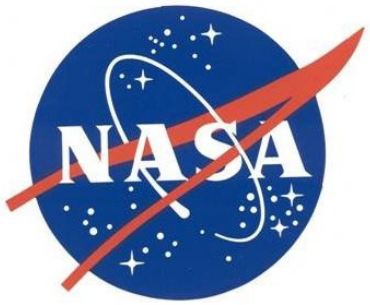
UN-NUMBERED OPERATIONAL AREAS
PRL 229 RAILROAD TIE DISPOSAL AREA POND
CONFIRMATORY SAMPLING REPORT

KENNEDY SPACE CENTER, FLORIDA

Prepared for:



National Aeronautics and Space Administration
Kennedy Space Center, Florida

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Revision 1

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CERTIFICATION AND APPROVAL

UN-NUMBERED OPERATIONAL AREAS, PRL 229
RAILROAD TIE DISPOSAL AREA POND
CONFIRMATORY SAMPLING REPORT

I hereby certify that in my professional judgment this document entitled: Un-Numbered Operational Areas, PRL 229 Railroad Tie Disposal Area (RTDA) Pond, Confirmatory Sampling Report dated September 2022, generally satisfies the requirements set forth in Chapter 471, Florida Statues. I have completed and/or been in responsible charge of work completed by qualified professionals working directly under my supervision and the applicable portions of this document and associated work comply with Chapter 62-780, Florida Administrative Code (FAC) and Rule 62-780.400(1), FAC.

September 21, 2022

Richard G. Smith, P.E.
Principal Engineer
Florida Professional Engineer Number: 39089
Certificate of Authorization Number: 26814

Date

RICHARD G. SMITH LICENSE No. 39089 STATE OF FLORIDA PROFESSIONAL ENGINEER

This item has been electronically signed and sealed by Richard G. Smith using a Digital Signature and date. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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LIST OF ACRONYMS/ABBREVIATIONS

µg/L	micrograms per liter
ft	foot or feet
kg	kilogram
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
ppth	parts per thousand
BAPE	benzo(a)pyrene equivalents
BCF	bioconcentration factor
BERA	baseline ecological risk assessment
bls	below land surface
BSAF	biota-sediment accumulation factor
BTV	background threshold value
COPC	contaminant of potential concern
CORE	CORE Engineering and Construction, Inc.
CS	confirmatory sampling
CSM	conceptual site model
CSR	Confirmatory Sampling Report
CSWP	Confirmatory Sampling Work Plan
DPD	Decision Process Document for the RCRA Corrective Action Program
ERA	ecological risk assessment
ERP	Environmental Resource Permit
ESA	ecological scoping assessment
ESV	ecological screening value
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
GCTL	groundwater cleanup target level
Geosyntec	Geosyntec Consultants, Inc.
HGL	HydroGeoLogic, Inc.
HQ	hazard quotient
IHA	InoMedic Health Applications, Inc.
IM	Interim Measure
IMWP	Interim Measure Work Plan
IPaC	information for planning and consultation
Jacobs	Jacobs Engineering Group, Inc.

KSC	Kennedy Space Center
KSCRT	Kennedy Space Center Remediation Team
LANL	Los Alamos National Laboratory
LOC	location of concern
MassDep	Massachusetts Department of Environmental Protection
MDL	method detection limit
NASA	National Aeronautics and Space Administration
NFA	no further action
NOAEL	no observed adverse effects level
PAH	polynuclear aromatic hydrocarbon
PEC	probable effect concentration
PEL	probable effect level
PQL	practical quantitation limit
PRL	Potential Release Location
R-SCTL	residential soil cleanup target level
RCRA	Resource Conservation and Recovery Act
RSV	refinement screening values
RTDA	Railroad Tie Disposal Area
SA	SWMU Assessment
SAJ	Jacksonville District
SCTL	soil cleanup target level
SLERA	Screening Level Ecological Risk Assessment
SLERAWP	SLERA Work Plan
SQAG	Sediment Quality Assessment Guideline
SVOC	semi-volatile organic compound
SWMU	Solid Waste Management Unit
TEC	threshold effects concentration
TEL	threshold effect level
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbon
UNOA	Un-Numbered Operational Areas
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

EXECUTIVE SUMMARY

This Confirmatory Sampling (CS) Report (CSR) was prepared for the National Aeronautics and Space Administration (NASA), Kennedy Space Center (KSC), Florida in accordance with the CS Work Plan (CSWP) (HGL, 2022a). The CSR summarizes investigation activities performed on the Railroad Tie Disposal Area (RTDA) of the Un-Numbered Operational Areas (UNOA), Potential Release Location (PRL) 229 located at KSC during December 16, 2021.

PURPOSE

The purpose of the CSR is to provide information to evaluate the level of potential contamination in surface water and sediment samples collected from the RTDA PRL 229 Pond and determine if contaminants pose unacceptable risks to ecological receptors. The CSR provides analytical data of 10 sets of surface water and sediment samples collected in 2021. Surface water samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polynuclear aromatic hydrocarbon (PAHs), metals, hardness, and salinity, while sediment samples were analyzed for metals, total organic carbon (TOC), SVOCs, PAHs, and total petroleum hydrocarbon (TPH). The CSR includes a Screening Level Ecological Risk Assessment (SLERA) conducted under KSC's Resource Conservation and Recovery Act (RCRA) Corrective Action Program to determine if unacceptable risks to ecological receptors exist at PRL 229 Pond.

SITE DESCRIPTION

UNOA PRL 229 consists of three areas associated with former railroad operations. The East Yard and RTDA pond occupy two areas of the site, located on the Atlantic coastline of KSC, east of and between Launch Complex 39A and Launch Complex 39B. Both the East Yard and RTDA were under the ownership of the Florida East Coast Railway when the area was developed in 1963-1965 as part of the KSC Railroad System. In 1983, NASA acquired the KSC portion of the railroad from Florida East Coast Railway. Between 1986 and 2003, the East Yard was used as a staging area for loaded liquid hydrogen tanker railroad cars.

The RTDA was identified initially as two piles of railroad ties to the north of the East Yard during a solid waste management unit (SWMU) assessment in 2014. CS activities conducted between 2018 and 2019 found six railroad tie piles at the RTDA and characterized potential soil contamination. The absence of sediment data from the pond adjacent to RTDA was identified as a data gap, therefore sediment samples were collected during a second CS completed in June 2020. Interim Measure (IM) activities were completed from January 3, 2022, through February 7, 2022 to remove railroad ties and contaminated soil (HGL, 2022b). Because soil contamination associated with the RTDA has already been removed, the half-acre pond that abuts the western edge of the RTDA is the focus of the CSR and SLERA.

SCOPE

Surface water and sediment samples were collected on December 16, 2021 and analyzed for the parameters specified in the PRL 229 Pond CSWP and summarized above. Surface water samples

were collected adjacent to the shoreline near the water surface and sediment samples were collected at the same locations as the surface water samples.

The SLERA determined that ecologically viable habitat is present at PRL 229 Pond and evaluated potential risks to ecological receptors.

RESULTS

Metals and PAHs were detected in surface water samples, including detections of antimony, arsenic, barium, calcium, copper, lead, magnesium, thallium, zinc, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene and pyrene. Based on measured salinity (1.03 to 1.21 parts per thousand [ppth]), the pond was identified as freshwater.

Sediment analytical results also contained detections of metals and PAHs, including antimony, arsenic, barium, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, zinc, anthracene benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene and pyrene.

SITE CONCEPTUAL EXPOSURE MODEL

The preliminary ecological conceptual site model (CSM) identifies potentially complete exposure routes for ecological receptors. There are potentially complete exposure routes for soil. However, thereis no longer a potential risk from exposure to soil based on the recent IM completed at the site. The potentially contaminated environmental media consist of surface water and sediment. Ecological receptors (invertebrate, plant, bird, etc.) can be exposed to contaminants in sediment and surface water through direct contact (i.e., ingestion and dermal contact), inhalation, and bioaccumulation.

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

Potential risks to ecological receptors were evaluated in accordance with the SLERA Work Plan included in Appendix B of the CSWP (HGL, 2022a) and the *Decision Process Document for the Resource Conservation and Recovery Act (RCRA) Corrective Action Program at KSC* (DPD) (Geosyntec, 2019), and using the 2021 sediment and surface water analytical results. Potential ecological receptors evaluated in the SLERA include the aquatic community, benthic invertebrates, aquatic birds, and aquatic mammals. The SLERA included Steps 2a through 2c of the Ecological Risk Assessment (ERA) process in accordance with the DPD.

Using multiple lines of evidence, the SLERA concluded that many of the detected analytes are present at concentrations similar to those in background or reference locations at KSC, and/or at concentrations that would not pose a significant risk to ecological communities. There are no screening values available for the avian community, and PAHs are bioaccumulative compounds. For this reason, food web modeling was completed as a supplement to Step 2c to provide a quantitative evaluation of this exposure pathway. Food web modeling indicates that PAHs are

unlikely to pose a risk to birds exposed to site sediment and surface water. Based on the results of the SLERA, the contaminants in sediment and surface water pose no to minimal risk to the ecological communities that could live or forage at the site.

RECOMMENDATIONS

Based on the results of the SLERA, no further study is recommended for the RTDA Pond at PRL 229.

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PRL 229 RAILROAD TIE DISPOSAL AREA POND
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1.0 INTRODUCTION

HydroGeoLogic, Inc. (HGL) has prepared this Confirmatory Sampling Report (CSR) for the National Aeronautics and Space Administration (NASA), Kennedy Space Center (KSC), Florida, under Contract Number 80KSC019D0012, Task Order 80KSC019F0118.

KSC's operating permit (0026028-009-HO) issued by the Florida Department of Environmental Protection (FDEP) under the Hazardous and Solid Waste Amendment portion of the Resource Conservation and Recovery Act (RCRA) requires KSC to investigate all known solid waste management units (SWMUs) and locations of concern at KSC. In support of this requirement, the Un-Numbered Operational Areas (UNOA) is designated as Potential Release Location (PRL) 229 under the NASA RCRA permit. This CSR addresses the Railroad Tie Disposal Area (RTDA) Pond portion of PRL 229.

2.0 SITE DESCRIPTION, LOCATION, AND HISTORY

2.1 SITE LOCATION AND DESCRIPTION

KSC is centrally located on the east coast of Florida, to the north and west of Cape Canaveral (Figure 1). It is situated in Brevard and Volusia Counties between the Merritt Island Barge Canal to the south, the town of Oak Hill to the north, the Atlantic Ocean and Cape Canaveral Space Force Station to the east, and the Indian River to the west. A large portion of the area, between the Indian River and the Atlantic Ocean, is in the northern part of Brevard County on Merritt Island, with the extreme north boundary extending approximately 7 miles into Volusia County.

UNOA (PRL 229), which consisted of three areas associated with former railroad operations, was first developed by the U.S. Air Force in 1958. The East Yard and RTDA pond occupy two areas of the site, located on the Atlantic coastline of KSC, east of and between Launch Complex 39A and Launch Complex 39B (Figure 1). The RTDA was identified initially as two piles of railroad ties to the north of the East Yard during the SWMU assessment (SA) in 2014. Four additional piles were identified during Confirmatory Sampling (CS) activities in 2019 (Figure 2).

2.2 PREVIOUS INVESTIGATIONS AND FINDINGS

2.2.1 Solid Waste Management Unit Assessment

In support of the NASA Hazardous and SA requirements, this site was identified as PRL 229 and a SA was conducted in 2014 (IHA, 2015). The SA originally identified the RTDA as a location of concern (LOC), designated LOC 1, for potential contamination based on past activities. The SA

identified hydrocarbons, metals, and solvents as potential contaminants from discarded railroad tie piles. During the June 2015 KSC Remediation Team (KSCRT) meeting, consensus was reached to add the East Yard as LOC 2.

2.2.2 Confirmatory Sampling

CS activities were conducted in accordance with the CS Work Plan (CSWP), Revision 1 (IHA, 2015) at PRL 229 from September 2018 to May 2019 (Jacobs/CORE, 2019b). Initially, two soil samples were collected for laboratory analysis of the contaminants of potential concern (COPCs) (volatile organic compounds [VOCs], polynuclear aromatic hydrocarbons [PAHs], total recoverable petroleum hydrocarbon [TRPH], and priority pollutant metals and barium) identified in the CSWP. The sampling identified PAHs and TRPH as the contaminants of concern.

A total of 105 additional soils samples were collected and analyzed to delineate soil with exceedances of carcinogenic PAHs as benzo(a)pyrene equivalents (BAPE) and/or TRPH. During delineation activities, a total of six railroad tie piles were encountered. The soil beneath and around the ties were sampled, along with several areas of soil disturbance that had no visible railroad ties. The maximum sample concentrations for BAPE were 26 milligrams per kilogram (mg/kg) and for TRPH was 1,100 mg/kg. Four areas of soil that exceeded the residential soil cleanup target level (R-SCTL) for BAPE and/or TRPH were delineated. Two additional areas with abandoned railroad ties but without exceedances of SCTLs were identified. The total affected area was 4,328 square feet (ft).

To assess potential groundwater contamination at LOC 1, a groundwater monitoring well (MW0001) was installed in February 2019 near soil location SB0001 and screened from 2 to 12 ft below land surface (bls). A sample was collected and analyzed for PAHs and pentachlorophenol. No analytes were detected, and all method detection limits (MDLs) were below their respective FDEP groundwater cleanup target levels (GCTLs).

The CS results were presented to KSCRT meeting in June 2019 and consensus was reached on the following:

- No Further Action (NFA) for groundwater at LOC 1 (1906-D42); and
- Interim measure (IM) to remove railroad ties and BAPE/TRPH-affected soil, with the addition of sediment sample collection (1906-D43).

Following the June 2019 KSCRT meeting, an IM Work Plan (IMWP) was prepared in September 2019 to mitigate potential human health risks associated with carcinogenic PAHs as BAPE- and TRPH-affected soils (Jacobs/CORE, 2019a).

On June 23, 2020, six sediment samples were collected from the pond in the RTDA (Figure 3). Sediment samples were collected along the northeast edge of the pond at a depth of 0 to 0.5 ft below the sediment surface and analyzed for PAHs and TRPH. Sediment samples were collected 2 to 3 ft from the shoreline in 6- to 8-inches of water cover.

The laboratory analytical results for sediment samples were compared to Florida Marine Sediment Quality Assessment Guidelines (SQAG) in accordance with the February 2019 NASA Decision Process Document for the RCRA Corrective Action Program (NASA, 2019). The analytical results for each sediment sampling location indicated exceedances of the SQAGs for Florida Inland Waters Threshold Effect Concentrations for multiple PAHs. Total PAH concentrations ranged from 2.92 mg/kg to 39.29 mg/kg, with each sample exceeding the SQAG of 1.6 mg/kg. Concentrations of total PAHs were calculated by summing the total concentration of each of the detected PAHs and one-half of the laboratory detection limit concentration for non-detected PAHs. In general, higher concentrations of PAHs were detected west of Tie Pile #2 and decreased to the north and south. The analytical results are presented in Table 1.

The June 2020 sampling results were presented to the KSCRT in August 2020 and consensus was reached on the following:

- Implementing IM soil removal to the edge of the pond (within 5 ft) at Tie Piles #1 and #2, recognizing this will reduce but may not eliminate site contaminated soil footprint. Following excavation, evaluate remaining soil contamination to determine if additional action is necessary (2008-D40); and
- Implementing the IM and removing soil and Tie Piles #3 through #6. NFA for these areas will be necessary for human health and ecological receptors (2008-D39).

The June 2020 sampling results were summarized in a CS Report Addendum (HGL, 2020), which recommended additional assessment of the pond based on the PAHs exceedances of SQAGs in sediment samples.

2.2.3 Soil Interim Measure Implementation

IM activities were completed from January 3, 2022, through February 7, 2022, to remove 50.67 tons of railroad ties and 908.54 tons of BAPE/TRPH-contaminated soil. During excavation operations, HGL observed railroad ties outside of excavation areas and within the pond (former borrow pit). During IM operations HGL removed and disposed of railroad ties observed outside of excavation limits that were readily accessible. The IM implementation activities were presented during the KSCRT meeting on May 3, 2022. The KSCRT reached consensus on the completion of the IM reducing the area affected by BAPE/TRPH above the R-SCTLs. The KSCRT concluded the remaining affected area is along the edge of the pond. IM activities are summarized in the May 2022 Interim Measure Report (HGL, 2022b).

2.2.4 PRL 229 Pond Confirmatory Sampling Work Plan

A CSWP was prepared to outline the sampling activities to be performed at the PRL 229 Pond (HGL, 2022a). The CSWP proposed the collection of 10 sets of surface water and sediment samples along the edge of the pond with one set of sediment and surface water samples collected from the northwest and southeast ends and four evenly spaced sets sediment and surface water samples will be collected from the northeast and southwest sides of the pond. Surface water samples were to be analyzed for VOCs, semi-volatile organic compounds (SVOCs), PAHs, priority pollutants metals plus barium, total hardness, and salinity (field measurement). Sediment

samples were also to be analyzed for SVOCs, PAHs, total petroleum hydrocarbons (TPH), priority pollutants metals plus barium, and Total Organic Carbon (TOC).

The CSWP included a Screening Level Ecological Risk Assessment (SLERA) Work Plan (SLERAWP) which outlined the approach to be used for a SLERA. The SLERAWP stated that the SLERA will be conducted under KSC's RCRA Corrective Action Program. The ecological risk assessment (ERA) process at NASA-KSC mirrors the U.S. Environmental Protection Agency (USEPA) eight-step ERA process (USEPA, 1997), of which the SLERA for the RTDA site will include the following three steps:

- Step 1 – screening level problem formulation,
- Step 2 – screening level exposure estimate and risk calculation, and
- Step 3a – SLERA refinement.

The dataset to be used in the SLERA included the analytical results for the six sediment samples collected in December 2020 and the sediment and surface water data to be collected as part of the planned CS.

3.0 FIELD ACTIVITIES

The planned surface water and sediment samples were collected on December 16, 2021 and analyzed for the parameters specified in the PRL 229 Pond CSWP. Surface water samples were collected adjacent to the shoreline near the water surface and sediment samples were collected with a stainless-steel scoop at the same locations as the surface water samples. Surface water and sediment sample locations are shown on Figure 4. Field forms are included as Appendix A. The laboratory analytical reports are provided as Appendix B.

Surface water analytical results were as follows: arsenic, barium, copper, thallium, and zinc were each detected in 1 or 2 samples; antimony was detected in 7 samples; calcium, lead, and magnesium detected in all samples; anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-c,d)pyrene, and pyrene were each detected in 1 to 3 samples; benzo(b)fluoranthene was detected in 6 samples; and salinity ranged from 1.03 to 1.21 parts per thousand (ppth), which is on the border of freshwater (< 1 ppth) and slightly saline (1 to 3 ppth). The 2021 surface water sampling results are summarized in Table 2 and shown on Figure 5.

Sediment analytical results were as follows: arsenic, barium, chromium, copper, lead, mercury, nickel, and zinc were detected in all samples; antimony, beryllium, and cadmium were each detected in 7 or 8 samples; selenium and thallium were detected in 3 samples; benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-c,d)pyrene were each detected in 8 to 10 samples; and anthracene, dibenzo(a,h)anthracene, fluoranthene, and pyrene were each detected in 1 or 2 samples. The 2021 sediment sampling results are summarized in Table 3 and shown on Figure 6.

4.0 SCREENING LEVEL ECOLOGIC RISK ASSESSMENT

HGL prepared this SLERA in support of the CSR for the RTDA of the UNOA, PRL 229 located at KSC, FL. This SLERA was prepared in accordance with the approach described in the PRL 229 SLERAWP provided as Appendix B of the CSWP for the RTDA. The SLERAWP was modeled on the DPD (Geosyntec, 2019).

This SLERA was conducted under KSC's RCRA Corrective Action Program. The ERA approach outlined in the DPD is based on FDEP guidance, USEPA guidance, and historical ERAs completed for NASA-KSC sites. The DPD outlines four steps to an ERA: ecological scoping assessment (ESA) (Step 1); SLERA (Step 2); baseline ERA (Step 3); and ecological risk management (Step 4). The SLERA, or Step 2, consists of three sub-steps:

- Step 2a – SLERA problem formulation,
- Step 2b – SLERA exposure estimate and risk calculation, and
- Step 2c – SLERA refinement.

Depending on the results of Step 2, it might not be necessary for a site to proceed to Step 3 and Step 4. Per the current scope of work, the ERA for the RTDA ends at Step 2c.

4.1 STEP 1 – ECOLOGICAL SCOPING ASSESSMENT FINDINGS

Per Section 5.2 of the DPD, the first step in an ERA is to determine whether ecologically viable habitat is present at a given site. This evaluation considers multiple characteristics of the site, such as its size; type of ground cover; presence of nearby habitat; known or suspected ecological receptors; importance or uniqueness of the site's habitat; presence of threatened species, endangered species, or species of special concern; historical, current, and future land and water uses; nature and extent of contamination; and potential for offsite contaminant transport. These characteristics for the RTDA are discussed below.

4.1.1 Site Description

The RTDA is located on the Atlantic coastline of KSC, east of and between Launch Complex 39A and Launch Complex 39B. An additional UNOA site, the East Yard, is located adjacent to the RTDA. As illustrated on Figure 2, an approximately half-acre sized pond abuts the western edge of the RTDA. Because soil contamination associated with the RTDA has already been removed, the half-acre pond is the focus of this ESA.

The pond is a wetland and part of what is called the Launch Complex 39 Lagoonal System, which has the following surface water classification per Florida Administrative Code (FAC) 62-302.400: Class III – Fish Consumption; Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife, Predominantly Marine Waters. It is likely that the pond supports benthic invertebrate and aquatic communities. The pond could also provide habitat for amphibians and reptiles. It is not known if the pond contains fish. Birds and mammals could use the pond as a source of drinking water and forage for invertebrates, amphibians, and reptiles in the pond and along its shoreline.

The area within a half-mile radius of the site consists of predominantly shrub and brushland interspersed with saltwater ponds and marshes. East of the site is a small dry prairie (constructed dune), a beach, and the Atlantic Ocean. Types and locations of vegetative cover within a half-mile radius of the pond are presented on Figure 7.

The pond is surrounded by wetland that was partially cleared in support of the soil IM permitted under Jacksonville District (SAJ) #2021-03116 and Environmental Resource Permit (ERP) #151241-3. The pond bottom contains approximately 18 inches of muck, which was determined during staff gauge installation. The RTDA's ecological habitat consists of a wetland area that has been remediated and the pond that is the focus of this ESA (Figure 8).

According to the U.S. Fish & Wildlife Service Information for Planning and Consultation (IPaC) tool (available at https://ecos.fws.gov/ipac/), 16 federally listed species are potentially present at the RTDA site. These species are listed in Table 4 and the IPaC report is provided in Appendix C. Because there was no ecological or biological survey of the RTDA site, it is not known if these listed species are present. For the purposes of the SLERA, it is assumed the site could provide habitat for the species listed in Table 4.

4.1.2 Land and Water Use

Both the East Yard and the RTDA were under the ownership of the Florida East Coast Railway when the area was developed in 1963-1965 as part of the KSC Railroad System. The railroad system consisted of a single track, with a parallel siding track in the East Yard that allowed for passing train traffic and railcar staging. In 1983, NASA acquired the KSC portion of the railroad from Florida East Coast Railway. Between 1984 and 1986, a 6-mile portion of railway along the Atlantic coast was replaced due to poor conditions from age and weathering. The original track was replaced with new materials, and granite ballast replaced the original limestone ballast. Between 1986 and 2003, the East Yard was used as a staging area for loaded liquid hydrogen tanker railroad cars. No evidence of railroad operations was identified in historical aerial photos from 2004 to 2013. The East Yard tracks were removed between December 2013 and January 2014 as part of NASA's Beach Dune Restoration Project (Jacobs/CORE, 2019).

The RTDA is approximately 350 ft north of East Yard and west of the former railroad. The site was identified based on the presence of two large piles of discarded railroad ties. The date(s) when the railroad ties were placed at this location is not known (Jacobs/CORE, 2019).

