

**SOIL INTERIM MEASURES IMPLEMENTATION REPORT
Q6 RADAR STATION – SOLID WASTE MANAGEMENT UNIT 112
LOCATIONS OF CONCERN 3 AND 10
KENNEDY SPACE CENTER, FLORIDA**

Prepared for:



**Environmental Assurance Branch
National Aeronautics and Space Administration
Kennedy Space Center, Florida 32899**

**A-E Contract 80KSC019D0010
Task Order 80KSC019F0086**

**January 2024
Revision: 0**

**Prepared by:
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In accordance with the provisions of Florida Statutes, Chapter 471, this Soil Interim Measures Implementation Report for the Kennedy Space Center Q6 Radar Station located in Merritt Island, Florida, has been prepared under the direct supervision of a Professional Engineer registered in the State of Florida. This work was performed in accordance with generally accepted professional engineering practices pursuant to Chapter 471 of the Florida Statutes. The data, findings, recommendations, specifications, or professional opinions were prepared solely for the use of the National Aeronautics and Space Administration and the Florida Department of Environmental Protection. AECOM makes no other warranty, either expressed or implied, and is not responsible for the interpretation by others of these data.

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State of Florida
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Date

Program Manager

Florida License No. 57964

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ABBREVIATIONS, ACRONYMS, AND SYMBOLS

ADP	Advance Data Package
AECOM	AECOM Technical Services, Inc.
bls	below land surface
CS	Confirmatory Sampling
Eurofins	Eurofins Environmental Testing Southeast, LLC
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
IM	Interim Measures
KSC	John F. Kennedy Space Center
KSCRT	Kennedy Space Center Remediation Team
LOC	location of concern
NASA	National Aeronautics and Space Administration
NFA	No Further Action
Q6RS	Q6 Radar Station
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RIS	Remediation Information System
SCTL	Soil Cleanup Target Level
SWMU	Solid Waste Management Unit
TCLP	Toxic Characteristic Leaching Procedure
µg/L	microgram per liter
USEPA	United States Environmental Protection Agency
UST	underground storage tank

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EXECUTIVE SUMMARY

This report presents a summary of the soil interim measures (IM) implementation activities that occurred from January 23 through June 6, 2023, at the Q6 Radar Station (Q6RS) Solid Waste Management Unit (SWMU) 112, located at the John F. Kennedy Space Center (KSC), Florida. The site is monitored under KSC's Resource Conservation and Recovery Act Corrective Action Program, which also meets the requirements of Chapter 62-780, Florida Administrative Code.

Assessment activities have previously been performed at 10 Q6RS Locations of Concern (LOCs), identified during a SWMU assessment in 2013 (NASA 2013). Since the SWMU assessment, further confirmatory sampling and assessment was conducted for each LOC, and based on the data collected during these assessments, it was determined that Resource Conservation and Recovery Act Facility Investigation to further evaluate soil and groundwater was to be conducted at two LOCs: LOC 1 – Former Underground Storage Tanks (groundwater) and LOC 3 – Radar Antenna Refurbishment Area (soil). The LOC 1 groundwater assessment is ongoing, and the results will be presented under a separate cover. It was also determined that soil IM would be completed at two of the LOCs, LOC 3 and LOC 10 – Compressor Building Condensate Discharge. A Soil IM Work Plan was prepared and submitted in October 2021 (NASA 2021). The plan proposed excavation and disposal of barium and copper impacted soil in the LOC 3 and 10 areas. This report presents a summary and results of the soil IM implementation activities conducted at LOCs 3 and 10. The site contaminants of concern for this soil IM are barium and copper.

The activities presented in this report includes soil IM implementation and groundwater sampling. From January 23 through March 24, 2023, AECOM Technical Services, Inc. (AECOM) field personnel conducted IM implementation activities in the LOC 3 and 10 areas. As presented in the IM Work Plan, shallow soils, impacted with metals, were excavated to a depth of 2 feet below land surface in the central area of the site around the radar antenna and associated equipment. AECOM personnel excavated 77.43 tons of soil using hand tools and, when able, heavy equipment. The soils were placed into lined roll-off containers, which were covered and transported under manifest to the Cedar Trail Landfill in Bartow, Florida. The site was restored to original condition using certified clean backfill material (sand), with filter fabric, and gravel. Areas outside of the excavation were restored with grass seed.

On June 6, 2023, AECOM field personnel conducted groundwater sampling activities within the soil IM excavation area. AECOM personnel collected one groundwater sample from monitoring well Q6RS-MW0003. The sample was submitted to a fixed-based laboratory for analysis by United States Environmental Protection Agency Method 6020B for metals (barium and copper). Barium and copper were detected at 18 micrograms per liter ($\mu\text{g/L}$) and 14 $\mu\text{g/L}$, respectively, and were below the State of Florida Groundwater Cleanup Target Levels (GCTLs) for barium at 2,000 $\mu\text{g/L}$ and copper at 1,000 $\mu\text{g/L}$.

Conclusions

Based on soil IM implementation and sampling activities performed during this reporting period, the following conclusions are provided:

- The LOC 3 and 10 Soil IM was implemented and removed shallow soils with barium and copper concentrations greater than the State of Florida Residential Soil Cleanup Target Levels.
- Approximately 77.43 tons (equating to a soil volume of approximately 66.5 cubic yards) of impacted soils were excavated and the waste was transported, under manifests, and properly disposed at a permitted landfill.
- The excavated areas were backfilled with certified-clean soil and finished with seed and/or gravel to restore to original condition.
- Shallow groundwater within the excavation footprint was sampled at monitoring well Q6RS-MW0003, and barium and copper concentrations were below their respective GCTLs.
- Groundwater investigation for other constituents remains ongoing for LOC 1 at the site and will be presented under a separate cover.
- No additional soil or groundwater sampling for barium or copper is required in the LOC 3 and LOC 10 areas.

Recommendations

Based on soil IM implementation and sampling activities performed during this reporting period, the following recommendations are provided:

- No Further Action is recommended for soil at the Q6RS site.
- Continuation of the LOC 1 investigation for groundwater under the Q6 Radar Station – SWMU 112 Project is recommended. The results will be presented under a separate cover.

SECTION 1 INTRODUCTION

1.1 OVERVIEW

The National Aeronautics and Space Administration (NASA), through its Environmental Assurance Branch, is managing cleanup of two Locations of Concern (LOC) associated with the Q6 Radar Station (Q6RS) Solid Waste Management Unit (SWMU) 112 at Kennedy Space Center (KSC), Florida. Assessment activities have previously been performed at 10 Q6RS LOCs, identified during SWMU assessments in 2013 (NASA 2013). Based on the data collected during these assessments and subsequent assessments it was determined that soil interim measures (IM) activities would be completed at two of the LOCs, LOC 3 – Radar Antenna Refurbishment Area and LOC 10 – Compressor Building Condensate Discharge.

AECOM Technical Services, Inc. (AECOM) implemented soil IM activities at the Q6RS site and prepared this report for NASA under Contract 80KSC019D0010, Task Order 80KSC019F0086. An Advance Data Package (ADP) was presented to the KSC Remediation Team (KSCRT) in during a meeting on October 3, 2023. The ADP documented that a soil IM was conducted in accordance with the approved Soil IM Work Plan (NASA 2021). The ADP and meeting minutes are provided as **Appendix A**. This Soil IM Implementation Report presents a summary of the LOC 3 and LOC 10 soil IM activities performed from January 23 through June 6, 2023.

1.2 FACILITY LOCATION AND SITE USE

KSC is located on the east-central Atlantic Coast of Florida in the northern portion of Merritt Island, between the Indian River and Banana River Lagoons in Brevard County. The Q6RS is located at the southern end of KSC approximately 0.6 mile north of the Barge Canal on Merritt Island and 5.5 miles south of the KSC South Gate, outside of the secured area of KSC. The site location is presented on **Figure 1-1**. The site is in Sections 6 and 7, Township 24S and Range 37E, of the Courtenay Topographic Quadrangle Map (United States Geological Survey 1976), which is included as **Figure 1-2**.

The Q6RS was constructed in 1964 by the United States Air Force as a radar support site for KSC and Cape Canaveral Air Force Station (currently known as Cape Canaveral Space Force Station) and is currently surrounded by undeveloped land. Operational areas of the facility can be separated into two areas approximately 0.3 mile apart: the radar area to the north (surrounded by perimeter fencing and gate, which is locked when personnel are not on-site) and the boresight tower area to the south (surrounded by unlocked perimeter fencing). The site has not undergone any significant changes since construction. The current site layout is presented on **Figure 1-3**.

1.3 SITE BACKGROUND

In 2013, a spill contamination investigation was conducted along with Confirmatory Sampling (CS) (NASA 2013). Two gallons of transformer oil leaked onto soil. The contaminated soil was excavated, and soil samples were collected to confirm that no further sampling was required.

In May 2013, a SWMU site assessment was conducted, and a CS Work Plan was prepared (NASA 2013). The site assessment included site reconnaissance and interviews with staff knowledgeable of past and present work practices and operations, and 10 LOCs were identified within the Q6RS site. The location of each LOC is shown on **Figure 1-4**. The LOCs are listed below.

- LOC 1: Former Underground Storage Tanks (USTs)
- LOC 2: Aboveground Storage Tank and Oil/Water Separator Discharge
- LOC 3: Radar Antenna Refurbishment Area
- LOC 4: Electrical Transformers C and D
- LOC 5: Electrical Transformer USS 141
- LOC 6: Former Electrical Transformers A and B
- LOC 7: Flammable Storage Shed
- LOC 8: Boresight Tower Refurbishment Area
- LOC 9: Paint/Oil Locker Shed Pad Area
- LOC 10: Compressor Building Condensate Discharge

From August 2018 through July 2019, CS activities were conducted at the 10 LOCs. In the September 2019 CS Report (NASA 2019b) No Further Action (NFA) was recommended for LOCs 2, 4, 5, 6, 7, 8, and 9. Recommendations presented in the 2019 CS report for LOCs 1, 3, and 10 are listed below:

- LOC 1: Proceed to a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) to further evaluate State of Florida Groundwater Cleanup Target Level (GCTL) exceedances in groundwater.
- LOC 3: Proceed to RFI to delineate State of Florida Soil Cleanup Target Level (SCTL) exceedances in soil.
- LOC 10: Proceed to Soil IM for soil removal to address SCTL exceedances.

The Florida Department of Environmental Protection (FDEP) approved the CS Report recommendations, including NFA for LOCs 2, 4, 5, 6, 7, 8, and 9, in a letter, dated January 31, 2020 (FDEP 2020).

1.4 LOCs 1, 3, AND 10 – BACKGROUND

Previous investigations for LOCs 1, 3, and 10 are presented below. This report focuses on the soil IM implementation that was conducted at LOCs 3 and 10.

LOC 1 - Former USTs

LOC 1 is a grass area associated with two former USTs that were located on the west side of the powerhouse building. The USTs are suspected to have been removed in 1982 along with the expansion of the powerhouse building. Under the RFI, LOC 1 is being investigated under the NASA KSC Q6RS project and will be discussed under a separate cover.

LOC 3 – Radar Antenna Refurbishment

LOC 3 is the area surrounding the base of the radar antenna, located in the central area of the site. Unpaved areas outside the radar antenna base were historically impacted by refurbishment activities. LOC 3 includes the compressor area to the west of the radar pad, which is identified as LOC 10.

In 2018, CS results identified SCTL exceedances in soil for site contaminants of concern: barium and copper. In February 2021, under the RFI, soil sampling was completed, and the results were used to delineate the horizontal and vertical extent of barium and copper in shallow soil. The delineation of the barium and copper shallow soil plumes completed the RFI for LOC 3.

LOC 10 – Compressor Building Condensate Discharge

LOC 10 is the compressor area to the west of the LOC 3 radar antenna pad. This LOC was evaluated collectively as part of LOC 3.

A Soil IM Work Plan was submitted in October 2021 (NASA 2021), and is included as **Appendix B**. The plan proposed excavation and disposal of approximately 63 cubic yards of barium and copper impacted soil in the LOC 3 and LOC 10 areas. Hand digging or vacuum soil extraction was recommended given proximity of underground utilities and communications infrastructure. It was recommended to excavate to known clean locations (locations with soil samples results not exceeding SCTLs) and existing concrete slabs in the area around the radar antenna, therefore no confirmation samples were recommended. The concrete slabs have been in place since the facility was constructed. Soil IM removal activities were completed in early 2023 and are discussed in this report.

1.5 PURPOSE

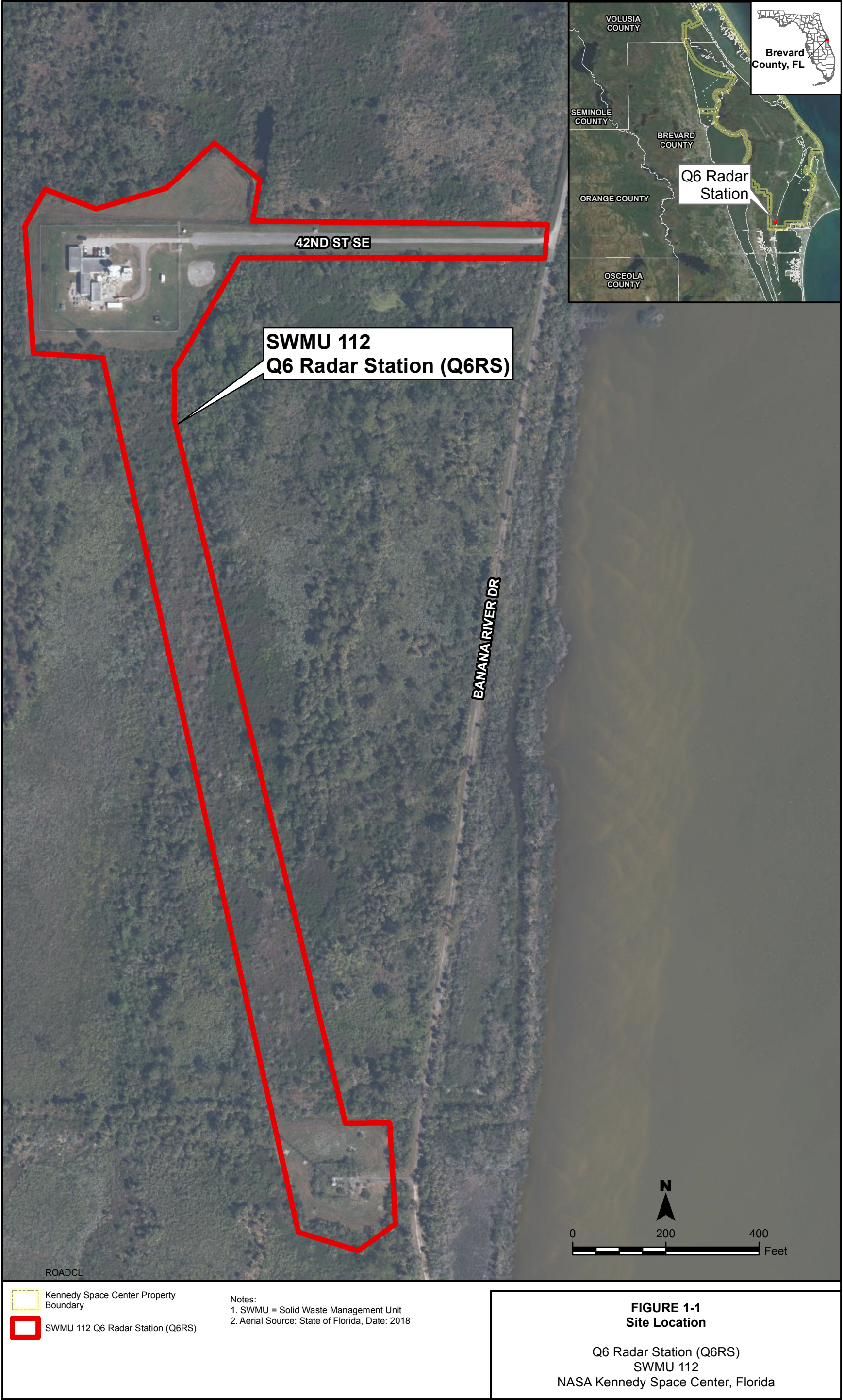
The purpose of this report is to present the soil IM implementation field activities conducted from January 23 through March 24, 2023, and to present the results for groundwater sampling conducted in June 2023.

1.6 REPORT ORGANIZATION

The remainder of this report is organized as follows:

- **Section 2:** Field Activities and Results. This section describes the methodology used and presents a summary of the soil IM implementation and groundwater sampling activities. It also summarizes the analytical results for the groundwater sampling activities.
- **Section 3:** Conclusions and Recommendations. This section presents conclusions and recommendations for the future of the site.
- **Section 4:** References. This section lists the documents used in developing this report.

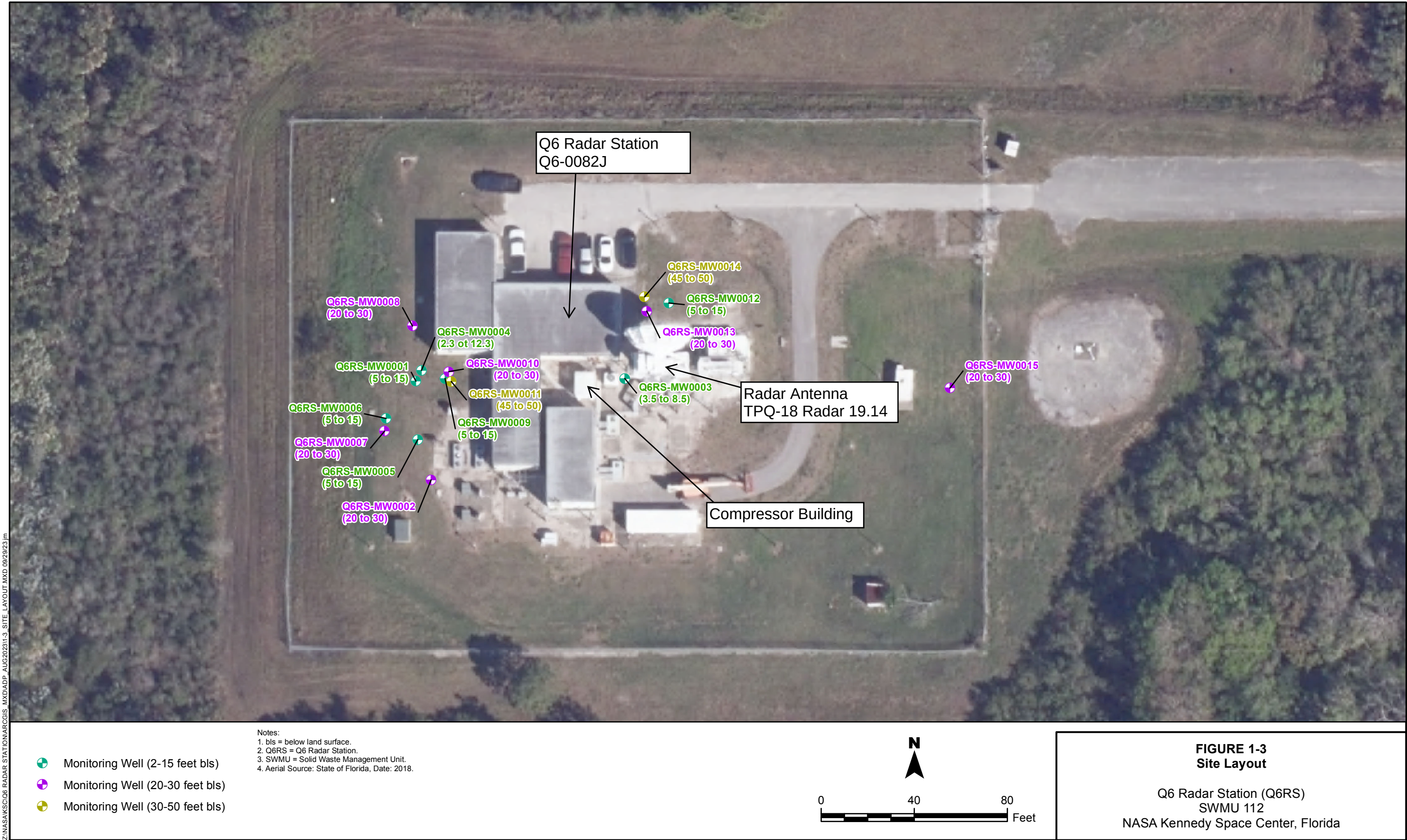
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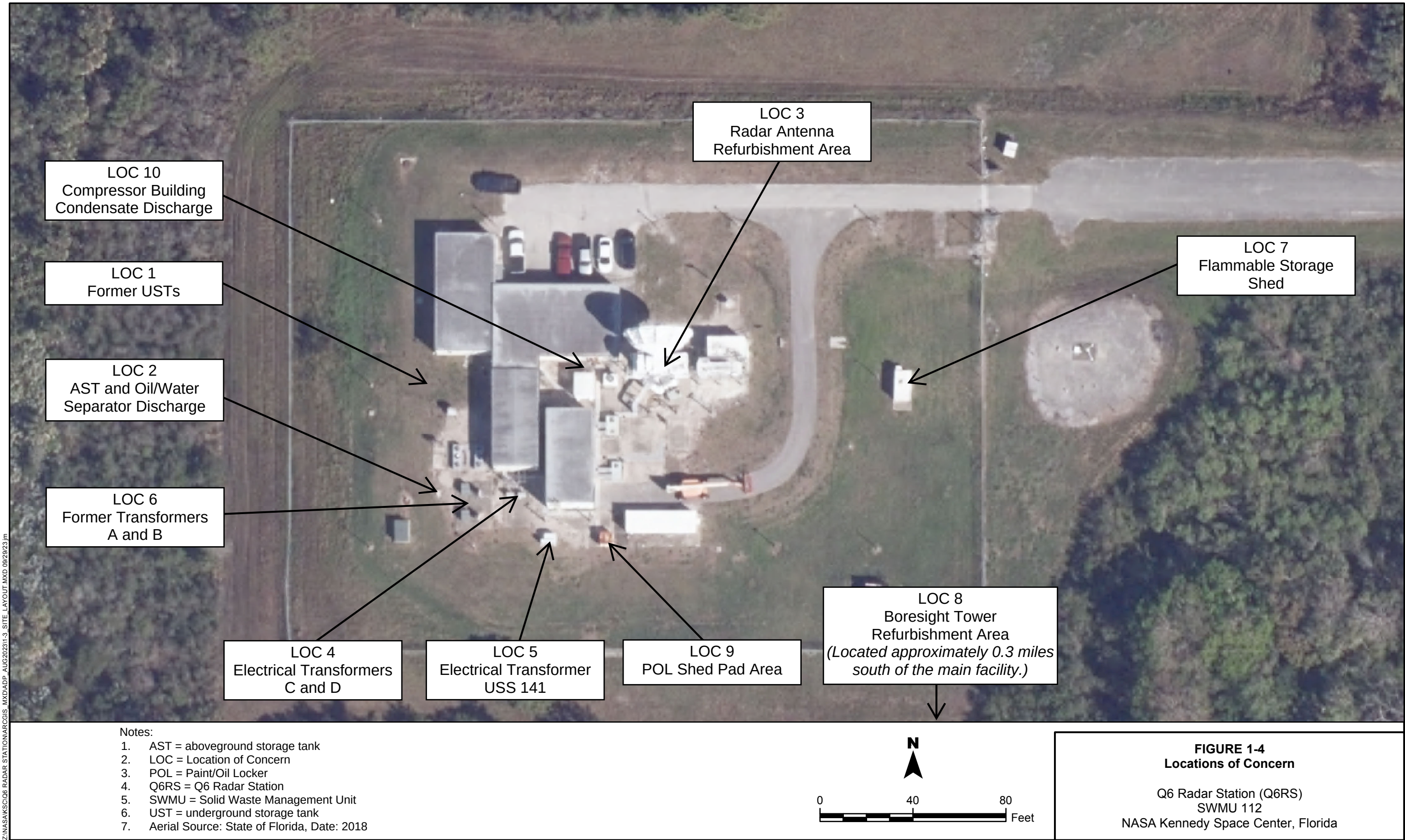
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SECTION 2 FIELD ACTIVITIES AND RESULTS

2.1 OVERVIEW

From January 23 through March 24, 2023, AECOM field personnel conducted IM implementation activities in the LOC 3 and 10 areas. On June 6, 2023, AECOM field personnel conducted groundwater sampling activities. Field activities were conducted in accordance with the Soil IM Work Plan (NASA 2021), included as **Appendix B**; FDEP Standard Operating Procedures (FDEP 2018); the KSC Sampling and Analysis Plan (NASA 2017); and the KSC Decision Process Document for the RCRA Corrective Action Program (NASA 2019a). Soil IM field implementation consisted of site preparation, mobilization, excavation, transportation and disposal, backfill, and site restoration.

The Soil IM Work Plan (NASA 2021) soil analytical results are included in **Table 2-1**, and are presented, along with the as-built IM excavation area, on **Figure 2-1**. The groundwater sampling analytical results are included in **Table 2-2** and are presented on **Figure 2-2**. Photos of the IM implementation activities are included in the ADP provided in **Appendix A**. Field notes and logs are provided in **Appendix C**. The laboratory analytical reports are included in **Appendix D**. Waste manifests and weight tickets for excavated soils and backfill materials are provided in **Appendix E**. Data were uploaded to the Remediation Information System (RIS) upon receipt. The RIS completion tickets are provided in **Appendix F**.

Investigation-derived waste from groundwater sampling field activities was contained in properly labeled 55-gallon drums, which were stored on NASA-provided spill pallets, and secured with cargo straps to be properly disposed of by NASA.

2.2 SITE PREPARATION, EXCAVATION, AND TRANSPORTATION AND DISPOSAL

From January 23 through February 9, 2023, AECOM conducted soil IM activities at the Q6RS facility. As presented in the IM Work Plan, shallow soils, impacted with metals, were excavated to a depth of 2 feet below land surface (bls) in the central area of the site around the radar antenna and associated equipment. No deviations from the IM Work Plan excavation extents and depths were made. Prior to beginning the excavation, a professional land surveyor, Land and Sea Surveying Concepts, Inc., located and marked the previous soil boring locations to ensure accurate marking of the excavation extents. AECOM personnel excavated 77.43 tons of soil using hand tools and, when able, heavy equipment. The soils were placed into lined roll-off containers, which were covered and transported under manifest to a permitted facility, Cedar Trail Landfill in Bartow, Florida, and disposed as industrial non-hazardous solid waste. The roll-off container delivery, transportation, and soil disposal was managed by Hulls Environmental, Inc. AECOM personnel also collected a composite soil sample of the excavated soils for waste characterization. The sample was submitted to a fix-based laboratory, Eurofins Environmental Testing Southeast, LLC (Eurofins), to be analyzed for 8 RCRA metals, including analysis using the Toxic Characteristic Leaching Procedure (TCLP), by United States Environmental Protection Agency (USEPA) Method 6020B (total and TCLP:

arsenic, barium, cadmium, chromium, lead, selenium, and silver), 7471B (total mercury) 7470A (TCLP: mercury).

2.3 BACKFILL AND SITE RESTORATION

The site was restored to original condition using clean backfill material (sand). The backfill was provided by Hulls Environmental and was sampled by AECOM personnel prior to use. The backfill sample was submitted to Eurofins for analysis by USEPA Methods 8260D for volatile organic compounds, 8270D for pesticides, 8270E for semi-volatile organic compounds, 8081B for organochloride pesticides, 8082A for polychlorinated biphenyls, 8151A for herbicides, 537 for per- and polyfluorinated substances, 8290A for dioxins and furans, 6020B for 8 RCRA metals, SM 2550G for cyanide, and FL-PRO for Total Recoverable Petroleum Hydrocarbons.

The backfill activities were conducted in conjunction with the excavation activities to eliminate large areas of open excavation to maintain health and safety at the site. The areas that were excavated were backfilled with sand to the surface in 3- to 6-inch layers and compacted between each layer using a vibrating plate compactor.

On February 17 and March 24, 2023, AECOM personnel performed site restoration activities at Q6RS. The disturbed areas within the excavation area were restored using filter fabric and gravel. The filter fabric was cut to fit, placed directly on the backfill sand, and then staked to prevent movement. The gravel was placed on top of the filter fabric to a minimum depth of 3 inches and a maximum depth of 6 inches. The outer areas that were disturbed during the IM activities were seeded using a Pennington Annual Ryegrass seed on February 17, 2023, and again on March 24, 2023. The seed was spread using a battery-operated hand-held spreader, and then was gently raked to work the seed into the soil.

2.4 GROUNDWATER SAMPLING FIELD ACTIVITIES AND ANALYTICAL RESULTS

On June 6, 2023, AECOM personnel collected a groundwater sample from one monitoring well, Q6RS-MW0003, screened from 3.5 to 8.5 feet bls. Q6RS-MW0003 is located immediately west of the radar antenna within the LOC 3 soil IM footprint. During monitoring well purging, the following geochemical parameters were recorded at regular intervals: pH, temperature, dissolved oxygen, conductivity, oxidation reduction potential, salinity, and turbidity. The groundwater sample was submitted to Eurofins for analysis by USEPA Method 6020B for metals (barium and copper). The laboratory analytical data were reviewed for completeness, and the data are acceptable for their intended use as it pertains to this report. Barium and copper were detected at 18 micrograms per liter (µg/L) and 14 µg/L, respectively, and were below the GCTLs for barium at 2,000 µg/L and copper at 1,000 µg/L.

Table 2-1
LOC 3 and LOC 10 Soil Analytical Results - Barium and Copper
Q6 Radar Station - SWMU 112

Category					Metals by Method 6010C	
Analyte					Barium	Copper
FDEP RSCTL (mg/kg)					120	150
FDEP ISCTL (mg/kg)					130,000	89,000
FDEP LSCT (mg/kg)					1,600	-
Location ID	Northing	Easting	Sample Date	Screened Interval (feet bls)		
Q6RS-SB0003	453324.4690	232878.6317	8/9/2018	0-0.5	191	280
			10/9/2018	0.5-2	4.8	1.3 I
Q6RS-SB0004	453321.1715	232882.6477	8/9/2018	0-0.5	315	140 B
			10/9/2018	0.5-2	20	NS
Q6RS-SB0005	453314.0148	232878.4477	8/13/2018	0-0.5	1,030	147 B
			10/9/2018	0.5-2	17	NS
Q6RS-SB0006	453318.9247	232874.6909	8/13/2018	0-0.5	401	235 B
			10/9/2018	0.5-2	6.2	10
Q6RS-SB0007	453323.3216	232881.8372	8/9/2018	0-0.5	127	38.6
			10/10/2018	0.5-2	4.4	NS
Q6RS-SB0034	453318.6598	232866.6283	8/13/2018	0-0.5	222	88.1 B
			10/10/2018	0-0.5	290	NS
			10/10/2018	0.5-2	6.8	NS
Q6RS-SB0039	453326.1434	232878.6503	10/10/2018	0-0.5	29	14
Q6RS-SB0040	453326.8112	232882.6193	10/10/2018	0-0.5	8.1	5.2
Q6RS-SB0041	453324.9622	232885.2181	10/10/2018	0-0.5	5.3	1.2 I
Q6RS-SB0042	453312.9891	232882.8972	10/10/2018	0-0.5	3.9	NS
Q6RS-SB0043	453310.5808	232879.1827	10/10/2018	0-0.5	2.7	NS
Q6RS-SB0045	453319.9212	232868.5102	10/10/2018	0-0.5	29	15
Q6RS-SB0046	453322.2685	232884.2333	7/19/2019	0-0.5	18	11
Q6RS-SB0047	453325.9390	232877.2774	7/19/2019	0-0.5	400	180
			7/19/2019	0.5-2	7.9	6.1
Q6RS-SB0048	453320.5398	232890.9137	7/19/2019	0-0.5	11	9.5
Q6RS-SB0049	453315.4287	232885.0961	7/19/2019	0-0.5	15	6.0
			7/19/2019	0.5-2	4.5	0.66 I
Q6RS-SB0050	453309.6061	232881.1633	7/19/2019	0-0.5	3.5	1.6 I
Q6RS-SB0051	453309.7584	232875.7272	7/19/2019	0-0.5	2.4	1.6 I
Q6RS-SB0052	453312.7161	232874.1473	7/19/2019	0-0.5	140	26
			7/19/2019	0.5-2	NS	32
Q6RS-SB0053	453314.2872	232873.6818	7/19/2019	0-0.5	950	280
Q6RS-SB0054	453315.8378	232868.9909	7/19/2019	0-0.5	340	140
			7/19/2019	0.5-2	14	NS
Q6RS-SB0055	453316.2686	232866.8341	7/19/2019	0-0.5	57	67
Q6RS-SB0056	453315.7461	232863.4030	7/19/2019	0-0.5	21	64
Q6RS-SB0057	453318.4829	232863.9140	7/19/2019	0-0.5	63	590
			7/19/2019	0.5-2	NS	23
Q6RS-SB0058	453326.2696	232876.3847	2/22/2021	0-0.5	23.0	72.4

Table 2-1
LOC 3 and LOC 10 Soil Analytical Results - Barium and Copper
Q6 Radar Station - SWMU 112

Category					<i>Metals by Method 6010C</i>	
Analyte					Barium	Copper
FDEP RSCTL (mg/kg)					120	150
FDEP ISCTL (mg/kg)					130,000	89,000
FDEP LSCTL (mg/kg)					1,600	-
Location ID	Northing	Easting	Sample Date	Screened Interval (feet bls)		
Q6RS-SB0059	453311.5047	232874.0221	2/22/2021	0-0.5	182	46.2
			2/22/2021	0.5-2	30.6	NS
Q6RS-SB0060	453309.6527	232873.9560	2/22/2021	0-0.5	40.5	28.3
Q6RS-SB0061	453320.5666	232864.0341	2/22/2021	0-0.5	81.7	27.4
Q6RS-SB0062	453320.3821	232872.1606	2/22/2021	0-0.5	90.3	356
			2/22/2021	0.5-2	NS	87.6

Notes:

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of residential SCTLs

Highlighted cell indicates an exceedance of industrial SCTLs

Italicized font indicates an exceedance of soil leachability to groundwater

bls = below land surface

NS = not sampled

B = indicates the analyte was detected in the laboratory method blank

I = indicates the result is greater than the method detection limit but lower than the practical quantitation limit

mg/kg = milograms per kilogram

All results and screening criteria presented in mg/kg

FDEP RSCTL = Florida Department of Environmental Protection Residential Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

FDEP ISCTL = Florida Department of Environmental Protection Industrial Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

FDEP LSCTL = Florida Department of Environmental Protection Leachability Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

Table 2-2
LOC 3 and LOC 10 Groundwater Analytical Results - Barium and Copper
Q6 Radar Station - SWMU 112

Category			Metals by Method 6020	
Analyte			Barium	Copper
FDEP GCTLs (µg/L)			2,000	1,000
FDEP NADCs (µg/L)			20,000	10,000
Location ID	Screened Interval (feet bls)	Sample Date		
Q6RS-MW0003	3.5 to 8.5	6/6/2023	18	14

Notes:

Bolded results indicate the presence of an analyte at the specified concentration

Red font indicates an exceedance of FDEP GCTLs

Highlighted cell indicates an exceedance of FDEP NADCs

Blank cells indicate the analyte was not analyzed for that specific well and date

bls = below land surface

GCTL = Groundwater Cleanup Target Level, Chapter 62-777 Florida Administrative Code, Table 1 (2005)

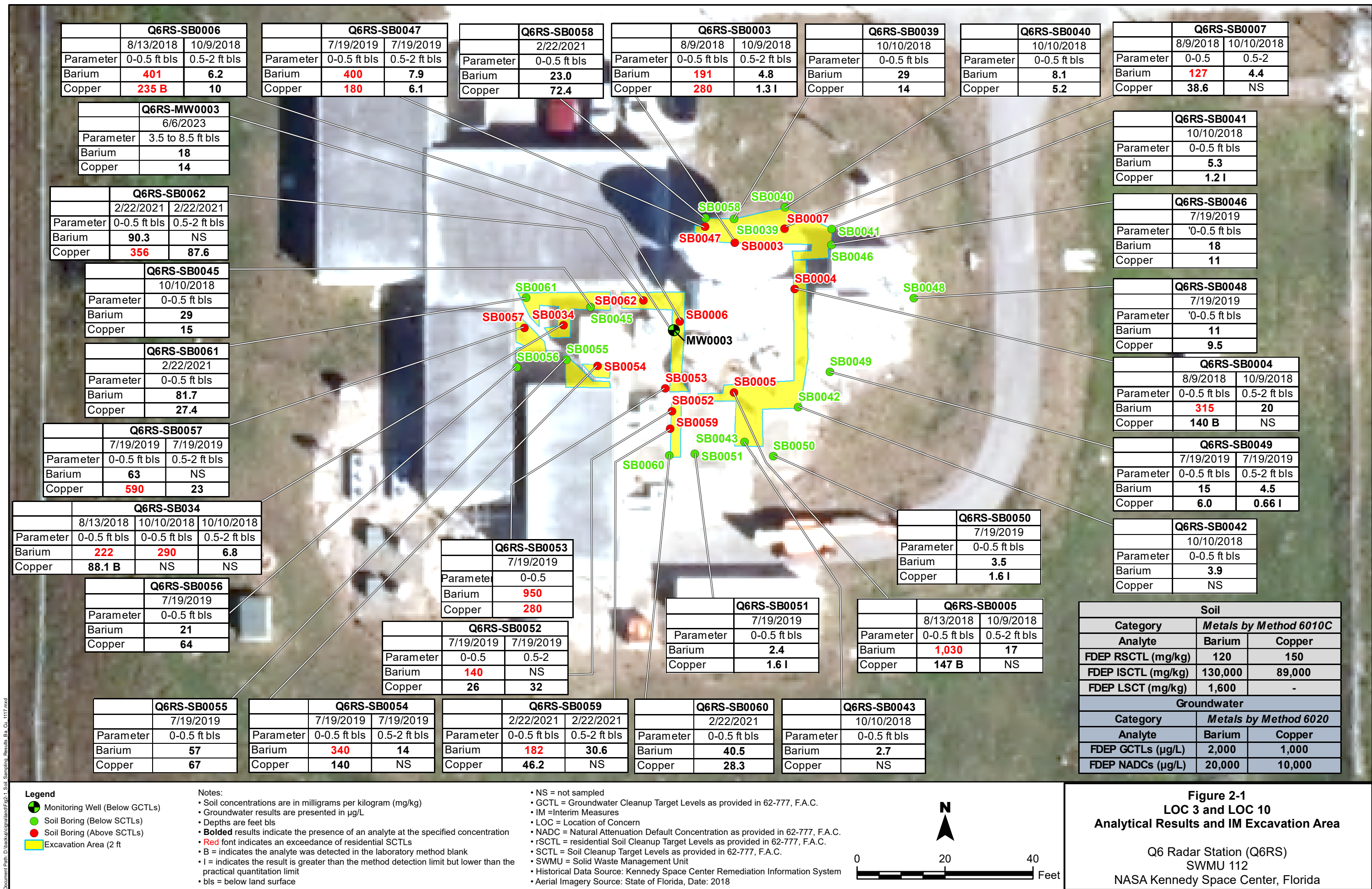
NADC = Natural Attenuation Default Concentration, Chapter 62-777 Florida Administrative Code, Table V (2005)

SWMU - Solid Waste Management Unit

µg/L = micrograms per liter

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SECTION 3 CONCLUSIONS AND RECOMMENDATIONS

The Q6RS IM Implementation and sampling activities and results were presented in an ADP to the KSCRT in October 2023, and the KSCRT agreed with the following conclusions and recommendations, with the understanding that FDEP will review this report and provide comments. The ADP and KSCRT meeting minutes are provided in **Appendix A**.

3.1 CONCLUSIONS

Based on soil IM implementation and sampling activities performed during this reporting period, the following conclusions are provided:

- The LOC 3 and 10 Soil IM was implemented and removed shallow soils with barium and copper concentrations greater than the residential SCTL.
- Approximately 77.43 tons (equating to a soil volume of approximately 66.5 cubic yards) of impacted soils were excavated and the waste was transported, under manifests, and properly disposed at a permitted landfill.
- The excavated areas were backfilled with certified-clean soil and finished with seed and/or gravel to restore to original condition.
- Shallow groundwater within the excavation footprint was sampled at monitoring well Q6RS-MW0003, and barium and copper concentrations were below their respective GCTLs.
- Groundwater investigation for other constituents remains ongoing for LOC 1 at the site and will be presented under a separate cover.
- No additional soil or groundwater sampling for barium or copper is required in the LOC 3 and LOC 10 areas.

3.2 RECOMMENDATIONS

Based on soil IM implementation and sampling activities performed during this reporting period, the following recommendations are provided:

- NFA is recommended for soil at the Q6RS site.
- Continuation of the LOC 1 investigation for groundwater under the Q6RS – SWMU 112 Project is recommended. The results will be presented under a separate cover.

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SECTION 4 REFERENCES

FDEP. 2018. Department of Environmental Protection Standard Operating Procedures for Field Activities, DEP-SOP-001/01. Florida Department of Environmental Protection.

FDEP. 2020. Review Letter, dated January 31, 2022, for the Confirmatory Sampling (CS) Report and RCRA Facility Investigation Work Plan, Revision 0, Potential Release Location (PRL) 214, Q6 Radar Station, National Aeronautics and Space Administration (NASA) – Kennedy Space Center (KSC), USEPA ID #FL6 800 014 585, Florida (Tetra Tech, October 4, 2019). Florida Department of Environmental Protection.

NASA. 2013. Q6-Radar Station (Q6RS), (Q6-0082) PRL 214, SWMU Assessment Report / Confirmatory Sampling Work Plan, Kennedy Space Center, Florida (Revision 0). Prepared by MESCI/IHA Environmental Services Branch Environmental Sampling, Analysis and Monitoring Section IHA-4300/IHA-022, Kennedy Space Center, Florida.

NASA. 2017. Sampling and Analysis Plan for the RCRA Corrective Action Program, Kennedy Space Center, Florida (Revision 5). Prepared by Geosyntec Consultants, Inc., Boca Raton, Florida.

NASA. 2019a. Decision Process Document for the RCRA Corrective Action Program, John F. Kennedy Space Center, Florida (Revision 2). Prepared by Geosyntec Consultants, Inc., Boca Raton, Florida.

NASA. 2019b. Q6 Radar Station, Q6-0082, PRL 214, Confirmatory Sampling Report and RCRA Facility Investigation Work Plan Kennedy Space Center, Florida (Revision 0). Prepared by Tetra Tech, Inc. Pittsburgh, Pennsylvania.

NASA. 2021. Soil Interim Measures Work Plan, Q6 Radar Station, Q6-0082, Solid Waste Management Unit #112, Location of Concern 3, Kennedy Space Center, Florida (Revision 0). Prepared by AECOM, Orlando, Florida.

United States Geological Survey. 1976. Courtenay Florida Topographic Quadrangle Map.

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APPENDIX A

**ADVANCE DATA PACKAGE AND
KSC REMEDIATION TEAM MEETING MINUTES**

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Soil Interim Measures at Various Sites

Q6 Radar Station, Q6-0082, Solid Waste Management Unit 112 –
Locations of Concern 3 and 10 – Soil Interim Measures Implementation

October 2023

Outline

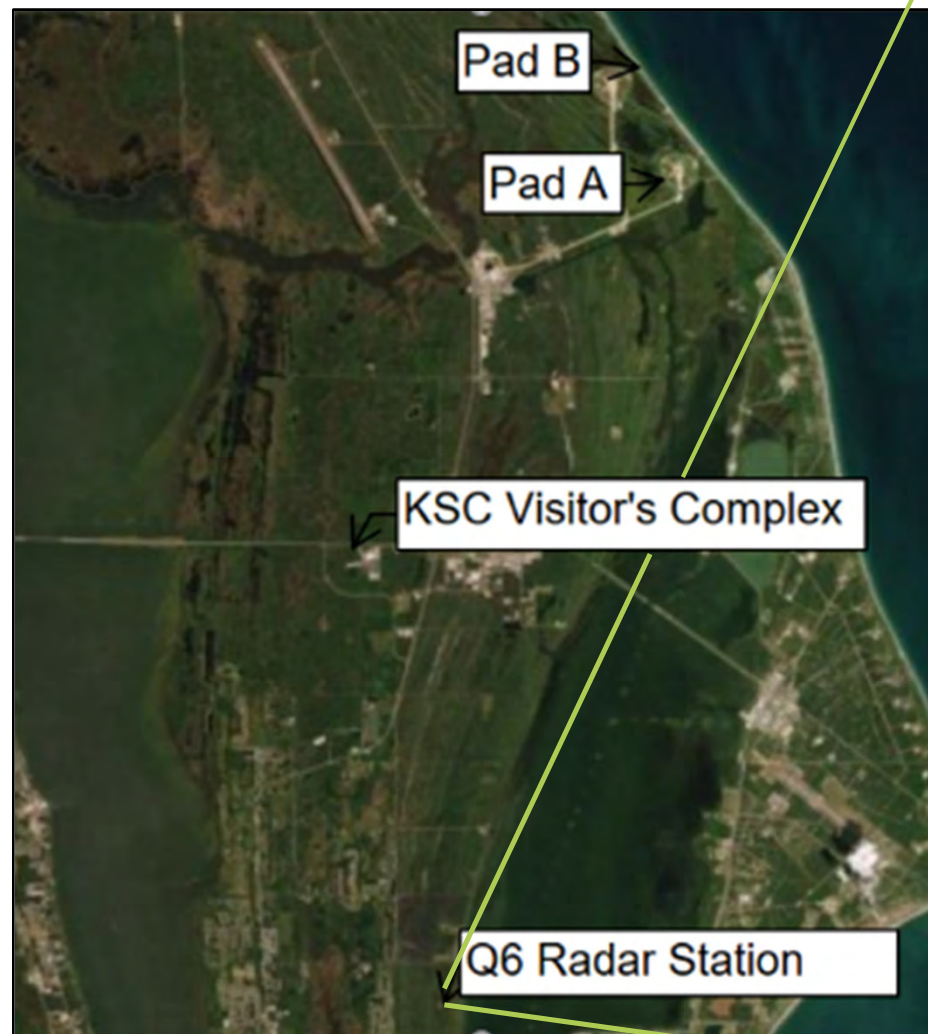
- Q6 Radar Station (Q6RS), Q6-0082, Solid Waste Management Unit (SWMU) 112 – Locations of Concern (LOC) 3 and 10 – Soil Interim Measures (IM) Implementation
 - Site Description and History
 - Previous Investigations
 - Soil IM Work Plan Overview
 - Soil IM Implementation
 - Path Forward
 - Test Consensus

Objective:
No Further Action
for Soil



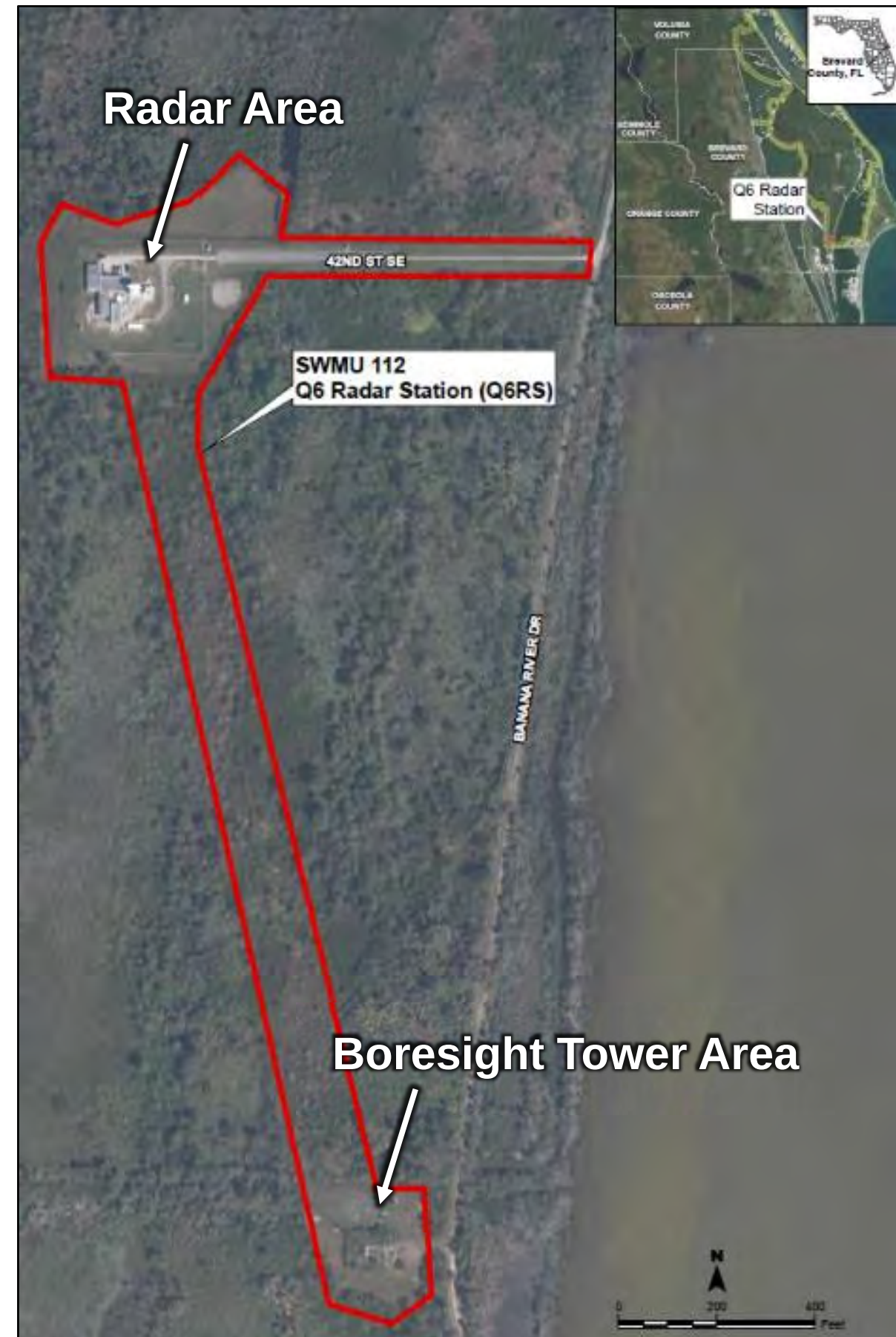
Q6RS – Site Description

- The Q6 Radar Station is located at the southern end of Kennedy Space Center (KSC)
- Approximately 6.8 miles south of the KSC Visitor's Complex and adjacent to the Banana River
- The site is outside of the secured perimeter of KSC



