 140*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189091 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

LCS Sample ID: **LCS-189091** Units: **mg/L** Analysis Date: **01-Feb-2023 17:36**
Client ID: Run ID: **FID-8_427109** SeqNo: **7103179** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.02523	0.00100	0.05	0	50.5	40 - 140				
Aromatics >C12 - C16	0.1251	0.00400	0.2	0	62.5	40 - 140				
Aromatics >C16 - C21	0.1546	0.00300	0.15	0	103	40 - 140				
Aromatics >C21 - C35	0.4123	0.00900	0.45	0	91.6	40 - 140				
Surr: 2-Bromonaphthalene	*0.02128*	*0*	*0.04*	*0*	*53.2*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.01917*	*0*	*0.04*	*0*	*47.9*	*40 - 140*				
Surr: o-Terphenyl	*0.03395*	*0*	*0.04*	*0*	*84.9*	*40 - 140*				

MS Sample ID: **HS23011232-06MS** Units: **mg/L** Analysis Date: **01-Feb-2023 18:39**
Client ID: Run ID: **FID-7_427121** SeqNo: **7103464** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.05254	0.00100	0.05	0	105	40 - 140				
Aliphatics >C12 - C16	0.1046	0.00200	0.1	0	105	40 - 140				
Aliphatics >C16 - C35	0.4204	0.00800	0.4	0	105	40 - 140				
Surr: 1-Chlorooctadecane	*0.03351*	*0*	*0.04*	*0*	*83.8*	*40 - 140*				

MS Sample ID: **HS23011232-06MS** Units: **mg/L** Analysis Date: **01-Feb-2023 18:39**
Client ID: Run ID: **FID-8_427109** SeqNo: **7103181** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.045	0.00100	0.05	0	90.0	40 - 140				
Aromatics >C12 - C16	0.1958	0.00400	0.2	0	97.9	40 - 140				
Aromatics >C16 - C21	0.1643	0.00300	0.15	0	110	40 - 140				
Aromatics >C21 - C35	0.393	0.00900	0.45	0	87.3	40 - 140				
Surr: 2-Bromonaphthalene	*0.03863*	*0*	*0.04*	*0*	*96.6*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.01798*	*0*	*0.04*	*0*	*45.0*	*40 - 140*				
Surr: o-Terphenyl	*0.03571*	*0*	*0.04*	*0*	*89.3*	*40 - 140*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189091 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

MSD Sample ID: **HS23011232-06MSD** Units: **mg/L** Analysis Date: **01-Feb-2023 19:11**
Client ID: Run ID: **FID-7_427121** SeqNo: **7103465** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.04473	0.00100	0.05	0	89.5	40 - 140	0.05254	16.1	50	
Aliphatics >C12 - C16	0.08843	0.00200	0.1	0	88.4	40 - 140	0.1046	16.8	50	
Aliphatics >C16 - C35	0.3935	0.00800	0.4	0	98.4	40 - 140	0.4204	6.6	50	
Surr: 1-Chlorooctadecane	*0.02813*	*0*	*0.04*	*0*	*70.3*	*40 - 140*	*0.03351*	*17.5*	*50*	

MSD Sample ID: **HS23011232-06MSD** Units: **mg/L** Analysis Date: **01-Feb-2023 19:11**
Client ID: Run ID: **FID-8_427109** SeqNo: **7103182** PrepDate: **31-Jan-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.05114	0.00100	0.05	0	102	40 - 140	0.045	12.8	50	
Aromatics >C12 - C16	0.2026	0.00400	0.2	0	101	40 - 140	0.1958	3.38	50	
Aromatics >C16 - C21	0.1609	0.00300	0.15	0	107	40 - 140	0.1643	2.09	50	
Aromatics >C21 - C35	0.3987	0.00900	0.45	0	88.6	40 - 140	0.393	1.45	50	
Surr: 2-Bromonaphthalene	*0.03349*	*0*	*0.04*	*0*	*83.7*	*40 - 140*	*0.03863*	*14.2*	*50*	
Surr: 2-Fluorobiphenyl	*0.02087*	*0*	*0.04*	*0*	*52.2*	*40 - 140*	*0.01798*	*14.9*	*50*	
Surr: o-Terphenyl	*0.03494*	*0*	*0.04*	*0*	*87.3*	*40 - 140*	*0.03571*	*2.19*	*50*	

The following samples were analyzed in this batch: HS23011349-01 HS23011349-02 HS23011349-03 HS23011349-04 HS23011349-05 HS23011349-06 HS23011349-07 HS23011349-08 HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427008 (0) **Instrument:** FID-14 **Method:** MASSACHUSETTS VPH, FEB 2018, REV 2.1

MBLK Sample ID: **MBLK-230131** Units: **mg/L** Analysis Date: **01-Feb-2023 05:20**
Client ID: Run ID: **FID-14_427008** SeqNo: **7100413** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	U	0.0100								
Aliphatics >C8 - C10	U	0.0100								
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.3136*	*0.0100*	*0.25*	*0*	*125*	*70 - 130*				

LCS Sample ID: **LCS-230131** Units: **mg/L** Analysis Date: **01-Feb-2023 04:41**
Client ID: Run ID: **FID-14_427008** SeqNo: **7100412** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	0.02277	0.0100	0.025	0	91.1	70 - 130				
Aliphatics >C8 - C10	0.02222	0.0100	0.025	0	88.9	70 - 130				
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.3161*	*0.0100*	*0.25*	*0*	*126*	*70 - 130*				

MS Sample ID: **HS23011232-06MS** Units: **mg/L** Analysis Date: **01-Feb-2023 09:09**
Client ID: Run ID: **FID-14_427008** SeqNo: **7100649** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	0.02964	0.0100	0.025	0	119	70 - 130				
Aliphatics >C8 - C10	0.02649	0.0100	0.025	0	106	70 - 130				
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.28*	*0.0100*	*0.25*	*0*	*112*	*70 - 130*				

MSD Sample ID: **HS23011232-06MSD** Units: **mg/L** Analysis Date: **01-Feb-2023 09:47**
Client ID: Run ID: **FID-14_427008** SeqNo: **7100650** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	0.02858	0.0100	0.025	0	114	70 - 130	0.02964	3.63	25	
Aliphatics >C8 - C10	0.02613	0.0100	0.025	0	105	70 - 130	0.02649	1.38	25	
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.3019*	*0.0100*	*0.25*	*0*	*121*	*70 - 130*	*0.28*	*7.53*	*25*	

The following samples were analyzed in this batch: HS23011349-01, HS23011349-02, HS23011349-03, HS23011349-04, HS23011349-05, HS23011349-06, HS23011349-07, HS23011349-08, HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427011 (0) **Instrument: FID-15** **Method: MASSACHUSETTS VPH, FEB 2018, REV 2.1**

MBLK Sample ID: **MBLK-230131** Units: **mg/L** Analysis Date: **01-Feb-2023 05:20**
Client ID: Run ID: **FID-15_427011** SeqNo: **7100442** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	U	0.0100								
Surr: 2,5-Dibromotoluene (Aromatic)	*0.2808*	*0.0100*	*0.25*	*0*	*112*	*70 - 130*				

LCS Sample ID: **LCS-230131** Units: **mg/L** Analysis Date: **01-Feb-2023 04:41**
Client ID: Run ID: **FID-15_427011** SeqNo: **7100441** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	0.09523	0.0100	0.1	0	95.2	70 - 130				
Surr: 2,5-Dibromotoluene (Aromatic)	*0.3081*	*0.0100*	*0.25*	*0*	*123*	*70 - 130*				

MS Sample ID: **HS23011232-06MS** Units: **mg/L** Analysis Date: **01-Feb-2023 09:09**
Client ID: Run ID: **FID-15_427011** SeqNo: **7100706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	0.1126	0.0100	0.1	0	113	70 - 130				
Surr: 2,5-Dibromotoluene (Aromatic)	*0.3092*	*0.0100*	*0.25*	*0*	*124*	*70 - 130*				

MSD Sample ID: **HS23011232-06MSD** Units: **mg/L** Analysis Date: **01-Feb-2023 09:47**
Client ID: Run ID: **FID-15_427011** SeqNo: **7100707** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	0.11	0.0100	0.1	0	110	70 - 130	0.1126	2.32	25	
Surr: 2,5-Dibromotoluene (Aromatic)	*0.274*	*0.0100*	*0.25*	*0*	*110*	*70 - 130*	*0.3092*	*12.1*	*25*	

The following samples were analyzed in this batch:

HS23011349-01	HS23011349-02	HS23011349-03	HS23011349-04
HS23011349-05	HS23011349-06	HS23011349-07	HS23011349-08
HS23011349-09			

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-189475** Units: **mg/L** Analysis Date: **08-Feb-2023 16:26**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114887** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Calcium	U	0.500								
Chromium	U	0.00400								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01266	0.200								J
Manganese	U	0.00500								
Potassium	U	0.200								
Selenium	U	0.00200								
Silver	U	0.00200								
Sodium	0.0812	0.200								J
Strontium	U	0.00500								
Zinc	U	0.00400								

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-189475** Units: **mg/L** Analysis Date: **08-Feb-2023 16:28**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114888** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05321	0.00200	0.05	0	106	80 - 120				
Barium	0.0526	0.00400	0.05	0	105	80 - 120				
Cadmium	0.05362	0.00200	0.05	0	107	80 - 120				
Calcium	5.286	0.500	5	0	106	80 - 120				
Chromium	0.05038	0.00400	0.05	0	101	80 - 120				
Iron	5.166	0.200	5	0	103	80 - 120				
Lead	0.05278	0.00200	0.05	0	106	80 - 120				
Magnesium	5.333	0.200	5	0	107	80 - 120				
Manganese	0.05285	0.00500	0.05	0	106	80 - 120				
Potassium	5.276	0.200	5	0	106	80 - 120				
Selenium	0.05356	0.00200	0.05	0	107	80 - 120				
Silver	0.05446	0.00200	0.05	0	109	80 - 120				
Sodium	5.155	0.200	5	0	103	80 - 120				
Strontium	0.1079	0.00500	0.1	0	108	80 - 120				
Zinc	0.05377	0.00400	0.05	0	108	80 - 120				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS23011253-02MS** Units: **mg/L** Analysis Date: **08-Feb-2023 16:36**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114892** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05468	0.00200	0.05	0.003453	102	80 - 120				
Barium	0.06918	0.00400	0.05	0.01637	106	80 - 120				
Cadmium	0.05256	0.00200	0.05	0.000007	105	80 - 120				
Calcium	46.1	0.500	5	43.08	60.3	80 - 120				SO
Chromium	0.04874	0.00400	0.05	0.000238	97.0	80 - 120				
Iron	6.75	0.200	5	1.848	98.0	80 - 120				
Lead	0.05219	0.00200	0.05	0.000315	104	80 - 120				
Magnesium	8.345	0.200	5	3.599	94.9	80 - 120				
Manganese	0.2335	0.00500	0.05	0.1892	88.5	80 - 120				
Potassium	5.565	0.200	5	0.5658	100.0	80 - 120				
Selenium	0.05138	0.00200	0.05	0.00015	102	80 - 120				
Silver	0.05325	0.00200	0.05	-0.000003	107	80 - 120				
Sodium	17.64	0.200	5	13.25	87.9	80 - 120				
Strontium	0.2116	0.00500	0.1	0.1001	111	80 - 120				
Zinc	0.05577	0.00400	0.05	0.005267	101	80 - 120				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS23011253-02MSD** Units: **mg/L** Analysis Date: **08-Feb-2023 16:38**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114893** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05516	0.00200	0.05	0.003453	103	80 - 120	0.05468	0.874	20	
Barium	0.06688	0.00400	0.05	0.01637	101	80 - 120	0.06918	3.39	20	
Cadmium	0.05117	0.00200	0.05	0.000007	102	80 - 120	0.05256	2.68	20	
Calcium	46.92	0.500	5	43.08	76.7	80 - 120	46.1	1.76	20	SO
Chromium	0.04895	0.00400	0.05	0.000238	97.4	80 - 120	0.04874	0.434	20	
Iron	6.798	0.200	5	1.848	99.0	80 - 120	6.75	0.711	20	
Lead	0.05176	0.00200	0.05	0.000315	103	80 - 120	0.05219	0.831	20	
Magnesium	8.33	0.200	5	3.599	94.6	80 - 120	8.345	0.176	20	
Manganese	0.2355	0.00500	0.05	0.1892	92.6	80 - 120	0.2335	0.887	20	
Potassium	5.598	0.200	5	0.5658	101	80 - 120	5.565	0.586	20	
Selenium	0.05302	0.00200	0.05	0.00015	106	80 - 120	0.05138	3.15	20	
Silver	0.05213	0.00200	0.05	-0.000003	104	80 - 120	0.05325	2.14	20	
Sodium	17.55	0.200	5	13.25	86.1	80 - 120	17.64	0.514	20	
Strontium	0.2065	0.00500	0.1	0.1001	106	80 - 120	0.2116	2.42	20	
Zinc	0.05597	0.00400	0.05	0.005267	101	80 - 120	0.05577	0.353	20	

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS23011253-02PDS** Units: **mg/L** Analysis Date: **08-Feb-2023 16:40**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114894** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1088	0.00200	0.1	0.003453	105	75 - 125				
Barium	0.122	0.00400	0.1	0.01637	106	75 - 125				
Cadmium	0.1055	0.00200	0.1	0.000007	105	75 - 125				
Calcium	51.92	0.500	10	43.08	88.4	75 - 125				O
Chromium	0.09926	0.00400	0.1	0.000238	99.0	75 - 125				
Iron	11.95	0.200	10	1.848	101	75 - 125				
Lead	0.1039	0.00200	0.1	0.000315	104	75 - 125				
Magnesium	13.46	0.200	10	3.599	98.6	75 - 125				
Manganese	0.285	0.00500	0.1	0.1892	95.7	75 - 125				
Potassium	10.64	0.200	10	0.5658	101	75 - 125				
Selenium	0.1086	0.00200	0.1	0.00015	108	75 - 125				
Silver	0.105	0.00200	0.1	-0.000003	105	75 - 125				
Sodium	22.59	0.200	10	13.25	93.4	75 - 125				
Strontium	0.1995	0.00500	0.1	0.1001	99.3	75 - 125				
Zinc	0.1076	0.00400	0.1	0.005267	102	75 - 125				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189475 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS23011253-02SD** Units: **mg/L** Analysis Date: **08-Feb-2023 16:34**
Client ID: Run ID: **ICPMS06_427569** SeqNo: **7114891** PrepDate: **08-Feb-2023** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.004472	0.0100					0.003453	0	10	J
Barium	0.01589	0.0200					0.01637	0	10	J
Cadmium	U	0.0100					0.000007	0	10	
Calcium	42.57	2.50					43.08	1.19	10	
Chromium	0.01043	0.0200					0.000238	0	10	J
Iron	1.879	1.00					1.848	1.67	10	
Lead	U	0.0100					0.000315	0	10	
Magnesium	3.649	1.00					3.599	1.4	10	
Manganese	0.1891	0.0250					0.1892	0.0523	10	
Potassium	0.634	1.00					0.5658	0	10	J
Selenium	U	0.0100					0.00015	0	10	
Silver	U	0.0100					-0.000003	0	10	
Sodium	13.93	1.00					13.25	5.17	10	
Strontium	0.1003	0.0250					0.1001	0.129	10	
Zinc	U	0.0200					0.005267	0	10	

The following samples were analyzed in this batch: HS23011349-01 HS23011349-02 HS23011349-03 HS23011349-04 HS23011349-05 HS23011349-06 HS23011349-07 HS23011349-08 HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: 189499 (0) **Instrument: HG04** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-189499** Units: **mg/L** Analysis Date: **08-Feb-2023 16:28**
Client ID: Run ID: **HG04_427624** SeqNo: **7115073** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U		0.000200								

LCS Sample ID: **LCS-189499** Units: **mg/L** Analysis Date: **08-Feb-2023 16:30**
Client ID: Run ID: **HG04_427624** SeqNo: **7115074** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00486	0.000200	0.005	0	97.2	80 - 120				

MS Sample ID: **HS23011349-03MS** Units: **mg/L** Analysis Date: **08-Feb-2023 16:51**
Client ID: **Brine Well 7A BS** Run ID: **HG04_427624** SeqNo: **7115078** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00485	0.000200	0.005	0.000007	96.9	75 - 125				

MSD Sample ID: **HS23011349-03MSD** Units: **mg/L** Analysis Date: **08-Feb-2023 16:53**
Client ID: **Brine Well 7A BS** Run ID: **HG04_427624** SeqNo: **7115079** PrepDate: **08-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00486	0.000200	0.005	0.000007	97.1	75 - 125	0.00485	0.206	20	

The following samples were analyzed in this batch:

HS23011349-01	HS23011349-02	HS23011349-03	HS23011349-04
HS23011349-05	HS23011349-06	HS23011349-07	HS23011349-08
HS23011349-09			

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R426800 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230128** Units: **ug/L** Analysis Date: **28-Jan-2023 12:31**
Client ID: Run ID: **VOA7_426800** SeqNo: **7095095** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
Surr: 1,2-Dichloroethane-d4	*48.82*	*1.0*	*50*	*0*	*97.6*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*48.43*	*1.0*	*50*	*0*	*96.9*	*77 - 113*				
Surr: Dibromofluoromethane	*49.11*	*1.0*	*50*	*0*	*98.2*	*73 - 126*				
Surr: Toluene-d8	*50.19*	*1.0*	*50*	*0*	*100*	*81 - 120*				

LCS Sample ID: **VLCSW-230128** Units: **ug/L** Analysis Date: **28-Jan-2023 11:48**
Client ID: Run ID: **VOA7_426800** SeqNo: **7095094** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	19.32	1.0	20	0	96.6	74 - 120				
Ethylbenzene	20.51	1.0	20	0	103	77 - 117				
m,p-Xylene	40.93	2.0	40	0	102	77 - 122				
o-Xylene	20.13	1.0	20	0	101	75 - 119				
Toluene	19.75	1.0	20	0	98.7	77 - 118				
Xylenes, Total	61.07	1.0	60	0	102	75 - 122				
Surr: 1,2-Dichloroethane-d4	*51.12*	*1.0*	*50*	*0*	*102*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*49.77*	*1.0*	*50*	*0*	*99.5*	*77 - 113*				
Surr: Dibromofluoromethane	*49.23*	*1.0*	*50*	*0*	*98.5*	*73 - 126*				
Surr: Toluene-d8	*49.92*	*1.0*	*50*	*0*	*99.8*	*81 - 120*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R426800 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS23011349-09MS** Units: **ug/L** Analysis Date: **28-Jan-2023 20:03**
Client ID: **019-995** Run ID: **VOA7_426800** SeqNo: **7095116** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.84	1.0	20	0	94.2	70 - 127				
Ethylbenzene	19.88	1.0	20	0	99.4	70 - 124				
m,p-Xylene	39.08	2.0	40	0	97.7	70 - 130				
o-Xylene	19.32	1.0	20	0	96.6	70 - 124				
Toluene	19.06	1.0	20	0	95.3	70 - 123				
Xylenes, Total	58.4	1.0	60	0	97.3	70 - 130				
Surr: 1,2-Dichloroethane-d4	*50.98*	*1.0*	*50*	*0*	*102*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*49.44*	*1.0*	*50*	*0*	*98.9*	*77 - 113*				
Surr: Dibromofluoromethane	*50.26*	*1.0*	*50*	*0*	*101*	*77 - 123*				
Surr: Toluene-d8	*49.74*	*1.0*	*50*	*0*	*99.5*	*82 - 127*				

MSD Sample ID: **HS23011349-09MSD** Units: **ug/L** Analysis Date: **28-Jan-2023 20:24**
Client ID: **019-995** Run ID: **VOA7_426800** SeqNo: **7095117** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	17.76	1.0	20	0	88.8	70 - 127	18.84	5.89	20	
Ethylbenzene	18.64	1.0	20	0	93.2	70 - 124	19.88	6.45	20	
m,p-Xylene	37.05	2.0	40	0	92.6	70 - 130	39.08	5.32	20	
o-Xylene	18.13	1.0	20	0	90.6	70 - 124	19.32	6.35	20	
Toluene	17.82	1.0	20	0	89.1	70 - 123	19.06	6.74	20	
Xylenes, Total	55.18	1.0	60	0	92.0	70 - 130	58.4	5.66	20	
Surr: 1,2-Dichloroethane-d4	*51.7*	*1.0*	*50*	*0*	*103*	*70 - 126*	*50.98*	*1.4*	*20*	
Surr: 4-Bromofluorobenzene	*49.39*	*1.0*	*50*	*0*	*98.8*	*77 - 113*	*49.44*	*0.0912*	*20*	
Surr: Dibromofluoromethane	*49.43*	*1.0*	*50*	*0*	*98.9*	*77 - 123*	*50.26*	*1.66*	*20*	
Surr: Toluene-d8	*49.35*	*1.0*	*50*	*0*	*98.7*	*82 - 127*	*49.74*	*0.793*	*20*	

The following samples were analyzed in this batch:

HS23011349-01	HS23011349-02	HS23011349-03	HS23011349-04
HS23011349-05	HS23011349-06	HS23011349-07	HS23011349-08
HS23011349-09			