4.1.3 Nature and Extent of Contamination

A SWMU Assessment was conducted in 2014 to identify potential environmental impacts related to operations at UNOA, which encompasses the RTDA. The SWMU Assessment included site reconnaissance and interviews with personnel possessing knowledge of past and present work practices and operations at the site. The SWMU Assessment evaluated engineering documents and basic information guides, historical photographs, real property records, safety data sheets for chemicals that may have been used or stored at the facility, soil type and lithology descriptions, and types of wildlife habitat at the site. In addition, current site conditions were documented in

photographs. The objective of the SWMU Assessment was to identify potential locations and contaminants of concern at UNOA and the need, if any, for further study (IHA, 2015).

The SWMU Assessment identified no potential sources of contamination at the East Yard and recommended NFA for this area. The RTDA was identified as a LOC based on the potential for creosote, metals, hydrocarbons, and solvents to have been released to the surrounding soil due to weathering of or leaching from the piled and scattered railroad ties. Some of the ties were partially or fully submerged in the pond. Contaminant release mechanisms included dissolution of contaminants into surface water from submerged railroad ties, adsorption of contaminants onto sediment from submerged railroad ties, and overland flow of contaminants in eroded soil.

CS was completed at the RTDA between September 2018 and April 2019 to characterize and delineate potential contamination in site soil (Jacobs/CORE, 2019). The subsequent report concluded that carcinogenic PAHs and TPHs detected in RTDA soil represented a potential health risk for human receptors under both residential and industrial land use scenarios. For ecological receptors, low molecular and/or high molecular weight PAHs were present in soil at concentrations greater than ecological screening values (ESVs), resulting in the conclusion that this PAH contamination could pose an ecological risk. Soil contamination was addressed by an IM to excavate and properly dispose of the PAH- and TPH-contaminated soil off site.

The analytical results of the CS soil samples indicated that metals and VOCs were not potential soil contaminants and no further investigation of these chemicals in soil was recommended. Based on comparison of soil data to the state of Florida leachability SCTLs and groundwater data, the CS report recommended NFA for groundwater. The absence of sediment data from the pond adjacent to RTDA was identified as a data gap (Jacobs/CORE, 2019).

In June 2020, six sediment samples were collected from the northeast edge of the pond adjacent to RTDA and analyzed for PAHs and TPH (HGL, 2020). Exceedances of SQAGs were observed for at least one PAH at each location. Based on these results, the CS Report recommended further characterization of potential sediment and surface water contamination in the RTDA pond (HGL, 2020).

4.1.4 Potential for Offsite Contaminant Transport

The pond has no inlet or outlet. The pond receives stormwater runoff from the surrounding area. Based on this topography, there is no potential for offsite transport of contaminants in the pond. Contaminants in soil surrounding the pond can continue to migrate into the pond through erosion and overland flow. The recent removal of the railroad ties and associated soil has mitigated this potential transport pathway.

PAHs are bioaccumulative, meaning that they can accumulate in the tissues of invertebrates and other organisms that live or forage in the pond.

4.1.5 Ecological Scoping Assessment Conclusions

Based on the information presented in the subsections above, the pond at the RTDA provides viable ecological habitat that warrants completion of a SLERA.

4.2 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

As stated in Section 4.1, the SLERA for the RTDA pond consists of Steps 2a through 2c of the ERA process outlined in the DPD.

4.2.1 Step 2A – SLERA Problem Formulation

Per the DPD, the intent of the problem formulation is to develop the conceptual site model (CSM) for ecological receptors in order to define the ecological risk management goals and preliminary assessment endpoints. There are four parts to the SLERA problem formulation: (i) perform an ecological characterization; (ii) prepare the preliminary ecological CSM; (iii) define risk management goals; (iv) identify preliminary assessment endpoints.

4.2.1.1 Ecological Characterization

The pond along the western boundary of the RTDA is the focus of this SLERA. Potential ecological risks posed by soil contamination from the railroad ties were addressed through removal of the ties and contaminated soil. For this reason, the only remaining ecological concern at the site is the aquatic habitat provided by the pond. As described in Section 4.1.1, the pond is a wetland and part of what is called the Launch Complex 39 Lagoonal System, which is classified as Class III – Fish Consumption: Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife, Predominantly Marine Waters. It is likely that the pond supports benthic invertebrate and aquatic communities. The pond could also provide habitat for amphibians and reptiles. It is not known if the pond contains fish. Birds and mammals could use the pond as a source of drinking water and forage for invertebrates, amphibians, and reptiles in the pond and along its shoreline.

Table 4 lists the threatened and endangered species as well as non-listed species that could occur at the site. It is not known if any of the listed species are actually present and/or utilize habitat at the site.

4.2.1.2 Preliminary Ecological CSM

The preliminary ecological CSM identifies potentially complete exposure routes for ecological receptors. The exposure route describes how the ecological receptor (invertebrate, plant, bird, etc.) can be exposed to site-related contaminants. At the RTDA pond, the potentially contaminated environmental media consist of surface water and sediment. Ecological receptors can be exposed to contaminants in sediment and surface water through the routes listed below:

- Surface water:
    - Direct contact: organisms, such as invertebrates, that live in the pond can be directly exposed to the contaminants dissolved in surface water.
    - Ingestion: wildlife such as birds and mammals can use the pond as a water source.

  - Bioaccumulation: dissolved contaminants can be taken up by insects, plants, frogs, and other organisms that live in the pond. Birds, mammals, reptiles, and amphibians can eat the contaminated tissues.

- Sediment:
  - Direct contact: organisms, such as benthic invertebrates, that live in the sediment can be directly exposed to contaminants in the sediment.
  - Ingestion: foraging wildlife can inadvertently ingest sediment while hunting.
  - Bioaccumulation: contaminants in site sediment can accumulate in organisms that live in sediment. These contaminated organisms can then be consumed by birds, mammals, and other upper trophic level receptors.

Birds and mammals can also be exposed to contaminants through dermal uptake. Most ecological exposure models focus on ingestion; there is limited information on dermal uptake by wildlife. For this reason, and in accordance with USEPA guidance, SLERAs typically do not consider dermal uptake.

Figure 9 presents the preliminary ecological CSM for the RTDA pond. As shown in this CSM, although there are complete exposure routes for soil, there is no longer potential risk from exposure to soil based on the recent removal action.

4.2.1.3 Management Goals

The management goals identify the site's ecological values that are to be protected. Because there is no documentation of a protected species being present at the site, the management goals for the RTDA pond were developed to protect the classes of receptors that could use the pond as a place to live or forage. These classes of receptors are the aquatic community, benthic community, and wildlife (birds, mammals, reptiles, and amphibians) that could hunt in or along the shore of the pond.

4.2.1.4 Preliminary Assessment Endpoints

The preliminary assessment endpoints are growth, reproduction, and survival of the aquatic community (plants, invertebrates, and fish, if present), benthic invertebrate community, aquatic mammal populations, and aquatic bird populations. Reptiles and amphibians were not selected as assessment endpoints because there are no screening values specific to these receptors and there is limited ecotoxicity information available for these organisms. Table 5 presents the preliminary assessment endpoints.

4.2.2 Step 2B – SLERA Exposure Estimate and Risk Characterization

The purpose of Step 2b is to provide a conservative screening to determine whether site contaminants have the potential to pose an ecological risk. There are three parts to Step 2b: (i) estimate ecological exposure; (ii) identify effects values; and (iii) compare exposure estimates to effects values to identify ecological COPCs.

4.2.2.1 Estimation of Ecological Exposure

The first step in estimating potential ecological exposure is to identify the data that characterize the habitat of concern, which in this case is the pond. Two sets of samples have been collected from the pond, the first in December 2020 and the second in December 2021. In December 2020, six sediment samples were collected. All six sample locations were within the footprint of the interim removal action (Figure 3). For this reason, the December 2020 data no longer represent site conditions and were not considered in the SLERA.

In December 2021, 10 co-located sediment and surface water samples were collected. The sample locations were distributed along the banks of the RTDA pond as shown on Figure 4. The sediment samples were analyzed for metals, TOC, SVOCs, PAHs, and TPH (C8-C40 using Method FL-PRO); and the surface water samples were analyzed for VOCs, metals, hardness, salinity, SVOCs, and PAHs. The analytical results were validated and are considered usable for risk assessment.

One result was used for each parent sample and field duplicate pair. If an analyte was detected in both the parent and duplicate samples, the maximum detection was used as the proxy concentration for that location. If an analyte was positively detected in only one sample, the detection was used as the proxy concentration. If an analyte was not detected in either sample, the lower of the two limits of detection was used as the proxy result.

The surface water samples were analyzed for 1,2,4-trichlorobenzene, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, and hexachlorobutadiene using both the VOC method and SVOC method. Neither analytical method detected these analytes. Because the VOC method provided a more sensitive analysis (lower limits of detection) than the SVOC method, the SLERA considered only the VOC method results for these compounds.

The maximum detection of each analyte was used as the exposure point concentration in Step 2b.

4.2.2.2 Identification of Effects Values

The risk-based ESVs for surface water and sediment were obtained from Tables D-4 and D-6, respectively, of the DPD. The DPD used the hierarchy of values recommended in FDEP's *Florida Ecological Risk Assessment Guidance Document* (University of Florida, 2016) to select these ESVs. Because the DPD does not provide an ESV for TPH, this SLERA used the Massachusetts Department of Environmental Protection (MassDEP) sediment benchmark for the C9-C12 fraction (adjusted to account for the average site-specific organic carbon content) (MassDEP, 2007) as the ESV. Table 6 presents the ESVs used in this SLERA. In addition, Table 6 provides the background threshold values (BTVs). The BTVs are also considered in the screening process because the analyte is unlikely to pose an ecological risk if the maximum detection is less than the background value.

There are separate ESVs for fresh surface water/sediment and marine surface water/sediment. In addition, there are separate BTVs for fresh surface water and marine surface water. Per the DPD, 1,500 milligrams per liter (mg/L) chloride is the threshold used to determine if surface water is freshwater or marine. Although the surface water samples were not analyzed for chloride, salinity was measured in the field. The salinity measurements ranged from 1.03 parts per thousand to 1.21

ppth. These measurements are on the upper end of freshwater (< 1 ppth) and low end of slightly saline (1 to 3 ppth) (https://www.usgs.gov/special-topics/water-science-school/science/saline-water-and-salinity). Based on these field measurements, the pond was identified as freshwater. Therefore, the freshwater BTVs and ESVs were used for the SLERA. For sediment, the general industrial area BTVs were used because of the industrialized nature of KSC. If a general industrial area BTV was not available, then the combined sediment BTV was selected.

4.2.2.3 Identification of Ecological Contaminants of Potential Concern

The final part of Step 2b is identification of the ecological COPCs. First, maximum detections are compared to BTVs. If the maximum detection is less than or equal to the BTV, then the analyte is not identified as an ecological COPC. If the maximum detection is greater than the BTV or if no BTV is available, then Step 2b ecological risks are quantified using a hazard quotient (HQ) approach. The HQ is calculated with the equation below.

$$HQ = \frac{Exposure\ Point\ Concentration}{ESV}$$

Table 7 and Table 8 compare the maximum detections for sediment and surface water, respectively, to the BTVs and present the HQs. All HQs are reported to one significant figure. The decision logic outlined below was used to identify the ecological COPCs.

Constituents were excluded from further evaluation (i.e., not identified as ecological COPCs) if:

- The maximum detection is less than or equal to the BTV;
- For non-bioaccumulative constituents detected at concentrations greater than the BTVs, the HQ is less than or equal to 1;
- For bioaccumulative constituents detected at concentration greater than the BTVs, the HQ is less than or equal to 1 and the ESV is protective of upper trophic level receptors; or
- The constituent is an essential nutrient (calcium, magnesium, potassium, and sodium).

Constituents were identified as ecological COPCs if:

- The constituent is present at concentrations greater than the BTV, or there is no BTV, and the HQ is greater than 1;
- For bioaccumulative constituents detected at concentrations greater than the BTV, or that do not have a BTV, the HQ is less than or equal to 1 but the ESV is not protective of upper trophic-level receptors (i.e., the SQAG is the ESV basis) or the ESV's basis is unknown;
- The maximum detection exceeds the BTV and an ESV is not available; or
- The constituent lacks both a BTV and ESV or appropriate surrogate.

As shown in Table 7, lead, thallium, and fluoranthene are present in sediment at concentrations less than the BTVs. In the surface water samples, antimony, calcium, lead, and magnesium were detected at concentrations less than the BTVs. These constituents were not considered further.

Based on the HQs and whether the constituent is bioaccumulative, multiple contaminants in sediment and surface water were identified as ecological COPCs. The COPCs and potentially affected communities are listed below.

- Arsenic in sediment and surface water (birds and mammals);
- Beryllium in sediment (benthic invertebrates);
- Cadmium in sediment (birds and mammals);
- Chromium in sediment (birds and mammals);
- Copper in sediment and surface water (birds and mammals);
- Mercury in sediment (birds and mammals);
- Nickel in sediment (birds and mammals);
- Selenium in sediment (birds, and mammals);
- Zinc in sediment and surface water (benthic invertebrates, birds, and mammals);
- Anthracene in sediment and surface water (benthic invertebrates, birds, and mammals);
- Benzo(a)anthracene in sediment and surface water (benthic invertebrates, aquatic community, birds, and mammals);
- Benzo(a)pyrene in sediment and surface water (benthic invertebrates, aquatic community, birds, and mammals);
- Benzo(b)fluoranthene in sediment and surface water (benthic invertebrates, aquatic community, birds, and mammals);
- Benzo(g,h,i)perylene in sediment and surface water (benthic invertebrates, birds, and mammals);
- Benzo(k)fluoranthene in sediment and surface water (benthic invertebrates, birds, and mammals);
- Chrysene in sediment and surface water (benthic invertebrates, birds, and mammals);
- Dibenzo(a,h)anthracene in sediment and surface water (benthic invertebrates, aquatic community, birds, and mammals);
- Fluoranthene in surface water (birds and mammals);
- Indeno(1,2,3-cd)pyrene in sediment and surface water (benthic invertebrates, aquatic community, birds, and mammals); and
- Pyrene in sediment and surface water (benthic invertebrates, birds, and mammals).

To evaluate the analytical sensitivity and associated uncertainty for chemicals not detected in any of the sediment samples or any of the surface water samples, Tables 9 and 10 compared the limits of detection for non-detected analytes for sediment and surface water to the ESVs. All historical chemical use information was obtained from the National Library of Medicine's PubChem database, available at URL: https://pubchem.ncbi.nlm.nih.gov/.

As shown in Table 9, for 20 SVOCs analyzed in sediment, both the minimum and the maximum nondetect result exceeds the ESV. Historical uses of 2-chlorophenol, 2,4-dichlorophenol, 2,4-dinitrophenol, and pentachlorophenol include wood preservation, and could be present in site sediment based on the site's contaminant source. These non-detect results contribute uncertainty to the SLERA. Based on a review of the historical use information, it is unlikely that the remaining 16 SVOCs for which minimum and maximum nondetect results exceed ESVs were used or released at the site. As such, the analytical sensitivity for these 16 SVOCs contributes minimally to the SLERA uncertainty. For 11 SVOCs that were not detected, the maximum limit of detection exceeds the ESV, however, the minimum limit of detection does not. For these analytes, as shown in Table 9, analytical sensitivity is low enough at some sample locations to detect concentrations less than or equal to the ESV, which reduces uncertainty. For the remaining 18 SVOCs and all PAHs and metals that were not detected in site sediment, both the minimum and maximum limits of detection were less than the ESV, indicating it is unlikely these compounds would be present at the site at concentrations that exceed the ESV.

As shown in Table 10, the minimum and maximum nondetect result in surface water for 1,2,4-trichlorobenzene, pentachlorophenol, butyl benzyl phthalate, 3,3'-dichlorobenzidine, hexachlorobenzene, hexachlorobutadiene, hexachloroethane, cadmium, mercury, and silver exceed their respective ESV. It is unlikely that these constituents would be present in site surface water based on the likely historical use of each chemical, except for pentachlorophenol which may have been used in wood preservation. However, the maximum limit of detection for pentachlorophenol in surface water is below the aquatic community, avian, and mammalian Los Alamos National Laboratory (LANL) benchmarks based on no effects. For this reason, analytical sensitivity for pentachlorophenol contributes little to the uncertainty of the SLERA. Maximum limits of detection in surface water were also compared to the FDEP target practical quantitation limits (PQLs), where available. The maximum limits of detection for hexachlorobenzene, phenanthrene and silver exceed their respective PQLs.

In summary, no COPCs were identified based on a comparison of ESVs and PQLs to limits of detection for analytes that were not detected. Based on the number of ecological COPCs identified in the Step 2b screening, the SLERA proceeded to Step 2c. KSCRT concurrence is not required to proceed to Step 2c.

4.2.3 Step 2C – SLERA Refinement

The purpose of Step 2c is to provide a more realistic evaluation of potential risks posed by the ecological COPCs identified in Step 2b and use this evaluation to obtain KSCRT consensus on a scientifically defensible recommendation to (i) terminate the ERA process and submit a request for no further action; (ii) propose a risk management strategy; or (iii) conduct a baseline ecological risk assessment (BERA). The refinement step considers several lines of evidence in assessing

whether an ecological COPC has the potential to pose a significant risk. These lines of evidence include comparison of mean concentrations to the range of background values; spatial distribution of the contaminants; frequency and magnitude of ESV exceedances; bioaccumulation potential of the ecological COPCs; and the basis for the ESV.

4.2.3.1 Detailed Comparison to Background Concentrations

Per the DPD, Step 2c includes comparing the mean site concentration to the range of background values and the spatial distributions of the contaminants. Table 11 compares the maximum and mean detections for the site sediment samples to the BTVs and ranges of background values. Because the eastern shore of the pond is closest to the contamination source, it is expected that contaminant concentrations would be greater along the eastern bank as compared to the other sides of the pond. For this reason, Table 11 includes the mean detections of all samples and mean detections of samples collected along the pond's eastern bank.

4.2.3.1.1 Sediment

All arsenic and mercury detections are greater than the ranges of background values, and 7 of 10 zinc results are greater than the range of background values. These three metals appear to be present in the pond sediment at concentration greater than background levels.

With a maximum of 10.4 mg/kg, all chromium detections fall within the range of background values (0.81–17.3 mg/kg). Based on the similarity between the site's range of chromium results and range of background values, the chromium in site sediment reflects natural heterogeneity instead of contamination.

Four of 10 copper detections (maximum of 13.1 mg/kg) slightly exceed the range of background values (0.87–9.7 mg/kg). It is not known if these slight exceedances of the range of background values indicate heterogeneity or contamination.

Background values are not available for beryllium, cadmium, nickel, and selenium. The maximum detections of these four metals are low (0.21 mg/kg for beryllium; 0.34 mg/kg for cadmium; 4 mg/kg for nickel; and 1 mg/kg for selenium). These four metals were detected at similar concentrations around the pond shoreline, a distribution that is not indicative of a contaminant source along the pond's eastern bank. Selenium was detected in only three of the ten samples, two of which were collected from the pond's western bank. The relatively uniform distributions of these metals around the pond suggests that these metals are background constituents and not site-related contaminants. Beryllium, cadmium, and nickel data are also normally distributed, which supports the conclusion that these metals are background constituents.

Anthracene was detected in one of the ten sediment samples. Dibenzo(a,h)anthracene was detected in two of ten sediment samples. There are no background values for anthracene. The limited detection frequencies of these two PAHs suggest limited presence of these potential contaminants.

All detections for benzo(a)anthracene (maximum site detection of 0.513 mg/kg; background range of 0.0046–0.77 mg/kg), benzo(a)pyrene (maximum site detection of 0.504 mg/kg; background range of 0.011–0.74 mg/kg), benzo(g,h,i)perylene (maximum site detection of 0.303 mg/kg;

background range of 0.0099–0.52 mg/kg), benzo(k)fluoranthene (maximum site detection of 0.335 mg/kg; background range of 0.0048–0.55 mg/kg), chrysene (maximum site detection of 0.651 mg/kg; background range of 0.0089–1.1 mg/kg), indeno(1,2,3-c,d)pyrene (maximum site detection of 0.364 mg/kg; background range of 0.0029–21 mg/kg), and pyrene (maximum site detection of 0.738 mg/kg; background range of 0.0045–1.7 mg/kg) are within the ranges of detections reported for the background sediment samples. These comparisons suggest that the pond concentrations are similar to background levels of these PAHs.

Only the maximum benzo(b)fluoranthene detection, 1.12 mg/kg, is greater than the range of background values (0.0049–0.73 mg/kg). Throughout most of the pond sediment, the benzo(b)fluoranthene concentration appears to be similar to background levels of this PAH.

In summary, excluding arsenic, mercury, and zinc, the concentrations of the sediment ecological COPCs appear to be similar to those for background or reference locations at KSC.

4.2.3.1.2 Surface Water

As noted in Section 4.2.2.2, the surface water BTVs are those for freshwater settings. There are no freshwater BTVs for arsenic, copper, zinc, and the PAHs. Arsenic and copper were each detected in only one surface water sample, and zinc was detected in only two surface water samples. Except for benzo(b)fluoranthene, which was detected in six of ten surface water samples, the PAHs were detected in only a few surface water samples, ranging from one to three samples. These results suggest limited presence of the surface water COPCs excluding benzo(b)fluoranthene.

4.2.3.2 Basis for the ESVs and Bioaccumulation Potential

4.2.3.2.1 Wildlife Receptors (Birds and Mammals)

Birds and mammals are primarily exposed to site contaminants through food web exposure (i.e., consumption of organisms in which contaminants have accumulated). Sediment and surface water ESVs, however, are based on direct contact by benthic or aquatic organisms and, thus, are not directly applicable to birds and mammals. LANL maintains screening values based on exposure of birds and mammals via the food web. For the SLERA refinement, maximum detections of the bioaccumulative ecological COPCs were compared to no effects levels and low effects levels for birds and mammals. The low effects level represents the lowest concentration at which adverse effects are observed in a representative species.

4.2.3.2.1.1 Birds

As shown in Table 12 and Table 13, the maximum concentrations for many of the bioaccumulative COPCs are less than the no effect levels, indicating that these chemicals are unlikely to pose adverse effects to avian receptors. These analytes and associated environmental media are listed below.

- Arsenic (sediment and surface water)
- Cadmium (sediment)
- Chromium (sediment)

- Copper (sediment and surface water)
- Nickel (sediment)
- Selenium (sediment)
- Zinc (surface water)
- Benzo(a)anthracene (sediment)
- Pyrene (sediment)

The maximum detections of mercury and zinc in sediment exceed the avian no effects levels but are less than the low effects levels, indicating significant impacts to bird populations exposed to mercury and zinc in sediment are unlikely. Additionally, mercury was not detected in site surface water and zinc concentrations in surface water are less than the no effect level.

The following bioaccumulative chemicals lack food web screening values for birds:

- Anthracene in sediment and surface water;
- Benzo(a)anthracene in surface water;
- Benzo(a)pyrene in sediment and surface water;
- Benzo(b)fluoranthene in sediment and surface water;
- Benzo(g,h,i)perylene in sediment and surface water;
- Benzo(k)fluoranthene in sediment and surface water;
- Chrysene in sediment and surface water;
- Dibenzo(a,h)anthracene in sediment and surface water;
- Fluoranthene in sediment and surface water;
- Indeno(1,2,3-cd)pyrene in sediment and surface water; and
- Pyrene in surface water.

4.2.3.2.1.2 Mammals

As shown in Table 12 and Table 13, the maximum concentrations of chemicals listed below are less than the no effect level for mammals, indicating it is unlikely that these analytes pose a risk to aquatic mammals.

- Arsenic (sediment and surface water),
- Chromium (sediment),
- Copper (sediment and surface water),
- Mercury (sediment),
- Nickel (sediment),
- Selenium (sediment),
- Zinc (surface water),
- Anthracene (sediment and surface water),
- Benzo(a)anthracene (sediment and surface water),
- Benzo(a)pyrene (sediment and surface water),
- Benzo(b)fluoranthene (sediment and surface water),
- Benzo(g,h,i)perylene (sediment and surface water),

- Benzo(k)fluoranthene (sediment and surface water),
- Chrysene (sediment and surface water),
- Dibenzo(a,h)anthracene (sediment and surface water),
- Fluoranthene (surface water),
- Indeno(1,2,3-cd)pyrene (sediment and surface water), and
- Pyrene (sediment and surface water).