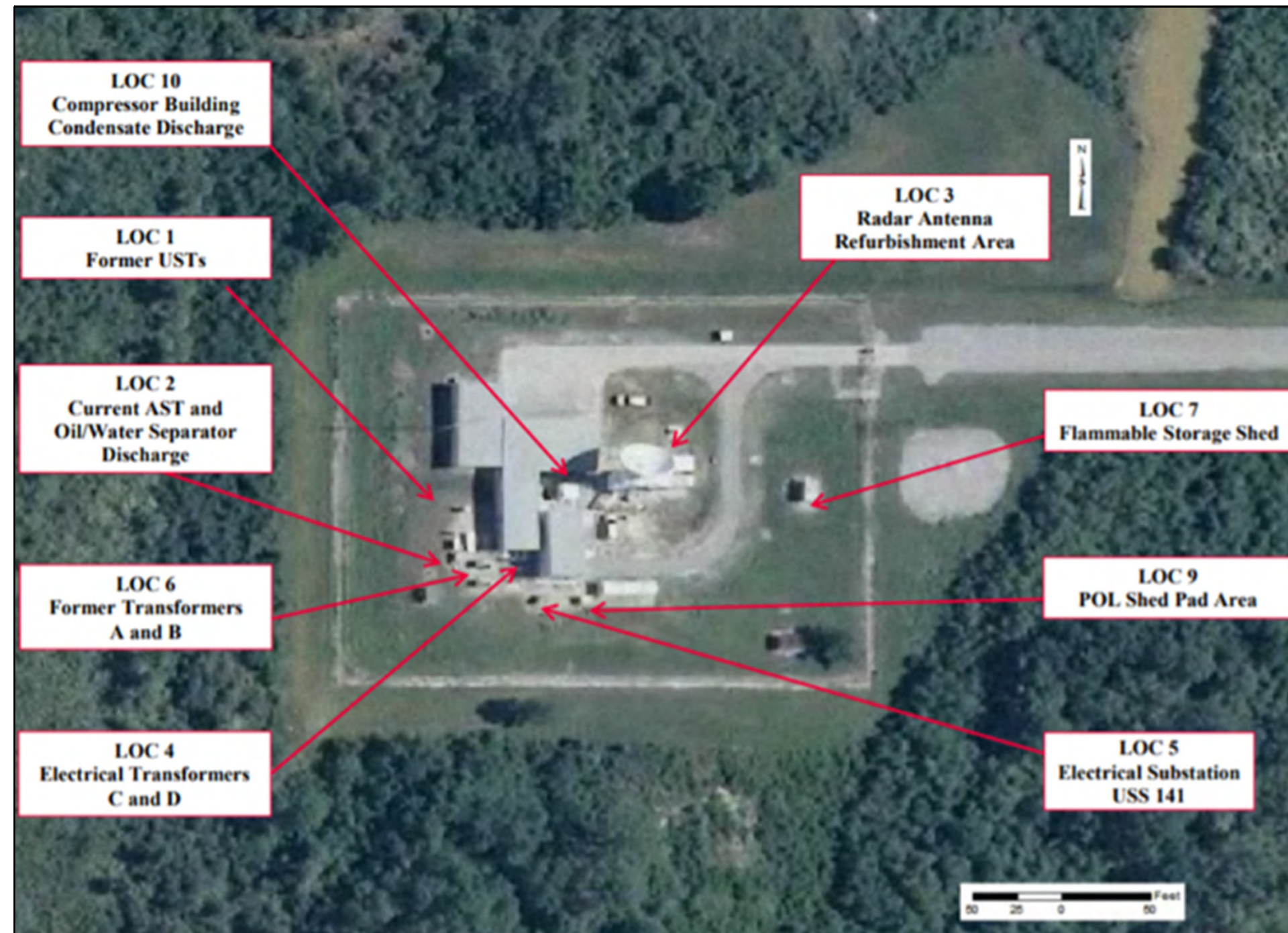
Q6RS – Site Description and History

- Constructed in 1964 by the United States Air Force as a radar support site for KSC and Cape Canaveral Air Force Station (currently known as Cape Canaveral Space Force Station)
- Operational areas of the facility can be separated into two areas approximately 0.3 mile apart:
 - Radar area to the north (surrounded by perimeter fencing and gate, which is locked when personnel are not on-site)
 - Boresight tower area to the south (surrounded by unlocked perimeter fencing)
- Site has not undergone any significant changes since construction



Q6RS – Previous Investigations Overview

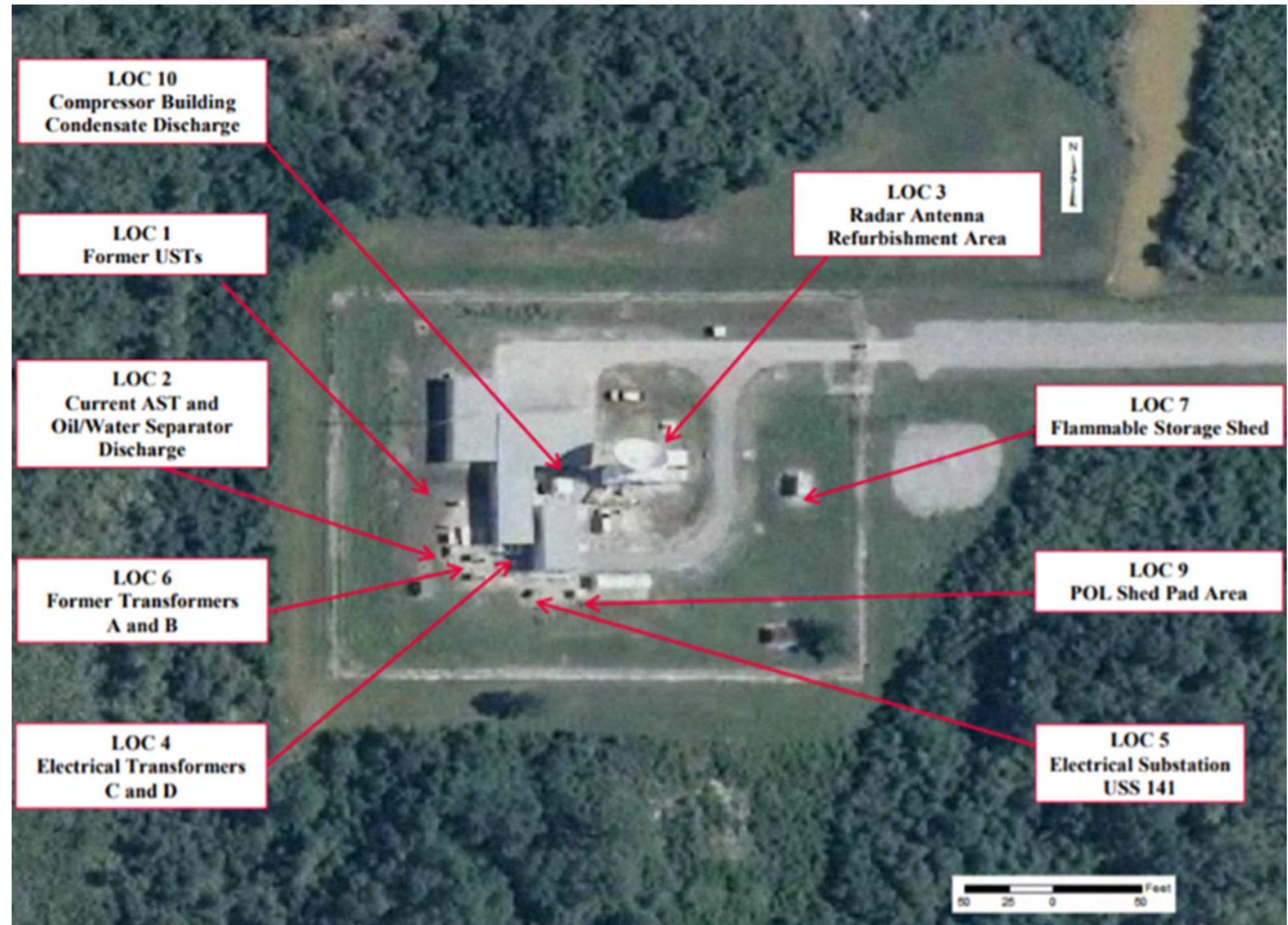
- 1996 Incidental Wastewater Discharge Study
 - Q6 Radar Station was evaluated as part of a larger KSC study; no discharges were identified
 - No sampling was recommended
- 2013 Spill Contamination Investigation and Confirmatory Sampling (CS)
 - 2 gallons of transformer oil leaked onto soil
 - Contaminated soil was excavated, and soil samples collected to confirm no further sampling required
- May 2013 SWMU Site Assessment Report (SAR) and Confirmatory Sampling Work Plan (CSWP)
 - Included site reconnaissance and interviews with staff knowledgeable of past and present work practices and operations
 - Identified 10 LOCs and recommended CS to confirm the presence or absence of impacts at the LOCs
- CS activities were conducted from August 2018 through July 2019 at the 10 LOCs



Note: LOC 8 – Boresight Tower Refurbishment Area is located to the south of this figure.

Q6RS – Previous Investigations Overview (continued)

- September 2019 CS Report recommendations:
 - No Further Action (NFA) recommended for LOCs 2, 4, 5, 6, 7, 8, and 9
 - LOC 1: Proceed to Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) to further evaluate State of Florida Groundwater Cleanup Target Level (GCTL) exceedances in groundwater
 - LOC 3: Proceed to RFI to delineate State of Florida Soil Cleanup Target Level (SCTL) exceedances in soil
 - LOC 10 proceed to Soil IM for soil removal to address SCTL exceedances
- The Florida Department of Environmental Protection (FDEP) approved the CS Report recommendations in a letter dated January 2020



Note: LOC 8 – Boresight Tower Refurbishment Area is located to the south of this figure.

Q6RS – Summary of Previous Investigations

Date	Investigation
1996	Incidental Wastewater Discharge Study
2013	Spill Contamination Investigation and CS
2013	SWMU Assessment
2013	SWMU SAR and CSWP, 10 LOCs identified
2018 - 2019	CS activities
2019	CS Report with RFI Work Plan and Soil IM Work Plan provided as appendices, The CS Report recommended a path forward for the 10 LOCs (FDEP provided approval in a letter dated January 2020)

CS Report recommendations for all 10 LOCs:

LOCs 2, 4, 5, 6, 7, 8, and 9	LOC 1 (Former Underground Storage Tanks [USTs])	LOC 3 (Radar Antenna Refurbishment)	LOC 10 (Compressor Building Condensate Discharge)
NFA	Proceed to RFI	Proceed to RFI	Proceed to Soil IM

Note: This presentation focuses on Soil IM activities associated with LOCs 3 and 10.

Q6RS – Previous Investigations - LOCs 1, 3, and 10

- LOC 1 - Former Underground Storage Tanks (USTs)
 - Grass area associated with two former USTs that were located on the west side of the powerhouse building
 - Former USTs suspected to have been removed in 1982 with expansion of the powerhouse building
 - LOC 1 is being investigated and will be discussed under separate cover
- LOC 3 - Radar Antenna Refurbishment
 - Area surrounding base of radar antenna
 - Unpaved areas outside the radar antenna base impacted by refurbishment activities
 - Includes the compressor area to the west of the radar pad, which was identified as LOC 10
- LOC 10 - Compressor Building Condensate Discharge
 - The compressor area to the west of the LOC 3 radar pad
 - This LOC was evaluated collectively as part of LOC 3

LOC 1



LOC 3

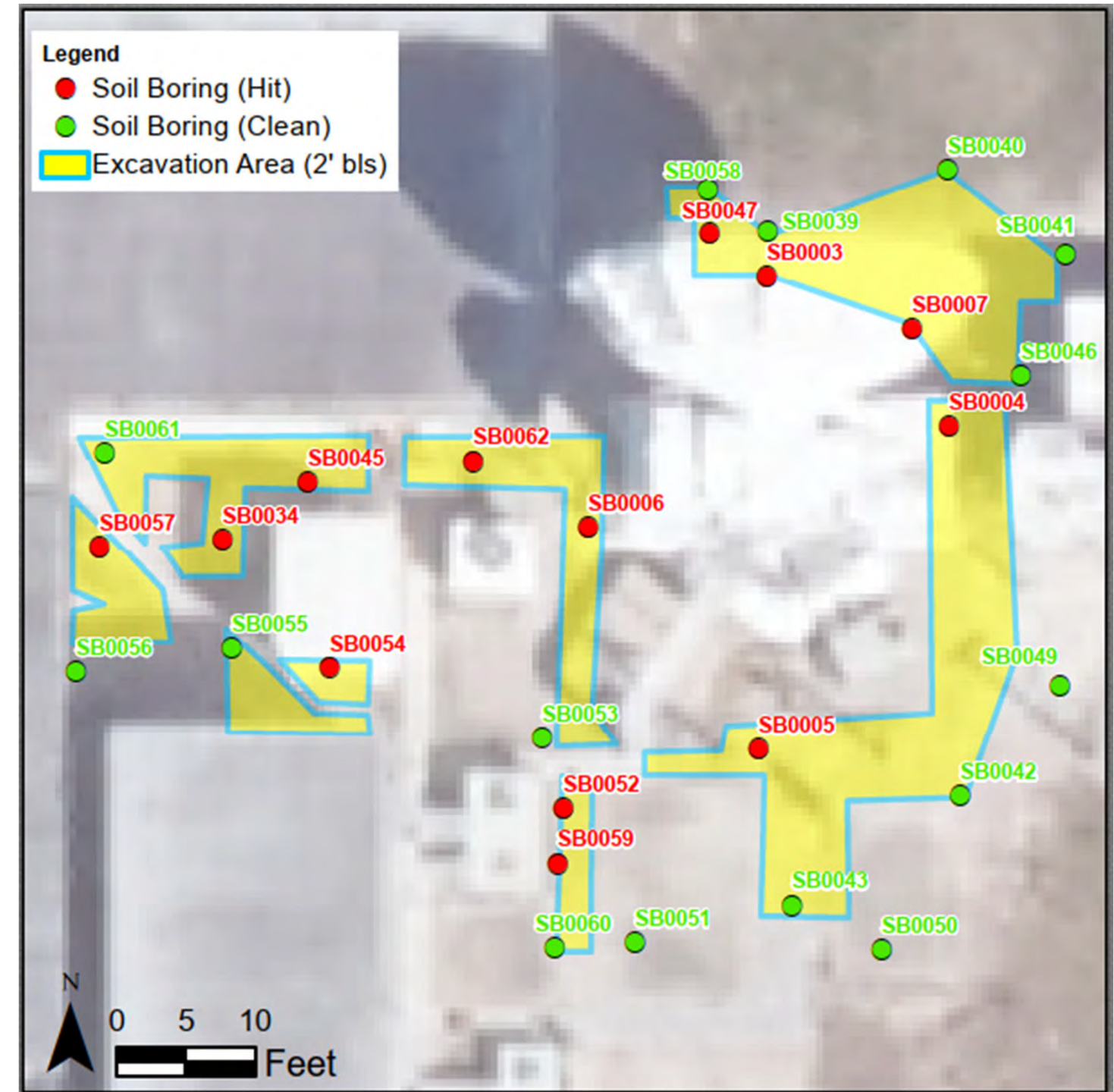


LOC 10



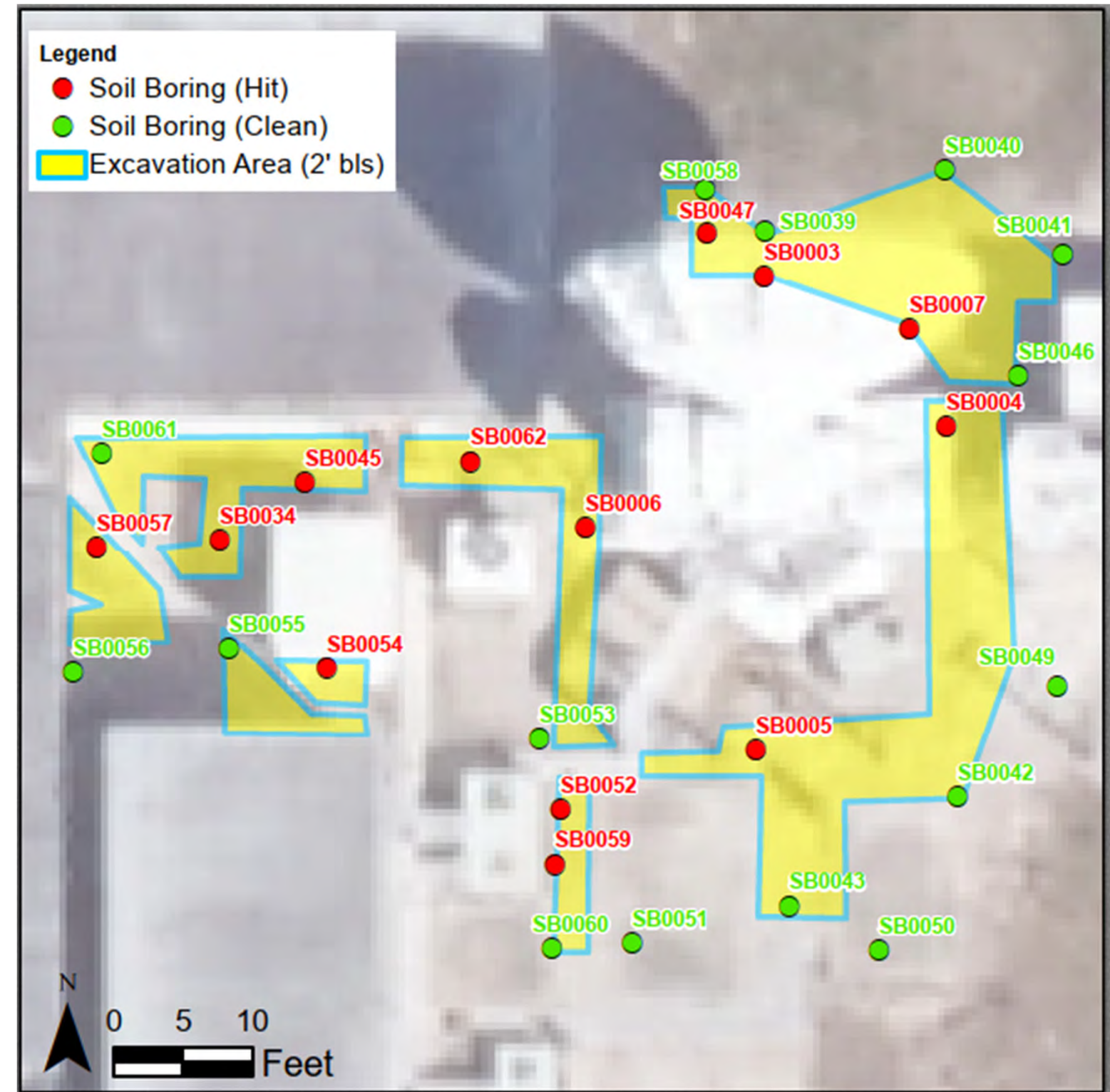
Q6RS – Previous Investigations - LOC 3 and LOC 10

- CS results identified SCTL exceedances in soil for barium and copper
- Soil sampling completed per the RFI Work Plan
 - Activities conducted February 2021
 - Delineated the horizontal and vertical extent of barium and copper in soil
- Soil IM Work Plan submitted in October 2021
 - Proposed excavation and disposal of approximately 63 cubic yards of barium and copper impacted soil
 - Recommended hand dig or vacuum soil extraction given proximity of underground utilities and communications infrastructure
 - No confirmation samples recommended; will excavate to known clean locations and existing concrete slabs
- Soil IM removal activities were completed in early 2023 and are discussed in this presentation.



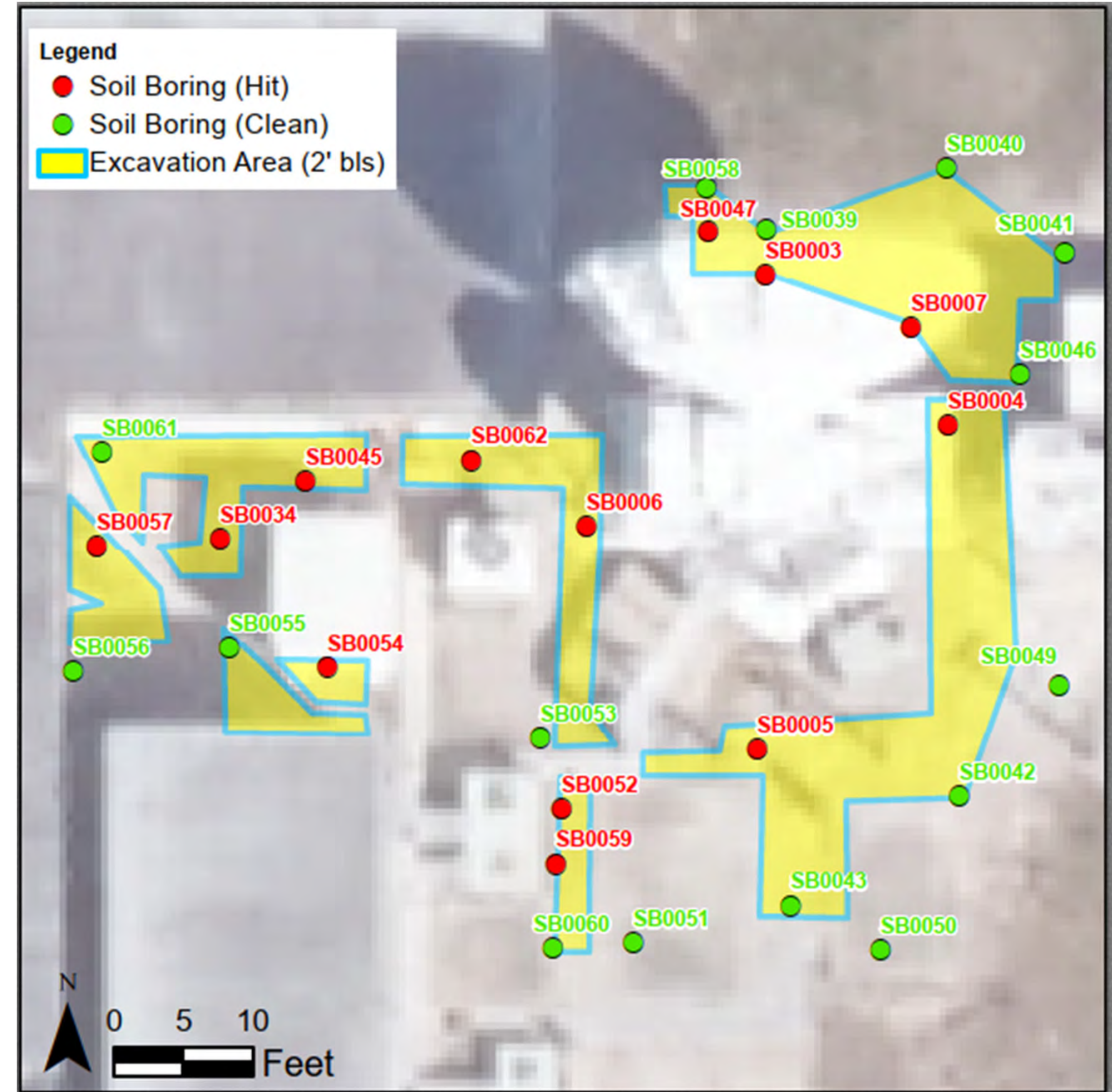
Q6RS – Soil IM Work Plan Overview

- Remove approximately 63 cubic yards of barium and copper contaminated soil
- 2.0 feet total depth
- Extent of excavation defined by samples less than residential SCTLs, buildings, and equipment structures
- Hand digging or the use of vacuum soil extraction will be necessary due to the proximity to buildings, underground and surface utilities, and communications infrastructure
- Work plan states that no confirmation of samples will be required; however, due to the age of the in-situ samples, one additional waste characterization composite sample was required by the disposal facility for RCRA 8 metals analysis
- Restore the areas by backfilling with clean soil and compacting to existing grade

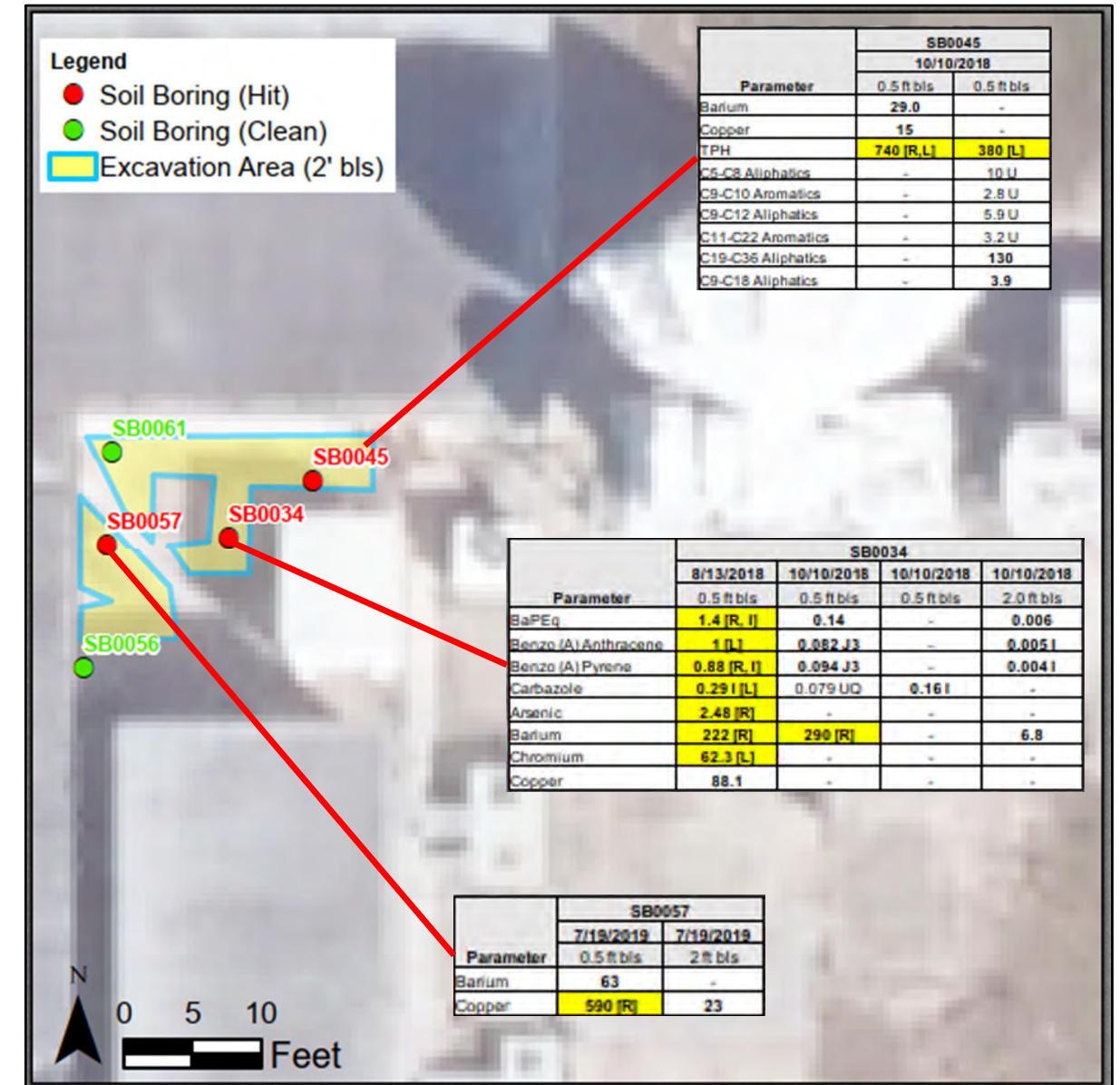
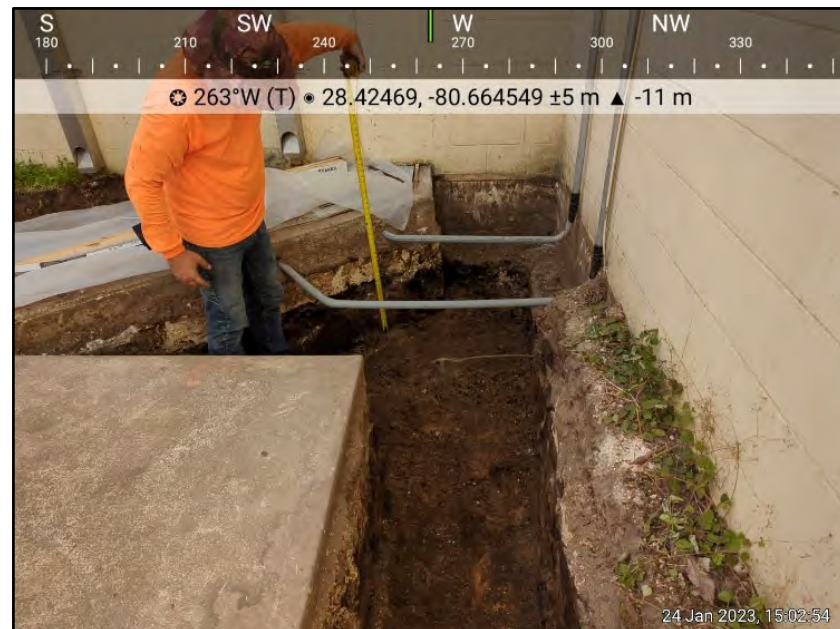


Q6RS – Soil IM Implementation

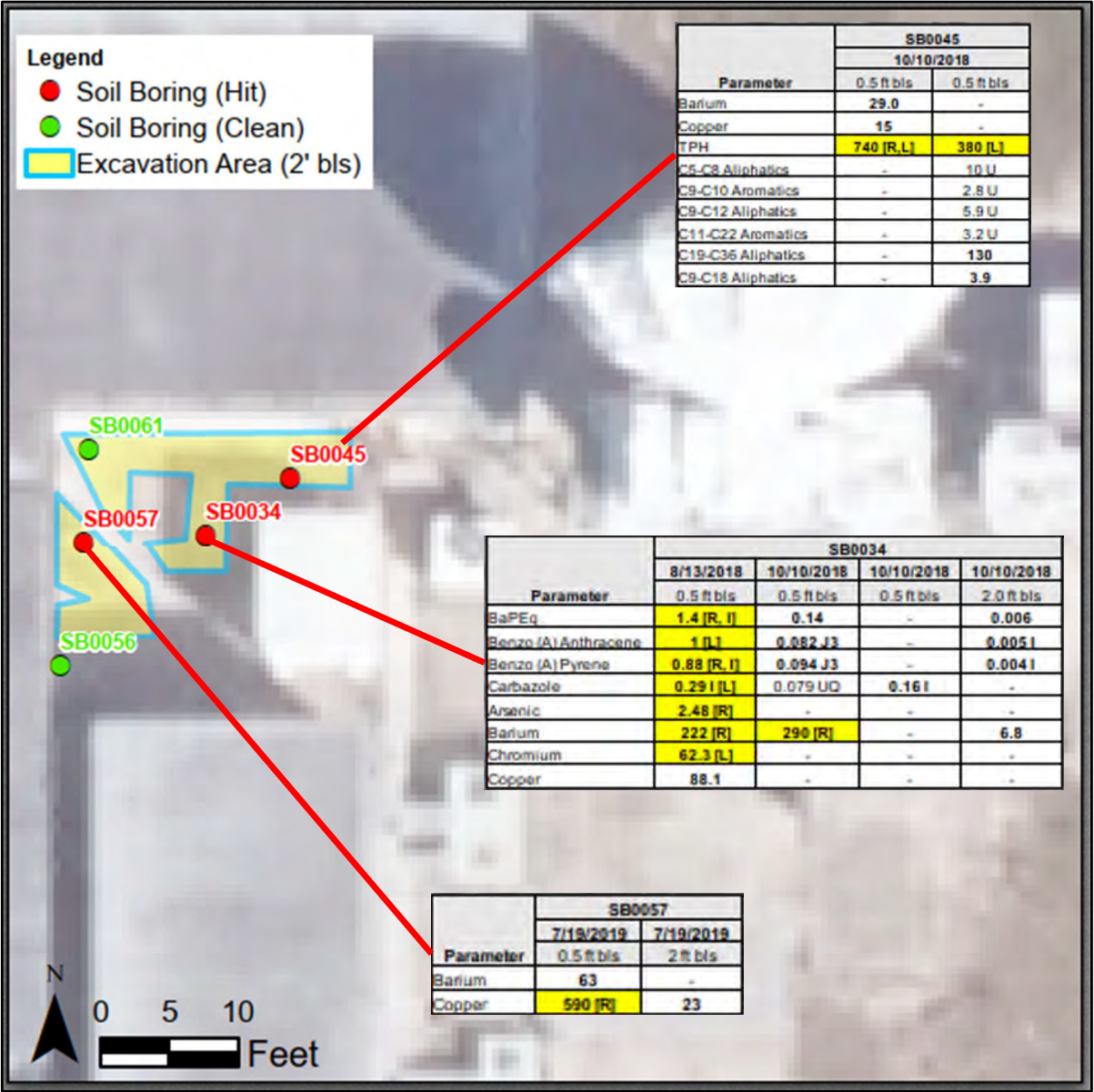
- Conducted soil removal and backfill activities from January 23 through February 9, 2023
- Completed site restoration activities on February 17 and March 24, 2023
- Soil boring locations were located by a Professional Surveyor prior to marking excavation extents
- Removed 77.43 tons (approximately 64.5 cubic yards) of barium and copper contaminated soil
- 2.0 feet total depth
- Hand dug most areas, and transported soils using wheelbarrows to a skid-steer bucket loader and then to staged roll-off containers
- Seven lined roll-off containers were covered and transported under manifest to the Cedar Trail Landfill in Bartow, Florida, for disposal
- Restored the site original condition using certified clean backfill material (sand), and then finished the surface with 3 to 6 inches of 57 stone gravel on top of weed prevention filter fabric
- Disturbed areas outside of the excavation were seeded with an annual ryegrass grass seed, which was gently raked in to work the seed into the soil



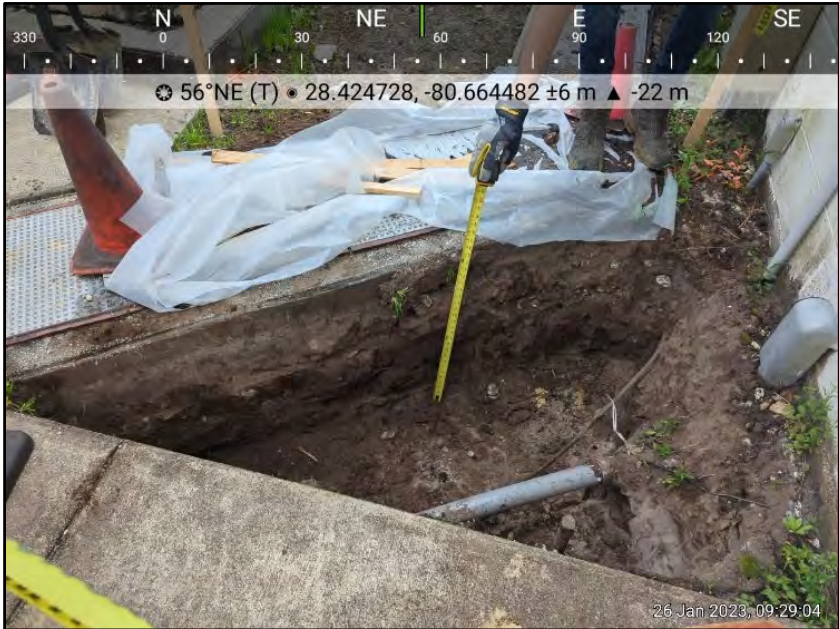
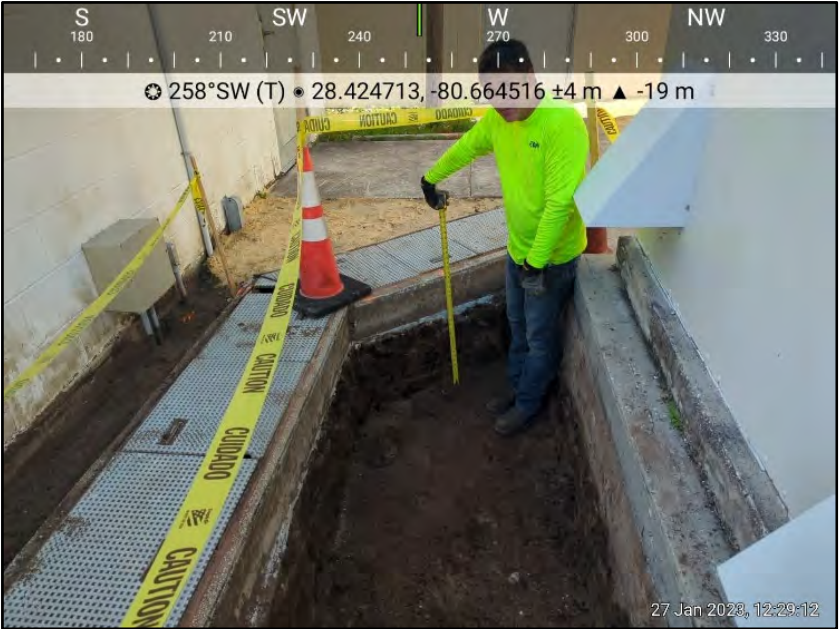
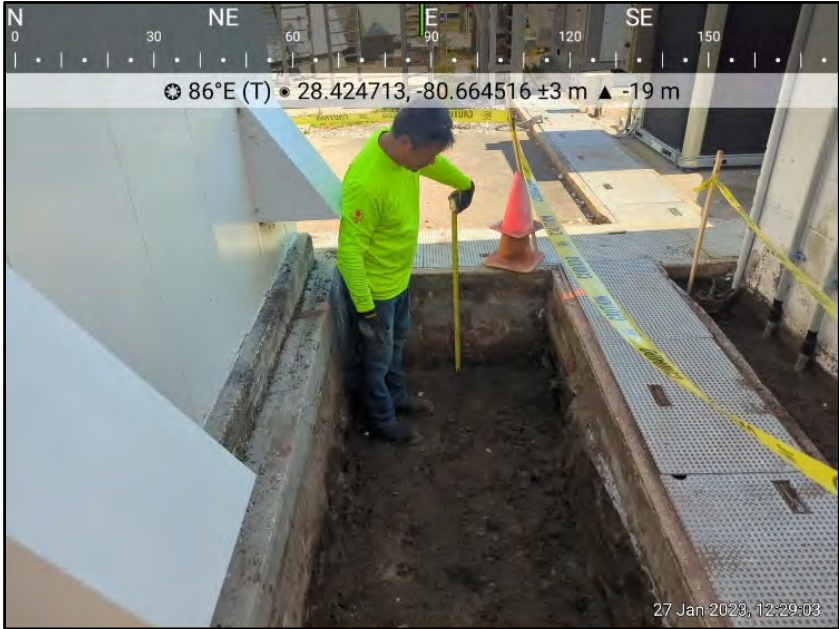
Q6RS – Soil IM Implementation



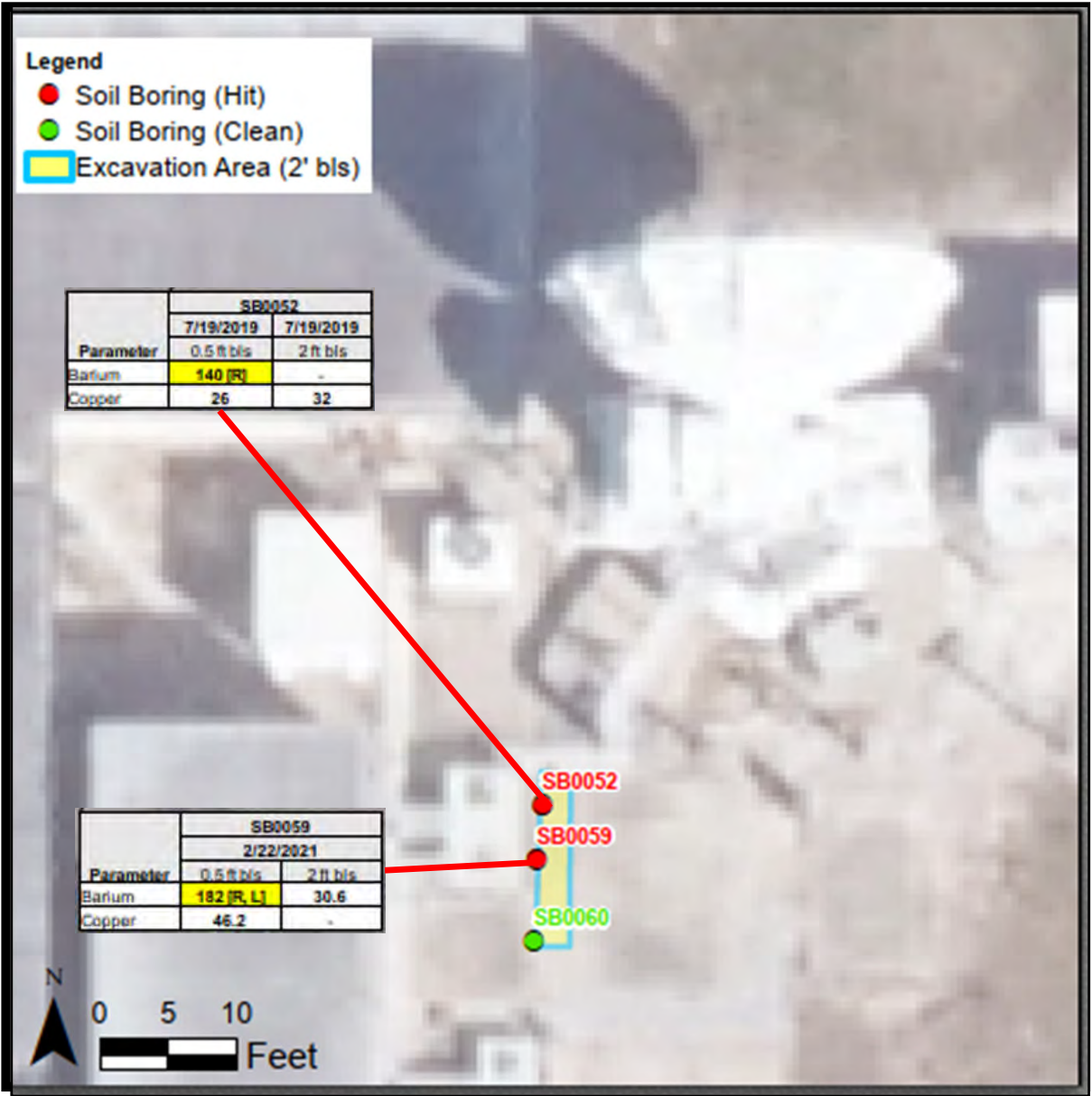
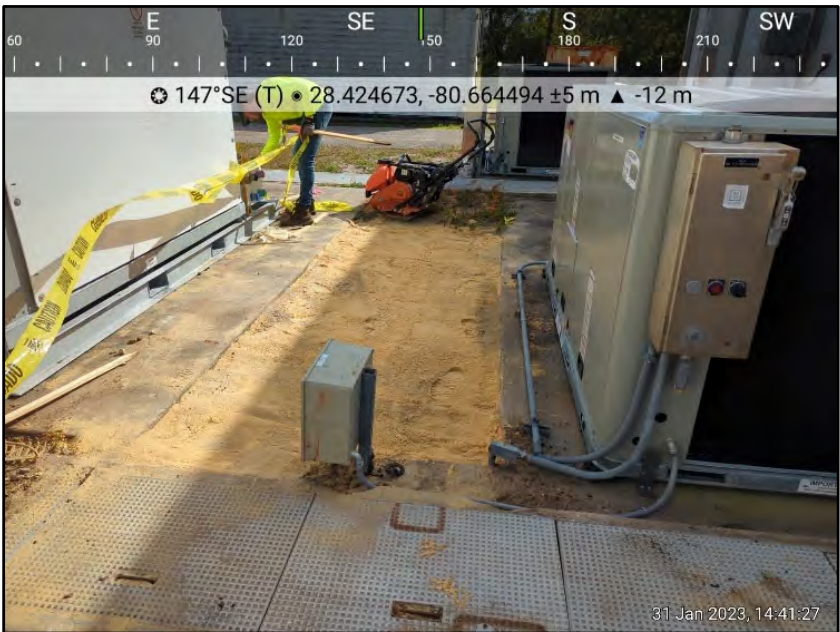
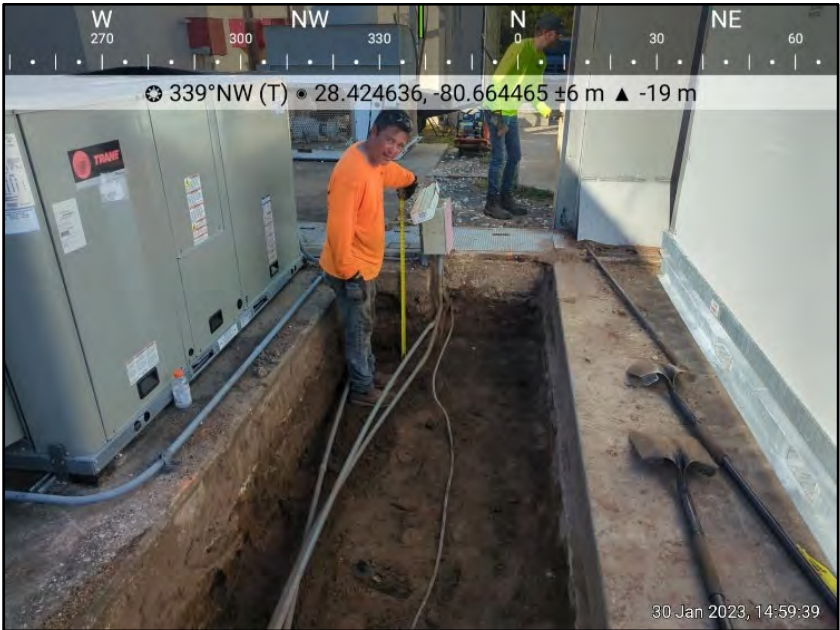
Q6RS – Soil IM Implementation



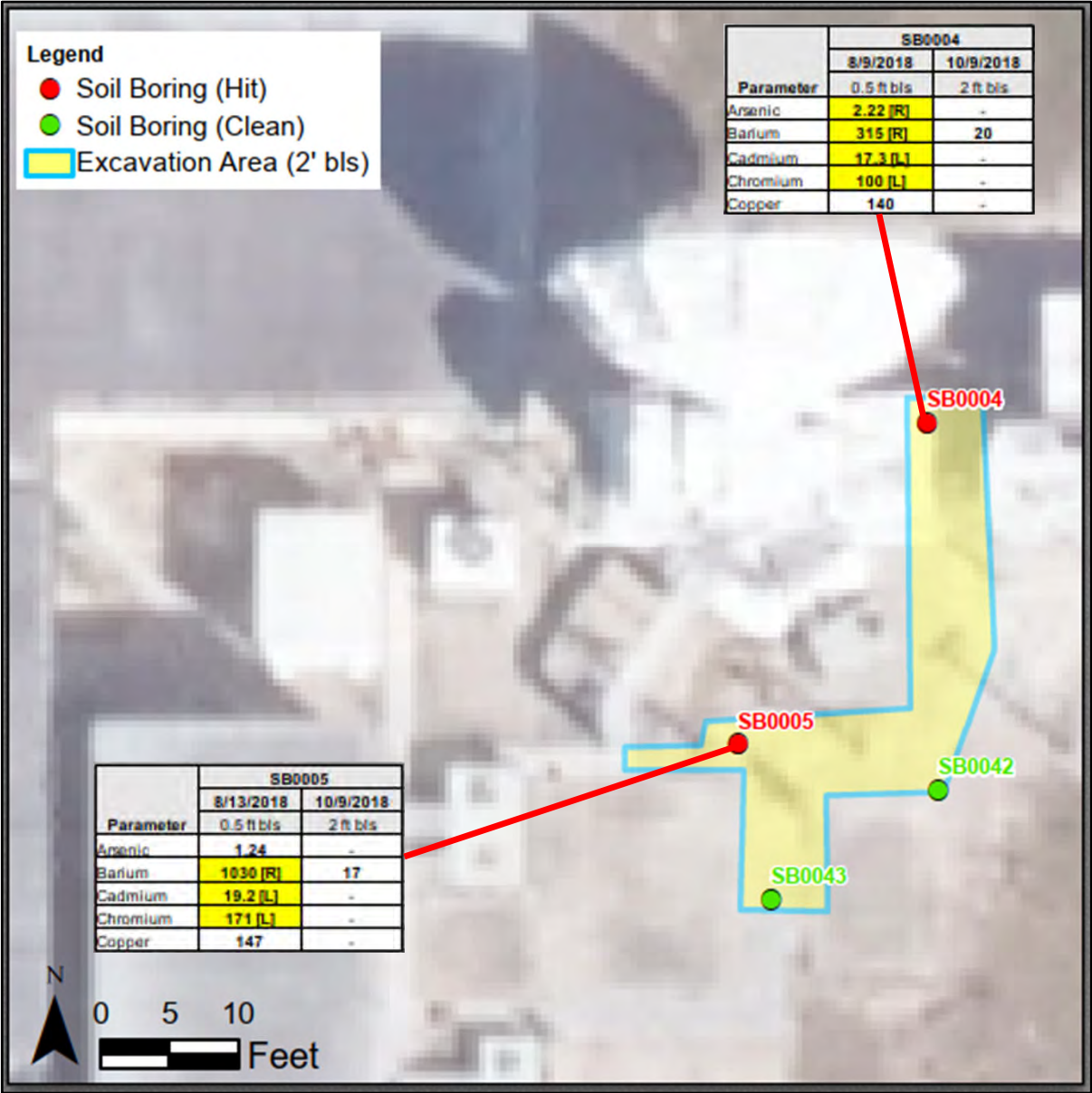
Q6RS – Soil IM Implementation



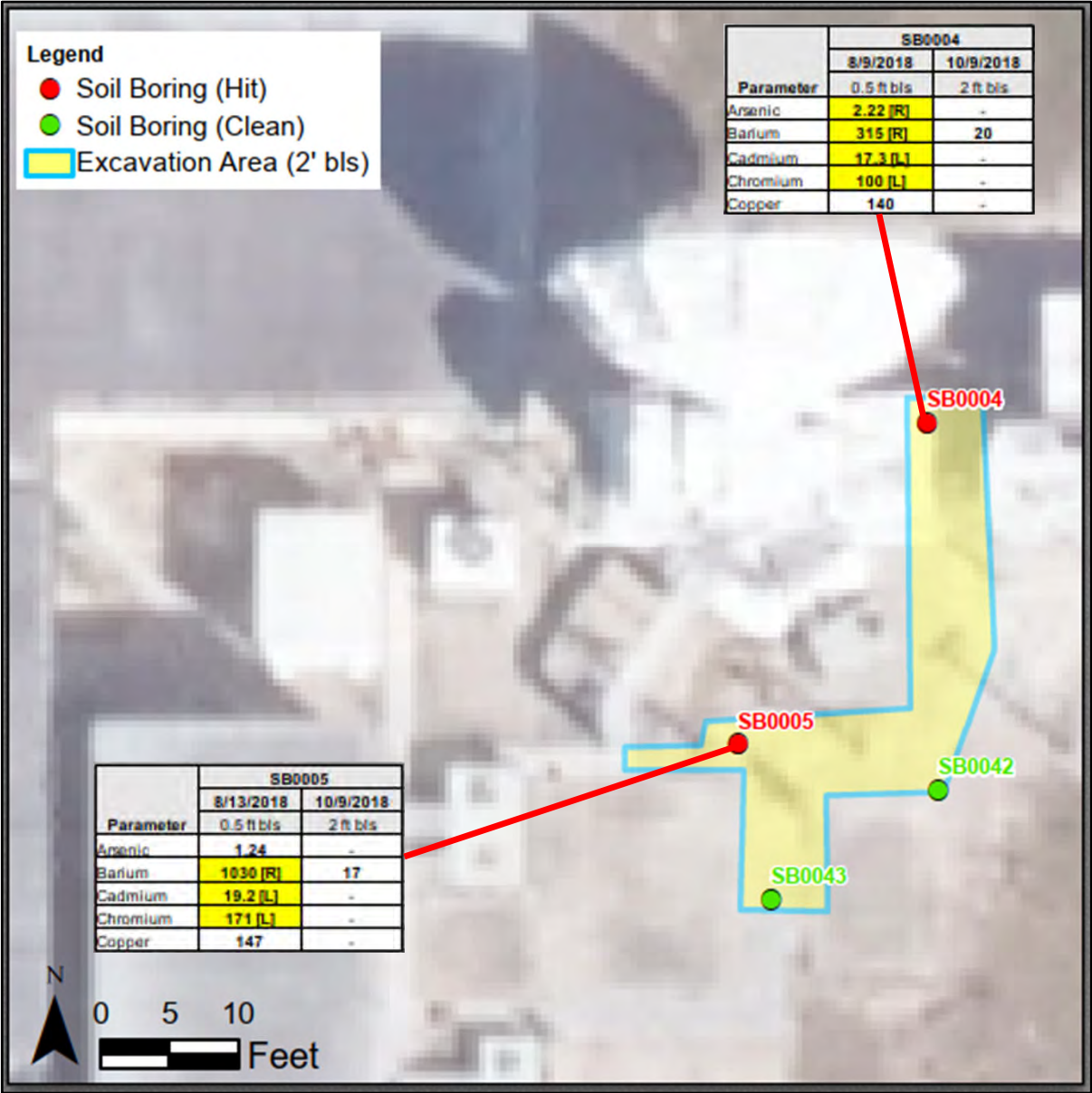
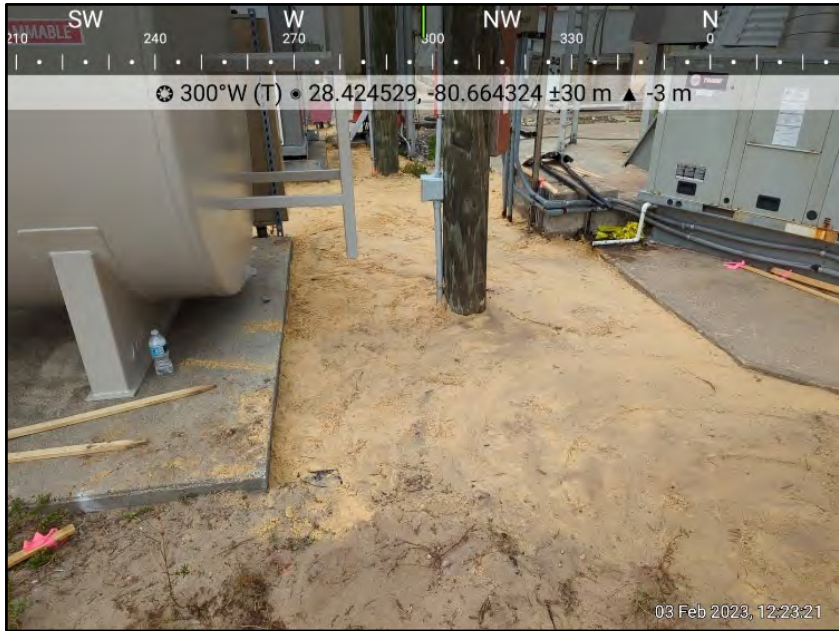
Q6RS – Soil IM Implementation