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R426965 (0) **Instrument: WetChem_HS** **Method: SULFIDE BY SM4500 S2-F-2011**

MBLK Sample ID: **MBLK-R426965** Units: **mg/L** Analysis Date: **31-Jan-2023 15:38**
Client ID: Run ID: **WetChem_HS_426965** SeqNo: **7099187** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	1.00								

LCS Sample ID: **LCS-R426965** Units: **mg/L** Analysis Date: **31-Jan-2023 15:38**
Client ID: Run ID: **WetChem_HS_426965** SeqNo: **7099186** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	21.96	1.00	25	0	87.8	85 - 115				

LCSD Sample ID: **LCSD-R426965** Units: **mg/L** Analysis Date: **31-Jan-2023 15:38**
Client ID: Run ID: **WetChem_HS_426965** SeqNo: **7099185** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.16	1.00	25	0	88.6	85 - 115	21.96	0.907	20	

MS Sample ID: **HS23011349-01MS** Units: **mg/L** Analysis Date: **31-Jan-2023 15:38**
Client ID: **Brine Well 22 BS** Run ID: **WetChem_HS_426965** SeqNo: **7099188** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.16	1.00	25	-1.64	95.2	80 - 120				

The following samples were analyzed in this batch:

HS23011349-01	HS23011349-02	HS23011349-03	HS23011349-04
HS23011349-05	HS23011349-06	HS23011349-07	HS23011349-08
HS23011349-09			

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427041 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-01312023** Units: **mg/L** Analysis Date: **31-Jan-2023 10:30**
Client ID: Run ID: **Balance1_427041** SeqNo: **7101298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **LCS-01312023** Units: **mg/L** Analysis Date: **31-Jan-2023 10:30**
Client ID: Run ID: **Balance1_427041** SeqNo: **7101297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1114	10.0	1000	0	111	85 - 115				

DUP Sample ID: **HS23011380-01DUP** Units: **mg/L** Analysis Date: **31-Jan-2023 10:30**
Client ID: Run ID: **Balance1_427041** SeqNo: **7101291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	838	10.0					838	0	5	

DUP Sample ID: **HS23011349-03DUP** Units: **mg/L** Analysis Date: **31-Jan-2023 10:30**
Client ID: **Brine Well 7A BS** Run ID: **Balance1_427041** SeqNo: **7101281** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	320	10.0					320	0	5	

The following samples were analyzed in this batch: HS23011349-01 HS23011349-02 HS23011349-03 HS23011349-04 HS23011349-05

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427164 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-02012023** Units: **mg/L** Analysis Date: **01-Feb-2023 10:30**
Client ID: Run ID: **Balance1_427164** SeqNo: **7104341** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **LCS-02012023** Units: **mg/L** Analysis Date: **01-Feb-2023 10:30**
Client ID: Run ID: **Balance1_427164** SeqNo: **7104340** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1106	10.0	1000	0	111	85 - 115				

DUP Sample ID: **HS23011472-21DUP** Units: **mg/L** Analysis Date: **01-Feb-2023 10:30**
Client ID: Run ID: **Balance1_427164** SeqNo: **7104335** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	270	10.0					270	0	5	

DUP Sample ID: **HS23011407-04DUP** Units: **mg/L** Analysis Date: **01-Feb-2023 10:30**
Client ID: Run ID: **Balance1_427164** SeqNo: **7104326** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	74	10.0					74	0	5	

The following samples were analyzed in this batch: HS23011349-06 HS23011349-07 HS23011349-08 HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427323 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **04-Feb-2023 10:15**
Client ID: Run ID: **ICS-Integrion_427323** SeqNo: **7108558** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	U	0.100								
Chloride	U	0.500								
Sulfate	U	0.500								

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **04-Feb-2023 10:32**
Client ID: Run ID: **ICS-Integrion_427323** SeqNo: **7108559** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	4.366	0.100	4	0	109	80 - 120				
Chloride	20.06	0.500	20	0	100	80 - 120				
Sulfate	21.06	0.500	20	0	105	80 - 120				

MS Sample ID: **HS23011349-09MS** Units: **mg/L** Analysis Date: **04-Feb-2023 12:57**
Client ID: **019-995** Run ID: **ICS-Integrion_427323** SeqNo: **7108579** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.109	0.100	2	0.0931	101	80 - 120				
Chloride	36.99	0.500	10	28.66	83.2	80 - 120				
Sulfate	14.15	0.500	10	3.634	105	80 - 120				

MSD Sample ID: **HS23011349-09MSD** Units: **mg/L** Analysis Date: **04-Feb-2023 13:02**
Client ID: **019-995** Run ID: **ICS-Integrion_427323** SeqNo: **7108580** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	2.108	0.100	2	0.0931	101	80 - 120	2.109	0.019	20	
Chloride	36.86	0.500	10	28.66	81.9	80 - 120	36.99	0.349	20	
Sulfate	14.09	0.500	10	3.634	105	80 - 120	14.15	0.399	20	

The following samples were analyzed in this batch:

HS23011349-01	HS23011349-02	HS23011349-03	HS23011349-04
HS23011349-05	HS23011349-06	HS23011349-07	HS23011349-08
HS23011349-09			

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427613 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK-R427613** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427613** SeqNo: **7115003** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								

LCS Sample ID: **LCS-R427613** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427613** SeqNo: **7115002** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1071	5.00	1000	0	107	85 - 115				

LCSD Sample ID: **LCSD-R427613** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427613** SeqNo: **7115001** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	919.6	5.00	1000	0	92.0	85 - 115	1071	15.2	20	

DUP Sample ID: **HS23011335-02DUP** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427613** SeqNo: **7115004** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	567.4	5.00					613.9	7.87	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	

The following samples were analyzed in this batch: HS23011349-07 HS23011349-08 HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427662 (0) **Instrument: WetChem_HS** **Method: HYDROGEN SULFIDE BY E376.1**

MBLK Sample ID: **MBLK-R427662** Units: **mg/L** Analysis Date: **31-Jan-2023 10:38**
Client ID: Run ID: **WetChem_HS_427662** SeqNo: **7116115** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	U	1.00								

LCS Sample ID: **LCS-R427662** Units: **mg/L** Analysis Date: **31-Jan-2023 10:38**
Client ID: Run ID: **WetChem_HS_427662** SeqNo: **7116114** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	23.33	1.00	25	0	93.3	80 - 120				

LCSD Sample ID: **LCSD-R427662** Units: **mg/L** Analysis Date: **31-Jan-2023 10:38**
Client ID: Run ID: **WetChem_HS_427662** SeqNo: **7116113** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	23.54	1.00	25	0	94.2	80 - 120	23.33	0.907	20	

The following samples were analyzed in this batch: HS23011349-01 HS23011349-02 HS23011349-03 HS23011349-04 HS23011349-05 HS23011349-06 HS23011349-07 HS23011349-08 HS23011349-09

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427664 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK-R427664** Units: **mg/L** Analysis Date: **08-Feb-2023 19:49**
Client ID: Run ID: **Skalar 03_427664** SeqNo: **7116099** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								

LCS Sample ID: **LCS-R427664** Units: **mg/L** Analysis Date: **08-Feb-2023 19:49**
Client ID: Run ID: **Skalar 03_427664** SeqNo: **7116098** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	969.4	5.00	1000	0	96.9	85 - 115				

LCSD Sample ID: **LCSD-R427664** Units: **mg/L** Analysis Date: **08-Feb-2023 19:49**
Client ID: Run ID: **Skalar 03_427664** SeqNo: **7116097** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	979.8	5.00	1000	0	98.0	85 - 115	969.4	1.07	20	

DUP Sample ID: **HS23011253-03DUP** Units: **mg/L** Analysis Date: **08-Feb-2023 19:49**
Client ID: Run ID: **Skalar 03_427664** SeqNo: **7116100** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	445.7	5.00					447.9	0.492	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	

The following samples were analyzed in this batch: HS23011349-01 HS23011349-02 HS23011349-03 HS23011349-04 HS23011349-05

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011349

QC BATCH REPORT

Batch ID: R427665 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK-R427665** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427665** SeqNo: **7116127** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								

LCS Sample ID: **LCS-R427665** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427665** SeqNo: **7116126** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	987.2	5.00	1000	0	98.7	85 - 115				

LCSD Sample ID: **LCSD-R427665** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427665** SeqNo: **7116125** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	990.2	5.00	1000	0	99.0	85 - 115	987.2	0.303	20	

DUP Sample ID: **HS23011253-01DUP** Units: **mg/L** Analysis Date: **07-Feb-2023 17:45**
Client ID: Run ID: **Skalar 03_427665** SeqNo: **7116353** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	493.2	5.00					601.7	19.8	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	

The following samples were analyzed in this batch: HS23011349-06

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: **HS23011349**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

Sample Receipt Checklist

Work Order ID: HS23011349 **Date/Time Received:** **26-Jan-2023 16:13**

Client Name: ERMSW-HOU **Received by:** **Corey Grandits**

Completed By: */S/ Corey Grandits* (eSignature) 27-Jan-2023 17:34 (Date/Time) **Reviewed by:** */S/ Bernadette A. Fini* (eSignature) 30-Jan-2023 09:15 (Date/Time)

Matrices: **W** Carrier name: **Client**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:287175
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.4UC/0.9C , 1.3UC/0.8C , 2.0UC/1.5C	IR31	
Cooler(s)/Kit(s):	Lg Blue 1-3		
Date/Time sample(s) sent to storage:	1/27/23		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Everett, WA +1 425 356 2600
Fort Collins, CO +1 970 490 1511
Holland, MI +1 616 399 6070

Chain of Custody Form

Page 1 of 1

COC ID: 287175

HS23011349

Environmental Resources Mgmt.
Sulphur Dome

ALS Project Manager:

Customer Information		Project Information			
Purchase Order		Project Name	Sulphur Dome	A	8260_LL_W (Low Level VOC (8260) BTEX)
Work Order		Project Number	0677804	B	MA EPH_W_La (MA EPH)
Company Name	Environmental Resources Mgmt.	Bill To Company	Environmental Resources Mgmt.	C	MA VPH_LA_W (MA VPH)
Send Report To	Scott Himes	Invoice Attn	Accounts Payable	D	9056_anions_W (Cl,SO4,Br)
Address	CityCentre Four 840 W. Sam Houston Pkwy., Suite 6	Address	CityCentre Four 840 W. Sam Houston Pkwy., Suite 6	E	ALK_W 2320B (carb, bicarb)
City/State/Zip	Houston, TX 77024	City/State/Zip	Houston TX 77024	F	H2S_W (H2S)
Phone	(281) 600-1000	Phone	(281) 600-1000	G	HG_W (Mercury)
Fax	(281) 600-1001	Fax	(281) 600-1001	H	ICP_TW (As,Ba,Cd,Ca,Cr,Fe,Pb,Mg,Mn,K,Se,Ag,Na,Sr,Zn)
e-Mail Address	scott.himes@erm.com	e-Mail Address	ERMNAAccountsPayable@erm.com	J	SULFD_4500S F (Sulfide)
				J	TDS_W 2540C (TDS)

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Brine Well 22 BS	1/25/23	1230	W		12	X	X	X	X	X	X	X	X	X	X	
2	6X Brine		1330	W													
3	Brine Well 7A BS		1410	W													
4	Culvert		1600	W													
5	Central Pond		1630	W													
6	019-1055	1/26/23	0800	W													
7	019-582		0830	W													
8	019-580		0910	W													
9	019-995		0945	W													
10																	

Sampler(s) Please Print & Sign: Scott Himes

Shipment Method: Drop off

Required Turnaround Time: (Check Box) ☐ Other ____ ☒ STD 10 Wk Days ☐ 5 Wk Days ☐ 2 Wk Days ☐ 24 Hour

Results Due Date:

Relinquished by: Date: 1/26/23 Time: 1617

Received by:

Relinquished by: Date: Time:

Received by (Laboratory): COURIER 1-26-23 1617

Logged by (Laboratory): Date: Time:

Checked by (Laboratory):

Notes: ERM Sulphur Dome

Cooler ID	Cooler Temp.
LA BLUE	1.4
LA BLUE	1.3
LA TEAL	2.0

QC Package: (Check One Box Below)

☒ Level II Std QC
☐ Level III Std QC/Raw Data
☐ Level IV SW846/CLP
☐ Other
☐ TRRP Checklist
☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

IR91

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

February 14, 2023

Scott Himes
Environmental Resources Mgmt.
CityCentre Four
840 W. Sam Houston Pkwy., Suite 600
Houston, TX 77024

Work Order: **HS23011621**

Laboratory Results for: **Sulphur Dome**

Dear Scott Himes,

ALS Environmental received 3 sample(s) on Jan 30, 2023 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
Bernadette A. Fini
Project Manager

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Work Order: HS23011621

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS23011621-01	CP BS 1	Water		30-Jan-2023 11:00	30-Jan-2023 16:00	☐
HS23011621-02	CP BS 2	Water		30-Jan-2023 11:30	30-Jan-2023 16:00	☐
HS23011621-03	CP BS 3	Water		30-Jan-2023 12:30	30-Jan-2023 16:00	☐

Client: Environmental Resources Mgmt. **CASE NARRATIVE**
Project: Sulphur Dome
Work Order: HS23011621

GC Semivolatiles by Method MA EPH

Batch ID: 189369

Sample ID: HS23020048-04MS

- MS and MSD are for an unrelated sample

GC Volatiles by Method MA VPH

Batch ID: R427540,R427549

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R427341

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020A

Batch ID: 189598

Sample ID: HS23011436-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470A

Batch ID: 189560

Sample ID: HS23020298-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method E376.1

Batch ID: R427869

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R427935

Sample ID: CP BS 1 (HS23011621-01MS)

- The MS and/or MSD recovery was outside of the control limits; however, the result in the parent sample is greater than 4x the spike amount. (Chloride,Sulfate)
- The recovery of the Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) associated with this analyte was outside of the established control limits. However, the LCS was within control limits. The recovery of the MS/MSD may be due to sample matrix interference. (Bromide)

WetChemistry by Method SM2320B

Batch ID: R427809

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Environmental Resources Mgmt. **CASE NARRATIVE**
Project: Sulphur Dome
Work Order: HS23011621

WetChemistry by Method M2540C

Batch ID: R427370

Sample ID: CP BS 3(HS23011621-03DUP)

- Duplicate RPD was above the control limits.

WetChemistry by Method SM4500 S2-F

Batch ID: R427230

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 1
Collection Date: 30-Jan-2023 11:00

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	04-Feb-2023 11:49
Ethylbenzene		U	0.30	1.0	ug/L	1	04-Feb-2023 11:49
m,p-Xylene		U	0.50	2.0	ug/L	1	04-Feb-2023 11:49
o-Xylene		U	0.30	1.0	ug/L	1	04-Feb-2023 11:49
Toluene		U	0.20	1.0	ug/L	1	04-Feb-2023 11:49
Xylenes, Total		U	0.30	1.0	ug/L	1	04-Feb-2023 11:49
Surr: 1,2-Dichloroethane-d4	*99.7*			*70-126*	*%REC*	*1*	*04-Feb-2023 11:49*
Surr: 4-Bromofluorobenzene	*91.0*			*77-113*	*%REC*	*1*	*04-Feb-2023 11:49*
Surr: Dibromofluoromethane	*94.9*			*77-123*	*%REC*	*1*	*04-Feb-2023 11:49*
Surr: Toluene-d8	*109*			*82-127*	*%REC*	*1*	*04-Feb-2023 11:49*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: PJM
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	07-Feb-2023 18:57
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 18:57
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 18:57
Surr: 2,5-Dibromotoluene (Aliphatic)	*118*			*70-130*	*%REC*	*1*	*07-Feb-2023 18:57*
Surr: 2,5-Dibromotoluene (Aromatic)	*113*			*70-130*	*%REC*	*1*	*07-Feb-2023 18:57*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 06-Feb-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	11-Feb-2023 03:56
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	11-Feb-2023 03:56
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	11-Feb-2023 03:56
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	14-Feb-2023 02:23
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	14-Feb-2023 02:23
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	14-Feb-2023 02:23
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	14-Feb-2023 02:23
Surr: 1-Chlorooctadecane	*84.8*			*40-140*	*%REC*	*1*	*11-Feb-2023 03:56*
Surr: 2-Bromonaphthalene	*111*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:23*
Surr: 2-Fluorobiphenyl	*72.1*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:23*
Surr: o-Terphenyl	*97.4*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:23*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 1
Collection Date: 30-Jan-2023 11:00

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-01
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 10-Feb-2023		Analyst: JC
Arsenic	**0.000862**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Feb-2023 22:17
Barium	**0.160**		**0.00190**	**0.00400**	**mg/L**	1	10-Feb-2023 22:17
Cadmium	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:17
Calcium	**75.3**		**0.0340**	**0.500**	**mg/L**	1	10-Feb-2023 22:17
Chromium	U		0.000400	0.00400	mg/L	1	10-Feb-2023 22:17
Iron	**0.132**	J	**0.0120**	**0.200**	**mg/L**	1	10-Feb-2023 22:17
Lead	U		0.000600	0.00200	mg/L	1	10-Feb-2023 22:17
Magnesium	**15.0**		**0.0100**	**0.200**	**mg/L**	1	10-Feb-2023 22:17
Manganese	**0.266**		**0.000700**	**0.00500**	**mg/L**	1	10-Feb-2023 22:17
Potassium	**2.90**		**0.0180**	**0.200**	**mg/L**	1	10-Feb-2023 22:17
Selenium	U		0.00110	0.00200	mg/L	1	10-Feb-2023 22:17
Silver	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:17
Sodium	**174**		**0.140**	**2.00**	**mg/L**	10	13-Feb-2023 13:02
Strontium	**0.556**		**0.000200**	**0.00500**	**mg/L**	1	10-Feb-2023 22:17
Zinc	**0.00452**		**0.00200**	**0.00400**	**mg/L**	1	10-Feb-2023 22:17
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 09-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	09-Feb-2023 17:28
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	03-Feb-2023 12:28
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**80.0**		**5.00**	**10.0**	**mg/L**	1	03-Feb-2023 16:00
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**241**		**5.00**	**5.00**	**mg/L**	1	10-Feb-2023 12:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	10-Feb-2023 12:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	03-Feb-2023 11:23
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	14-Feb-2023 01:32
Chloride	**308**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 01:49
Sulfate	**113**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 01:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 2
Collection Date: 30-Jan-2023 11:30

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	04-Feb-2023 12:11
Ethylbenzene		U	0.30	1.0	ug/L	1	04-Feb-2023 12:11
m,p-Xylene		U	0.50	2.0	ug/L	1	04-Feb-2023 12:11
o-Xylene		U	0.30	1.0	ug/L	1	04-Feb-2023 12:11
Toluene		U	0.20	1.0	ug/L	1	04-Feb-2023 12:11
Xylenes, Total		U	0.30	1.0	ug/L	1	04-Feb-2023 12:11
Surr: 1,2-Dichloroethane-d4	*99.9*			*70-126*	*%REC*	*1*	*04-Feb-2023 12:11*
Surr: 4-Bromofluorobenzene	*91.5*			*77-113*	*%REC*	*1*	*04-Feb-2023 12:11*
Surr: Dibromofluoromethane	*96.3*			*77-123*	*%REC*	*1*	*04-Feb-2023 12:11*
Surr: Toluene-d8	*109*			*82-127*	*%REC*	*1*	*04-Feb-2023 12:11*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: PJM
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	07-Feb-2023 19:35
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 19:35
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 19:35
Surr: 2,5-Dibromotoluene (Aliphatic)	*119*			*70-130*	*%REC*	*1*	*07-Feb-2023 19:35*
Surr: 2,5-Dibromotoluene (Aromatic)	*111*			*70-130*	*%REC*	*1*	*07-Feb-2023 19:35*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 06-Feb-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	11-Feb-2023 04:28
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	11-Feb-2023 04:28
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	11-Feb-2023 04:28
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	14-Feb-2023 02:55
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	14-Feb-2023 02:55
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	14-Feb-2023 02:55
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	14-Feb-2023 02:55
Surr: 1-Chlorooctadecane	*77.2*			*40-140*	*%REC*	*1*	*11-Feb-2023 04:28*
Surr: 2-Bromonaphthalene	*122*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:55*
Surr: 2-Fluorobiphenyl	*67.3*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:55*
Surr: o-Terphenyl	*114*			*40-140*	*%REC*	*1*	*14-Feb-2023 02:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 2
Collection Date: 30-Jan-2023 11:30