The maximum detections of cadmium and zinc in sediment exceed the no effects levels for mammals. However, the maximum concentrations of both metals are less than the low effects levels, indicating significant effects to mammals exposed to cadmium and zinc in sediment are unlikely. Additionally, cadmium was not detected in site surface water and the maximum zinc concentration in surface water was less than the mammalian no effect level. It is unlikely that copper and zinc pose a significant risk to mammal populations.

4.2.3.2.2 Benthic Invertebrates

Step 2b retained beryllium, zinc, and all of the PAHs except the background constituent fluoranthene as ecological COPCs for benthic invertebrates. The Step 2b screening is a conservative comparison of maximum detections to threshold effects concentrations (TECs). The TEC represents the concentration below which biological effects are not expected. The SLERA refinement for benthic invertebrates includes comparison of maximum sediment concentrations to probable effect concentrations (PECs) and comparison of mean concentrations to threshold effect levels (TELs) and probable effect levels (PELs). Biological effects are probable for contaminant concentrations exceeding the PEL. The TELs and PELs are the Florida SQAGs and were obtained from Table D-9 of the DPD.

As shown in Table 14, PECs are available for zinc, most of the PAHs, and the sum of all PAHs. All of the zinc, individual PAH, and sum of PAHs results are less than the PECs. These comparisons indicate that zinc and PAH concentrations (based on the total PAH concentrations) are less than those at which biological effects are probable.

Neither a TEC nor a PEC is available for benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, and indeno(1,2,3-c,d)pyrene. USEPA Region 4 Sediment Screening Values for Hazardous Waste Sites (USEPA, 2018) includes ESVs for these four PAHs. In addition, the USEPA Region 4 guidance describes a refined evaluation for PAHs based on the equilibrium partitioning sediment benchmark toxic unit. This refined evaluation consists of first normalizing the PAH concentrations to the organic carbon content (i.e., the mass of PAH is divided by the mass of organic carbon on the sediment as opposed to the sediment dry weight; the normalized organic carbon concentration unit is milligram PAH per kilogram organic carbon). The carbon-normalized concentrations are divided by the chronic screening values listed in Table 3-4 of USEPA (2003) and summed. If the sum of the quotients is less than 1, then adverse effects for benthic organisms are unlikely. As shown in Table 14, the sum of the toxic unit quotients for all PAHs in the pond sediment, based on the maximum detections, is 0.03, indicating that the PAHs do not pose a risk to benthic organisms.

There are no screening values for beryllium in sediment.

4.2.3.2.3 Aquatic Community

Step 2b identified five PAHs as surface water COPCs for the aquatic community. For the refined evaluation, the data for these five PAHs were compared to the USEPA Region 4 chronic freshwater values (USEPA, 2018) and low effects levels listed in the LANL Ecorisk database, version 4.1. Similar to the PELs and refinement screening values (RSVs) for sediment, the low effects levels are concentrations at which adverse effects are observed. Thus, concentrations that are less than the low effects levels are unlikely to pose significant risks to the aquatic community.

Table 15 compares the maximum and mean detections to the additional screening values. All benzo(a)anthracene detections (maximum of 0.19 micrograms per liter [µg/L]) are less than the USEPA Region 4 freshwater ESV of 4.7 µg/L and LANL low effects level (0.27 µg/L). Similarly, the maximum benzo(b)fluoranthene detection of 0.34 µg/L is less than the USEPA Region 4 ESV of 2.6 µg/L and LANL low effects level of 90 µg/L. This comparison indicates that these two PAHs are unlikely to adversely affect the aquatic community.

The mean benzo(a)pyrene concentration of 0.0893 µg/L is slightly greater than the USEPA Region 4 freshwater ESV of 0.06 µg/L and is less than the LANL low effects level of 0.14 µg/L. This comparison suggests that benzo(a)pyrene poses minimal risk to the pond's aquatic community.

All indeno(1,2,3-c,d)pyrene detections (maximum of 0.14 µg/L) are less than the LANL low effects level of 43 µg/L. This comparison indicates that indeno(1,2,3-c,d)pyrene poses minimal risk to the aquatic community.

As indicated in Table 15, both the maximum and mean dibenzo(a,h)anthracene detections in surface water exceed the USEPA Region 4 chronic freshwater ESV and LANL low effects levels. Dibenzo(a,h)anthracene was detected in 2 out of 10 samples at concentrations of 0.044 J µg/L and 0.089 J µg/L. The average detection, 0.0665 µg/L, is slightly greater than the low effects level of 0.034 µg/L. This PAH was not detected in eight of the ten surface water samples. The limit of detection is 0.04 µg/L, which is only slightly greater than the low effects level. If one-half the limit of detection is used as a proxy concentration for the non-detect results, the average dibenzo(a,h)anthracene concentration is 0.029 µg/L, which is less than the low effects level.

4.2.3.3 Food Web Modeling

As indicated in the previous sections, there are no screening values available for the avian community, and PAHs are bioaccumulative compounds. For this reason, food web modeling was completed as a supplement to Step 2c to provide a quantitative evaluation of risks posed to birds exposed to PAHs in site sediment and surface water.

4.2.3.3.1 Initial Food Web Analysis

The potential effects to wildlife receptors were initially assessed by estimating the maximum chemical intake for each receptor and comparing this intake to the no observed adverse effects level (NOAEL). Although wildlife receptors may be exposed to chemicals via dermal contact and/or inhalation, there is limited information on assessing exposure via these routes and USEPA determined that inhalation and dermal exposures typically contribute negligibly to overall risk

(USEPA, 2003 and updates). Therefore, the estimation of chemical intake considered only the ingestion route. The ingestion route includes direct ingestion of the contaminated medium (i.e., incidental consumption of sediment) and ingestion of chemicals accumulated in the tissue of the wildlife receptor's diet (plants, benthic invertebrates, and/or fish). Table 16 identifies the exposure assumptions (food ingestion rate, dietary components, etc.) that were used to quantify chemical intake for each wildlife receptor. The NOAELs are presented in Table 17. The equation used to estimate chemical intake is presented below:

$$E_j = \left[\sum_{i=1}^{N} B_{ij} \times P_i \times FIR \right]$$

Where:
- E_j = daily dose (mg/kg-body weight/day)
- FIR = species-specific food ingestion rate (kilogram [kg]-dry weight food/kg body weight/day)
- B_{ij} = concentration of chemical (j) in biota type (i) (mg/kg-dry weight food)
- P_i = proportion of biota type (i) in diet

As noted, the chemical intake is dependent on chemical concentrations in various biota. Because tissue samples were not collected during the CS investigation, the tissue concentrations of invertebrates and fish were estimated based on the chemical concentrations in surface water and sediment along with chemical-specific bioaccumulation factors. Tissue concentrations in benthic invertebrates were estimated by multiplying the measured sediment concentration for each chemical by a biota-sediment accumulation factor (BSAF). BSAFs are presented in Table 18 and were obtained from the source listed below:

- *Biota Sediment Accumulation Factors for Invertebrates: Review and Recommendations for the Oak Ridge Reservation*. Prepared for U.S. Department of Energy. BJC/OR-112, August (Bechtel-Jacobs, 1998).

Tissue concentrations in fish were estimated by multiplying the measured surface water concentration for each chemical by a bioconcentration factor (BCF). BCFs are presented in Table 18 and were obtained from the Risk Assessment Information System, available at URL https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef.

In accordance with USEPA guidance, chemicals that result in a NOAEL-based quotient greater than 1 should be retained as COPCs. The chemical intake and NOAEL-based quotient calculations are presented in Tables 19 through 21. The NOAEL-based quotients for all analytes and all three wildlife species are less than 1, indicating risks are not likely. As such, further refined food web modeling is not warranted.

4.2.4 Uncertainty Assessment

4.2.4.1 Chemical Analysis

At any site, it is possible that there are more individual chemical substances present than are identified in the sampling and analysis effort. The potential site contaminants are PAHs, TPH,

SVOCs, VOCs and metals associated with contamination from railroad tie disposal. All samples were analyzed for full analytical suites of these analyte groups, minimizing the possibility that potential site-related contaminants were not identified. However, it is possible that non-detected analytes are present at concentrations posing a risk to ecological receptors. To evaluate this possibility, the reporting limits for nondetect analytes were compared to ESVs, as shown in Table 9 for sediment and Table 10 for surface water. As described in Section 4.2.2.3, the analytical sensitivity contributes little to the uncertainty of the SLERA.

4.2.4.2 Wildlife Exposure Factors

Food web modeling requires making assumptions regarding animals' dietary habits and the contaminant concentrations of the dietary items. This uncertainty is minimized by using food ingestion rates available in USEPA guidance documents or other literature and by using bioaccumulation factors from USEPA guidance and other reliable sources in the literature. However, assumptions used in the food web modeling could over- or underestimate potential exposure and potential risk to upper trophic level receptors.

4.2.4.3 Toxicity Factors

The use of literature-based NOAELs to estimate whether a daily dose poses no or minimal risk to an ecological community contributes to the SLERA uncertainty. These NOAELs were selected from various guidance documents to provide a conservative evaluation for various wildlife receptors. These toxicity reference values, however, could over- or underestimate potential risks.

4.3 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

In summary, a SLERA consisting of Steps 2a through 2c was completed in accordance with the DPD and SLERAWP. Step 2b identified multiple ecological COPCs based on the decision logic outlined in the DPD. Table 22 summarizes these COPCs.

The ecological COPCs were evaluated in greater detail in Step 2c. Step 2c considered multiple lines of evidence including comparison of the ranges of site detections to the ranges of background values, detection frequency, and additional screening values specific to the preliminary assessment endpoints. In addition, comparison of the data to low effects levels was evaluated. Table 22 summarizes application of these lines of evidence to the individual ecological COPCs. In general, these lines of evidence indicate that many of the analytes were detected at concentrations similar to those in background or reference locations at KSC, and/or at concentrations that would not pose a significant risk to ecological communities.

There are no screening values available for the avian community, and PAHs are bioaccumulative compounds. For this reason, food web modeling was completed as a supplement to Step 2c to provide a quantitative evaluation of this exposure pathway. Food web modeling indicates that PAHs are unlikely to pose a risk to birds exposed to site sediment and surface water. Based on the results of this SLERA, no further study is recommended for the RTDA at PRL 229.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Surface water and sediment sampling from the PRL 229 Pond indicates the presence of metals and PAHs at detectable concentrations in both media. A SLERA was completed in accordance with the KSC DPD and SLERAWP. The SLERA concluded that many of the analytes were detected at concentrations similar to those in background or reference locations at KSC, and/or at concentrations that would not pose a significant risk to ecological communities. Food web modeling was completed as a supplement to provide a quantitative evaluation of avian receptors exposed to PAHs in site media. Food web modeling indicates that PAHs are unlikely to pose a risk to birds exposed to site sediment and surface water.

Based on the results of the SLERA, no further study is recommended for the RTDA Pond at PRL 229.

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TABLES

Table 1
Sediment Sample Analytical Results - 2020

LOCATION	SQAG	UNOA-SD0001	UNOA-SD0002	UNOA-SD0003	UNOA-SD0004	UNOA-SD0005	UNOA-SD0006
Depth Interval (ft. bls)		**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**	**0 - 0.5**
SAMPLE DATE		**6/23/2020**	**6/23/2020**	**6/23/2020**	**6/23/2020**	**6/23/2020**	**6/23/2020**
PAHs (ug/kg)							
1-METHYLNAPHTHALENE	-	0.15 U	0.18 U	0.66 U	0.48 U	0.32 U	0.1 U
2-METHYLNAPHTHALENE	0.0202	0.15 U	0.18 U	0.66 U	0.48 U	0.32 U	0.1 U
ACENAPHTHENE	0.0067	0.15 U	0.18 U	**1.22 J**	0.48 U	0.32 U	0.1 U
ACENAPHTHYLENE	0.00587	0.15 U	0.18 U	**1.92**	**1.35**	**0.485 J**	**0.112 J**
ANTHRACENE	0.04690	**0.0816 J**	0.18 U	**1.52**	**1.04**	**0.432 J**	**0.0952 J**
BENZO(A)ANTHRACENE	0.0748	**0.595**	**0.195**	**2.26**	**1.28**	**3.62**	**0.646**
BENZO(A)PYRENE	0.0888	**0.504**	**0.207**	**3.84**	**2.55**	**3.82**	**0.665**
BENZO(B)FLUORANTHENE	-	**0.995**	**0.473**	**8.09**	**5.42**	**7.67**	**1.55**
BENZO(G,H,I)PERYLENE	0.153	**0.241**	**0.138**	**3.31**	**2.19**	**1.18**	**0.236**
BENZO(K)FLUORANTHENE	-	**0.336**	**0.151**	**2.36**	**1.58**	**2.42**	**0.463**
CHRYSENE	0.108	**0.736**	**0.267**	**1.95**	**1.12**	**3.85**	**0.792**
DIBENZO(A,H)ANTHRACENE	0.033	**0.0946**	**0.0446 J**	**0.915**	**0.569**	**0.485**	**0.0853**
FLUORANTHENE	0.113	**0.831**	**0.267 J**	**3**	**1.37**	**3.53**	**0.797**
FLUORENE	0.021	0.15 U	0.18 U	0.66 U	0.48 U	0.32 U	0.1 U
INDENO(1,2,3-CD)PYRENE	-	**0.302**	**0.156**	**4.1**	**2.43**	**1.68**	**0.317**
NAPHTHALENE	0.18	0.15 U	0.18 U	0.66 U	0.48 U	0.32 U	0.1 U
PHENANTHRENE	0.09	**0.0851 J**	0.18 U	**0.411 J**	0.48 U	**0.269 J**	**0.0789 J**
PYRENE	0.153	**0.745**	**0.298 J**	**3.07**	**1.71**	**4.74**	**0.869**
TOTAL PAHs	1.6	**6.00**	**2.92**	**39.29**	**24.05**	**34.98**	**6.96**
TRPH (mg/kg)							
TPH (C8-C40)		**161**	**257**	**450**	**503**	**307**	**302**

Definitions and Acronyms
UNOA = Un-Numbered Operational Area
SD = Sediment
ft. bls = feet below land surface
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
PAHs = polynuclear aromatic hydrocarbons
SQAG = sediment quality assessment guideline
TRPH / TPH = total recoverable petroleum hydrocarbons

Footnotes:
Bold = Analyte was detected.

Data Qualifiers:
Blank (i.e., no qualifier) = the chemical was detected.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.

Exceeds SQAG

Table 2
Surface Water Sample Analytical Results - 2021

LOCATION	UNOA-SW0001	UNOA-SW0002	UNOA-SW0003	UNOA-SW0004	UNOA-SW0005	UNOA-SW0006	UNOA-SW0007	UNOA-SW0008	UNOA-SW0009	UNOA-SW0010
Depth Interval (ft. bls)	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
SAMPLE DATE	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021
VOCs (ug/L)										
1,1,1,2-TETRACHLOROETHANE	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
1,1,1-TRICHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-TETRACHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-TRICHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DICHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DICHLOROETHENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,1-DICHLOROPROPENE	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U	3.5 U
1,2,3-TRICHLOROBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2,3-TRICHLOROPROPANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-TRICHLOROBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-TRIMETHYLBENZENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DIBROMO-3-CHLOROPROPANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-DIBROMOETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-DICHLOROBENZENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-DICHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,2-DICHLOROPROPANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3,5-TRIMETHYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-DICHLOROBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
1,3-DICHLOROPROPANE	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
1,4-DICHLOROBENZENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2,2-DICHLOROPROPANE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-BUTANONE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-CHLOROTOLUENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
2-HEXANONE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-CHLOROTOLUENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-ISOPROPYLTOLUENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
4-METHYL-2-PENTANONE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
ACETONE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BROMOBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BROMOCHLOROMETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BROMODICHLOROMETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BROMOFORM	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
BROMOMETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
CARBON DISULFIDE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
CARBON TETRACHLORIDE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
CHLOROBENZENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CHLORODIBROMOMETHANE	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
CHLOROETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
CHLOROFORM	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
CHLOROMETHANE	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U

Table 2
Surface Water Sample Analytical Results - 2021

LOCATION	UNOA-SW0001	UNOA-SW0002	UNOA-SW0003	UNOA-SW0004	UNOA-SW0005	UNOA-SW0006	UNOA-SW0007	UNOA-SW0008	UNOA-SW0009	UNOA-SW0010
Depth Interval (ft. bls)	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
SAMPLE DATE	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**
CIS-1,2-DICHLOROETHENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CIS-1,3-DICHLOROPROPENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
DIBROMOMETHANE	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U	4.0 U
DICHLORODIFLUOROMETHANE	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
ETHYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
HEXACHLOROBUTADIENE	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
ISOPROPYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
M+P-XYLENES	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
METHYL TERT-BUTYL ETHER	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
METHYLENE CHLORIDE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
NAPHTHALENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
N-BUTYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
N-PROPYLBENZENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
O-XYLENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
SEC-BUTYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
STYRENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TERT-BUTYLBENZENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TETRACHLOROETHENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TOLUENE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
TRANS-1,2-DICHLOROETHENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TRANS-1,3-DICHLOROPROPENE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TRICHLOROETHENE	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
TRICHLOROFLUOROMETHANE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
VINYL ACETATE	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
VINYL CHLORIDE	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
SVOCs (ug/L)										
BENZOIC ACID	24 U	24 U	24 U	24 U	24 U	24 U	24 U	24 U	24 U	24 U
4-CHLORO-3-METHYL PHENOL	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2-CHLOROPHENOL	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2,4-DICHLOROPHENOL	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2,4-DIMETHYLPHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
2,4-DINITROPHENOL	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
4,6-DINITRO-O-CRESOL	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U	3.8 U
2-METHYLPHENOL	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
3&4-METHYLPHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
2-NITROPHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
4-NITROPHENOL	9.5 U	9.5 U	9.6 U	9.6 U	9.6 U	9.6 U	9.5 U	9.5 U	9.5 U	9.5 U
PENTACHLOROPHENOL	9.5 U	9.5 U	9.6 U	9.6 U	9.6 U	9.6 U	9.5 U	9.5 U	9.5 U	9.5 U
PHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U

Table 2
Surface Water Sample Analytical Results - 2021

LOCATION	UNOA-SW0001	UNOA-SW0002	UNOA-SW0003	UNOA-SW0004	UNOA-SW0005	UNOA-SW0006	UNOA-SW0007	UNOA-SW0008	UNOA-SW0009	UNOA-SW0010
Depth Interval (ft. bls)	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5	0.0-0.5
SAMPLE DATE	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021	12/16/2021
SVOCs (ug/L)										
2,4,5-TRICHLOROPHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
2,4,6-TRICHLOROPHENOL	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
BENZYL ALCOHOL	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
4-BROMOPHENYL PHENYL ETHER	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
BUTYL BENZYL PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
CARBAZOLE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
4-CHLOROANILINE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
BIS(2-CHLOROETHOXY)METHANE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
BIS(2-CHLOROETHYL)ETHER	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2,2'-OXYBIS(1-CHLOROPROPANE)	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2-CHLORONAPHTHALENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
4-CHLOROPHENYL PHENYL ETHER	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
DIBENZOFURAN	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
1,2-DICHLOROBENZENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
1,3-DICHLOROBENZENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
1,4-DICHLOROBENZENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
3,3'-DICHLOROBENZIDINE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DIETHYL PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DIMETHYL PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DI-N-BUTYL PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
DI-N-OCTYL PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
2,4-DINITROTOLUENE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2,6-DINITROTOLUENE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
BIS(2-ETHYLHEXYL)PHTHALATE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
HEXACHLOROBENZENE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
HEXACHLOROBUTADIENE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
HEXACHLOROCYCLOPENTADIENE	3.3 U	3.3 U	3.4 U	3.4 U	3.4 U	3.4 U	3.3 U	3.3 U	3.3 U	3.3 U
HEXACHLOROETHANE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
ISOPHORONE	0.95 U	0.95 U	0.96 U	0.96 U	0.96 U	0.96 U	0.95 U	0.95 U	0.95 U	0.95 U
2-NITROANILINE	3.3 U	3.3 U	3.4 U	3.4 U	3.4 U	3.4 U	3.3 U	3.3 U	3.3 U	3.3 U
3-NITROANILINE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
4-NITROANILINE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
NITROBENZENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
N-NITROSODI-N-PROPYLAMINE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
N-NITROSODIPHENYLAMINE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U
1,2,4-TRICHLOROBENZENE	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U

Table 2
Surface Water Sample Analytical Results - 2021

LOCATION	UNOA-SW0001	UNOA-SW0002	UNOA-SW0003	UNOA-SW0004	UNOA-SW0005	UNOA-SW0006	UNOA-SW0007	UNOA-SW0008	UNOA-SW0009	UNOA-SW0010
Depth Interval (ft. bls)	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
SAMPLE DATE	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**
PAHs (ug/L)										
1-METHYLNAPHTHALENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
2-METHYLNAPHTHALENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
ACENAPHTHENE	0.40 U	0.40 U	0.40 U	0.40 U	**0.21 J**	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
ACENAPHTHYLENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.19**	0.040 U	0.040 U	**0.051 J**	0.040 U	**0.080 J**
ANTHRACENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.18**	0.040 U	0.040 U	**0.037 J**	0.040 U	**0.051 J**
BENZO(A)ANTHRACENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.34**	**0.037 J**	**0.048 J**	**0.092**	**0.034 J**	**0.16**
BENZO(A)PYRENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.12 J**	0.040 U	0.040 U	**0.061 J**	0.040 U	**0.12 J**
BENZO(B)FLUORANTHENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.11**	0.040 U	0.040 U	**0.052 J**	0.040 U	**0.095**
BENZO(G,H,I)PERYLENE	0.080 U	0.080 U	0.080 U	0.080 U	**0.21**	0.080 U	0.080 U	**0.057 J**	0.080 U	**0.095 J**
BENZO(K)FLUORANTHENE	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	0.040 U	**0.044 J**	0.040 U	**0.089 J**
CHRYSENE	0.40 U	0.40 U	0.40 U	0.40 U	**0.28 J**	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
DIBENZO(A,H)ANTHRACENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
FLUORANTHENE	0.040 U	0.040 U	0.040 U	0.040 U	**0.14 J**	0.040 U	0.040 U	**0.070 J**	0.040 U	**0.14 J**
FLUORENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
INDENO(1,2,3-CD)PYRENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
NAPHTHALENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
PHENANTHRENE	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
PYRENE	0.40 U	0.40 U	0.40 U	0.40 U	**0.30 J**	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
METALS (ug/L)										
ANTIMONY	**2.4 J**	**1.9 J**	**1.1 J**	**1.8 J**	5.0 U	5.0 U	**1.5 J**	**2.2 J**	**1.0 J**	5.0 U
ARSENIC	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**2.0 J**	5.0 U	5.0 U	5.0 U	5.0 U
BARIUM	5.0 U	**5.2 J**	5.0 U	5.0 U	5.0 U	**1.9 J**	5.0 U	5.0 U	5.0 U	5.0 U
BERYLLIUM	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CADMIUM	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
CALCIUM	**64400**	**66400**	**67900**	**68500**	**70600**	**76800**	**68300**	**67000**	**66100**	**68200**
CHROMIUM	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
COPPER	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	**3.0 J**	2.0 U	2.0 U	2.0 U	2.0 U
LEAD	**2.4 J**	**2.1 J**	**2.4 J**	**1.8 J**	**2.2 J**	**2.3 J**	**3.1 J**	**2.2 J**	**2.2 J**	**2.7 J**
MAGNESIUM	**59200**	**59600**	**58300**	**62000**	**61900**	**57000**	**61400**	**61100**	**60200**	**62400**
MERCURY	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
NICKEL	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
SELEIUM	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
SILVER	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U
THALLIUM	**1.4 J**	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	**1.4 J**	2.0 U
ZINC	5.0 U	5.0 U	5.0 U	**7.5 J**	5.0 U	**7.3 J**	5.0 U	5.0 U	5.0 U	5.0 U

Table 2
Surface Water Sample Analytical Results - 2021

LOCATION	UNOA-SW0001	UNOA-SW0002	UNOA-SW0003	UNOA-SW0004	UNOA-SW0005	UNOA-SW0006	UNOA-SW0007	UNOA-SW0008	UNOA-SW0009	UNOA-SW0010
Depth Interval (ft. bls)	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
SAMPLE DATE	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**
MISCELLANEOUS PARAMETERS (mg/L)										
HARDNESS, TOTAL as CaCO3	**405**	**411**	**410**	**426**	**431**	**426**	**423**	**419**	**413**	**427**

Definitions and Acronyms
UNOA = Un-Numbered Operational Area
SW = Surface Water
ft. bls = feet below land surface
ug/L = micrograms per liter
mg/kg = milligrams per liter
PAHs = polynuclear aromatic hydrocarbons
SVOCs = semi-volatile organic carbons
VOCs = svolatile organic carbons

Footnotes:
Bold = Analyte was detected.