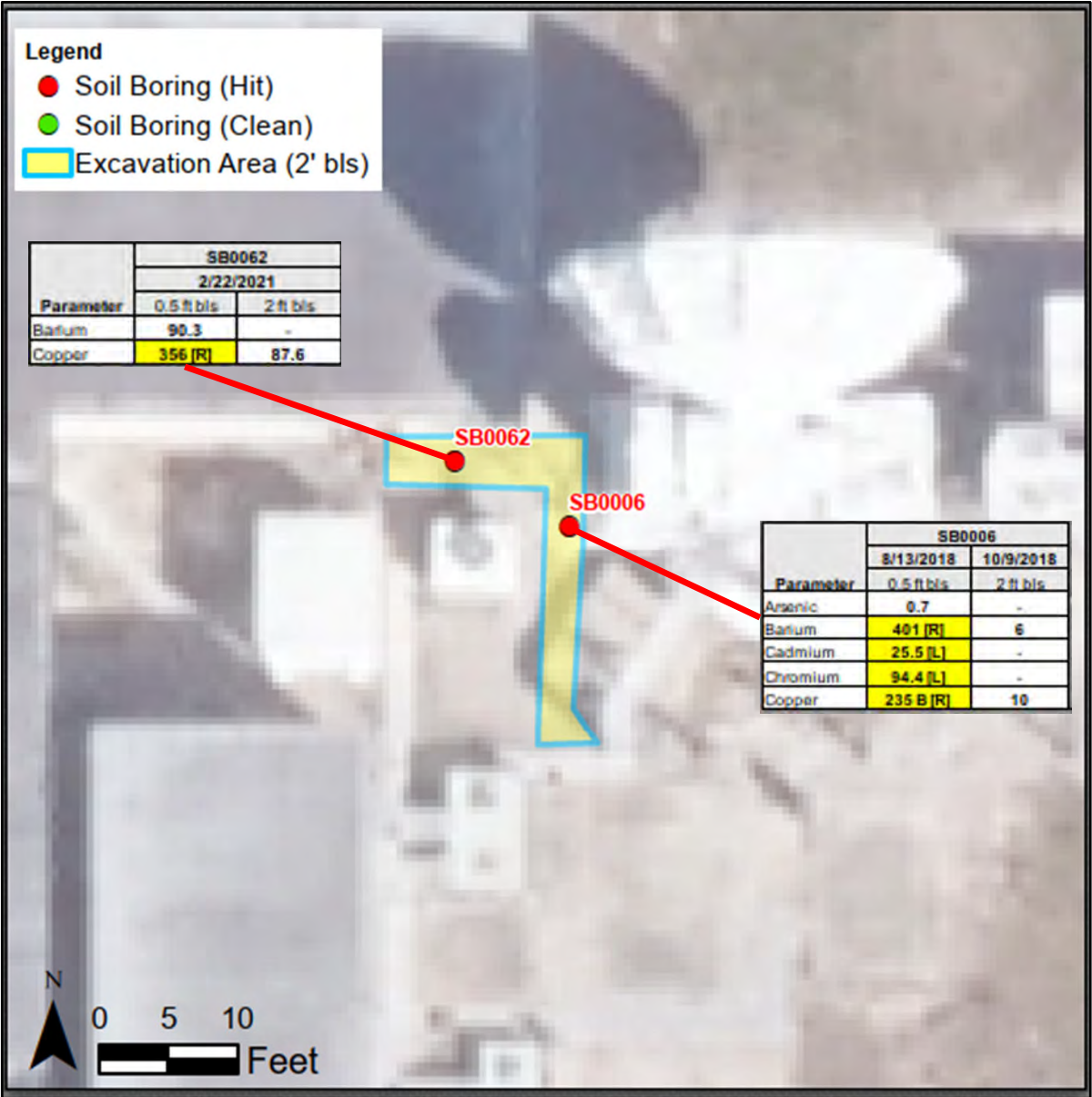
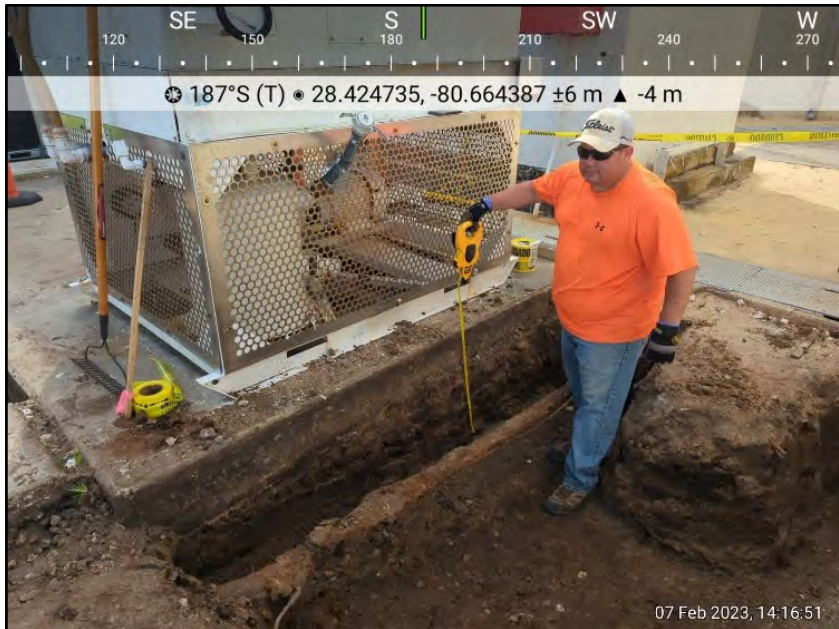
Q6RS – Soil IM Implementation



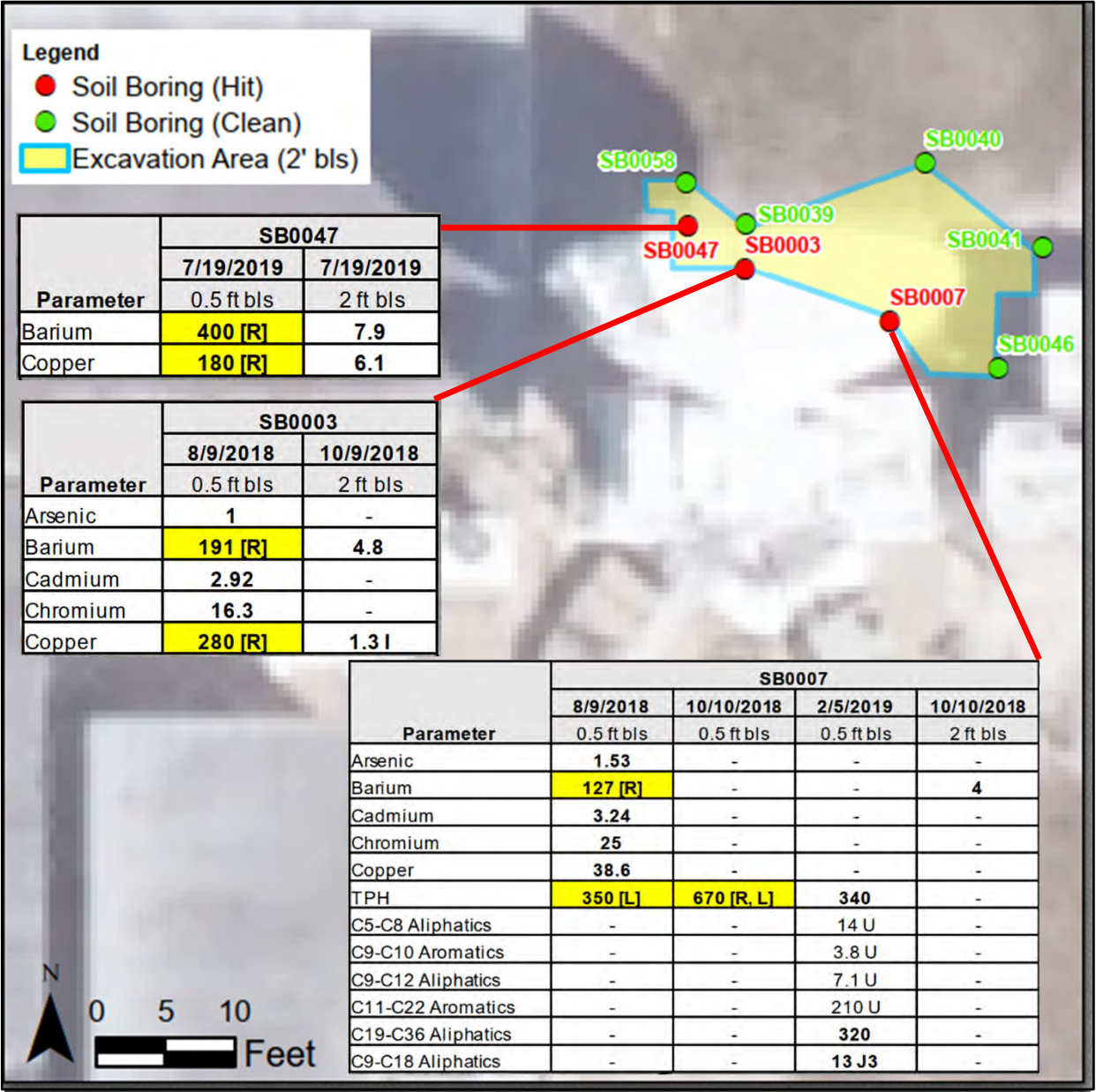
Q6RS – Soil IM Implementation



Q6RS – Soil IM Implementation



Q6RS – Soil IM Implementation

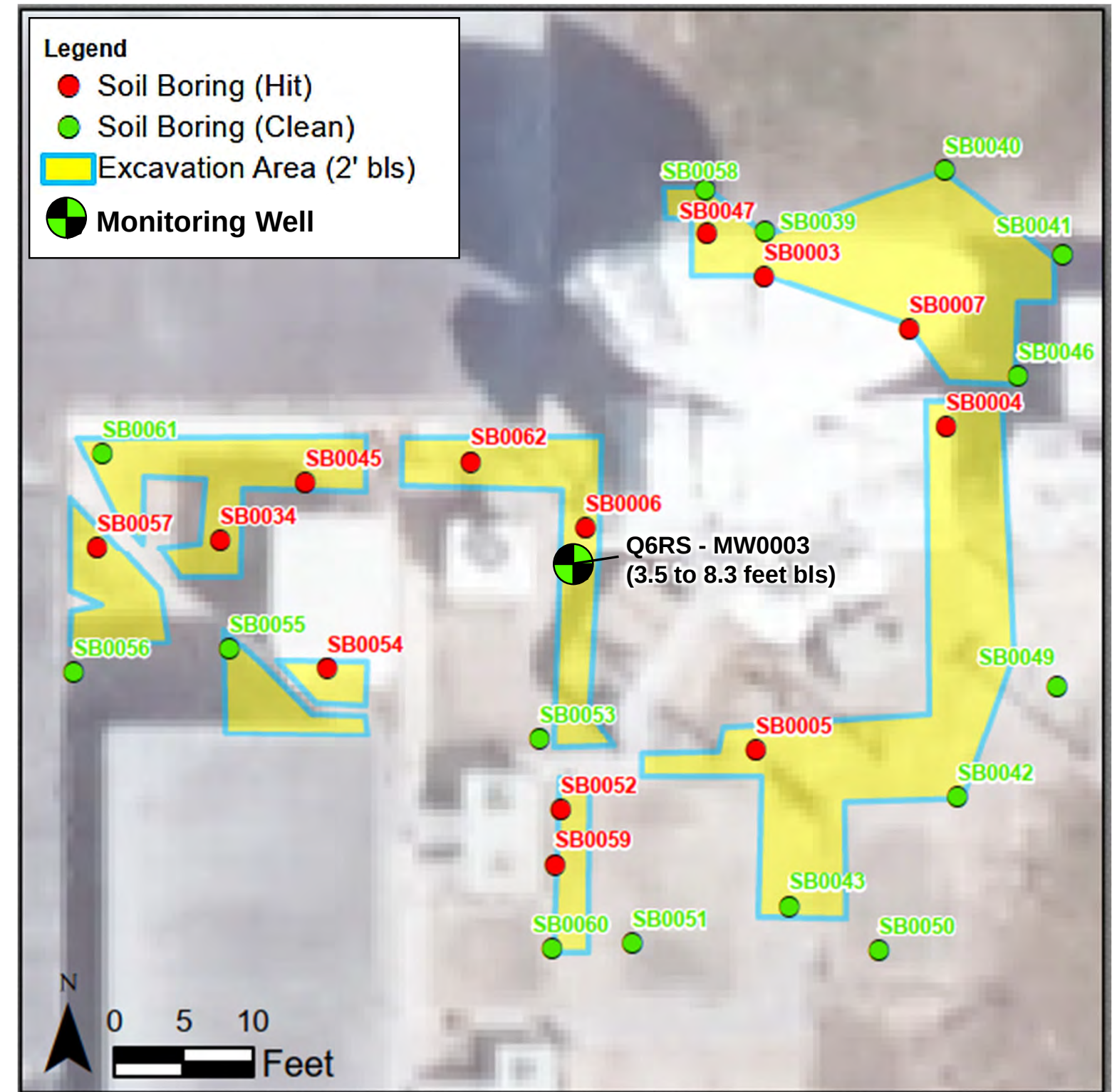


Q6RS – Soil IM Implementation – Site Restoration



Q6RS – Soil IM Implementation – Groundwater Sampling

- Groundwater Sampling Activities were performed on June 6, 2023
- Conducted to determine if barium and copper had infiltrated the groundwater in the Soil IM area
- Sampled one monitoring well Q6RS-MW0003, screened from 3.5 to 8.5 feet bls
- Analyzed for barium and copper
- Analytical results for MW0003:
 - Barium: 18 µg/L micrograms per liter (µg/L)
 - Copper: 14 µg/L
- Analytical results were below the GCTLs for barium (2,000 µg/L) and copper (1,000 µg/L)



Q6RS – Path Forward and Test Consensus

Path Forward

- Soil: NFA for LOC 3 and LOC 10
- Groundwater: Ongoing for LOC 1

Test Consensus

- Propose NFA for soil in a Soil IM Report
- Continue the LOC 1 investigation for groundwater under the Q6 Radar Station – SWMU 112 Project; results will be presented under separate cover





Soil Interim Measures at Various Sites

Q6 Radar Station, Q6-0082, Solid Waste Management Unit 112 –
Locations of Concern 3 and 10 – Soil Interim Measures Implementation

October 2023

Tables and figures presenting the analytical results discussed in this ADP are attached.

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Revision 2 Meeting Minutes for October 3rd & 4th, 2023

Attendees:

- | | |
|-------------------------------|--------------------------------|
| 1. Jason French/FDEP | 14. Jennifer Buel/Tetra Tech |
| 2. TJ Touran/FDEP | 15. Jennifer Gootee/AECOM |
| 3. Ryan O'Meara/NASA | 16. Linnea King Clark/AECOM |
| 4. Deda Johansen/NASA | 17. Randy Sillan/AECOM |
| 5. Anne Chrest/NASA | 18. Richard Smith/HGL |
| 6. Chris Adkison/NASA | 19. Jason Bublit/HGL |
| 7. Michelle Moore/NEMCON | 20. Ryan Sullivan/HGL |
| 8. Mark Jonnet/Tetra Tech | 21. Chad Lee/AECOM |
| 9. Mark Speranza/Tetra Tech | 22. Sarah Dampousse/Tetra Tech |
| 10. Andrew Walters/Tetra Tech | |
| 11. Chris Pike/Tetra Tech | |
| 12. Alex Murphy/Tetra Tech | |
| 13. Debbie Wilson/Tetra Tech | |

2310-M01 Michelle Moore/NEMCON

Meeting Minutes and Miscellaneous Items

Objective:

To discuss meeting minutes from the last Team meeting and review open action items for possible closure.

Discussion:

It was pointed out a couple of comments did not make it into the Revision 2 meeting minutes that was recently finalized and sent out via email. A Revision 3 will be issued to correct this after the meeting for Team members to vote on. Revision 3 will then become the finalized minutes that will be distributed and uploaded to the Remediation Information System (RIS).

Note: Post-meeting, Revision 3 of the 2023 June Kennedy Space Center Remediation Team (KSCRT) meeting minutes and decision/action items were approved via email and finalized on October 31, 2023. Members are aware that these could become public record as part of a report at a later date.

Open action items were reviewed, and the following were closed out:

Following sample collection and analysis, an Air Monitoring Report will be prepared to present field notes, field photographs, soil gas and ambient (outdoor) air analytical data, and a comparison of detected concentrations to EPA target Vapor Intrusion Screening Levels (VISL) for soil gas (cancer risk = 1E-06, non-cancer hazard quotient = 0.1).

If detected soil gas concentrations exceed EPA target VISLs for soil gas, indoor air sampling will be recommended. In this scenario, indoor air sampling procedures will be detailed in a future Air Monitoring Plan. If detected soil gas concentrations are less than EPA target VISLs for soil gas, the Air Monitoring Report will conclude that unacceptable risks are not indicated in Building M6-791 which lies within SWMU 082.

The Team reached consensus to proceed with the proposed Air Monitoring Plan as outlined in the advance data package. Two soil gas sampling events from proposed locations as shown on Slide 16 will be conducted, and an air monitoring report will be submitted **(2310-D47)**.

This is part of the larger site characterization which will be presented at the next meeting. This is not a stand-alone element and just part of a bigger picture. FDEP observed that the Contaminated Site Cleanup Criteria rule does not address vapor intrusion or ambient air. Performing this evaluation as part of the larger conceptual site model is appropriate.

NASA stated that air monitoring results will be shared with KSC's Industrial Hygienist.

Results: Decision Item 2310-D47

2310-M14 Chad Lee/AECOM

Q6 Radar Station

Objective:

This briefing provides a summary of the activities performed for the Q6 Radar Station, Q6-0082, Solid Waste Management Unit (SWMU) 112 – Locations of Concern (LOCs) 3 and 10 – Soil Interim Measures (IM) Implementation.

Discussion:**Q6 Radar Station – SWMU 112:**

A summary of work includes:

Soil IM removal and backfill activities from January 23 through February 9, 2023.

Site restoration activities on February 17 and March 24, 2023.

Removal of 77.43 tons (approximately 64.5 cubic yards) of barium and copper contaminated soil to a total depth of 2.0 feet below land surface (bls).

Restoration of the site to original condition using certified clean backfill material (sand), and then finishing the surface with 3 to 6 inches of 57 stone gravel on top of weed prevention filter fabric.

Groundwater sampling at one monitoring well Q6RS-MW0003 (screened from 3.5 to 8.5 feet bls), which is located within the Soil IM removal area, for barium and copper analysis.

Analytical results indicated barium and copper concentrations were both below the State of Florida Groundwater Cleanup Target Levels in groundwater in the Soil IM Area.

NASA added that the interim measure was bounded by sidewalk/concrete all the way around. Vertically, soils were excavated to the depth of clean samples.

FDEP inquired if the Team is saying they only got to exposed soils and not the soils under concrete? NASA responded that the concrete has been in place since initial construction of the facility. With paint residues from structures as the source of soil contamination, the paved surfaces provided a barrier to the soils beneath,

No Further Action (NFA) for soil at LOC 3 and LOC 10 is proposed. FDEP would like to review the data more closely prior to granting an NFA concurrence.

The Team reached consensus to continue the LOC 1 investigation for groundwater under the Q6 Radar Station – SWMU 112 Project; results will be presented under separate cover (**2310-D48**).

Results: Decision Item 2310-D48

October 2023 Decision Items Rev 2		Decision
Decision No.	Minutes Reference	
2310-D45	2310-M12	Vehicle Assembly Building (VAB) Area Groundwater Long-Term Monitoring (LTM) Update: The Team reached consensus to conduct groundwater sampling at three monitoring wells, SFOC-IW0001S, SFOC-IW0004S, and SFOC-IW0009, and analyze the samples for antimony.
2310-D46	2310-M12	Vehicle Assembly Building (VAB) Area Groundwater Long-Term Monitoring (LTM) Update: The Team reached consensus to continue water level measurements at nine monitoring wells, SFOC-IW0001S through SFOCIW0009. Due to the NADC exceedance for antimony in SFOC-IW0001S, the next sampling event will be scheduled for November 2024.
2310-D47	2310-M13	Communications, Maintenance & Storage (CM&S) Vapor Intrusion Work Plan (SWMU 082): The Team reached consensus to proceed with the proposed Air Monitoring Plan as outlined in the advance data package. Two soil gas sampling events from proposed locations as shown on Slide 16 will be conducted, and an air monitoring report will be submitted.
2310-D48	2310-M14	Q6 Radar Station: The Team reached consensus to continue the LOC 1 investigation for groundwater under the Q6 Radar Station – SWMU 112 Project; results will be presented under separate cover.
2310-D49	2310-M16	Paint and Oil Locker (POL) Southern Treatment Area and Supply Warehouse 3 (SW3) Program: The Team reached consensus to prepare the POL Southern Treatment Area Year 2 Performance Monitoring Report and POL Northern Area and SW3 LTM Report and submit to FDEP/NASA.
2310-D50	2310-M16	Paint and Oil Locker (POL) Southern Treatment Area and Supply Warehouse 3 (SW3) Program: The Team reached consensus to transition the following wells under the POL Southern Treatment Area to LTM sampling (sample in October 2023 in conjunction with POL North and SW3). The wells are Shallow: POL-MW0012S, -MW0016S, -MW0017S, -MW0026S, and -MW0045S; Intermediate: POL-MW0022I, -MW0036SI, MW0041SI, -MW0042SI, -MW0043I, and -MW0045I; and Deep: POL-MW0022D, -MW0039ID, -MW0043D, -MW0044D, and -MW0047D.
2310-D51	2310-M16	Paint and Oil Locker (POL) Southern Treatment Area and Supply Warehouse 3 (SW3) Program: The Team reached consensus to continue with the following LTM to include: SW3: Continue sampling SW3-MW0009, -MW0024, -MW0025, -MW0027, and -MW0028 through -MW0035 (conducted in October 2023 to maintain uniform sampling cycle); POL Northern Area: Continue sampling POL-MW0009S, -MW0026S, -MW0033SI, -MW0034S, -MW0048I, and -MW0048D.
2310-D52	2310-M16	Paint and Oil Locker (POL) Southern Treatment Area and Supply Warehouse 3 (SW3) Program: The Team reached consensus to prepare LTM Report capturing above LTM recommendations for NASA's submittal to FDEP.

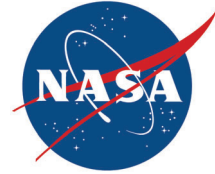
APPENDIX B

SOIL INTERIM MEASURES WORK PLAN

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National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899



October 29, 2021

Reply to Attn of: SI-E2

Mr. Bruce Moore, P.G.
Florida Department of Environmental
Protection
Bob Martinez Center
Mail Station 4535
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Q6 Radar Station, Q6-0082, Solid Waste Management Unit (SWMU) #112, Location of Concern 3 Soil Interim Measure Work Plan, Kennedy Space Center (KSC), Florida

Dear Mr. Moore:

Please find enclosed for your review and approval the Soil Interim Measure Work Plan for the Q6 Radar Station, SWMU #112, Location of Concern 3, at KSC, Florida. Soil sampling activities were conducted on February 22, 2021, in accordance with the Resource Conservation and Recovery Act Facility Investigation (RFI) Work Plan. The sampling results, along with a soil excavation interim measure work plan, were presented to the KSC Remediation Team at the June 2021 meeting. Team consensus was reached that the barium and copper affected soils are delineated both vertically and horizontally (decision item 2106-D02) and an interim measure should be performed (decision item 2106-D03).

If you have any questions regarding this submittal, please contact me at anne.m.chrest@nasa.gov.

Sincerely,

ANNE CHREST Digitally signed by ANNE
CHREST
Date: 2021.10.29 12:56:45 -04'00'

Anne M. Chrest
Remediation Project Manager
Environmental Assurance Branch

Enclosures:

1. Q6 Radar Station, SWMU #112, Soil Interim Measure Work Plan for Location of Concern 3

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**SOIL INTERIM MEASURES WORK PLAN
Q6 RADAR STATION, Q6-0082, SOLID WASTE MANAGEMENT UNIT #112,
LOCATION OF CONCERN 3
KENNEDY SPACE CENTER, FLORIDA**

Prepared for:



**Environmental Assurance Branch
National Aeronautics and Space Administration
Kennedy Space Center, Florida 32899**

**A-E Contract 80KSC019D0010
Task Order 80KSC020F0027**

**October 2021
Revision 0**

**Prepared by:
AECOM
150 N Orange Ave, Suite 200
Orlando, FL 32801
407-843-6552**

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**SOIL INTERIM MEASURES WORK PLAN
Q6 RADAR STATION, Q6-0082, SOLID WASTE MANAGEMENT UNIT #112
LOCATION OF CONCERN 3
KENNEDY SPACE CENTER, FLORIDA**

**October 2021
Revision 0**

**Prepared for:
Environmental Assurance Branch
National Aeronautics and Space Administration
Kennedy Space Center, Florida 32899
A-E Contract 80KSC019D0010
Task Order 80KSC020F0027**

**Prepared by:
AECOM
150 North Orange Avenue, Suite 200
Orlando, Florida 32801
407-843-6552**

In accordance with the provisions of Florida Statutes, Chapter 471, this Q6 Radar Station Interim Measures Work Plan for the Kennedy Space Center in Merritt Island, Florida, has been prepared under the direct supervision of a Professional Engineer registered in the State of Florida. This document and the work described herein complies with standard professional practices and the requirements of Chapter 62-780, Florida Administrative Code (FAC) and other rules of the Florida Department of Environmental Protection according to Rule 62-780.400(1), FAC. The data, findings, recommendations, specifications, or professional opinions were prepared solely for the use of the National Aeronautics and Space Administration and the Florida Department of Environmental Protection. AECOM makes no other warranty, either expressed or implied, and is not responsible for the interpretation by others of these data.

This item has been digitally signed and sealed by:

Steven C. Cobert, PE	Date
Florida License No. 54899	
Florida Certificate of Authorization No. 8115	
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SOIL INTERIM MEASURES WORK PLAN

Facility Name/SMWU No.:	Q6 Radar Station, Q6-0082, Solid Waste Management Unit #112, Location of Concern 3
Consultant/PM:	AECOM Technologies, Inc./Steve Cobert
NASA RPM:	Anne Chrest
CAMP Date:	None
Prepared On:	August 13, 2021
Revised On:	N/A

Site Usage and Soil Investigation Activities

1. **Describe facility usage.** The main function of the Q6 Radar Station is to house various types of radar tracking equipment in support of launches from KSC and Cape Canaveral Space Force Station (CCSFS). The structures and buildings are owned by the United States Air Force (USAF), and are located on NASA property. Operational areas of the Q6 Radar Station can be separated into two areas: the radar area to the north and the boresight tower area located approximately 0.3 miles to the south. The Banana River is located approximately 1,100 feet to the east of the radar pad. A site location figure is provided as **Figure 1**.

Location of concern (LOC) 3 is the area surrounding the base of the radar antenna, adjacent to the Powerhouse and Hydraulic Shed. This area consists of exterior walls of concrete block construction and metal stairs with wooden and metal handrails.

2. **Is the facility normally occupied? Describe how site controls will be performed and how area workers will be informed of health and safety issues associated with the Interim Measures.** The Q6 Radar Station is normally occupied and staffed from approximately 07:00 to 15:30. Launch schedules may require the facility to be staffed outside the normal working hours. The Interim Measure (IM) activities will be scheduled and coordinated with the Q6 Radar Station facility manager and National Aeronautics and Space Administration (NASA) RPM. A Site-Specific Safety and Health Plan for IM activities will be developed for NASA Safety and Environmental Health.

3. **What are the contaminants of concern (COC)? Describe the soil investigation activities completed and regulatory approvals.** Confirmatory sampling (CS) was completed to confirm the presence or absence of polychlorinated biphenyls (PCBs), hydrocarbons, metals, and solvents in soil and or groundwater from radar antenna refurbishment activities or spills and leaks associated with the Powerhouse or Hydraulic Shed. Based on the CS results, barium and copper were identified as COCs at LOC 3. A CS Report and Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Workplan were submitted to Florida Department of Environmental Protection (FDEP) in September 2019, and subsequently approved on January 20, 2020.

RFI soil sampling activities were conducted on February 22, 2021 and achieved the RFI Workplan objective to delineate the horizontal and vertical extent of barium and copper affected soils. The soil sampling results were presented to the KSC Remediation Team at the June 23, 2021 meeting. Team consensus was reached that the barium and copper affected soil have been delineated and an interim measure should be conducted. Copies of the CS Report and RFI Workplan FDEP approval letter, and June 23, 2021 KSCRT meeting minutes and decision items, are included in **Attachment A**.

CS and RFI sampling results obtained to date have indicated the following:

- The results identified soil contaminated with barium and copper at concentrations exceeding their Chapter 62-770, Florida Administrative Code (FAC), Residential Soil Cleanup Target Level (RSCTL) of 120 and 150 milligrams per kilogram (mg/kg), respectively. The copper and barium impacts are limited to the 0.5-foot interval. Barium and copper soil analytical results are provided in **Table 1** of **Attachment B**.
- Arsenic was detected at soil borings SB0004 and SB0034 at concentrations exceeding the RSCTL in the 0.5-foot interval. However, the reported arsenic concentrations were below established Kennedy Space Center (KSC) background concentrations of 8.5 mg/kg. FDEP concurred arsenic is not a COC at LOC 3.
- Cadmium and chromium were identified in soil borings SB0004, SB0005, SB0006, and SB0034 at the 0.5-foot interval at concentrations exceeding Leachability SCTL (LSCTL) criteria. The soil samples were submitted for analysis by Synthetic Precipitation leaching Procedure (SPLP), and the results were below Groundwater Cleanup Target Level (GCTL) criteria. FDEP concurred cadmium and chromium are not COCs at LOC 3.
- Total lead was detected at soil boring SB0006 at a concentration exceeding established background levels but less than the RSCTL. SPLP extraction was performed on the sample to further evaluate leachability and the extract result was greater than the GCTL. A monitoring well MW0003 was installed near the soil boring SB0006 location with a screened interval at the top of the water table. Laboratory analysis of the groundwater sample did not detect total lead at a concentration exceeding GCTL criteria. FDEP concurred lead is not a COC at LOC 3.
- Total Petroleum Hydrocarbons (TPH) was detected at soil borings SB0007 and SB0045 at concentrations exceeding RSCTL criteria. However, the samples were submitted for TPH speciation, which indicated that no analyzed carbon ranges exceeded RSCTL or LSCTL criteria. FDEP concurred TPH is not a COC at LOC 3.

4. **When did the release(s) occur at this facility, if known.** The soil impacts are thought to be the result of radar station refurbishment activities, and deposition of containments to surrounding soils. The last known refurbishment activities occurred in 2009. Refurbishment activities were likely performed prior to that as well, which was customary practice for painted metal towers and antennas.

5. **Are the copper and barium detections associated with a liquid release, paint residue, or other (please describe)?** It is suspected that the contaminated media is associated with radar station refurbishment activities, and the disposition of contaminated media to the surrounding soils.

Interim Measures Information

6. **What is the purpose of the proposed Interim Measures (IM)? Include a list of the parameter groups being addressed by the IM.** The objective of the IM is to mitigate approximately 58 cubic yards (cy) of barium and/or copper impacted soil in the area surrounding the radar base, unpaved areas outside the radar antenna base, and the compressor area to the west of the radar pad. The excavation areas are delineated on **Figures 1 through 7** provided in **Attachment C**. Hand digging tools and/or the use of vacuum soil extraction will be required given the proximity of buildings, surface utilities, and communications infrastructure. Following excavation, these areas will be backfilled with clean soil and compacted to existing grade.

7. **List the specific contaminants being addressed by the IM, maximum facility concentrations, and the associated proposed cleanup goals and source(s) (industrial SCTLs, etc.).** Copper and barium concentrations are presented in mg/kg in the following table.

Contaminant	Maximum Facility Concentration (mg/kg)	Cleanup Goal (mg/kg)	Cleanup Goal Source
Copper	590	150	FDEP, SCTL, Residential
Barium	1,030	120	FDEP, SCTL, Residential

Note: FDEP = Florida Department of Environmental Protection

8. **Will a land use control implementation plan (LUCIP) be required following completion of the IM (i.e., will residual concentrations of any contaminant exceed applicable residential criteria)?** No, a LUCIP will not be required for soil at the LOC 3 area.

9. **List each proposed excavation area, contaminants of concern (COC), area of excavation, and associated depth intervals.**

Contaminant(s) of Concern	Area of Excavation (ft ²)	Depth interval (ft bls)	Volume (cy)	Comments
Barium and Copper	785	0-2	58	See note below

Note:

- a) Figures 1 through 7 show each excavation area with coordinates and soil sample results.

10. **Will confirmation samples be required? If so, describe. Consider the need for both vertical and horizontal extent samples and indicate sampling frequencies (number of samples per square foot, etc.).** No confirmation sampling will be required. The excavation areas are horizontally and vertically bounded by samples with barium and copper concentrations that are less than FDEP RSCTL or a physical boundary (i.e., concrete pavement, curb, or structure). Barium was detected in the 0.5-foot interval at soil boring SB0052, however a 2-foot interval samples was not collected at this location. A 2-foot interval sample was collected at the location of soil boring SB0059, which is located approximately five feet from soil boring SB0052. The actual location of soil boring SB0046 was reviewed following the June 23, 201 KSCRT meeting, and the location of soil boring SB0046 was corrected based on photographs and field logs from the 2019 CS activities. It appears that the radar structure interfered with the ability to obtain accurate GPS coordinates, and the coordinates used to prepare the ADP presented at the KCRT meeting in June 2021 did not accurately reflect the location of soil boring SB0046. Based on the corrected soil boring SB0046 location, the proposed soil excavation area surrounding soil boring SB0007 is bound by clean soil samples and/or physical structures such as building foundations or sidewalks (refer to **Figures 1 and 2**).

11. **Will shoring or dewatering be required? If so, describe.** Dewatering and/or shoring will not be required.

12. **Are there any special decontamination requirements? If so, describe.** A general decontamination area will be created and maintained. Decontamination fluids that are generated will be containerized and characterized for proper disposal.

Waste Handling and Disposal

13. **How will excavated soil be stored prior to disposal?**

Drums Roll-offs ☒ Other (describe): It is expected that soils will be excavated by hand or with the use of a vacuum truck. Soils excavated using hand tools will be stockpiled and subsequently loaded into trucks or roll-offs for transport and disposal. Soils excavated using a vacuum truck will be stored within the vacuum truck, then stockpiled as needed, and loaded into trucks for transport and disposal. Each truck will be weighed, manifested, and transported to J.E.D. Solid Waste Management Facility (formerly known as OMNI Landfill), or a similarly permitted facility for disposal.

14. **How will miscellaneous debris and decontamination fluids be stored prior to disposal?**

☒ Drums Roll-offs Other (describe):

15. **Are there any special waste segregation requirements? If so, describe.** None are expected.

16. **How will the waste be characterized for disposal?** A minimum of one composite soil sample will be collected per 500 tons of soil for waste characterization. The samples will be analyzed for criteria required by the landfill. Soil will be disposed of as non-hazardous waste if analytical values are less than the regulatory limits.

17. **Are there any special fill characterization or compaction requirements? If so, describe.** Certified clean fill (i.e., less than or equal to FDEP SCTLs) will be required. There are no

special compaction requirements; the areas will be backfilled and restored to pre-excavation elevations. Care will be taken during excavation, backfilling, and restoration activities to avoid undermining surrounded paved areas and impacting buried utilities.

Other Issues

18. **Are there any other specific issues, including health and safety that need to be considered? If so, describe.** Erosion and sediment controls Best Management Practices (BMPs) will be maintained throughout the project and until permanent site stabilization is obtained. Dust on access roads and construction zones will be kept to a minimum by watering dry areas during excavation and loading of impacted soil. Care will be taken not to contact underground utilities. Appropriate personal protective equipment (PPE) will be used. The IM field work will be completed in close coordination with the NASA facility manager and work will be scheduled with the demolition contractor. Existing monitoring well MW0003 should be preserved during the excavation activities.

19. **Work schedule:** This work will be scheduled after the work plan is approved.

Attachments

Attachment A **CS Report and RFI Workplan FDEP Approval Letter and June 23, 2021 Meeting Minutes and Decision Items**

Attachment B **Table**

Table 1: Soil Analytical Results for Barium and Copper

Attachment C **Figures**

Figure 1: LOC 3 Soil Boring Sample Results
Figure 2: LOC 3 – SB0007 Excavation Area
Figure 3: LOC 3 – SB0004 Excavation Area
Figure 4: LOC 3 – SB0006 Excavation Area
Figure 5: LOC 3 – SB0057 Excavation Area
Figure 6: LOC 3 – SB0054 Excavation Area
Figure 7: LOC 3 – SB0060 Excavation Area

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ATTACHMENT A

FDEP CORRESPONDENCE AND KSCRT MEETING MINUTES

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FLORIDA DEPARTMENT OF Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

January 31, 2020

Attention: Mr. Mike Deliz
Environmental Program Manager
Environmental Assurance Branch
National Aeronautics and Space Administration
John F. Kennedy Space Center
Kennedy Space Center, Florida 32899-0001

RE: Confirmatory Sampling (CS) Report and RCRA Facility Investigation Work Plan, Revision 0, Potential Release Location (PRL) 214, Q6 Radar Station, National Aeronautics and Space Administration (NASA) – Kennedy Space Center (KSC), USEPA ID #FL6 800 014 585, Florida (Tetra Tech, October 4, 2019)

Dear Mr. Deliz:

The Department has reviewed the subject document dated October 4, 2019 (received on October 9, 2019). The purpose of this CS Report is to present the findings of CS activities completed at Q6RS. In the Conclusions and Recommendations Section of the document it states that based on the results of the CS, it is recommended that LOCs 1 and 3 proceed to an RCRA Facility Investigation (RFI) to delineate SCTL and GCTL exceedances identified at these LOCs during the CS and LOC 10 proceed to a soil IM to address residential SCTL exceedances. NFA is recommended at LOCs 2, 4, 5, 6, 7, 8, and 9 based on the absence of contamination found during CS.

Based on this review, and the fact that the KSC Remediation Team (KSCRT) reached consensus on the NFA recommendations for these LOCs at the June 2019 Team Meeting, the Department concurs with the recommendations outlined in the document and with the RFI Work Plan for LOCs 1 and 3 and the soil IM Work Plan for LOC 10 as presented in the appendices E and F within the document.

Additionally, per the June 26, 2017 University of Florida (U of F) Center for Environmental and Human Toxicology letter concerning the review of the calculation for

alternative cleanup target levels for copper and barium at Cape Canaveral Air Force Station and Patrick Air Force Base (see attachment), the Department wishes to clarify the clean up target levels established using the exposure parameters outlined in the letter are to be considered Alternative Soil Cleanup Target Levels (ASCTLs) not Provisional SCTLs.

Thank you for the opportunity to review this document. If you require additional clarification or other assistance, please feel free to contact me at 850/245-8999.

Sincerely,

A handwritten signature in blue ink, appearing to read "John Winters".

John Winters, P.G.
Remedial Project Manager
Federal Programs Section
Waste Cleanup Program

LB/jw

Handwritten initials "LB" in blue ink, enclosed in a circle.

ATTACHMENT B

TABLE

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Table 1
Q6 Radar Station - PRL 214, LOC 3
Soil Analytical Results for Barium and Copper

Category					Metals by Method 6010C	
Analyte					Barium	Copper
FDEP RSCTL (mg/kg)					120	150
FDEP ISCTL (mg/kg)					130,000	89,000
FDEP LSCT (mg/kg)					1600	-
Location ID	Northing	Easting	Sample Date	Screened Interval (ft bls)		
Q6RS-SB0003	453324.4690	232878.6317	8/9/2018	0-0.5	191	280
			10/9/2018	0.5-2	4.8	1.3 I
Q6RS-SB0004	453321.1715	232882.6477	8/9/2018	0-0.5	315	140 B
			10/9/2018	0.5-2	20	NS
Q6RS-SB0005	453314.0148	232878.4477	8/13/2018	0-0.5	1030	147
			10/9/2018	0.5-2	17	NS
Q6RS-SB0006	453318.9247	232874.6909	8/13/2018	0-0.5	401	235
			10/9/2018	0.5-2	6.2	10
Q6RS-SB0007	453323.3216	232881.8372	8/9/2018	0-0.5	127	38.6
			10/10/2018	0.5-2	4.4	NS
Q6RS-SB0034	453318.6598	232866.6283	8/13/2018	0-0.5	222	88.1
			10/10/2018	0-0.5	290	NS
			10/10/2018	0.5-2	6.8	NS
Q6RS-SB0039	453326.1434	232878.6503	10/10/2018	0-0.5	29	14
Q6RS-SB0040	453326.8112	232882.6193	10/10/2018	0-0.5	8.1	5.2
Q6RS-SB0041	453324.9622	232885.2181	10/10/2018	0-0.5	5.3	1.2 I
Q6RS-SB0042	453312.9891	232882.8972	10/10/2018	0-0.5	3.9	NS
Q6RS-SB0043	453310.5808	232879.1827	10/10/2018	0-0.5	2.7	NS
Q6RS-SB0045	453319.9212	232868.5102	10/10/2018	0-0.5	29	15
Q6RS-SB0046	453322.2685	232884.2333	7/19/2019	0-0.5	18	11
Q6RS-SB0047	453325.9390	232877.2774	7/19/2019	0-0.5	400	180
			7/19/2019	0.5-2	7.9	6.1
Q6RS-SB0048	453320.5398	232890.9137	7/19/2019	0-0.5	11	9.5
Q6RS-SB0049	453315.4287	232885.0961	7/19/2019	0-0.5	15	6
			7/19/2019	0.5-2	4.5	0.66 I
Q6RS-SB0050	453309.6061	232881.1633	7/19/2019	0-0.5	3.5	1.6 I
Q6RS-SB0051	453309.7584	232875.7272	7/19/2019	0-0.5	2.4	1.6 I
Q6RS-SB0052	453312.7161	232874.1473	7/19/2019	0-0.5	140	26
			7/19/2019	0.5-2	NS	32
Q6RS-SB0053	453314.2872	232873.6818	7/19/2019	0-0.5	950	280
Q6RS-SB0054	453315.8378	232868.9909	7/19/2019	0-0.5	340	140
			7/19/2019	0.5-2	14	NS
Q6RS-SB0055	453316.2686	232866.8341	7/19/2019	0-0.5	57	67
Q6RS-SB0056	453315.7461	232863.4030	7/19/2019	0-0.5	21	64
Q6RS-SB0057	453318.4829	232863.9140	7/19/2019	0-0.5	63	590
			7/19/2019	0.5-2	NS	23
Q6RS-SB0058	453326.2696	232876.3847	2/22/2021	0-0.5	23	72.4

Table 1
Q6 Radar Station - PRL 214, LOC 3
Soil Analytical Results for Barium and Copper

Category					Metals by Method 6010C	
Analyte					Barium	Copper
FDEP RSCTL (mg/kg)					120	150
FDEP ISCTL (mg/kg)					130,000	89,000
FDEP LSCTL (mg/kg)					1600	-
Location ID	Northing	Easting	Sample Date	Screened Interval (ft bls)		
Q6RS-SB0059	453311.5047	232874.0221	2/22/2021	0-0.5	182	46.2
			2/22/2021	0.5-2	30.6	NS
Q6RS-SB0060	453309.6527	232873.9560	2/22/2021	0-0.5	40.5	28.3
Q6RS-SB0061	453320.5666	232864.0341	2/22/2021	0-0.5	81.7	27.4
Q6RS-SB0062	453320.3821	232872.1606	2/22/2021	0-0.5	90.3	356
			2/22/2021	0.5-2	NS	87.6

Notes:

ft bls = below land surface

NS = not sampled

I = Result is between the method detection limit and the limit of quantitation

mg/kg = milograms per kilogram

All results and screening criteria presented in mg/kg

Bolded results indicate the presence of an analyte above the FDEP RSCTL

FDEP RSCTL = Florida Department of Environmental Protection Residential Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

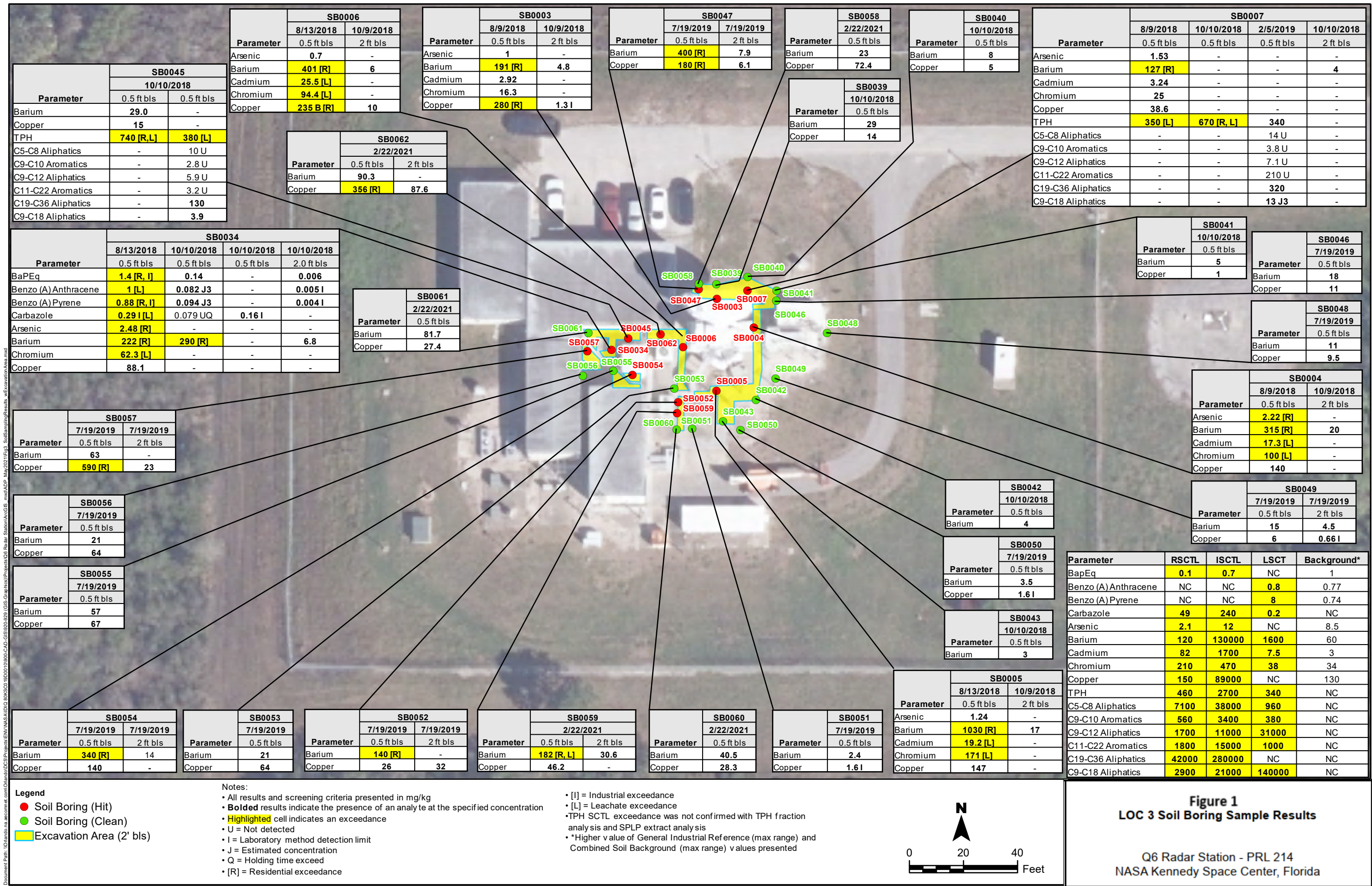
FDEP ISCTL = Florida Department of Environmental Protection Industrial Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