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-02
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 10-Feb-2023		Analyst: JC
Arsenic	**0.000868**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Feb-2023 22:19
Barium	**0.367**		**0.00190**	**0.00400**	**mg/L**	1	10-Feb-2023 22:19
Cadmium	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:19
Calcium	**64.2**		**0.0340**	**0.500**	**mg/L**	1	10-Feb-2023 22:19
Chromium	U		0.000400	0.00400	mg/L	1	10-Feb-2023 22:19
Iron	**0.0258**	J	**0.0120**	**0.200**	**mg/L**	1	10-Feb-2023 22:19
Lead	U		0.000600	0.00200	mg/L	1	10-Feb-2023 22:19
Magnesium	**12.6**		**0.0100**	**0.200**	**mg/L**	1	10-Feb-2023 22:19
Manganese	**0.458**		**0.000700**	**0.00500**	**mg/L**	1	10-Feb-2023 22:19
Potassium	**2.58**		**0.0180**	**0.200**	**mg/L**	1	10-Feb-2023 22:19
Selenium	U		0.00110	0.00200	mg/L	1	10-Feb-2023 22:19
Silver	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:19
Sodium	**166**		**0.0140**	**0.200**	**mg/L**	1	10-Feb-2023 22:19
Strontium	**0.482**		**0.000200**	**0.00500**	**mg/L**	1	10-Feb-2023 22:19
Zinc	**0.00213**	J	**0.00200**	**0.00400**	**mg/L**	1	10-Feb-2023 22:19
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 09-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	09-Feb-2023 17:30
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	03-Feb-2023 12:28
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**512**		**5.00**	**10.0**	**mg/L**	1	03-Feb-2023 16:00
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**238**		**5.00**	**5.00**	**mg/L**	1	10-Feb-2023 12:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	10-Feb-2023 12:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	03-Feb-2023 11:23
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	14-Feb-2023 01:55
Chloride	**296**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 02:01
Sulfate	**111**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 02:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 3
Collection Date: 30-Jan-2023 12:30

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
LOW LEVEL VOLATILES BY SW8260C		**Method:SW8260**					Analyst: AKP
Benzene		U	0.20	1.0	ug/L	1	04-Feb-2023 12:32
Ethylbenzene		U	0.30	1.0	ug/L	1	04-Feb-2023 12:32
m,p-Xylene		U	0.50	2.0	ug/L	1	04-Feb-2023 12:32
o-Xylene		U	0.30	1.0	ug/L	1	04-Feb-2023 12:32
Toluene		U	0.20	1.0	ug/L	1	04-Feb-2023 12:32
Xylenes, Total		U	0.30	1.0	ug/L	1	04-Feb-2023 12:32
Surr: 1,2-Dichloroethane-d4	*99.3*			*70-126*	*%REC*	*1*	*04-Feb-2023 12:32*
Surr: 4-Bromofluorobenzene	*91.9*			*77-113*	*%REC*	*1*	*04-Feb-2023 12:32*
Surr: Dibromofluoromethane	*97.1*			*77-123*	*%REC*	*1*	*04-Feb-2023 12:32*
Surr: Toluene-d8	*109*			*82-127*	*%REC*	*1*	*04-Feb-2023 12:32*
MASSACHUSETTS VPH, FEB 2018, REV 2.1		**Method:MA VPH**					Analyst: PJM
Aliphatics >C6 - C8		U	0.0100	0.0100	mg/L	1	07-Feb-2023 20:13
Aliphatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 20:13
Aromatics >C8 - C10		U	0.0100	0.0100	mg/L	1	07-Feb-2023 20:13
Surr: 2,5-Dibromotoluene (Aliphatic)	*117*			*70-130*	*%REC*	*1*	*07-Feb-2023 20:13*
Surr: 2,5-Dibromotoluene (Aromatic)	*117*			*70-130*	*%REC*	*1*	*07-Feb-2023 20:13*
MASSACHUSETTS EPH R2.1, DEC 2019		**Method:MA EPH**			Prep:SW3510 / 06-Feb-2023		Analyst: PPM
Aliphatics >C10 - C12		U	0.00100	0.00100	mg/L	1	11-Feb-2023 04:59
Aliphatics >C12 - C16		U	0.00200	0.00200	mg/L	1	11-Feb-2023 04:59
Aliphatics >C16 - C35		U	0.00800	0.00800	mg/L	1	11-Feb-2023 04:59
Aromatics >C10 - C12		U	0.00100	0.00100	mg/L	1	14-Feb-2023 03:27
Aromatics >C12 - C16		U	0.00400	0.00400	mg/L	1	14-Feb-2023 03:27
Aromatics >C16 - C21		U	0.00300	0.00300	mg/L	1	14-Feb-2023 03:27
Aromatics >C21 - C35		U	0.00900	0.00900	mg/L	1	14-Feb-2023 03:27
Surr: 1-Chlorooctadecane	*63.5*			*40-140*	*%REC*	*1*	*11-Feb-2023 04:59*
Surr: 2-Bromonaphthalene	*131*			*40-140*	*%REC*	*1*	*14-Feb-2023 03:27*
Surr: 2-Fluorobiphenyl	*128*			*40-140*	*%REC*	*1*	*14-Feb-2023 03:27*
Surr: o-Terphenyl	*103*			*40-140*	*%REC*	*1*	*14-Feb-2023 03:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
Sample ID: CP BS 3
Collection Date: 30-Jan-2023 12:30

ANALYTICAL REPORT
WorkOrder:HS23011621
Lab ID:HS23011621-03
Matrix:Water

ANALYSES	RESULT	QUAL	MDL	REPORT LIMIT	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020A**			Prep:SW3010A / 10-Feb-2023		Analyst: JC
Arsenic	**0.000769**	J	**0.000400**	**0.00200**	**mg/L**	1	10-Feb-2023 22:21
Barium	**0.155**		**0.00190**	**0.00400**	**mg/L**	1	10-Feb-2023 22:21
Cadmium	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:21
Calcium	**77.7**		**0.0340**	**0.500**	**mg/L**	1	10-Feb-2023 22:21
Chromium	U		0.000400	0.00400	mg/L	1	10-Feb-2023 22:21
Iron	**0.125**	J	**0.0120**	**0.200**	**mg/L**	1	10-Feb-2023 22:21
Lead	U		0.000600	0.00200	mg/L	1	10-Feb-2023 22:21
Magnesium	**15.0**		**0.0100**	**0.200**	**mg/L**	1	10-Feb-2023 22:21
Manganese	**0.232**		**0.000700**	**0.00500**	**mg/L**	1	10-Feb-2023 22:21
Potassium	**2.86**		**0.0180**	**0.200**	**mg/L**	1	10-Feb-2023 22:21
Selenium	U		0.00110	0.00200	mg/L	1	10-Feb-2023 22:21
Silver	U		0.000200	0.00200	mg/L	1	10-Feb-2023 22:21
Sodium	**19.1**		**0.140**	**2.00**	**mg/L**	10	13-Feb-2023 13:04
Strontium	**0.578**		**0.000200**	**0.00500**	**mg/L**	1	10-Feb-2023 22:21
Zinc	**0.00748**		**0.00200**	**0.00400**	**mg/L**	1	10-Feb-2023 22:21
MERCURY BY SW7470A		**Method:SW7470A**			Prep:SW7470A / 09-Feb-2023		Analyst: JS
Mercury	U		0.0000300	0.000200	mg/L	1	09-Feb-2023 17:31
HYDROGEN SULFIDE BY E376.1		**Method:E376.1**					Analyst: CD
Hydrogen Sulfide	U		0.500	1.00	mg/L	1	03-Feb-2023 12:28
TOTAL DISSOLVED SOLIDS BY SM2540C -2011		**Method:M2540C**					Analyst: DC
Total Dissolved Solids (Residue, Filterable)	**892**		**5.00**	**10.0**	**mg/L**	1	03-Feb-2023 16:00
ALKALINITY BY SM 2320B-2011		**Method:SM2320B**					Analyst: JAC
Alkalinity, Bicarbonate (As CaCO3)	**245**		**5.00**	**5.00**	**mg/L**	1	10-Feb-2023 12:49
Alkalinity, Carbonate (As CaCO3)	U		5.00	5.00	mg/L	1	10-Feb-2023 12:49
SULFIDE BY SM4500 S2-F-2011		**Method:SM4500 S2-F**					Analyst: CD
Sulfide	U		1.00	1.00	mg/L	1	03-Feb-2023 11:23
ANIONS BY SW9056A		**Method:SW9056**					Analyst: TH
Bromide	U		0.0300	0.100	mg/L	1	14-Feb-2023 02:07
Chloride	**343**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 02:12
Sulfate	**135**		**2.00**	**5.00**	**mg/L**	10	14-Feb-2023 02:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Weight / Prep Log

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

Batch ID: 189369 **Start Date:** 06 Feb 2023 11:52 **End Date:** 06 Feb 2023 14:30
Method: MA EPH EXTRACTION-FRACTIONATION **Prep Code:** MA EPH_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011621-01	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011621-02	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2
HS23011621-03	1	1000 (mL)	2 (mL)	0.002	1-litre amber glass, HCL to pH <2

Batch ID: 189560 **Start Date:** 09 Feb 2023 10:00 **End Date:** 09 Feb 2023 13:00
Method: MERCURY PREP BY 7470A- WATER **Prep Code:** HG_WPR

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011621-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011621-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011621-03		10 (mL)	10 (mL)	1	120 plastic HNO3

Batch ID: 189598 **Start Date:** 10 Feb 2023 13:00 **End Date:** 10 Feb 2023 17:00
Method: WATER - SW3010A **Prep Code:** 3010A

Sample ID	Container	Sample Wt/Vol	Final Volume	Prep Factor	
HS23011621-01		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011621-02		10 (mL)	10 (mL)	1	120 plastic HNO3
HS23011621-03		10 (mL)	10 (mL)	1	120 plastic HNO3

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: 189369 (0)	**Test Name :** MASSACHUSETTS EPH R2.1, DEC 2019				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00		06 Feb 2023 11:52	14 Feb 2023 02:23	1
HS23011621-01	CP BS 1	30 Jan 2023 11:00		06 Feb 2023 11:52	11 Feb 2023 03:56	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30		06 Feb 2023 11:52	14 Feb 2023 02:55	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30		06 Feb 2023 11:52	11 Feb 2023 04:28	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30		06 Feb 2023 11:52	14 Feb 2023 03:27	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30		06 Feb 2023 11:52	11 Feb 2023 04:59	1
Batch ID: 189560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00		09 Feb 2023 10:00	09 Feb 2023 17:28	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30		09 Feb 2023 10:00	09 Feb 2023 17:30	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30		09 Feb 2023 10:00	09 Feb 2023 17:31	1
Batch ID: 189598 (0)	**Test Name :** ICP-MS METALS BY SW6020A				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00		10 Feb 2023 13:00	13 Feb 2023 13:02	10
HS23011621-01	CP BS 1	30 Jan 2023 11:00		10 Feb 2023 13:00	10 Feb 2023 22:17	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30		10 Feb 2023 13:00	10 Feb 2023 22:19	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30		10 Feb 2023 13:00	13 Feb 2023 13:04	10
HS23011621-03	CP BS 3	30 Jan 2023 12:30		10 Feb 2023 13:00	10 Feb 2023 22:21	1
Batch ID: R427230 (0)	**Test Name :** SULFIDE BY SM4500 S2-F-2011				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			03 Feb 2023 11:23	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			03 Feb 2023 11:23	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			03 Feb 2023 11:23	1
Batch ID: R427341 (0)	**Test Name :** LOW LEVEL VOLATILES BY SW8260C				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			04 Feb 2023 11:49	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			04 Feb 2023 12:11	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			04 Feb 2023 12:32	1
Batch ID: R427370 (0)	**Test Name :** TOTAL DISSOLVED SOLIDS BY SM2540C-2011				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			03 Feb 2023 16:00	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			03 Feb 2023 16:00	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			03 Feb 2023 16:00	1
Batch ID: R427540 (0)	**Test Name :** MASSACHUSETTS VPH, FEB 2018, REV 2.1				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			07 Feb 2023 18:57	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			07 Feb 2023 19:35	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			07 Feb 2023 20:13	1
Batch ID: R427549 (0)	**Test Name :** MASSACHUSETTS VPH, FEB 2018, REV 2.1				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			07 Feb 2023 18:57	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			07 Feb 2023 19:35	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			07 Feb 2023 20:13	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

DATES REPORT

Sample ID	Client Samp ID	Collection Date	Leachate Date	Prep Date	Analysis Date	DF
Batch ID: R427809 (0)	**Test Name :** ALKALINITY BY SM 2320B-2011				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			10 Feb 2023 12:49	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			10 Feb 2023 12:49	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			10 Feb 2023 12:49	1
Batch ID: R427869 (0)	**Test Name :** HYDROGEN SULFIDE BY E376.1				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			03 Feb 2023 12:28	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			03 Feb 2023 12:28	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			03 Feb 2023 12:28	1
Batch ID: R427935 (0)	**Test Name :** ANIONS BY SW9056A				**Matrix:** Water	
HS23011621-01	CP BS 1	30 Jan 2023 11:00			14 Feb 2023 01:49	10
HS23011621-01	CP BS 1	30 Jan 2023 11:00			14 Feb 2023 01:32	1
HS23011621-02	CP BS 2	30 Jan 2023 11:30			14 Feb 2023 02:01	10
HS23011621-02	CP BS 2	30 Jan 2023 11:30			14 Feb 2023 01:55	1
HS23011621-03	CP BS 3	30 Jan 2023 12:30			14 Feb 2023 02:12	10
HS23011621-03	CP BS 3	30 Jan 2023 12:30			14 Feb 2023 02:07	1

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189369 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

MBLK Sample ID: **MBLK-189369** Units: **mg/L** Analysis Date: **10-Feb-2023 21:38**
Client ID: Run ID: **FID-7_427962** SeqNo: **7122864** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	U	0.00100								
Aliphatics >C12 - C16	U	0.00200								
Aliphatics >C16 - C35	U	0.00800								
Surr: 1-Chlorooctadecane	*0.02901*	*0*	*0.04*	*0*	*72.5*	*40 - 140*				

MBLK Sample ID: **MBLK-189369** Units: **mg/L** Analysis Date: **13-Feb-2023 20:05**
Client ID: Run ID: **FID-8_427951** SeqNo: **7122643** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	U	0.00100								
Aromatics >C12 - C16	U	0.00400								
Aromatics >C16 - C21	U	0.00300								
Aromatics >C21 - C35	U	0.00900								
Surr: 2-Bromonaphthalene	*0.04412*	*0*	*0.04*	*0*	*110*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.04002*	*0*	*0.04*	*0*	*100*	*40 - 140*				
Surr: o-Terphenyl	*0.03357*	*0*	*0.04*	*0*	*83.9*	*40 - 140*				

LCS Sample ID: **LCS-189369** Units: **mg/L** Analysis Date: **10-Feb-2023 22:10**
Client ID: Run ID: **FID-7_427962** SeqNo: **7122865** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.05792	0.00100	0.05	0	116	40 - 140				
Aliphatics >C12 - C16	0.1203	0.00200	0.1	0	120	40 - 140				
Aliphatics >C16 - C35	0.4216	0.00800	0.4	0	105	40 - 140				
Surr: 1-Chlorooctadecane	*0.03294*	*0*	*0.04*	*0*	*82.3*	*40 - 140*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189369 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

LCS Sample ID: **LCS-189369** Units: **mg/L** Analysis Date: **13-Feb-2023 20:36**
Client ID: Run ID: **FID-8_427951** SeqNo: **7122644** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.05207	0.00100	0.05	0	104	40 - 140				
Aromatics >C12 - C16	0.2177	0.00400	0.2	0	109	40 - 140				
Aromatics >C16 - C21	0.1905	0.00300	0.15	0	127	40 - 140				
Aromatics >C21 - C35	0.5759	0.00900	0.45	0	128	40 - 140				
Surr: 2-Bromonaphthalene	*0.04841*	*0*	*0.04*	*0*	*121*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.02984*	*0*	*0.04*	*0*	*74.6*	*40 - 140*				
Surr: o-Terphenyl	*0.04001*	*0*	*0.04*	*0*	*100*	*40 - 140*				

MS Sample ID: **HS23020048-04MS** Units: **mg/L** Analysis Date: **11-Feb-2023 07:37**
Client ID: Run ID: **FID-7_427962** SeqNo: **7122882** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.05096	0.00100	0.05	0	102	40 - 140				
Aliphatics >C12 - C16	0.1068	0.00200	0.1	0	107	40 - 140				
Aliphatics >C16 - C35	0.4667	0.00800	0.4	0	117	40 - 140				
Surr: 1-Chlorooctadecane	*0.03437*	*0*	*0.04*	*0*	*85.9*	*40 - 140*				

MS Sample ID: **HS23020048-04MS** Units: **mg/L** Analysis Date: **14-Feb-2023 06:04**
Client ID: Run ID: **FID-8_427951** SeqNo: **7122667** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.06965	0.00100	0.05	0	139	40 - 140				
Aromatics >C12 - C16	0.2691	0.00400	0.2	0	135	40 - 140				
Aromatics >C16 - C21	0.2228	0.00300	0.15	0	149	40 - 140				S
Aromatics >C21 - C35	0.6892	0.00900	0.45	0	153	40 - 140				S
Surr: 2-Bromonaphthalene	*0.05281*	*0*	*0.04*	*0*	*132*	*40 - 140*				
Surr: 2-Fluorobiphenyl	*0.04429*	*0*	*0.04*	*0*	*111*	*40 - 140*				
Surr: o-Terphenyl	*0.04594*	*0*	*0.04*	*0*	*115*	*40 - 140*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189369 (0) **Instrument: FID-7** **Method: MASSACHUSETTS EPH R2.1, DEC 2019**

MSD Sample ID: **HS23020048-04MSD** Units: **mg/L** Analysis Date: **11-Feb-2023 08:08**
Client ID: Run ID: **FID-7_427962** SeqNo: **7122883** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C10 - C12	0.04895	0.00100	0.05	0	97.9	40 - 140	0.05096	4.02	50	
Aliphatics >C12 - C16	0.103	0.00200	0.1	0	103	40 - 140	0.1068	3.68	50	
Aliphatics >C16 - C35	0.4655	0.00800	0.4	0	116	40 - 140	0.4667	0.25	50	
Surr: 1-Chlorooctadecane	*0.03332*	*0*	*0.04*	*0*	*83.3*	*40 - 140*	*0.03437*	*3.12*	*50*	

MSD Sample ID: **HS23020048-04MSD** Units: **mg/L** Analysis Date: **14-Feb-2023 06:36**
Client ID: Run ID: **FID-8_427951** SeqNo: **7122668** PrepDate: **06-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C10 - C12	0.05973	0.00100	0.05	0	119	40 - 140	0.06965	15.3	50	
Aromatics >C12 - C16	0.2318	0.00400	0.2	0	116	40 - 140	0.2691	14.9	50	
Aromatics >C16 - C21	0.1951	0.00300	0.15	0	130	40 - 140	0.2228	13.3	50	
Aromatics >C21 - C35	0.6294	0.00900	0.45	0	140	40 - 140	0.6892	9.08	50	
Surr: 2-Bromonaphthalene	*0.04487*	*0*	*0.04*	*0*	*112*	*40 - 140*	*0.05281*	*16.3*	*50*	
Surr: 2-Fluorobiphenyl	*0.03961*	*0*	*0.04*	*0*	*99.0*	*40 - 140*	*0.04429*	*11.2*	*50*	
Surr: o-Terphenyl	*0.04115*	*0*	*0.04*	*0*	*103*	*40 - 140*	*0.04594*	*11*	*50*	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427540 (0) **Instrument:** FID-14 **Method:** MASSACHUSETTS VPH, FEB 2018, REV 2.1

MBLK Sample ID: **MBLK-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 18:18**
Client ID: Run ID: **FID-14_427540** SeqNo: **7113700** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	U	0.0100								
Aliphatics >C8 - C10	U	0.0100								
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.2933*	*0.0100*	*0.25*	*0*	*117*	*70 - 130*				

LCS Sample ID: **LCS-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 16:24**
Client ID: Run ID: **FID-14_427540** SeqNo: **7113697** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	0.02447	0.0100	0.025	0	97.9	70 - 130				
Aliphatics >C8 - C10	0.02458	0.0100	0.025	0	98.3	70 - 130				
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.2964*	*0.0100*	*0.25*	*0*	*119*	*70 - 130*				

LCSD Sample ID: **LCSD-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 17:02**
Client ID: Run ID: **FID-14_427540** SeqNo: **7113698** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aliphatics >C6 - C8	0.02544	0.0100	0.025	0	102	70 - 130	0.02447	3.89	25	
Aliphatics >C8 - C10	0.02482	0.0100	0.025	0	99.3	70 - 130	0.02458	0.955	25	
Surr: 2,5-Dibromotoluene (Aliphatic)	*0.2959*	*0.0100*	*0.25*	*0*	*118*	*70 - 130*	*0.2964*	*0.141*	*25*	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427549 (0) **Instrument: FID-15** **Method: MASSACHUSETTS VPH, FEB 2018, REV 2.1**

MBLK Sample ID: **MBLK-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 18:18**
Client ID: Run ID: **FID-15_427549** SeqNo: **7113997** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	U	0.0100								
Surr: 2,5-Dibromotoluene (Aromatic)	*0.2825*	*0.0100*	*0.25*	*0*	*113*	*70 - 130*				

LCS Sample ID: **LCS-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 16:24**
Client ID: Run ID: **FID-15_427549** SeqNo: **7113995** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	0.09332	0.0100	0.1	0	93.3	70 - 130				
Surr: 2,5-Dibromotoluene (Aromatic)	*0.2962*	*0.0100*	*0.25*	*0*	*118*	*70 - 130*				