Data Qualifiers:
Blank (i.e., no qualifier) = the chemical was detected.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.

Table 3
Sediment Sample Analytical Results - 2021

LOCATION	UNOA-SD0007	UNOA-SD0008	UNOA-SD0009	UNOA-SD0010	UNOA-SD0011	UNOA-SD0012	UNOA-SD0013	UNOA-SD0014	UNOA-SD0015	UNOA-SD0016
Depth Interval (ft. bls)	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
SAMPLE DATE	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**
SVOCs (ug/kg)										
BENZOIC ACID	3100 U	3300 U	2800 U	1100 U	3100 U	2500 U	860 U	1800 U	1500 U	1400 U
4-CHLORO-3-METHYL PHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2-CHLOROPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,4-DICHLOROPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,4-DIMETHYLPHENOL	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
2,4-DINITROPHENOL	4600 U	4900 U	4200 U	1700 U	4700 U	3800 U	1300 U	2700 U	2300 U	2100 U
4,6-DINITRO-O-CRESOL	1200 U	1300 U	1100 U	450 U	1300 U	1000 U	350 U	710 U	610 U	560 U
2-METHYLPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
3&4-METHYLPHENOL	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
2-NITROPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
4-NITROPHENOL	3100 U	3300 U	2800 U	1100 U	3100 U	2500 U	860 U	1800 U	1500 U	1400 U
PENTACHLOROPHENOL	3100 U	3300 U	2800 U	1100 U	3100 U	2500 U	860 U	1800 U	1500 U	1400 U
PHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,4,5-TRICHLOROPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,4,6-TRICHLOROPHENOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
BENZYL ALCOHOL	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
4-BROMOPHENYL PHENYL ETHER	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
BUTYL BENZYL PHTHALATE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
CARBAZOLE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
4-CHLOROANILINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
BIS(2-CHLOROETHOXY)METHANE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
BIS(2-CHLOROETHYL)ETHER	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,2'-OXYBIS(1-CHLOROPROPANE)	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2-CHLORONAPHTHALENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
4-CHLOROPHENYL PHENYL ETHER	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
DIBENZOFURAN	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
1,2-DICHLOROBENZENE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
1,3-DICHLOROBENZENE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
1,4-DICHLOROBENZENE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
3,3'-DICHLOROBENZIDINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
DIETHYL PHTHALATE	1100 U	1100 U	980 U	400 U	1100 U	890 U	300 U	620 U	530 U	490 U
DIMETHYL PHTHALATE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
DI-N-BUTYL PHTHALATE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
DI-N-OCTYL PHTHALATE	1100 U	1100 U	980 U	400 U	1100 U	890 U	300 U	620 U	530 U	490 U
2,4-DINITROTOLUENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2,6-DINITROTOLUENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
BIS(2-ETHYLHEXYL)PHTHALATE	1100 U	1100 U	980 U	400 U	1100 U	890 U	300 U	620 U	530 U	490 U
HEXACHLOROBENZENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
HEXACHLOROBUTADIENE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
HEXACHLOROCYCLOPENTADIENE	2500 U	2600 U	2200 U	900 U	2500 U	2000 U	690 U	1400 U	1200 U	1100 U
HEXACHLOROETHANE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
ISOPHORONE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
2-NITROANILINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
3-NITROANILINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
4-NITROANILINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
NITROBENZENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
N-NITROSODI-N-PROPYLAMINE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U
N-NITROSODIPHENYLAMINE	610 U	650 U	560 U	230 U	630 U	510 U	170 U	360 U	300 U	280 U
1,2,4-TRICHLOROBENZENE	310 U	330 U	280 U	110 U	310 U	250 U	86 U	180 U	150 U	140 U

Table 3
Sediment Sample Analytical Results - 2021

LOCATION	UNOA-SD0007	UNOA-SD0008	UNOA-SD0009	UNOA-SD0010	UNOA-SD0011	UNOA-SD0012	UNOA-SD0013	UNOA-SD0014	UNOA-SD0015	UNOA-SD0016
Depth Interval (ft. bls)	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**	**0.0-0.5**
SAMPLE DATE	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**	**12/16/2021**
PAHs (ug/kg)										
1-METHYLNAPHTHALENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
2-METHYLNAPHTHALENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
ACENAPHTHENE	310 U	330 U	280 U	110 U	**225 J**	250 U	85 U	180 U	150 U	140 U
ACENAPHTHYLENE	61 U	**75.5 J**	**42.0 J**	**42.3 J**	**513**	**192**	**23.8 J**	**39.7 J**	31 U	**21.9 J**
ANTHRACENE	61 U	**77.3 J**	**47.9 J**	**43.4 J**	**504**	**221**	**26.5 J**	**48.6 J**	31 U	**22.2 J**
BENZO(A)ANTHRACENE	**66.2 J**	**165**	**103 J**	**88.9**	**1120**	**457**	**51.6**	**98.1**	**24.8 J**	**46.0 J**
BENZO(A)PYRENE	61 U	**53.5 J**	**33.5 J**	**31.3 J**	**303**	**145**	**17.5 J**	**39.3 J**	31 U	**15.3 J**
BENZO(B)FLUORANTHENE	61 U	**53.6 J**	**30.7 J**	**26.2 J**	**335**	**148**	**16.4 J**	**31.5 J**	31 U	**15.3 J**
BENZO(G,H,I)PERYLENE	**38.2 J**	**97.1 J**	**57.8 J**	**51**	**651**	**230**	**29.5 J**	**58.6 J**	31 U	**25.4 J**
BENZO(K)FLUORANTHENE	61 U	65 U	56 U	23 U	**85.2 J**	**39.9 J**	17 U	35 U	31 U	28 U
CHRYSENE	310 U	330 U	280 U	110 U	**621**	**211 J**	85 U	180 U	150 U	140 U
DIBENZO(A,H)ANTHRACENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
FLUORANTHENE	61 U	**61.3 J**	**39.3 J**	**34.0 J**	**364**	**170**	**19.9 J**	**44.2 J**	31 U	**17.6 J**
FLUORENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
INDENO(1,2,3-CD)PYRENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
NAPHTHALENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
PHENANTHRENE	310 U	330 U	280 U	110 U	310 U	250 U	85 U	180 U	150 U	140 U
PYRENE	310 U	330 U	280 U	110 U	**738**	**242 J**	85 U	180 U	150 U	140 U
METALS (mg/kg)										
ANTIMONY	2.3 U	**1.2 J**	**0.77 J**	0.76 U	**0.76 J**	1.8 U	**0.14 J**	**0.43 J**	**0.47 J**	**0.23 J**
ARSENIC	**3.9 J**	**5.5**	**8.2**	**1.6**	**7.1**	**6.6**	**1.4**	**3.8**	**5.6**	**3.3**
BARIUM	**16.0 J**	**6.8 J**	**7.1 J**	**3.8 J**	**10.8 J**	**8.4 J**	**2.6 J**	**4.9 J**	**5.6 J**	**5.6 J**
BERYLLIUM	0.46 U	0.46 U	0.40 U	**0.076 J**	**0.21 J**	**0.18 J**	**0.070 J**	**0.14 J**	**0.14 J**	**0.12 J**
CADMIUM	**0.23 J**	**0.23 J**	**0.20 J**	**0.076 J**	**0.34 J**	**0.18 J**	0.10 U	0.21 U	**0.14 J**	**0.11 J**
CHROMIUM	**7**	**8.2**	**5.5**	**2.8**	**10.4**	**7.8**	**2.9**	**5.6**	**5.3**	**5.6**
COPPER	**8.5 J**	**13.1**	**7.2 J**	**2.9 J**	**12.3**	**10.8**	**1.9 J**	**4.3 J**	**11.2**	**4.6**
LEAD	**7.5 J**	**7.3 J**	**7.5 J**	**2.9 J**	**12.1**	**15.3**	**6.8**	**10.5**	**9.6**	**6.4**
MERCURY	**0.12 J**	**0.15 J**	**0.12 J**	**0.034 J**	**0.14 J**	**0.15 J**	**0.036 J**	**0.094 J**	**0.085 J**	**0.065 J**
NICKEL	**3.3 J**	**4.0 J**	**2.7 J**	**1.2 J**	**4.0 J**	**3.0 J**	**1.1 J**	**2.3 J**	**2.2 J**	**2.0 J**
SELEIUM	2.3 U	2.3 U	2.0 U	0.76 U	2.1 U	**1.0 J**	0.50 U	**0.62 J**	1.0 U	**0.47 J**
SILVER	0.92 U	0.92 U	0.81 U	0.31 U	0.84 U	0.73 U	0.20 U	0.41 U	0.41 U	0.35 U
THALLIUM	2.3 U	2.3 U	2.0 U	0.76 U	**0.46 J**	**0.51 J**	**0.11 J**	1.0 U	1.0 U	0.88 U
ZINC	**169**	**213**	**113**	**41.9**	**241**	**136**	**19.3**	**40.5**	**107**	**68.8**
TRPH (mg/kg)										
TPH (C8-C40)	**37.8 J**	**89.9**	**64**	**22.0 J**	**74.2**	**56.2**	**10.7 J**	**19.3 J**	**33.8**	**16.0 J**

Definitions and Acronyms
UNOA = Un-Numbered Operational Area
SD = Sediment
ft. bls = feet below land surface
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
PAHs = polynuclear aromatic hydrocarbons
TRPH / TPH = total recoverable petroleum hydrocarbons
SVOCs = semi-volatile organic carbons

Footnotes:
Bold = Analyte was detected.

Data Qualifiers:
Blank (i.e., no qualifier) = the chemical was detected.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.

Table 4
Federal and State Listed Species and Non-Listed Species Potentially Present On Site
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Common Name *(Scientific Name)*	Status
Reptiles	
Atlantic salt marsh snake *(Nerodia clarkii taeniata)*	FT
Eastern indigo snake *(Drymarchon corais couperi)*	FT
Gopher tortoise *(Gopherus polyphemus)*	FC/ST
Green sea turtle *(Chelonia mydas)*	FT
Hawksbill sea turtle *(Eretmochelys imbricata)*	FE
Leatherback sea turtle *(Dermochelys coriacea)*	FE
Loggerhead sea turtle *(Caretta caretta)*	FT
Birds	
Eastern black rail *(Laterallus jamaicensis ssp. jamaicensis)*	FT
Florida scrub-jay *(Aphelocoma coerulescens)*	FT
Red knot *(Calidris canutus rufa)*	FT
Wood stork *(Mycteria americana)*	FT
Mammals	
Southeastern beach mouse (*Peromyscus polionotus niveiventris*)	FT
Insects	
Monarch butterfly *(Danaus plexippus)*	FC
Plants	
Carter's mustard *(Warea carteri)*	FE
Lewton's polygala (*Polygala lewtonii)*	FE
Leather Fern (*Rumohra adiantiformis*)	Not Listed
Marsh Hay (*Spartina patens*)	Not Listed
Smooth Cordgrass (*Spartina alterniflora*)	Not Listed
Purple Muhly (*Muhlenbergia capillaris*)	Not Listed
Dune Sunflower (*Helianthus debilis*)	Not Listed

Notes:
FC = federal candidate for listing
FE =federally listed as endangered
FT = federally listed as threatened
ST = state listed as threatened

Table 5
Preliminary Assessment and Measurement Endpoints
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Assessment Endpoint	Basis For Assessment Endpoint	Measurement Endpoint
Growth, survival, and reproduction of benthic invertebrate communities.	Benthic invertebrates recycle nutrients and condition the sediment. They also are important prey species for upper trophic level receptors.	Comparison of the maximum detections reported for sediment and surface water samples to ecological screening values. A refined evaluation, including incorporation of mean concentration, detection frequency, lateral distribution, etc., was completed, as warranted by the initial comparison.
Growth, survival, and reproduction of aquatic communities, including fish.	A healthy aquatic community is critical to maintenance of water body function. Members of this community serve as prey species for upper trophic level receptors.	
Growth, survival, and reproduction of aquatic mammalian communities.	Aquatic/wetland mammals utilize a wide variety of food sources, including insects, amphibians, benthic invertebrates, and fish, thereby providing balance for the aquatic ecosystem. Mammals may be particularly vulnerable to bioaccumulative chemicals.	
Growth, survival, and reproduction of aquatic avian communities.	Aquatic/wetland birds utilize a wide variety of food sources, including insects, amphibians, benthic invertebrates, and fish. Birds may be particularly vulnerable to bioaccumulative chemicals.	

Table 6
Background Values and Ecological Screening Values
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte[1]	Sediment[2]		Surface Water[3]	
	BTV (mg/kg)	ESV (mg/kg)	BTV (µg/L)	ESV (µg/L)
ANTIMONY	--	2	15	240
ARSENIC	0.66	9.8	--	50
BARIUM	11.1	20	--	220
BERYLLIUM	--	--	--	--
CADMIUM	--	1	--	--
CALCIUM	--	--	196,760	116,000
CHROMIUM	8.24	43	--	--
COPPER	7.86	32	--	2.9
LEAD	21.2	36	8.6	0.54
MAGNESIUM			634,276	82,000
MERCURY	0.02	0.18	--	--
NICKEL	--	23	--	--
SELENIUM	--	11	--	--
THALLIUM	1.33	--	--	6.3
ZINC	43.2	120	--	37
ANTHRACENE	--	--	--	540
BENZO(A)ANTHRACENE	0.18	--	--	0.014
BENZO(A)PYRENE	0.26	--	--	0.0014
BENZO(B)FLUORANTHENE	0.22	--	--	0.014
BENZO(G,H,I)PERYLENE	0.17	--	--	0.44
BENZO(K)FLUORANTHENE	0.16	--	--	0.14
CHRYSENE	0.3	--	--	1.4
DIBENZO(A,H)ANTHRACENE	--	--	--	0.0014
FLUORANTHENE	0.74	--	--	19
INDENO(1,2,3-CD)PYRENE	0.18	--	--	0.014
PYRENE	0.46	--	--	49
SUM OF PAHS	--	1.6	--	--
TPH (C08-C40)	--	484	--	--

Notes:

[1] Only detected analytes are shown.

[2] Sediment BTVs and ESVs were obtained from Table D-6 of Geosyntec Consultants, Inc. (2019). The selected BTV is the Mean x 2 value for Combined Sediment Background; if this value was not available, the selected BTV is the Mean x 2 value for General Industrial Areas.

[3] Surface Water BTVs and ESVs were obtained from Table D-4 of Geosyntec Consultants, Inc. (2019). The selected BTV is the Mean x 2 value for Marine Water.

-- = not available or analyte not detected in the indicated medium
BTV = background threshold value
ESV = ecological screening value
mg/kg = milligrams per kilogram
PAH = polynuclear aromatic hydrocarbon
TPH = total petroleum hydrocarbon
µg/L = micrograms per liter

Geosyntec Consultants, Inc., 2019. Decision Process Document for the RCRA Corrective Action Program, John F. Kennedy Space Center, Florida. Revision 2. February.

Table 7
Occurrence, Distribution, and Selection of COPCs - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte[1]	Detection Frequency	Mean Concentration (mg/kg)	Minimum Detection (mg/kg)	Minimum Detection Qualifier	Maximum Detection (mg/kg)	Maximum Detection Qualifier	Location of Maximum Detection	Minimum LOD (mg/lg)	Maximum LOD (mg/kg)	BTV[2] (mg/kg)	Is the analyte considered a contaminant?	ESV[2] (mg/kg)	Frequency of ESV Exceedance	HQ[3]	COPC	COPC Communities	Benthic Invertebrate COPC Rationale	Wildlife COPC Rationale[2]
ANTIMONY	7/10	0.571	0.14	J	1.2	J	UNOA-SD0008	3.1	9.2	--	Yes, no BTV	2	0/10	0.6	No	None	HQ ≤ 1	Not Bioaccumulative
ARSENIC	10/10	4.7	1.4		8.2		UNOA-SD0009	--	--	0.66	Yes, BTV exceedance	9.8	0/10	0.8	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
BARIUM	10/10	7.16	2.6	J	16	J	UNOA-SD0007	--	--	11.1	Yes, BTV exceedance	20	0/10	0.8	No	None	HQ ≤ 1	Not Bioaccumulative
BERYLLIUM	7/10	0.134	0.07	J	0.21	J	UNOA-SD0011	2	2.3	--	Yes, no BTV	--	--	--	Yes	Benthic Invertebrates	No ESV	Not Bioaccumulative
CADMIUM	8/10	0.188	0.076	J	0.34	J	UNOA-SD0011	0.4	0.83	--	Yes, no BTV	1	0/10	0.3	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
CHROMIUM	10/10	6.11	2.8		10.4		UNOA-SD0011	--	--	8.24	Yes, BTV exceedance	43	0/10	0.2	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
COPPER	10/10	7.68	1.9	J	13.1		UNOA-SD0008	--	--	7.86	Yes, BTV exceedance	32	0/10	0.4	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
LEAD	10/10	8.59	2.9	J	15.3		UNOA-SD0012	--	--	21.2	No, maximum ≤ BTV	36	0/10	--	No	None	Not a contaminant	Not a contaminant
MERCURY	10/10	0.0994	0.034	J	0.15	J	UNOA-SD0008, UNOA-SD0012	--	--	0.02	Yes, BTV exceedance	0.18	0/10	0.8	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
NICKEL	10/10	2.58	1.1	J	4	J	UNOA-SD0008, UNOA-SD0011	--	--	--	Yes, no BTV	23	0/10	0.2	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
SELENIUM	3/10	0.697	0.47	J	1	J	UNOA-SD0012	2	9.2	--	Yes, no BTV	11	0/10	0.1	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
THALLIUM	3/10	0.36	0.11	J	0.51	J	UNOA-SD0012	1.5	4.6	1.33	No, maximum ≤ BTV	--	--	--	No	None	Not a contaminant	Not a contaminant
ZINC	10/10	115	19.3		241		UNOA-SD0011	--	--	43.2	Yes, BTV exceedance	120	4/10	2	Yes	Benthic Invertebrates and Wildlife	--	Bioaccumulative
ANTHRACENE	1/10	0.225	0.225	J	0.225	J	UNOA-SD0011	0.17	0.65	--	Yes, no BTV	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
BENZO(A)ANTHRACENE	8/10	0.119	0.0219	J	0.513		UNOA-SD0011	0.061	0.12	0.18	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
BENZO(A)PYRENE	8/10	0.124	0.0222	J	0.504		UNOA-SD0011	0.061	0.12	0.26	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
BENZO(B)FLUORANTHENE	10/10	0.222	0.0248	J	1.12		UNOA-SD0011	--	--	0.22	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
BENZO(G,H,I)PERYLENE	8/10	0.0798	0.0153	J	0.303		UNOA-SD0011	0.061	0.12	0.17	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
BENZO(K)FLUORANTHENE	8/10	0.0821	0.0153	J	0.335		UNOA-SD0011	0.061	0.12	0.16	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
CHRYSENE	9/10	0.138	0.0254	J	0.651		UNOA-SD0011	0.061	0.061	0.3	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
DIBENZO(A,H)ANTHRACENE	2/10	0.0626	0.0399	J	0.0852	J	UNOA-SD0011	0.034	0.13	--	Yes, no BTV	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
FLUORANTHENE	2/10	0.416	0.211	J	0.621		UNOA-SD0011	0.17	0.65	0.74	No, maximum ≤ BTV	--	--	--	No	None	--	Not a contaminant
INDENO(1,2,3-CD)PYRENE	8/10	0.0938	0.0176	J	0.364		UNOA-SD0011	0.061	0.12	0.18	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
PYRENE	2/10	0.49	0.242	J	0.738		UNOA-SD0011	0.17	0.65	0.46	Yes, BTV exceedance	--	--	--	Yes	Evaluated as total PAHs	--	Bioaccumulative
SUM OF PAHS	10/10	1.64	0.649		4.84		UNOA-SD0011	0.74	2.09	--	--	1.6	2/10	3	Yes	Benthic Invertebrates and Wildlife	HQ > 1	Bioaccumulative
TPH (C08-C40)	10/10	42.39	10.7	J	89.9		UNOA-SD0008	--	--	--	Yes, no BTV	484	0/10	0.2	No	None	HQ ≤ 1	Not Bioaccumulative

Notes:

[1] Only detected analytes are shown.

[2] BTVs, ESVs, and whether an analyte is considered bioaccumulative were obtained from Table D-6 of Geosyntec Consultants, Inc. (2019). The selected BTV is the Mean x 2 value for Combined Sediment Background; if this value was not available, the selected BTV is the Mean x 2 value for General Industrial Areas.

[3] HQ calculated based on maximum detection.

-- = not applicable or not available
BTV = background threshold value
COPC = chemical of potential concern
ESV = ecological screening value
HQ = hazard quotient
J = estimated value
LOD = limit of detection
mg/kg = milligrams per kilogram
PAH = polynuclear aromatic hydrocarbon
SQAG = Sediment Quality Assessment Guidelines
SVOC = semivolatile organic carbon
TPH = total petroleum hydrocarbon

Geosyntec Consultants, Inc., 2019. Decision Process Document for the RCRA Corrective Action Program, John F. Kennedy Space Center, Florida. Revision 2. February.