FDEP LSCTL = Florida Department of Environmental Protection Leachability Soil Cleanup Target Levels, Chapter 62-777 Florida Administrative Code, Table II (April 2005)

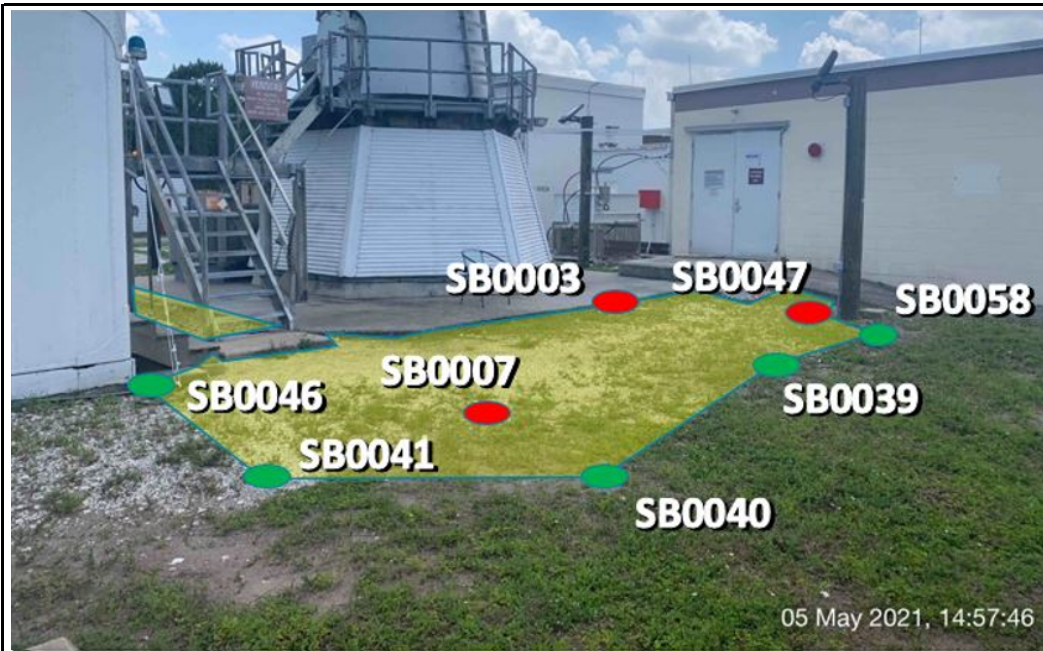
ATTACHMENT C

FIGURES

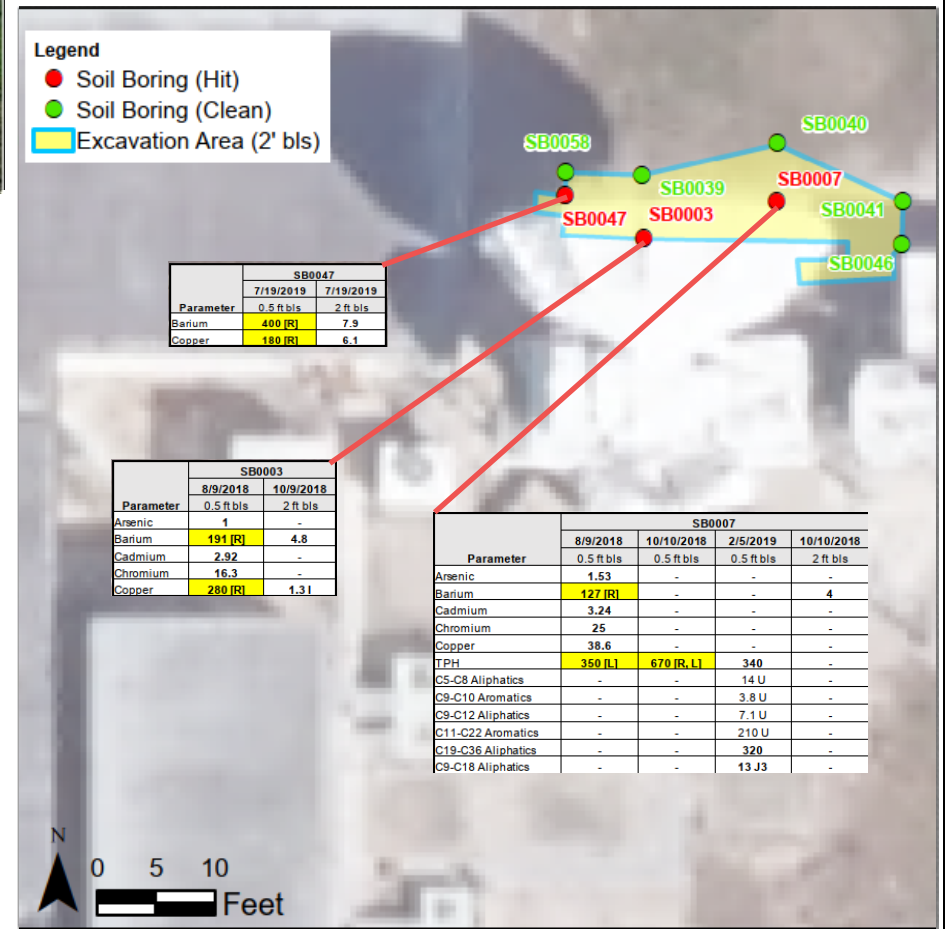
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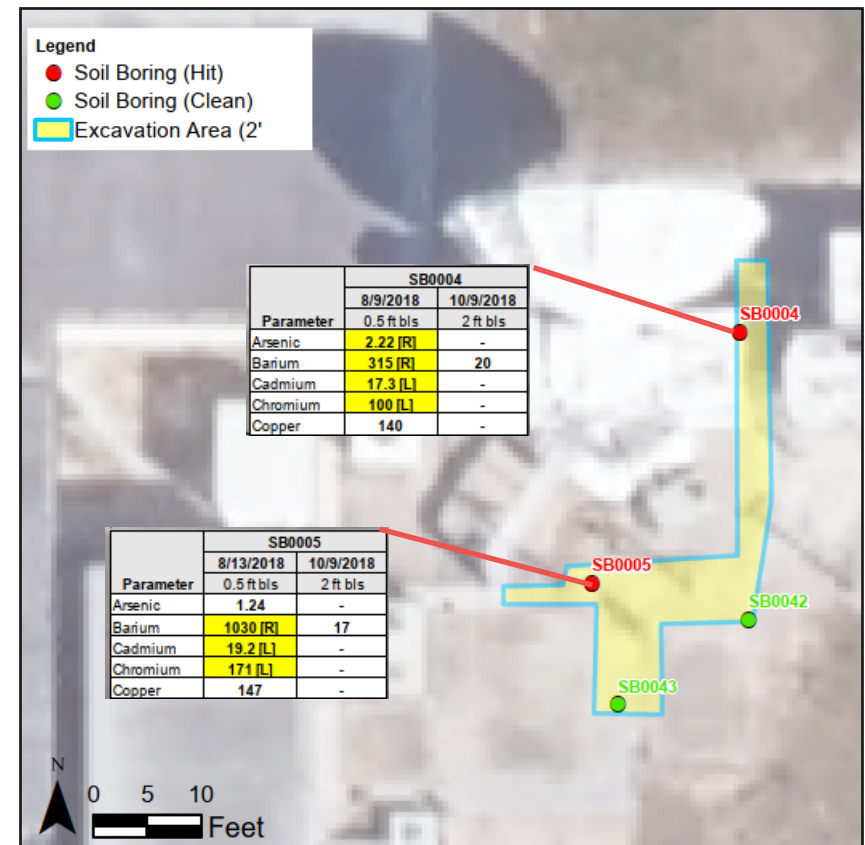
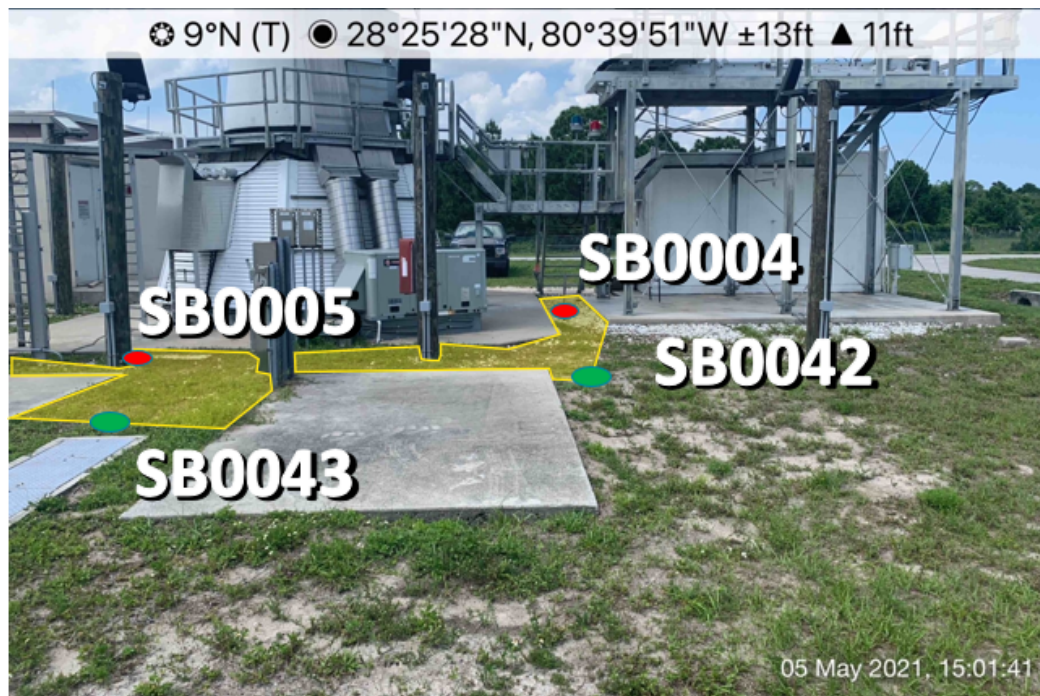


203 square feet
15 cubic yards



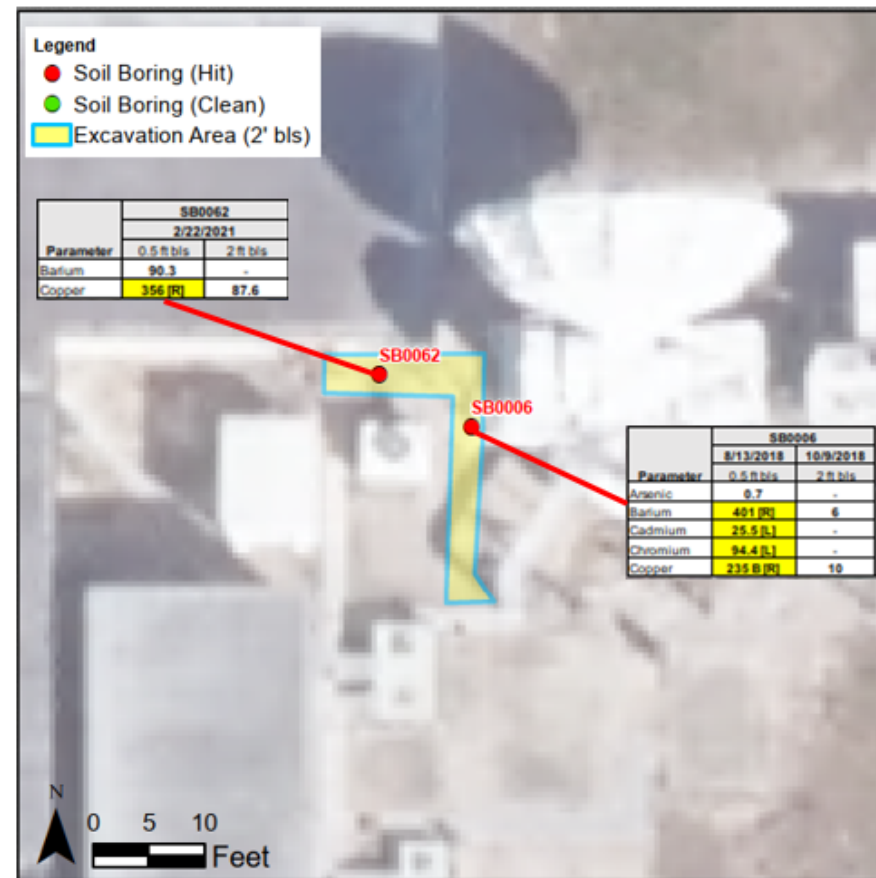
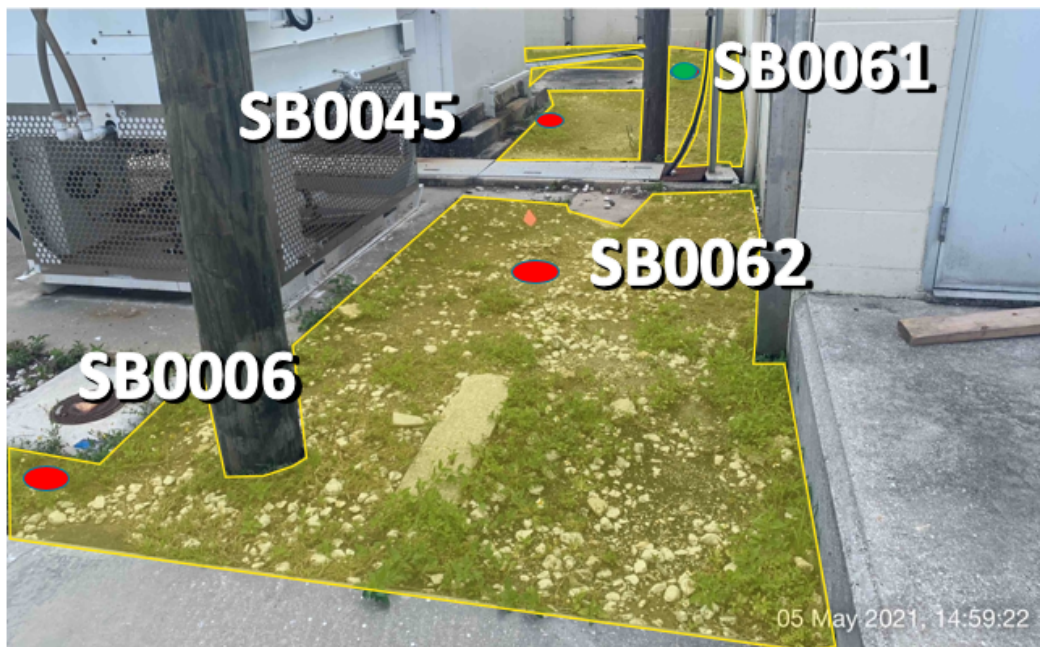
■ Proposed Excavation Area (2' bls)

Figure 2
LOC 3 - SB0007 Excavation Area



■ Proposed Excavation Area (2' bls)

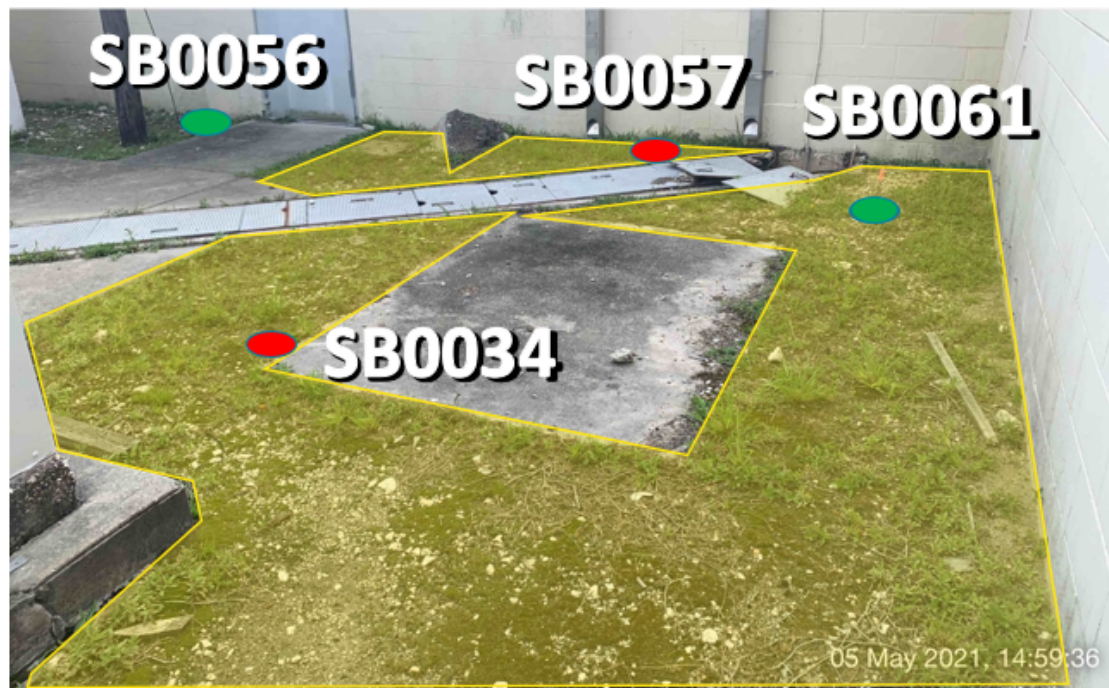
Figure 3
LOC 3 - SB0004 Excavation Area



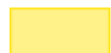
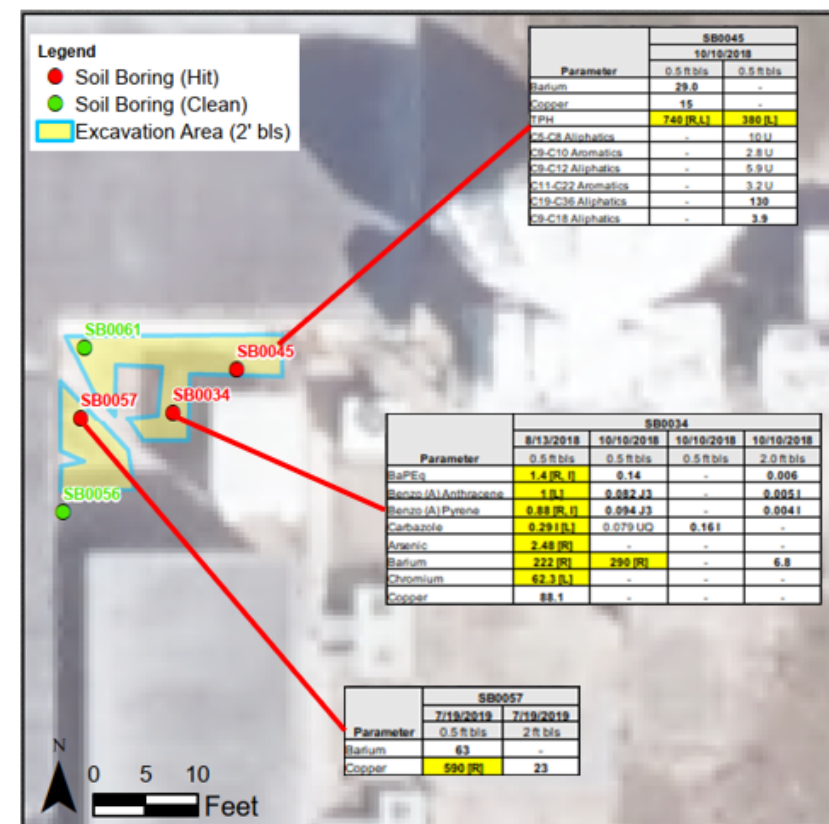
107 square feet
7.9 cubic yards

■ Proposed Excavation Area (2' bls)

Figure 4
LOC 3 - SB0006 Excavation Area

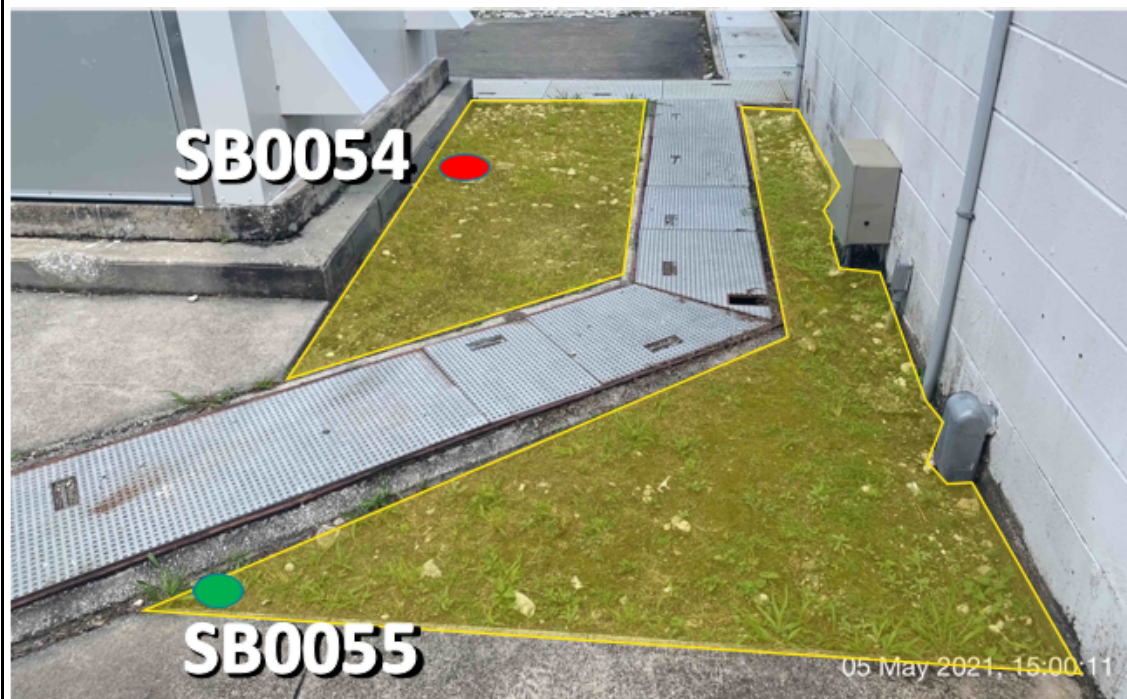


151 square feet
11.2 cubic yards

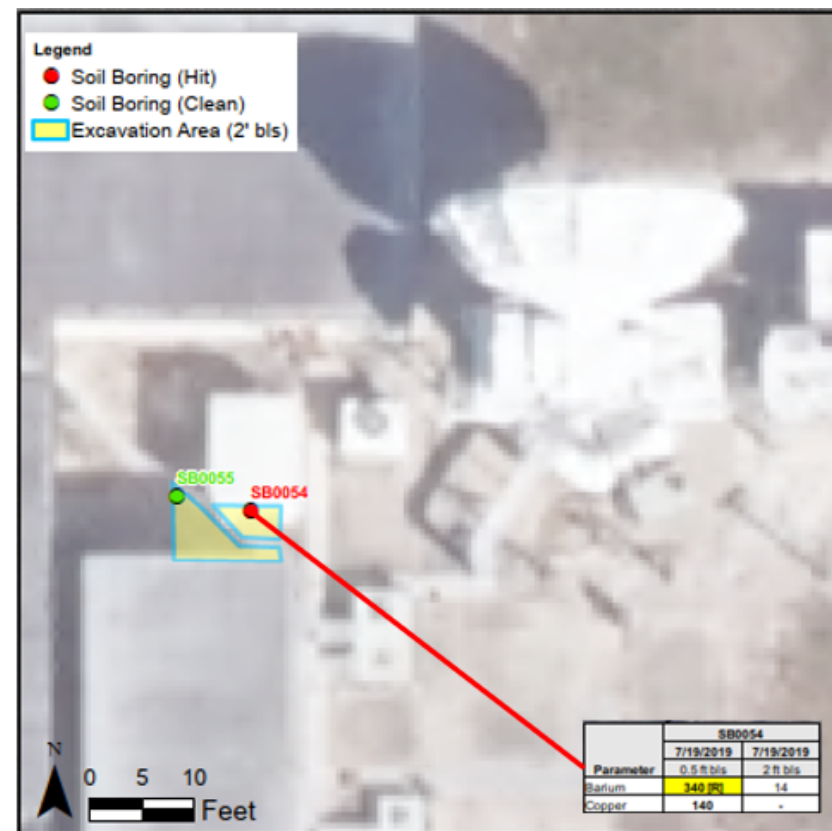


Proposed Excavation Area (2' bls)

Figure 5
LOC 3 - SB0057 Excavation Area



50 square feet
3.7 cubic yards

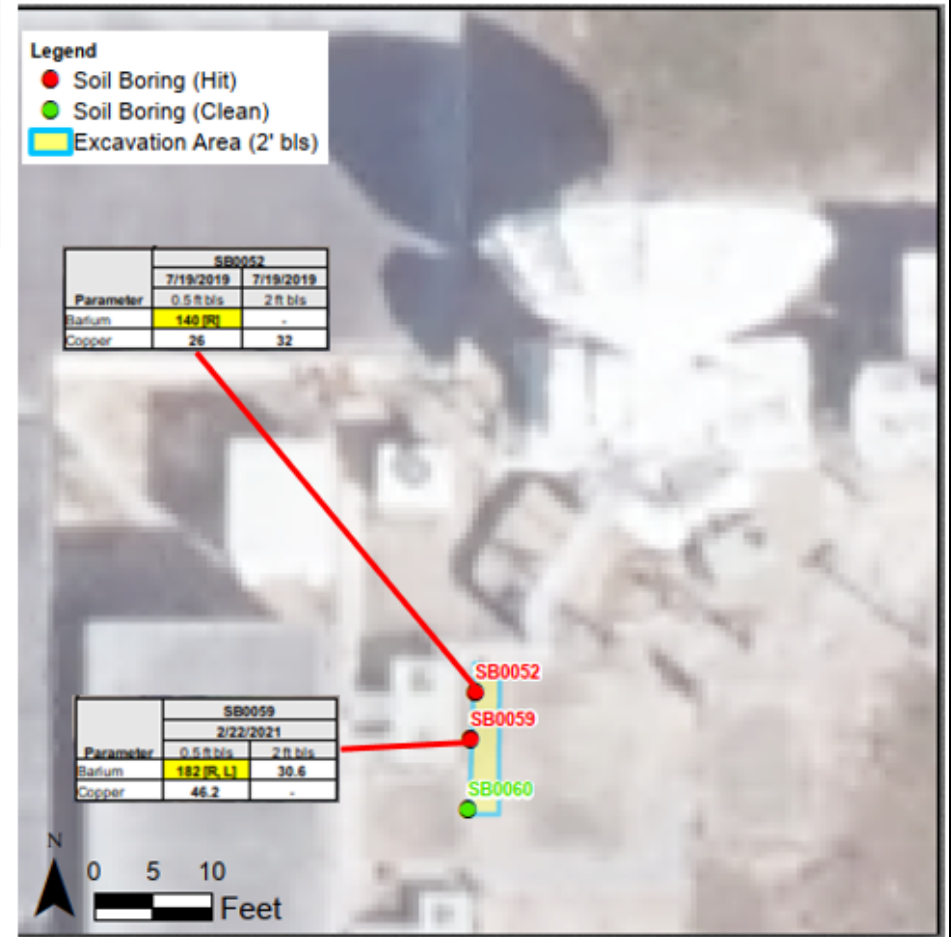


 Proposed Excavation Area (2' bls)

Figure 6
LOC 3 - SB0054 Excavation Area



29 square feet
2.2 cubic yards



■ Proposed Excavation Area (2' bls)

Figure 7
LOC 3 - SB0060 Excavation Area

APPENDIX C

FIELD NOTES AND LOGS

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1/23/23

KSC Soil Team

p. 1 of 15 15/08/2023

QB Radar Station

0745- Dustin Slater & Chad Lee onsite.

0800- James Bradford & Christopher Settin
onsite.

Weather: Sunny, some clouds 67°F.

- Check in with office personnel & sign in.

- Jeff & Alfredo onsite.

0820- Land & Sea Surveying onsite.

- H&S meeting with QB radar personnel.

- Everyone signs in with them.

- Jeff & Alfredo perform locates.

0840 - Land & Sea begin surveying previous
soil boring locations.

0900- Jeff & Alfredo offsite.

0915- Sunbelt driver arrives with the
rental equipment.

Equipment

- Mini Excavator:

- Skid Steer:

- Plate Compactor:

1035- Hull's Environmental arrives with
roll-off.

1130- DS / JB / CS offsite for lunch.

1200- CL / Land & Sea offsite.

1245- DS / JB / CS back onsite.

DS

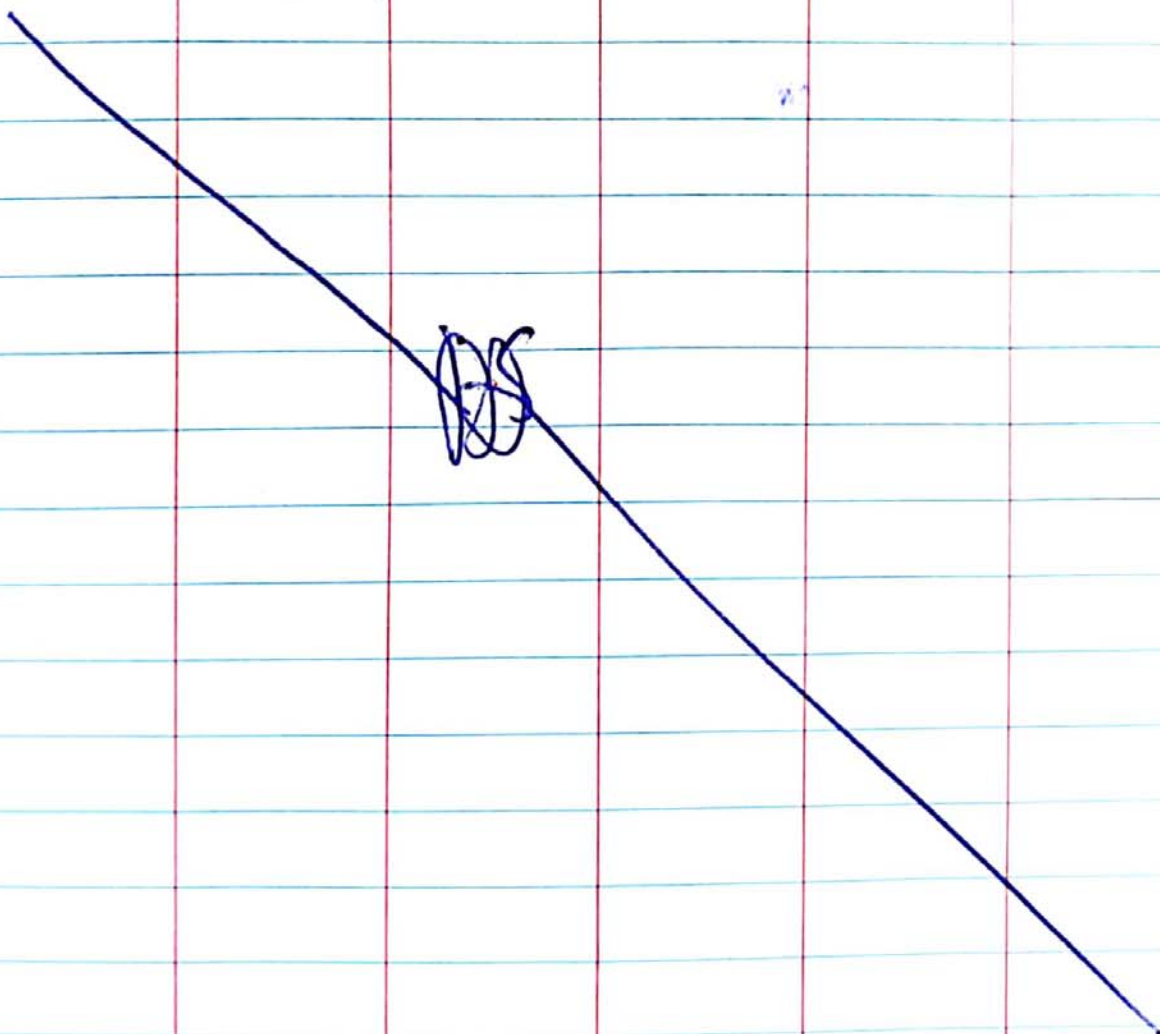
1/23/23

KSC Soil IM p. 2 of 15 DS/JS/CS
QB Radar Station

1230- Begin digging in Area A (locations
marked on figure)

1500- Stop digging for the day.
- Cone off area & clean up site.
- Skid steer parked in staging
area in front of radar dish.

1530- DS/JS/CS offsite -



DS

1/24/23

KSC Soil IM

p. 3 of 15 AS/JB/CS/CL

Q6 Radar Station

0745 - Dustin Slater, Chad Lee, James Bradford,
& Christopher Setrain onsite.

0800 - John McCoy (NASA Safety) onsite.

- Sign in with office.

Weather: Sunny, cool 52°F.

- John conducts Nuts & Bolts
Safety meeting.

0830 - Chad, John offsite.

- Begin excavating soil in Area A
again.

1115 - Break for lunch.

1200 - Back from lunch.

1330 - Upon digging soil near building we
find an asphalt slab approximately
2 inches below layer of soil that
extends from the building on south
side to ~~smaller~~ building in between
the 2 larger buildings.

- Call Chad to inform him of the
asphalt.

1450 - Finish digging for the day. Cone
off open excavation. Clean up site.

1515 - AS/JB/CS offsite.

1/25/23

KSC Soil EM p.4 of 15

OS/JB/CS

Q6 Radon Station

0745 - Dustin Slater & James Bradford onsite.

0830 - Christopher Setraim onsite.

Weather: Partly cloudy, 65%.

- Sign in with office.

- H&S meeting.

0900 - Talk to Chad Lee & he informs us there is a no dig for today.

- Prepare open excavations for backfill.

1230 - Hall's Environmental onsite with roll off full of backfill.

1345 - Begin backfilling

1445 - Begin cleaning up site & blocking off open excavations.

1515 - OS/JB/CS offsite.

~~JB~~

1/24/13

KSC Soil Team p. 5 of 15 DS/JB/CS

RR Radar Station

0745 - Arrive Station, James Bradford, & Christopher
Suprin onsite.

Weather: Cloudy, 63°F.

- Sign in with office.

- H&S meeting.

- Continue backfilling until we get the
all close to begin digging again

1315 - Hull's Environmental onsite with
backfill.

- Place backfill near other pile of
backfill.

1330 - Continue backfilling Area A.

1445 - Finish backfilling the parts of Area A
that have been excavated.

- Clean up site & cone off open holes.

1520 - DS/JB/CS offsite.

OK

1/27/23

KSC Soil EM p. 6 of 15 DS/GB/CS
Q6 Radar Station

0745 - Dustin Slater, James Bradford, &
Christopher Setrin onsite.

Weather: Sunny, 70°F.

Sign in with office -

- H&S meeting -

- Begin digging in Area B while also
continuing in Area A.

- Area A has asphalt that needs to
be taken up before we finish that
side -

1015 - Talk to Chad Lee and he informs
us that we need to collect a
pre disposal sample & submit it to
Eurofins -

- Continue excavating -

1255 - Collect Q6RS-CP0001-000.5-20230127
Sample for RCRA 8 metals w/ TCLP.

1300 - Cone off open excavations -

1315 - Offsite -

- Dustin will take sample to Eurofins
in Altamonte Springs -



1/30/23

KSC Soil IM p. 7 of 15 05/18/05
Ab Radan Station

0730- Dustin Slater, James Bradford, &
Christopher Setrin onsite.

Weather: Sunny, 65°F -

Sign in with office -

- H&S meeting -

- Begin excavating Area C since the
lunch got pushed back -

1215- Hall's Environmental onsite with
backfill -

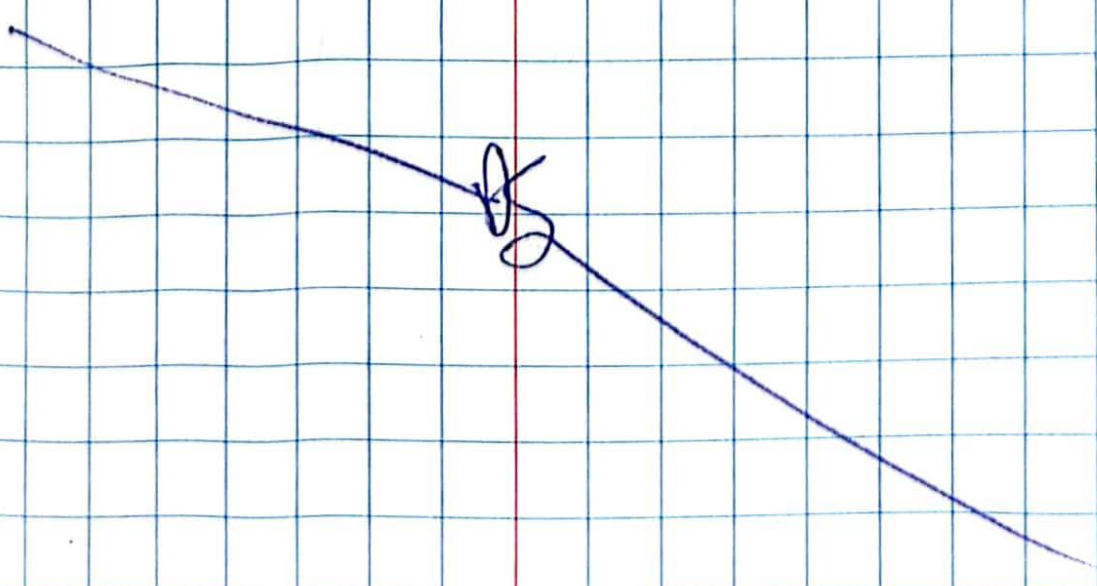
- Dump backfill then put roll off in
line with other ones,

- Continue excavating Area C -

1445- Stop digging for the day.

Clean up site & cone off open
holes -

1515- Offsite -


A large handwritten 'X' mark is drawn across the bottom half of the page, starting from the left margin and extending towards the right, with a small loop in the middle.

1/31/23

KSC Soil EM

p. 8 of 15 05/25/23

Ab Radar Station

0715 - Dustin Stator onsite -

0720 - John McCoy (NASA Safety) onsite to
check progress -

0730 - Christopher Setrin onsite. John offsite.

0745 - James Bradford onsite -

Sign in with office -

- Hqs meeting

- Begin backfilling Area A & Area B -

- Also backfill portion of Area C.

1455 - Chris ~~Alkerson~~ (NASA Rpm) onsite to
check progress

- Walk him around site to show
him what we've gotten done -

1520 - Offsite for day -

1215 - Hull's onsite
to drop off backfills
roll off

2/1/23

KSC Soil TM

p. 9 of 15 10/28/25

DL Radar Station

0730 - Justin Slater, James Bradford, & Christopher Setrain onsite

Weather: Cloudy, foggy, 67°F.

- Sign in with office

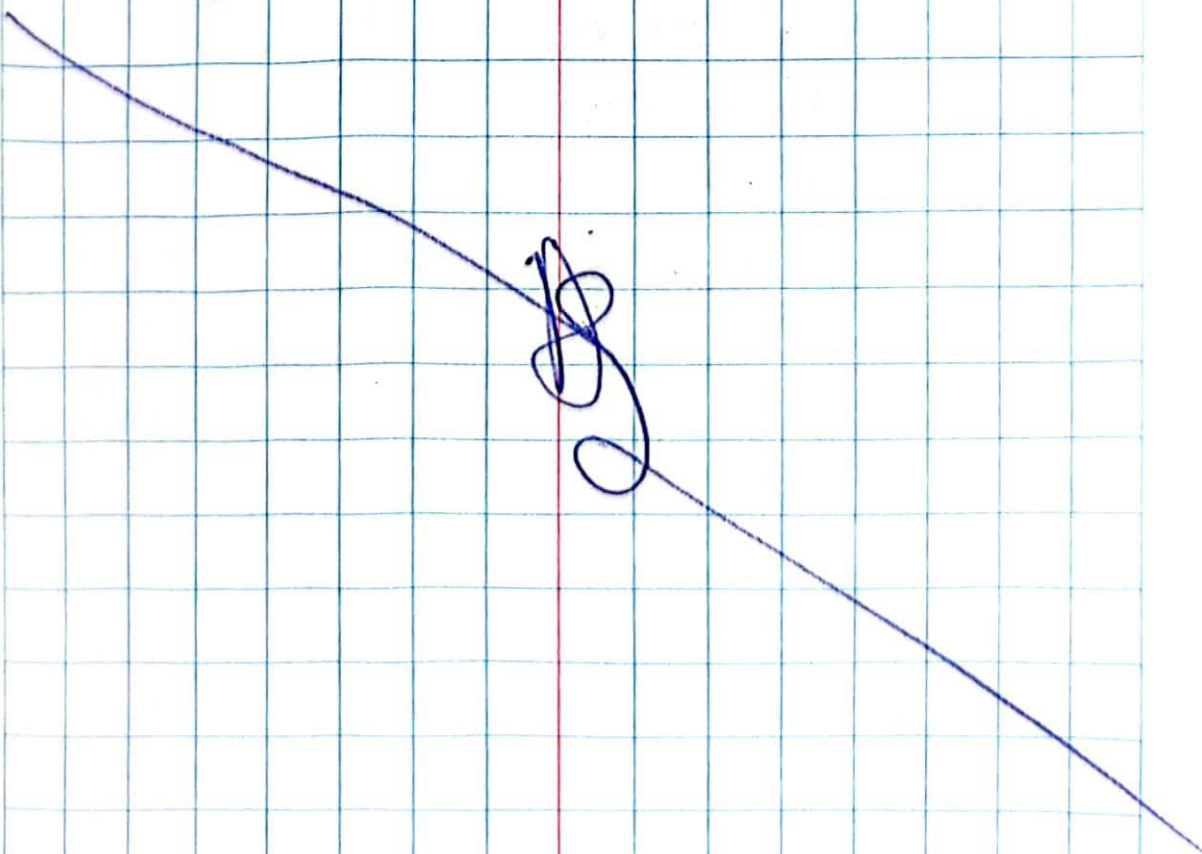
- H&S meeting

0745 - Begin digging in Area C again.

1000 - Begin digging in Area D, while also continuing in Area C.

1445 - Clean up site. Close off open excavations.

1515 - Offsite.



2/2/23

KSC Soil TM p. 10 of 15 05/18/05
26 Ruden Station

0730 - Austin Slater, James Bradford, &
Christopher Setrin onsite.

Weather: foggy, will be mostly sunny 67°F.

Sign in with office.

- H&S meeting

0800 - Chad informs us there is a nodig
right now.

- Begin backfilling Area C.

1050 - Chad lets us know we are clear
to dig.

- Continue on Area C & Area D.

1400 - finish on Area C & portion of Area D
up to the stairs.

1405 - Move back to remainder of Area A
on the west side of the radar.

1450 - Clean up site. Cone off open excavations.

1520 - offsite.

~~SS~~

2/3/23

KSC Soil/IM

p. 11 of 15 w/8/23

@ Radar Station

0730- Dustin Sklar, James Bradford, & Christopher Setrin onsite.

Weather: Cloudy, some sun, rain likely, 67°F.
Sign in with office -

- H & S meeting

0745- Begin backfilling remainder of Area C & part of Area D

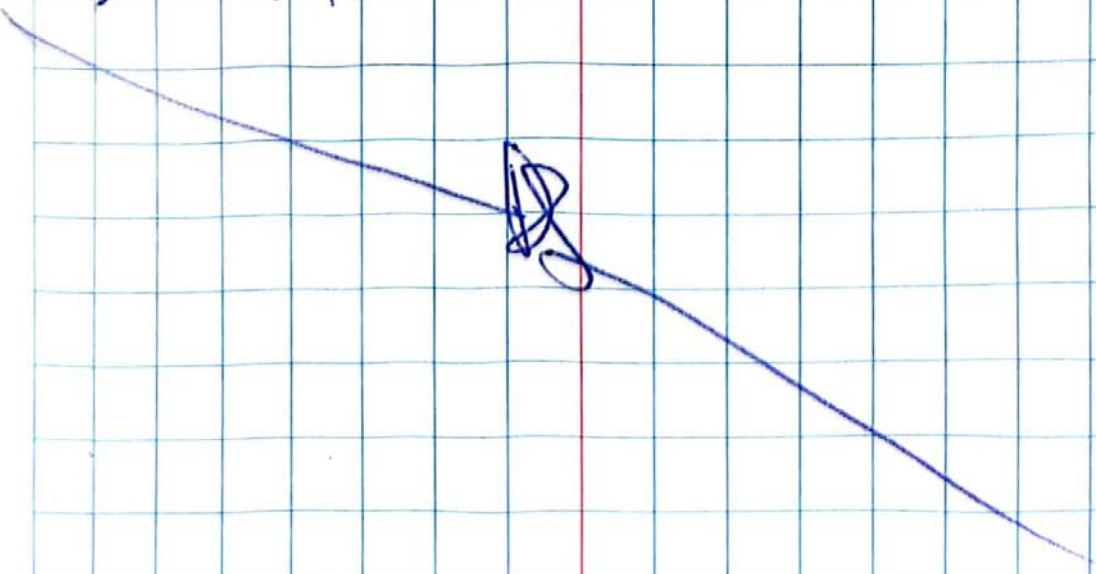
1145- Move stockpile of contaminated soil to roll off -

1245- Begins to rain heavily & lightning.
- Cover open roll off -

Wait for Hull's to show up with next load of backfill

1315- Chad calls & informs us that no roll off is coming -

1330- Offsite -


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2/4/23

KSC Soil IM

p. 12 of 15 OS/CS/BF

26 Radon Station

0800 - Dustin Sklar, Christopher Setrin, & Brittany Follett onsite.

Weather - Sunny, light breeze, leaf.

Sign in with office.

- H&S meeting.

- There is a no dig in place so we aren't able to dig.

- Pick up remaining contaminated soil & load it into roll off.

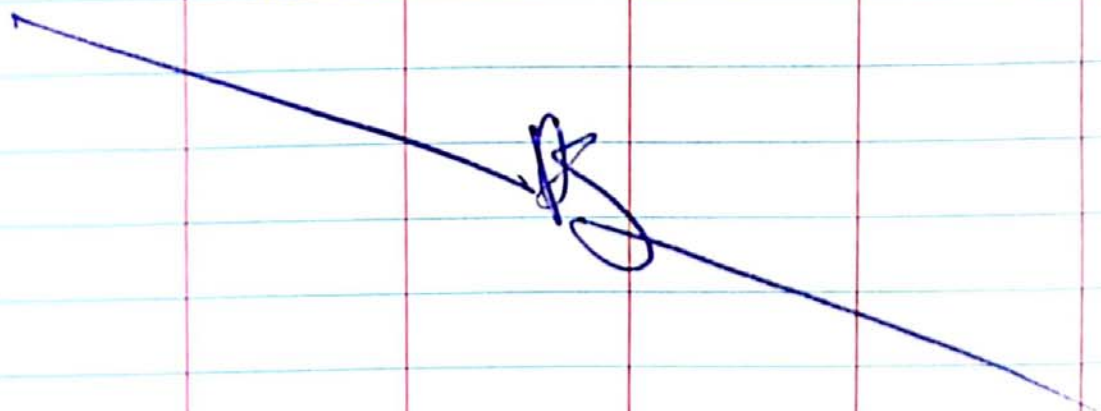
- Straighten up site while we wait for the roll off to arrive.

0930 - Brittany offsite to A3RB to help Deda.

1415 - Hull's onsite with backfill & roll off.

- Dump backfill, then put roll off in line with the other ones.

1500 - Offsite.



2/7/23

KSC Soil EM

p. 13 of 15 ASCL/CS/BF

Q6 Radar Station

0730 - Justin Slater, Chad Lee, Christopher Setrin, & Brittany Follett onsite.

Weather: Sunny, cool, low.

Sign in with office.

H&S meeting -

- Begin digging in Area A (directly west of Radar)

1230 - Break for lunch -

1300 - back to digging in Area A, then begin backfilling

1515 - Work complete for the day.
Offsite.



2/8/23

KSC Soil IM p. 14 & 15 03/04/05/06

06 Radar Station

0715 - Got a call from Hull's driver stating he was almost to the site.

Call Chad to inform him.

0725 - Chad Lee & Brittany Collett onsite.

Hull's there to drop backfill & roll off.

0730 - Christopher Setrin & Dustin Slataz onsite.

Weather: Sunny, 62°F.

Sign in with office.

H&S meeting

- Continue backfilling Area A from yesterday.

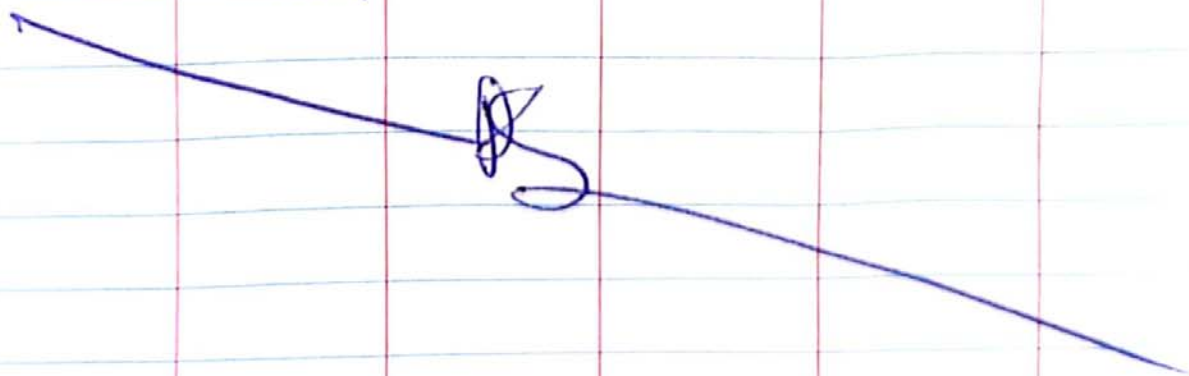
1030 - Begin excavating Area E.
(North side of radar).

1330 - Begin backfilling west side of Area E.

1415 - Continue digging Area E.

1510 - Work complete for the day -
Close up roll off.

1525 - Offsite.



2/9/23

KSC Soil IM p. 15 of 15 05/02/25

Q6. Dundas Station

0730- Chad Lee & Brittany Follett onsite.

0740- Austin Slater onsite-

Weather: Sunny, 63°F -

Sign in with office-

H&S meeting -

-Continue digging remaining portion of Area E.

0850- Hall's onsite with last load of backfill.

0945- Begin backfilling last part of Area E.

1030 - Compact the Area with compactor

1045 - Chris Adkison onsite-

- Finish with compacting. Back drag the site with skid steer to clean up all of the track marks-

1230. Clean up site- Take photos of all the completed work-

- Close up roll offs-

- Park skid steer & excavator outside the gate-

1300. Offsite-



2/17/23

SOIL IM - NASA KSC

Q6 Radar Site Restoration

CL/JB/PB
/6

09:00 Chad Lee (CL), James Bradford (JB), and Patrick Bend (PB) to Home Depot to get 50 bags of Gravel & Supplies. Geotextile fabric is also purchased.

11:30 CL/JB/PB onsite. CL begins clean up of wind blown sand in and around the Radar equipment. JB/PB begin laying down geotextile fabric & then putting the gravel on top. (Before work begins crew had a H&S tailgate & signed in.)

12:00 CL has finish clean up and helps with fabric and gravel.