LCSD Sample ID: **LCSD-230207** Units: **mg/L** Analysis Date: **07-Feb-2023 17:02**
Client ID: Run ID: **FID-15_427549** SeqNo: **7113996** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aromatics >C8 - C10	0.09502	0.0100	0.1	0	95.0	70 - 130	0.09332	1.81	25	
Surr: 2,5-Dibromotoluene (Aromatic)	*0.2974*	*0.0100*	*0.25*	*0*	*119*	*70 - 130*	*0.2962*	*0.403*	*25*	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189560 (0) **Instrument: HG04** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-189560** Units: **mg/L** Analysis Date: **09-Feb-2023 17:24**
Client ID: Run ID: **HG04_427717** SeqNo: **7117340** PrepDate: **09-Feb-2023** DF: **1**

Analyte	Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U		0.000200								

LCS Sample ID: **LCS-189560** Units: **mg/L** Analysis Date: **09-Feb-2023 17:26**
Client ID: Run ID: **HG04_427717** SeqNo: **7117341** PrepDate: **09-Feb-2023** DF: **1**

Analyte	Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00499		0.000200	0.005	0	99.8	80 - 120				

MS Sample ID: **HS23020298-01MS** Units: **mg/L** Analysis Date: **09-Feb-2023 17:58**
Client ID: Run ID: **HG04_427717** SeqNo: **7117349** PrepDate: **09-Feb-2023** DF: **1**

Analyte	Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00172		0.000200	0.005	0.000014	34.1	75 - 125				S

MSD Sample ID: **HS23020298-01MSD** Units: **mg/L** Analysis Date: **09-Feb-2023 17:59**
Client ID: Run ID: **HG04_427717** SeqNo: **7117350** PrepDate: **09-Feb-2023** DF: **1**

Analyte	Result		PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00159		0.000200	0.005	0.000014	31.5	75 - 125	0.00172	7.85	20	S

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189598 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-189598** Units: **mg/L** Analysis Date: **10-Feb-2023 19:38**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120141** PrepDate: **10-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	U	0.00200								
Barium	U	0.00400								
Cadmium	U	0.00200								
Calcium	U	0.500								
Chromium	U	0.00400								
Iron	U	0.200								
Lead	U	0.00200								
Magnesium	0.01078	0.200								J
Manganese	U	0.00500								
Potassium	U	0.200								
Selenium	U	0.00200								
Silver	U	0.00200								
Sodium	U	0.200								
Strontium	U	0.00500								
Zinc	U	0.00400								

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189598 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-189598** Units: **mg/L** Analysis Date: **10-Feb-2023 19:40**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120142** PrepDate: **10-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.046	0.00200	0.05	0	92.0	80 - 120				
Barium	0.04713	0.00400	0.05	0	94.3	80 - 120				
Cadmium	0.04794	0.00200	0.05	0	95.9	80 - 120				
Calcium	4.742	0.500	5	0	94.8	80 - 120				
Chromium	0.04613	0.00400	0.05	0	92.3	80 - 120				
Iron	4.609	0.200	5	0	92.2	80 - 120				
Lead	0.04782	0.00200	0.05	0	95.6	80 - 120				
Magnesium	4.58	0.200	5	0	91.6	80 - 120				
Manganese	0.04608	0.00500	0.05	0	92.2	80 - 120				
Potassium	4.595	0.200	5	0	91.9	80 - 120				
Selenium	0.04608	0.00200	0.05	0	92.2	80 - 120				
Silver	0.04853	0.00200	0.05	0	97.1	80 - 120				
Sodium	4.715	0.200	5	0	94.3	80 - 120				
Strontium	0.09576	0.00500	0.1	0	95.8	80 - 120				
Zinc	0.04802	0.00400	0.05	0	96.0	80 - 120				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189598 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS23011436-01MS** Units: **mg/L** Analysis Date: **10-Feb-2023 19:46**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120145** PrepDate: **10-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05557	0.00200	0.05	0.008224	94.7	80 - 120				
Barium	0.2066	0.00400	0.05	0.1511	111	80 - 120				
Cadmium	0.04772	0.00200	0.05	0.000007	95.4	80 - 120				
Calcium	160.5	0.500	5	157.1	67.6	80 - 120				SO
Chromium	0.04668	0.00400	0.05	0.000102	93.2	80 - 120				
Iron	7.715	0.200	5	3.166	91.0	80 - 120				
Lead	0.0499	0.00200	0.05	0.000113	99.6	80 - 120				
Magnesium	18.82	0.200	5	14.15	93.5	80 - 120				
Manganese	0.6736	0.00500	0.05	0.6235	100	80 - 120				O
Potassium	6.944	0.200	5	2.323	92.4	80 - 120				
Selenium	0.04534	0.00200	0.05	0.000269	90.1	80 - 120				
Silver	0.04738	0.00200	0.05	0.000002	94.8	80 - 120				
Sodium	80.45	0.200	5	75.1	107	80 - 120				O
Strontium	1.938	0.00500	0.1	1.8	138	80 - 120				SEO
Zinc	0.04785	0.00400	0.05	0.002329	91.0	80 - 120				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189598 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS23011436-01MSD** Units: **mg/L** Analysis Date: **10-Feb-2023 19:48**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120146** PrepDate: **10-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05515	0.00200	0.05	0.008224	93.9	80 - 120	0.05557	0.755	20	
Barium	0.2041	0.00400	0.05	0.1511	106	80 - 120	0.2066	1.18	20	
Cadmium	0.0473	0.00200	0.05	0.000007	94.6	80 - 120	0.04772	0.901	20	
Calcium	160.4	0.500	5	157.1	66.0	80 - 120	160.5	0.0515	20	SO
Chromium	0.04648	0.00400	0.05	0.000102	92.8	80 - 120	0.04668	0.423	20	
Iron	7.694	0.200	5	3.166	90.6	80 - 120	7.715	0.27	20	
Lead	0.04847	0.00200	0.05	0.000113	96.7	80 - 120	0.0499	2.9	20	
Magnesium	18.71	0.200	5	14.15	91.3	80 - 120	18.82	0.576	20	
Manganese	0.677	0.00500	0.05	0.6235	107	80 - 120	0.6736	0.509	20	O
Potassium	6.922	0.200	5	2.323	92.0	80 - 120	6.944	0.313	20	
Selenium	0.04589	0.00200	0.05	0.000269	91.2	80 - 120	0.04534	1.21	20	
Silver	0.04707	0.00200	0.05	0.000002	94.1	80 - 120	0.04738	0.671	20	
Sodium	80.09	0.200	5	75.1	99.9	80 - 120	80.45	0.441	20	O
Strontium	1.951	0.00500	0.1	1.8	152	80 - 120	1.938	0.704	20	SEO
Zinc	0.04911	0.00400	0.05	0.002329	93.6	80 - 120	0.04785	2.61	20	

PDS Sample ID: **HS23011436-01PDS** Units: **mg/L** Analysis Date: **10-Feb-2023 19:50**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120147** PrepDate: **10-Feb-2023** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1049	0.00200	0.1	0.008224	96.7	75 - 125				
Barium	0.2486	0.00400	0.1	0.1511	97.5	75 - 125				
Cadmium	0.09679	0.00200	0.1	0.000007	96.8	75 - 125				
Calcium	165.8	0.500	10	157.1	87.0	75 - 125				O
Chromium	0.09569	0.00400	0.1	0.000102	95.6	75 - 125				
Iron	12.55	0.200	10	3.166	93.9	75 - 125				
Lead	0.09731	0.00200	0.1	0.000113	97.2	75 - 125				
Magnesium	23.39	0.200	10	14.15	92.5	75 - 125				
Manganese	0.7173	0.00500	0.1	0.6235	93.8	75 - 125				O
Potassium	11.83	0.200	10	2.323	95.1	75 - 125				
Selenium	0.09459	0.00200	0.1	0.000269	94.3	75 - 125				
Silver	0.09264	0.00200	0.1	0.000002	92.6	75 - 125				
Sodium	85.2	0.200	10	75.1	101	75 - 125				O
Zinc	0.09723	0.00400	0.1	0.002329	94.9	75 - 125				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: 189598 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS23011436-01PDS** Units: **mg/L** Analysis Date: **13-Feb-2023 13:37**
Client ID: Run ID: **ICPMS06_427871** SeqNo: **7120970** PrepDate: **10-Feb-2023** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Strontium	3.397	0.100	2	1.771	81.3	75 - 125				

SD Sample ID: **HS23011436-01SD** Units: **mg/L** Analysis Date: **10-Feb-2023 19:44**
Client ID: Run ID: **ICPMS06_427759** SeqNo: **7120144** PrepDate: **10-Feb-2023** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.008387	0.0100					0.008224	0	10	J
Barium	0.1499	0.0200					0.1511	0.836	10	
Cadmium	U	0.0100					0.000007	0	10	
Calcium	149.9	2.50					157.1	4.58	10	
Chromium	0.004771	0.0200					0.000102	0	10	J
Iron	3.088	1.00					3.166	2.48	10	
Lead	U	0.0100					0.000113	0	10	
Magnesium	13.7	1.00					14.15	3.12	10	
Manganese	0.6354	0.0250					0.6235	1.9	10	
Potassium	2.243	1.00					2.323	3.47	10	
Selenium	U	0.0100					0.000269	0	10	
Silver	U	0.0100					0.000002	0	10	
Sodium	74.46	1.00					75.1	0.856	10	
Zinc	U	0.0200					0.002329	0	10	

SD Sample ID: **HS23011436-01SD** Units: **mg/L** Analysis Date: **13-Feb-2023 12:54**
Client ID: Run ID: **ICPMS06_427871** SeqNo: **7120801** PrepDate: **10-Feb-2023** DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Strontium	1.837	0.500					1.771	3.76	10	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427341 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MBLK Sample ID: **VBLKW-230203** Units: **ug/L** Analysis Date: **04-Feb-2023 08:15**
Client ID: Run ID: **VOA7_427341** SeqNo: **7109149** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	U	1.0								
Ethylbenzene	U	1.0								
m,p-Xylene	U	2.0								
o-Xylene	U	1.0								
Toluene	U	1.0								
Xylenes, Total	U	1.0								
Surr: 1,2-Dichloroethane-d4	*49.88*	*1.0*	*50*	*0*	*99.8*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*45.87*	*1.0*	*50*	*0*	*91.7*	*77 - 113*				
Surr: Dibromofluoromethane	*48.11*	*1.0*	*50*	*0*	*96.2*	*73 - 126*				
Surr: Toluene-d8	*54.63*	*1.0*	*50*	*0*	*109*	*81 - 120*				

LCS Sample ID: **VLCSW-230203** Units: **ug/L** Analysis Date: **04-Feb-2023 07:32**
Client ID: Run ID: **VOA7_427341** SeqNo: **7109148** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Benzene	18.57	1.0	20	0	92.8	74 - 120				
Ethylbenzene	21.38	1.0	20	0	107	77 - 117				
m,p-Xylene	41.65	2.0	40	0	104	77 - 122				
o-Xylene	20.89	1.0	20	0	104	75 - 119				
Toluene	20.44	1.0	20	0	102	77 - 118				
Xylenes, Total	62.54	1.0	60	0	104	75 - 122				
Surr: 1,2-Dichloroethane-d4	*48.57*	*1.0*	*50*	*0*	*97.1*	*70 - 123*				
Surr: 4-Bromofluorobenzene	*46.64*	*1.0*	*50*	*0*	*93.3*	*77 - 113*				
Surr: Dibromofluoromethane	*47.35*	*1.0*	*50*	*0*	*94.7*	*73 - 126*				
Surr: Toluene-d8	*53.87*	*1.0*	*50*	*0*	*108*	*81 - 120*				

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427341 (0) **Instrument: VOA7** **Method: LOW LEVEL VOLATILES BY SW8260C**

MS Sample ID: **HS23011585-01MS** Units: **ug/L** Analysis Date: **04-Feb-2023 15:54**
Client ID: Run ID: **VOA7_427341** SeqNo: **7109170** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	50.95	1.0	20	30.82	101	70 - 127				
Ethylbenzene	21.22	1.0	20	0	106	70 - 124				
m,p-Xylene	41.83	2.0	40	0	105	70 - 130				
o-Xylene	20.88	1.0	20	0	104	70 - 124				
Toluene	20.84	1.0	20	0	104	70 - 123				
Xylenes, Total	62.71	1.0	60	0	105	70 - 130				
Surr: 1,2-Dichloroethane-d4	*51.08*	*1.0*	*50*	*0*	*102*	*70 - 126*				
Surr: 4-Bromofluorobenzene	*46.42*	*1.0*	*50*	*0*	*92.8*	*77 - 113*				
Surr: Dibromofluoromethane	*48.04*	*1.0*	*50*	*0*	*96.1*	*77 - 123*				
Surr: Toluene-d8	*53.73*	*1.0*	*50*	*0*	*107*	*82 - 127*				

MSD Sample ID: **HS23011585-01MSD** Units: **ug/L** Analysis Date: **04-Feb-2023 16:16**
Client ID: Run ID: **VOA7_427341** SeqNo: **7109171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Benzene	46.18	1.0	20	30.82	76.8	70 - 127	50.95	9.82	20	
Ethylbenzene	19.32	1.0	20	0	96.6	70 - 124	21.22	9.35	20	
m,p-Xylene	38.26	2.0	40	0	95.7	70 - 130	41.83	8.92	20	
o-Xylene	19.15	1.0	20	0	95.8	70 - 124	20.88	8.63	20	
Toluene	19.28	1.0	20	0	96.4	70 - 123	20.84	7.77	20	
Xylenes, Total	57.41	1.0	60	0	95.7	70 - 130	62.71	8.82	20	
Surr: 1,2-Dichloroethane-d4	*50.04*	*1.0*	*50*	*0*	*100*	*70 - 126*	*51.08*	*2.05*	*20*	
Surr: 4-Bromofluorobenzene	*46.89*	*1.0*	*50*	*0*	*93.8*	*77 - 113*	*46.42*	*1.01*	*20*	
Surr: Dibromofluoromethane	*47.46*	*1.0*	*50*	*0*	*94.9*	*77 - 123*	*48.04*	*1.21*	*20*	
Surr: Toluene-d8	*53.83*	*1.0*	*50*	*0*	*108*	*82 - 127*	*53.73*	*0.195*	*20*	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427230 (0) **Instrument: WetChem_HS** **Method: SULFIDE BY SM4500 S2-F-2011**

MBLK Sample ID: **MBLK-R427230** Units: **mg/L** Analysis Date: **03-Feb-2023 11:23**
Client ID: Run ID: **WetChem_HS_427230** SeqNo: **7106163** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	U	1.00								

LCS Sample ID: **LCS-R427230** Units: **mg/L** Analysis Date: **03-Feb-2023 11:23**
Client ID: Run ID: **WetChem_HS_427230** SeqNo: **7106162** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.12	1.00	25	0	88.5	85 - 115				

LCSD Sample ID: **LCSD-R427230** Units: **mg/L** Analysis Date: **03-Feb-2023 11:23**
Client ID: Run ID: **WetChem_HS_427230** SeqNo: **7106161** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.32	1.00	25	0	89.3	85 - 115	22.12	0.9	20	

MS Sample ID: **HS23011590-04MS** Units: **mg/L** Analysis Date: **03-Feb-2023 11:23**
Client ID: Run ID: **WetChem_HS_427230** SeqNo: **7106164** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sulfide	22.32	1.00	25	-1.48	95.2	80 - 120				

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427370 (0) **Instrument:** Balance1 **Method:** TOTAL DISSOLVED SOLIDS BY SM2540C-2011

MBLK Sample ID: **WBLK-02032023** Units: **mg/L** Analysis Date: **03-Feb-2023 16:00**
Client ID: Run ID: **Balance1_427370** SeqNo: **7109836** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	U	10.0								

LCS Sample ID: **LCS-02032023** Units: **mg/L** Analysis Date: **03-Feb-2023 16:00**
Client ID: Run ID: **Balance1_427370** SeqNo: **7109835** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1072	10.0	1000	0	107	85 - 115				

DUP Sample ID: **HS23020011-02DUP** Units: **mg/L** Analysis Date: **03-Feb-2023 16:00**
Client ID: Run ID: **Balance1_427370** SeqNo: **7109824** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	1348	10.0					1352	0.296	5	

DUP Sample ID: **HS23011621-03DUP** Units: **mg/L** Analysis Date: **03-Feb-2023 16:00**
Client ID: **CP BS 3** Run ID: **Balance1_427370** SeqNo: **7109821** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Total Dissolved Solids (Residue, Filterable)	940	10.0					892	5.24	5	R

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427809 (0) **Instrument: Skalar 03** **Method: ALKALINITY BY SM 2320B-2011**

MBLK Sample ID: **MBLK-R427809** Units: **mg/L** Analysis Date: **10-Feb-2023 12:49**
Client ID: Run ID: **Skalar 03_427809** SeqNo: **7119408** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	U	5.00								
Alkalinity, Carbonate (As CaCO3)	U	5.00								

LCS Sample ID: **LCS-R427809** Units: **mg/L** Analysis Date: **10-Feb-2023 12:49**
Client ID: Run ID: **Skalar 03_427809** SeqNo: **7119407** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1005	5.00	1000	0	101	85 - 115				

LCSD Sample ID: **LCSD-R427809** Units: **mg/L** Analysis Date: **10-Feb-2023 12:49**
Client ID: Run ID: **Skalar 03_427809** SeqNo: **7119406** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Carbonate (As CaCO3)	1030	5.00	1000	0	103	85 - 115	1005	2.42	20	

DUP Sample ID: **HS23011590-04DUP** Units: **mg/L** Analysis Date: **10-Feb-2023 12:49**
Client ID: Run ID: **Skalar 03_427809** SeqNo: **7119409** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Alkalinity, Bicarbonate (As CaCO3)	814.7	5.00					788.4	3.28	20	
Alkalinity, Carbonate (As CaCO3)	U	5.00					0	0	20	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427869 (0) **Instrument: WetChem_HS** **Method: HYDROGEN SULFIDE BY E376.1**

MBLK Sample ID: **MBLK-R427869** Units: **mg/L** Analysis Date: **03-Feb-2023 12:28**
Client ID: Run ID: **WetChem_HS_427869** SeqNo: **7120729** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	U	1.00								

LCS Sample ID: **LCS-R427869** Units: **mg/L** Analysis Date: **03-Feb-2023 12:28**
Client ID: Run ID: **WetChem_HS_427869** SeqNo: **7120728** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	23.5	1.00	25	0	94.0	80 - 120				

LCSD Sample ID: **LCSD-R427869** Units: **mg/L** Analysis Date: **03-Feb-2023 12:28**
Client ID: Run ID: **WetChem_HS_427869** SeqNo: **7120727** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hydrogen Sulfide	23.72	1.00	25	0	94.9	80 - 120	23.5	0.9	20	

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: HS23011621

QC BATCH REPORT

Batch ID: R427935 (0) **Instrument:** ICS-Integrion **Method:** ANIONS BY SW9056A

MBLK Sample ID: **MBLK** Units: **mg/L** Analysis Date: **14-Feb-2023 01:14**
Client ID: Run ID: **ICS-Integrion_427935** SeqNo: **7122262** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	U	0.100								
Chloride	U	0.500								
Sulfate	U	0.500								

LCS Sample ID: **LCS** Units: **mg/L** Analysis Date: **14-Feb-2023 01:26**
Client ID: Run ID: **ICS-Integrion_427935** SeqNo: **7122263** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	3.978	0.100	4	0	99.4	80 - 120				
Chloride	19.91	0.500	20	0	99.6	80 - 120				
Sulfate	20.19	0.500	20	0	101	80 - 120				

MS Sample ID: **HS23011621-01MS** Units: **mg/L** Analysis Date: **14-Feb-2023 01:38**
Client ID: **CP BS 1** Run ID: **ICS-Integrion_427935** SeqNo: **7122265** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.9198	0.100	2	0	46.0	80 - 120				S
Chloride	305.8	0.500	10	305.5	3.03	80 - 120				SEO
Sulfate	117.6	0.500	10	113.1	45.5	80 - 120				SEO

MSD Sample ID: **HS23011621-01MSD** Units: **mg/L** Analysis Date: **14-Feb-2023 01:43**
Client ID: **CP BS 1** Run ID: **ICS-Integrion_427935** SeqNo: **7122266** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Bromide	0.9352	0.100	2	0	46.8	80 - 120	0.9198	1.66	20	S
Chloride	305.5	0.500	10	305.5	0.190	80 - 120	305.8	0.0929	20	SEO
Sulfate	117.5	0.500	10	113.1	44.5	80 - 120	117.6	0.0875	20	SEO

The following samples were analyzed in this batch: HS23011621-01 HS23011621-02 HS23011621-03

Client: Environmental Resources Mgmt.
Project: Sulphur Dome
WorkOrder: **HS23011621**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	22-041-0	27-Mar-2023
California	2919 2022-2023	30-Apr-2023
Dept of Defense	L21-682	31-Dec-2023
Florida	E87611-36	30-Jun-2023
Illinois	2000322022-9	09-May-2023
Kansas	E-10352; 2022-2023	31-Jul-2023
Kentucky	123043, 2022-2023	30-Apr-2023
Louisiana	03087, 2022-2023	30-Jun-2023
Maryland	343, 2022-2023	30-Jun-2023
North Carolina	624-2023	31-Dec-2023
North Dakota	R-193 2022-2023	30-Apr-2023
Oklahoma	2022-141	31-Aug-2023
Texas	T104704231-22-29	30-Apr-2023
Utah	TX026932022-13	31-Jul-2023

Sample Receipt Checklist

Work Order ID: HS23011621 **Date/Time Received:** **30-Jan-2023 16:00**

Client Name: ERMSW-HOU **Received by:** **Paul Matta**

Completed By:	/S/ Corey Grandits	31-Jan-2023 15:34	**Reviewed by:**	/S/ Tyler Monroe	01-Feb-2023 09:24
	eSignature	Date/Time		eSignature	Date/Time

Matrices: **W** Carrier name: **Client**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:288554
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.5UC/1.0C	IR31	
Cooler(s)/Kit(s):	47598		
Date/Time sample(s) sent to storage:	1/31/23		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page 1 of 1

COC ID: 288554

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order	0677804	Project Name	Sulphur Dome	A	8260_LL_W (Low Level VOC (8260) BTEX)
Work Order		Project Number		B	MA EPH_W_La (MA EPH)
Company Name	Environmental Resources Mgmt.	Bill To Company	Environmental Resources Mgmt.	C	MA VPH_LA_W (MA VPH)
Send Report To	Scott Himes	Invoice Attn	Accounts Payable	D	9056_anions_W (Cl,SO4,Br)
Address	CityCentre Four 840 W. Sam Houston Pkwy., Suite 6	Address	CityCentre Four 840 W. Sam Houston Pkwy., Suite 6	E	ALK_W 2320B (carb, bicarb)
				F	H2S_W (H2S)
City/State/Zip	Houston, TX 77024	City/State/Zip	Houston TX 77024	G	HG_W (Mercury)
Phone	(281) 600-1000	Phone	(281) 600-1000	H	ICP_TW (As,Ba,Cd,Ca,Cr,Fe,Pb,Mg,Mn,K,Se,Ag,Na,Sr,Zn)
Fax	(281) 600-1001	Fax	(281) 600-1001	I	SULFD_4500S F (Sulfide)
e-Mail Address	scott.himes@erm.com	e-Mail Address	ERMNAAccountsPayable@erm.com	J	TDS_W 2540C (TDS)

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	CP BS 1	1/30/23	1100	W		12	X	X	X	X	X	X	X	X	X	X	
2	CP BS 2	↓	1130	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
3	CP BS 3	↓	1230	↓		↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

HS23011621

Environmental Resources Mgmt.