Table 8
Occurrence, Distribution, and Selection of COPCs - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte[1]	Detection Frequency	Mean Concentration (µg/L)	Minimum Concentration (µg/L)	Minimum Qualifier	Maximum Concentration (µg/L)	Maximum Qualifier	Location of Maximum Detection	Minimum LOD (µg/L)	Maximum LOD (µg/L)	BTV[2] (µg/L)	Is the analyte considered a contaminant?	ESV[2] (µg/L)	Frequency of ESV Exceedance	HQ[3]	COPC	COPC Communities	Aquatic Community COPC Rationale	Wildlife COPC Rationale[2]
ANTIMONY	7/10	1.7	1	J	2.4	J	UNOA-SW0001	6	6	15	No, no BTV exceedance.	240	0/10	--	No	None	Not a Contaminant	Not a Contaminant
ARSENIC	1/10	2	2	J	2	J	UNOA-SW0006	10	10	--	Yes, no BTV available.	50	0/10	0.04	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
BARIUM	2/10	3.55	1.9	J	5.2	J	UNOA-SW0002	200	200	--	Yes, no BTV available.	220	0/10	0.0236	No	None	HQ ≤ 1	Not Bioaccumulative
CALCIUM	10/10	68420	64400		76,800		UNOA-SW0006	--	--	196,760	No, no BTV exceedance.	116,000	0/10	--	No	None	Not a Contaminant	Not a Contaminant
COPPER	1/10	3	3	J	3	J	UNOA-SW0006	25	25	--	Yes, no BTV available.	2.9	1/10	1	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
LEAD	10/10	2.34	1.8	J	3.1	J	UNOA-SW0007	--	--	8.6	No, no BTV exceedance.	0.54	10/10	--	No	None	Not a Contaminant	Not a Contaminant
MAGNESIUM	10/10	60310	57000		62,400		UNOA-SW0010	--	--	634,276	No, no BTV exceedance.	82,000	0/10	--	No	None	Not a Contaminant	Not a Contaminant
THALLIUM	2/10	1.4	1.4	J	1.4	J	UNOA-SW0001	10	10	--	Yes, no BTV available.	6.3	0/10	0.2	No	None	HQ ≤ 1	Not Bioaccumulative
ZINC	2/10	7.4	7.3	J	7.5	J	UNOA-SW0004	20	20	--	Yes, no BTV available.	37	0/10	0.2	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
ANTHRACENE	1/10	0.21	0.21	J	0.21	J	UNOA-SW0005	0.8	0.8	--	Yes, no BTV available.	540	0/10	0.0004	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
BENZO(A)ANTHRACENE	3/10	0.107	0.051	J	0.19		UNOA-SW0005	0.16	0.16	--	Yes, no BTV available.	0.014	3/10	10	Yes	Aquatic Community and Wildlife	HQ > 1	Bioaccumulative
BENZO(A)PYRENE	3/10	0.0893	0.037	J	0.18		UNOA-SW0005	0.16	0.16	--	Yes, no BTV available.	0.0014	3/10	100	Yes	Aquatic Community and Wildlife	HQ > 1	Bioaccumulative
BENZO(B)FLUORANTHENE	6/10	0.119	0.034		0.34		UNOA-SW0005	0.08	0.08	--	Yes, no BTV available.	0.014	6/10	20	Yes	Aquatic Community and Wildlife	HQ > 1	Bioaccumulative
BENZO(G,H,I)PERYLENE	3/10	0.1	0.061	J	0.12	J	UNOA-SW0005	0.16	0.16	--	Yes, no BTV available.	0.44	3/10	0.3	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
BENZO(K)FLUORANTHENE	3/10	0.0857	0.052	J	0.11		UNOA-SW0005	0.08	0.08	--	Yes, no BTV available.	0.14	0/10	0.8	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
CHRYSENE	3/10	0.121	0.057	J	0.21		UNOA-SW0005	0.16	0.16	--	Yes, no BTV available.	1.4	0/10	0.2	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
DIBENZO(A,H)ANTHRACENE	2/10	0.0665	0.044	J	0.089	J	UNOA-SW0010	0.16	0.16	--	Yes, no BTV available.	0.0014	2/10	60	Yes	Aquatic Community and Wildlife	HQ > 1	Bioaccumulative
FLUORANTHENE	1/10	0.28	0.28	J	0.28	J	UNOA-SW0005	0.8	0.8	--	Yes, no BTV available.	19	0/10	0.01	Yes	Wildlife	HQ ≤ 1	Bioaccumulative
INDENO(1,2,3-CD)PYRENE	3/10	0.117	0.07	J	0.14	J	UNOA-SW0005	0.16	0.16	--	Yes, no BTV available.	0.014	3/10	10	Yes	Aquatic Community and Wildlife	HQ > 1	Bioaccumulative
PYRENE	1/10	0.3	0.3	J	0.3	J	UNOA-SW0005	0.8	0.8	--	Yes, no BTV available.	49	0/10	0.006	Yes	Wildlife	HQ ≤ 1	Bioaccumulative

Notes:
[1] Only detected analytes are shown.
[2] BTVs, ESVs, and whether an analyte is bioaccumulative were obtained from Table D-4 of Geosyntec Consultants, Inc. (2019). The selected BTV is the Mean x 2 value for Marine Water.
[3] HQ calculated based on maximum detection.

BTV = background threshold value
COPC = chemical of potential concern
ESV = ecological screening value
HQ = hazard quotient
J = estimated value
LOD = limit of detection
µg/L = micrograms per liter
PAH = polynuclear aromatic hydrocarbon
SVOC = semivolatile organic carbon
TPH = total petroleum hydrocarbon
VOC = volatile organic carbon

Geosyntec Consultants, Inc., 2019. Decision Process Document for the RCRA Corrective Action Program, John F. Kennedy Space Center, Florida. Revision 2. February.

Table 9
Non-Detected Analytes with Reporting Limits Above Screening Values - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/kg)	ESV Source	Minimum LOD (µg/kg)	Maximum LOD (µg/kg)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/kg)	One-Half Maximum LOD (µg/kg)	Number Samples with of One-Half of the LOD > ESV	Sediment PQL (µg/kg) [2]	Number of Samples with LOD > PQL	Frequency of One Half of the LOD Exceeding the PQL
Semi-volatile Organic Compounds												
Benzoic Acid	10	NSV	--	860	3300	0	430	1650	0	--	--	--
4-Chloro-3-methyl Phenol	10	37	Region IV ESV EqP	86	330	10	43	165	10	--	--	--
2-Chlorophenol	10	61	Region IV ESV EqP	86	330	10	43	165	10	--	--	--
2,4-Dichlorophenol	10	54	Region IV ESV EqP	86	330	10	43	165	10	--	--	--
2,4-Dimethylphenol	10	35	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
2,4-Dinitrophenol	10	202	Region IV ESV EqP	1300	4900	10	650	2450	10	--	--	--
4,6-Dinitro-o-cresol	10	2477	Region IV ESV EqP	350	1300	0	175	650	0	--	--	--
2-Methylphenol	10	NSV	--	86	330	0	43	165	0	--	--	--
3&4-Methylphenol	10	NSV	--	170	650	0	85	325	0	--	--	--
2-Nitrophenol	10	146	Region IV ESV EqP	86	330	7	43	165	3	--	--	--
4-Nitrophenol	10	135	Region IV ESV EqP	860	3300	10	430	1650	10	--	--	--
Pentachlorophenol	10	744	Region IV ESV EqP	860	3300	10	430	1650	8	--	--	--
Phenol	10	120	Region IV ESV	86	330	8	43	165	5	--	--	--
2,4,5-Trichlorophenol	10	34	Region IV ESV EqP	86	330	10	43	165	10	--	--	--
2,4,6-Trichlorophenol	10	87	Region IV ESV EqP	86	330	9	43	165	6	--	--	--
Benzyl Alcohol	10	NSV	--	86	330	0	43	165	0	--	--	--
4-Bromophenyl phenyl ether	10	46	Region IV ESV EqP	86	330	10	43	165	9	--	--	--
Butyl benzyl phthalate	10	592	Region IV ESV EqP	170	650	3	85	325	0	--	--	--
Carbazole	10	900	Region IV ESV	86	330	0	43	165	0	--	--	--
4-Chloroaniline	10	316	Region IV ESV EqP	170	650	6	85	325	1	--	--	--
bis(2-Chloroethoxy)methane	10	NSV	--	86	330	0	43	165	0	--	--	--
bis(2-Chloroethyl)ether	10	4761	Region IV ESV EqP	86	330	0	43	165	0	--	--	--
2,2'-Oxybis(1-chloropropane)	10	NSV	--	86	330	0	43	165	0	--	--	--
2-Chloronaphthalene	10	417	Region V ESL EqP	86	330	0	43	165	0	--	--	--
4-Chlorophenyl phenyl ether	10	NSV	--	86	330	0	43	165	0	--	--	--
Dibenzofuran	10	151	Region IV ESV EqP	86	330	6	43	165	3	--	--	--
1,2-Dichlorobenzene	10	88	Region IV ESV EqP	170	650	10	85	325	9	--	--	--
1,3-Dichlorobenzene	10	83	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
1,4-Dichlorobenzene	10	35	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
3,3'-Dichlorobenzidine	10	30	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
Diethyl Phthalate	10	630	SQAG TEC	300	1100	5	150	550	0	--	--	--
Dimethyl Phthalate	10	348	Region IV ESV EqP	170	650	6	85	325	0	--	--	--
Di-n-octyl Phthalate	10	513	Region IV ESV EqP	170	650	4	85	325	0	--	--	--
Di-n-butyl Phthalate	10	220	Region IV ESV EqP	300	1100	10	150	550	8	--	--	--
2,4-Dinitrotoluene	10	127	Region IV ESV EqP	86	330	8	43	165	4	--	--	--
2,6-Dinitrotoluene	10	271	Region IV ESV EqP	86	330	4	43	165	0	--	--	--
bis(2-Ethylhexyl)phthalate	10	180	SQAG TEC	300	1100	10	150	550	9	--	--	--
Hexachlorobenzene	10	20	SQAG TEC	86	330	10	43	165	10	--	--	--
Hexachlorobutadiene	10	55	SQAG TEC	170	650	10	85	325	10	--	--	--
Hexachlorocyclopentadiene	10	6.6	Region IV ESV EqP	690	2600	10	345	1300	10	--	--	--
Hexachloroethane	10	24	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
Isophorone	10	600	Region IV ESV EqP	86	330	0	43	165	0	--	--	--
2-Nitroaniline	10	NSV	--	170	650	0	85	325	0	--	--	--
3-Nitroaniline	10	NSV	--	170	650	0	85	325	0	--	--	--

Table 9
Non-Detected Analytes with Reporting Limits Above Screening Values - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/kg)	ESV Source	Minimum LOD (µg/kg)	Maximum LOD (µg/kg)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/kg)	One-Half Maximum LOD (µg/kg)	Number Samples with of One-Half of the LOD > ESV	Sediment PQL (µg/kg) [2]	Number of Samples with LOD > PQL	Frequency of One Half of the LOD Exceeding the PQL
Semi-volatile Organic Compounds (continued)												
4-Nitroaniline	10	NSV	--	170	650	0	85	325	0	--	--	--
Nitrobenzene	10	559	Region IV ESV EqP	86	330	0	43	165	0	--	--	--
N-Nitrosodi-n-propylamine	10	NSV	--	86	330	0	43	165	0	240	5	0
N-Nitrosodiphenylamine	10	35	Region IV ESV EqP	170	650	10	85	325	10	--	--	--
1,2,4-Trichlorobenzene	10	1700	Region IV ESV EqP	86	330	0	43	165	0	--	--	--
Polynuclear Aromatic Hydrocarbons												
Acenaphthene	10	Evaluated as sum of Total PAH	--	85	330	--	42.5	165	--	--	--	--
Acenaphthylene	10			85	330	--	42.5	165	--	--	--	--
Fluorene	10			85	330	--	42.5	165	--	--	--	--
1-Methylnaphthalene	10			85	330	--	42.5	165	--	--	--	--
2-Methylnaphthalene	10			85	330	--	42.5	165	--	--	--	--
Naphthalene	10			85	330	--	42.5	165	--	--	--	--
Phenanthrene	10			85	330	--	42.5	165	--	--	--	--
Sum of PAH	10	1610	Region IV ESV EqP	595	2310	0	297.5	1155	0	--	--	--
Metals												
Silver	10	1000	SQAG TEC	200	920	0	100	460	0	--	--	--

Notes:
[1] Only analytes that were not detected in all samples are presented.
[2] Target PQL is obtained from FDEPs Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits, Table D, October 2004. Residential soil values are used as surrogates for sediment.
Shaded cells denote the limit of detection result exceeds the ecological screening value.
SQAC TEC - Florida Sediment Quality Assessment Guidelines for inland and coastal sediments, 1994
Region IV - EPA Region IV Ecological Risk Assessment Supplemental Guidance, Interim Draft, Table 2a and 2b, August 2015.

EqP = the ESV was calculated using equilibrium partitioning methods, where a total organic carbon content of sediment is assumed to be 1%.
ESV = ecological screening value
LOD = limit of detection
µg/kg = microgram per kilogram
NSV = no screening value
PAH = polynuclear aromatic hyrdocarbon
PQL = practical quantitation limit
-- = not applicable or not available

Table 10
Non-Detected Analytes with Reporting Limits Above Screening Values - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/L)	ESV Source	Minimum LOD (µg/L)	Maximum LOD (µg/L)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/L)	One-Half Maximum LOD (µg/L)	Number Samples with of One-Half of the LOD > ESV	Surface Water PQL (µg/L)[2]	Number of Samples with LOD > PQL	Number Samples with of One-Half of the LOD > PQL
Volatile Organic Compounds												
Acetone	10	1700	FDEP 62-777	20	20	0	10	10	0	--	--	--
Benzene	10	53	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Bromobenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Bromochloromethane	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Bromodichloromethane	10	57	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Bromoform	10	260	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
2-Butanone (MEK)	10	NSV	--	3.5	3.5	0	1.75	1.75	0	--	--	--
n-Butylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
sec-Butylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
tert-Butylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Carbon Disulfide	10	110	FDEP 62-777	1	1	0	0.5	0.5	0	--	--	--
Carbon Tetrachloride	10	10	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Chlorobenzene	10	970	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Chloroethane	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
Chloroform	10	2300	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
o-Chlorotoluene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
p-Chlorotoluene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Dibromochloromethane	10	44	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,2-Dibromo-3-chloropropane	10	NSV	--	2	2	0	1	1	0	--	--	--
1,2-Dibromoethane	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
Dichlorodifluoromethane	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
1,2-Dichlorobenzene	10	3900	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,3-Dichlorobenzene	10	18	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,4-Dichlorobenzene	10	1100	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1-Dichloroethane	10	410	Region IV	0.5	0.5	0	0.25	0.25	0	--	--	--
1,2-Dichloroethane	10	1200	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1-Dichloroethylene	10	16000	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
cis-1,2-Dichloroethylene	10	620	Region IV	0.5	0.5	0	0.25	0.25	0	--	--	--
trans-1,2-Dichloroethylene	10	3900	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,2-Dichloropropane	10	63	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,3-Dichloropropane	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
2,2-Dichloropropane	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1-Dichloropropene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
cis-1,3-Dichloropropene	10	23	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--

Table 10
Non-Detected Analytes with Reporting Limits Above Screening Values - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/L)	ESV Source	Minimum LOD (µg/L)	Maximum LOD (µg/L)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/L)	One-Half Maximum LOD (µg/L)	Number Samples with of One-Half of the LOD > ESV	Surface Water PQL (µg/L)[2]	Number of Samples with LOD > PQL	Number Samples with of One-Half of the LOD > PQL
Volatile Organic Compounds (continued)												
trans-1,3-Dichloropropene	10	23	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Ethylbenzene	10	140	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Hexachlorobutadiene	10	0.018	FDEP 62-302	1	1	10	0.5	0.5	10	--	--	--
2-Hexanone	10	99	Region IV	5	5	0	2.5	2.5	0	--	--	--
Isopropylbenzene	10	260	FDEP 62-777	0.5	0.5	0	0.25	0.25	0	--	--	--
p-Isopropyltoluene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Methyl Bromide	10	NSV	--	4	4	0	2	2	0	--	--	--
Methyl Chloride	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
Methylene Bromide	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Methylene Chloride	10	2300	FDEP 62-302	4	4	0	2	2	0	--	--	--
4-Methyl-2-pentanone (MIBK)	10	NSV	--	2	2	0	1	1	0	--	--	--
Methyl Tert Butyl Ether	10	34000	FDEP 62-777	0.5	0.5	0	0.25	0.25	0	--	--	--
Naphthalene	10	26	FDEP 62-777	2	2	0	1	1	0	--	--	--
n-Propylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Styrene	10	460	FDEP 62-777	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1,1,2-Tetrachloroethane	10	85	Region IV	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1,2,2-Tetrachloroethane	10	5.9	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Tetrachloroethylene	10	66	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Toluene	10	610	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,2,3-Trichlorobenzene	10	85	FDEP 62-777	1	1	0	0.5	0.5	0	--	--	--
1,2,4-Trichlorobenzene	10	0.15	FDEP 62-302	1	1	10	0.5	0.5	10	--	--	--
1,1,1-Trichloroethane	10	190000	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,1,2-Trichloroethane	10	20	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Trichloroethylene	10	15	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
Trichlorofluoromethane	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
1,2,3-Trichloropropane	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
1,2,4-Trimethylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
1,3,5-Trimethylbenzene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Vinyl Acetate	10	NSV	--	5	5	0	2.5	2.5	0	--	--	--
Vinyl Chloride	10	3	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
m,p-Xylene	10	NSV	--	1	1	0	0.5	0.5	0	--	--	--
o-Xylene	10	NSV	--	0.5	0.5	0	0.25	0.25	0	--	--	--
Total Xylenes	10	370	FDEP 62-777	1.5	1.5	0	0.75	0.75	0	--	--	--

Table 10
Non-Detected Analytes with Reporting Limits Above Screening Values - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/L)	ESV Source	Minimum LOD (µg/L)	Maximum LOD (µg/L)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/L)	One-Half Maximum LOD (µg/L)	Number Samples with of One-Half of the LOD > ESV	Surface Water PQL (µg/L)[2]	Number of Samples with LOD > PQL	Number Samples with of One-Half of the LOD > PQL
Semivolatile Organic Compounds												
Benzoic Acid	10	NSV	--	24	24	0	12	12	0	--	--	--
4-Chloro-3-methyl Phenol	10	2700	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	--	--	--
2-Chlorophenol	10	860	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	--	--	--
2,4-Dichlorophenol	10	65	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	--	--	--
2,4-Dimethylphenol	10	2800	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
2,4-Dinitrophenol	10	330	FDEP 62-302	19	19	0	9.5	9.5	0	--	--	--
4,6-Dinitro-o-cresol	10	29	FDEP 62-302	3.8	3.8	0	1.9	1.9	0	--	--	--
2-Methylphenol	10	NSV	--	0.95	0.96	0	0.475	0.48	0	--	--	--
3&4-Methylphenol	10	NSV	--	1.9	1.9	0	0.95	0.95	0	--	--	--
2-Nitrophenol	10	73	Region IV	1.9	1.9	0	0.95	0.95	0	--	--	--
4-Nitrophenol	10	55	FDEP 62-777	9.5	9.6	0	4.75	4.8	0	--	--	--
Pentachlorophenol	10	0.11	FDEP 62-302	9.5	9.6	10	4.75	4.8	10	--	--	--
Phenol	10	300	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
2,4,5-Trichlorophenol	10	23	FDEP 62-777	1.9	1.9	0	0.95	0.95	0	--	--	--
2,4,6-Trichlorophenol	10	6.6	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
Benzyl Alcohol	10	NSV	--	0.95	0.96	0	0.475	0.48	0	--	--	--
4-Bromophenyl Phenyl Ether	10	1.5	Region IV	0.95	0.96	0	0.475	0.48	0	--	--	--
Butyl Benzyl Phthalate	10	0.29	FDEP 62-302	1.9	1.9	10	0.95	0.95	10	--	--	--
Carbazole	10	47	FDEP 62-777	0.95	0.96	0	0.475	0.48	0	--	--	--
4-Chloroaniline	10	2.5	FDEP 62-777	0.95	0.96	0	0.475	0.48	0	--	--	--
bis(2-Chloroethoxy)methane	10	NSV	--	1.9	1.9	0	0.95	0.95	0	--	--	--
bis(2-Chloroethyl)ether	10	4.1	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	10	0	0
2,2'-Oxybis(1-chloropropane)	10	NSV	--	0.95	0.96	0	0.475	0.48	0	--	--	--
2-Chloronaphthalene	10	1400	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
4-Chlorophenyl Phenyl Ether	10	NSV	--	0.95	0.96	0	0.475	0.48	0	--	--	--
Dibenzofuran	10	67	FDEP 62-777	0.95	0.96	0	0.475	0.48	0	--	--	--
1,2-Dichlorobenzene	10	3900	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,3-Dichlorobenzene	10	18	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
1,4-Dichlorobenzene	10	1100	FDEP 62-302	0.5	0.5	0	0.25	0.25	0	--	--	--
3,3'-Dichlorobenzidine	10	0.34	FDEP 62-302	1.9	1.9	10	0.95	0.95	10	--	--	--
Diethyl Phthalate	10	840	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
Dimethyl Phthalate	10	2400	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
Di-n-butyl Phthalate	10	36	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
Di-n-octyl Phthalate	10	NSV	--	1.9	1.9	0	0.95	0.95	0	--	--	--
2,4-Dinitrotoluene	10	3.5	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	--	--	--
2,6-Dinitrotoluene	10	81	Region IV	0.95	0.96	0	0.475	0.48	0	--	--	--
bis(2-Ethylhexyl)phthalate	10	2.1	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
Hexachlorobenzene	10	0.0003	Region IV	0.95	0.96	10	0.475	0.48	10	0.1	10	10
Hexachlorobutadiene	10	0.018	FDEP 62-302	1	1	10	0.5	0.5	10	--	--	--

Table 10
Non-Detected Analytes with Reporting Limits Above Screening Values - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/L)	ESV Source	Minimum LOD (µg/L)	Maximum LOD (µg/L)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/L)	One-Half Maximum LOD (µg/L)	Number Samples with of One-Half of the LOD > ESV	Surface Water PQL (µg/L)[2]	Number of Samples with LOD > PQL	Number Samples with of One-Half of the LOD > PQL
Hexachlorocyclopentadiene	10	5	FDEP 62-302	3.3	3.4	0	1.65	1.7	0	--	--	--
Hexachloroethane	10	0.27	FDEP 62-302	1.9	1.9	10	0.95	0.95	10	10	0	0
Isophorone	10	3600	FDEP 62-302	0.95	0.96	0	0.475	0.48	0	--	--	--
2-Nitroaniline	10	NSV	--	3.3	3.4	0	1.65	1.7	0	--	--	--
3-Nitroaniline	10	NSV	--	1.9	1.9	0	0.95	0.95	0	--	--	--
4-Nitroaniline	10	1200	FDEP 62-777	1.9	1.9	0	0.95	0.95	0	--	--	--
Nitrobenzene	10	570	FDEP 62-302	1.9	1.9	0	0.95	0.95	0	--	--	--
N-Nitrosodi-n-propylamine	10	NSV	--	1.9	1.9	0	0.95	0.95	0	--	--	--
N-Nitrosodiphenylamine	10	25	Region IV	1.9	1.9	0	0.95	0.95	0	--	--	--
1,2,4-Trichlorobenzene	10	0.15	FDEP 62-302	1	1	10	0.5	0.5	10	--	--	--

Table 10
Non-Detected Analytes with Reporting Limits Above Screening Values - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte [1]	Number of Samples	ESV (µg/L)	ESV Source	Minimum LOD (µg/L)	Maximum LOD (µg/L)	Number of Samples with LOD > ESV	One-Half Minimum LOD (µg/L)	One-Half Maximum LOD (µg/L)	Number Samples with of One-Half of the LOD > ESV	Surface Water PQL (µg/L)[2]	Number of Samples with LOD > PQL	Number Samples with of One-Half of the LOD > PQL
Polynuclear Aromatic Hydrocarbons												
Acenaphthene	10	130	FDEP 62-302	0.4	0.4	0	0.2	0.2	0	10	0	0
Acenaphthylene	10	13	Region IV	0.4	0.4	0	0.2	0.2	0	1	0	0
Fluorene	10	94	FDEP 62-302	0.4	0.4	0	0.2	0.2	0	--	--	--
1-Methylnaphthalene	10	95	FDEP 62-777	0.4	0.4	0	0.2	0.2	0	--	--	--
2-Methylnaphthalene	10	30	FDEP 62-777	0.4	0.4	0	0.2	0.2	0	--	--	--
Naphthalene	10	26	FDEP 62-777	2	2	0	1	1	0	--	--	--
Phenanthrene	10	2	Region IV	0.4	0.4	0	0.2	0.2	0	0.2	10	0
Metals												
Beryllium	10	64	FDEP 62-302	1	1	0	0.5	0.5	0	2	0	0
Cadmium	10	0.097	FDEP 62-302	1	1	10	0.5	0.5	10	--	--	--
Chromium	10	11	FDEP 62-302[3]	5	5	0	2.5	2.5	0	--	--	--
Mercury	10	0.012	FDEP 62-302	0.1	0.1	10	0.05	0.05	10	--	--	--
Nickel	10	16	FDEP 62-302	1	1	0	0.5	0.5	0	--	--	--
Selenium	10	5	FDEP 62-302	5	5	0	2.5	2.5	0	--	--	--
Silver	10	0.1	FDEP 62-302	2	2	10	1	1	10	1	10	0

Notes:
[1]Only analytes that were not detected in all samples are presented.
[2] Target PQL is obtained from FDEPs Guidance for the Selection of Analytical Methods and for the Evaluation of Practical Quantitation Limits, Table D, October 2004.
[3] The hexavalent chromium ESV is conservatively used as a surrogate for total chromium.
FDEP 62-302 - Chapter 62-302 F.A.C. Surface Water Quality Standards (WQS) for Class III surface water, updated November 17, 2016
FDEP 62-777 - Chapter 62-777 F.A.C. Surface Water Cleanup Target Levels (SWCTL)
Region IV - EPA Region IV Ecological Risk Assessment Supplemental Guidance, Interim Draft, Table 1a, August 2015.
Shaded cells denote the limit of detection result exceeds the ecological screening value.