14:00 Chris Setrin (CS) onsite to help. CL transitions to spread grass seed. Grass seed is placed in the outer disturbed areas and is raked in to prevent the seed from being blown away.

15:15 Crew offsite. More fabric and gravel are needed to complete the restoration. 50 bags were used & 1-roll of geotextile.

~~CS~~

03/24/23

NASA KSC - SOIL IM

Q6RS Site Restoration

CL/DS/DK/CS

07:30 Chad Lee (CL), Dustin Slater (DS), Devin Kehoe (DK), and Chris Setrin (CS) onsite. Crew signs in & H&S tailgate is conducted.

07:50 Geotextile fabric is layed down & staked in place in remaining excavation areas.

09:10 Grass seed "Annual Ryegrass" is spread in the outer areas that were disturbed during the IM activities. The grass is lightly raked in to prevent the seed from being washed or blown away.

10:00 Hull's environmental onsite to deliver a load (≈ 10 tons) of #57 stone.

10:20 The crew spreads the gravel by hand using shovels, rakes, and wheel barrows. The stone is placed in all excavated areas to a minimum thickness of 3 inches on top of the Geotextile fabric.

(11:00) Chris Addison - NASA RPM visits the site to observe progress & to make sure we didn't need anything. He was onsite for approximately 30 minutes.

12:30 CL ~~breaks~~ ^{CS} breaks away to finish spreading grass seed. ~~the crew~~

13:15 The crew has completed the gravel areas and begins cleanup and raking in

03/24/23

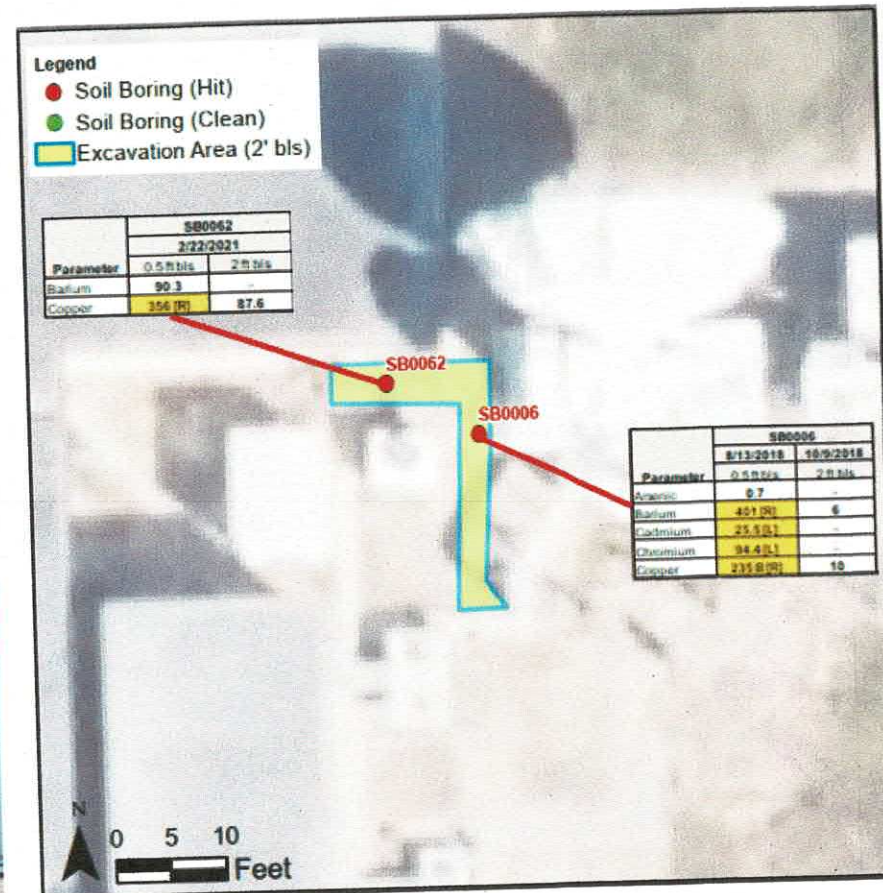
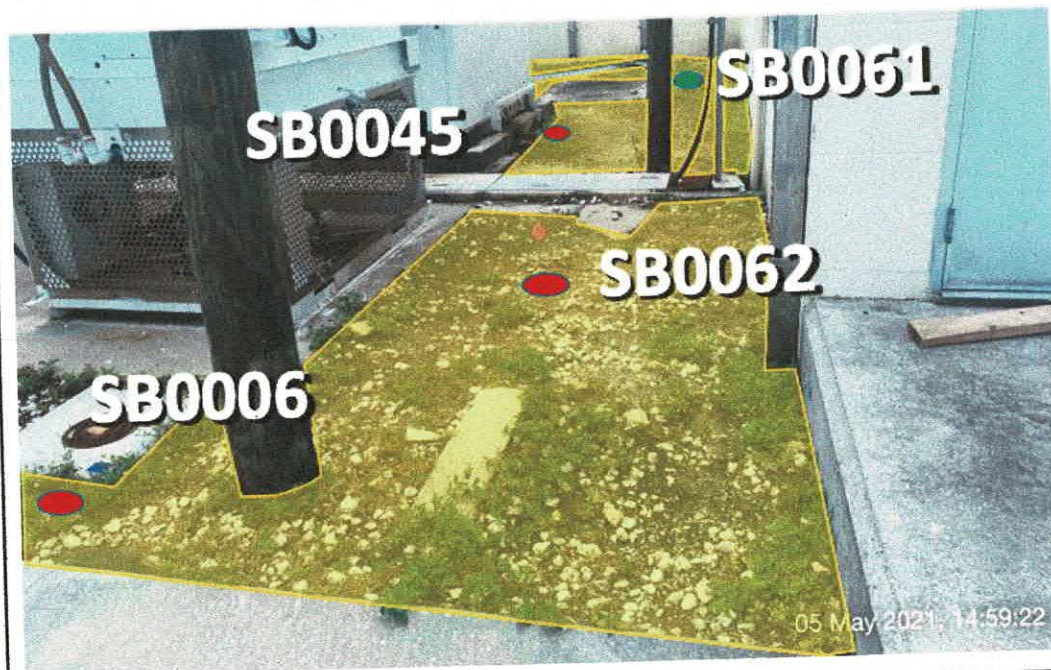
NASA KSC - SOIL IM
Q6RS Site Restoration

CL/DS/DK/CS

the grass. seed.

14:05 Crew has cleaned up the areas and is
offsite to move to Orlando, FL.



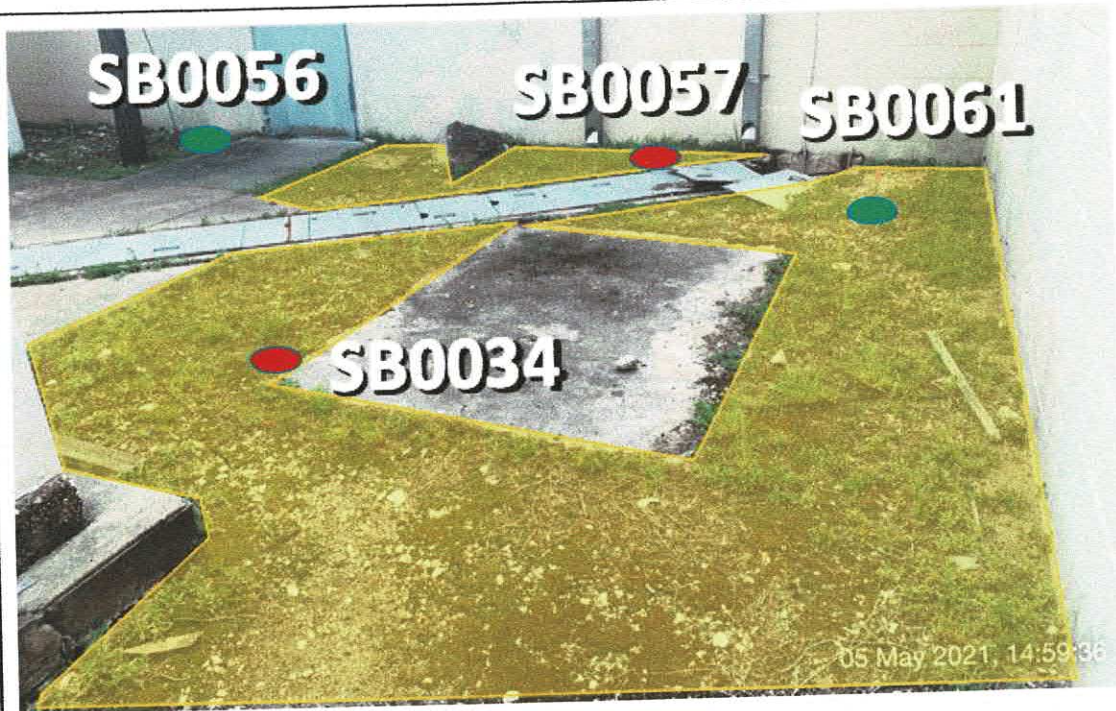


107 square feet
7.9 cubic yards

Dig # A

Proposed Excavation Area (2' bls)

Figure 4
LOC 3 - SB0006 Excavation Area



151 square feet
11.2 cubic yards

Area A

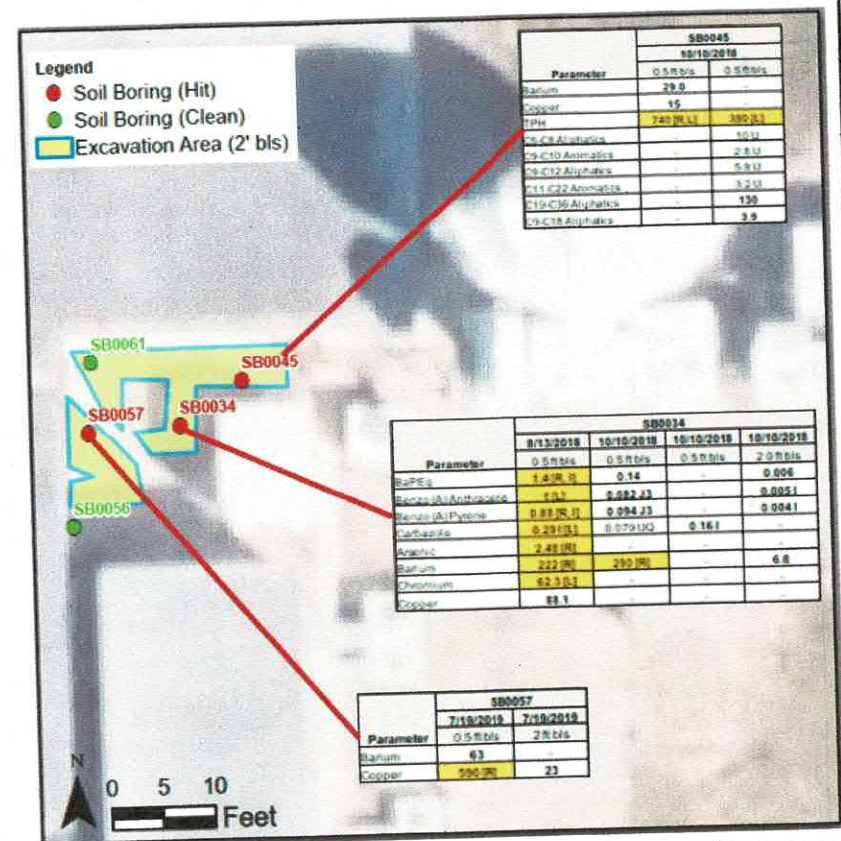


Figure 5
LOC 3 - SB0057 Excavation Area

Proposed Excavation Area (2' bls)



50 square feet
3.7 cubic yards

Area B

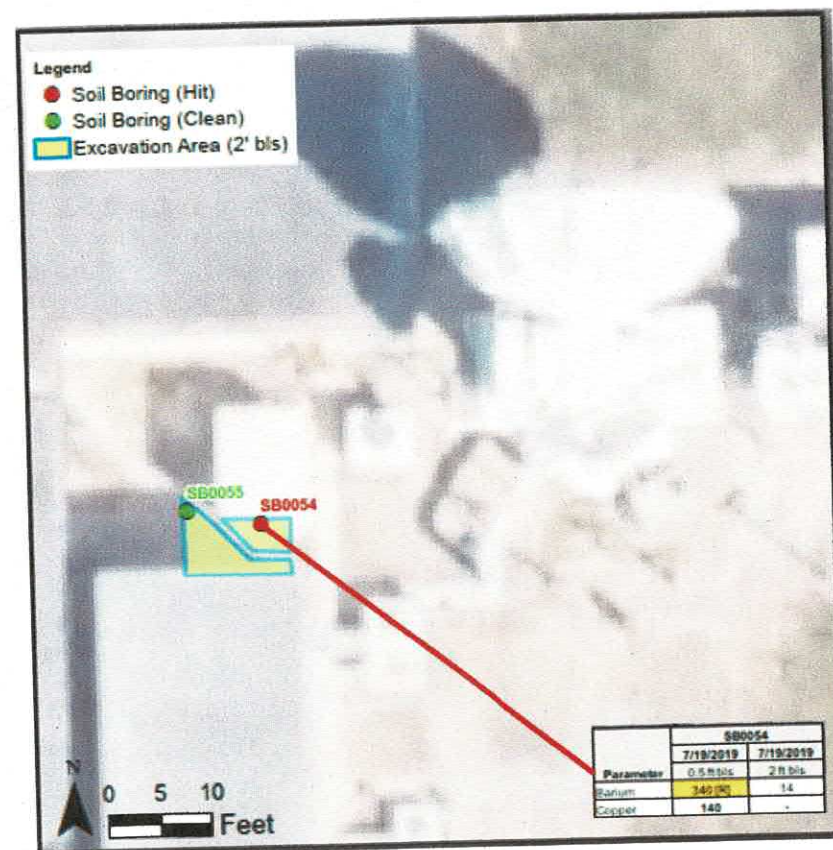


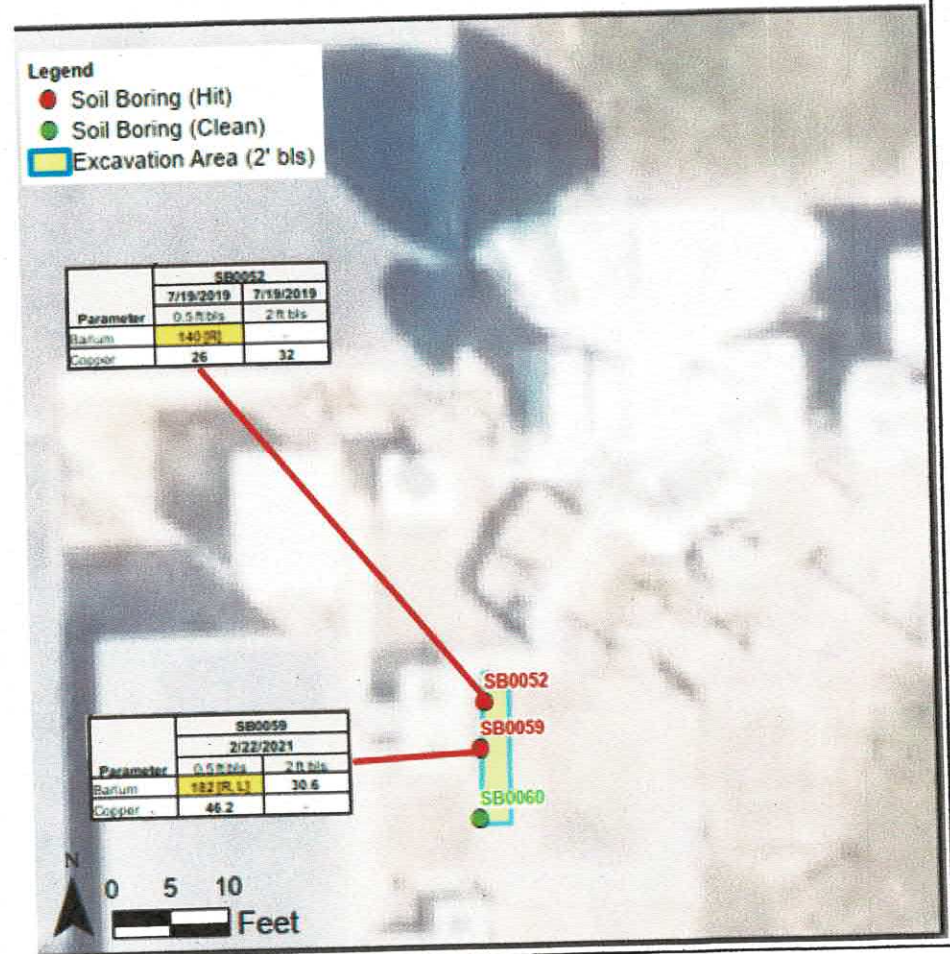
Figure 6
LOC 3 - SB0054 Excavation Area

Proposed Excavation Area (2' bls)



29 square feet
2.2 cubic yards

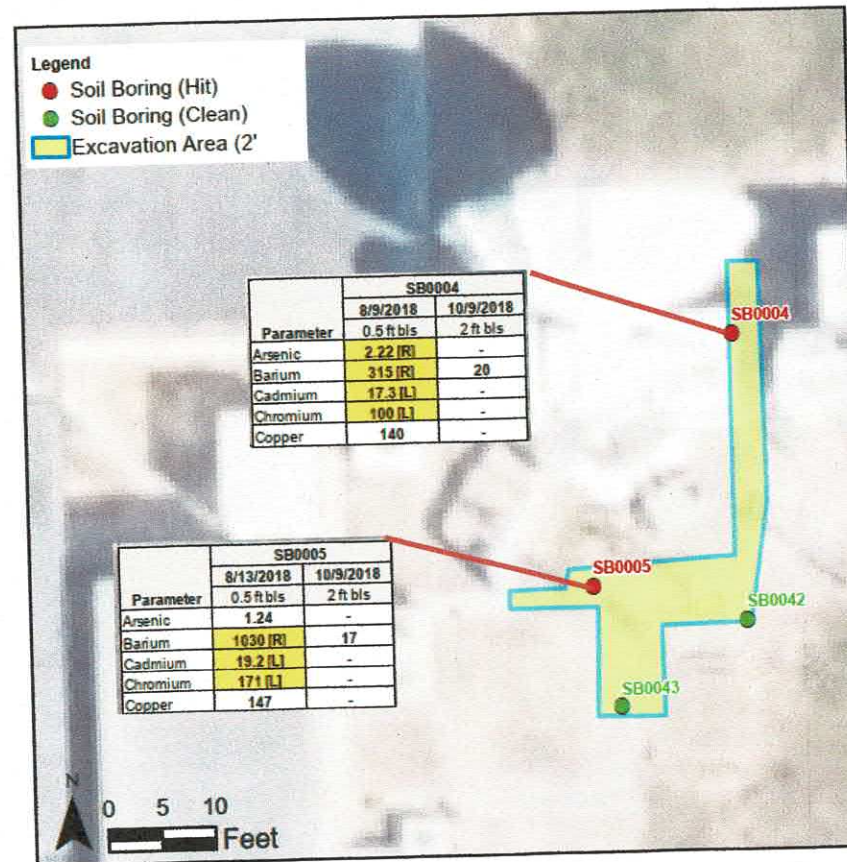
Area C



Proposed Excavation Area (2' bls)

Figure 7
LOC 3 - SB0060 Excavation Area

☉ 9°N (T) ☉ 28°25'28"N, 80°39'51"W ±13ft ▲ 11ft

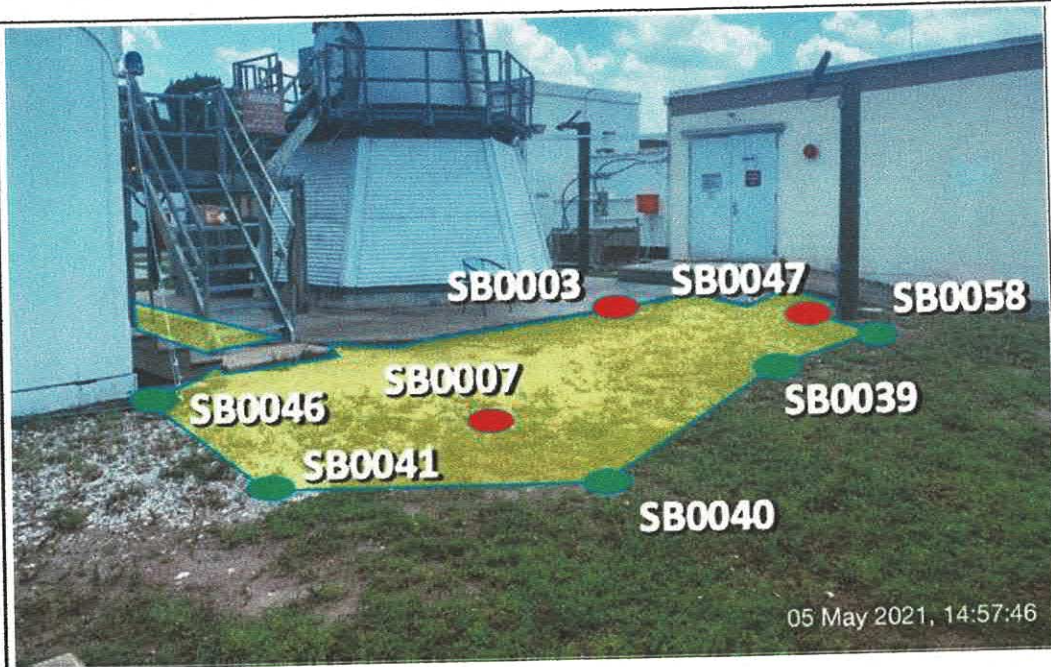


Area D

245 square feet
18 cubic yards

■ Proposed Excavation Area (2' bls)

Figure 3
LOC 3 - SB0004 Excavation Area



203 square feet
15 cubic yards

Area E

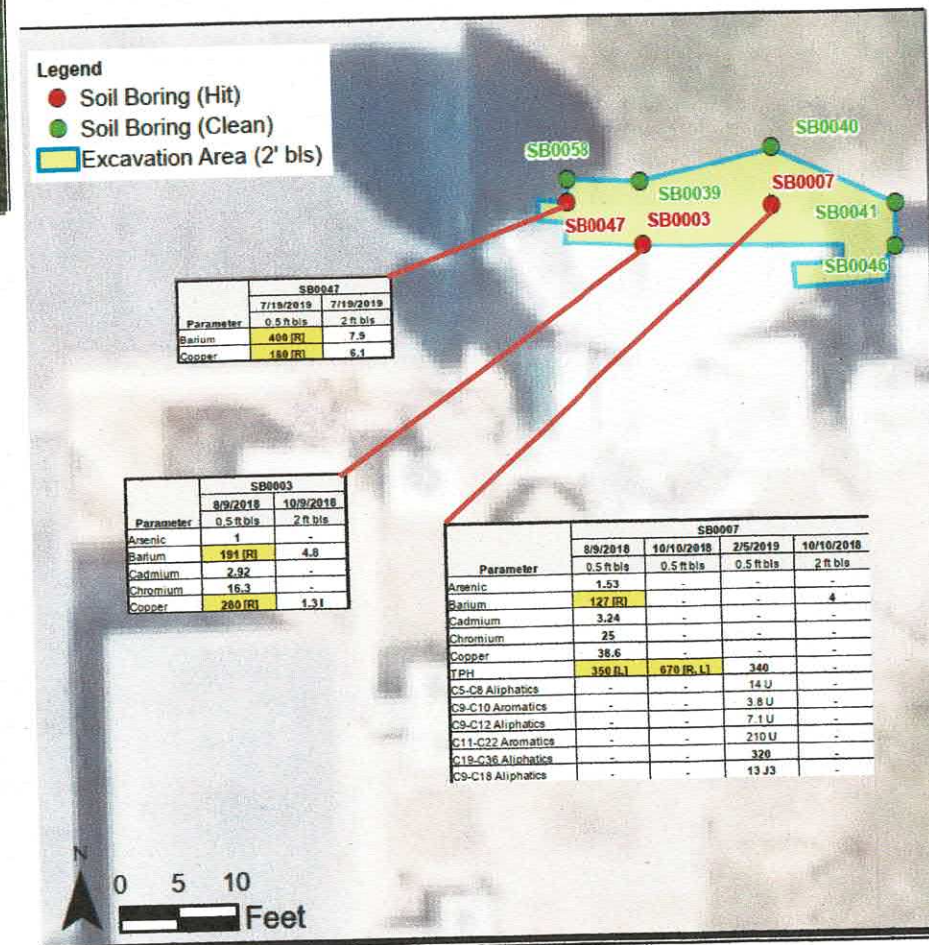


Figure 2
LOC 3 - SB0007 Excavation Area

Proposed Excavation Area (2' bls)

06/04/23

KSC Soil IM
MW Sampling
1 of 1

BF

0830 Brittany Follett departs AECOM
depot for Q6 Radar Station

0940 BF arrives at Q6 Radar Station

- Sign in to facility

- Weather: 87°F Cloudy

1000 Calibrate and begin Sampling
MW0003

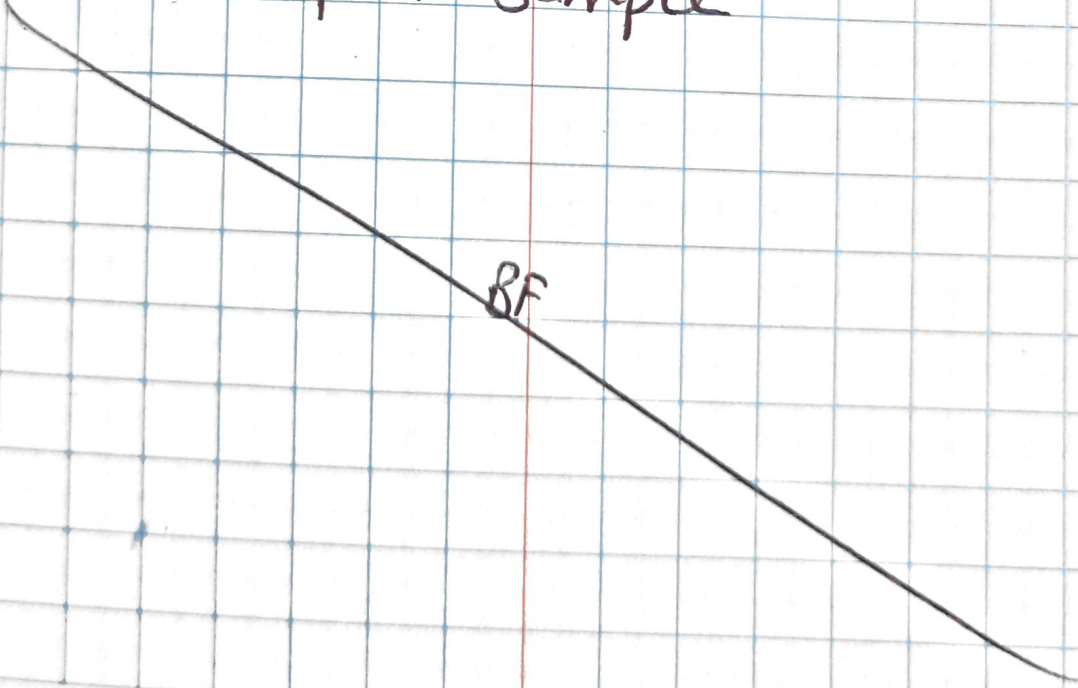
1145 Complete Sampling Activities
depart Site to dump purge
water at POL

1210 Arrive at POL

1220 Depart POL for AECOM depot

1330 Arrive at depot. Pack cooler with
additional Ice.

1345 Depart depot for Eurofins Lab
to drop off sample



BF

GROUNDWATER SAMPLE LOG SHEET **AECOM**

Event: Q6RS-MW0003 for barium and copper analysis
 Site Name: NASA - Kennedy Space Center
 Project #: Q6 Radar Station

Sample ID: Q6RS-MW0003-006.0-20230606 Sampler: Brittany Follett
 Well ID: Q6RS-MW0003 Location Type: Monitoring Well
 Comments:

Well Information			
Well Diameter (in):	1	Static Water Level (ft-BTOC):	4.31 FT
Top of Screen (ft-BTOC):	3.50	H/S PID Monitor Reading: (ppm)	0
Bottom of Screen (ft-BTOC):	8.50	Purge/Sample Method:	Low Flow
Measured Well Depth (ft-BTOC):	NM	Sample Analysis:	Barium and Copper

Purge Information													
Time	Purge Rate (gal/min)	Vol Purged (gal)	Cumul. Vol Purged (gal)	Depth to Water (FT)	pH (S.U.)	S.C. (US/CM)	DO (MG/L)	Turbidity (NTU)	Temp (C)	ORP (MV)	Salinity (PSU)	Color (NA)	Odor (NA)
10:56 AM	0.05	1	1	4.65	6.12	218.1	0.27	1.65	26.9	-135.4	0.1	Clear	None
10:58 AM	0.05	0.1	1.1	4.65	6.14	218.2	0.24	1.64	26.8	-134.7	0.1	Clear	None
11:00 AM	0.05	0.1	1.2	4.65	6.12	217.8	0.23	1.93	26.8	-133.2	0.1	Clear	None
11:02 AM	0.05	0.1	1.3	4.65	6.12	216.9	0.23	2.82	26.7	-122.3	0.1	Clear	None

Start Purge:	6/6/2023 10:56:00 AM	End Purge:	6/6/2023 11:02:00 AM	Total Volume (gal):	1.3
--------------	----------------------	------------	----------------------	---------------------	-----

Calibration Report

Instrument Aqua TROLL 600
Serial Number 606696
Created 6/6/2023

Sensor	RDO
Serial Number	911003
Last Calibrated	6/6/2023

Calibration Details

Slope 1.010808
Offset 0.00 mg/L

Calibration point 100%

Concentration 8.11 mg/L
Pre Measurement 104.77 %Sat
Post Measurement 100.00 %Sat
Temperature 25.60 °C
Barometric Pressure 1,015.8 mbar

Sensor	Conductivity
Serial Number	673517
Last Calibrated	6/6/2023

Calibration Details

TDS Conversion Factor (ppm) 0.65
Cell Constant 1.012
Reference Temperature 25.00 °C

Pre Measurement

Actual Conductivity 7,912.0 µS/cm
Specific Conductivity 7,992.2 µS/cm

Post Measurement

Actual Conductivity 7,919.7 µS/cm
Specific Conductivity 8,000.0 µS/cm

Sensor	pH/ORP
Serial Number	723210
Last Calibrated	6/6/2023

Calibration Details

Calibration Point 1

pH of Buffer 7.00 pH
pH mV -14.9 mV
Temperature 24.47 °C

Pre Measurement

pH 7.22 pH
pH mV -14.8 mV

Post Measurement

pH 7.00 pH
pH mV -14.8 mV

Slope and Offset 1

Slope -59.06 mV/pH
Offset -14.9 mV

ORP

ORP Solution	Quick-Cal
Offset	-95.6 mV
Temperature	24.47 °C
Pre Measurement	329.9 mV
Post Measurement	224.3 mV

Sensor	Turbidity
--------	-----------

Serial Number	759683
Last Calibrated	Factory Defaults

Sensor	Barometric Pressure
--------	---------------------

Serial Number	606696
Last Calibrated	Factory Defaults

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APPENDIX D

LABORATORY ANALYICAL REPORTS

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Environment Testing

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A handwritten signature in blue ink, appearing to read "Alex M.", is positioned above a horizontal line.
Signature

10.14.2022

Date

Eurofins Environment Testing Southeast, LLC
Alex Montoya
President
5102 LaRoche Avenue
Savannah, GA 31404

ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 1/25/2023 4:21:22 PM

JOB DESCRIPTION

NASA KSC Backfill

JOB NUMBER

670-12724-1

Eurofins Orlando

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984

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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J1	Estimated value; value may not be accurate. Surrogate recovery outside of criteria.
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value.

GC Semi VOA

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J1	Estimated value; value may not be accurate. Surrogate recovery outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

LCMS

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Dioxin

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J	Estimated value; value may not be accurate.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected at or above the method detection limit in both the sample and the associated method blank and the value of 10 times the blank value was equal to or greater than the associated sample value.

Metals

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

General Chemistry

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)

Eurofins Orlando

Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Job ID: 670-12724-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-12724-1

Receipt

The sample was received on 1/10/2023 1:35 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5° C.

GC/MS VOA

Method 8260D: The continuing calibration verification (CCV) associated with batch 670-17984 recovered above the upper control limit for Methylene Chloride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCVIS 670-17984/3).

Method 8260D: The continuing calibration verification (CCV) associated with batch 670-17984 recovered outside acceptance criteria, low biased, for Acetone. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA

Methods 8270D, 8270E: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 400-608596 and analytical batch 400-608998 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

Methods 8270D, 8270E: The continuing calibration verification (CCV) associated with batch 400-608998 recovered above the upper control limit for 4-Chlorophenyl phenyl ether. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Methods 8270D, 8270E: The following samples were diluted due to the nature of the sample matrix: (400-231772-E-1-F), (400-231772-E-1-D MS) and (400-231772-E-1-E MSD). Elevated reporting limits (RLs) are provided.

Method 8270E: The continuing calibration verification (CCV) associated with batch 400-608998 recovered outside acceptance criteria, low biased, for Nitrobenzene, Bis(2-chloroethyl)ether, Phenol, Isophorone, 2,2'-oxybis[1-chloropropane], N-Nitrosodi-n-propylamine, Benzyl alcohol and Bis(2-chloroethoxy)methane. A reporting limit (RL) standard was analyzed, and the target analytes are detected. Since the associated samples were non-detect for the analyte(s), the data are reported.

Methods 8270D, 8270E: The laboratory control sample (LCS) for preparation batch 400-608596 and analytical batch 400-609136 recovered outside control limits for the following analytes: 3,3'-Dichlorobenzidine. The analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

Method 8270D: The continuing calibration verification (CCV) associated with batch 400-609569 recovered above the upper control limit for Ethyl Parathion, Sulfotepp and EPN. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8270E SIM: Surrogate recovery for the following samples were outside control limits: (660-126256-A-13-C), (660-126256-A-13-A MS) and (660-126256-A-13-B MSD). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8270E SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 670-18478 and analytical batch 670-18585 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Method 8270E SIM: The instrument blank for analytical batch 670-18585 contained Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Chrysene and Indeno[1,2,3-cd]pyrene greater than the reporting limit (RL), and were not reanalyzed because the samples are non detect. The data have been qualified and reported.

Method 8270E SIM: The following sample was diluted due to the nature of the sample matrix: Q6RS-FILLDIRT1-20230110 (670-12724-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA

Methods 8082, 8082A: The continuing calibration verification (CCV) associated with batch 400-608960 recovered above the upper control limit for PCB-1260. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8081B: The continuing calibration verification (CCV) associated with batch 400-608962 recovered above the upper control limit for

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Job ID: 670-12724-1 (Continued)

Laboratory: Eurofins Orlando (Continued)

4,4'-DDD, 4,4'-DDE and Toxaphene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8081B: Two surrogates are used for this analysis. The laboratory's SOP allows one of these surrogates to be outside acceptance criteria without performing re-extraction/re-analysis. The following sample contained an allowable number of surrogate compounds outside limits: (670-12724-A-1-B MS). These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Dioxin

Method 8290A: Any peak area that is the result of interferences from poly-chlorinated diphenyl ethers observed in the sample has been removed from the calculated results prior to reporting the data for totals.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

LCMS

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Dioxin Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Analyte	Result	Qualifier	RL	EDL	Unit	Dil	Fac	D	Method	Prep Type
1,2,3,4,6,7,8-HpCDD	0.0000013	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				22						
1,2,3,4,6,7,8-HpCDF	0.00000091	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				16						
1,2,3,4,7,8-HxCDD	0.000000044	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				025						
1,2,3,6,7,8-HxCDD	0.00000011	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				025						
1,2,3,6,7,8-HxCDF	0.00000010	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				094						
1,2,3,7,8-PeCDD	0.00000011	I J	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				14						
1,2,3,7,8-PeCDF	0.00000011	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				074						
1,2,3,7,8,9-HxCDD	0.00000017	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				024						
1,2,3,7,8,9-HxCDF	0.000000085	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				10						
2,3,4,6,7,8-HxCDF	0.000000086	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				094						
2,3,4,7,8-PeCDF	0.00000011	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				059						
2,3,7,8-TCDD	0.000000079	I J	0.0000010	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				055						
OCDD	0.000013		0.000010	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				54						
OCDF	0.00000075	I V	0.000010	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				19						
Total HxCDD	0.00000032	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				025						
Total HxCDF	0.00000027	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				097						
Total HpCDD	0.00000013	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				22						
Total HpCDF	0.00000091	I V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				19						
Total PeCDD	0.00000011	I J	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				14						
Total PeCDF	0.00000022	I J V	0.0000050	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				066						
Total TCDD	0.000000079	I J	0.0000010	0.0000000	mg/Kg	1	✱		8290A	Total/NA
				055						
Arsenic	1.0		1.0	0.51	mg/Kg	5	✱		6020B	Total/NA
Barium	3.9		2.0	1.0	mg/Kg	5	✱		6020B	Total/NA
Chromium	2.4		1.0	0.51	mg/Kg	5	✱		6020B	Total/NA
Lead	4.3		1.0	0.51	mg/Kg	5	✱		6020B	Total/NA
Total Solids	99		0.025	0.025	%	1			SM 2540G	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,1,2,2-Tetrachloroethane	0.00059	U	0.012	0.00059	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,1,2-Trichloroethane	0.00068	U	0.012	0.00068	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,1-Dichloroethane	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,1-Dichloroethene	0.00061	U	0.012	0.00061	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,2-Dichloroethane	0.00052	U	0.059	0.00052	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
1,2-Dichloropropane	0.00058	U	0.012	0.00058	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
2-Butanone (MEK)	0.0043	U	0.099	0.0043	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
2-Hexanone	0.0034	U	0.099	0.0034	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
4-Methyl-2-pentanone	0.0036	U	0.099	0.0036	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Acetone	0.025	U	0.099	0.025	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Benzene	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Bromodichloromethane	0.00062	U	0.012	0.00062	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Bromoform	0.00077	U	0.012	0.00077	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Bromomethane	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Carbon disulfide	0.0025	U	0.012	0.0025	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Carbon tetrachloride	0.00059	U	0.012	0.00059	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Chlorobenzene	0.00052	U	0.012	0.00052	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Chloroethane	0.00066	U	0.012	0.00066	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Chloroform	0.00060	U	0.012	0.00060	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Chloromethane	0.00064	U	0.012	0.00064	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
cis-1,2-Dichloroethene	0.00063	U	0.012	0.00063	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
cis-1,3-Dichloropropene	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Dibromochloromethane	0.00071	U	0.012	0.00071	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Ethylbenzene	0.00057	U	0.012	0.00057	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Methylene Chloride	0.0064	U	0.069	0.0064	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Styrene	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Tetrachloroethene	0.00066	U	0.012	0.00066	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Toluene	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
trans-1,2-Dichloroethene	0.00068	U	0.012	0.00068	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
trans-1,3-Dichloropropene	0.00049	U	0.012	0.00049	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Trichloroethene	0.00059	U	0.012	0.00059	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Vinyl chloride	0.00043	U	0.012	0.00043	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1
Xylenes, Total	0.0011	U	0.020	0.0011	mg/Kg	☆	01/11/23 10:38	01/12/23 16:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		70 - 130	01/11/23 10:38	01/12/23 16:39	1
4-Bromofluorobenzene (Surr)	95		70 - 130	01/11/23 10:38	01/12/23 16:39	1
Dibromofluoromethane (Surr)	101		70 - 130	01/11/23 10:38	01/12/23 16:39	1

Method: SW846 8270D - Pesticides by GC/MS

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bolstar	0.015	U	0.066	0.015	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Chlorpyrifos	0.0075	U	0.066	0.0075	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Azinphos-methyl	0.0087	U	0.13	0.0087	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Coumaphos	0.013	U	0.66	0.013	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Diazinon	0.015	U	0.13	0.015	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Dichlorvos	0.0090	U	0.13	0.0090	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Disulfoton	0.0067	U	0.13	0.0067	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Ethoprop	0.011	U	0.066	0.011	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8270D - Pesticides by GC/MS (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fensulfothion	0.011	U	0.66	0.011	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Fenthion	0.017	U	0.066	0.017	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Methyl parathion	0.0076	U	0.066	0.0076	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Mevinphos	0.013	U	0.13	0.013	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Phorate	0.018	U	0.066	0.018	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Ronnel	0.0074	U	0.066	0.0074	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Stirophos	0.018	U	0.066	0.018	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Tokuthion	0.021	U	0.066	0.021	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Trichloronate	0.0067	U	0.66	0.0067	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Dimethoate	0.0082	U	0.13	0.0082	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
EPN	0.0081	U	0.13	0.0081	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Ethyl Parathion	0.0084	U	0.066	0.0084	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Naled	0.0092	U	0.66	0.0092	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Malathion	0.0067	U	0.066	0.0067	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Sulfotepp	0.0066	U	0.066	0.0066	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Monochrotophos	0.0097	U	0.66	0.0097	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1
Pyrophosphoric acid, tetraethyl ester	0.033	U	0.066	0.033	mg/Kg	☆	01/20/23 11:33	01/23/23 18:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Triphenylphosphate	74		30 - 164	01/20/23 11:33	01/23/23 18:37	1

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
2-Methylnaphthalene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Acenaphthene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Acenaphthylene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Anthracene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Benzo[a]anthracene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Benzo[a]pyrene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Benzo[b]fluoranthene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Benzo[g,h,i]perylene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Benzo[k]fluoranthene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Chrysene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Dibenz(a,h)anthracene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Fluoranthene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Fluorene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Indeno[1,2,3-cd]pyrene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Naphthalene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Phenanthrene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5
Pyrene	0.0084	U	0.017	0.0084	mg/Kg	☆	01/16/23 06:29	01/16/23 21:55	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	86		50 - 150	01/16/23 06:29	01/16/23 21:55	5
Fluoranthene-d10 (Surr)	109		50 - 150	01/16/23 06:29	01/16/23 21:55	5

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
1,2-Dichlorobenzene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3-Dichlorobenzene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
1,4-Dichlorobenzene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4,5-Trichlorophenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4,6-Trichlorophenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4-Dichlorophenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4-Dimethylphenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4-Dinitrophenol	0.28	U	0.97	0.28	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,4-Dinitrotoluene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2,6-Dinitrotoluene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2-Chloronaphthalene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2-Chlorophenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2-Methylphenol	0.079	U	0.32	0.079	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2-Nitroaniline	0.069	U	0.32	0.069	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
2-Nitrophenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
3,3'-Dichlorobenzidine	0.032	U J3	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
3 & 4 Methylphenol	0.032	U	0.65	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
3-Nitroaniline	0.077	U	0.32	0.077	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4,6-Dinitro-2-methylphenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Bromophenyl phenyl ether	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Chloro-3-methylphenol	0.080	U	0.32	0.080	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Chlorophenyl phenyl ether	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Chloroaniline	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Nitroaniline	0.11	U	0.32	0.11	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
4-Nitrophenol	0.11	U	0.32	0.11	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Benzoic acid	0.34	U	0.97	0.34	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Benzyl alcohol	0.11	U	0.32	0.11	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Butyl benzyl phthalate	0.070	U	0.32	0.070	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Bis(2-chloroethoxy)methane	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Bis(2-chloroethyl)ether	0.090	U	0.32	0.090	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Bis(2-ethylhexyl) phthalate	0.080	U	0.32	0.080	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
bis (2-chloroisopropyl) ether	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Carbazole	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Dibenzofuran	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Diethyl phthalate	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Dimethyl phthalate	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Di-n-butyl phthalate	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Di-n-octyl phthalate	0.12	U	0.32	0.12	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Hexachlorobenzene	0.098	U	0.32	0.098	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Hexachlorobutadiene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Hexachlorocyclopentadiene	0.065	U	0.32	0.065	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Hexachloroethane	0.030	U	0.32	0.030	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Isophorone	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Nitrobenzene	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
N-Nitrosodi-n-propylamine	0.037	U	0.32	0.037	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
N-Nitrosodiphenylamine	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1
Phenol	0.032	U	0.32	0.032	mg/Kg	☆	01/16/23 08:32	01/19/23 02:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Phenol-d5 (Surr)	54		29 - 130	01/16/23 08:32	01/19/23 02:32	1
Terphenyl-d14 (Surr)	99		24 - 146	01/16/23 08:32	01/19/23 02:32	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	74		10 - 150	01/16/23 08:32	01/19/23 02:32	1
2-Fluorobiphenyl	82		27 - 127	01/16/23 08:32	01/19/23 02:32	1
2-Fluorophenol (Surr)	56		25 - 128	01/16/23 08:32	01/19/23 02:32	1
Nitrobenzene-d5 (Surr)	62		15 - 136	01/16/23 08:32	01/19/23 02:32	1

Method: SW846 8081B - Organochlorine Pesticides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	0.00030	U	0.0016	0.00030	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
alpha-BHC	0.00034	U	0.0016	0.00034	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
beta-BHC	0.00027	U	0.0016	0.00027	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
delta-BHC	0.00030	U	0.0016	0.00030	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
gamma-BHC (Lindane)	0.00019	U	0.0016	0.00019	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
alpha-Chlordane	0.00027	U	0.0016	0.00027	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
gamma-Chlordane	0.00027	U	0.0016	0.00027	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
4,4'-DDD	0.00029	U	0.0016	0.00029	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
4,4'-DDE	0.00028	U	0.0016	0.00028	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
4,4'-DDT	0.0012	U	0.0016	0.0012	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Dieldrin	0.00031	U	0.0016	0.00031	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endosulfan I	0.00034	U	0.0016	0.00034	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endosulfan II	0.00034	U	0.0016	0.00034	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endosulfan sulfate	0.00042	U	0.0016	0.00042	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endrin	0.00029	U	0.0016	0.00029	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endrin aldehyde	0.00051	U	0.0016	0.00051	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Endrin ketone	0.00012	U	0.0016	0.00012	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Heptachlor	0.00030	U	0.0016	0.00030	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Heptachlor epoxide	0.00030	U	0.0016	0.00030	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Methoxychlor	0.00075	U	0.0016	0.00075	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
Toxaphene	0.028	U	0.095	0.028	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	80		26 - 129	01/16/23 09:27	01/18/23 15:42	1
Tetrachloro-m-xylene	46		31 - 122	01/16/23 09:27	01/18/23 15:42	1

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0071	U	0.016	0.0071	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1221	0.0076	U	0.016	0.0076	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1232	0.010	U	0.016	0.010	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1242	0.0078	U	0.016	0.0078	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1248	0.0031	U	0.016	0.0031	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1254	0.0020	U	0.016	0.0020	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1
PCB-1260	0.0055	U	0.016	0.0055	mg/Kg	☆	01/16/23 09:27	01/18/23 15:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	73		26 - 129	01/16/23 09:27	01/18/23 15:42	1
Tetrachloro-m-xylene	46		31 - 122	01/16/23 09:27	01/18/23 15:42	1

Method: SW846 8151A - Herbicides (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	0.0048	U	0.038	0.0048	mg/Kg	☆	01/18/23 11:35	01/22/23 16:45	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8151A - Herbicides (GC) (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-TP (Silvex)	0.0048	U	0.038	0.0048	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
2,4-D	0.0067	U	0.19	0.0067	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
2,4-DB	0.0077	U	0.014	0.0077	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
Dalapon	0.0058	U	0.019	0.0058	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
Dicamba	0.0058	U	0.058	0.0058	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
Dichlorprop	0.0048	U	0.12	0.0048	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
Dinoseb	0.0077	U	0.19	0.0077	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
MCPA	1.3	U	48	1.3	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
MCP	3.0	U	48	3.0	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1
Pentachlorophenol	0.0067	U	0.0096	0.0067	mg/Kg	✱	01/18/23 11:35	01/22/23 16:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	78		10 - 150	01/18/23 11:35	01/22/23 16:45	1

Method: FL-DEP FL-PRO - Florida - Petroleum Range Organics (GC)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Petroleum Hydrocarbons (C8-C40)	11	U	21	11	mg/Kg	✱	01/13/23 07:57	01/17/23 22:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-terphenyl (Surr)	89		66 - 136	01/13/23 07:57	01/17/23 22:15	1
C35 (Surr)	69		36 - 132	01/13/23 07:57	01/17/23 22:15	1

Method: EPA 537 IDA - EPA 537 Isotope Dilution

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11CI-PF3OUdS	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
4:2 Fluorotelomer sulfonic acid	0.00059	U	0.0020	0.00059	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
6:2 Fluorotelomer sulfonic acid	0.00059	U	0.0020	0.00059	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
8:2 Fluorotelomer sulfonic acid	0.00059	U	0.0030	0.00059	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
9CI-PF3ONS	0.00020	U	0.0020	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
DONA	0.00020	U	0.0030	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
HFPODA	0.00099	U	0.0020	0.00099	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
NEtFOSAA	0.00020	U	0.0020	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
NMeFOSAA	0.00020	U	0.0020	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
NMeFOSA	0.00049	U	0.0020	0.00049	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorobutanesulfonic acid	0.00039	U	0.0020	0.00039	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorobutanoic acid	0.00079	U	0.0020	0.00079	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorodecanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorodecanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorododecanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluoroheptanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluoroheptanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorohexanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorohexanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorononanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorononanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorooctanesulfonamide	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorooctanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorooctanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluoropentanesulfonic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluoropentanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: EPA 537 IDA - EPA 537 Isotope Dilution (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluorotridecanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Perfluoroundecanoic acid	0.00020	U	0.00059	0.00020	mg/Kg	✱	01/19/23 08:56	01/24/23 14:48	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
M2-4:2 FTS	125		10 - 200				01/19/23 08:56	01/24/23 14:48	1
M2-6:2 FTS	133		10 - 200				01/19/23 08:56	01/24/23 14:48	1
M2-8:2 FTS	136		15 - 200				01/19/23 08:56	01/24/23 14:48	1
13C2 PFTeDA	132		10 - 169				01/19/23 08:56	01/24/23 14:48	1
13C3 HFPO-DA	111		10 - 169				01/19/23 08:56	01/24/23 14:48	1
13C3 PFBS	141		27 - 179				01/19/23 08:56	01/24/23 14:48	1
13C4 PFBA	133		28 - 153				01/19/23 08:56	01/24/23 14:48	1
13C4 PFHpA	131		10 - 178				01/19/23 08:56	01/24/23 14:48	1
13C5 PFPeA	132		24 - 161				01/19/23 08:56	01/24/23 14:48	1
13C8 PFOA	129		26 - 159				01/19/23 08:56	01/24/23 14:48	1
13C8 PFOS	142		41 - 154				01/19/23 08:56	01/24/23 14:48	1
d3-NMeFOSAA	62		10 - 178				01/19/23 08:56	01/24/23 14:48	1
d5-NEtFOSAA	85		10 - 193				01/19/23 08:56	01/24/23 14:48	1
13C3 PFHxS	141		24 - 171				01/19/23 08:56	01/24/23 14:48	1
13C5 PFHxA	119		10 - 174				01/19/23 08:56	01/24/23 14:48	1
13C6 PFDA	123		26 - 161				01/19/23 08:56	01/24/23 14:48	1
13C7 PFUnA	130		12 - 173				01/19/23 08:56	01/24/23 14:48	1
d3-NMePFOSA	112		10 - 175				01/19/23 08:56	01/24/23 14:48	1
13C8 FOSA	112		14 - 163				01/19/23 08:56	01/24/23 14:48	1
13C2-PFDoDA	132		11 - 166				01/19/23 08:56	01/24/23 14:48	1
13C9 PFNA	129		26 - 165				01/19/23 08:56	01/24/23 14:48	1