Sulphur Dome

Sampler(s) Please Print & Sign: Scott Himes

Shipment Method: Drop off

Required Turnaround Time: (Check Box) [X] STD 10 Wk Days [ ] 5 Wk Days [ ] 2 Wk Days [ ] 24 Hour [ ] Other

Results Due Date:

Relinquished by: Date: 1/30/23 Time: 1600 Received by:

Relinquished by: Date: 1/30/23 Time: 1600 Received by (Laboratory):

Logged by (Laboratory): Date: Time: Checked by (Laboratory):

Notes: ERM Sulphur Dome

Cooler ID	Cooler Temp.
4798	1.5
	4+R31

QC Package: (Check One Box Below)

[X] Level II Std QC
[ ] Level III Std QC/Raw Data
[ ] Level IV SW846/CLP
[ ] Other
[ ] TRRP Checklist
[ ] TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

ATTACHMENT B

Westlake Emergency Response Plan

WESTLAKE CORPORATION, LLC
INCIDENT ACTION PLAN
SULPHUR MINES DOME

I. Purpose and Scope--This document establishes a plan for responding to any surface expression caused by a failure of any of the brine caverns operated by Westlake on the Sulphur Mines Dome in Calcasieu Parish, Louisiana.

II. Emergency Reporting and Notification Procedures

A. In the event of the appearance of a surface expression, immediately notify Josh Bradley, Brine Field Superintendent, (c) 337-540-6681

B. Following notification of Mr. Bradley immediately notify:

1. Westlake Lake Charles South Facility Shift Superintendent 337-708-4340 or 337-499-6313 who will then activate Lake Charles South Emergency Operations Center and notify:

a. Louisiana State Police Hazardous Materials Hotline (225) 925-6595

b. Louisiana State Police Troop D (337) 491-2511

c. Dome Operators:

i. Boardwalk Doug Fournet 337-764-6965

ii. Liberty Gas Maurice Gilbert 713-206-6713

iii. Yellowrock Vance Hill 337-515-8350

iv. Sasol Heather Kress, Sr. Manager Legal, Americas at Sasol - Heather.Kress@us.sasol.com.

d. LOSCO – Gina Saizan, Program Manager; em gina.saizan@la.gov; office 225.925.6606; desk 225.925.7016; cell 225.933.1600

e. GOHSEP – Melton Gaspard, Section Chief Operations, em melton.gaspard@la.gov; office 225.925.7520; cell 985.634.2520

f. LDNR (225) 342-5515.

g. LDEQ, Lake Charles Regional Office rep or direct phone line.

h. Calcasieu Parish Sheriff's Office (337) 491-3700

NOTE: Plan is subject to timely update and revision commensurate with the known facts and circumstances at that time.

i. Dick Gremillion – Calcasieu Parish Director of Emergency Preparedness - dgremillion@calcasieu.gov

3. 2. Jared Maze – Calcasieu Parish Chief of Operations - jmaze@calcasieu.govEPA National Response Center 1-800-424-8802

4. Entergy 1-800-968-8243

III. Notification to impacted landowners:

A. Mr. Bradley or his designee will also notify the following within 2 hours of the discovery of a surface expression:

1. Landowner:

a. Sulphur Dome LLC. 601-978-1763

IV. Response Assets-Westlake has consulted with vendors and service providers who will be asked to assist in addressing any impacts caused by a surface expression. They are:

A. Hazardous Liquid Spill Containment and Remediation

1. E3 OMI Billy Barnett (337) 502-7779 or 1-800-645-6671

B. Water and Air Sampling and Monitoring

1. ERM (o) (225) 292-3001Angela Levert (c) (504) 812-6378 or Dave Angle (c) (281) 433-3826

C. Wild Well Control

1. Wild Weld Control LLC (281) 784-4700

ATTACHMENT C

RESPEC Inc.
Plan for Geomechanical Modeling of Sulphur Dome

January 17, 2023

Coleman Hale
Vice President/Sr. Petroleum Engineer
Lonquist & Co., LLC
1415 Louisiana St., Suite 3800
Houston, Texas 77002

Dear Coleman,

RE: Geomechanical Evaluation of Hypothetical Low-Pressure Conditions in Westlake Cavern 7B at the Sulphur Mines Salt Dome, Calcasieu Parish, Louisiana (RSI/P-8041) (Revision 1)

This letter provides a proposal to perform a geomechanical evaluation of hypothetical low-pressure conditions in Westlake Cavern 7B on the Sulphur Mines salt dome. In late 2021, Cavern 7B experienced a sudden pressure loss event that subsided after approximately 2 weeks. Throughout most of 2022, the cavern returned to a historically typical pressure increase trend. In late 2022, the pressure began to decline in Cavern 7B and at an increasing rate of change. Brine injection operations are currently ongoing to maintain cavern pressure slightly above a brine pressure gradient, and it is presently unknown how low the pressure may drop if brine injections are discontinued. Westlake would like to evaluate the possibility of discontinuing the brine injections and allowing the pressure to drop in Cavern 7B until it stabilizes. Lonquist has engaged RESPEC to perform a geomechanical evaluation of hypothetical low-pressure conditions in Caverns 7B and 6X to determine if the caverns will become unstable, assuming various pressure stabilization conditions. Additionally, the proposed study will evaluate the impact of low-pressure conditions in Caverns 7B and 6X on the surrounding caverns in the salt dome.

BACKGROUND

The fluid pressure in a solution-mined cavern helps support the geologic loads that act on the rock surrounding and overlying the cavern. As the cavern pressure decreases, the loads that must be supported by the surrounding rock increase. If the loads exceed the rock strength, the rock will fail and lose strength. Unlike brittle rock types that fail suddenly, rock salt around a solution-mined cavern will typically begin to fail through microfracturing along the grain boundaries, which is a process referred to as dilation (or damage). If dilatant states of stress are maintained, the microfractures will increase and coalesce, which, in turn, reduces the strength of the salt. Salt damage is a progressive process that can lead to the salt spalling from the roof and walls of the cavern and may lead to salt-web failure or roof collapse. It is desirable to design and operate salt caverns in a manner that precludes the onset of salt dilation to maintain cavern stability.

The cavern and salt-web stability between caverns and between the caverns and the edge-of-salt (i.e., dome flank) is a function of web thickness, web height, and cavern fluid pressures. If the web thickness is small and the cavern pressure is too low, the shear stresses in the salt surrounding the caverns can exceed the strength of the salt. The stability of the caverns and the salt webs will be evaluated by post-analyzing the model-predicted

3824 JET DRIVE
RAPID CITY, SD 57703
P.O. BOX 725 // RAPID CITY, SD 57709
605.394.6400

stress states to determine factor-of-safety values with respect to salt dilation using the RESPEC Dilation (RD) criterion[1]. The RD criterion parameter values previously developed by Heiberger [2017][2] for the Sulphur Mines salt dome will be used in this study.

NUMERICAL MODELING

RESPEC proposes conducting a three-dimensional (3D) numerical analysis to simulate and analyze the hypothetical pressure-reduction scenarios defined by Lonquist. The proposed numerical analysis will use the stratigraphy and material properties that were used in the previous geomechanical study conducted by RESPEC in 2017[2]. The most recent cavern sonar surveys, pressure histories for Caverns 7B and 6X, measured brine injection flows for Caverns 7B and 6X, and any relevant geological data will be required to complete this study.

RESPEC will develop a 3D finite difference model of the Westlake Caverns 7B and 6X, and surrounding caverns within the region of influence. The model will include representation of the salt dome boundary, the caprock, and a simplified representation of the sedimentary basin surrounding the salt dome. Lonquist will need to provide the most recent dome contours, cavern sonar surveys, and gyroscopic surveys to fully define the 3D model for this study. The 3D model will be used to estimate the in situ stress conditions in the salt dome and the surrounding sedimentary basin to initialize the stress state in the model prior to any cavern development. The model will then be used to simulate the historical development and operations of the existing caverns in the salt dome that are included in the model, up until the recent pressure loss event in Cavern 7B. The pressure histories and brine flow data from Caverns 7B and 6X will be used to approximate the cavern pressure conditions in Caverns 7B and 6X up to present day to estimate the stress state in the surrounding salt stock in January 2023. The model-predicted stress state in the salt surrounding Caverns 7B and 6X at present day will be analyzed to determine factors of safety with respect to salt dilation to establish a baseline condition of cavern and salt web stability prior to simulating the hypothetical pressure-reduction scenarios.

The 3D model will be used to simulate the steady-state creep response of the caverns to gradual pressure reductions. Because the modeling will not account for the transient creep response typically seen during dynamic pressure changes, the model-predicted stresses will not be representative of short-term pressure-reduction conditions. The model will be used to evaluate three hypothetical pressure-reduction scenarios with Cavern 7B at a brine pressure gradient of 0.52 pounds per square inch per foot (psi/ft) of depth at the casing shoe depth and two other pressure gradients to be defined by Lonquist. The pressure histories for Caverns 7B and 6X will be used to estimate correlated pressure reductions in Cavern 6X. The model-predicted stress states with the caverns at the hypothetical reduced pressures will be analyzed to predict dilation factors of safety in the salt surrounding the caverns. The modeling results will provide a comparative analysis of the stress state in the salt webs before and after the cavern pressures are reduced, which can be used to evaluate the potential impact of the low-pressure conditions on cavern stability.

Because of the limited data available for the dome flank and the nonsalt rock immediately adjacent to the salt dome, the deformation and strength properties of the nonsalt rock and the interface with the salt dome cannot be well defined in the numerical model. The proposed 3D modeling approach will assume that the salt is perfectly bonded to the adjacent nonsalt rock formations along the dome flank.

---

[1] **DeVries, K. L., K. D. Mellegard, G. D. Callahan, and W. M. Goodman, 2005.** *Cavern Roof Stability for Natural Gas Storage in Bedded Salt*, RSI-1829, prepared by RESPEC, Rapid City, SD, for the US Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA.

[2] **Heiberger, K. J., 2017.** *Geomechanical Evaluation of the Coalesced Caverns in the Sulphur Mines Salt Dome, Calcasieu Parish, Louisiana,* RSI-2574, prepared by RESPEC, Rapid City, SD, for Lonquist & Co., LLC, Austin, TX.

This modeling assumption may represent artificially higher stiffness and strength for the salt webs between the caverns and the dome flank, which may result in unconservative predictions of the stability of the salt webs. Therefore, the proposed analysis will primarily provide a comparative evaluation of the change in stresses at the caverns' surfaces as a result of the cavern pressure being reduced to the hypothetical steady-state conditions.

REPORTING

At the conclusion of the study, RESPEC will provide a comprehensive technical presentation that describes the technical approach, assumptions, numerical model, modeling results, and conclusions. A draft PowerPoint will initially be presented and delivered as a PDF to Lonquist for review and comment, and the final presentation can be delivered within 1 to 2 weeks after receiving comments on the draft presentation.

SCHEDULE AND COST

RESPEC has several engineers with the experience and skills required to complete the proposed project successfully. Based on current personnel availability, we anticipate this study can be completed within [redacted] weeks after commencement of the project. A fixed-price contract is proposed, and the estimated cost to complete the scope of work outlined in this proposal is $[redacted] Table 1 summarizes the project tasks, costs, and schedule.

Table 1. Project Tasks, Costs, and Schedule

Task	Schedule (weeks)	Fixed-Price Cost ($)
3D Numerical Modeling	[redacted]	
Project Management & Reporting		
Total		

Thank you for the opportunity to develop this proposal. If you have questions or comments, please contact me by telephone (605.394.6447) or email (kevin.heiberger@respec.com).

Sincerely,

Kevin Heiberger
Manager, Cavern Geomechanics

KJH:akm
cc: Project Central File 996-8041

ATTACHMENT D

Lonquist & Co. LLC
Plan for Development of a Failure & Response/Mitigation Report

Plan for Development of a Failure Analysis Report

Sulphur Mines Cavern No. 7

A "Failure Analysis Report" is under development and at this time can be summarized by way of the following table of contents and brief description of what is planned to be included in each report section. It is expected that a final draft of this report will be ready by the end of July 2023.

1. Introduction
    - ❖ An introduction to the report structure, Sulphur Mines dome history (as possible through available records), and purpose of the report. Visualizations and supportive analysis will be included as appendices.
2. Cavern 7 History, Pressure Loss Event, & To-Date Status
    - ❖ An overview of the operational life of Cavern 7 (as possible through available records), a summary of the operational pressure history of Cavern 7, a discussion of the pressure loss event, and summary of the cavern pressures and operational actions to-date. Visualizations and supportive analysis will be included as appendices.
3. Sulphur Dome & Cavern 7 Structure
    - ❖ An overview of the geologic interpretation of the Sulphur Mines salt dome, Cavern 7 geometry, and its relation to other caverns and features. Visualizations and supportive analysis will be included as appendices.
4. Examples of Cavern Integrity Failure Incidents
    - ❖ A summary of cavern failure incidents from around the world that relate to the ongoing observations of Cavern 7, and the perceived theoretical failure scenarios.
5. Theoretical Failure Scenarios
    - ❖ A summary of various failure mechanisms and their projected impact to formations, the surface environment, the USDW, and sub-surface or surface infrastructure. Visualizations and supportive analysis/documentation/reports will be included as appendices. The scenarios theorized and discussed may not be an exhaustive list, rather, the most likely scenarios based upon the available data/understanding.
6. Pre-Failure Monitoring & Evaluation
    - ❖ A summary of the ongoing monitoring and evaluation efforts, and a discussion of the results of those efforts to-date. Including appendices to support.
7. Post-Failure Response & Monitoring
    - ❖ A plan for response and monitoring actions assuming a certain failure scenario.
8. Concluding Remarks
    - ❖ A summary/concluding statement for the report.
9. References

ATTACHMENT E

Lonquist & Co. LLC
Plan to Acquire, Process, & Evaluate 3D Seismic

Plan for Evaluation of the 3D Seismic

Sulphur Mines

An integrated geologic and geophysical (G&G) evaluation is planned for 3D seismic data licensed over the Sulphur Mines storage facility. The evaluation will utilize the following data and process:

1. Well bores – geologic control
2. Extensive research regarding well locations (surface / bottom hole) and directional surveys
3. Sonar surveys taken within storage caverns
4. 3D surface seismic data – licensed from SEI
5. Local Velocity Surveys
6. Synthetic seismograms generated from nearby sonic logs
7. An integrated interpretation of the 3D seismic data which honors well control (formation tops)
8. Initial seismic interpretation will utilize commercially available PSTM data (Pre Stack Time Migration)
9. Final interpretation of 3D seismic will be after reprocessing thru PSDM (Pre Stack Depth Migration)
10. Final deliverables will be Top of Salt Map, and additional geologic horizons adjacent to salt face

1) Approximately 400wells will be included in this integrated G&G interpretation. Extensive historical research of both surface locations and bottom hole locations for well bores was conducted prior to utilizing the formation top information registered by these well penetrations. Additionally, most recent information from publicly available well information (such as SONRIS, IHS, Enverus, TGS,) will be utilized.

2) Sonar information collected over the past 16 years will also be taken into account. The sonar logs will be visualized utilizing CAD software in order to present the vertical and horizontal relationship between caverns, geologic formations (including salt face) and nearby well control.

3) Five square miles of 3D seismic data was licensed from SEI. The acquisition parameters utilized to acquire the data contains sufficient far offset data, and shot/receiver spacing to undertake this study. Nearby velocity surveys are incorporated into the study to establish the time to depth relationship necessary to produce integrated G&G maps. Additionally local sonic logs will be utilized to generate synthetic seismograms to further validate the time to depth relationship. Ultimately a comprehensive velocity model will be generated for the area covered by the licensed 3D data. This velocity model will be used for mapping purposes and also for the planned reprocessing thru PSDM.

4) Initial mapping will utilize the PSTM versions of the 3D seismic provided by SEI. The PSTM interpretation will honor the local well control and synthetic seismograms. The subsequent PSDM also will be processed to honor local well depths via a velocity model calibrated to the local well. Our expectation is that the resulting PSDM will yield the "highest" resolution for the given seismic data, and as importantly, will more accurately locate the position and dip of the salt dome and adjacent formations.

5) Final deliverables for this integrated study will be

- A depth calibrated Top of Salt Map
- Depth calibrated maps for at least two additional horizons adjacent to the salt face
- Best estimates for cavern distances to salt face within this study area

6) Timeline

- Validate current well control (2 weeks)
- Initial PSTM interpretation (2 weeks)
- Reprocess thru PSDM (3 months)
- Interpret PSDM (2 weeks)
- Integrate sonar data and generate report (1 month)

ATTACHMENT F

MEQ Geo Inc./Jarpe Data Solutions
Plan to Install Micro-Seismic Monitoring

Surface Seismic Monitoring Plan Sulphur Mines Salt Dome

Julie Shemeta, MEQ Geo Inc.
Steve Jarpe, Jarpe Data Solutions

Date: Feb. 8, 2023

Seismic monitoring plan

- We plan a three phase seismic monitoring plan:
  - **Phase 1**: Seven “temporary” seismic boxes were installed at the end of January 2023 to start recording seismic data on Sulphur Mines dome.
    - The data is currently recorded on site and data disks are shipped out for data processing every Monday, Wednesday and Friday.
  - **Phase 2**: Install seven “semi-permanent ” surface seismic stations.
    - We are reviewing the data quality from the “temporary array” to decide on the placement of a semi-permanent telemetered array.
    - The data for semi-permanent array will be sent directly to processing office via cell phone telemetry and seismic data will be recorded in real-time.
  - **Phase 3**: Install a borehole seismic network
    - We are starting some modeling work to explore the feasibility of running a borehole seismic network on Sulphur Mines salt dome using two existing well bores for a dual-array monitoring.
      - We plan to model two Well pairs: PPG 6X and PPG 20 and PPG 6X and Fee 1010 side track (an oil and gas well).
    - Depending on the seismic activity at Sulphur Mines dome, the surface array will likely be removed once the borehole array is up and running.

Surface seismic recording at Sulphur Mines

Seven “temporary” surface seismic boxes deployed starting approximately Jan. 30, 2023 and are recording data continuously.