ESV = ecological screening value
LOD = limit of detection
ug/L = microgram per liter
NSV = no screening value
PAH = polynuclear aromatic hyrdocarbon
PQL = practical quantitation limits
-- = not applicable or not available

Table 11
Detailed Comparison of Site Detections to Background Values - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte[1]	Detection Frequency	Location of Maximum Detection	Maximum Detection (mg/kg)	Mean Detection (mg/kg)	East Bank Mean Detection[2] (mg/kg)	BTV[3] (mg/kg)	Range of Background Detections (mg/kg)
ARSENIC	10/10	UNOA-SD0009	8.2	4.7	5.8	0.66	0.23 - 0.82
BARIUM	10/10	UNOA-SD0007	16	7.16	7.38	11.1	1.9 - 13.5
BERYLLIUM	7/10	UNOA-SD0011	0.21	0.134	0.155	--	--
CADMIUM	8/10	UNOA-SD0011	0.34	0.188	0.205	--	--
CHROMIUM	10/10	UNOA-SD0011	10.4	6.11	6.94	8.24	0.81 - 17.3
COPPER	10/10	UNOA-SD0008	13.1	7.68	9.26	7.86	0.87 - 9.7
MERCURY	10/10	UNOA-SD0008, UNOA-SD0012	0.15	0.0994	0.119	0.02	0.005 - 0.019
NICKEL	10/10	UNOA-SD0008, UNOA-SD0011	4	2.58	2.98	--	--
SELENIUM	3/10	UNOA-SD0012	1	0.697	1	--	--
ZINC	10/10	UNOA-SD0011	241	115	149	43.2	4 - 50.3
ANTHRACENE	1/10	UNOA-SD0011	0.225	0.225	0.225	--	--
BENZO(A)ANTHRACENE	8/10	UNOA-SD0011	0.513	0.119	0.173	0.18	0.0046 - 0.77
BENZO(A)PYRENE	8/10	UNOA-SD0011	0.504	0.124	0.179	0.26	0.011 - 0.74
BENZO(B)FLUORANTHENE	10/10	UNOA-SD0011	1.12	0.222	0.387	0.22	0.0049 - 0.73
BENZO(G,H,I)PERYLENE	8/10	UNOA-SD0011	0.303	0.080	0.113	0.17	0.0099 - 0.52
BENZO(K)FLUORANTHENE	8/10	UNOA-SD0011	0.335	0.082	0.119	0.16	0.0048 - 0.55
CHRYSENE	9/10	UNOA-SD0011	0.651	0.138	0.217	0.3	0.0089 - 1.1
DIBENZO(A,H)ANTHRACENE	2/10	UNOA-SD0011	0.0852	0.063	0.063	--	--
INDENO(1,2,3-CD)PYRENE	8/10	UNOA-SD0011	0.364	0.094	0.134	0.18	0.0029 - 21
PYRENE	2/10	UNOA-SD0011	0.738	0.490	0.490	0.46	0.0045 - 1.7

Notes:
[1] Only detected analytes are shown.
[2] The east bank is comprised of samples UNOA-SD0008, UNOA-SD0009, UNOA-SD0010, UNOA-SD0011, and UNOA-SD0012

[3] BTVs were obtained from Table D-6 of Geosyntec Consultants, Inc. (2019). The selected BTV is the Mean x 2 value for Combined Sediment Background; if this value was not available, the selected BTV is the Mean x 2 value for General Industrial Areas.

BTV = background threshold value
mg/kg = milligrams per kilogram

Table 12
Wildlife Refinement Screening - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analytical Group	Analyte[1]	Detection Frequency	Location of Maximum Detection	Maximum Concentration (mg/kg)	No Effect Level[2] (mg/kg)		Low Effect Level[2] (mg/kg)	
					Mammals	Birds	Mammals	Birds
Metals	ARSENIC	10/10	UNOA-SD0009	1.4	24	34	--	--
	CADMIUM	8/10	UNOA-SD0011	0.076	0.3	0.37	3	--
	CHROMIUM	10/10	UNOA-SD0011	2.8	83	60	--	--
	COPPER	10/10	UNOA-SD0008	1.9	49	23	--	--
	MERCURY	10/10	UNOA-SD0008, UNOA-SD0012	0.034	2	0.017	--	0.17
	NICKEL	10/10	UNOA-SD0008, UNOA-SD0011	1.1	12	31	--	--
	SELENIUM	3/10	UNOA-SD0012	0.47	0.8	1	--	--
	ZINC	10/10	UNOA-SD0011	19.3	110	63	1,100	630
PAHs	ANTHRACENE	1/10	UNOA-SD0011	0.225	240	NSV	--	NSV
	BENZO(A)ANTHRACENE	8/10	UNOA-SD0011	0.0219	5.2	2.1	--	--
	BENZO(A)PYRENE	8/10	UNOA-SD0011	0.0222	74	NSV	--	NSV
	BENZO(B)FLUORANTHENE	10/10	UNOA-SD0011	0.0248	53	NSV	--	NSV
	BENZO(G,H,I)PERYLENE	8/10	UNOA-SD0011	0.0153	29	NSV	--	NSV
	BENZO(K)FLUORANTHENE	8/10	UNOA-SD0011	0.0153	83	NSV	--	NSV
	CHRYSENE	9/10	UNOA-SD0011	0.0254	3.9	NSV	--	NSV
	DIBENZO(A,H)ANTHRACENE	2/10	UNOA-SD0011	0.0399	17	NSV	--	NSV
	INDENO(1,2,3-CD)PYRENE	8/10	UNOA-SD0011	0.0176	83	NSV	--	NSV
	PYRENE	2/10	UNOA-SD0011	0.242	26	46	--	--

Notes:
[1] Only analytes identified as COPECs for wildlife in Table 5.3 are presented.
[2] No effect and low effect levels were obtained from the Los Alamos EcoRisk Database (Version 4.1).
Shaded cells indicated the maximum concentration exceeds the effect level.

NSV = no screening value
-- = not applicable, the low effect screening was only completed for analytes with a no effect ESL exceedance.
mg/kg = milligrams per kilogram
COPEC = chemical of potential ecological concern
PAH = polynuclear aromatic hydrocarbon

Table 13
Wildlife Refinement Screening - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analytical Group	Analyte[1]	Detection Frequency	Location of Maximum Detection	Maximum Concentration (µg/L)	No Effect Level[2] (µg/L)		Low Effect Level[2] (µg/L)	
					Mammals	Birds	Mammals	Birds
Metals	ARSENIC	1/10	UNOA-SW0006	2	560	21,000	--	--
	COPPER	1/10	UNOA-SW0006	3	22,000	12,000	--	--
	ZINC	2/10	UNOA-SW0004	7.3	560,000	490,000	--	--
PAHs	ANTHRACENE	1/10	UNOA-SW0005	0.21	440,000	NSV	--	NSV
	BENZO(A)ANTHRACENE	3/10	UNOA-SW0005	0.051	760	NSV	--	NSV
	BENZO(A)PYRENE	3/10	UNOA-SW0005	0.037	4,400	NSV	--	NSV
	BENZO(B)FLUORANTHENE	6/10	UNOA-SW0005	0.034	17,000	NSV	--	NSV
	BENZO(G,H,I)PERYLENE	3/10	UNOA-SW0005	0.061	32,000	NSV	--	NSV
	BENZO(K)FLUORANTHENE	3/10	UNOA-SW0005	0.052	32,000	NSV	--	NSV
	CHRYSENE	3/10	UNOA-SW0005	0.057	760	NSV	--	NSV
	DIBENZO(A,H)ANTHRACENE	2/10	UNOA-SW0010	0.044	5,900	NSV	--	NSV
	FLUORANTHENE	1/10	UNOA-SW0005	0.28	56,000	NSV	--	NSV
	INDENO(1,2,3-CD)PYRENE	3/10	UNOA-SW0005	0.07	32,000	NSV	--	NSV
	PYRENE	1/10	UNOA-SW0005	0.3	33,000	NSV	--	NSV

Notes:
[1] Only analytes identified as COPECs for wildlife in Table 5.4 are presented.
[2] No effect and low effect levels were obtained from the Los Alamos EcoRisk Database (Version 4.1).
Shaded cells indicated the maximum concentration exceeds the effect level.

NSV = no screening value
-- = not applicable, the low effect screening was only completed for analytes with a no effect ESL exceedance.
µg/L = micrograms per liter
COPEC = chemical of potential ecological concern
PAH = polynuclear aromatic hydrocarbon

Table 14
Benthic Invertebrate Refinement Screening - Sediment
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analytical Group	Analyte[1]	Detection Frequency	Location of Maximum Detection	Maximum Concentration (mg/kg)	Mean Concentration (mg/kg)	East Bank[2] Mean Concentration (mg/kg)	Floride SQAG[3]		EPA Region 4 Sediment Screening Values[4]				
							TEL (mg/kg)	PEC (mg/kg)	ESV (mg/kg)	RSV (mg/kg)	Maximum Concentration Normalized to Organic Carbon (mg/kg) [5]	Screening Value Normalized to Organic Carbon (mg/kg) [6]	Toxic Units
Metals	BERYLLIUM	7/10	UNOA-SD0011	0.07	0.134	0.155	NSV	NSV	NSV	NSV	--	--	--
	ZINC	10/10	UNOA-SD0011	19.3	115	149	*120*	460	--	--			
PAHs	ANTHRACENE	1/10	UNOA-SD0011	0.225	0.225	0.225	***0.057***	0.85	--	Sum of toxic units approach	1.05	594	0.0018
	BENZO(A)ANTHRACENE	8/10	UNOA-SD0011	0.0219	0.119	0.173	***0.11***	1.1	--		0.10	841	0.0001
	BENZO(A)PYRENE	8/10	UNOA-SD0011	0.0222	0.124	0.179	*0.15*	1.5	--		0.10	965	0.0001
	BENZO(B)FLUORANTHENE	10/10	UNOA-SD0011	0.0248	0.222	0.387	--	--	***0.19***		0.12	979	0.0001
	BENZO(G,H,I)PERYLENE	8/10	UNOA-SD0011	0.0153	0.080	0.113	--	--	0.17		0.07	1095	0.0001
	BENZO(K)FLUORANTHENE	8/10	UNOA-SD0011	0.0153	0.082	0.119	--	--	0.24		0.07	981	0.0001
	CHRYSENE	9/10	UNOA-SD0011	0.0254	0.138	0.217	*0.17*	1.3	--		0.12	844	0.0001
	DIBENZO(A,H)ANTHRACENE	2/10	UNOA-SD0011	0.0399	0.063	0.063	***0.033***	0.14	--		0.19	1123	0.0002
	INDENO(1,2,3-CD)PYRENE	8/10	UNOA-SD0011	0.0176	0.094	0.134	--	--	0.2		0.08	1115	0.0001
	PYRENE	2/10	UNOA-SD0011	0.242	0.490	0.490	***0.2***	1.5	--		1.13	697	0.0016
	SUM OF PAHS	--	--	0.65	1.64	2.10	***1.6***	23	--	--	--	--	0.004

Notes:
[1] Only analytes identified as COPECs for the benthic invertebrate community in Table 5.3 are presented.
[2] The east bank is comprised of samples UNOA-SD0008, UNOA-SD0009, UNOA-SD0010, UNOA-SD0011, and UNOA-SD0012
[3] Florida SQAGs for inland (freshwater) sediment obtained from Table D-9 of Geosyntec Consultants, Inc. (2019).
[4] EPA Region 4 freshwater sediment screening values, obtained from USEPA (2018).
EPA Region 4 values are only listed for analytes that exceed Florida SQAGs or do not have Florida SQAGs.
A Region 4 RSV is only listed if the ESV is exceeded.
If an EPA Region 4 screening value was not listed in Table D-9 of Geosyntec Consultants, Inc. (2019), which lists values from 2015, but is available in the EPA Region 4 screening value update from 2018, the updated 2018 value is listed.
[5] Total organic carbon concentration for UNOA-SD0011 is 214,000 mg/kg.
[6] Table 3-4, Procedures for the Derivation of Equilibrium Partitioning Sediment Benchmarks (ESBs) for the Protection of Benthic Organisms: PAH Mixtures. EPA-600-R-02-013. November 2003.

Shaded values indicate the maximum concentration exceeds the screening level
Bold values indicate the sitewide mean concentration exceeds the screening level
Italicized values indicate the east bank mean concentration exceeds the screening level

NSV = no screening value
-- = not applicable
ESV = ecological screening value
RSV = refinement screening value
mg/kg = milligrams per kilogram
TEL = threshold effect level
PEL = probable effect concentration
PAH = polynuclear aromatic hydrocarbon
SQAG = sediment quality assessment guideline
COPEC = chemical of potential ecological concern

Geosyntec Consultants, Inc., 2019. Decision Process Document for the RCRA Corrective Action Program, John F. Kennedy Space Center, Florida. Revision 2. February.

Table 15
Aquatic Community Refinement Screening - Surface Water
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analytical Group	Analyte[1]	Detection Frequency	Location of Maximum Detection	Maximum Detection (µg/L)	Mean Detection (µg/L)	DPD ESV (µg/L)	USEPA Region 4 Chronic Freshwater ESV (µg/L)	LANL Low Effects Level (mg/L)
PAHs	BENZO(A)ANTHRACENE	3/10	UNOA-SW0005	0.051	0.107	**0.014**	4.7	0.27
	BENZO(A)PYRENE	3/10	UNOA-SW0005	0.037	0.0893	**0.0014**	**0.06**	0.14
	BENZO(B)FLUORANTHENE	6/10	UNOA-SW0005	0.034	0.119	**0.014**	2.6	90
	DIBENZO(A,H)ANTHRACENE	2/10	UNOA-SW0010	0.044	0.0665	**0.0014**	**0.012**	**0.034**
	INDENO(1,2,3-CD)PYRENE	3/10	UNOA-SW0005	0.07	0.117	**0.014**	**0.012**	43

Notes
[1] Only analytes identified as COPCs for the aquatic community in Table 5.4 are presented.

Shaded values indicate the maximum concentration exceeds the screening level
Bold values indicate the sitewide mean concentration exceeds the screening level

NSV = no screening value
-- = not applicable, the low effect screening was only completed for analytes with a no effect level exceedance.
µg/L = micrograms per liter
COPEC = chemical of potential ecological concern
PAH = polynuclear aromatic hydrocarbon

Table 16
Exposure Parameters for Upper Trophic Level Ecological Receptors
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Receptor	Food Ingestion Rate (g/g-day)		Sediment Ingestion Rate (percent of food ingestion rate)		Water Ingestion Rate (L/g-day)		Dietary Composition (percent)					Foraging Area (hectares)	
	Value	Comment	Value	Comment	Value	Comment	Plants	Benthic Invertebrates	Small Mammals	Fish	Comment	Value	Comment
Birds													
Dunlin	0.75	Equation #39 for Charadriiformes from Nagy, 2001; used body weight of 56 g from Cornell, 2014; wet weight ingestion rate	16.0%	Geometric mean fraction of soil in the diet for four species of sandpipers (EPA, 1993)	0.0014	Equation 3-15 from EPA, 1993; Used body weight of 56 g from Cornell, 2014	0	100	0	0	Cornell, 2014; represents avian insectivore	[1]	
	0.21	Equation #40 for Charadriiformes from Nagy, 2001; used body weight of 56 g from Cornell, 2014; dry weight ingestion rate											
Green heron	0.16	Default NASA (2003) wet weight ingestion rate, cited as the 16% body weight from two chicks on fish diet at flying stage; used body weight of 197 g from NASA, 2003	0.0%	Assumed to be minimal	0.00043	Equation 3-15 from EPA, 1993; Used body weight of 179 g from NASA, 2003	0	50	0	50	NASA, 2003; diet assumed to consist of equal parts fish and invertebrates	700	NASA, 2003
	0.032	Dry weight ingestion rate estimated from the default NASA (2003) wet weight ingestion rate; used body weight of 197 g from NASA, 2003											
Osprey	0.20	Default NASA (2003) wet weight ingestion rate; used body weight of 1,500 g from NASA, 2003	0.0%	Assumed to be minimal	0.000052	Equation 3-15 from EPA, 1993; Used body weight of 1,500 g from NASA, 2003	0	0	0	100	Represents piscivore	500	NASA, 2003
	0.040	Dry weight ingestion rate estimated from the default NASA (2003) wet weight ingestion rate; used body weight of 1,500 g from NASA, 2003											

Notes:
[1] = Receptor assumed to be present in the study area 100 percent of the time.

% = percent
g/g-day = grams per gram (body weight) per day
L/g-day = liters per gram (body weight) per day
g = gram

References:
Cornell, 2014. Cornell Lab of Ornithology. All About Birds. Available on-line at: http://www.allaboutbirds.org/guide/dunlin/id. Accessed March 2014.
EPA, 1993. *Wildlife Exposure Factors Handbook.* EPA/600/R-93/187. December.
Nagy, KA. 2001. Food Requirements of Wild Animals: Predictive Equations for Free-Living Mammals, Reptiles, and Birds. Nutrition Abstracts and Reviews, Series B71, 21R-31R.
NASA (National Aeronautic and Space Administration), 2003. Wildlife Exposure Factors and Toxicity Reference Values for the John F. Kennedy Space Center, Florida. January.

Table 17
NOAELs for Aquatic Food Webs
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte	Avian Receptors	
	NOAEL (mg/kg-bw-day)	Source
Low Molecular Weight PAHs	1000	NASA, 2003; diet, 7 month., mixed PAHs surrorgate., physiological.
High Molecular Weight PAHs	40	NASA, 2003; subchronic NOAEL, fertility and malformation, benzo(a)pyrene surrogate.

mg/kg-bw-day = milligrams per kilogram of body weight a day
Eco-SSL = Ecological Soil Screening Level
NOAEL = no observed adverse effects level
LOAEL = lowest observed adverse effects level

NASA (National Aeronautic and Space Administration), 2003. Wildlife Exposure Factors and Toxicity Reference Values for the John F. Kennedy Space Center, Florida. January.

Table 18
Bioaccumulation Factors Used For Aquatic Food Webs
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Analyte	Sediment-Benthic Invertebrate BSAF[1] (wet weight)	Surface Water-Fish BCF[2] (wet weight)
Anthracene	0.29	1,800
Benzo(a)anthracene	0.29	260
Benzo(a)pyrene	0.29	5,150
Benzo(b)fluoranthene	0.29	3,020
Benzo(g,h,i)perylene	0.29	11,000
Benzo(k)fluoranthene	0.29	4,990
Chrysene	0.29	3,170
Dibenzo(a,h)anthracene	0.29	9,600
Fluoranthene	0.29	3,630
Indeno(1,2,3-c,d)pyrene	0.29	12,200
Pyrene	0.29	1,510

Notes:

[1] BSAFs for PAHs are for wet weight and are from EPA, 2004. BSAFs for PAHs will be normalized to organic carbon and lipid content using the site-specific fraction of organic carbon and an assumed lipid fraction of 0.03. The PAH BSAF of 0.29 was used as a surrogate for benzo(g,h,i)perylene.

[2] BCFs obtained from the Risk Assessment Information System (https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chemspef).

BSAF = biota-sediment accumulation factor
BCF = bioconcentration factor
PAH = polycyclic aromatic hydrocarbon
EPA = United States Environmental Protection Agency

References:

EPA, 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey, Second Edition. EPA-823-R-04-007. November.

Table 19
Initial Food Web Modeling - Dunlin
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Chemical	Maximum Surface Water Detection (mg/L)	Maximum Sediment Detection (mg/kg)	Sediment-to-Benthic Invertebrate BSAF[1]	Benthic Invertebrate Tissue Concentration[2] (mg/kg, dry weight)	Average Daily Dose (mg/kg-day)	NOAEL[3] (mg/kg-day)	NOAEL Ecological Quotient
Low Molecular Weight PAHs							
Anthracene	0.00021	0.225	0.29	5.06E-02	1.85E-02	Evaluated as Sum of Low Molecular Weight PAHs	
Fluoranthene	0.00028	0.621	0.29	1.40E-01	5.06E-02		
Total Low Molecular Weight PAHs					6.90E-02	1,000	0.00007
High Molecular Weight PAHs							
Benzo(a)anthracene	0.00019	0.513	0.29	1.15E-01	4.17E-02	Evaluated as Sum of High Molecular Weight PAHs	
Benzo[a]pyrene	0.00018	0.504	0.29	1.13E-01	4.10E-02		
Benzo[b]fluoranthene	0.00034	1.12	0.29	2.52E-01	9.10E-02		
Benzo[g,h,i]perylene	0.00012	0.303	0.29	6.81E-02	2.46E-02		
Benzo(k)fluoranthene	0.00011	0.335	0.29	7.53E-02	2.72E-02		
Chrysene	0.00021	0.651	0.29	1.46E-01	5.29E-02		
Dibenz[a,h]anthracene	0.000089	0.0852	0.29	1.91E-02	7.01E-03		
Indeno[1,2,3-c,d]pyrene	0.00014	0.364	0.29	8.18E-02	2.96E-02		
Pyrene	0.0003	0.738	0.29	1.66E-01	6.00E-02		
Total High Molecular Weight PAHs					3.75E-01	40	0.009

Exposure Assumptions - Dunlin (exposure assumptions obtained from Table 13)

Sediment ingestion rate (kg/kgBW-day)	0.0336
Surface Water Ingestion Rate (L/kgBW-day)	1.4
Food ingestion rate (kg-DW/kgBW-day)	0.21
Moisture content of benthic invertebrates	0.78
Benthic invertebrate ingestion rate (kg-DW/kgBW-day)	0.21
No area use factor applied.	
Assume that diet consists of 100% benthic invertebrates.	
Average fraction organic carbon	0.176

Notes:
[1] BSAFs for PAHs are for wet weight and are from EPA, 2004. The PAH BSAF of 0.29 was used as a surrogate for benzo(g,h,i)perylene.
[2] Sediment concentrations were normalized to organic carbon and lipid content using the site-specific fraction of organic carbon and an assumed lipid fraction of 0.03.
[3] NOAELs listed in Table 14.

NOAEL = no observed adverse effects level
kg-DW = kilograms as dry weight
N/A = not available, analyte was not detected
mg/kg = milligrams per kilogram
BSAF = biota sediment accumulation factor
kgBW = kilogram body weight
mg/L = milligrams per liter
PAH = polycyclic aromatic hydrocarbon

References:
EPA, 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. National Sediment Quality Survey Second Edition. EPA-823-R-04-007. November.

Table 20
Initial Food Web Modeling - Green Heron
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Chemical	Maximum Surface Water Detection (mg/L)	Maximum Sediment Detection (mg/kg)	Surface Water-to-Fish BCF[1] (L/kg)	Fish Tissue Concentration (mg/kg, wet weight)	Sediment-to-Benthic Invertebrate BSAF[2]	Benthic Invertebrate Tissue Concentration[3] (mg/kg, dry weight)	Average Daily Dose (mg/kg-day)	NOAEL[4] (mg/kg-day)	NOAEL Ecological Quotient
Low Molecular Weight PAHs									
Anthracene	0.00021	0.225	1,800	3.78E-01	0.29	5.06E-02	3.11E-02	Evaluated as Sum of Low Molecular Weight PAHs	
Fluoranthene	0.00028	0.621	3,630	1.02E+00	0.29	1.40E-01	8.37E-02		
Total Low Molecular Weight PAHs							1.15E-01	1,000	0.0001
High Molecular Weight PAHs									
Benzo(a)anthracene	0.00019	0.513	260	4.94E-02	0.29	1.15E-01	5.88E-03	Evaluated as Sum of High Molecular Weight PAHs	
Benzo[a]pyrene	0.00018	0.504	5,150	9.27E-01	0.29	1.13E-01	7.60E-02		
Benzo[b]fluoranthene	0.00034	1.12	3,020	1.03E+00	0.29	2.52E-01	8.63E-02		
Benzo[g,h,i]perylene	0.00012	0.303	11,000	1.32E+00	0.29	6.81E-02	1.07E-01		
Benzo(k)fluoranthene	0.00011	0.335	4,990	5.49E-01	0.29	7.53E-02	4.52E-02		
Chrysene	0.00021	0.651	3,170	6.66E-01	0.29	1.46E-01	5.57E-02		
Dibenz[a,h]anthracene	0.000089	0.0852	9,600	8.54E-01	0.29	1.91E-02	6.87E-02		
Indeno[1,2,3-c,d]pyrene	0.00014	0.364	12,200	1.71E+00	0.29	8.18E-02	1.38E-01		
Pyrene	0.0003	0.738	1,510	4.53E-01	0.29	1.66E-01	3.90E-02		
Total High Molecular Weight PAHs							6.22E-01	40	0.02

Exposure Assumptions - Green Heron (exposure assumptions obtained from Table 13)

Sediment ingestion rate (kg/kgBW-day)	0
Surface Water Ingestion Rate (L/kgBW-day)	0.43
Food ingestion rate (kg-DW/kgBW-day)	0.032
Food ingestion rate (kg-WW/kgBW-day)	0.16
Fish ingestion rate (kg-WW/kgBW-day)	0.08
Moisture content of benthic invertebrates	0.78
Benthic invertebrate ingestion rate (kg-DW/kgBW-day)	0.016
No area use factor applied.	
Assume that diet consists of 50% benthic invertebrates and 50% fish.	
Average fraction organic carbon	0.176

Notes:
[1] Fish BCFs from the Risk Assessment Information System, Oak Ridge National Laboratory: https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef
[2] BSAFs for PAHs are for wet weight and are from EPA, 2004. The PAH BSAF of 0.29 was used as a surrogate for benzo(g,h,i)perylene.
[3] Sediment concentrations were normalized to organic carbon and lipid content using the site-specific fraction o| mg/kg = milligrams per kilogram
[4] NOAELs listed in Table 14.