Method: SW846 8290A - Dioxins and Furans (HRGC/HRMS)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.0000013	I V	0.0000050	0.0000000 22	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,4,6,7,8-HpCDF	0.00000091	I V	0.0000050	0.0000000 16	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,4,7,8-HxCDD	0.00000044	I J V	0.0000050	0.0000000 025	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,4,7,8-HxCDF	0.000000009	U	0.0000050	0.0000000 098	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,4,7,8,9-HpCDF	0.000000023	U	0.0000050	0.0000000 23	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,6,7,8-HxCDD	0.00000011	I J V	0.0000050	0.0000000 025	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,6,7,8-HxCDF	0.00000010	I J V	0.0000050	0.0000000 094	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,7,8-PeCDD	0.00000011	I J	0.0000050	0.0000000 14	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,7,8-PeCDF	0.00000011	I J V	0.0000050	0.0000000 074	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,7,8,9-HxCDD	0.00000017	I J V	0.0000050	0.0000000 024	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
1,2,3,7,8,9-HxCDF	0.000000085	I V	0.0000050	0.0000000 10	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
2,3,4,6,7,8-HxCDF	0.000000086	I J V	0.0000050	0.0000000 094	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Analyte	Result	Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
2,3,4,7,8-PeCDF	0.00000011	I V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				059					
2,3,7,8-TCDD	0.00000079	I J	0.0000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				055					
2,3,7,8-TCDF	0.000000004	U	0.0000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
	8			048					
OCDD	0.000013		0.000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				54					
OCDF	0.00000075	I V	0.000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				19					
Total HxCDD	0.00000032	I J V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				025					
Total HxCDF	0.00000027	I J V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				097					
Total HpCDD	0.0000013	I V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				22					
Total HpCDF	0.00000091	I V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				19					
Total PeCDD	0.00000011	I J	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				14					
Total PeCDF	0.00000022	I J V	0.0000050	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				066					
Total TCDD	0.00000079	I J	0.0000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
				055					
Total TCDF	0.000000004	U	0.0000010	0.0000000	mg/Kg	✱	01/20/23 16:40	01/24/23 00:12	1
	8			048					

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-OCDF	72		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-OCDD	67		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-2,3,7,8-TCDF	71		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-2,3,7,8-TCDD	65		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-2,3,4,7,8-PeCDF	71		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-2,3,4,6,7,8-HxCDF	79		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,7,8,9-HxCDF	78		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,7,8,9-HxCDD	74		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,7,8-PeCDF	69		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,7,8-PeCDD	65		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,6,7,8-HxCDF	78		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,6,7,8-HxCDD	73		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,4,7,8,9-HpCDF	72		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,4,7,8-HxCDF	78		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,4,7,8-HxCDD	74		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,4,6,7,8-HpCDF	76		40 - 135	01/20/23 16:40	01/24/23 00:12	1
13C-1,2,3,4,6,7,8-HpCDD	73		40 - 135	01/20/23 16:40	01/24/23 00:12	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.0		1.0	0.51	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5
Barium	3.9		2.0	1.0	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5
Cadmium	0.51	U	1.0	0.51	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5
Chromium	2.4		1.0	0.51	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5
Lead	4.3		1.0	0.51	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5
Selenium	1.0	U	2.0	1.0	mg/Kg	✱	01/11/23 10:52	01/11/23 19:24	5

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	0.25	U	0.51	0.25	mg/Kg	☆	01/11/23 10:52	01/11/23 19:24	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.020	U	0.041	0.020	mg/Kg	☆	01/11/23 08:31	01/11/23 14:52	1

General Chemistry

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (SW846 9012B)	0.13	U	0.25	0.13	mg/Kg	☆	01/16/23 13:41	01/20/23 21:10	1
Total Solids (SM 2540G)	99		0.025	0.025	%			01/11/23 10:07	1

Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		TOL (70-130)	BFB (70-130)	DBFM (70-130)
670-12724-1	Q6RS-FILLDIRT1-20230110	98	95	101
LCS 670-17984/4	Lab Control Sample	97	94	105
LCSD 670-17984/5	Lab Control Sample Dup	99	94	104
MB 670-17984/8	Method Blank	98	96	102

Surrogate Legend

TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8270D - Pesticides by GC/MS

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)				
Lab Sample ID	Client Sample ID	TPP (30-164)				
670-12724-1	Q6RS-FILLDIRT1-20230110	74				
762-588-A-3-A MS	Matrix Spike	103				
762-588-A-3-B MSD	Matrix Spike Duplicate	118				
LCS 400-609285/2-A	Lab Control Sample	110				
MB 400-609285/1-A	Method Blank	106				

Surrogate Legend

TPP = Triphenylphosphate

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)					
		PHL (29-130)	TPHL (24-146)	TBP (10-150)	FBP (27-127)	2FP (25-128)	NBZ (15-136)
400-231772-E-1-D MS	Matrix Spike	55	107	98	91	54	68
400-231772-E-1-E MSD	Matrix Spike Duplicate	48	93	76	75	46	61
670-12724-1	Q6RS-FILLDIRT1-20230110	54	99	74	82	56	62
LCS 400-608596/2-A	Lab Control Sample	96	116	102	89	94	92
MB 400-608596/1-A	Method Blank	54	101	59	85	61	55

Surrogate Legend

PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		2MN (50-150)	FLN10 (50-150)
660-126256-A-13-A MS	Matrix Spike	764 J1	2483 J1

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Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	2MN (50-150)	FLN10 (50-150)
660-126256-A-13-B MSD	Matrix Spike Duplicate	1621 J1	2472 J1
670-12724-1	Q6RS-FILLDIRT1-20230110	86	109
LCS 670-18478/2-A	Lab Control Sample	67	107
MB 670-18478/1-A	Method Blank	77	111
Surrogate Legend			
2MN = 2-methylnaphthalene-d10			
FLN10 = Fluoranthene-d10 (Surr)			

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	DCBP1 (26-129)	TCX1 (31-122)
670-12724-1	Q6RS-FILLDIRT1-20230110	80	46
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	142 J1	73
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	115	59
LCS 400-608618/2-A	Lab Control Sample	121	60
MB 400-608618/1-A	Method Blank	115	57
Surrogate Legend			
DCBP = DCB Decachlorobiphenyl			
TCX = Tetrachloro-m-xylene			

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	DCBP1 (26-129)	TCX1 (31-122)
670-12724-1	Q6RS-FILLDIRT1-20230110	73	46
LCS 400-608618/16-A	Lab Control Sample	78	42
LCSD 400-608618/17-A	Lab Control Sample Dup	74	41
MB 400-608618/1-A	Method Blank	110	57
Surrogate Legend			
DCBP = DCB Decachlorobiphenyl			
TCX = Tetrachloro-m-xylene			

Method: 8151A - Herbicides (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	DCPAA2 (10-150)	
670-12724-1	Q6RS-FILLDIRT1-20230110	78	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	77	
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	79	
LCS 400-608953/2-A	Lab Control Sample	83	
MB 400-608953/1-A	Method Blank	88	
Surrogate Legend			

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Surrogate Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill
DCPAA = 2,4-Dichlorophenylacetic acid

Job ID: 670-12724-1

Method: FL-PRO - Florida - Petroleum Range Organics (GC)
Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	OTP	C-35
		(66-136)	(36-132)
670-12724-1	Q6RS-FILLDIRT1-20230110	89	69
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	92	84
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	125	110
LCS 670-18266/2-A	Lab Control Sample	111	107
MB 670-18266/1-A	Method Blank	92	105
Surrogate Legend			
OTP = o- terphenyl (Surr)			
C-35 = C35 (Surr)			

Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 537 IDA - EPA 537 Isotope Dilution

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	M242FTS (10-200)	M262FTS (10-200)	M282FTS (15-200)	PFTDA (10-169)	HFPODA (10-169)	C3PFBS (27-179)	PFBA (28-153)	C4PFHA (10-178)
670-12724-1	Q6RS-FILLDIRT1-20230110	125	133	136	132	111	141	133	131
LCS 410-336883/2-B	Lab Control Sample	106	120	131	130	99	125	116	110
MB 410-336883/1-B	Method Blank	116	125	145	132	99	129	114	115

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFPeA (24-161)	C8PFOA (26-159)	C8PFOS (41-154)	d3NMFOS (10-178)	d5NEFOS (10-193)	C3PFHS (24-171)	13C5PHA (10-174)	C6PFDA (26-161)
670-12724-1	Q6RS-FILLDIRT1-20230110	132	129	142	62	85	141	119	123
LCS 410-336883/2-B	Lab Control Sample	115	122	128	115	125	127	107	117
MB 410-336883/1-B	Method Blank	113	115	137	110	118	138	107	120

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	13C7PUA (12-173)	d3NMFSA (10-175)	PFOSA (14-163)	PFDODA (11-166)	C9PFNA (26-165)			
670-12724-1	Q6RS-FILLDIRT1-20230110	130	112	112	132	129			
LCS 410-336883/2-B	Lab Control Sample	129	98	104	133	118			
MB 410-336883/1-B	Method Blank	126	108	113	124	117			

Surrogate Legend

M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
PFTDA = 13C2 PFTeDA
HFPODA = 13C3 HFPO-DA
C3PFBS = 13C3 PFBS
PFBA = 13C4 PFBA
C4PFHA = 13C4 PFHpA
PFPeA = 13C5 PFPeA
C8PFOA = 13C8 PFOA
C8PFOS = 13C8 PFOS
d3NMFOS = d3-NMeFOSAA
d5NEFOS = d5-NEtFOSAA
C3PFHS = 13C3 PFHxS
13C5PHA = 13C5 PFHxA
C6PFDA = 13C6 PFDA
13C7PUA = 13C7 PFUnA
d3NMFSA = d3-NMePFOSA
PFOSA = 13C8 FOSA
PFDODA = 13C2-PFDODA
C9PFNA = 13C9 PFNA

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OCDF (40-135)	OCDD (40-135)	TCDF (40-135)	TCDD (40-135)	PeCF (40-135)	13CHxCF (40-135)	HxCF (40-135)	13CHxCD (40-135)
670-12724-1	Q6RS-FILLDIRT1-20230110	72	67	71	65	71	79	78	74
LCS 410-337449/2-A	Lab Control Sample	55	52	62	59	61	63	65	60
MB 410-337449/1-A	Method Blank	45	44	58	54	53	56	57	51

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Isotope Dilution Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Matrix: Solid

Prep Type: Total/NA

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PeCDF (40-135)	PeCDD (40-135)	HxDF (40-135)	HxDD (40-135)	HpCDF2 (40-135)	HxCDF (40-135)	HxCDD (40-135)	HpCDF (40-135)
670-12724-1	Q6RS-FILLDIRT1-20230110	69	65	78	73	72	78	74	76
LCS 410-337449/2-A	Lab Control Sample	59	55	65	59	59	64	62	58
MB 410-337449/1-A	Method Blank	53	47	57	53	51	57	53	51

Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	HpCDD (40-135)
670-12724-1	Q6RS-FILLDIRT1-20230110	73
LCS 410-337449/2-A	Lab Control Sample	58
MB 410-337449/1-A	Method Blank	49

Surrogate Legend

OCDF = 13C-OCDF
OCDD = 13C-OCDD
TCDF = 13C-2,3,7,8-TCDF
TCDD = 13C-2,3,7,8-TCDD
PeCF = 13C-2,3,4,7,8-PeCDF
13CHxCF = 13C-2,3,4,6,7,8-HxCDF
HxCF = 13C-1,2,3,7,8,9-HxCDF
13CHxCD = 13C-1,2,3,7,8,9-HxCDD
PeCDF = 13C-1,2,3,7,8-PeCDF
PeCDD = 13C-1,2,3,7,8-PeCDD
HxDF = 13C-1,2,3,6,7,8-HxCDF
HxDD = 13C-1,2,3,6,7,8-HxCDD
HpCDF2 = 13C-1,2,3,4,7,8,9-HpCDF
HxCDF = 13C-1,2,3,4,7,8-HxCDF
HxCDD = 13C-1,2,3,4,7,8-HxCDD
HpCDF = 13C-1,2,3,4,6,7,8-HpCDF
HpCDD = 13C-1,2,3,4,6,7,8-HpCDD

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 670-17984/8

Matrix: Solid

Analysis Batch: 17984

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,1-Trichloroethane	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
1,1,2,2-Tetrachloroethane	0.00060	U	0.012	0.00060	mg/Kg			01/12/23 10:00	1
1,1,2-Trichloroethane	0.00069	U	0.012	0.00069	mg/Kg			01/12/23 10:00	1
1,1-Dichloroethane	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
1,1-Dichloroethene	0.00062	U	0.012	0.00062	mg/Kg			01/12/23 10:00	1
1,2-Dichloroethane	0.00053	U	0.060	0.00053	mg/Kg			01/12/23 10:00	1
1,2-Dichloropropane	0.00059	U	0.012	0.00059	mg/Kg			01/12/23 10:00	1
2-Butanone (MEK)	0.0044	U	0.10	0.0044	mg/Kg			01/12/23 10:00	1
2-Hexanone	0.0034	U	0.10	0.0034	mg/Kg			01/12/23 10:00	1
4-Methyl-2-pentanone	0.0036	U	0.10	0.0036	mg/Kg			01/12/23 10:00	1
Acetone	0.025	U	0.10	0.025	mg/Kg			01/12/23 10:00	1
Benzene	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
Bromodichloromethane	0.00063	U	0.012	0.00063	mg/Kg			01/12/23 10:00	1
Bromoform	0.00078	U	0.012	0.00078	mg/Kg			01/12/23 10:00	1
Bromomethane	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
Carbon disulfide	0.0025	U	0.012	0.0025	mg/Kg			01/12/23 10:00	1
Carbon tetrachloride	0.00060	U	0.012	0.00060	mg/Kg			01/12/23 10:00	1
Chlorobenzene	0.00053	U	0.012	0.00053	mg/Kg			01/12/23 10:00	1
Chloroethane	0.00067	U	0.012	0.00067	mg/Kg			01/12/23 10:00	1
Chloroform	0.00061	U	0.012	0.00061	mg/Kg			01/12/23 10:00	1
Chloromethane	0.00065	U	0.012	0.00065	mg/Kg			01/12/23 10:00	1
cis-1,2-Dichloroethene	0.00064	U	0.012	0.00064	mg/Kg			01/12/23 10:00	1
cis-1,3-Dichloropropene	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
Dibromochloromethane	0.00072	U	0.012	0.00072	mg/Kg			01/12/23 10:00	1
Ethylbenzene	0.00058	U	0.012	0.00058	mg/Kg			01/12/23 10:00	1
Methylene Chloride	0.0065	U	0.070	0.0065	mg/Kg			01/12/23 10:00	1
Styrene	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
Tetrachloroethene	0.00067	U	0.012	0.00067	mg/Kg			01/12/23 10:00	1
Toluene	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
trans-1,2-Dichloroethene	0.00069	U	0.012	0.00069	mg/Kg			01/12/23 10:00	1
trans-1,3-Dichloropropene	0.00050	U	0.012	0.00050	mg/Kg			01/12/23 10:00	1
Trichloroethene	0.00060	U	0.012	0.00060	mg/Kg			01/12/23 10:00	1
Vinyl chloride	0.00044	U	0.012	0.00044	mg/Kg			01/12/23 10:00	1
Xylenes, Total	0.0011	U	0.020	0.0011	mg/Kg			01/12/23 10:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8 (Surr)	98		70 - 130		01/12/23 10:00	1
4-Bromofluorobenzene (Surr)	96		70 - 130		01/12/23 10:00	1
Dibromofluoromethane (Surr)	102		70 - 130		01/12/23 10:00	1

Lab Sample ID: LCS 670-17984/4

Matrix: Solid

Analysis Batch: 17984

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1,1-Trichloroethane	0.0500	0.0344		mg/Kg		69	45 - 157
1,1,2,2-Tetrachloroethane	0.0500	0.0328		mg/Kg		66	47 - 151
1,1,2-Trichloroethane	0.0500	0.0362		mg/Kg		72	49 - 148

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 670-17984/4

Matrix: Solid

Analysis Batch: 17984

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethane	0.0500	0.0300		mg/Kg		60	52 - 148
1,1-Dichloroethene	0.0500	0.0299		mg/Kg		60	22 - 166
1,2-Dichloroethane	0.0500	0.0374	I	mg/Kg		75	39 - 162
1,2-Dichloropropane	0.0500	0.0324		mg/Kg		65	52 - 139
2-Butanone (MEK)	0.500	0.406		mg/Kg		81	10 - 180
2-Hexanone	0.500	0.374		mg/Kg		75	43 - 177
4-Methyl-2-pentanone	0.500	0.366		mg/Kg		73	31 - 174
Acetone	0.500	0.297		mg/Kg		59	21 - 180
Benzene	0.0500	0.0340		mg/Kg		68	49 - 152
Bromodichloromethane	0.0500	0.0354		mg/Kg		71	45 - 146
Bromoform	0.0500	0.0373		mg/Kg		75	40 - 155
Bromomethane	0.0500	0.0383		mg/Kg		77	10 - 180
Carbon disulfide	0.0500	0.0272		mg/Kg		54	19 - 177
Carbon tetrachloride	0.0500	0.0318		mg/Kg		64	43 - 163
Chlorobenzene	0.0500	0.0340		mg/Kg		68	45 - 147
Chloroethane	0.0500	0.0336		mg/Kg		67	10 - 180
Chloroform	0.0500	0.0361		mg/Kg		72	48 - 148
Chloromethane	0.0500	0.0334		mg/Kg		67	38 - 160
cis-1,2-Dichloroethene	0.0500	0.0328		mg/Kg		66	48 - 137
cis-1,3-Dichloropropene	0.0500	0.0317		mg/Kg		63	54 - 140
Dibromochloromethane	0.0500	0.0358		mg/Kg		72	44 - 149
Ethylbenzene	0.0500	0.0323		mg/Kg		65	54 - 139
Methylene Chloride	0.0500	0.0460	I	mg/Kg		92	28 - 152
Styrene	0.0500	0.0335		mg/Kg		67	55 - 139
Tetrachloroethene	0.0500	0.0306		mg/Kg		61	46 - 163
Toluene	0.0500	0.0325		mg/Kg		65	55 - 136
trans-1,2-Dichloroethene	0.0500	0.0289		mg/Kg		58	50 - 138
trans-1,3-Dichloropropene	0.0500	0.0346		mg/Kg		69	52 - 155
Trichloroethene	0.0500	0.0316		mg/Kg		63	51 - 147
Vinyl chloride	0.0500	0.0332		mg/Kg		66	29 - 158
Xylenes, Total	0.100	0.0668		mg/Kg		67	50 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Toluene-d8 (Surr)	97		70 - 130
4-Bromofluorobenzene (Surr)	94		70 - 130
Dibromofluoromethane (Surr)	105		70 - 130

Lab Sample ID: LCSD 670-17984/5

Matrix: Solid

Analysis Batch: 17984

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,1,1-Trichloroethane	0.0500	0.0336		mg/Kg		67	45 - 157	2	27
1,1,1,2-Tetrachloroethane	0.0500	0.0340		mg/Kg		68	47 - 151	4	27
1,1,2-Trichloroethane	0.0500	0.0375		mg/Kg		75	49 - 148	3	28
1,1-Dichloroethane	0.0500	0.0299		mg/Kg		60	52 - 148	0	37
1,1-Dichloroethene	0.0500	0.0290		mg/Kg		58	22 - 166	3	23
1,2-Dichloroethane	0.0500	0.0379	I	mg/Kg		76	39 - 162	1	20

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 670-17984/5

Matrix: Solid

Analysis Batch: 17984

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2-Dichloropropane	0.0500	0.0312		mg/Kg		62	52 - 139	4	27
2-Butanone (MEK)	0.500	0.408		mg/Kg		82	10 - 180	1	35
2-Hexanone	0.500	0.374		mg/Kg		75	43 - 177	0	31
4-Methyl-2-pentanone	0.500	0.378		mg/Kg		76	31 - 174	3	33
Acetone	0.500	0.300		mg/Kg		60	21 - 180	1	50
Benzene	0.0500	0.0338		mg/Kg		68	49 - 152	1	19
Bromodichloromethane	0.0500	0.0349		mg/Kg		70	45 - 146	1	21
Bromoform	0.0500	0.0376		mg/Kg		75	40 - 155	1	27
Bromomethane	0.0500	0.0407		mg/Kg		81	10 - 180	6	34
Carbon disulfide	0.0500	0.0258		mg/Kg		52	19 - 177	5	43
Carbon tetrachloride	0.0500	0.0304		mg/Kg		61	43 - 163	5	20
Chlorobenzene	0.0500	0.0330		mg/Kg		66	45 - 147	3	18
Chloroethane	0.0500	0.0329		mg/Kg		66	10 - 180	2	49
Chloroform	0.0500	0.0366		mg/Kg		73	48 - 148	1	29
Chloromethane	0.0500	0.0319		mg/Kg		64	38 - 160	5	30
cis-1,2-Dichloroethene	0.0500	0.0323		mg/Kg		65	48 - 137	2	20
cis-1,3-Dichloropropene	0.0500	0.0322		mg/Kg		64	54 - 140	1	27
Dibromochloromethane	0.0500	0.0360		mg/Kg		72	44 - 149	1	25
Ethylbenzene	0.0500	0.0321		mg/Kg		64	54 - 139	0	33
Methylene Chloride	0.0500	0.0460		mg/Kg		92	28 - 152	0	50
Styrene	0.0500	0.0332		mg/Kg		66	55 - 139	1	31
Tetrachloroethene	0.0500	0.0301		mg/Kg		60	46 - 163	2	26
Toluene	0.0500	0.0324		mg/Kg		65	55 - 136	0	21
trans-1,2-Dichloroethene	0.0500	0.0281		mg/Kg		56	50 - 138	3	29
trans-1,3-Dichloropropene	0.0500	0.0347		mg/Kg		69	52 - 155	0	21
Trichloroethene	0.0500	0.0325		mg/Kg		65	51 - 147	3	26
Vinyl chloride	0.0500	0.0319		mg/Kg		64	29 - 158	4	23
Xylenes, Total	0.100	0.0657		mg/Kg		66	50 - 150	2	30

Surrogate	LCSD %Recovery	LCSD Qualifier	LCSD Limits
Toluene-d8 (Surr)	99		70 - 130
4-Bromofluorobenzene (Surr)	94		70 - 130
Dibromofluoromethane (Surr)	104		70 - 130

Method: 8270D - Pesticides by GC/MS

Lab Sample ID: MB 400-609285/1-A

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 609285

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bolstar	0.015	U	0.066	0.015	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Chlorpyrifos	0.0075	U	0.066	0.0075	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Azinphos-methyl	0.0087	U	0.13	0.0087	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Coumaphos	0.013	U	0.66	0.013	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Diazinon	0.015	U	0.13	0.015	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Dichlorvos	0.0090	U	0.13	0.0090	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Disulfoton	0.0067	U	0.13	0.0067	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Ethoprop	0.011	U	0.066	0.011	mg/Kg		01/20/23 11:33	01/23/23 17:45	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270D - Pesticides by GC/MS (Continued)

Lab Sample ID: MB 400-609285/1-A

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 609285

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fensulfothion	0.011	U	0.66	0.011	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Fenthion	0.017	U	0.066	0.017	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Methyl parathion	0.0076	U	0.066	0.0076	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Mevinphos	0.013	U	0.13	0.013	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Phorate	0.018	U	0.066	0.018	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Ronnel	0.0074	U	0.066	0.0074	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Stirophos	0.018	U	0.066	0.018	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Tokuthion	0.021	U	0.066	0.021	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Trichloronate	0.0067	U	0.66	0.0067	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Dimethoate	0.0082	U	0.13	0.0082	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
EPN	0.0081	U	0.13	0.0081	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Ethyl Parathion	0.0084	U	0.066	0.0084	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Naled	0.0092	U	0.66	0.0092	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Malathion	0.0067	U	0.066	0.0067	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Sulfotepp	0.0066	U	0.066	0.0066	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Monochrotophos	0.0097	U	0.66	0.0097	mg/Kg		01/20/23 11:33	01/23/23 17:45	1
Pyrophosphoric acid, tetraethyl ester	0.033	U	0.066	0.033	mg/Kg		01/20/23 11:33	01/23/23 17:45	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Triphenylphosphate	106		30 - 164	01/20/23 11:33	01/23/23 17:45	1

Lab Sample ID: LCS 400-609285/2-A

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 609285

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Bolstar	0.667	0.651		mg/Kg		98	36 - 121
Chlorpyrifos	0.667	0.628		mg/Kg		94	50 - 118
Azinphos-methyl	0.667	0.670		mg/Kg		101	41 - 125
Coumaphos	0.667	0.655	I	mg/Kg		98	39 - 138
Diazinon	0.667	0.606		mg/Kg		91	48 - 114
Dichlorvos	0.667	0.590		mg/Kg		89	31 - 133
Disulfoton	0.667	0.581		mg/Kg		87	18 - 124
Ethoprop	0.667	0.620		mg/Kg		93	50 - 118
Fensulfothion	0.667	0.657	I	mg/Kg		99	45 - 150
Fenthion	0.667	0.620		mg/Kg		93	48 - 120
Methyl parathion	0.667	0.666		mg/Kg		100	42 - 149
Mevinphos	0.667	0.624		mg/Kg		94	42 - 116
Phorate	0.667	0.547		mg/Kg		82	31 - 124
Ronnel	0.667	0.606		mg/Kg		91	48 - 121
Stirophos	0.667	0.601		mg/Kg		90	43 - 126
Tokuthion	0.667	0.574		mg/Kg		86	10 - 150
Trichloronate	0.667	0.568	I	mg/Kg		85	39 - 119
Dimethoate	0.667	0.597		mg/Kg		90	13 - 150
EPN	0.667	0.762		mg/Kg		114	44 - 149
Ethyl Parathion	0.667	0.718		mg/Kg		108	50 - 145
Naled	0.667	0.570	I	mg/Kg		86	10 - 120
Malathion	0.667	0.638		mg/Kg		96	47 - 124

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270D - Pesticides by GC/MS (Continued)

Lab Sample ID: LCS 400-609285/2-A

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 609285

Rep Data: 00000									
Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfotepp			0.667	0.747		mg/Kg		112	42 - 132
Monochrotophos			0.667	0.641	I	mg/Kg		96	10 - 150
Pyrophosphoric acid, tetraethyl ester			0.667	0.348		mg/Kg		52	10 - 130
Rep Data: 00010									
Surrogate			LCS %Recovery	LCS Qualifier		Limits			
Triphenylphosphate			110			30 - 164			

Lab Sample ID: 762-588-A-3-A MS

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 609285

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec		
	Result	Qualifier	Added	Result	Qualifier				Limits		
Bolstar	0.031	U	0.684	0.677		mg/Kg	☼	99	40 - 156		
Chlorpyrifos	0.015	U	0.684	0.644		mg/Kg	☼	94	22 - 130		
Azinphos-methyl	0.018	U	0.684	0.751		mg/Kg	☼	110	16 - 130		
Coumaphos	0.027	U	0.684	0.745	I	mg/Kg	☼	109	51 - 147		
Diazinon	0.031	U	0.684	0.663		mg/Kg	☼	97	41 - 130		
Dichlorvos	0.018	U	0.684	0.650		mg/Kg	☼	95	10 - 130		
Disulfoton	0.014	U	0.684	0.619		mg/Kg	☼	91	10 - 134		
Ethoprop	0.022	U	0.684	0.655		mg/Kg	☼	96	30 - 130		
Fensulfothion	0.022	U	0.684	0.768	I	mg/Kg	☼	112	43 - 145		
Fenthion	0.035	U	0.684	0.658		mg/Kg	☼	96	10 - 128		
Methyl parathion	0.016	U	0.684	0.775		mg/Kg	☼	113	36 - 149		
Mevinphos	0.027	U	0.684	0.674		mg/Kg	☼	99	30 - 130		
Phorate	0.037	U	0.684	0.597		mg/Kg	☼	87	36 - 130		
Ronnel	0.015	U	0.684	0.658		mg/Kg	☼	96	30 - 130		
Stirophos	0.037	U	0.684	0.626		mg/Kg	☼	92	36 - 126		
Tokuthion	0.043	U	0.684	0.633		mg/Kg	☼	93	14 - 130		
Trichloronate	0.014	U	0.684	0.628	I	mg/Kg	☼	92	50 - 150		
Dimethoate	0.017	U	0.684	0.638		mg/Kg	☼	93	38 - 130		
EPN	0.017	U J3	0.684	0.885	J3	mg/Kg	☼	130	48 - 124		
Ethyl Parathion	0.017	U	0.684	0.820		mg/Kg	☼	120	24 - 151		
Naled	0.019	U	0.684	0.651	I	mg/Kg	☼	95	54 - 130		
Malathion	0.014	U	0.684	0.668		mg/Kg	☼	98	10 - 141		
Sulfotepp	0.013	U	0.684	0.787		mg/Kg	☼	115	13 - 171		
Monochrotophos	0.020	U	0.684	0.708	I	mg/Kg	☼	103	40 - 140		
Pyrophosphoric acid, tetraethyl ester	0.067	U	0.684	0.522		mg/Kg	☼	76			

Lab Sample ID: 762-588-A-3-B MSD

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 609285

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Bolstar	0.031	U	0.679	0.694		mg/Kg	✱	102	40 - 156	3	40

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270D - Pesticides by GC/MS (Continued)

Lab Sample ID: 762-588-A-3-B MSD

Matrix: Solid

Analysis Batch: 609569

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 609285

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chlorpyrifos	0.015	U	0.679	0.676		mg/Kg	✱	100	22 - 130	5	40
Azinphos-methyl	0.018	U	0.679	0.788		mg/Kg	✱	116	16 - 130	5	50
Coumaphos	0.027	U	0.679	0.685	I	mg/Kg	✱	101	51 - 147	8	40
Diazinon	0.031	U	0.679	0.692		mg/Kg	✱	102	41 - 130	4	30
Dichlorvos	0.018	U	0.679	0.691		mg/Kg	✱	102	10 - 130	6	40
Disulfoton	0.014	U	0.679	0.651		mg/Kg	✱	96	10 - 134	5	93
Ethoprop	0.022	U	0.679	0.700		mg/Kg	✱	103	30 - 130	7	40
Fensulfothion	0.022	U	0.679	0.902	I	mg/Kg	✱	133	43 - 145	16	40
Fenthion	0.035	U	0.679	0.680		mg/Kg	✱	100	10 - 128	3	60
Methyl parathion	0.016	U	0.679	0.852		mg/Kg	✱	126	36 - 149	10	40
Mevinphos	0.027	U	0.679	0.727		mg/Kg	✱	107	30 - 130	8	40
Phorate	0.037	U	0.679	0.625		mg/Kg	✱	92	36 - 130	5	40
Ronnel	0.015	U	0.679	0.675		mg/Kg	✱	99	30 - 130	3	40
Stirophos	0.037	U	0.679	0.698		mg/Kg	✱	103	36 - 126	11	40
Tokuthion	0.043	U	0.679	0.594		mg/Kg	✱	87	14 - 130	6	40
Trichloronate	0.014	U	0.679	0.643	I	mg/Kg	✱	95	50 - 150	2	40
Dimethoate	0.017	U	0.679	0.708		mg/Kg	✱	104	38 - 130	10	40
EPN	0.017	U J3	0.679	0.979	J3	mg/Kg	✱	144	48 - 124	10	30
Ethyl Parathion	0.017	U	0.679	0.870		mg/Kg	✱	128	24 - 151	6	79
Naled	0.019	U	0.679	0.648	I	mg/Kg	✱	95	54 - 130	0	40
Malathion	0.014	U	0.679	0.727		mg/Kg	✱	107	10 - 141	8	40
Sulfotepp	0.013	U	0.679	0.792		mg/Kg	✱	117	13 - 171	1	65
Monochrotophos	0.020	U	0.679	0.786	I	mg/Kg	✱	116	40 - 140	11	50
Pyrophosphoric acid, tetraethyl ester	0.067	U	0.679	0.607		mg/Kg	✱	89		15	

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Triphenylphosphate	118		30 - 164

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 400-608596/1-A

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608596

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trichlorobenzene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
1,2-Dichlorobenzene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
1,3-Dichlorobenzene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
1,4-Dichlorobenzene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4,5-Trichlorophenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4,6-Trichlorophenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4-Dichlorophenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4-Dimethylphenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4-Dinitrophenol	0.29	U	0.99	0.29	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,4-Dinitrotoluene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2,6-Dinitrotoluene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2-Chloronaphthalene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2-Chlorophenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 400-608596/1-A

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608596

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2-Methylphenol	0.080	U	0.33	0.080	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2-Nitroaniline	0.070	U	0.33	0.070	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
2-Nitrophenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
3,3'-Dichlorobenzidine	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
3 & 4 Methylphenol	0.033	U	0.66	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
3-Nitroaniline	0.078	U	0.33	0.078	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4,6-Dinitro-2-methylphenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Bromophenyl phenyl ether	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Chloro-3-methylphenol	0.081	U	0.33	0.081	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Chlorophenyl phenyl ether	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Chloroaniline	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Nitroaniline	0.11	U	0.33	0.11	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
4-Nitrophenol	0.11	U	0.33	0.11	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Benzoic acid	0.35	U	0.99	0.35	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Benzyl alcohol	0.11	U	0.33	0.11	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Butyl benzyl phthalate	0.071	U	0.33	0.071	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Bis(2-chloroethoxy)methane	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Bis(2-chloroethyl)ether	0.092	U	0.33	0.092	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Bis(2-ethylhexyl) phthalate	0.081	U	0.33	0.081	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
bis (2-chloroisopropyl) ether	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Carbazole	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Dibenzofuran	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Diethyl phthalate	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Dimethyl phthalate	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Di-n-butyl phthalate	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Di-n-octyl phthalate	0.12	U	0.33	0.12	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Hexachlorobenzene	0.10	U	0.33	0.10	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Hexachlorobutadiene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Hexachlorocyclopentadiene	0.066	U	0.33	0.066	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Hexachloroethane	0.031	U	0.33	0.031	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Isophorone	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Nitrobenzene	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
N-Nitrosodi-n-propylamine	0.038	U	0.33	0.038	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
N-Nitrosodiphenylamine	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1
Phenol	0.033	U	0.33	0.033	mg/Kg		01/16/23 08:32	01/18/23 16:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Phenol-d5 (Surr)	54		29 - 130	01/16/23 08:32	01/18/23 16:47	1
Terphenyl-d14 (Surr)	101		24 - 146	01/16/23 08:32	01/18/23 16:47	1
2,4,6-Tribromophenol (Surr)	59		10 - 150	01/16/23 08:32	01/18/23 16:47	1
2-Fluorobiphenyl	85		27 - 127	01/16/23 08:32	01/18/23 16:47	1
2-Fluorophenol (Surr)	61		25 - 128	01/16/23 08:32	01/18/23 16:47	1
Nitrobenzene-d5 (Surr)	55		15 - 136	01/16/23 08:32	01/18/23 16:47	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 400-608596/2-A

Matrix: Solid

Analysis Batch: 609136

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608596

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2,4-Trichlorobenzene	2.00	1.56		mg/Kg		78	48 - 120
1,2-Dichlorobenzene	2.00	1.66		mg/Kg		83	49 - 120
1,3-Dichlorobenzene	2.00	1.56		mg/Kg		78	48 - 120
1,4-Dichlorobenzene	2.00	1.57		mg/Kg		78	49 - 120
2,4,5-Trichlorophenol	2.00	2.03		mg/Kg		101	53 - 133
2,4,6-Trichlorophenol	2.00	1.98		mg/Kg		99	51 - 125
2,4-Dichlorophenol	2.00	1.83		mg/Kg		92	56 - 120
2,4-Dimethylphenol	2.00	1.72		mg/Kg		86	54 - 120
2,4-Dinitrophenol	4.00	2.94		mg/Kg		74	10 - 138
2,4-Dinitrotoluene	2.00	2.22		mg/Kg		111	59 - 133
2,6-Dinitrotoluene	2.00	2.00		mg/Kg		100	57 - 123
2-Chloronaphthalene	2.00	1.79		mg/Kg		89	55 - 120
2-Chlorophenol	2.00	1.75		mg/Kg		87	52 - 120
2-Methylphenol	2.00	1.83		mg/Kg		91	51 - 123
2-Nitroaniline	2.00	1.98		mg/Kg		99	55 - 129
2-Nitrophenol	2.00	1.66		mg/Kg		83	53 - 120
3,3'-Dichlorobenzidine	2.67	4.09	J3	mg/Kg		153	42 - 120
3 & 4 Methylphenol	2.00	1.81		mg/Kg		90	47 - 123
3-Nitroaniline	2.00	1.92		mg/Kg		96	45 - 120
4,6-Dinitro-2-methylphenol	4.00	2.83		mg/Kg		71	35 - 135
4-Bromophenyl phenyl ether	2.00	1.83		mg/Kg		91	51 - 120
4-Chloro-3-methylphenol	2.00	1.99		mg/Kg		99	57 - 124
4-Chlorophenyl phenyl ether	2.00	1.97		mg/Kg		99	56 - 120
4-Chloroaniline	2.00	1.59		mg/Kg		79	34 - 120
4-Nitroaniline	2.00	1.82		mg/Kg		91	52 - 126
4-Nitrophenol	4.00	3.75		mg/Kg		94	38 - 133
Benzoic acid	9.23	6.03		mg/Kg		65	10 - 139
Benzyl alcohol	2.00	1.78		mg/Kg		89	10 - 127
Butyl benzyl phthalate	2.00	2.29		mg/Kg		114	58 - 126
Bis(2-chloroethoxy)methane	2.00	1.56		mg/Kg		78	52 - 120
Bis(2-chloroethyl)ether	2.00	1.53		mg/Kg		77	28 - 120
Bis(2-ethylhexyl) phthalate	2.00	2.07		mg/Kg		103	58 - 158
bis (2-chloroisopropyl) ether	2.00	1.60		mg/Kg		80	34 - 120
Carbazole	2.00	2.06		mg/Kg		103	61 - 132
Dibenzofuran	2.00	1.94		mg/Kg		97	58 - 120
Diethyl phthalate	2.00	1.95		mg/Kg		97	56 - 128
Dimethyl phthalate	2.00	1.85		mg/Kg		93	58 - 120
Di-n-butyl phthalate	2.00	2.03		mg/Kg		101	64 - 122
Di-n-octyl phthalate	2.00	2.02		mg/Kg		101	57 - 137
Hexachlorobenzene	2.00	1.91		mg/Kg		96	49 - 127
Hexachlorobutadiene	2.00	1.63		mg/Kg		82	43 - 120
Hexachlorocyclopentadiene	2.00	1.74		mg/Kg		87	10 - 140
Hexachloroethane	2.00	1.65		mg/Kg		82	45 - 120
Isophorone	2.00	1.63		mg/Kg		81	50 - 120
Nitrobenzene	2.00	1.59		mg/Kg		79	50 - 120
N-Nitrosodi-n-propylamine	2.00	1.71		mg/Kg		86	48 - 120
N-Nitrosodiphenylamine	1.98	1.75		mg/Kg		88	54 - 120
Phenol	2.00	1.75		mg/Kg		88	51 - 120

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 400-608596/2-A

Matrix: Solid

Analysis Batch: 609136

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608596

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Phenol-d5 (Surr)	96		29 - 130
Terphenyl-d14 (Surr)	116		24 - 146
2,4,6-Tribromophenol (Surr)	102		10 - 150
2-Fluorobiphenyl	89		27 - 127
2-Fluorophenol (Surr)	94		25 - 128
Nitrobenzene-d5 (Surr)	92		15 - 136

Lab Sample ID: 400-231772-E-1-D MS

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 608596

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
1,2,4-Trichlorobenzene	0.079	U	2.44	1.65		mg/Kg	☼	68	40 - 140
1,2-Dichlorobenzene	0.079	U	2.44	1.49		mg/Kg	☼	61	40 - 140
1,3-Dichlorobenzene	0.079	U	2.44	1.45		mg/Kg	☼	59	40 - 140
1,4-Dichlorobenzene	0.079	U	2.44	1.52		mg/Kg	☼	62	40 - 140
2,4,5-Trichlorophenol	0.079	U	2.44	2.07		mg/Kg	☼	85	40 - 140
2,4,6-Trichlorophenol	0.079	U	2.44	1.91		mg/Kg	☼	78	40 - 140
2,4-Dichlorophenol	0.079	U	2.44	1.77		mg/Kg	☼	73	40 - 140
2,4-Dimethylphenol	0.079	U	2.44	1.44		mg/Kg	☼	59	40 - 140
2,4-Dinitrophenol	0.69	U J3	4.87	1.59	I J3	mg/Kg	☼	33	40 - 140
2,4-Dinitrotoluene	0.079	U	2.44	2.07		mg/Kg	☼	85	40 - 140
2,6-Dinitrotoluene	0.079	U	2.44	1.83		mg/Kg	☼	75	40 - 140
2-Chloronaphthalene	0.079	U	2.44	1.85		mg/Kg	☼	76	40 - 140
2-Chlorophenol	0.079	U	2.44	1.47		mg/Kg	☼	60	40 - 140
2-Methylphenol	0.19	U	2.44	1.49		mg/Kg	☼	61	40 - 140
2-Nitroaniline	0.17	U	2.44	1.55		mg/Kg	☼	63	40 - 140
2-Nitrophenol	0.079	U	2.44	1.59		mg/Kg	☼	65	40 - 140
3,3'-Dichlorobenzidine	0.079	U J3	3.25	4.01		mg/Kg	☼	123	40 - 140
3 & 4 Methylphenol	0.079	U	2.44	1.47	I	mg/Kg	☼	60	40 - 140
3-Nitroaniline	0.19	U	2.44	1.44		mg/Kg	☼	59	40 - 140
4,6-Dinitro-2-methylphenol	0.079	U	4.87	2.30		mg/Kg	☼	47	40 - 140
4-Bromophenyl phenyl ether	0.079	U	2.44	2.05		mg/Kg	☼	84	40 - 140
4-Chloro-3-methylphenol	0.19	U	2.44	1.26		mg/Kg	☼	52	40 - 140
4-Chlorophenyl phenyl ether	0.079	U	2.44	2.23		mg/Kg	☼	91	40 - 140
4-Chloroaniline	0.079	U	2.44	1.69		mg/Kg	☼	69	40 - 140
4-Nitroaniline	0.27	U	2.44	1.76		mg/Kg	☼	72	40 - 140
4-Nitrophenol	0.26	U	4.87	3.38		mg/Kg	☼	69	40 - 140
Benzoic acid	0.84	U J3	11.2	2.65	J3	mg/Kg	☼	24	40 - 140
Benzyl alcohol	0.26	U J3	2.44	0.597	I J3	mg/Kg	☼	25	40 - 140
Butyl benzyl phthalate	0.17	U	2.44	1.84		mg/Kg	☼	76	40 - 140
Bis(2-chloroethoxy)methane	0.079	U	2.44	1.16		mg/Kg	☼	48	40 - 140
Bis(2-chloroethyl)ether	0.22	U	2.44	1.12		mg/Kg	☼	46	40 - 140
Bis(2-ethylhexyl) phthalate	0.19	U	2.44	1.96		mg/Kg	☼	81	40 - 140
bis (2-chloroisopropyl) ether	0.079	U J3	2.44	0.679	I J3	mg/Kg	☼	28	40 - 140
Carbazole	0.23	I	2.44	2.20		mg/Kg	☼	81	40 - 140
Dibenzofuran	0.10	I	2.44	2.22		mg/Kg	☼	87	40 - 140
Diethyl phthalate	0.079	U	2.44	2.06		mg/Kg	☼	84	40 - 140

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 400-231772-E-1-D MS

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 608596

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Dimethyl phthalate	0.079	U	2.44	1.94		mg/Kg	☼	80	40 - 140
Di-n-butyl phthalate	0.079	U	2.44	1.90		mg/Kg	☼	78	40 - 140
Di-n-octyl phthalate	0.29	U	2.44	2.01		mg/Kg	☼	83	40 - 140
Hexachlorobenzene	0.24	U	2.44	2.06		mg/Kg	☼	85	40 - 140
Hexachlorobutadiene	0.079	U	2.44	1.82		mg/Kg	☼	75	40 - 140
Hexachlorocyclopentadiene	0.16	U J3	2.44	0.662	I J3	mg/Kg	☼	27	40 - 140
Hexachloroethane	0.074	U	2.44	1.32		mg/Kg	☼	54	40 - 140
Isophorone	0.079	U	2.44	1.19		mg/Kg	☼	49	40 - 140
Nitrobenzene	0.079	U	2.44	1.23		mg/Kg	☼	51	40 - 140
N-Nitrosodi-n-propylamine	0.091	U	2.44	1.15		mg/Kg	☼	47	40 - 140
N-Nitrosodiphenylamine	0.079	U	2.42	1.85		mg/Kg	☼	77	40 - 140
Phenol	0.079	U	2.44	1.12		mg/Kg	☼	46	40 - 140

Surrogate	MS %Recovery	MS Qualifier	Limits
Phenol-d5 (Surr)	55		29 - 130
Terphenyl-d14 (Surr)	107		24 - 146
2,4,6-Tribromophenol (Surr)	98		10 - 150
2-Fluorobiphenyl	91		27 - 127
2-Fluorophenol (Surr)	54		25 - 128
Nitrobenzene-d5 (Surr)	68		15 - 136

Lab Sample ID: 400-231772-E-1-E MSD

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 608596

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,2,4-Trichlorobenzene	0.079	U	2.42	1.57		mg/Kg	☼	65	40 - 140	5	30
1,2-Dichlorobenzene	0.079	U	2.42	1.37		mg/Kg	☼	57	40 - 140	8	30
1,3-Dichlorobenzene	0.079	U	2.42	1.31		mg/Kg	☼	54	40 - 140	10	30
1,4-Dichlorobenzene	0.079	U	2.42	1.38		mg/Kg	☼	57	40 - 140	9	30
2,4,5-Trichlorophenol	0.079	U	2.42	1.57		mg/Kg	☼	65	40 - 140	27	30
2,4,6-Trichlorophenol	0.079	U	2.42	1.73		mg/Kg	☼	71	40 - 140	10	30
2,4-Dichlorophenol	0.079	U	2.42	1.51		mg/Kg	☼	62	40 - 140	16	30
2,4-Dimethylphenol	0.079	U	2.42	1.34		mg/Kg	☼	55	40 - 140	7	30
2,4-Dinitrophenol	0.69	U J3	4.85	1.36	I J3	mg/Kg	☼	28	40 - 140	15	30
2,4-Dinitrotoluene	0.079	U	2.42	1.82		mg/Kg	☼	75	40 - 140	13	30
2,6-Dinitrotoluene	0.079	U	2.42	1.66		mg/Kg	☼	68	40 - 140	10	30
2-Chloronaphthalene	0.079	U	2.42	1.75		mg/Kg	☼	72	40 - 140	6	30
2-Chlorophenol	0.079	U	2.42	1.35		mg/Kg	☼	56	40 - 140	9	30
2-Methylphenol	0.19	U	2.42	1.44		mg/Kg	☼	60	40 - 140	3	30
2-Nitroaniline	0.17	U	2.42	1.42		mg/Kg	☼	59	40 - 140	8	30
2-Nitrophenol	0.079	U	2.42	1.45		mg/Kg	☼	60	40 - 140	9	30
3,3'-Dichlorobenzidine	0.079	U J3	3.23	3.81		mg/Kg	☼	118	40 - 140	5	30
3 & 4 Methylphenol	0.079	U	2.42	1.34	I	mg/Kg	☼	55	40 - 140	9	30
3-Nitroaniline	0.19	U	2.42	1.50		mg/Kg	☼	62	40 - 140	4	30
4,6-Dinitro-2-methylphenol	0.079	U	4.85	1.92		mg/Kg	☼	40	40 - 140	18	30
4-Bromophenyl phenyl ether	0.079	U	2.42	1.88		mg/Kg	☼	78	40 - 140	9	30
4-Chloro-3-methylphenol	0.19	U	2.42	1.33		mg/Kg	☼	55	40 - 140	6	30

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 400-231772-E-1-E MSD

Matrix: Solid

Analysis Batch: 608998

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 608596

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4-Chlorophenyl phenyl ether	0.079	U	2.42	2.03		mg/Kg	✱	84	40 - 140	9	30
4-Chloroaniline	0.079	U	2.42	1.63		mg/Kg	✱	67	40 - 140	4	30
4-Nitroaniline	0.27	U	2.42	1.76		mg/Kg	✱	72	40 - 140	0	30
4-Nitrophenol	0.26	U	4.85	3.35		mg/Kg	✱	69	40 - 140	1	30
Benzoic acid	0.84	U J3	11.2	1.36	I J3	mg/Kg	✱	12	40 - 140	64	30
Benzyl alcohol	0.26	U J3	2.42	0.445	I J3	mg/Kg	✱	18	40 - 140	29	30
Butyl benzyl phthalate	0.17	U	2.42	1.72		mg/Kg	✱	71	40 - 140	7	30
Bis(2-chloroethoxy)methane	0.079	U	2.42	1.00		mg/Kg	✱	41	40 - 140	14	30
Bis(2-chloroethyl)ether	0.22	U	2.42	1.09		mg/Kg	✱	45	40 - 140	3	30
Bis(2-ethylhexyl) phthalate	0.19	U	2.42	2.57		mg/Kg	✱	106	40 - 140	27	30
bis (2-chloroisopropyl) ether	0.079	U J3	2.42	0.599	I J3	mg/Kg	✱	25	40 - 140	13	30
Carbazole	0.23	I	2.42	1.95		mg/Kg	✱	71	40 - 140	12	30
Dibenzofuran	0.10	I	2.42	1.91		mg/Kg	✱	75	40 - 140	15	30
Diethyl phthalate	0.079	U	2.42	1.87		mg/Kg	✱	77	40 - 140	9	30
Dimethyl phthalate	0.079	U	2.42	1.81		mg/Kg	✱	75	40 - 140	7	30
Di-n-butyl phthalate	0.079	U	2.42	1.79		mg/Kg	✱	74	40 - 140	6	30
Di-n-octyl phthalate	0.29	U	2.42	1.85		mg/Kg	✱	76	40 - 140	9	30
Hexachlorobenzene	0.24	U	2.42	1.91		mg/Kg	✱	79	40 - 140	8	30
Hexachlorobutadiene	0.079	U	2.42	1.65		mg/Kg	✱	68	40 - 140	10	30
Hexachlorocyclopentadiene	0.16	U J3	2.42	0.559	I J3	mg/Kg	✱	23	40 - 140	17	30
Hexachloroethane	0.074	U	2.42	1.21		mg/Kg	✱	50	40 - 140	8	30
Isophorone	0.079	U	2.42	1.10		mg/Kg	✱	46	40 - 140	8	30
Nitrobenzene	0.079	U	2.42	1.11		mg/Kg	✱	46	40 - 140	10	30
N-Nitrosodi-n-propylamine	0.091	U	2.42	1.06		mg/Kg	✱	44	40 - 140	8	30
N-Nitrosodiphenylamine	0.079	U	2.40	1.72		mg/Kg	✱	71	40 - 140	8	30
Phenol	0.079	U	2.42	1.03		mg/Kg	✱	42	40 - 140	9	30

Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits
Phenol-d5 (Surr)	48		29 - 130
Terphenyl-d14 (Surr)	93		24 - 146
2,4,6-Tribromophenol (Surr)	76		10 - 150
2-Fluorobiphenyl	75		27 - 127
2-Fluorophenol (Surr)	46		25 - 128
Nitrobenzene-d5 (Surr)	61		15 - 136

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 670-18478/1-A

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 18478

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
2-Methylnaphthalene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Acenaphthene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Acenaphthylene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Anthracene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Benzo[a]anthracene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Benzo[a]pyrene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 670-18478/1-A

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 18478

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzo[b]fluoranthene	0.00393		0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Benzo[g,h,i]perylene	0.00206	I	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Benzo[k]fluoranthene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Chrysene	0.00261	I	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Dibenz(a,h)anthracene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Fluoranthene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Fluorene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Indeno[1,2,3-cd]pyrene	0.00183	I	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Naphthalene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Phenanthrene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1
Pyrene	0.0017	U	0.0033	0.0017	mg/Kg		01/16/23 06:29	01/16/23 19:59	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-methylnaphthalene-d10	77		50 - 150	01/16/23 06:29	01/16/23 19:59	1
Fluoranthene-d10 (Surr)	111		50 - 150	01/16/23 06:29	01/16/23 19:59	1

Lab Sample ID: LCS 670-18478/2-A

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 18478

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.00660	0.00417		mg/Kg		63	32 - 121
2-Methylnaphthalene	0.00660	0.00424		mg/Kg		64	33 - 120
Acenaphthene	0.00660	0.00427		mg/Kg		65	43 - 121
Acenaphthylene	0.00660	0.00485		mg/Kg		73	38 - 128
Anthracene	0.00660	0.00539		mg/Kg		82	58 - 120
Benzo[a]anthracene	0.00660	0.00760		mg/Kg		115	62 - 120
Benzo[a]pyrene	0.00660	0.00678		mg/Kg		103	58 - 120
Benzo[b]fluoranthene	0.00660	0.00591	V	mg/Kg		90	61 - 124
Benzo[g,h,i]perylene	0.00660	0.00562	V	mg/Kg		85	58 - 124
Benzo[k]fluoranthene	0.00660	0.00569		mg/Kg		86	65 - 127
Chrysene	0.00660	0.00558	V	mg/Kg		85	69 - 122
Dibenz(a,h)anthracene	0.00660	0.00604		mg/Kg		91	60 - 128
Fluoranthene	0.00660	0.00680		mg/Kg		103	65 - 120
Fluorene	0.00660	0.00449		mg/Kg		68	46 - 121
Indeno[1,2,3-cd]pyrene	0.00660	0.00622	V	mg/Kg		94	61 - 126
Naphthalene	0.00660	0.00397		mg/Kg		60	37 - 120
Phenanthrene	0.00660	0.00490		mg/Kg		74	52 - 120
Pyrene	0.00660	0.00614		mg/Kg		93	68 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-methylnaphthalene-d10	67		50 - 150
Fluoranthene-d10 (Surr)	107		50 - 150

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 660-126256-A-13-A MS

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Batch: 18478

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.051	I J3	0.00702	0.122	J3	mg/Kg	✱	1006	32 - 121
2-Methylnaphthalene	0.045	I J3	0.00702	0.035	U J3	mg/Kg	✱	0	33 - 120
Acenaphthene	0.19	J3	0.00702	0.256	J3	mg/Kg	✱	992	43 - 121
Acenaphthylene	0.057	I J3	0.00702	0.423	J3	mg/Kg	✱	5210	38 - 128
Anthracene	0.16	J3	0.00702	0.186	J3	mg/Kg	✱	316	58 - 120
Benzo[a]anthracene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	62 - 120
Benzo[a]pyrene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	58 - 120
Benzo[b]fluoranthene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	61 - 124
Benzo[g,h,i]perylene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	58 - 124
Benzo[k]fluoranthene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	65 - 127
Chrysene	0.041	I J3	0.00702	0.0550	I J3	mg/Kg	✱	195	69 - 122
Dibenz(a,h)anthracene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	60 - 128
Fluoranthene	0.15	J3	0.00702	0.179	J3	mg/Kg	✱	446	65 - 120
Fluorene	0.32	J3	0.00702	0.420	J3	mg/Kg	✱	1369	46 - 121
Indeno[1,2,3-cd]pyrene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	61 - 126
Naphthalene	0.043	I J3	0.00702	0.0583	I J3	mg/Kg	✱	221	37 - 120
Phenanthrene	0.15	J3	0.00702	0.182	J3	mg/Kg	✱	430	52 - 120
Pyrene	0.53	J3	0.00702	0.594	J3	mg/Kg	✱	868	68 - 120

Surrogate	MS %Recovery	MS Qualifier	Limits
2-methylnaphthalene-d10	764	J1	50 - 150
Fluoranthene-d10 (Surr)	2483	J1	50 - 150

Lab Sample ID: 660-126256-A-13-B MSD

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 18478

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
1-Methylnaphthalene	0.051	I J3	0.00702	0.170	J3	mg/Kg	✱	1688	32 - 121	33	30
2-Methylnaphthalene	0.045	I J3	0.00702	0.0732	J3	mg/Kg	✱	401	33 - 120	NC	30
Acenaphthene	0.19	J3	0.00702	0.176	J3	mg/Kg	✱	-161	43 - 121	37	30
Acenaphthylene	0.057	I J3	0.00702	0.0527	I J3	mg/Kg	✱	-64	38 - 128	156	30
Anthracene	0.16	J3	0.00702	0.183	J3	mg/Kg	✱	274	58 - 120	2	30
Benzo[a]anthracene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	62 - 120	NC	30
Benzo[a]pyrene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	58 - 120	NC	30
Benzo[b]fluoranthene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	61 - 124	NC	30
Benzo[g,h,i]perylene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	58 - 124	NC	30
Benzo[k]fluoranthene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	65 - 127	NC	30
Chrysene	0.041	I J3	0.00702	0.0533	I J3	mg/Kg	✱	171	69 - 122	3	30
Dibenz(a,h)anthracene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	60 - 128	NC	30
Fluoranthene	0.15	J3	0.00702	0.179	J3	mg/Kg	✱	436	65 - 120	0	30
Fluorene	0.32	J3	0.00702	0.324	J3	mg/Kg	✱	4	46 - 121	26	30
Indeno[1,2,3-cd]pyrene	0.035	U	0.00702	0.035	U	mg/Kg	✱	NC	61 - 126	NC	30
Naphthalene	0.043	I J3	0.00702	0.0623	I J3	mg/Kg	✱	279	37 - 120	7	30
Phenanthrene	0.15	J3	0.00702	0.200	J3	mg/Kg	✱	683	52 - 120	9	30
Pyrene	0.53	J3	0.00702	0.592	J3	mg/Kg	✱	840	68 - 120	0	30

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 660-126256-A-13-B MSD

Matrix: Solid

Analysis Batch: 18585

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 18478

Surrogate	MSD %Recovery	MSD Qualifier	Limits
2-methylnaphthalene-d10	1621	J1	50 - 150
Fluoranthene-d10 (Surr)	2472	J1	50 - 150

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 400-608618/1-A

Matrix: Solid

Analysis Batch: 608962

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608618

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aldrin	0.00031	U	0.0017	0.00031	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
alpha-BHC	0.00036	U	0.0017	0.00036	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
beta-BHC	0.00028	U	0.0017	0.00028	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
delta-BHC	0.00032	U	0.0017	0.00032	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
gamma-BHC (Lindane)	0.00020	U	0.0017	0.00020	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
alpha-Chlordane	0.00028	U	0.0017	0.00028	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
gamma-Chlordane	0.00028	U	0.0017	0.00028	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
4,4'-DDD	0.00030	U	0.0017	0.00030	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
4,4'-DDE	0.00029	U	0.0017	0.00029	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
4,4'-DDT	0.0013	U	0.0017	0.0013	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Dieldrin	0.00033	U	0.0017	0.00033	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endosulfan I	0.00036	U	0.0017	0.00036	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endosulfan II	0.00036	U	0.0017	0.00036	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endosulfan sulfate	0.00044	U	0.0017	0.00044	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endrin	0.00030	U	0.0017	0.00030	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endrin aldehyde	0.00054	U	0.0017	0.00054	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Endrin ketone	0.00013	U	0.0017	0.00013	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Heptachlor	0.00032	U	0.0017	0.00032	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Heptachlor epoxide	0.00032	U	0.0017	0.00032	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Methoxychlor	0.00079	U	0.0017	0.00079	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
Toxaphene	0.029	U	0.10	0.029	mg/Kg		01/16/23 09:27	01/18/23 13:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	115		26 - 129	01/16/23 09:27	01/18/23 13:57	1
Tetrachloro-m-xylene	57		31 - 122	01/16/23 09:27	01/18/23 13:57	1

Lab Sample ID: LCS 400-608618/2-A

Matrix: Solid

Analysis Batch: 608962

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Aldrin	0.0333	0.0249		mg/Kg		75	47 - 137
alpha-BHC	0.0333	0.0257		mg/Kg		77	50 - 148
beta-BHC	0.0333	0.0282		mg/Kg		85	46 - 133
delta-BHC	0.0333	0.0339		mg/Kg		102	10 - 150
gamma-BHC (Lindane)	0.0333	0.0279		mg/Kg		84	50 - 148
alpha-Chlordane	0.0333	0.0311		mg/Kg		93	35 - 134
gamma-Chlordane	0.0333	0.0321		mg/Kg		96	39 - 146

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 400-608618/2-A

Matrix: Solid

Analysis Batch: 608962

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,4'-DDD	0.0333	0.0399		mg/Kg		120	46 - 150
4,4'-DDE	0.0333	0.0326		mg/Kg		98	49 - 148
4,4'-DDT	0.0333	0.0327		mg/Kg		98	44 - 150
Dieldrin	0.0333	0.0365		mg/Kg		110	41 - 150
Endosulfan I	0.0333	0.0345		mg/Kg		104	50 - 141
Endosulfan II	0.0333	0.0356		mg/Kg		107	47 - 148
Endosulfan sulfate	0.0333	0.0361		mg/Kg		108	50 - 145
Endrin	0.0333	0.0408		mg/Kg		123	45 - 150
Endrin aldehyde	0.0333	0.0319		mg/Kg		96	10 - 150
Endrin ketone	0.0333	0.0322		mg/Kg		96	48 - 150
Heptachlor	0.0333	0.0261		mg/Kg		78	46 - 150
Heptachlor epoxide	0.0333	0.0331		mg/Kg		99	49 - 148
Methoxychlor	0.0333	0.0305		mg/Kg		92	40 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	121		26 - 129
Tetrachloro-m-xylene	60		31 - 122

Lab Sample ID: 670-12724-1 MS

Matrix: Solid

Analysis Batch: 608962

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Aldrin	0.00030	U	0.0331	0.0304		mg/Kg	✱	92	10 - 154
alpha-BHC	0.00034	U	0.0331	0.0314		mg/Kg	✱	95	15 - 152
beta-BHC	0.00027	U	0.0331	0.0340		mg/Kg	✱	103	10 - 160
delta-BHC	0.00030	U	0.0331	0.0406		mg/Kg	✱	122	10 - 160
gamma-BHC (Lindane)	0.00019	U	0.0331	0.0337		mg/Kg	✱	102	26 - 142
alpha-Chlordane	0.00027	U	0.0331	0.0379		mg/Kg	✱	114	10 - 160
gamma-Chlordane	0.00027	U	0.0331	0.0385		mg/Kg	✱	116	10 - 160
4,4'-DDD	0.00029	U	0.0331	0.0472		mg/Kg	✱	143	13 - 146
4,4'-DDE	0.00028	U	0.0331	0.0395		mg/Kg	✱	119	23 - 143
4,4'-DDT	0.0012	U	0.0331	0.0372		mg/Kg	✱	112	10 - 160
Dieldrin	0.00031	U	0.0331	0.0443		mg/Kg	✱	134	10 - 160
Endosulfan I	0.00034	U	0.0331	0.0425		mg/Kg	✱	128	10 - 160
Endosulfan II	0.00034	U	0.0331	0.0427		mg/Kg	✱	129	10 - 160
Endosulfan sulfate	0.00042	U	0.0331	0.0428		mg/Kg	✱	129	27 - 143
Endrin	0.00029	U	0.0331	0.0490		mg/Kg	✱	148	20 - 156
Endrin aldehyde	0.00051	U	0.0331	0.0395		mg/Kg	✱	119	14 - 160
Endrin ketone	0.00012	U	0.0331	0.0362		mg/Kg	✱	109	31 - 155
Heptachlor	0.00030	U	0.0331	0.0259		mg/Kg	✱	78	10 - 160
Heptachlor epoxide	0.00030	U	0.0331	0.0399		mg/Kg	✱	120	10 - 160
Methoxychlor	0.00075	U	0.0331	0.0350		mg/Kg	✱	106	10 - 160

Surrogate	MS %Recovery	MS Qualifier	Limits
DCB Decachlorobiphenyl	142	J1	26 - 129
Tetrachloro-m-xylene	73		31 - 122

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 670-12724-1 MSD

Matrix: Solid

Analysis Batch: 608962

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Aldrin	0.00030	U	0.0328	0.0243		mg/Kg	☆	74	10 - 154	22	50
alpha-BHC	0.00034	U	0.0328	0.0263		mg/Kg	☆	80	15 - 152	18	50
beta-BHC	0.00027	U	0.0328	0.0288		mg/Kg	☆	88	10 - 160	17	50
delta-BHC	0.00030	U	0.0328	0.0341		mg/Kg	☆	104	10 - 160	17	50
gamma-BHC (Lindane)	0.00019	U	0.0328	0.0301		mg/Kg	☆	92	26 - 142	11	50
alpha-Chlordane	0.00027	U	0.0328	0.0305		mg/Kg	☆	93	10 - 160	22	50
gamma-Chlordane	0.00027	U	0.0328	0.0313		mg/Kg	☆	96	10 - 160	21	50
4,4'-DDD	0.00029	U	0.0328	0.0386		mg/Kg	☆	118	13 - 146	20	50
4,4'-DDE	0.00028	U	0.0328	0.0315		mg/Kg	☆	96	23 - 143	23	50
4,4'-DDT	0.0012	U	0.0328	0.0308		mg/Kg	☆	94	10 - 160	19	50
Dieldrin	0.00031	U	0.0328	0.0361		mg/Kg	☆	110	10 - 160	20	50
Endosulfan I	0.00034	U	0.0328	0.0344		mg/Kg	☆	105	10 - 160	21	50
Endosulfan II	0.00034	U	0.0328	0.0351		mg/Kg	☆	107	10 - 160	20	50
Endosulfan sulfate	0.00042	U	0.0328	0.0350		mg/Kg	☆	107	27 - 143	20	50
Endrin	0.00029	U	0.0328	0.0406		mg/Kg	☆	124	20 - 156	19	50
Endrin aldehyde	0.00051	U	0.0328	0.0323		mg/Kg	☆	99	14 - 160	20	50
Endrin ketone	0.00012	U	0.0328	0.0297		mg/Kg	☆	91	31 - 155	20	50
Heptachlor	0.00030	U	0.0328	0.0250		mg/Kg	☆	76	10 - 160	4	50
Heptachlor epoxide	0.00030	U	0.0328	0.0327		mg/Kg	☆	100	10 - 160	20	50
Methoxychlor	0.00075	U	0.0328	0.0277		mg/Kg	☆	85	10 - 160	23	50

Surrogate	MSD %Recovery	MSD Qualifier	Limits
DCB Decachlorobiphenyl	115		26 - 129
Tetrachloro-m-xylene	59		31 - 122

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 400-608618/1-A

Matrix: Solid

Analysis Batch: 608960

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608618

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.0075	U	0.017	0.0075	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1221	0.0080	U	0.017	0.0080	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1232	0.011	U	0.017	0.011	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1242	0.0082	U	0.017	0.0082	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1248	0.0033	U	0.017	0.0033	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1254	0.0021	U	0.017	0.0021	mg/Kg		01/16/23 09:27	01/18/23 13:57	1
PCB-1260	0.0058	U	0.017	0.0058	mg/Kg		01/16/23 09:27	01/18/23 13:57	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl	110		26 - 129	01/16/23 09:27	01/18/23 13:57	1
Tetrachloro-m-xylene	57		31 - 122	01/16/23 09:27	01/18/23 13:57	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCS 400-608618/16-A

Matrix: Solid

Analysis Batch: 608960

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PCB-1016	0.337	0.186		mg/Kg		55	17 - 156
PCB-1260	0.335	0.283		mg/Kg		85	27 - 133

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	78		26 - 129
Tetrachloro-m-xylene	42		31 - 122

Lab Sample ID: LCSD 400-608618/17-A

Matrix: Solid

Analysis Batch: 608960

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 608618

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016	0.337	0.176		mg/Kg		52	17 - 156	5	30
PCB-1260	0.335	0.264		mg/Kg		79	27 - 133	7	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl	74		26 - 129
Tetrachloro-m-xylene	41		31 - 122

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 400-608953/1-A

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608953

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-T	0.0050	U	0.040	0.0050	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
2,4,5-TP (Silvex)	0.0050	U	0.040	0.0050	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
2,4-D	0.0070	U	0.20	0.0070	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
2,4-DB	0.0080	U	0.015	0.0080	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
Dalapon	0.0060	U	0.020	0.0060	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
Dicamba	0.0060	U	0.060	0.0060	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
Dichlorprop	0.0050	U	0.13	0.0050	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
Dinoseb	0.0080	U	0.20	0.0080	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
MCPA	1.4	U	50	1.4	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
MCPP	3.1	U	50	3.1	mg/Kg		01/18/23 11:35	01/22/23 13:58	1
Pentachlorophenol	0.0070	U	0.010	0.0070	mg/Kg		01/18/23 11:35	01/22/23 13:58	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4-Dichlorophenylacetic acid	88		10 - 150	01/18/23 11:35	01/22/23 13:58	1

Lab Sample ID: LCS 400-608953/2-A

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608953

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4,5-T	0.168	0.101		mg/Kg		60	40 - 120
2,4,5-TP (Silvex)	0.168	0.0958		mg/Kg		57	34 - 120

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCS 400-608953/2-A

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608953

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	0.166	0.102	I	mg/Kg		62	34 - 120
2,4-DB	0.167	0.129		mg/Kg		77	16 - 120
Dalapon	0.167	0.0786		mg/Kg		47	10 - 120
Dicamba	0.165	0.114		mg/Kg		69	10 - 141
Dichlorprop	0.166	0.118	I	mg/Kg		71	28 - 120
Dinoseb	0.167	0.0972	I	mg/Kg		58	10 - 120
MCPA	16.5	11.6	I	mg/Kg		70	10 - 120
MCP	16.7	18.3	I	mg/Kg		110	10 - 120
Pentachlorophenol	0.165	0.0597		mg/Kg		36	10 - 150

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2,4-Dichlorophenylacetic acid	83		10 - 150

Lab Sample ID: 670-12724-1 MS

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608953

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4,5-T	0.0048	U	0.163	0.0894		mg/Kg	✱	55	10 - 107
2,4,5-TP (Silvex)	0.0048	U	0.163	0.0866		mg/Kg	✱	53	10 - 111
2,4-D	0.0067	U	0.161	0.0950	I	mg/Kg	✱	59	10 - 150
2,4-DB	0.0077	U	0.162	0.134		mg/Kg	✱	83	10 - 88
Dalapon	0.0058	U	0.162	0.0810		mg/Kg	✱	50	10 - 126
Dicamba	0.0058	U	0.160	0.100		mg/Kg	✱	62	10 - 150
Dichlorprop	0.0048	U	0.161	0.101	I	mg/Kg	✱	63	10 - 81
Dinoseb	0.0077	U	0.162	0.0873	I	mg/Kg	✱	54	10 - 64
MCPA	1.3	U	16.0	9.59	I	mg/Kg	✱	60	10 - 101
MCP	3.0	U	16.2	17.9	I	mg/Kg	✱	110	10 - 150
Pentachlorophenol	0.0067	U	0.161	0.0931		mg/Kg	✱	58	10 - 150

Surrogate	MS %Recovery	MS Qualifier	Limits
2,4-Dichlorophenylacetic acid	77		10 - 150

Lab Sample ID: 670-12724-1 MSD

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608953

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4,5-T	0.0048	U	0.166	0.0882		mg/Kg	✱	53	10 - 107	1	121
2,4,5-TP (Silvex)	0.0048	U	0.166	0.0850		mg/Kg	✱	51	10 - 111	2	102
2,4-D	0.0067	U	0.164	0.0986	I	mg/Kg	✱	60	10 - 150	4	101
2,4-DB	0.0077	U	0.165	0.137		mg/Kg	✱	83	10 - 88	2	109
Dalapon	0.0058	U	0.165	0.0768		mg/Kg	✱	47	10 - 126	5	76
Dicamba	0.0058	U	0.163	0.106		mg/Kg	✱	65	10 - 150	5	159
Dichlorprop	0.0048	U	0.164	0.102	I	mg/Kg	✱	62	10 - 81	1	96
Dinoseb	0.0077	U	0.165	0.0805	I	mg/Kg	✱	49	10 - 64	8	99
MCPA	1.3	U	16.3	13.1	I	mg/Kg	✱	80	10 - 101	31	134
MCP	3.0	U	16.5	22.6	I	mg/Kg	✱	137	10 - 150	23	100

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: 670-12724-1 MSD

Matrix: Solid

Analysis Batch: 609453

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608953

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Pentachlorophenol	0.0067	U	0.164	0.0851		mg/Kg	✱	52	10 - 150	9	100
Surrogate	MSD %Recovery	MSD Qualifier	MSD Limits								
2,4-Dichlorophenylacetic acid	79		10 - 150								

Method: FL-PRO - Florida - Petroleum Range Organics (GC)

Lab Sample ID: MB 670-18266/1-A

Matrix: Solid

Analysis Batch: 18748

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 18266

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Petroleum Hydrocarbons (C8-C40)	11	U	21	11	mg/Kg		01/13/23 07:57	01/17/23 20:36	1
Surrogate	MB %Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	92		66 - 136				01/13/23 07:57	01/17/23 20:36	1
C35 (Surr)	105		36 - 132				01/13/23 07:57	01/17/23 20:36	1

Lab Sample ID: LCS 670-18266/2-A

Matrix: Solid

Analysis Batch: 18748

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 18266

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Petroleum Hydrocarbons (C8-C40)	56.7	53.3		mg/Kg		94	55 - 130		
Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits						
o- terphenyl (Surr)	111		66 - 136						
C35 (Surr)	107		36 - 132						

Lab Sample ID: 670-12724-1 MS

Matrix: Solid

Analysis Batch: 18748

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 18266

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Petroleum Hydrocarbons (C8-C40)	11	U	56.8	47.4		mg/Kg	✱	83	55 - 125		
Surrogate	MS %Recovery	MS Qualifier	MS Limits								
o- terphenyl (Surr)	92		66 - 136								
C35 (Surr)	84		36 - 132								

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: FL-PRO - Florida - Petroleum Range Organics (GC) (Continued)

Lab Sample ID: 670-12724-1 MSD

Matrix: Solid

Analysis Batch: 18748

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 18266

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Petroleum Hydrocarbons (C8-C40)	11	U	57.2	57.1		mg/Kg	☆	100	55 - 125	19	25
Surrogate	%Recovery	MSD Qualifier	MSD Limits								
<i>o</i> -terphenyl (Surr)	125		66 - 136								
C35 (Surr)	110		36 - 132								

Method: 537 IDA - EPA 537 Isotope Dilution

Lab Sample ID: MB 410-336883/1-B

Matrix: Solid

Analysis Batch: 338182

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 336883

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
11CI-PF3OUdS	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
4:2 Fluorotelomer sulfonic acid	0.00060	U	0.0020	0.00060	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
6:2 Fluorotelomer sulfonic acid	0.00060	U	0.0020	0.00060	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
8:2 Fluorotelomer sulfonic acid	0.00060	U	0.0030	0.00060	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
9CI-PF3ONS	0.00020	U	0.0020	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
DONA	0.00020	U	0.0030	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
HFPODA	0.0010	U	0.0020	0.0010	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
NEtFOSAA	0.00020	U	0.0020	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
NMeFOSAA	0.00020	U	0.0020	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
NMeFOSA	0.00050	U	0.0020	0.00050	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorobutanesulfonic acid	0.00040	U	0.0020	0.00040	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorobutanoic acid	0.00080	U	0.0020	0.00080	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorodecanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorodecanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorododecanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluoroheptanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluoroheptanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorohexanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorohexanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorononanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorononanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorooctanesulfonamide	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorooctanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorooctanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluoropentanesulfonic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluoropentanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorotetradecanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluorotridecanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Perfluoroundecanoic acid	0.00020	U	0.00060	0.00020	mg/Kg		01/19/23 08:56	01/24/23 14:26	1
Isotope Dilution	%Recovery	MB Qualifier	MB Limits				Prepared	Analyzed	Dil Fac
M2-4:2 FTS	116		10 - 200				01/19/23 08:56	01/24/23 14:26	1
M2-6:2 FTS	125		10 - 200				01/19/23 08:56	01/24/23 14:26	1
M2-8:2 FTS	145		15 - 200				01/19/23 08:56	01/24/23 14:26	1
13C2 PFTeDA	132		10 - 169				01/19/23 08:56	01/24/23 14:26	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: MB 410-336883/1-B

Matrix: Solid

Analysis Batch: 338182

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 336883

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 HFPO-DA	99		10 - 169	01/19/23 08:56	01/24/23 14:26	1
13C3 PFBS	129		27 - 179	01/19/23 08:56	01/24/23 14:26	1
13C4 PFBA	114		28 - 153	01/19/23 08:56	01/24/23 14:26	1
13C4 PFHpA	115		10 - 178	01/19/23 08:56	01/24/23 14:26	1
13C5 PFPeA	113		24 - 161	01/19/23 08:56	01/24/23 14:26	1
13C8 PFOA	115		26 - 159	01/19/23 08:56	01/24/23 14:26	1
13C8 PFOS	137		41 - 154	01/19/23 08:56	01/24/23 14:26	1
d3-NMeFOSAA	110		10 - 178	01/19/23 08:56	01/24/23 14:26	1
d5-NEtFOSAA	118		10 - 193	01/19/23 08:56	01/24/23 14:26	1
13C3 PFHxS	138		24 - 171	01/19/23 08:56	01/24/23 14:26	1
13C5 PFHxA	107		10 - 174	01/19/23 08:56	01/24/23 14:26	1
13C6 PFDA	120		26 - 161	01/19/23 08:56	01/24/23 14:26	1
13C7 PFUnA	126		12 - 173	01/19/23 08:56	01/24/23 14:26	1
d3-NMePFOSA	108		10 - 175	01/19/23 08:56	01/24/23 14:26	1
13C8 FOSA	113		14 - 163	01/19/23 08:56	01/24/23 14:26	1
13C2-PFDoDA	124		11 - 166	01/19/23 08:56	01/24/23 14:26	1
13C9 PFNA	117		26 - 165	01/19/23 08:56	01/24/23 14:26	1

Lab Sample ID: LCS 410-336883/2-B

Matrix: Solid

Analysis Batch: 338182

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 336883

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
11Cl-PF3OUdS	0.0233	0.0225		mg/Kg		97	55 - 135
4:2 Fluorotelomer sulfonic acid	0.0234	0.0220		mg/Kg		94	58 - 131
6:2 Fluorotelomer sulfonic acid	0.0237	0.0222		mg/Kg		94	59 - 135
8:2 Fluorotelomer sulfonic acid	0.0240	0.0215		mg/Kg		90	55 - 133
9Cl-PF3ONS	0.0233	0.0207		mg/Kg		89	62 - 130
DONA	0.0236	0.0238		mg/Kg		101	57 - 137
HFPODA	0.0250	0.0258		mg/Kg		103	49 - 135
NEtFOSAA	0.0250	0.0250		mg/Kg		100	57 - 127
NMeFOSAA	0.0250	0.0249		mg/Kg		100	60 - 134
NMeFOSA	0.0250	0.0260		mg/Kg		104	60 - 129
Perfluorobutanesulfonic acid	0.0221	0.0223		mg/Kg		101	54 - 130
Perfluorobutanoic acid	0.0250	0.0219		mg/Kg		88	60 - 128
Perfluorodecanesulfonic acid	0.0241	0.0243		mg/Kg		101	57 - 132
Perfluorodecanoic acid	0.0250	0.0255		mg/Kg		102	56 - 133
Perfluorododecanoic acid	0.0250	0.0235		mg/Kg		94	60 - 135
Perfluoroheptanesulfonic acid	0.0238	0.0230		mg/Kg		97	59 - 132
Perfluoroheptanoic acid	0.0250	0.0252		mg/Kg		101	59 - 137
Perfluorohexanesulfonic acid	0.0228	0.0224		mg/Kg		98	59 - 129
Perfluorohexanoic acid	0.0250	0.0248		mg/Kg		99	59 - 132
Perfluorononanesulfonic acid	0.0240	0.0228		mg/Kg		95	60 - 132
Perfluorononanoic acid	0.0250	0.0260		mg/Kg		104	61 - 134
Perfluorooctanesulfonamide	0.0250	0.0254		mg/Kg		102	47 - 149
Perfluorooctanesulfonic acid	0.0231	0.0228		mg/Kg		99	61 - 126
Perfluorooctanoic acid	0.0250	0.0210		mg/Kg		84	59 - 131
Perfluoropentanesulfonic acid	0.0235	0.0219		mg/Kg		94	57 - 133
Perfluoropentanoic acid	0.0250	0.0232		mg/Kg		93	58 - 134

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 537 IDA - EPA 537 Isotope Dilution (Continued)

Lab Sample ID: LCS 410-336883/2-B

Matrix: Solid

Analysis Batch: 338182

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 336883

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluorotetradecanoic acid	0.0250	0.0243		mg/Kg		97	62 - 134
Perfluorotridecanoic acid	0.0250	0.0253		mg/Kg		101	53 - 143
Perfluoroundecanoic acid	0.0250	0.0253		mg/Kg		101	60 - 134

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
M2-4:2 FTS	106		10 - 200
M2-6:2 FTS	120		10 - 200
M2-8:2 FTS	131		15 - 200
13C2 PFTeDA	130		10 - 169
13C3 HFPO-DA	99		10 - 169
13C3 PFBS	125		27 - 179
13C4 PFBA	116		28 - 153
13C4 PFHpA	110		10 - 178
13C5 PFPeA	115		24 - 161
13C8 PFOA	122		26 - 159
13C8 PFOS	128		41 - 154
d3-NMeFOSAA	115		10 - 178
d5-NEtFOSAA	125		10 - 193
13C3 PFHxS	127		24 - 171
13C5 PFHxA	107		10 - 174
13C6 PFDA	117		26 - 161
13C7 PFUnA	129		12 - 173
d3-NMePFOSA	98		10 - 175
13C8 FOSA	104		14 - 163
13C2-PFDoDA	133		11 - 166
13C9 PFNA	118		26 - 165

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: MB 410-337449/1-A

Matrix: Solid

Analysis Batch: 337940

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 337449

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,4,6,7,8-HpCDD	0.000000289	I J	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,4,6,7,8-HpCDF	0.000000143	I J	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,4,7,8-HxCDD	0.000000147	I J	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,4,7,8-HxCDF	0.000000013	U	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,4,7,8,9-HpCDF	0.000000186	I J	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,6,7,8-HxCDD	0.000000095	I J	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,6,7,8-HxCDF	0.000000128	I	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,7,8-PeCDD	0.000000008	U	0.0000050	0.0000000	mg/Kg		01/20/23 16:40	01/23/23 20:58	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS) (Continued)

Lab Sample ID: MB 410-337449/1-A
Matrix: Solid
Analysis Batch: 337940

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 337449

Analyte	MB Result	MB Qualifier	RL	EDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,3,7,8-PeCDF	0.000000133	I J	0.0000050	0.0000000 055	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,7,8,9-HxCDD	0.000000139	I J	0.0000050	0.0000000 094	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
1,2,3,7,8,9-HxCDF	0.000000167	I J	0.0000050	0.0000000 14	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
2,3,4,6,7,8-HxCDF	0.000000187	I	0.0000050	0.0000000 13	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
2,3,4,7,8-PeCDF	0.000000076 4	I	0.0000050	0.0000000 046	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
2,3,7,8-TCDD	0.000000008 6	U	0.0000010	0.0000000 086	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
2,3,7,8-TCDF	0.000000005 5	U	0.0000010	0.0000000 055	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
OCDD	0.000000740	I	0.0000010	0.0000000 52	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
OCDF	0.000000307	I J	0.0000010	0.0000000 079	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total HxCDD	0.000000382	I J	0.0000050	0.0000000 095	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total HxCDF	0.000000482	I J	0.0000050	0.0000000 13	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total HpCDD	0.000000289	I J	0.0000050	0.0000000 18	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total HpCDF	0.000000329	I J	0.0000050	0.0000000 038	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total PeCDD	0.000000008 4	U	0.0000050	0.0000000 084	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total PeCDF	0.000000209	I J	0.0000050	0.0000000 050	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total TCDD	0.000000008 6	U	0.0000010	0.0000000 086	mg/Kg		01/20/23 16:40	01/23/23 20:58	1
Total TCDF	0.000000005 5	U	0.0000010	0.0000000 055	mg/Kg		01/20/23 16:40	01/23/23 20:58	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C-OCDF	45		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-OCDD	44		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-2,3,7,8-TCDF	58		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-2,3,7,8-TCDD	54		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-2,3,4,7,8-PeCDF	53		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-2,3,4,6,7,8-HxCDF	56		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,7,8,9-HxCDF	57		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,7,8,9-HxCDD	51		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,7,8-PeCDF	53		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,7,8-PeCDD	47		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,6,7,8-HxCDF	57		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,6,7,8-HxCDD	53		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,4,7,8,9-HpCDF	51		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,4,7,8-HxCDF	57		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,4,7,8-HxCDD	53		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,4,6,7,8-HpCDF	51		40 - 135	01/20/23 16:40	01/23/23 20:58	1
13C-1,2,3,4,6,7,8-HpCDD	49		40 - 135	01/20/23 16:40	01/23/23 20:58	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 8290A - Dioxins and Furans (HRGC/HRMS)

Lab Sample ID: LCS 410-337449/2-A
Matrix: Solid
Analysis Batch: 337940

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337449

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,2,3,4,6,7,8-HpCDD	0.000100	0.0000945		mg/Kg		94	77 - 127
1,2,3,4,6,7,8-HpCDF	0.000100	0.0000936		mg/Kg		94	77 - 127
1,2,3,4,7,8-HxCDD	0.000100	0.0000986		mg/Kg		99	77 - 127
1,2,3,4,7,8-HxCDF	0.000100	0.0000968		mg/Kg		97	77 - 129
1,2,3,4,7,8,9-HpCDF	0.000100	0.0000965		mg/Kg		97	77 - 127
1,2,3,6,7,8-HxCDD	0.000100	0.000103		mg/Kg		103	76 - 127
1,2,3,6,7,8-HxCDF	0.000100	0.0000947		mg/Kg		95	77 - 129
1,2,3,7,8-PeCDD	0.000100	0.0000992		mg/Kg		99	77 - 127
1,2,3,7,8-PeCDF	0.000100	0.000103		mg/Kg		103	75 - 129
1,2,3,7,8,9-HxCDD	0.000100	0.000102		mg/Kg		102	76 - 127
1,2,3,7,8,9-HxCDF	0.000100	0.0000945		mg/Kg		95	76 - 126
2,3,4,6,7,8-HxCDF	0.000100	0.0000964		mg/Kg		96	78 - 128
2,3,4,7,8-PeCDF	0.000100	0.0000992		mg/Kg		99	75 - 131
2,3,7,8-TCDD	0.0000200	0.0000191		mg/Kg		96	68 - 142
2,3,7,8-TCDF	0.0000200	0.0000196		mg/Kg		98	70 - 133
OCDD	0.000200	0.000195		mg/Kg		98	77 - 125
OCDF	0.000200	0.000193		mg/Kg		97	75 - 128

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C-OCDF	55		40 - 135
13C-OCDD	52		40 - 135
13C-2,3,7,8-TCDF	62		40 - 135
13C-2,3,7,8-TCDD	59		40 - 135
13C-2,3,4,7,8-PeCDF	61		40 - 135
13C-2,3,4,6,7,8-HxCDF	63		40 - 135
13C-1,2,3,7,8,9-HxCDF	65		40 - 135
13C-1,2,3,7,8,9-HxCDD	60		40 - 135
13C-1,2,3,7,8-PeCDF	59		40 - 135
13C-1,2,3,7,8-PeCDD	55		40 - 135
13C-1,2,3,6,7,8-HxCDF	65		40 - 135
13C-1,2,3,6,7,8-HxCDD	59		40 - 135
13C-1,2,3,4,7,8,9-HpCDF	59		40 - 135
13C-1,2,3,4,7,8-HxCDF	64		40 - 135
13C-1,2,3,4,7,8-HxCDD	62		40 - 135
13C-1,2,3,4,6,7,8-HpCDF	58		40 - 135
13C-1,2,3,4,6,7,8-HpCDD	58		40 - 135

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-17850/3-A
Matrix: Solid
Analysis Batch: 18019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17850

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.10	U	0.20	0.10	mg/Kg		01/11/23 10:52	01/11/23 19:16	1
Barium	0.20	U	0.40	0.20	mg/Kg		01/11/23 10:52	01/11/23 19:16	1
Cadmium	0.10	U	0.20	0.10	mg/Kg		01/11/23 10:52	01/11/23 19:16	1
Chromium	0.10	U	0.20	0.10	mg/Kg		01/11/23 10:52	01/11/23 19:16	1
Lead	0.10	U	0.20	0.10	mg/Kg		01/11/23 10:52	01/11/23 19:16	1

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 670-17850/3-A
Matrix: Solid
Analysis Batch: 18019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17850

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.20	U	0.40	0.20	mg/Kg		01/11/23 10:52	01/11/23 19:16	1
Silver	0.050	U	0.10	0.050	mg/Kg		01/11/23 10:52	01/11/23 19:16	1

Lab Sample ID: LCS 670-17850/1-A
Matrix: Solid
Analysis Batch: 18019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 17850

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	10.0	9.47		mg/Kg		95	80 - 120
Barium	10.0	10.0		mg/Kg		100	80 - 120
Cadmium	10.0	9.58		mg/Kg		96	80 - 120
Chromium	10.0	9.74		mg/Kg		97	80 - 120
Lead	10.0	9.63		mg/Kg		96	80 - 120
Selenium	10.0	9.29		mg/Kg		93	80 - 120
Silver	10.0	9.55		mg/Kg		96	80 - 120

Lab Sample ID: LCSD 670-17850/2-A
Matrix: Solid
Analysis Batch: 18019

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17850

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	10.0	9.57		mg/Kg		96	80 - 120	1	20
Barium	10.0	10.1		mg/Kg		101	80 - 120	1	20
Cadmium	10.0	9.65		mg/Kg		96	80 - 120	1	20
Chromium	10.0	9.85		mg/Kg		98	80 - 120	1	20
Lead	10.0	9.69		mg/Kg		97	80 - 120	1	20
Selenium	10.0	8.98		mg/Kg		90	80 - 120	3	20
Silver	10.0	9.43		mg/Kg		94	80 - 120	1	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 670-17815/11-A
Matrix: Solid
Analysis Batch: 17913

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 17815

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.020	U	0.040	0.020	mg/Kg		01/11/23 08:31	01/11/23 14:48	1

Lab Sample ID: LCSD 670-17815/10-A
Matrix: Solid
Analysis Batch: 17913

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 17815

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.200	0.195		mg/Kg		98	75 - 125	4	20

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 400-608672/1-A

Matrix: Solid

Analysis Batch: 609425

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 608672

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.13	U	0.25	0.13	mg/Kg		01/16/23 13:41	01/20/23 21:05	1

Lab Sample ID: LCS 400-608672/2-A

Matrix: Solid

Analysis Batch: 609425

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 608672

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.281	0.239		mg/Kg		85	75 - 125

Lab Sample ID: 670-12724-1 MS

Matrix: Solid

Analysis Batch: 609425

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608672

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.13	U	10.1	7.54		mg/Kg	⚠	75	57 - 136

Lab Sample ID: 670-12724-1 MSD

Matrix: Solid

Analysis Batch: 609425

Client Sample ID: Q6RS-FILLDIRT1-20230110

Prep Type: Total/NA

Prep Batch: 608672

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.13	U	10.1	8.02		mg/Kg	⚠	80	57 - 136	6	20

Lab Sample ID: MRL 400-609425/4

Matrix: Solid

Analysis Batch: 609425

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.00500	0.00324	I	mg/Kg		65	50 - 150

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

GC/MS VOA

Prep Batch: 17629

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	5035	

Analysis Batch: 17984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8260D	17629
MB 670-17984/8	Method Blank	Total/NA	Solid	8260D	
LCS 670-17984/4	Lab Control Sample	Total/NA	Solid	8260D	
LCSD 670-17984/5	Lab Control Sample Dup	Total/NA	Solid	8260D	

GC/MS Semi VOA

Prep Batch: 18478

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
MB 670-18478/1-A	Method Blank	Total/NA	Solid	3546	
LCS 670-18478/2-A	Lab Control Sample	Total/NA	Solid	3546	
660-126256-A-13-A MS	Matrix Spike	Total/NA	Solid	3546	
660-126256-A-13-B MSD	Matrix Spike Duplicate	Total/NA	Solid	3546	

Analysis Batch: 18585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8270E SIM	18478
MB 670-18478/1-A	Method Blank	Total/NA	Solid	8270E SIM	18478
LCS 670-18478/2-A	Lab Control Sample	Total/NA	Solid	8270E SIM	18478
660-126256-A-13-A MS	Matrix Spike	Total/NA	Solid	8270E SIM	18478
660-126256-A-13-B MSD	Matrix Spike Duplicate	Total/NA	Solid	8270E SIM	18478

Prep Batch: 608596

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
MB 400-608596/1-A	Method Blank	Total/NA	Solid	3546	
LCS 400-608596/2-A	Lab Control Sample	Total/NA	Solid	3546	
400-231772-E-1-D MS	Matrix Spike	Total/NA	Solid	3546	
400-231772-E-1-E MSD	Matrix Spike Duplicate	Total/NA	Solid	3546	

Analysis Batch: 608998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8270E	608596
MB 400-608596/1-A	Method Blank	Total/NA	Solid	8270E	608596
400-231772-E-1-D MS	Matrix Spike	Total/NA	Solid	8270E	608596
400-231772-E-1-E MSD	Matrix Spike Duplicate	Total/NA	Solid	8270E	608596

Analysis Batch: 609136

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 400-608596/2-A	Lab Control Sample	Total/NA	Solid	8270E	608596

Prep Batch: 609285

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
MB 400-609285/1-A	Method Blank	Total/NA	Solid	3546	
LCS 400-609285/2-A	Lab Control Sample	Total/NA	Solid	3546	

Eurofins Orlando

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

GC/MS Semi VOA (Continued)

Prep Batch: 609285 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
762-588-A-3-A MS	Matrix Spike	Total/NA	Solid	3546	
762-588-A-3-B MSD	Matrix Spike Duplicate	Total/NA	Solid	3546	

Analysis Batch: 609569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8270D	609285
MB 400-609285/1-A	Method Blank	Total/NA	Solid	8270D	609285
LCS 400-609285/2-A	Lab Control Sample	Total/NA	Solid	8270D	609285
762-588-A-3-A MS	Matrix Spike	Total/NA	Solid	8270D	609285
762-588-A-3-B MSD	Matrix Spike Duplicate	Total/NA	Solid	8270D	609285

GC Semi VOA

Prep Batch: 18266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
MB 670-18266/1-A	Method Blank	Total/NA	Solid	3546	
LCS 670-18266/2-A	Lab Control Sample	Total/NA	Solid	3546	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	

Analysis Batch: 18748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	FL-PRO	18266
MB 670-18266/1-A	Method Blank	Total/NA	Solid	FL-PRO	18266
LCS 670-18266/2-A	Lab Control Sample	Total/NA	Solid	FL-PRO	18266
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	FL-PRO	18266
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	FL-PRO	18266

Prep Batch: 608618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
MB 400-608618/1-A	Method Blank	Total/NA	Solid	3546	
LCS 400-608618/16-A	Lab Control Sample	Total/NA	Solid	3546	
LCS 400-608618/2-A	Lab Control Sample	Total/NA	Solid	3546	
LCSD 400-608618/17-A	Lab Control Sample Dup	Total/NA	Solid	3546	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3546	

Prep Batch: 608953

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	
MB 400-608953/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 400-608953/2-A	Lab Control Sample	Total/NA	Solid	8151A	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	

Analysis Batch: 608960

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8082A	608618
MB 400-608618/1-A	Method Blank	Total/NA	Solid	8082A	608618

Eurofins Orlando

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

GC Semi VOA (Continued)

Analysis Batch: 608960 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 400-608618/16-A	Lab Control Sample	Total/NA	Solid	8082A	608618
LCSD 400-608618/17-A	Lab Control Sample Dup	Total/NA	Solid	8082A	608618

Analysis Batch: 608962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8081B	608618
MB 400-608618/1-A	Method Blank	Total/NA	Solid	8081B	608618
LCS 400-608618/2-A	Lab Control Sample	Total/NA	Solid	8081B	608618
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8081B	608618
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8081B	608618

Analysis Batch: 609453

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	608953
MB 400-608953/1-A	Method Blank	Total/NA	Solid	8151A	608953
LCS 400-608953/2-A	Lab Control Sample	Total/NA	Solid	8151A	608953
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	608953
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8151A	608953

LCMS

Prep Batch: 336883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	537 (mod)	
MB 410-336883/1-B	Method Blank	Total/NA	Solid	537 (mod)	
LCS 410-336883/2-B	Lab Control Sample	Total/NA	Solid	537 (mod)	

Cleanup Batch: 336954

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	Extract Aliquot	336883
MB 410-336883/1-B	Method Blank	Total/NA	Solid	Extract Aliquot	336883
LCS 410-336883/2-B	Lab Control Sample	Total/NA	Solid	Extract Aliquot	336883

Analysis Batch: 338182

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	537 IDA	336954
MB 410-336883/1-B	Method Blank	Total/NA	Solid	537 IDA	336954
LCS 410-336883/2-B	Lab Control Sample	Total/NA	Solid	537 IDA	336954

Specialty Organics

Prep Batch: 337449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	HRMS-Soxtherm	
MB 410-337449/1-A	Method Blank	Total/NA	Solid	HRMS-Soxtherm	
LCS 410-337449/2-A	Lab Control Sample	Total/NA	Solid	HRMS-Soxtherm	

Analysis Batch: 337940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	8290A	337449
MB 410-337449/1-A	Method Blank	Total/NA	Solid	8290A	337449
LCS 410-337449/2-A	Lab Control Sample	Total/NA	Solid	8290A	337449

Eurofins Orlando

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Metals

Prep Batch: 17815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	7471B	
MB 670-17815/11-A	Method Blank	Total/NA	Solid	7471B	
LCSD 670-17815/10-A	Lab Control Sample Dup	Total/NA	Solid	7471B	

Prep Batch: 17850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	3050B	
MB 670-17850/3-A	Method Blank	Total/NA	Solid	3050B	
LCS 670-17850/1-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 670-17850/2-A	Lab Control Sample Dup	Total/NA	Solid	3050B	

Analysis Batch: 17913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	7471B	17815
MB 670-17815/11-A	Method Blank	Total/NA	Solid	7471B	17815
LCSD 670-17815/10-A	Lab Control Sample Dup	Total/NA	Solid	7471B	17815

Analysis Batch: 18019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	6020B	17850
MB 670-17850/3-A	Method Blank	Total/NA	Solid	6020B	17850
LCS 670-17850/1-A	Lab Control Sample	Total/NA	Solid	6020B	17850
LCSD 670-17850/2-A	Lab Control Sample Dup	Total/NA	Solid	6020B	17850

General Chemistry

Analysis Batch: 17845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	Moisture	
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	SM 2540G	
670-12756-A-1 DU	Duplicate	Total/NA	Solid	Moisture	

Prep Batch: 608672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	
MB 400-608672/1-A	Method Blank	Total/NA	Solid	9012B	
LCS 400-608672/2-A	Lab Control Sample	Total/NA	Solid	9012B	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	

Analysis Batch: 609425

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-12724-1	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	608672
MB 400-608672/1-A	Method Blank	Total/NA	Solid	9012B	608672
LCS 400-608672/2-A	Lab Control Sample	Total/NA	Solid	9012B	608672
MRL 400-609425/4	Lab Control Sample	Total/NA	Solid	9012B	
670-12724-1 MS	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	608672
670-12724-1 MSD	Q6RS-FILLDIRT1-20230110	Total/NA	Solid	9012B	608672

Eurofins Orlando

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Moisture		1	17845	IF	EET ORL	01/11/23 10:07
Total/NA	Analysis	SM 2540G		1	17845	IF	EET ORL	01/11/23 10:07

Client Sample ID: Q6RS-FILLDIRT1-20230110

Lab Sample ID: 670-12724-1

Date Collected: 01/10/23 10:07

Matrix: Solid

Date Received: 01/10/23 13:35

Percent Solids: 99.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	5035			17629	RG	EET ORL	01/11/23 10:38
Total/NA	Analysis	8260D		1	17984	K1P	EET ORL	01/12/23 16:39
Total/NA	Prep	3546			609285	LH	EET PEN	01/20/23 11:33
Total/NA	Analysis	8270D		1	609569	KJA	EET PEN	01/23/23 18:37
Total/NA	Prep	3546			608596	LH	EET PEN	01/16/23 08:32
Total/NA	Analysis	8270E		1	608998	S1B	EET PEN	01/19/23 02:32
Total/NA	Prep	3546			18478	SI	EET ORL	01/16/23 06:29
Total/NA	Analysis	8270E SIM		5	18585	JI	EET ORL	01/16/23 21:55
Total/NA	Prep	3546			608618	LH	EET PEN	01/16/23 09:27
Total/NA	Analysis	8081B		1	608962	DS	EET PEN	01/18/23 15:42
Total/NA	Prep	3546			608618	LH	EET PEN	01/16/23 09:27
Total/NA	Analysis	8082A		1	608960	DS	EET PEN	01/18/23 15:42
Total/NA	Prep	8151A			608953	LH	EET PEN	01/18/23 11:35
Total/NA	Analysis	8151A		1	609453	DS	EET PEN	01/22/23 16:45
Total/NA	Prep	3546			18266	YM	EET ORL	01/13/23 07:57
Total/NA	Analysis	FL-PRO		1	18748	FC	EET ORL	01/17/23 22:15
Total/NA	Prep	537 (mod)			336883	Q5YX	ELLE	01/19/23 08:56
Total/NA	Cleanup	Extract Aliquot			336954	Q5YX	ELLE	01/19/23 11:03
Total/NA	Analysis	537 IDA		1	338182	PY4D	ELLE	01/24/23 14:48
Total/NA	Prep	HRMS-Soxtherm			337449	SJ7Z	ELLE	01/20/23 16:40
Total/NA	Analysis	8290A		1	337940	UMA9	ELLE	01/24/23 00:12
Total/NA	Prep	3050B			17850	AS	EET ORL	01/11/23 10:52
Total/NA	Analysis	6020B		5	18019	JA	EET ORL	01/11/23 19:24
Total/NA	Prep	7471B			17815	AS	EET ORL	01/11/23 08:31
Total/NA	Analysis	7471B		1	17913	NR	EET ORL	01/11/23 14:52
Total/NA	Prep	9012B			608672	VB	EET PEN	01/16/23 13:41
Total/NA	Analysis	9012B		1	609425	DEK	EET PEN	01/20/23 21:10

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

EET PEN = Eurofins Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Eurofins Orlando

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Laboratory: Eurofins Orlando

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260D	5035	Solid	1,1-Dichloroethane
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
SM 2540G		Solid	Total Solids

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E87997	07-02-23

Laboratory: Eurofins Pensacola

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E81010	06-30-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8270D	3546	Solid	Azinphos-methyl
8270D	3546	Solid	Diazinon
8270D	3546	Solid	Methyl parathion

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET ORL
8270D	Pesticides by GC/MS	SW846	EET PEN
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET PEN
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	EET ORL
8081B	Organochlorine Pesticides (GC)	SW846	EET PEN
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	EET PEN
8151A	Herbicides (GC)	SW846	EET PEN
FL-PRO	Florida - Petroleum Range Organics (GC)	FL-DEP	EET ORL
537 IDA	EPA 537 Isotope Dilution	EPA	ELLE
8290A	Dioxins and Furans (HRGC/HRMS)	SW846	ELLE
6020B	Metals (ICP/MS)	SW846	EET ORL
7471B	Mercury (CVAA)	SW846	EET ORL
9012B	Cyanide, Total and/or Amenable	SW846	EET PEN
Moisture	Percent Moisture	EPA	EET ORL
SM 2540G	Total, Fixed, and Volatile Solids	SM	EET ORL
3050B	Preparation, Metals	SW846	EET ORL
3546	Microwave Extraction	SW846	EET ORL
3546	Microwave Extraction	SW846	EET PEN
5035	Closed System Purge and Trap	SW846	EET ORL
537 (mod)	EPA 537 Isotope Dilution	EPA	ELLE
7471B	Preparation, Mercury	SW846	EET ORL
8151A	Extraction (Herbicides)	SW846	EET PEN
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET PEN
Extract Aliquot	Preparation, Extract Aliquot	None	ELLE
HRMS-Soxtherm	Soxtherm Extraction	EPA	ELLE

Protocol References:

EPA = US Environmental Protection Agency

FL-DEP = State Of Florida Department Of Environmental Protection, Florida Administrative Code.