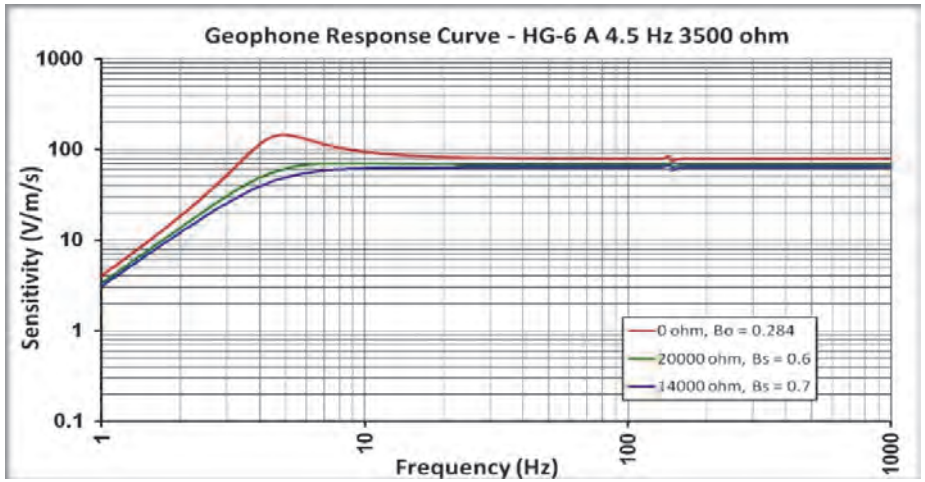
Placement of monitors at Sites 1, 2 and 3 will require consent of Boardwalk. At this time, we suggest this configuration is optimal for earthquake locations: there is good azimuthal station coverage by surrounding cavern 7 with sensors. The sensor distances from Cavern 7 shall allow for more accurate locations, if events are detected and well-recorded.

Photo of installed temporary station

Temporary Seismic Boxes

- Vendor: Jarpe Data Solutions
- Sensor: Three component, 4.5 Hz HG-6HS geophone element (78.9 V/m/s)
- GPS timing
- Battery powered
- Recording at 200 samples per second
- Boxes record onsite on SD card.
  - The SD cards are swapped Monday, Wednesday and Friday and shipped overnight for data processing at JDS offices in Arizona.
  - Seismic data scanned for earthquakes.
  - If seismic event is detected, if data quality is sufficient, the event is located and a magnitude estimated.

These temporary seismic stations will be used to support the feasibility for a semi-permanent telemetered array.



Frequency response curve of geophone

Semi-permanent surface monitoring

Surface instrumentation will record until borehole system is installed and operational.

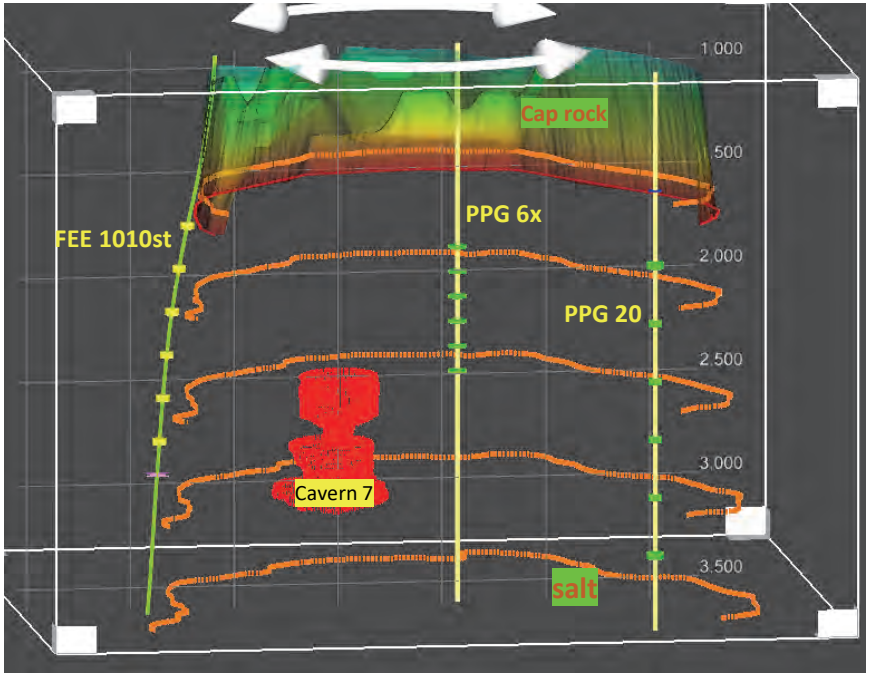
- Seven semi-permanent stations will be deployed in mid February 2023.
  - Solar powered
  - Real-time data telemetry to Arizona JDS offices.
  - GPS timing
  - Pole-mounted digitizer/telemetry equipment (avoid flooding)
  - Sensor 3C, 4.5 Hz geophones, same sensor as temporary boxes.
    - Sensors will be buried about 6 inches.
  - 125 sample per second sample rate.
  - Magnitude range ~ 0.5 to 3.5
  - Data processing done by JDS.

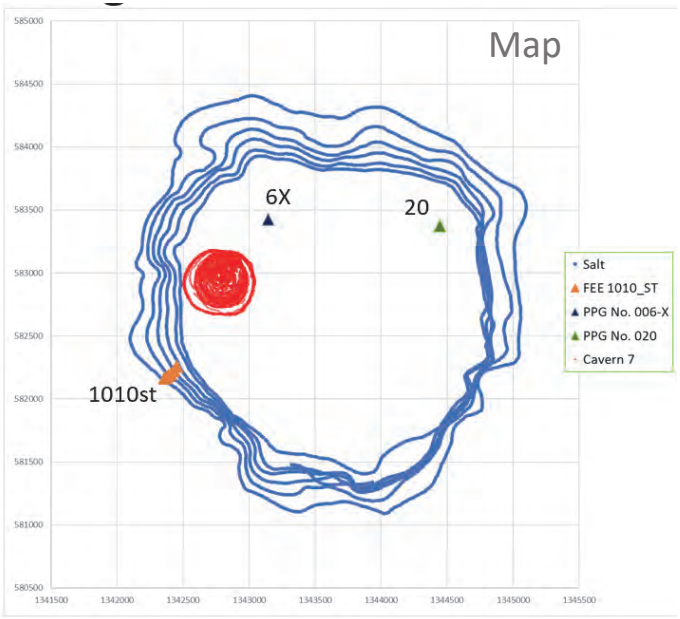
This surface array may be decommissioned once the borehole arrays are operational, depending on what seismic activity is observed.

Example of a JDS Semi-permanent seismic box with pole installation.

Borehole monitoring: In planning stages

- We are currently starting modeling three different existing wellbores for possible dual-array borehole monitoring.
- PPG 6x, PPG 20 and FEE 1010 (st) are possible observation wells.
- Well pairs under consideration are dual wells with sensors: PPG 6x – PPG 20 or dual PPG 6x - FEE 1010 (ST)
- If seismicity recorded and located on the surface array, it may help guide the sensor locations for the borehole arrays.
- The surface array will likely be decommissioned after the borehole array is operational (depending on what seismic activity we observe)





ATTACHMENT G

Lonquist & Co. LLC
Plan for Enhanced Subsidence Monitoring

Enhanced Subsidence Monitoring Plan

Continuous Monitoring of Ground Displacement Near Western Caverns and Dome Flank

Sulphur Dome
Westlake Chemicals

February 2023

Westlake Chemical

LONQUIST & CO. LLC
PETROLEUM ENGINEERS | ENERGY ADVISORS

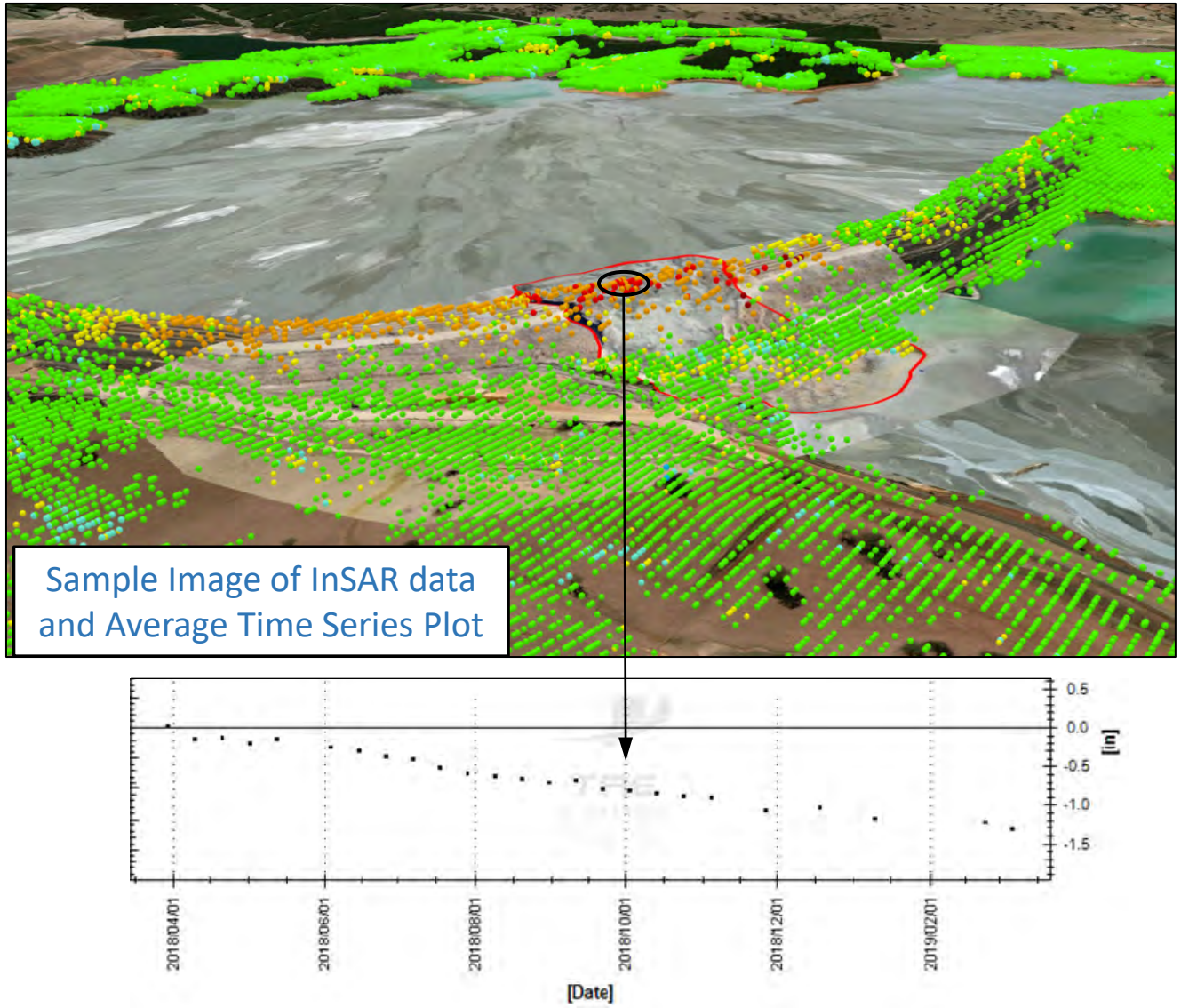
Continuous Monitoring Methodology

Continuous Monitoring of Ground Movement

- Methods for continuous monitoring of ground subsidence were investigated:
  - High-precision GPS surveys
  - Ground surveys - Geodetic Leveling / Differential Leveling
  - Satellite imagery - synthetic aperture radar (SAR)
- Interferometric Synthetic Aperture Radar (InSAR) monitoring has been established as the most reliable way to consistently evaluate small – normally undetectable - movements and provide advance notice of changing ground subsidence trends
- A Continuous Monitoring Plan using InSAR data has been developed with TRE-Altamira (TREA) and is currently being employed to evaluate ground movement across the Sulphur Dome area
- The following slides provide general information on the InSAR technology and measurement parameters being employed at the Sulphur Dome

Overview of InSAR Monitoring Technique

- InSAR analysis identifies and monitors the movement of natural targets on the ground
- Point cloud of measurement points (MP) is generated in analysis
- MP Attributes:
  - Annual displacement rate [in/yr]
  - Time Series of displacement [in]
  - 1-D (Line of Sight - LOS)
    - Line-of-sight (LOS angle) displacement along view path of satellite to ground target
- Measurement precision
  - Rate: ±0.01 in/yr
  - Single measurement: ±0.20 in



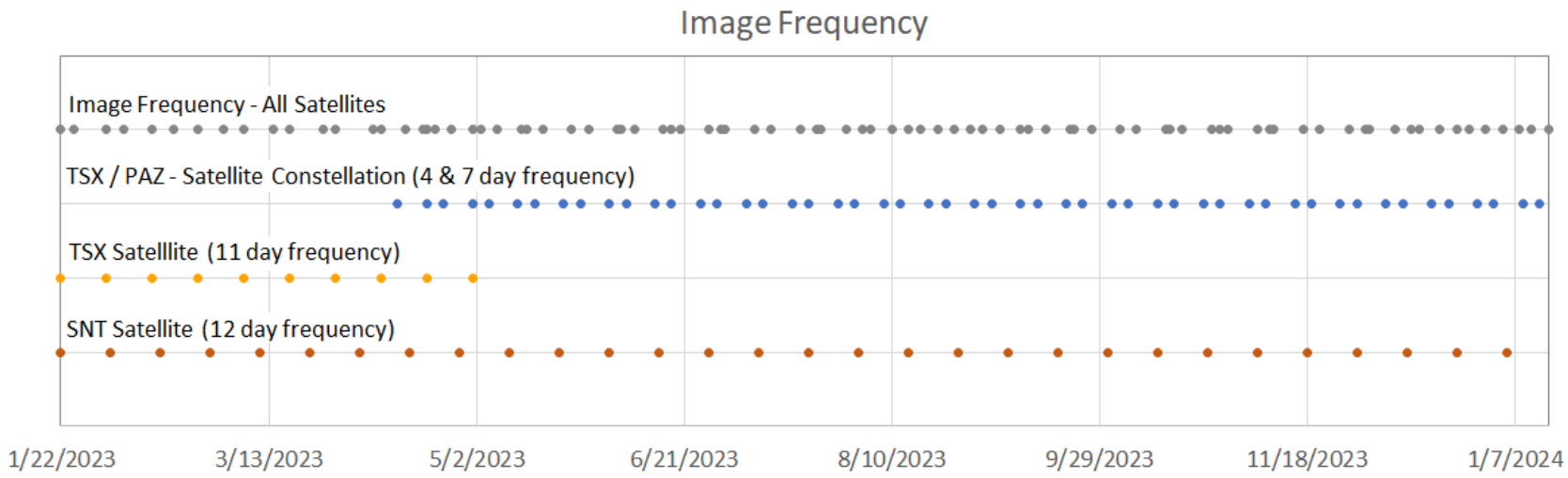
Data Coverage and Point Density

- The density and coverage of measurement points (MP) depends on the satellite signal parameters, surface characteristics and changes over time in the investigation area:
  - MP density increases with the satellite resolution and time span of image set
  - MP density and coverage is generally low over:
    - Vegetated areas and low reflectivity areas (i.e. areas where the signal backscattered to the satellite is low)
    - Areas affected by temporal decorrelation (i.e. radar signal is not coherent over time), which is generally associated with:
      - Seasonal surface changes, such as intermittent flooding in marshes and wetlands
      - Rapid surface changes, such as active operations areas
      - Fast movement (displacement rate >1 meter/yr)
  - No measurement of ground displacement is possible beneath water bodies

Parameters of InSAR Dataset and Collection Frequency

- Current Satellite and Data Delivery Frequency:
  - Sentinel 1 (SNT) 12 days
  - TerraSAR-X (TSX) 11 days
  - 5.40-day avg. frequency
- Starting April 2023:
  - Sentinel 1 (SNT) 12 days
  - TSX / PAZ Constellation 4 & 7 days
  - 3.96-day avg. frequency

	Sentinel-1	TerraSAR-X	TerraSAR-X	PAZ
Mode / Resolution	16 x 65 ft	Spotlight (3 x 3 ft)	Spotlight (3 x 3 ft)	Spotlight (3 x 3 ft)
Track	T136	T29	T67	T120
Band (wavelength)	C-Band (2.32 in)	X-Band (1.22 in)	X-Band (1.22 in)	X-Band (1.22 in)
Nominal frequency	12- day	11- day	11- day	11- day
Orbit (LOS angle)	Ascending 43°	Descending 17°	Descending 37°	Descending 37°
Date range	04 Oct 2016 – 20 Jan 2024	16 Jun 2022 – 01 May 2023	24 Jan 2023 – 11 Jan 2024	28 Jan 2023 – 15 Jan 2024
Number of images	199	30	34	33



InSAR Data Evaluation Plan

InSAR Data Evaluation Plan

- New datasets are delivered by TREA within 48 hours of new image capture
- Lonquist will review the data same-day and report any recognizable deviations from established subsidence trends
- Lonquist will evaluate the dataset and issue a standardized report that provides the following within 24 hours of receiving each dataset:
  - Map and time-series plots of ground movement showing statistical trends, for point groups near caverns and flank on the western side of the dome
  - Contour map showing current acceleration/deceleration trends in ground movement on western side of dome
  - Cross sections displaying profiles of ground movement and velocity over time across key areas on the western side of dome

InSAR Sample Preliminary Evaluation

- 2 SNT datasets and 3 TSX datasets have been received since continuous monitoring began
- The following slides depict preliminary analysis being performed on each incoming dataset as report method and format is being prepared
- No deviation from established subsidence trends has been observed to date