NOAEL = no observed adverse effects level
kg-DW = kilograms as dry weight
kg-WW = kilograms as wet weight
N/A = not available, analyte was not detected
mg/kg = milligrams per kilogram
BCF = bioconcentration factor
BSAF = biota sediment accumulation factor
kgBW = kilogram body weight
mg/L = milligrams per liter
PAH = polycyclic aromatic hydrocarbon

References:
EPA, 2004. The Incidence and Severity of Sediment Contamination in Surface Waters of the United States. National Sediment Quality Survey Second Edition. EPA-823-R-04-007. November.

Table 21
Initial Food Web Modeling - Osprey
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Chemical	Maximum Surface Water Detection (mg/L)	Maximum Sediment Detection (mg/kg)	Surface Water-to-Fish BCF[1] (L/kg)	Fish Tissue Concentration (mg/kg, wet weight)	Average Daily Dose (mg/kg-day)	NOAEL[2] (mg/kg-day)	NOAEL Ecological Quotient
Low Molecular Weight PAHs							
Anthracene	0.00021	0.225	1,800	3.78E-01	7.56E-02	Evaluated as Sum of Low Molecular Weight PAHs	
Fluoranthene	0.00028	0.621	3,630	1.02E+00	2.03E-01		
Total Low Molecular Weight PAHs					2.79E-01	1,000	0.0003
High Molecular Weight PAHs							
Benzo(a)anthracene	0.00019	0.513	260	4.94E-02	9.89E-03	Evaluated as Sum of High Molecular Weight PAHs	
Benzo[a]pyrene	0.00018	0.504	5,150	9.27E-01	1.85E-01		
Benzo[b]fluoranthene	0.00034	1.12	3,020	1.03E+00	2.05E-01		
Benzo[g,h,i]perylene	0.00012	0.303	11,000	1.32E+00	2.64E-01		
Benzo(k)fluoranthene	0.00011	0.335	4,990	5.49E-01	1.10E-01		
Chrysene	0.00021	0.651	3,170	6.66E-01	1.33E-01		
Dibenz[a,h]anthracene	0.000089	0.0852	9,600	8.54E-01	1.71E-01		
Indeno[1,2,3-c,d]pyrene	0.00014	0.364	12,200	1.71E+00	3.42E-01		
Pyrene	0.0003	0.738	1,510	4.53E-01	9.06E-02		
Total High Molecular Weight PAHs					1.51E+00	40	0.04

Exposure Assumptions - Osprey (exposure assumptions obtained from Table 13)

Sediment ingestion rate (kg/kgBW-day)	0
Surface Water Ingestion Rate (L/kgBW-day)	0.052
Food ingestion rate (kg-WW/kgBW-day)	0.2
Fish ingestion rate (kg-WW/kgBW-day)	0.2

No area use factor applied.
Assume that diet consists of 100% fish.

Notes:
[1] Fish BCFs from the Risk Assessment Information System, Oak Ridge National Laboratory: https://rais.ornl.gov/cgi-bin/tools/TOX_search?select=chem_spef
[2] NOAELs listed in Table 14.

NOAEL = no observed adverse effects level
kg-WW = kilograms as wet weight
N/A = not available, analyte was not detected
mg/L = milligrams per liter
mg/kg = milligrams per kilogram
BCF = bioconcentration factor
kgBW = kilogram body weight
L/kg = liters per kilogram
PAH = polycyclic aromatic hydrocarbon

Table 22
COPC Summary
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Step 2b COPC	COPC Communities	Retained or Eliminated in Step 2c	Step 2c Rationale to Retain or Eliminate
Sediment			
Arsenic	Wildlife	Eliminated	- Maximum concentration less than the avian and mammal no effects levels.
Beryllium	Benthic Invertebrates	Eliminated	- No background value available. Detections are low and similar around the shoreline, which is not indicative of a contaminant source along the pond's eastern bank. Data is normally distributed, which is not indicative of contamination.
Cadmium	Wildlife	Eliminated	- No background value available. Detections are similar around the shoreline, which is not indicative of a contaminant source along the pond's eastern bank. Data is normally distributed, which is not indicative of contamination. - Maximum concentration less than the avian no effects level and less than the mammal low effects level.
Chromium	Wildlife	Eliminated	- All detections fall within the range of background values indicating the chromium in site sediment reflects natural heterogeneity, not contamination. - Maximum concentration less than the avian and mammal no effects levels.
Copper	Wildlife	Eliminated	- Maximum concentration less than the avian and mammal no effects levels.
Mercury	Wildlife	Eliminated	- Maximum concentration less than the avian low effects level and less than the mammal no effects level.
Nickel	Wildlife	Eliminated	- No background value available. Detections are similar around the shoreline, which is not indicative of a contaminant source along the pond's eastern bank. Data is normally distributed, which is not indicative of contamination. - Maximum concentration less than the avian and mammal no effects levels.
Selenium	Wildlife	Eliminated	- No background value available. Detected in three of ten samples, two of which were collected from the western bank. This distribution is not indicative of a contaminant source along the eastern bank. - Maximum concentration less than the avian and mammal no effects levels.
Zinc	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the avian and mammal low effects levels. - Maximum concentration is less than the PEC for benthic invertebrates..
Anthracene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.

Table 22
COPC Summary
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Step 2b COPC	COPC Communities	Retained or Eliminated in Step 2c	Step 2c Rationale to Retain or Eliminate
Sediment			
Benzo(a)anthracene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the avian and mammal no effects levels. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.
Benzo(a)pyrene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.
Benzo(b)fluoranthene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Sum of toxic unit quotients for all PAHs in sediment is less than 1, indicating no risk to benthic organisms. - Food web modeling indicates no adverse health impacts to birds.
Benzo(g,h,i)perylene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Sum of toxic unit quotients for all PAHs in sediment is less than 1, indicating no risk to benthic organisms. - Food web modeling indicates no adverse health impacts to birds.
Benzo(k)fluoranthene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Sum of toxic unit quotients for all PAHs in sediment is less than 1, indicating no risk to benthic organisms. - Food web modeling indicates no adverse health impacts to birds.
Chrysene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.
Dibenzo(a,h)anthracene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.
Indeno(1,2,3-cd)pyrene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the mammal no effects level. - Sum of toxic unit quotients for all PAHs in sediment is less than 1, indicating no risk to benthic organisms. - Food web modeling indicates no adverse health impacts to birds.

Table 22
COPC Summary
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Step 2b COPC	COPC Communities	Retained or Eliminated in Step 2c	Step 2c Rationale to Retain or Eliminate
Pyrene	Benthic Invertebrates and Wildlife	Eliminated	- Maximum concentration less than the avian and mammal no effects levels. - Maximum concentration is less than the PEC for benthic invertebrates. - Food web modeling indicates no adverse health impacts to birds.
Sum of PAHs	Benthic Invertebrates and Wildlife	Eliminated	- Sum of maximum PAH detections is less than the PEC for benthic invertebrates.. - Sum of toxic unit quotients for all PAHs in sediment is less than 1, indicating no risk to benthic organisms. - All PAHs are less than the individual no effects levels for mammals. - Food web modeling indicates no adverse health impacts to birds.
Surface Water			
Arsenic	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs - Maximum concentration is less than the avian and mammal no effects levels.
Copper	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs - Maximum concentration is less than the avian and mammal no effects levels.
Zinc	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs - Maximum concentration is less than the avian and mammal no effects levels.
Anthracene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.
Benzo(a)anthracene	Aquatic Community and Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Maximum concentration is less than the USEPA Region 4 ESV and LANL low effects level for aquatic community. - Food web modeling indicates no adverse health impacts to birds.
Benzo(a)pyrene	Aquatic Community and Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Maximum concentration is less than the LANL low effects level for aquatic community. - Food web modeling indicates no adverse health impacts to birds.

Table 22
COPC Summary
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

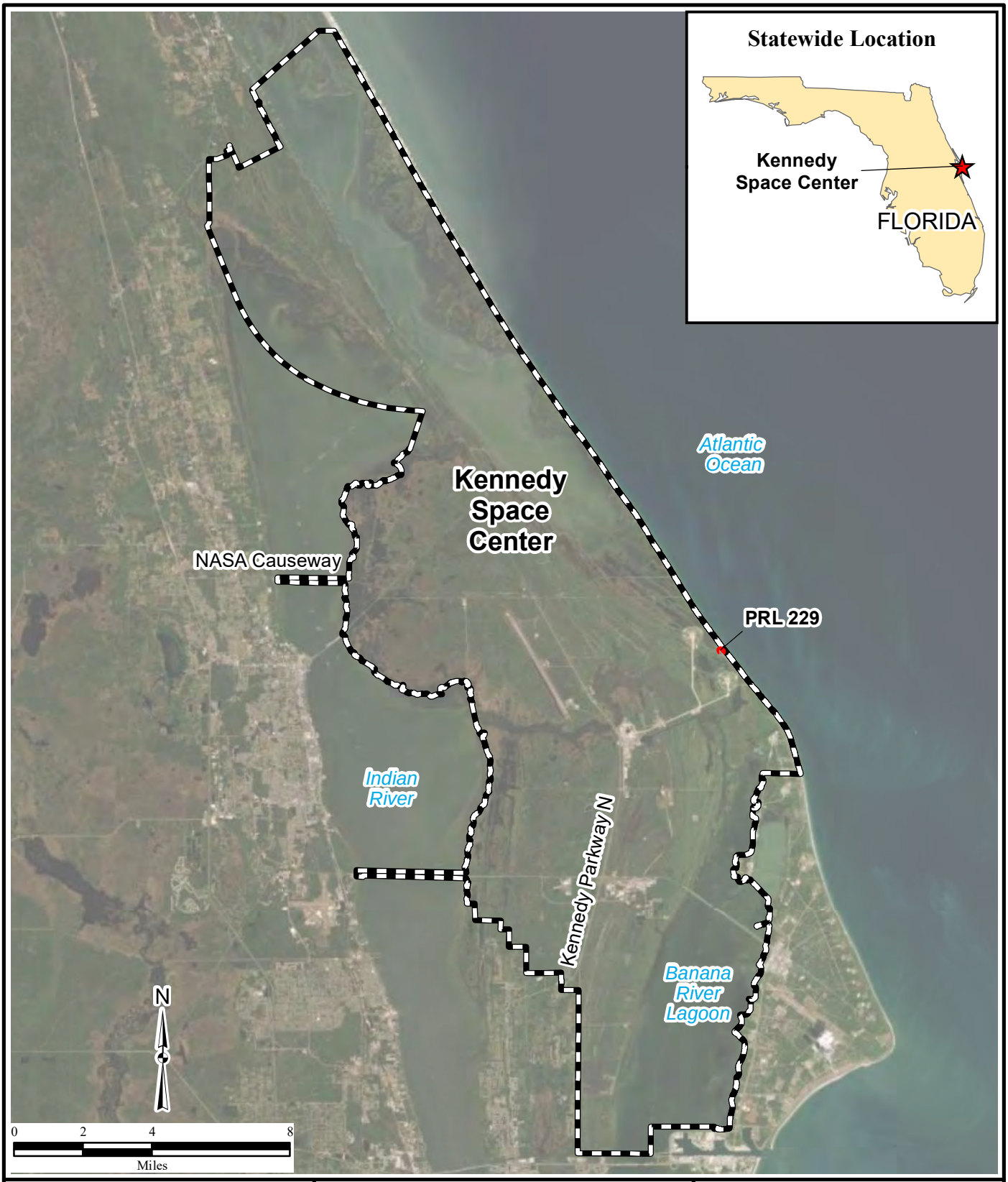
Step 2b COPC	COPC Communities	Retained or Eliminated in Step 2c	Step 2c Rationale to Retain or Eliminate
Surface Water			
Benzo(b)fluoranthene	Aquatic Community and Wildlife	Eliminated	- Maximum concentration is less than the mammal no effects level. - Maximum concentration is less than the USEPA Region 4 ESV and LANL low effects level for aquatic community. - Food web modeling indicates no adverse health impacts to birds.
Benzo(g,h,i)perylene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.
Benzo(k)fluoranthene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.
Chrysene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.
Dibenzo(a,h)anthracene	Aquatic Community and Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Average concentration (calculated by assuming concentrations equal to on-half the limit of detection for non-detect results) is less than the LANL low effects level for aquatic community. - Food web modeling indicates no adverse health impacts to birds.

Table 22
COPC Summary
Railroad Tie Disposal Area, Un-Numbered Operational Areas, PRL 229
Kennedy Space Center, Florida

Step 2b COPC	COPC Communities	Retained or Eliminated in Step 2c	Step 2c Rationale to Retain or Eliminate
Surface Water			
Fluoranthene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.
Indeno(1,2,3-cd)pyrene	Aquatic Community and Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Maximum concentration is less than LANL low effects level for aquatic community. - Food web modeling indicates no adverse health impacts to birds.
Pyrene	Wildlife	Eliminated	- Low detection frequency suggests limited presence of COPCs. - Maximum concentration is less than the mammal no effects level. - Food web modeling indicates no adverse health impacts to birds.

Notes:
PAH = polynucleear aromatic hydrocarbon
PEC = probable effects concentration
USEPA = U.S. Environmental Protection Agency

FIGURES



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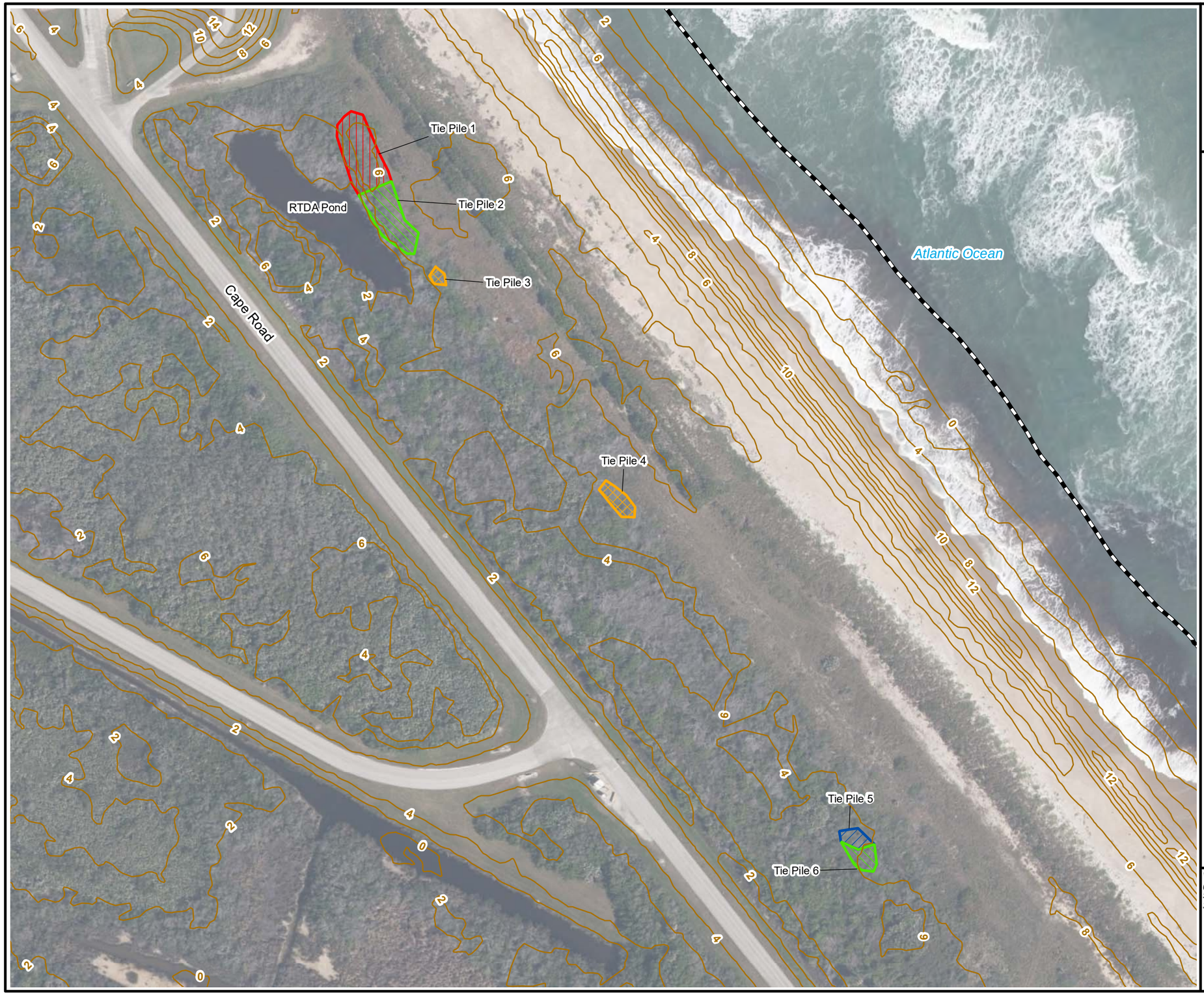
5/2/2022 TB
Source: HGL, 3E Consultants
ArcGIS Online Imagery

Legend

- Site Location
- Potential Release Location (PRL) 229 Boundary
- Kennedy Space Center

Figure 1
PRL 229
Railroad Tie
Disposal Area Pond
Site Location

Figure 2
PRL 229
Railroad Tie
Disposal Area Pond
Site Layout



Legend

- Topographic Elevation Contour (ft amsl, contour interval = 2 ft)
- Completed Interim Measure Area (0-0.5 ft.)
- Completed Interim Measure Area (0-2 ft.)
- Completed Interim Measure Area (0-3 ft.)

Notes:
amsl=above mean sea level
ft=feet
KSC=Kennedy Space Center
PRL=Potential Release Location
RTDA=Railroad Tie Disposal Area

N

0 60 120 240
Feet

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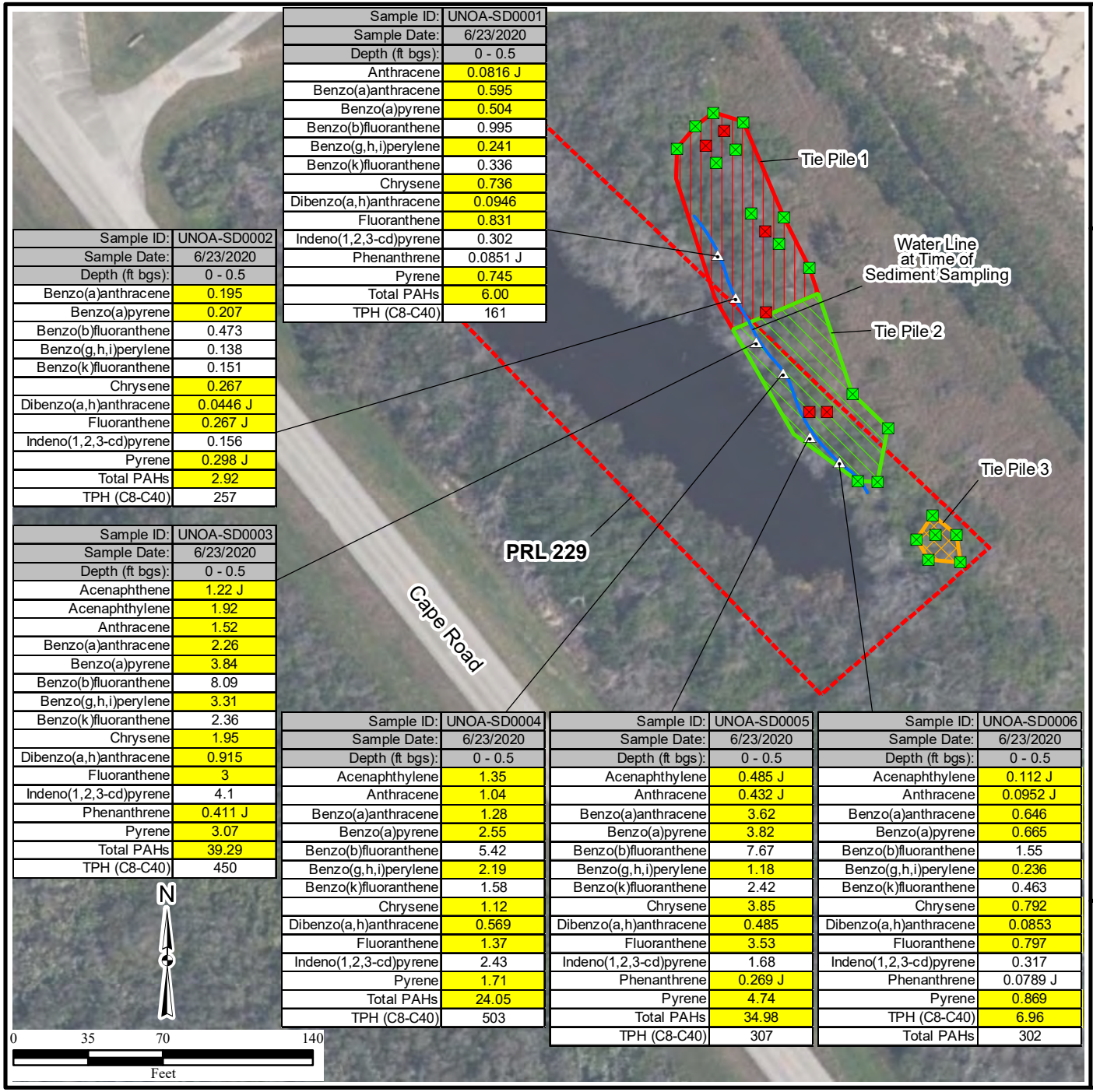
5/2/2022 TB
Source: HGL, FLDOT, USGS ArcGIS Online Imagery

Figure 3
PRL 229
Pond
Sediment Sample Results
June 2020



Sample ID:	UNOA-SD0001
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Anthracene	0.0816 J
Benzo(a)anthracene	0.595
Benzo(a)pyrene	0.504
Benzo(b)fluoranthene	0.995
Benzo(g,h,i)perylene	0.241
Benzo(k)fluoranthene	0.336
Chrysene	0.736
Dibenzo(a,h)anthracene	0.0946
Fluoranthene	0.831
Indeno(1,2,3-cd)pyrene	0.302
Phenanthrene	0.0851 J
Pyrene	0.745
Total PAHs	6.00
TPH (C8-C40)	161

Sample ID:	UNOA-SD0002
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Benzo(a)anthracene	0.195
Benzo(a)pyrene	0.207
Benzo(b)fluoranthene	0.473
Benzo(g,h,i)perylene	0.138
Benzo(k)fluoranthene	0.151
Chrysene	0.267
Dibenzo(a,h)anthracene	0.0446 J
Fluoranthene	0.267 J
Indeno(1,2,3-cd)pyrene	0.156
Pyrene	0.298 J
Total PAHs	2.92
TPH (C8-C40)	257

Sample ID:	UNOA-SD0003
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Acenaphthene	1.22 J
Acenaphthylene	1.92
Anthracene	1.52
Benzo(a)anthracene	2.26
Benzo(a)pyrene	3.84
Benzo(b)fluoranthene	8.09
Benzo(g,h,i)perylene	3.31
Benzo(k)fluoranthene	2.36
Chrysene	1.95
Dibenzo(a,h)anthracene	0.915
Fluoranthene	3
Indeno(1,2,3-cd)pyrene	4.1
Phenanthrene	0.411 J
Pyrene	3.07
Total PAHs	39.29
TPH (C8-C40)	450