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

EET PEN = Eurofins Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC Backfill

Job ID: 670-12724-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-12724-1	Q6RS-FILLDIRT1-20230110	Solid	01/10/23 10:07	01/10/23 13:35

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

(1) **AA**=Ambient air, **AQ**=Air quality control, **ASB**=Asbestos, **CK**=Caulk, **DS**=Storm drain sediment, **GS**=Soil gas, **IC**=IDW Concrete, **IDD**=IDW Solid, **IDS**=IDW soil, **IDW**=IDW Water, **LF**=Free Product, **MA**=Mastic, **PC**=Paint Chips, **SC**=Cement/Concrete, **SE**=Sediment, **SL**=Sludge, **SO**=Soil, **SQ**=Soil/Solid quality control, **SSD**=Subsurface sediment, **SU**=Surface soil (<6 in), **SW**=Swab or wipe, **TA**=Animal tissue, **TP**=Plant tissue, **TQ**=Tissue quality control, **WG**=Ground water, **WL**=Leachate, **WO**=Ocean water, **WP**=Drinking water, **WQ**=Water quality control, **WR**=Ground water effluent, **WS**=Surface water, **WU**=Storm water, **WW**=Waste water

(2) **Sample Type:** **AB**=Ambient Blk, **EB**=Equipment Blk, **FB**=Field Blk, **FD**=Field Duplicate Sample, **IDW**=Investigative-Derived Waste, **MIS**=Incremental Sampling Methodology, **N**=Normal Environmental Sample, **TB**=Trip Blk

(3) **Preservative added:** 4 **DEG C**=Cool to 4 degrees, **Dark**=Store in Darkness, store cool at 4 degrees **C H2SO4**=Hydrogen sulfide, **H2SO4 <2**=Adjust to pH < 2 with sulfuric acid, **H3PO4 <2**=Adjust to pH < 2 with phosphoric acid, **H3PO4 <2**=Adjust to pH < 2 with hydrochloric acid, **HNaO4S**=Sodium bisulfate preservation, **HNO3 <2**=Adjust to pH < 2 with nitric acid, **MeOH**=Methanol preservation, **Na2O3S2**=Sodium thiosulfate, **Na2O3S2 3/gal**=Add 3 mL 10% sodium thiosulfate per l-gal, **Na2O3S2 4/4oz**=4 drops of 10% sodium thiosulfate to 4 oz, **NaHSO4 <2**=Adjust to pH < 2 with sodium hydrogen sulfide, **NaOH >12**=Adjust to pH > 12 with sodium hydroxide, **NaOH >9**=Adjust to pH > 9 with sodium hydroxide, **VRC 0.6/500**=0.6 g of ascorbic acid to 500mLs, **ZnAct 2/500**=Add 2 mL of zinc acetate to 500mLs, **ZnAct >9**=Zinc acetate and NaOH to pH>9; store cool at 4C If **NO preservative** added leave blank

Rev 8/19

[illegible]

3

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-12724-1

Login Number: 12724

List Number: 1

Creator: Ferguson, Craig

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-12724-1

Login Number: 12724

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 2

List Creation: 01/12/23 03:32 PM

Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $> 6\text{mm}$ in diameter (none, if from WV)?	N/A	

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-12724-1

Login Number: 12724

List Number: 3

Creator: Peckinpaugh, Marshall

List Source: Eurofins Pensacola

List Creation: 01/12/23 04:52 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.5°C IR8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

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JOB DESCRIPTION

NASA KSC - Soil Interim Measures at Various Sites
SDG NUMBER Q6 Radar Station

JOB NUMBER

670-13680-1

Eurofins Orlando

Job Notes

The test results in this report meet NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted. Results pertain only to samples listed in this report. This report may not be reproduced, except in full, without the written approval of the laboratory. Questions should be directed to the person who signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various
Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Qualifiers

Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
J3	Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Job ID: 670-13680-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-13680-1

Receipt

The sample was received on 1/27/2023 2:38 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 20.7°C

Metals

Method 6020B: The TCLP leachate blank for batch 860-87989 and 860-88104 contained Barium above the reporting limit (RL). This target analyte concentration was less than the TCLP Regulatory Limit. The associated samples were also below the TCLP Regulatory Limit for this analyte; therefore, re-extraction was not performed.

Method 6020B: The matrix spike (MS) recoveries for preparation batch 860-87989 and 860-88104 and analytical batch 860-88317 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: AECOM Technical Services Inc.
 Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
 SDG: Q6 Radar Station

Client Sample ID: Q6RS-CP0001-000.5-20230127

Lab Sample ID: 670-13680-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.2		1.1	0.54	mg/Kg	5	✱	6020B	Total/NA
Barium	170	J3	2.2	1.1	mg/Kg	5	✱	6020B	Total/NA
Cadmium	5.0		1.1	0.54	mg/Kg	5	✱	6020B	Total/NA
Chromium	23	J3	1.1	0.54	mg/Kg	5	✱	6020B	Total/NA
Lead	93	J3	1.1	0.54	mg/Kg	5	✱	6020B	Total/NA
Silver	0.27	I	0.54	0.27	mg/Kg	5	✱	6020B	Total/NA
Arsenic	4.6	I	20	1.5	ug/L	1		6020B	TCLP
Barium	610	J3	20	6.7	ug/L	1		6020B	TCLP
Cadmium	91		10	1.2	ug/L	1		6020B	TCLP
Chromium	4.3	I	20	2.8	ug/L	1		6020B	TCLP
Lead	240		10	0.56	ug/L	1		6020B	TCLP
Selenium	1.4	I	10	1.3	ug/L	1		6020B	TCLP

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Client Sample ID: Q6RS-CP0001-000.5-20230127

Lab Sample ID: 670-13680-1

Date Collected: 01/27/23 12:55

Matrix: Solid

Date Received: 01/27/23 14:38

Percent Solids: 88.6

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.2		1.1	0.54	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Barium	170	J3	2.2	1.1	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Cadmium	5.0		1.1	0.54	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Chromium	23	J3	1.1	0.54	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Lead	93	J3	1.1	0.54	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Selenium	1.1	U	2.2	1.1	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5
Silver	0.27	I	0.54	0.27	mg/Kg	✱	01/27/23 17:07	01/30/23 13:59	5

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	4.6	I	20	1.5	ug/L		01/31/23 09:30	02/01/23 00:30	1
Barium	610	J3	20	6.7	ug/L		01/31/23 09:30	02/01/23 00:30	1
Cadmium	91		10	1.2	ug/L		01/31/23 09:30	02/01/23 00:30	1
Chromium	4.3	I	20	2.8	ug/L		01/31/23 09:30	02/01/23 00:30	1
Lead	240		10	0.56	ug/L		01/31/23 09:30	02/01/23 00:30	1
Selenium	1.4	I	10	1.3	ug/L		01/31/23 09:30	02/01/23 00:30	1
Silver	0.78	U	10	0.78	ug/L		01/31/23 09:30	02/01/23 00:30	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.032	U	0.20	0.032	ug/L		01/31/23 10:20	01/31/23 17:33	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.022	U	0.044	0.022	mg/Kg	✱	01/31/23 09:31	01/31/23 15:20	1

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-20323/3-A

Matrix: Solid

Analysis Batch: 20571

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 20323

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.10	U	0.20	0.10	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Barium	0.20	U	0.40	0.20	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Cadmium	0.10	U	0.20	0.10	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Chromium	0.15	U	0.15	0.15	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Lead	0.10	U	0.20	0.10	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Selenium	0.20	U	0.40	0.20	mg/Kg		01/27/23 17:07	01/30/23 13:51	1
Silver	0.050	U	0.10	0.050	mg/Kg		01/27/23 17:07	01/30/23 13:51	1

Lab Sample ID: LCS 670-20323/1-A

Matrix: Solid

Analysis Batch: 20571

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 20323

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	10.0	9.92		mg/Kg		99	80 - 120
Barium	10.0	10.7		mg/Kg		107	80 - 120
Cadmium	10.0	9.98		mg/Kg		100	80 - 120
Chromium	10.0	9.90		mg/Kg		99	80 - 120
Lead	10.0	9.91		mg/Kg		99	80 - 120
Selenium	10.0	10.2		mg/Kg		102	80 - 120
Silver	10.0	9.07		mg/Kg		91	80 - 120

Lab Sample ID: LCSD 670-20323/2-A

Matrix: Solid

Analysis Batch: 20571

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 20323

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	10.0	10.0		mg/Kg		100	80 - 120	1	20
Barium	10.0	10.8		mg/Kg		108	80 - 120	1	20
Cadmium	10.0	9.97		mg/Kg		100	80 - 120	0	20
Chromium	10.0	10.1		mg/Kg		101	80 - 120	2	20
Lead	10.0	10.2		mg/Kg		102	80 - 120	2	20
Selenium	10.0	10.1		mg/Kg		101	80 - 120	1	20
Silver	10.0	8.98		mg/Kg		90	80 - 120	1	20

Lab Sample ID: 670-13680-1 MS

Matrix: Solid

Analysis Batch: 20571

Client Sample ID: Q6RS-CP0001-000.5-20230127

Prep Type: Total/NA

Prep Batch: 20323

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.2		11.2	13.1		mg/Kg	✱	107	75 - 125
Barium	170	J3	11.2	145	J3	mg/Kg	✱	-215	75 - 125
Cadmium	5.0		11.2	16.2		mg/Kg	✱	100	75 - 125
Chromium	23	J3	11.2	40.4	J3	mg/Kg	✱	151	75 - 125
Lead	93	J3	11.2	120	J3	mg/Kg	✱	243	75 - 125
Selenium	1.1	U	11.2	13.2		mg/Kg	✱	118	75 - 125
Silver	0.27	I	11.2	10.6		mg/Kg	✱	95	75 - 125

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 670-13680-1 MSD

Matrix: Solid

Analysis Batch: 20571

Client Sample ID: Q6RS-CP0001-000.5-20230127

Prep Type: Total/NA

Prep Batch: 20323

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.2		11.2	13.3		mg/Kg	✱	109	75 - 125	1	20
Barium	170	J3	11.2	146	J3	mg/Kg	✱	-205	75 - 125	1	20
Cadmium	5.0		11.2	16.0		mg/Kg	✱	98	75 - 125	1	20
Chromium	23	J3	11.2	40.6	J3	mg/Kg	✱	154	75 - 125	1	20
Lead	93	J3	11.2	120	J3	mg/Kg	✱	237	75 - 125	1	20
Selenium	1.1	U	11.2	12.8		mg/Kg	✱	115	75 - 125	3	20
Silver	0.27	I	11.2	10.6		mg/Kg	✱	95	75 - 125	0	20

Lab Sample ID: MB 860-88104/1-A

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 88104

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil	Fac
Arsenic	0.29	U	4.0	0.29	ug/L		01/31/23 09:30	01/31/23 22:56		1
Barium	1.3	U	4.0	1.3	ug/L		01/31/23 09:30	01/31/23 22:56		1
Cadmium	0.24	U	2.0	0.24	ug/L		01/31/23 09:30	01/31/23 22:56		1
Chromium	0.56	U	4.0	0.56	ug/L		01/31/23 09:30	01/31/23 22:56		1
Lead	0.11	U	2.0	0.11	ug/L		01/31/23 09:30	01/31/23 22:56		1
Selenium	0.27	U	2.0	0.27	ug/L		01/31/23 09:30	01/31/23 22:56		1
Silver	0.16	U	2.0	0.16	ug/L		01/31/23 09:30	01/31/23 22:56		1

Lab Sample ID: LCS 860-88104/2-A

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 88104

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	100	93.5		ug/L		94	80 - 120
Barium	100	92.6		ug/L		93	80 - 120
Cadmium	100	95.5		ug/L		95	80 - 120
Chromium	100	94.0		ug/L		94	80 - 120
Lead	100	94.0		ug/L		94	80 - 120
Selenium	100	91.2		ug/L		91	80 - 120
Silver	50.0	52.1		ug/L		104	80 - 120

Lab Sample ID: LCSD 860-88104/3-A

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 88104

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	100	93.9		ug/L		94	80 - 120	0	20
Barium	100	91.4		ug/L		91	80 - 120	1	20
Cadmium	100	96.4		ug/L		96	80 - 120	1	20
Chromium	100	93.9		ug/L		94	80 - 120	0	20
Lead	100	93.3		ug/L		93	80 - 120	1	20
Selenium	100	93.6		ug/L		94	80 - 120	3	20
Silver	50.0	53.2		ug/L		106	80 - 120	2	20

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 560-107561-A-1-C MSD

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

Prep Batch: 88104

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	10		100	106		ug/L		95	75 - 125	0	20
Barium	19		100	115		ug/L		96	75 - 125	0	20
Cadmium	0.24	U	100	94.2		ug/L		94	75 - 125	1	20
Chromium	3.4	I	100	98.6		ug/L		95	75 - 125	0	20
Lead	0.49	I	100	98.3		ug/L		98	75 - 125	0	20
Selenium	3.3		100	97.1		ug/L		94	75 - 125	0	20
Silver	0.16	U	50.0	49.1		ug/L		98	75 - 125	0	20

Lab Sample ID: LB 860-87989/1-B

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Method Blank

Prep Type: TCLP

Prep Batch: 88104

Analyte	LB Result	LB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.5	U	20	1.5	ug/L		01/31/23 09:30	02/01/23 00:27	1
Barium	44.2		20	6.7	ug/L		01/31/23 09:30	02/01/23 00:27	1
Cadmium	1.2	U	10	1.2	ug/L		01/31/23 09:30	02/01/23 00:27	1
Chromium	2.8	U	20	2.8	ug/L		01/31/23 09:30	02/01/23 00:27	1
Lead	0.56	U	10	0.56	ug/L		01/31/23 09:30	02/01/23 00:27	1
Selenium	1.3	U	10	1.3	ug/L		01/31/23 09:30	02/01/23 00:27	1
Silver	0.78	U	10	0.78	ug/L		01/31/23 09:30	02/01/23 00:27	1

Lab Sample ID: 670-13680-1 MS

Matrix: Solid

Analysis Batch: 88317

Client Sample ID: Q6RS-CP0001-000.5-20230127

Prep Type: TCLP

Prep Batch: 88104

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.6	I	100	98.4		ug/L		94	75 - 125
Barium	610	J3	100	650	J3	ug/L		42	75 - 125
Cadmium	91		100	181		ug/L		90	75 - 125
Chromium	4.3	I	100	98.1		ug/L		94	75 - 125
Lead	240		100	317		ug/L		81	75 - 125
Selenium	1.4	I	100	92.1		ug/L		91	75 - 125
Silver	0.78	U	50.0	50.3		ug/L		101	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 860-88110/1-A

Matrix: Solid

Analysis Batch: 88230

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 88110

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.032	U	0.20	0.032	ug/L		01/31/23 10:19	01/31/23 16:53	1

Lab Sample ID: LCS 860-88110/2-A

Matrix: Solid

Analysis Batch: 88230

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 88110

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	2.00	1.93		ug/L		97	80 - 120

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QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCSD 860-88110/3-A
Matrix: Solid
Analysis Batch: 88230

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 88110

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	2.00	1.95		ug/L		97	80 - 120	1	20

Lab Sample ID: LB 860-87989/1-D
Matrix: Solid
Analysis Batch: 88230

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 88110

Analyte	LB Result	LB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.032	U	0.20	0.032	ug/L		01/31/23 10:20	01/31/23 16:57	1

Lab Sample ID: 860-41891-A-1-K MS
Matrix: Solid
Analysis Batch: 88230

Client Sample ID: Matrix Spike
Prep Type: TCLP
Prep Batch: 88110

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.032	U	2.00	1.81		ug/L		91	75 - 125

Lab Sample ID: 860-41891-A-1-L MSD
Matrix: Solid
Analysis Batch: 88230

Client Sample ID: Matrix Spike Duplicate
Prep Type: TCLP
Prep Batch: 88110

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.032	U	2.00	1.90		ug/L		95	75 - 125	5	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 670-20592/12-A
Matrix: Solid
Analysis Batch: 20694

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 20592

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.00025	U	0.00050	0.00025	mg/Kg		01/31/23 09:31	01/31/23 14:54	1

Lab Sample ID: LCS 670-20592/10-A
Matrix: Solid
Analysis Batch: 20694

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 20592

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.200	0.210		mg/Kg		105	75 - 125

Lab Sample ID: LCSD 670-20592/11-A
Matrix: Solid
Analysis Batch: 20694

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 20592

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.200	0.208		mg/Kg		104	75 - 125	1	20

Eurofins Orlando

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Metals

Prep Batch: 20323

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	3050B	
MB 670-20323/3-A	Method Blank	Total/NA	Solid	3050B	
LCS 670-20323/1-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 670-20323/2-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
670-13680-1 MS	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	3050B	
670-13680-1 MSD	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	3050B	

Analysis Batch: 20571

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	6020B	20323
MB 670-20323/3-A	Method Blank	Total/NA	Solid	6020B	20323
LCS 670-20323/1-A	Lab Control Sample	Total/NA	Solid	6020B	20323
LCSD 670-20323/2-A	Lab Control Sample Dup	Total/NA	Solid	6020B	20323
670-13680-1 MS	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	6020B	20323
670-13680-1 MSD	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	6020B	20323

Prep Batch: 20592

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	7471B	
MB 670-20592/12-A	Method Blank	Total/NA	Solid	7471B	
LCS 670-20592/10-A	Lab Control Sample	Total/NA	Solid	7471B	
LCSD 670-20592/11-A	Lab Control Sample Dup	Total/NA	Solid	7471B	

Analysis Batch: 20694

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	7471B	20592
MB 670-20592/12-A	Method Blank	Total/NA	Solid	7471B	20592
LCS 670-20592/10-A	Lab Control Sample	Total/NA	Solid	7471B	20592
LCSD 670-20592/11-A	Lab Control Sample Dup	Total/NA	Solid	7471B	20592

Leach Batch: 87989

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	TCLP	Solid	1311	
LB 860-87989/1-B	Method Blank	TCLP	Solid	1311	
LB 860-87989/1-D	Method Blank	TCLP	Solid	1311	
670-13680-1 MS	Q6RS-CP0001-000.5-20230127	TCLP	Solid	1311	
860-41891-A-1-K MS	Matrix Spike	TCLP	Solid	1311	
860-41891-A-1-L MSD	Matrix Spike Duplicate	TCLP	Solid	1311	

Prep Batch: 88104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	TCLP	Solid	3010A	87989
LB 860-87989/1-B	Method Blank	TCLP	Solid	3010A	87989
MB 860-88104/1-A	Method Blank	Total/NA	Solid	3010A	
LCS 860-88104/2-A	Lab Control Sample	Total/NA	Solid	3010A	
LCSD 860-88104/3-A	Lab Control Sample Dup	Total/NA	Solid	3010A	
560-107561-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	3010A	
670-13680-1 MS	Q6RS-CP0001-000.5-20230127	TCLP	Solid	3010A	87989

Eurofins Orlando

QC Association Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Metals

Prep Batch: 88110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	TCLP	Solid	7470A	87989
LB 860-87989/1-D	Method Blank	TCLP	Solid	7470A	87989
MB 860-88110/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 860-88110/2-A	Lab Control Sample	Total/NA	Solid	7470A	
LCSD 860-88110/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	
860-41891-A-1-K MS	Matrix Spike	TCLP	Solid	7470A	87989
860-41891-A-1-L MSD	Matrix Spike Duplicate	TCLP	Solid	7470A	87989

Analysis Batch: 88230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	TCLP	Solid	7470A	88110
LB 860-87989/1-D	Method Blank	TCLP	Solid	7470A	88110
MB 860-88110/1-A	Method Blank	Total/NA	Solid	7470A	88110
LCS 860-88110/2-A	Lab Control Sample	Total/NA	Solid	7470A	88110
LCSD 860-88110/3-A	Lab Control Sample Dup	Total/NA	Solid	7470A	88110
860-41891-A-1-K MS	Matrix Spike	TCLP	Solid	7470A	88110
860-41891-A-1-L MSD	Matrix Spike Duplicate	TCLP	Solid	7470A	88110

Analysis Batch: 88317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	TCLP	Solid	6020B	88104
LB 860-87989/1-B	Method Blank	TCLP	Solid	6020B	88104
MB 860-88104/1-A	Method Blank	Total/NA	Solid	6020B	88104
LCS 860-88104/2-A	Lab Control Sample	Total/NA	Solid	6020B	88104
LCSD 860-88104/3-A	Lab Control Sample Dup	Total/NA	Solid	6020B	88104
560-107561-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Solid	6020B	88104
670-13680-1 MS	Q6RS-CP0001-000.5-20230127	TCLP	Solid	6020B	88104

General Chemistry

Analysis Batch: 20595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-13680-1	Q6RS-CP0001-000.5-20230127	Total/NA	Solid	Moisture	
MB 670-20595/1	Method Blank	Total/NA	Solid	Moisture	
670-13679-A-2 DU	Duplicate	Total/NA	Solid	Moisture	

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Client Sample ID: Q6RS-CP0001-000.5-20230127

Lab Sample ID: 670-13680-1

Date Collected: 01/27/23 12:55

Matrix: Solid

Date Received: 01/27/23 14:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			87989	EMC	EET HOU	01/30/23 13:00 - 01/31/23 05:00 ¹
TCLP	Prep	3010A			88104	MD	EET HOU	01/31/23 09:30
TCLP	Analysis	6020B		1	88317	DP	EET HOU	02/01/23 00:30
TCLP	Leach	1311			87989	EMC	EET HOU	01/30/23 13:00 - 01/31/23 05:00 ¹
TCLP	Prep	7470A			88110	MCA	EET HOU	01/31/23 10:20
TCLP	Analysis	7470A		1	88230	SHZ	EET HOU	01/31/23 17:33
Total/NA	Analysis	Moisture		1	20595	IF	EET ORL	01/31/23 09:52

Client Sample ID: Q6RS-CP0001-000.5-20230127

Lab Sample ID: 670-13680-1

Date Collected: 01/27/23 12:55

Matrix: Solid

Date Received: 01/27/23 14:38

Percent Solids: 88.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3050B			20323	AS	EET ORL	01/27/23 17:07
Total/NA	Analysis	6020B		5	20571	JA	EET ORL	01/30/23 13:59
Total/NA	Prep	7471B			20592	NR	EET ORL	01/31/23 09:31
Total/NA	Analysis	7471B		1	20694	NR	EET ORL	01/31/23 15:20

¹ Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Laboratory: Eurofins Orlando

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Laboratory: Eurofins Houston

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	88-00759	08-04-23
Florida	NELAP	E871002	06-30-23
Louisiana	NELAP	03054	06-30-23
Louisiana (All)	NELAP	03054	06-30-23
Oklahoma	State	1306	08-31-23
Texas	NELAP	T104704215-22-48	06-30-23
Texas	TCEQ Water Supply	T104704215	12-28-25
USDA	US Federal Programs	P330-22-00025	03-02-23

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET HOU
6020B	Metals (ICP/MS)	SW846	EET ORL
7470A	Mercury (CVAA)	SW846	EET HOU
7471B	Mercury (CVAA)	SW846	EET ORL
Moisture	Percent Moisture	EPA	EET ORL
1311	TCLP Extraction	SW846	EET HOU
3010A	Preparation, Total Metals	SW846	EET HOU
3050B	Preparation, Metals	SW846	EET ORL
7470A	Preparation, Mercury	SW846	EET HOU
7471B	Preparation, Mercury	SW846	EET ORL

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET HOU = Eurofins Houston, 4145 Greenbriar Dr, Stafford, TX 77477, TEL (281)240-4200

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures at Various
Sites

Job ID: 670-13680-1
SDG: Q6 Radar Station

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-13680-1	Q6RS-CP0001-000.5-20230127	Solid	01/27/23 12:55	01/27/23 14:38

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14



670-13680 Chain of Custody

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-13680-1
SDG Number: Q6 Radar Station

Login Number: 13680

List Number: 1

Creator: Ferguson, Craig

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-13680-1
SDG Number: Q6 Radar Station

Login Number: 13680

List Number: 2

Creator: Pena, Jesiel

List Source: Eurofins Houston

List Creation: 01/28/23 02:10 PM

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	

ANALYTICAL REPORT

PREPARED FOR

Attn: Teresa Amentt Jennings
AECOM Technical Services Inc.
150 North Orange Avenue
Suite 200
Orlando, Florida 32801

Generated 6/13/2023 5:18:44 PM

JOB DESCRIPTION

NASA KSC - Soil Interim Measures SWPS

JOB NUMBER

670-20864-1

Eurofins Orlando

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



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Authorized for release by
Kaitlin Dylnicki, Project Manager
kaitlin.dylnicki@et.eurofinsus.com
(407)339-5984

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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Qualifiers

Metals

Qualifier	Qualifier Description
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Job ID: 670-20864-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative 670-20864-1

Receipt

The sample was received on 6/6/2023 2:49 PM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 8.5°C

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: AECOM Technical Services Inc.

Job ID: 670-20864-1

Project/Site: NASA KSC - Soil Interim Measures SWPS

Client Sample ID: Q6RS-MW0003-006.0-20230606

Lab Sample ID: 670-20864-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	18		4.4	2.2	ug/L	1		6020B	Total
Copper	14		2.2	1.1	ug/L	1		6020B	Recoverable
									Total
									Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins Orlando

Client Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Client Sample ID: Q6RS-MW0003-006.0-20230606

Lab Sample ID: 670-20864-1

Date Collected: 06/06/23 11:02

Matrix: Water

Date Received: 06/06/23 14:49

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	18		4.4	2.2	ug/L		06/07/23 11:23	06/07/23 21:51	1
Copper	14		2.2	1.1	ug/L		06/07/23 11:23	06/07/23 21:51	1

QC Sample Results

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-38139/3-A

Matrix: Water

Analysis Batch: 38343

Client Sample ID: Method Blank

Prep Type: Total Recoverable

Prep Batch: 38139

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	2.0	U	4.0	2.0	ug/L		06/07/23 11:23	06/07/23 21:26	1
Copper	1.0	U	2.0	1.0	ug/L		06/07/23 11:23	06/07/23 21:26	1

Lab Sample ID: LCS 670-38139/1-A

Matrix: Water

Analysis Batch: 38343

Client Sample ID: Lab Control Sample

Prep Type: Total Recoverable

Prep Batch: 38139

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	100	102		ug/L		102	80 - 120
Copper	100	96.2		ug/L		96	80 - 120

Lab Sample ID: LCSD 670-38139/2-A

Matrix: Water

Analysis Batch: 38343

Client Sample ID: Lab Control Sample Dup

Prep Type: Total Recoverable

Prep Batch: 38139

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	100	105		ug/L		105	80 - 120	3	20
Copper	100	99.2		ug/L		99	80 - 120	3	20

Lab Sample ID: 670-20878-A-1-A MS

Matrix: Water

Analysis Batch: 38343

Client Sample ID: Matrix Spike

Prep Type: Total Recoverable

Prep Batch: 38139

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	11		111	134		ug/L		110	75 - 125
Copper	1.1	U	111	111		ug/L		99	75 - 125

Lab Sample ID: 670-20878-A-1-B MSD

Matrix: Water

Analysis Batch: 38343

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total Recoverable

Prep Batch: 38139

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	11		111	129		ug/L		106	75 - 125	4	20
Copper	1.1	U	111	108		ug/L		97	75 - 125	3	20

QC Association Summary

Client: AECOM Technical Services Inc.

Job ID: 670-20864-1

Project/Site: NASA KSC - Soil Interim Measures SWPS

Metals

Prep Batch: 38139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20864-1	Q6RS-MW0003-006.0-20230606	Total Recoverable	Water	3005A	
MB 670-38139/3-A	Method Blank	Total Recoverable	Water	3005A	
LCS 670-38139/1-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 670-38139/2-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
670-20878-A-1-A MS	Matrix Spike	Total Recoverable	Water	3005A	
670-20878-A-1-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

Analysis Batch: 38343

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-20864-1	Q6RS-MW0003-006.0-20230606	Total Recoverable	Water	6020B	38139
MB 670-38139/3-A	Method Blank	Total Recoverable	Water	6020B	38139
LCS 670-38139/1-A	Lab Control Sample	Total Recoverable	Water	6020B	38139
LCSD 670-38139/2-A	Lab Control Sample Dup	Total Recoverable	Water	6020B	38139
670-20878-A-1-A MS	Matrix Spike	Total Recoverable	Water	6020B	38139
670-20878-A-1-B MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020B	38139

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Client Sample ID: Q6RS-MW0003-006.0-20230606
Date Collected: 06/06/23 11:02
Date Received: 06/06/23 14:49

Lab Sample ID: 670-20864-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total Recoverable	Prep	3005A			38139	JR	EET ORL	06/07/23 11:23
Total Recoverable	Analysis	6020B		1	38343	JA	EET ORL	06/07/23 21:51

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Project/Site: NASA KSC - Soil Interim Measures SWPS

Job ID: 670-20864-1

Laboratory: Eurofins Orlando

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

1

2

3

4

5

6

7

8

9

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Method Summary

Client: AECOM Technical Services Inc.

Job ID: 670-20864-1

Project/Site: NASA KSC - Soil Interim Measures SWPS

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET ORL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	EET ORL

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Sample Summary

Client: AECOM Technical Services Inc.

Job ID: 670-20864-1

Project/Site: NASA KSC - Soil Interim Measures SWPS

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-20864-1	Q6RS-MW0003-006.0-20230606	Water	06/06/23 11:02	06/06/23 14:49

1

2

3

4

5

6

7

8

9

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11

12

13

14

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 670-20864-1

Login Number: 20864

List Source: Eurofins Orlando

List Number: 1

Creator: Ferguson, Craig

Question	Answer	Comment
Radioactivity wasn't checked or is <= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX E

WASTE MANIFESTS AND WEIGHT TICKETS

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SITE

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

CUSTOMER

333337
HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

Contract:3779232146

Generator: NASA Kennedy Space Center

SITE

TICKET #

CELL

01

636898

WEIGHMASTER

Amanda P.

DATE/TIME IN

3/3/23 3:16 pm

DATE/TIME OUT

3/3/23 3:16 pm

VEHICLE

HULLS48328-SSWSI

CONTAINER

REFERENCE

WH101235184

BILL OF LADING

SCALE IN	GROSS WEIGHT	57,340	NET TONS	11.02
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	22,040

INBOUND
INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
0.00	YD	Tracking QTY				
11.02	tn	SW-CONT SOIL	Origin:BREVARD 100%			
Signature_____						

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

NET AMOUNT

TENDERED

CHANGE

CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

RS-F042UPR (04/19)

SIGNATURE

↑ GENERATOR ↓	NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number N.A	2. Page 1 of 1	3. Emergency Response Phone 866-450-9077	4. Waste Tracking Number WH101235184		
	5. Generator's Name and Mailing Address NASA Kennedy Space Center Environmental Assurance Branch KSC, FL 32899			Generator's Site Address (if different than mailing address) NASA Kennedy Space Center Site 06 Radar				
	6. Transporter 1 Company Name Hull's Environmental Services			U.S. EPA ID Number FLR000234492				
	7. Transporter 2 Company Name			U.S. EPA ID Number				
↑ TRANSPORTER ↓	8. Designated Facility Name and Site Address Cedar Trail Landfill 2500 State Road 60 West Bartow, Florida 33830 363-425-4884			U.S. EPA ID Number				
	Facility's Phone:							
	9. Waste Shipping Name and Description 1. NON RCRA NON REGULATED INDUSTRIAL SOLID WASTE			10. Containers		11. Total Quantity	12. Unit Wt./Vol.	
				No.	Type			
2.								
3.								
4.								
↑ DESIGNATED FACILITY ↓	13. Special Handling Instructions and Additional Information Hull's Environmental Services Emergency Response # 1-866-450-9077 9.1 Space Center Operations Refurbishment and Maintenance On The Radar Equipment Over Time HULL'S PO# WH101235184 Waste Profile #3779232146 Open Top Box # ER 2554							
	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.							
	Generator's/Offor's Printed/Typed Name Christopher Adkison			Signature [Signature]		Month	Day	Year
						02	27	23
↑ TRANSPORTER ↓	15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: Date leaving U.S.:							
	16. Transporter Acknowledgment of Receipt of Materials							
	Transporter 1 Printed/Typed Name X Bill [Signature]			Signature [Signature]		Month	Day	Year
	Transporter 2 Printed/Typed Name			Signature		Month	Day	Year
↑ DESIGNATED FACILITY ↓	17. Discrepancy							
	17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection							
	Manifest Reference Number:							
	17b. Alternate Facility (or Generator)			U.S. EPA ID Number				
↑ DESIGNATED FACILITY ↓	Facility's Phone:							
	17c. Signature of Alternate Facility (or Generator)					Month	Day	Year
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a								
Printed/Typed Name			Signature		Month	Day	Year	

SITE
Cedar Trail Landfill 863-533-8776
. 2500 W S.R. 60 Bartow, FL 33830

CUSTOMER
333337
HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

Contract:3779232146
Generator:NASA Kennedy Space Center

SITE 01	TICKET # 636275	CELL
WEIGHMASTER Amanda P.		
DATE/TIME IN 3/1/23 7:57 am	DATE/TIME OUT 3/1/23 8:15 am	
VEHICLE HULLS48328-SSWSI	CONTAINER	
REFERENCE WH101235184		
BILL OF LADING		

SCALE IN	GROSS WEIGHT	64,800	NET TONS	14.75	INBOUND
SCALE OUT	TARE WEIGHT	35,300	NET WEIGHT	29,500	INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
0.00	YD	Tracking QTY				
14.75	tn	SW-CONT SOIL Origin:BREVARD 100%				
Signature						

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

RS-F042UPR (04/19)

SIGNATURE _____

NET AMOUNT
TENDERED
CHANGE
CHECK#

SITE

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60-Bartow, FL 33830

333337

CUSTOMER

HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

Contract:3779232146

Generator:NASA Kennedy Space Center

SITE 01

TICKET # 636417

CELL

WEIGHMASTER

Amanda P.

DATE/TIME IN 3/1/23 2:05 pm

DATE/TIME OUT 3/1/23 2:05 pm

VEHICLE

HULLS48328-SSWSI

CONTAINER

REFERENCE

WH101235184

BILL OF LADING

SCALE IN	GROSS WEIGHT	61,400	NET TONS	13.05	INBOUND
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	26,100	INVOICE

QTY	UNIT	Tracking QTY	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
13.05	tn		SW-CONT SOIL Origin:BREVARD 100%				
Signature_____							

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

NET AMOUNT

TENDERED

CHANGE

CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

SITE

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60-Bartow, FL 33830

333337

CUSTOMER

HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

Contract:3779232146
Generator:NASA Kennedy Space Center

SITE

01

TICKET #

636650

CELL

WEIGHMASTER

Amanda P.

DATE/TIME IN

3/2/23 1:32 pm

DATE/TIME OUT

3/2/23 1:32 pm

VEHICLE

HULLS48328-SSWSI

CONTAINER

REFERENCE

WH101235184

BILL OF LADING

SCALE IN	GROSS WEIGHT	47,080	NET TONS	5.89	INBOUND
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	11,780	INVOICE

QTY	UNIT	Tracking QTY	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
5.89	tn	SW-CONT SOIL	Origin:BREVARD 100%				
Signature_____							

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

NET AMOUNT

TENDERED

CHANGE

CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

SIGNATURE_____

GENERATOR	NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number NA	2. Page 1 of 1	3. Emergency Response Phone 866-450-9077	4. Waste Tracking Number WH101235184		
	5. Generator's Name and Mailing Address NASA Kennedy Space Center Environmental Assurance Branch Mail Code SI-E2 KSC, FL 32899			Generator's Site Address (if different than mailing address) NASA Kennedy Space Center Site: Q6 Radar				
	Generator's Phone: 352-857-5364							
	6. Transporter 1 Company Name Hull's Environmental Services			U.S. EPA ID Number FLR000234497				
	7. Transporter 2 Company Name			U.S. EPA ID Number				
	8. Designated Facility Name and Site Address Cedar Trail Landfill 2500 State Road 60 West Bartow, Florida 33830 863-425-4884			U.S. EPA ID Number				
	Facility's Phone:							
	9. Waste Shipping Name and Description			10. Containers		11. Total Quantity	12. Unit Wt./Vol.	
				No.	Type			
	1.			001	CM	10	Y	
2.								
3.								
4.								
TRANSPORTER	13. Special Handling Instructions and Additional Information Hull's Environmental Services Emergency Response # 1-866-450-9077 9.1- Space Center Operations Refurbishment and Maintenance On The Radar Equipment Over Time HULL'S PO# WH101235184 Waste Profile #3779232146 Open Top Box # RT1501							
	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.							
	Generator's/Offor's Printed/Typed Name Christopher Adkinson			Signature [Signature]		Month	Day	Year
						02	27	23
	15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: _____							
	Transporter Signature (for exports only): _____ Date leaving U.S.: _____							
	16. Transporter Acknowledgment of Receipt of Materials							
	Transporter 1 Printed/Typed Name			Signature		Month	Day	Year
						02	27	23
	Transporter 2 Printed/Typed Name			Signature		Month	Day	Year
DESIGNATED FACILITY	17. Discrepancy							
	17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection							
	Manifest Reference Number:							
	17b. Alternate Facility (or Generator)			U.S. EPA ID Number				
	Facility's Phone:							
	17c. Signature of Alternate Facility (or Generator)					Month	Day	Year
	18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a							
	Printed/Typed Name			Signature		Month	Day	Year
						13	12	23

SITE 01	TICKET # 637865	CELL
WEIGHMASTER Amanda P.		
DATE/TIME IN 3/9/23 2:20 pm	DATE/TIME OUT 3/9/23 2:20 pm	
VEHICLE HULLS48328-SSWSI	CONTAINER	
REFERENCE WH101235184		
BILL OF LADING		

SCALE IN	GROSS WEIGHT	62,500	NET TONS	13.60	INBOUND
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	27,200	INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
0.00	YD	Tracking QTY				
13.60	tn	SW-CONT SOIL	Origin:BREVARD 100%			
						
Signature_____						

NET AMOUNT
TENDERED
CHANGE
CHECK#

SIGNATURE _____

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

**NON-HAZARDOUS
WASTE MANIFEST**

1. Generator ID Number

NA

2. Page 1 of

1

3. Emergency Response Phone

866 450 9077

4. Waste Tracking Number

WH101235184

5. Generator's Name and Mailing Address

Environmental
Assurance Branch

NASA Kennedy Space Center
Mail Code SE 2
KSC FL 32899

Generator's Site Address (if different than mailing address)

NASA Kennedy Space Center
Site 06 Radar

Generator's Phone:

321-887-3304

6. Transporter 1 Company Name

Hull's Environmental Services

U.S. EPA ID Number

FLR000234492

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

863-425 1889

Cedar Trail Landfill
2500 State Road 60 West
Lawrence, Florida 33830

U.S. EPA ID Number

Facility's Phone:

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total
Quantity

12. Unit
Wt./Vol.

1.

NON FLRA NON REGULATED INDUSTRIAL SOLID
WASTE

001

cm

10

Y

2.

3.

4.

13. Special Handling Instructions and Additional Information

Hull's Environmental Services Emergency Response V-1-866 450 9077
KSC Space Center Operations Refueling and Maintenance On The Radar Equipment Over Time
HULL'S POL WH101235184
Waste Profile 93779233346 : Open Top Box 11384406

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offor's Printed/Typed Name

Signature

Month Day Year

Christopher Arkinson

[Signature]

02 27 23

15. International Shipments

☐ Import to U.S.

☐ Export from U.S.

Port of entry/exit:

Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Signature

Month Day Year

[Signature]

[Signature]

02 27 23

Transporter 2 Printed/Typed Name

Signature

Month Day Year

17. Discrepancy

17a. Discrepancy Indication Space

☐ Quantity

☐ Type

☐ Residue

☐ Partial Rejection

☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)

Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

[Signature]

[Signature]

02 27 23

SITE 01	TICKET # 637375	CELL
WEIGHMASTER Amanda P.		
DATE/TIME IN 3/7/23 2:05 pm		DATE/TIME OUT 3/7/23 2:05 pm
VEHICLE HULLS48328-SSWSI		CONTAINER
REFERENCE WH101235184		
BILL OF LADING		

SCALE IN	GROSS WEIGHT	54,920	NET TONS	9.81	INBOUND
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	19,620	INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
0.00	YD	Tracking QTY				
9.81	tn	SW-CONT SOIL Origin:BREVARD 100%				
Signature_____						

NET AMOUNT
TENDERED
CHANGE
CHECK#

RS-F042UPR (04/19)

SIGNATURE _____

SITE

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60-Bartow, FL 33830

333337

CUSTOMER

HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

Contract:3779232146
Generator:NASA Kennedy Space Center

SITE

01

TICKET #

637223

CELL

WEIGHMASTER

Amanda P.

DATE/TIME IN

3/7/23 8:30 am

DATE/TIME OUT

3/7/23 8:30 am

VEHICLE

HULLS48328-SSWSI

CONTAINER

REFERENCE

WH101235184

BILL OF LADING

SCALE IN	GROSS WEIGHT	53,920	NET TONS	9.31	INBOUND
TARE OUT	TARE WEIGHT	35,300	NET WEIGHT	18,620	INVOICE

QTY	UNIT	Tracking QTY	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
9.31	tn	SW-CONT SOIL	Origin:BREVARD 100%				
Signature_____							

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

NET AMOUNT

TENDERED

CHANGE

CHECK#

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RS-F042UPR (04/19)

SIGNATURE_____

GENERATOR	NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number NA		2. Page 1 of 1		3. Emergency Response Phone 866-450-9077		4. Waste Tracking Number WH101235184			
	5. Generator's Name and Mailing Address NASA Kennedy Space Center Environmental Assurance Branch Mail Code-SI E2 KSC, FL 32899						Generator's Site Address (if different than mailing address) NASA Kennedy Space Center Site: Q6 Radar					
	Generator's Phone: 321-867-6064											
	6. Transporter 1 Company Name Hull's Environmental Services						U.S. EPA ID Number FL800023493					
	7. Transporter 2 Company Name						U.S. EPA ID Number					
	8. Designated Facility Name and Site Address Cedar Trail Landfill 2500 State Road 60 West Barrow, Florida 33830						U.S. EPA ID Number					
	Facility's Phone: 863-425-4826											
	9. Waste Shipping Name and Description NON RCRA NON REGULATED INDUSTRIAL SOLID WASTE						10. Containers		11. Total Quantity	12. Unit Wt./Vol.		
							No.	Type				
	1.						COI	CM	10	Y		
2.												
3.												
4.												
TRANSPORTER	13. Special Handling Instructions and Additional Information Hull's Environmental Services Emergency Response #1 866-450-9077 91 Space Center Operations Refurbishment and Maintenance On The Radar Equipment Over Time HULL'S POS WH101235184 Waste Profile 93779232146 Open Top Box # RT3256											
	14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.											
	Generator's/Offor's Printed/Typed Name Christopher Adkison					Signature [Signature]					Month Day Year 02 27 23	
	15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit: _____											
	Transporter Signature (for exports only): _____ Date leaving U.S.: _____											
	16. Transporter Acknowledgment of Receipt of Materials											
	Transporter 1 Printed/Typed Name Belva P					Signature [Signature]					Month Day Year 02 06 23	
	Transporter 2 Printed/Typed Name					Signature					Month Day Year	
	DESIGNATED FACILITY	17. Discrepancy										
		17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection										
17b. Alternate Facility (or Generator) Manifest Reference Number: _____ U.S. EPA ID Number _____												
Facility's Phone: _____												
17c. Signature of Alternate Facility (or Generator) _____ Month Day Year _____												
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a												
Printed/Typed Name OP					Signature OP					Month Day Year 12 31 23		

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01 636275

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/1/23 7:57 am 3/1/23 8:15 am
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	64,800	NET TONS	14.75	INBOUND
Scale Out TARE WEIGHT	35,300	NET WEIGHT	29,500	INVOICE

0.00	YD	Tracking QTY	
14.75	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01 636417

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/1/23 2:05 pm 3/1/23 2:05 pm
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	61,400	NET TONS	13.05	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	26,100	INVOICE

0.00	YD	Tracking QTY	
13.05	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01 636650

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/2/23 1:32 pm 3/2/23 1:32 pm
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	47,080	NET TONS	5.89	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	11,780	INVOICE

0.00	YD	Tracking QTY	
5.89	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01 636898

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/3/23 3:16 pm 3/3/23 3:16 pm
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	57,340	NET TONS	11.02	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	22,040	INVOICE

0.00	YD	Tracking QTY	
11.02	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01

637223

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/7/23 8:30 am 3/7/23 8:30 am
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	53,920	NET TONS	9.31	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	18,620	INVOICE

0.00	YD	Tracking QTY	
9.31	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01

637375

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/7/23 2:05 pm 3/7/23 2:05 pm
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	54,920	NET TONS	9.81	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	19,620	INVOICE

0.00	YD	Tracking QTY	
9.81	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

Cedar Trail Landfill 863-533-8776
2500 W S.R. 60 Bartow, FL 33830

01

637865

Amanda P.

333337 - HULLS ENVIRONMENTAL
1810 Industrial Pkwy
Panama City, FL 34205

3/9/23 2:20 pm 3/9/23 2:20 pm
HULLS48328-SSWSI
WH101235184

Contract:3779232146
Generator:NASA Kennedy Space Center

Scale In GROSS WEIGHT	62,500	NET TONS	13.60	INBOUND
Tare Out TARE WEIGHT	35,300	NET WEIGHT	27,200	INVOICE

0.00	YD	Tracking QTY	
13.60	tn	SW-CONT SOIL	Origin:BREVARD 100%

Hours: Monday - Friday 7:00 AM to 5:00 PM
Saturday 7:00 AM to 11:00 AM

CHANGE:
CHECK :

C.C. CALHOUN, INC.

P.O. BOX 1877
DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
1/25/2023	8121

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

CHECK NO.		PAYMENT METH...	PROJECT
		CREDIT CARD	
DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT 39172 (YARDS) Sales Tax	10		
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.

P.O. BOX 1877

DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
1/26/2023	8135

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

	CHECK NO.	PAYMENT METH..	PROJECT
		CREDIT CARD	
DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT (YARDS) 39198 Sales Tax	10		
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.

P.O. BOX 1877
DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
1/30/2023	9062

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT (YARDS)	10		
39252			
Sales Tax			
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.
P.O. BOX 1877
DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
1/3/2023	8878

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

CHECK NO.	PAYMENT METH...	PROJECT
	CREDIT CARD	

DESCRIPTION	QTY	RATE	AMOUNT
ST HELENA PIT FILL DIRT (YARDS) 63391 Sales Tax	10	7.00%	
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.

P.O. BOX 1877

DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
2/1/2023	8932

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

CHECK NO.	PAYMENT METH...	PROJECT
	CREDIT CARD	

DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT (YARDS) 39312 Sales Tax	10	7.00%	
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.
P.O. BOX 1877
DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
2/6/2023	8947

SOLD TO
HULL'S ENVIRONMENTAL SERVICES, LLC 950 WEST DERBY AVE AUBURNDALE, FL 33823

CHECK NO.	PAYMENT METH...	PROJECT
	CREDIT CARD	

DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT (YARDS) 39316 Sales Tax	10	7.00%	
THANK YOU FOR YOUR BUSINESS!		Total	

C.C. CALHOUN, INC.

P.O. BOX 1877

DUNDEE, FL 33838

Sales Receipt

DATE	SALE NO.
2/7/2023	8959

SOLD TO

HULL'S ENVIRONMENTAL SERVICES, LLC
950 WEST DERBY AVE
AUBURNDALE, FL 33823

CHECK NO.	PAYMENT METH...	PROJECT
	CREDIT CARD	

DESCRIPTION	QTY	RATE	AMOUNT
ST. HELENA PIT FILL DIRT (YARDS) 39318 2.7.2023	18		
ST. HELENA PIT FILL DIRT (YARDS) 39319 2.8.2023 Sales Tax	18	7.00%	
THANK YOU FOR YOUR BUSINESS!		Total	

APPENDIX F

RIS COMPLETION TICKETS

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Data Checker

Completion Ticket

On 11/15/2023 at 2:13 PM the following files were submitted to Tetra Tech

COMPLETION_AECOM_SOIL IM_20231115.txt

LITHOLOGY_AECOM_SOIL IM_20231115.txt

LOCATION_AECOM_SOIL IM_20231115.txt

PROJECT_AECOM_SOIL IM_20231115.txt

RESULT_AECOM_SOIL IM_20231115.txt

SAMPLE_AECOM_SOIL IM_20231115.txt

WATER_AECOM_SOIL IM_20231115.txt

The following comment was provided with this submission:

Hello TT! Attached is the data for SWPS and Q6RS for the Soil IM. Let me know if there are any issues. thanks! Jennifer Chastain

If you need to identify this session at a later date you may use the Ticket Key:

TetraTechExternalClientsProtectedDataRepository20231115_4701695326_kedd_AECOM

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Thank you for using the Data Checker, to upload more files click the "Data Checker" link in the menu.

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