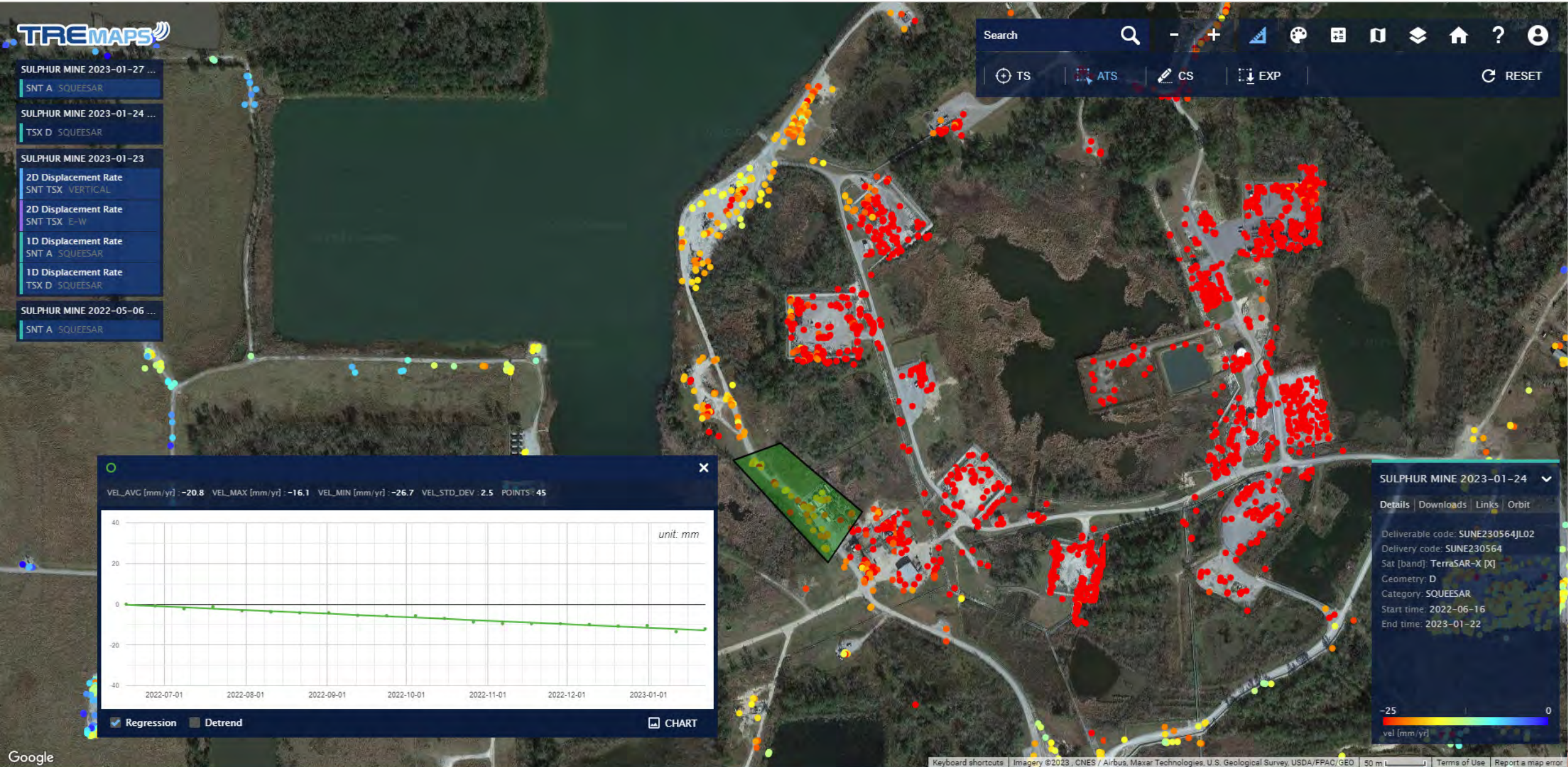
TerraSAR-X (TSX) Map

TerraSAR-X (TSX) – PPG 6

TerraSAR-X (TSX) – PPG 7

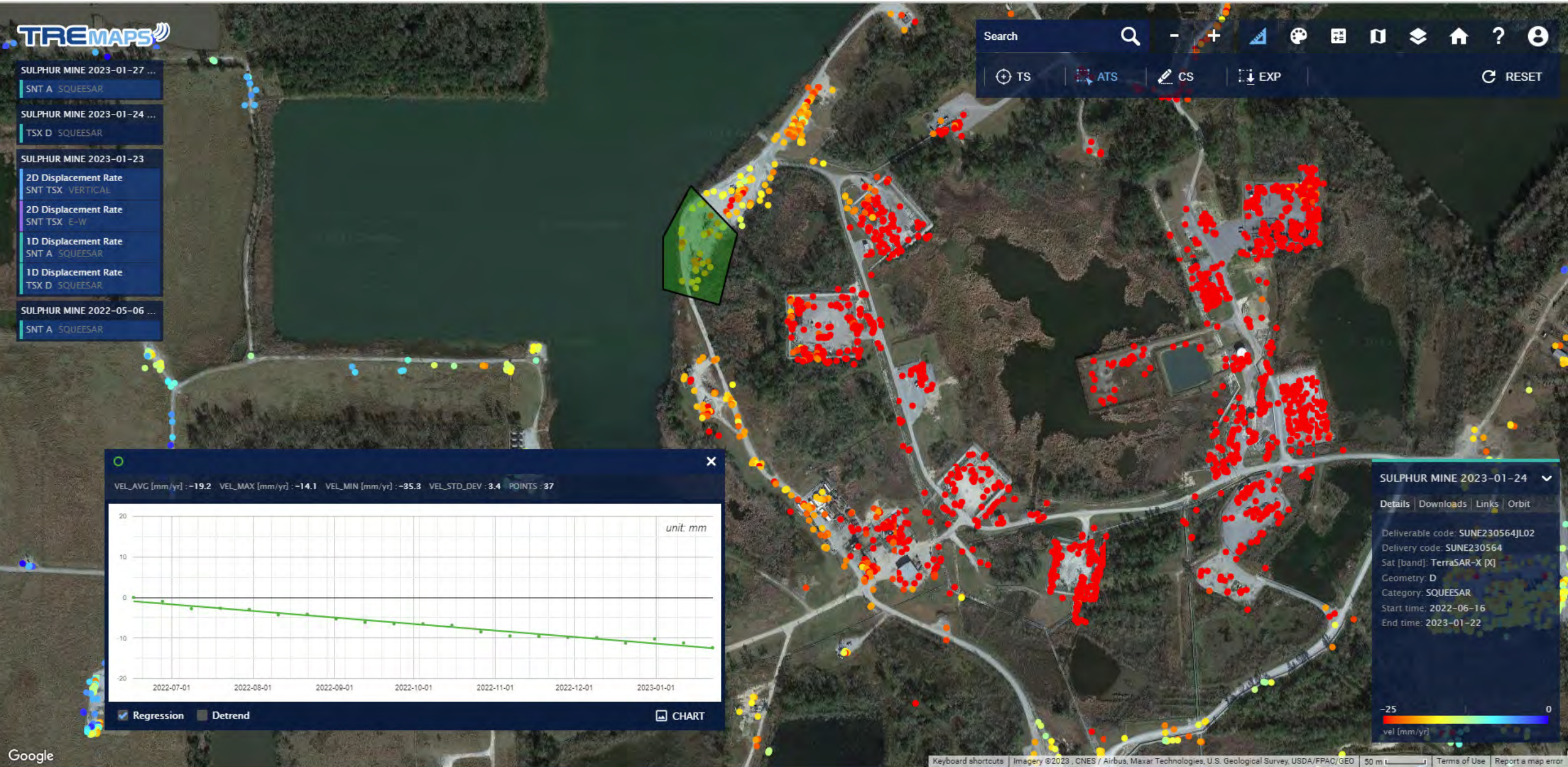
TerraSAR-X (TSX) – PPG 22

TerraSAR-X (TSX) – AOI #1

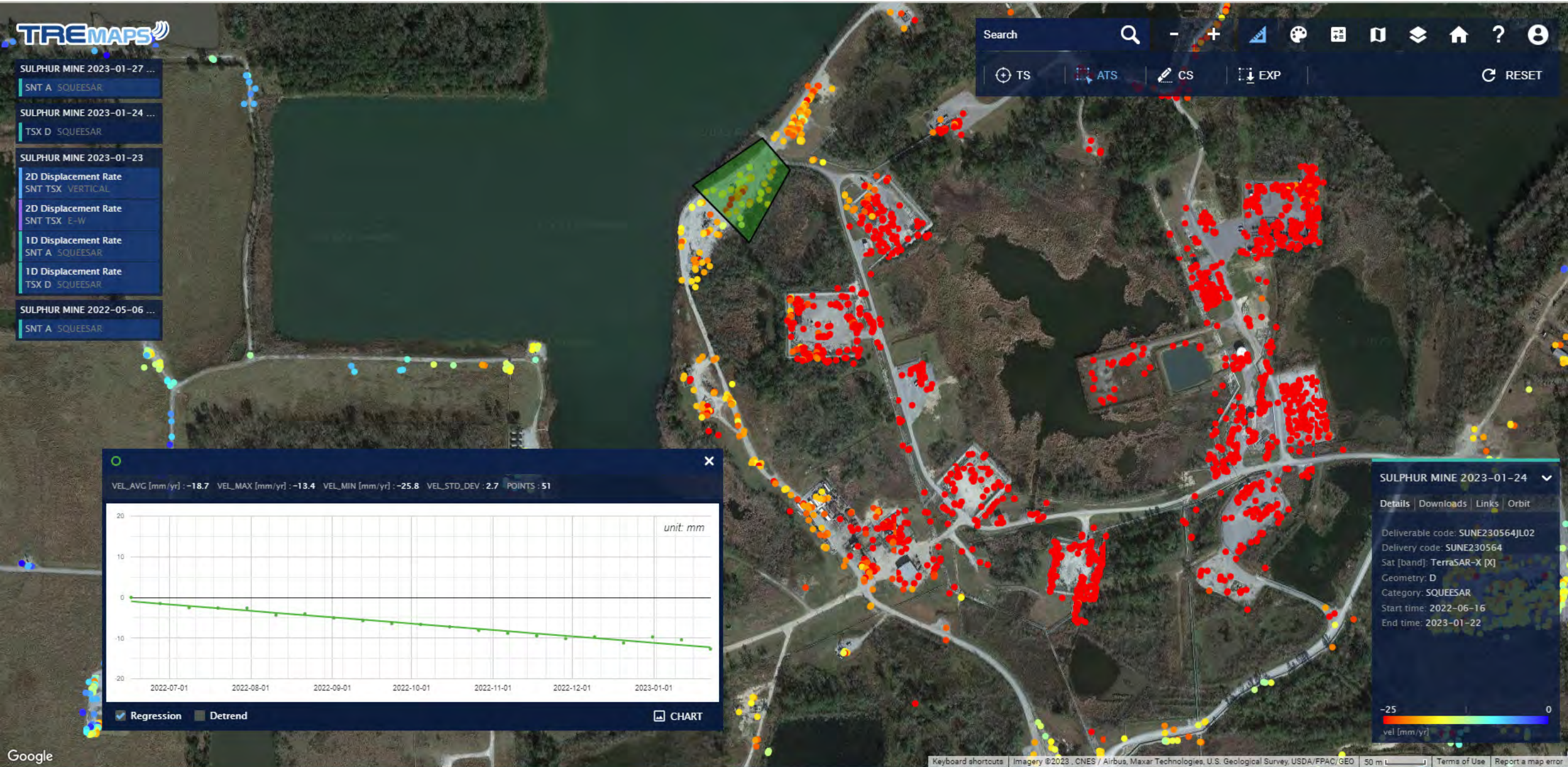


TerraSAR-X (TSX) – AOI #2

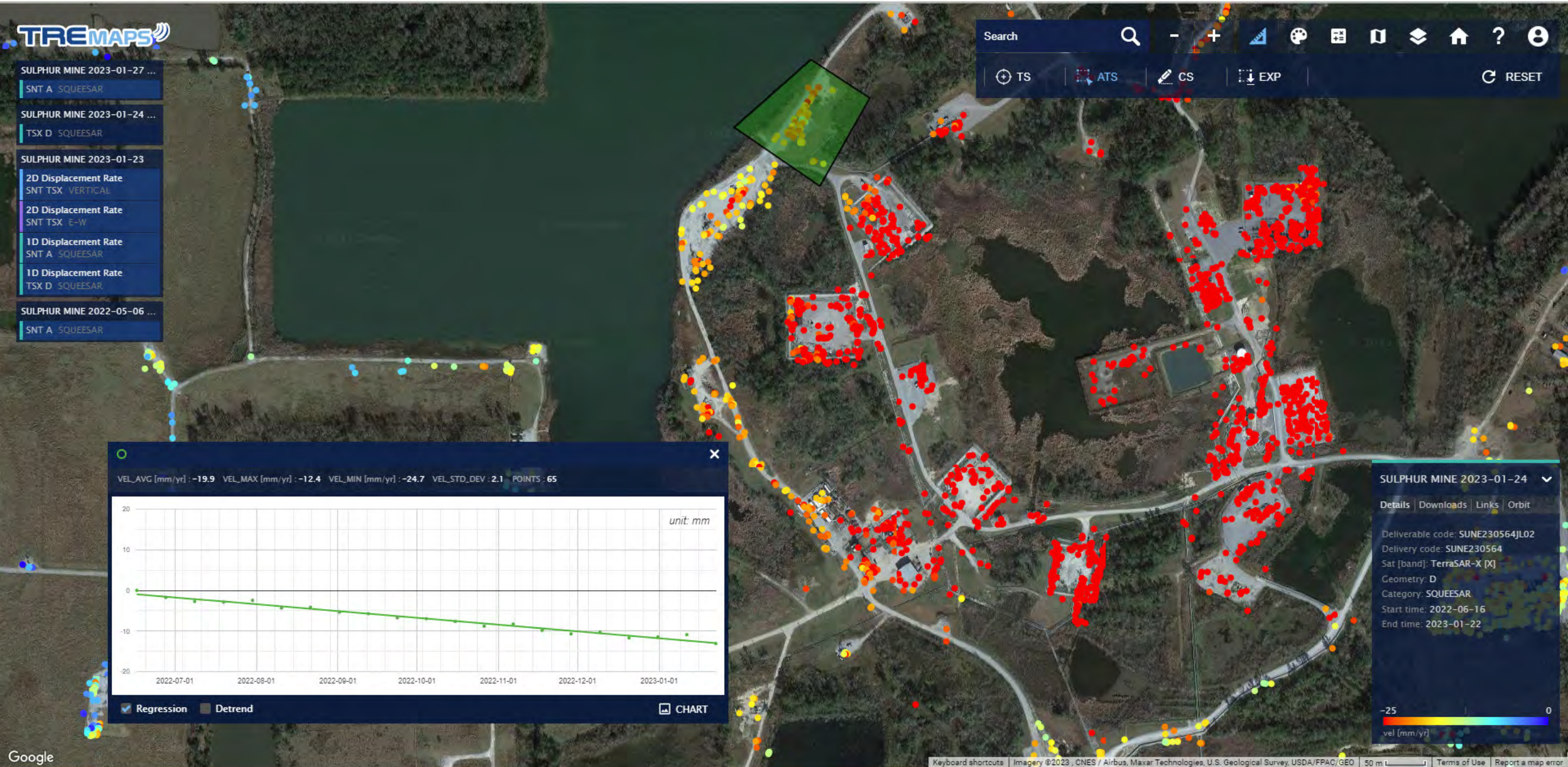
TerraSAR-X (TSX) – AOI #3



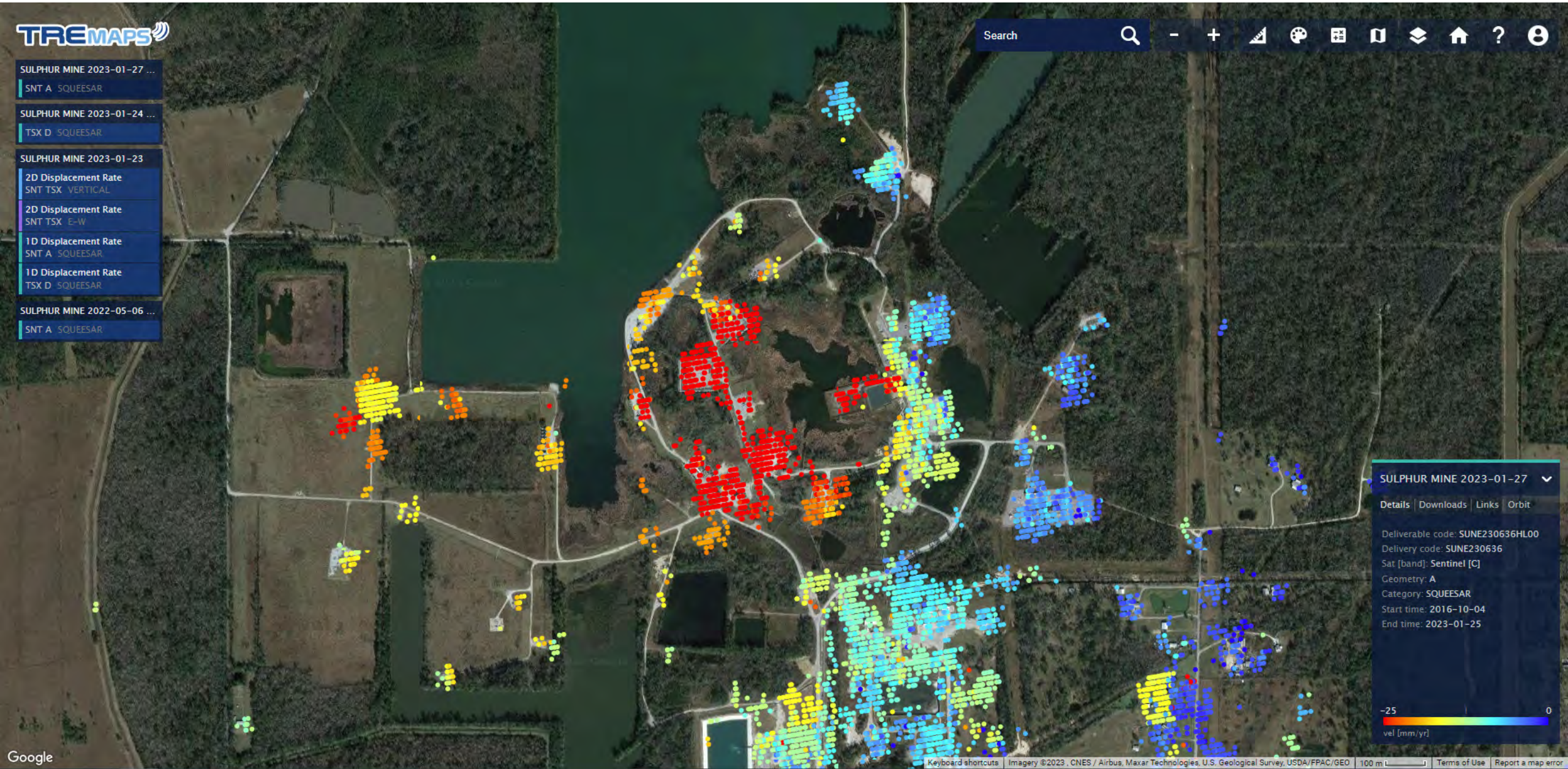
TerraSAR-X (TSX) – AOI #4



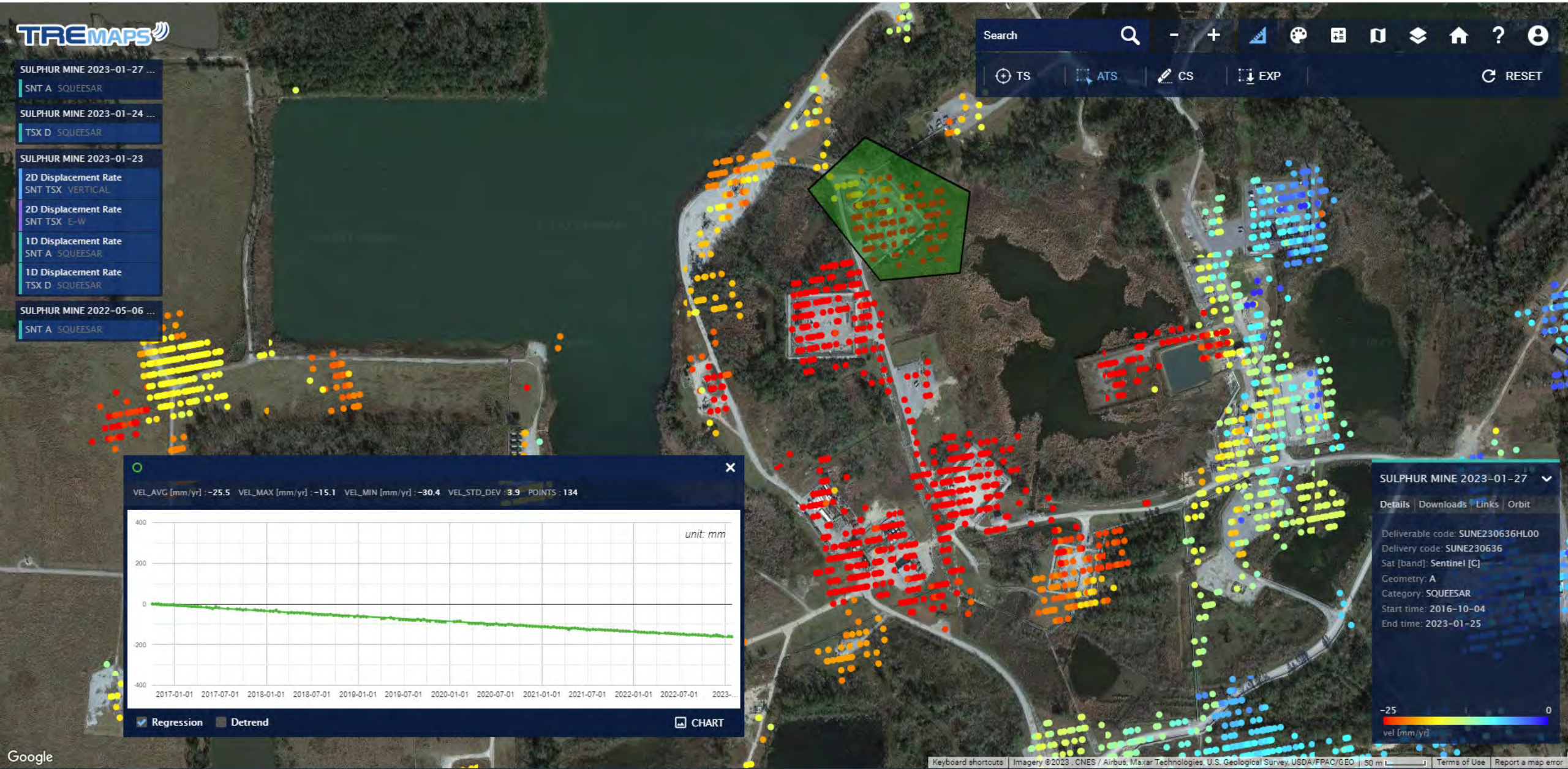
TerraSAR-X (TSX) – AOI #5



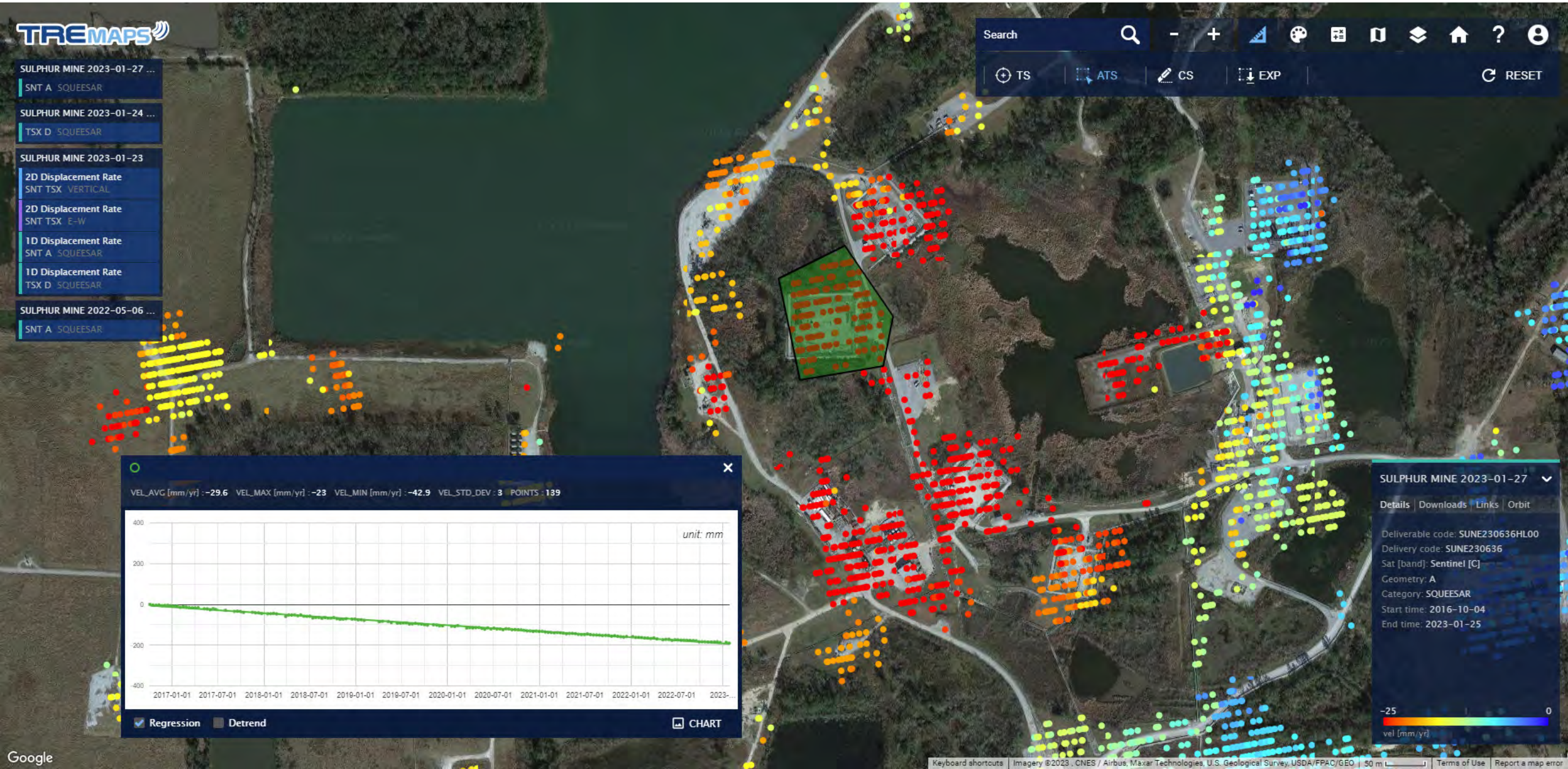
Sentinel (SNT) Map



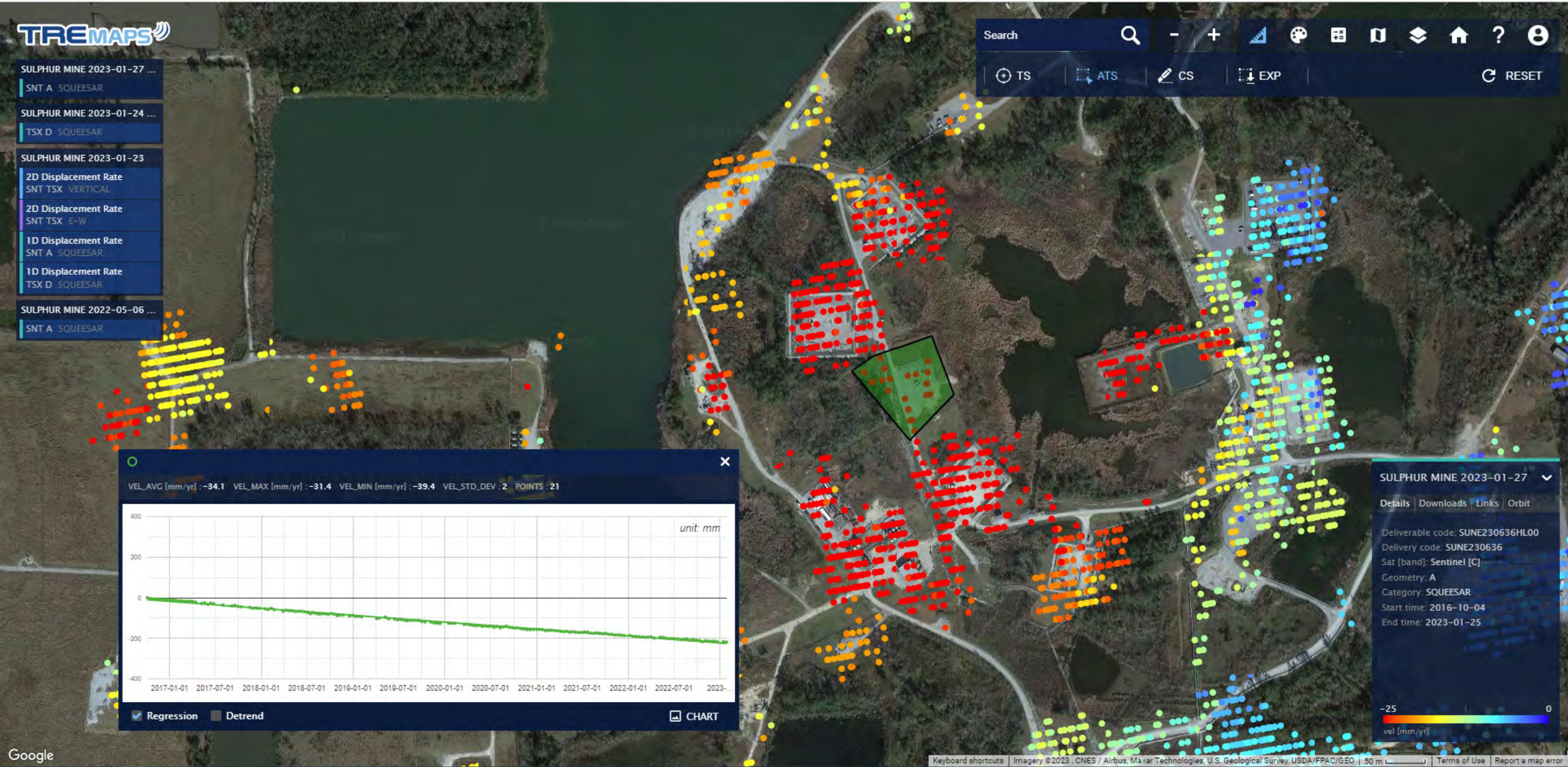
Sentinel (SNT) – PPG 6



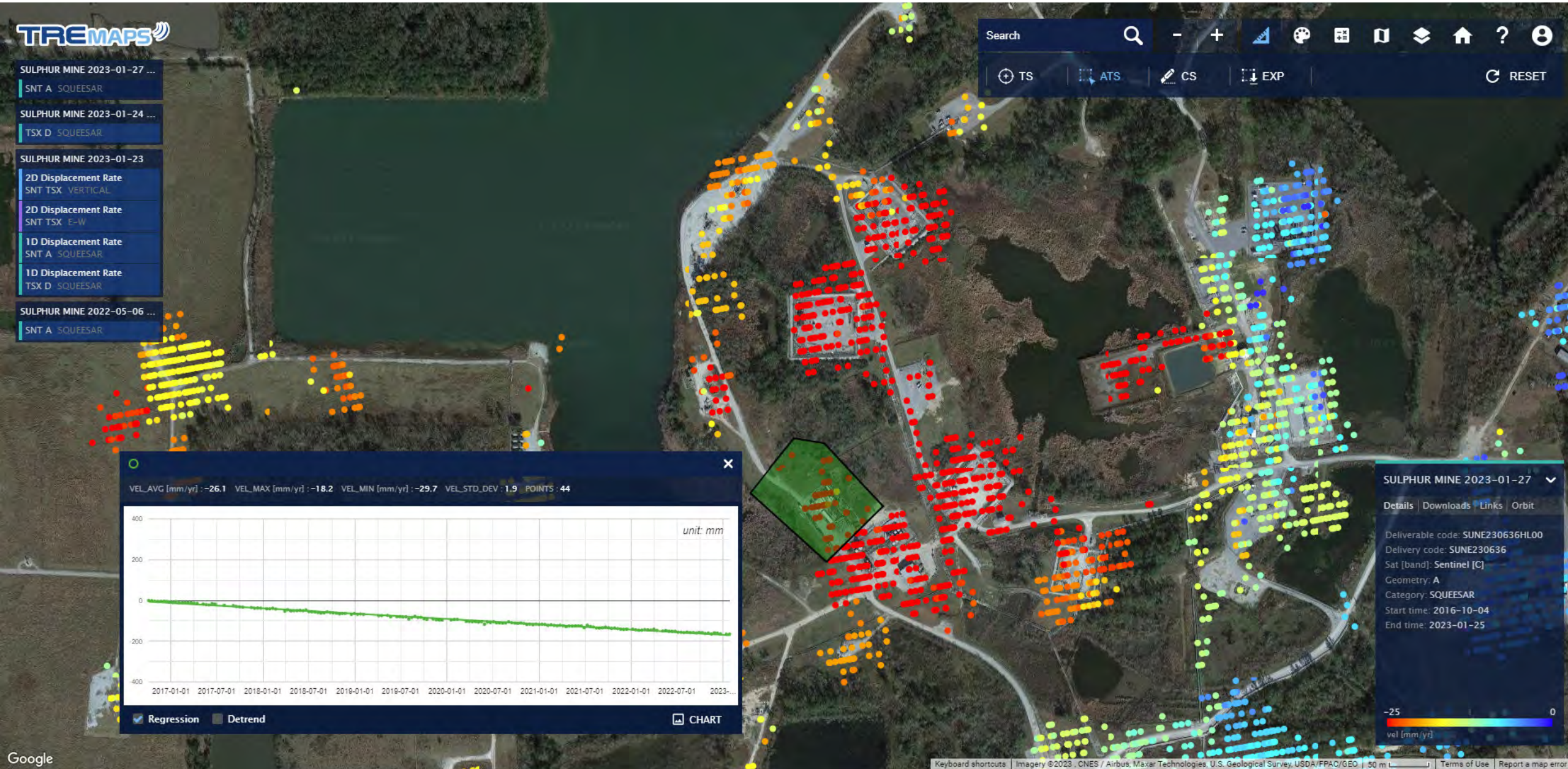
Sentinel (SNT) – PPG 7



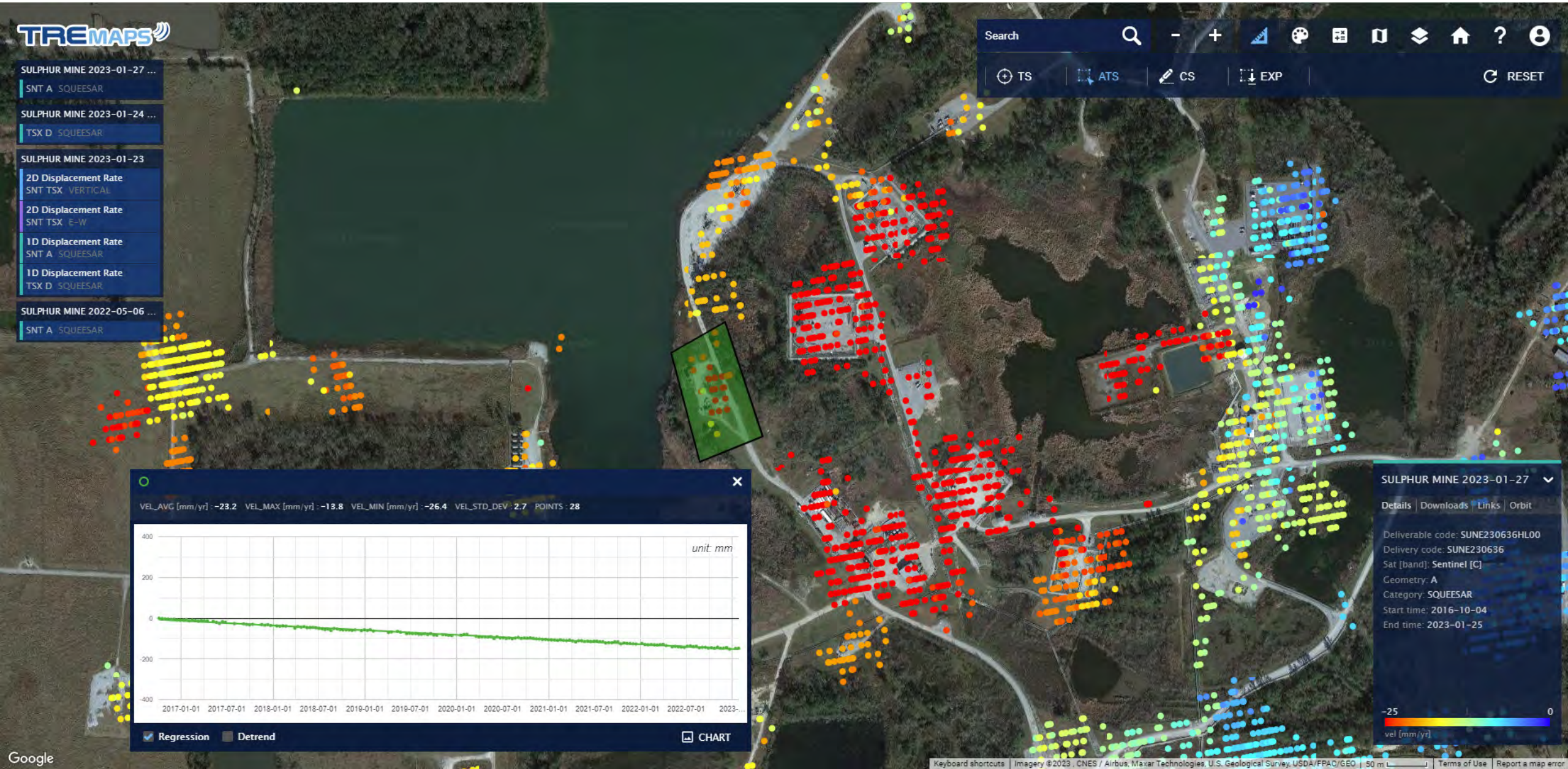
Sentinel (SNT) – PPG 22



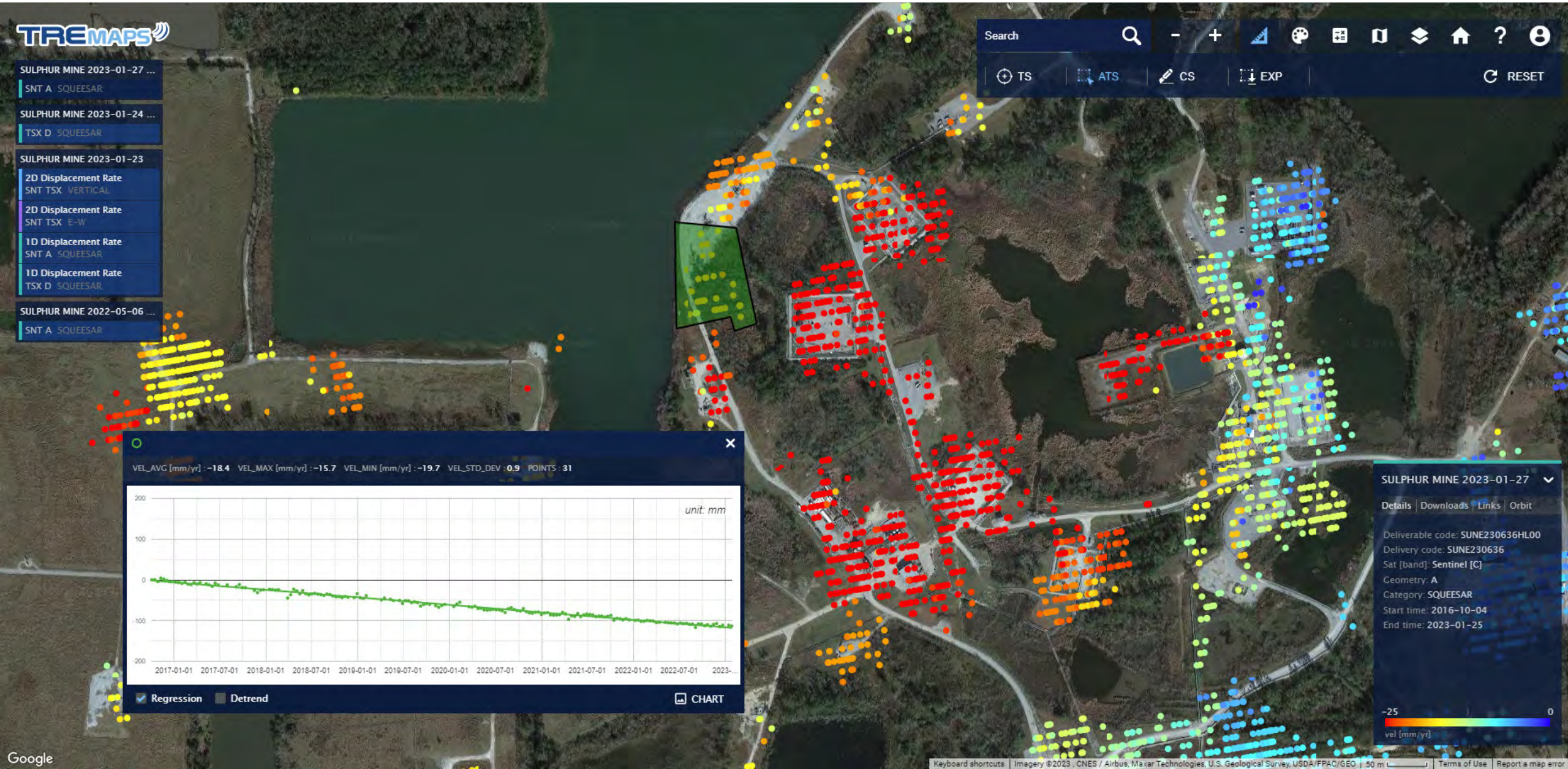
Sentinel (SNT) – AOI #1



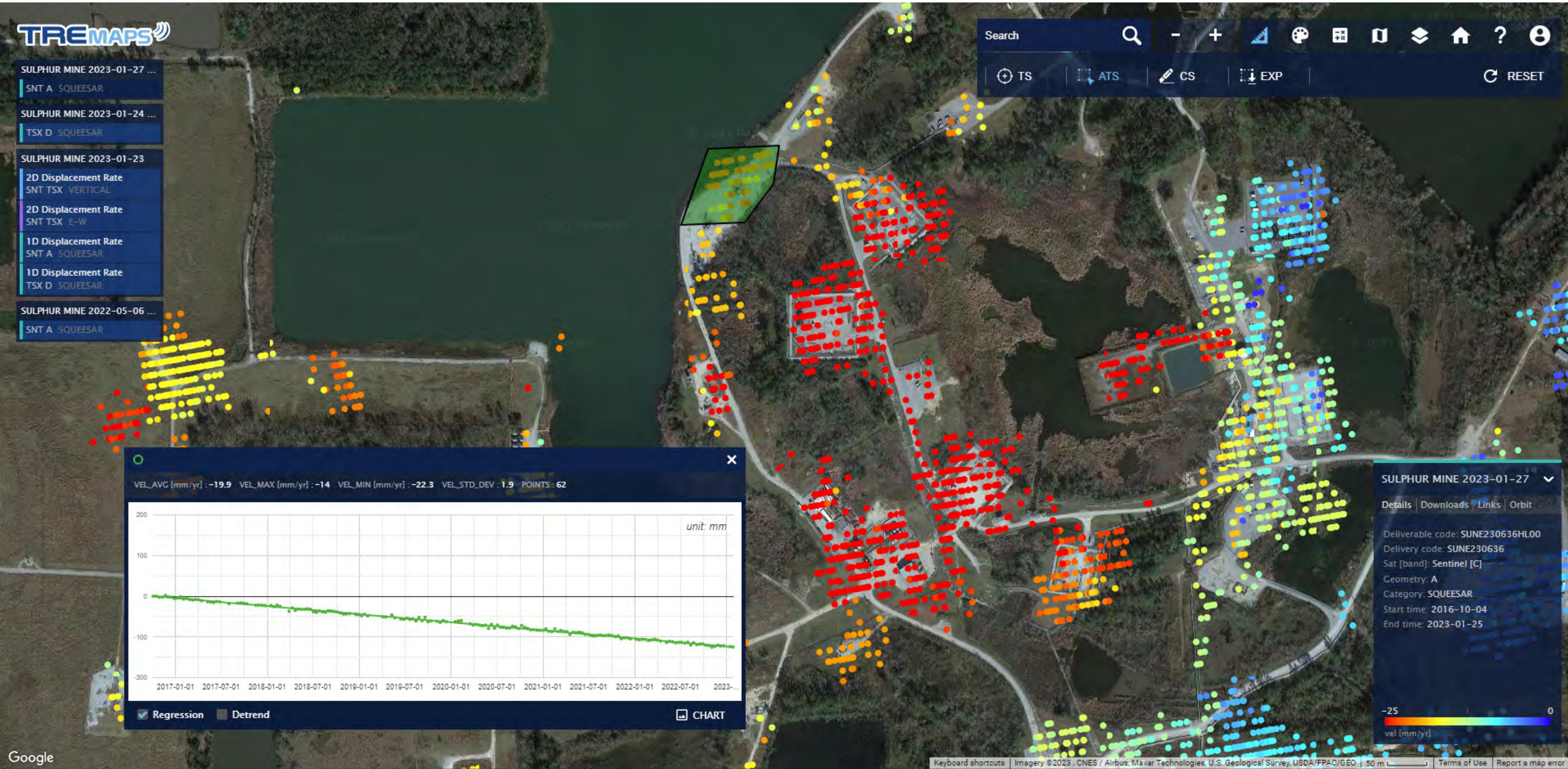
Sentinel (SNT) – AOI #2



Sentinel (SNT) – AOI #3



Sentinel (SNT) – AOI #4



Sentinel (SNT) – AOI #5