Sample ID:	UNOA-SD0004
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Acenaphthylene	1.35
Anthracene	1.04
Benzo(a)anthracene	1.28
Benzo(a)pyrene	2.55
Benzo(b)fluoranthene	5.42
Benzo(g,h,i)perylene	2.19
Benzo(k)fluoranthene	1.58
Chrysene	1.12
Dibenzo(a,h)anthracene	0.569
Fluoranthene	1.37
Indeno(1,2,3-cd)pyrene	2.43
Pyrene	1.71
Total PAHs	24.05
TPH (C8-C40)	503

Sample ID:	UNOA-SD0005
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Acenaphthylene	0.485 J
Anthracene	0.432 J
Benzo(a)anthracene	3.62
Benzo(a)pyrene	3.82
Benzo(b)fluoranthene	7.67
Benzo(g,h,i)perylene	1.18
Benzo(k)fluoranthene	2.42
Chrysene	3.85
Dibenzo(a,h)anthracene	0.485
Fluoranthene	3.53
Indeno(1,2,3-cd)pyrene	1.68
Phenanthrene	0.269 J
Pyrene	4.74
Total PAHs	34.98
TPH (C8-C40)	307

Sample ID:	UNOA-SD0006
Sample Date:	6/23/2020
Depth (ft bgs):	0 - 0.5
Acenaphthylene	0.112 J
Anthracene	0.0952 J
Benzo(a)anthracene	0.646
Benzo(a)pyrene	0.665
Benzo(b)fluoranthene	1.55
Benzo(g,h,i)perylene	0.236
Benzo(k)fluoranthene	0.463
Chrysene	0.792
Dibenzo(a,h)anthracene	0.0853
Fluoranthene	0.797
Indeno(1,2,3-cd)pyrene	0.317
Phenanthrene	0.0789 J
Pyrene	0.869
TPH (C8-C40)	6.96
Total PAHs	302

Legend

- Soil Sample Above SCTL
- Soil Sample Below SCTL
- Sediment Sampling Location
- Water Line (6/23/20)
- Completed Excavation Area (0-0.5 ft.)
- Completed Excavation Area (0-2 ft.)
- Completed Excavation Area (0-3 ft.)
- PRL 229

Note:
Yellow=exceeds SQAG
Data shown for detected compounds.
Total PAHs concentrations were calculated by summing the total concentration of each of the detected PAHs and half of the limit of detection concentration for non-detected PAHs.

ft=feet
PAH=polynuclear aromatic hydrocarbons
SCTL=soil cleanup target level
SQAG=Sediment Quality Assessment Guideline

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9/1/2022 TB
Source: HGL, ArcGIS Online Imagery

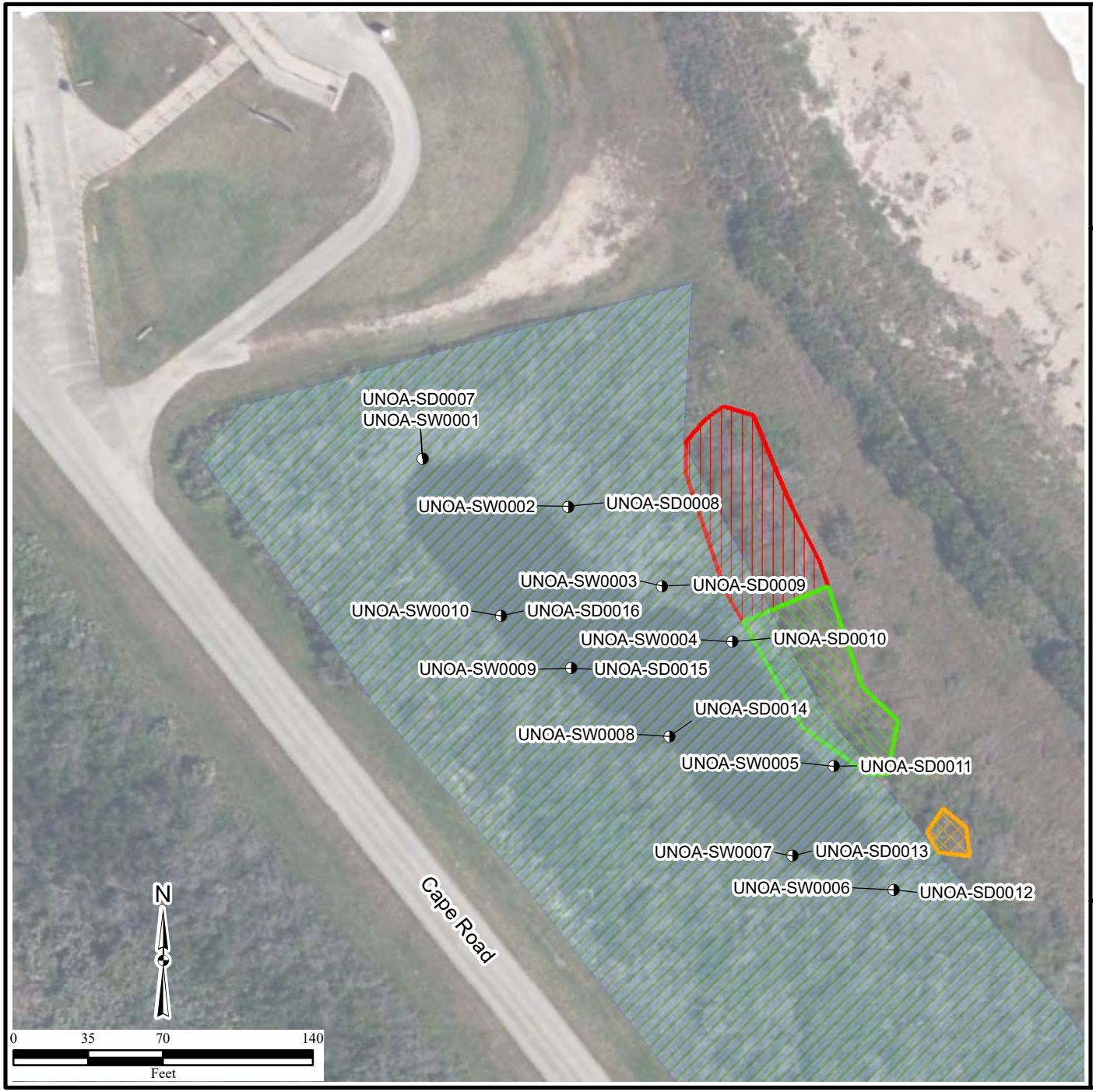


Figure 4
PRL 229 Pond
Surface Water and Sediment Sampling Locations
December 2021

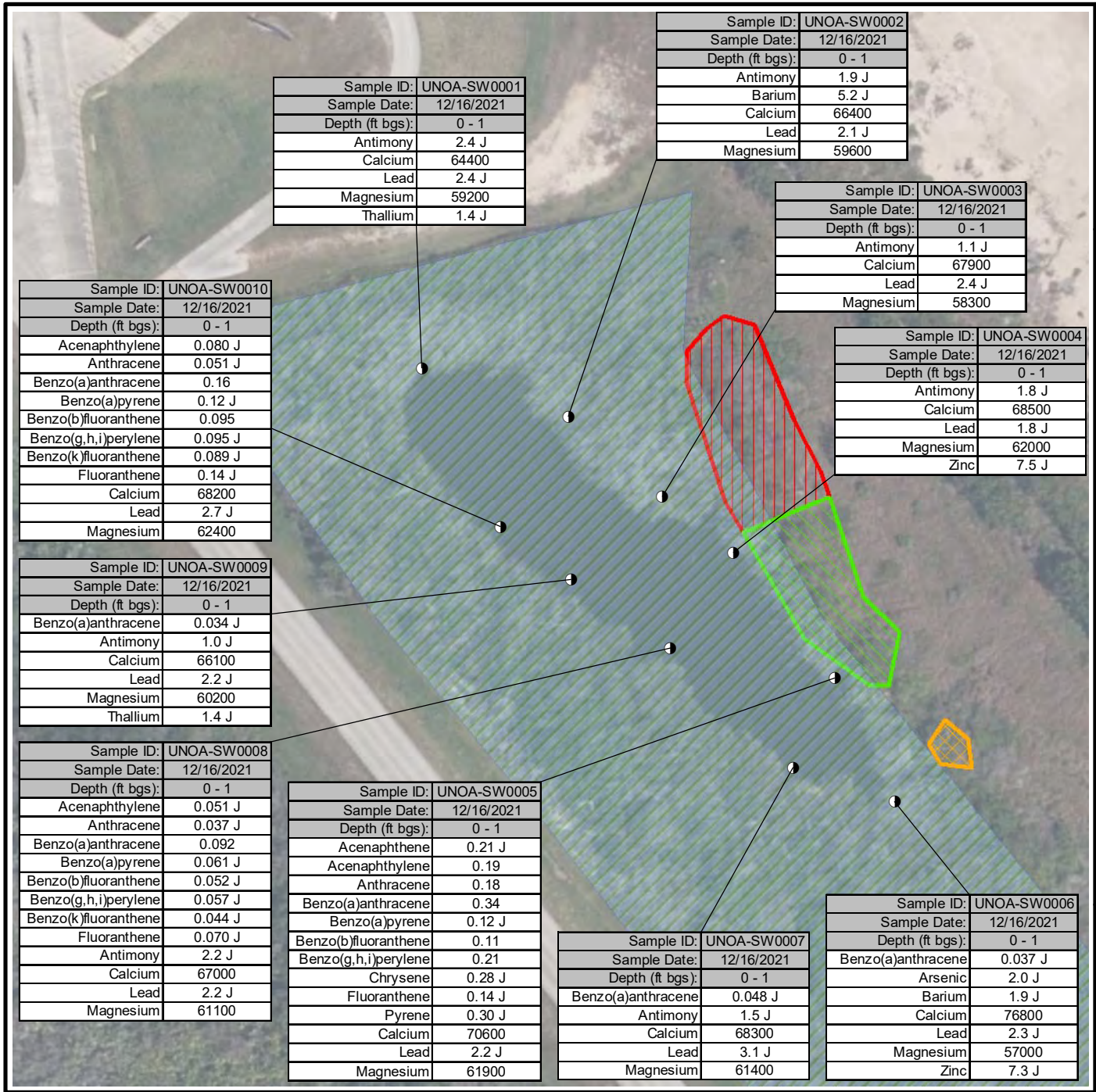
Legend

- Surface Water and Sediment Sample Location
- Completed Interim Measure Area (0-0.5 ft.)
- Completed Interim Measure Area (0-2 ft.)
- Completed Interim Measure Area (0-3 ft.)
- Wetlands

Notes:
amsl=above mean sea level
ft=feet

\\srv-gst-01\hglgis\KSC_NS1002\PRL_229\Pond_CSRAddendum\(04)SW_Sed_Locs.mxd
9/2/2022 TB
Source: HGL, ArcGIS Online Imagery

HGL HydroGeoLogic, Inc



Sample ID:	UNOA-SW0001
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Antimony	2.4 J
Calcium	64400
Lead	2.4 J
Magnesium	59200
Thallium	1.4 J

Sample ID:	UNOA-SW0002
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Antimony	1.9 J
Barium	5.2 J
Calcium	66400
Lead	2.1 J
Magnesium	59600

Sample ID:	UNOA-SW0003
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Antimony	1.1 J
Calcium	67900
Lead	2.4 J
Magnesium	58300

Sample ID:	UNOA-SW0004
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Antimony	1.8 J
Calcium	68500
Lead	1.8 J
Magnesium	62000
Zinc	7.5 J

Sample ID:	UNOA-SW0005
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Acenaphthene	0.21 J
Acenaphthylene	0.19
Anthracene	0.18
Benzo(a)anthracene	0.34
Benzo(a)pyrene	0.12 J
Benzo(b)fluoranthene	0.11
Benzo(g,h,i)perylene	0.21
Chrysene	0.28 J
Fluoranthene	0.14 J
Pyrene	0.30 J
Calcium	70600
Lead	2.2 J
Magnesium	61900

Sample ID:	UNOA-SW0006
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Benzo(a)anthracene	0.037 J
Arsenic	2.0 J
Barium	1.9 J
Calcium	76800
Lead	2.3 J
Magnesium	57000
Zinc	7.3 J

Sample ID:	UNOA-SW0007
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Benzo(a)anthracene	0.048 J
Antimony	1.5 J
Calcium	68300
Lead	3.1 J
Magnesium	61400

Sample ID:	UNOA-SW0008
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Acenaphthylene	0.051 J
Anthracene	0.037 J
Benzo(a)anthracene	0.092
Benzo(a)pyrene	0.061 J
Benzo(b)fluoranthene	0.052 J
Benzo(g,h,i)perylene	0.057 J
Benzo(k)fluoranthene	0.044 J
Fluoranthene	0.070 J
Antimony	2.2 J
Calcium	67000
Lead	2.2 J
Magnesium	61100

Sample ID:	UNOA-SW0009
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Benzo(a)anthracene	0.034 J
Antimony	1.0 J
Calcium	66100
Lead	2.2 J
Magnesium	60200
Thallium	1.4 J

Sample ID:	UNOA-SW0010
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 1
Acenaphthylene	0.080 J
Anthracene	0.051 J
Benzo(a)anthracene	0.16
Benzo(a)pyrene	0.12 J
Benzo(b)fluoranthene	0.095
Benzo(g,h,i)perylene	0.095 J
Benzo(k)fluoranthene	0.089 J
Fluoranthene	0.14 J
Calcium	68200
Lead	2.7 J
Magnesium	62400

Figure 5
PRL 229 Pond
Surface Water
Sampling Results
December 2021

Legend

- Surface Water Sample
- Completed Interim Measure Area (0-0.5 ft.)
- Completed Interim Measure Area (0-2 ft.)
- Completed Interim Measure Area (0-3 ft.)
- Wetlands

Notes:
amsl=above mean sea level
ft=feet
SWCTLs=Surface Water CleanupTarget Levels - Marine

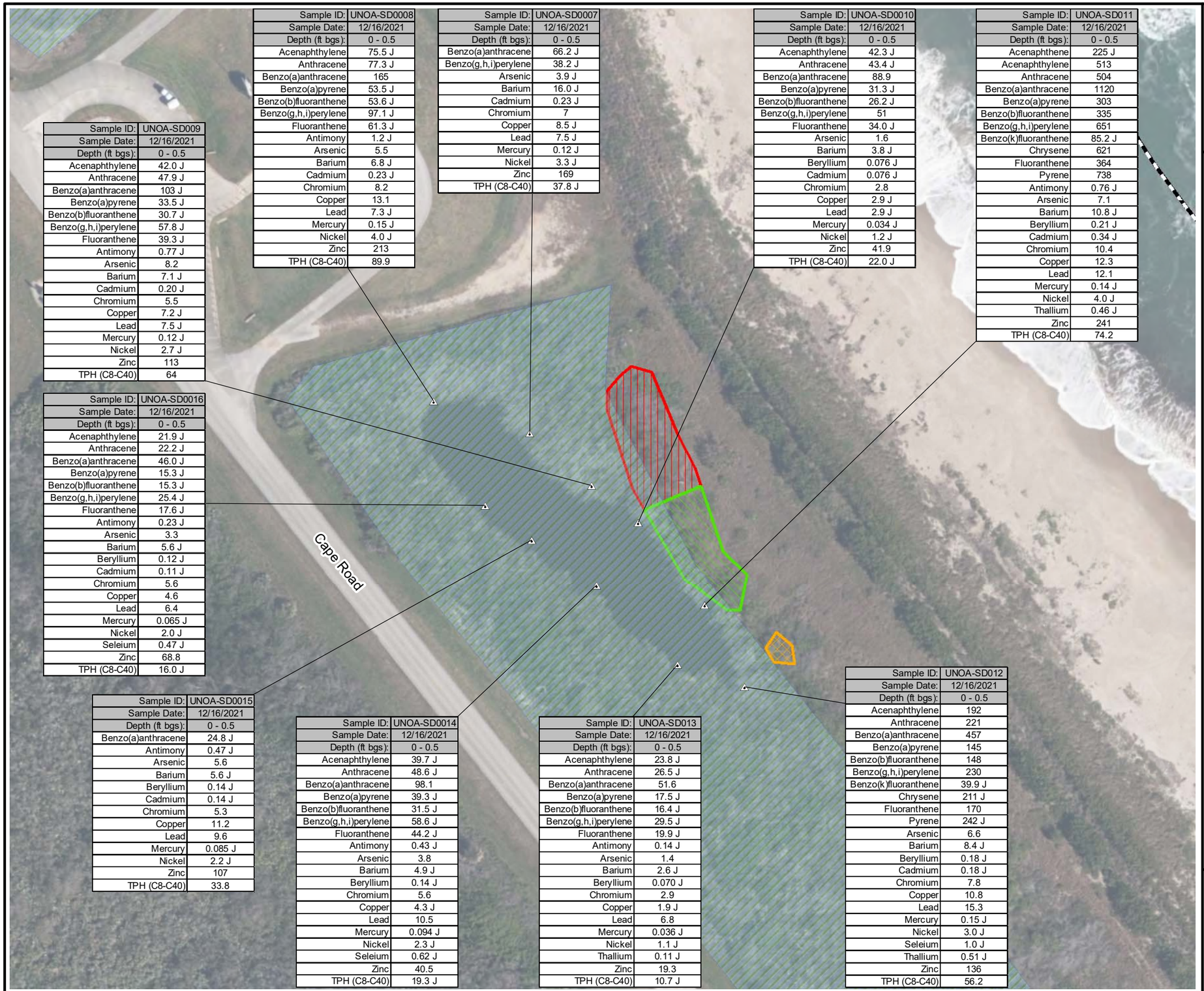
N

0 35 70 140
Feet

\\srv-gst-01\hglgis\KSC_NS1002\PRL_229\Pond_CSRAddendum\(05)SW_Sample_Results.mxd
9/1/2022 TB
Source: HGL, ArcGIS Online Imagery

HGL HydroGeoLogic, Inc

Figure 6
PRL 229 Pond
Sediment Sampling Results
December 2021



Sample ID:	UNOA-SD009
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	42.0 J
Anthracene	47.9 J
Benzo(a)anthracene	103 J
Benzo(a)pyrene	33.5 J
Benzo(b)fluoranthene	30.7 J
Benzo(g,h,i)perylene	57.8 J
Fluoranthene	39.3 J
Antimony	0.77 J
Arsenic	8.2
Barium	7.1 J
Cadmium	0.20 J
Chromium	5.5
Copper	7.2 J
Lead	7.5 J
Mercury	0.12 J
Nickel	2.7 J
Zinc	113
TPH (C8-C40)	64

Sample ID:	UNOA-SD0008
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	75.5 J
Anthracene	77.3 J
Benzo(a)anthracene	165
Benzo(a)pyrene	53.5 J
Benzo(b)fluoranthene	53.6 J
Benzo(g,h,i)perylene	97.1 J
Fluoranthene	61.3 J
Antimony	1.2 J
Arsenic	5.5
Barium	6.8 J
Cadmium	0.23 J
Chromium	8.2
Copper	13.1
Lead	7.3 J
Mercury	0.15 J
Nickel	4.0 J
Zinc	213
TPH (C8-C40)	89.9

Sample ID:	UNOA-SD0007
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Benzo(a)anthracene	66.2 J
Benzo(g,h,i)perylene	38.2 J
Arsenic	3.9 J
Barium	16.0 J
Cadmium	0.23 J
Chromium	7
Copper	8.5 J
Lead	7.5 J
Mercury	0.12 J
Nickel	3.3 J
Zinc	169
TPH (C8-C40)	37.8 J

Sample ID:	UNOA-SD0010
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	42.3 J
Anthracene	43.4 J
Benzo(a)anthracene	88.9
Benzo(a)pyrene	31.3 J
Benzo(b)fluoranthene	26.2 J
Benzo(g,h,i)perylene	51
Fluoranthene	34.0 J
Arsenic	1.6
Barium	3.8 J
Beryllium	0.076 J
Cadmium	0.076 J
Chromium	2.8
Copper	2.9 J
Lead	2.9 J
Mercury	0.034 J
Nickel	1.2 J
Zinc	41.9
TPH (C8-C40)	22.0 J

Sample ID:	UNOA-SD011
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthene	225 J
Acenaphthylene	513
Anthracene	504
Benzo(a)anthracene	1120
Benzo(a)pyrene	303
Benzo(b)fluoranthene	335
Benzo(g,h,i)perylene	651
Benzo(k)fluoranthene	85.2 J
Chrysene	621
Fluoranthene	364
Pyrene	738
Antimony	0.76 J
Arsenic	7.1
Barium	10.8 J
Beryllium	0.21 J
Cadmium	0.34 J
Chromium	10.4
Copper	12.3
Lead	12.1
Mercury	0.14 J
Nickel	4.0 J
Thallium	0.46 J
Zinc	241
TPH (C8-C40)	74.2

Sample ID:	UNOA-SD0016
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	21.9 J
Anthracene	22.2 J
Benzo(a)anthracene	46.0 J
Benzo(a)pyrene	15.3 J
Benzo(b)fluoranthene	15.3 J
Benzo(g,h,i)perylene	25.4 J
Fluoranthene	17.6 J
Antimony	0.23 J
Arsenic	3.3
Barium	5.6 J
Beryllium	0.12 J
Cadmium	0.11 J
Chromium	5.6
Copper	4.6
Lead	6.4
Mercury	0.065 J
Nickel	2.0 J
Seleium	0.47 J
Zinc	68.8
TPH (C8-C40)	16.0 J

Sample ID:	UNOA-SD0015
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Benzo(a)anthracene	24.8 J
Antimony	0.47 J
Arsenic	5.6
Barium	5.6 J
Beryllium	0.14 J
Cadmium	0.14 J
Chromium	5.3
Copper	11.2
Lead	9.6
Mercury	0.085 J
Nickel	2.2 J
Zinc	107
TPH (C8-C40)	33.8

Sample ID:	UNOA-SD0014
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	39.7 J
Anthracene	48.6 J
Benzo(a)anthracene	98.1
Benzo(a)pyrene	39.3 J
Benzo(b)fluoranthene	31.5 J
Benzo(g,h,i)perylene	58.6 J
Fluoranthene	44.2 J
Antimony	0.43 J
Arsenic	3.8
Barium	4.9 J
Beryllium	0.14 J
Chromium	5.6
Copper	4.3 J
Lead	10.5
Mercury	0.094 J
Nickel	2.3 J
Seleium	0.62 J
Zinc	40.5
TPH (C8-C40)	19.3 J

Sample ID:	UNOA-SD013
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	23.8 J
Anthracene	26.5 J
Benzo(a)anthracene	51.6
Benzo(a)pyrene	17.5 J
Benzo(b)fluoranthene	16.4 J
Benzo(g,h,i)perylene	29.5 J
Fluoranthene	19.9 J
Antimony	0.14 J
Arsenic	1.4
Barium	2.6 J
Beryllium	0.070 J
Chromium	2.9
Copper	1.9 J
Lead	6.8
Mercury	0.036 J
Nickel	1.1 J
Thallium	0.11 J
Zinc	19.3
TPH (C8-C40)	10.7 J

Sample ID:	UNOA-SD012
Sample Date:	12/16/2021
Depth (ft bgs):	0 - 0.5
Acenaphthylene	192
Anthracene	221
Benzo(a)anthracene	457
Benzo(a)pyrene	145
Benzo(b)fluoranthene	148
Benzo(g,h,i)perylene	230
Benzo(k)fluoranthene	39.9 J
Chrysene	211 J
Fluoranthene	170
Pyrene	242 J
Arsenic	6.6
Barium	8.4 J
Beryllium	0.18 J
Cadmium	0.18 J
Chromium	7.8
Copper	10.8
Lead	15.3
Mercury	0.15 J
Nickel	3.0 J
Seleium	1.0 J
Thallium	0.51 J
Zinc	136
TPH (C8-C40)	56.2

Legend

- Sediment Sample
- Completed Interim Measure Area (0-0.5 ft.)
- Completed Interim Measure Area (0-2 ft.)
- Completed Interim Measure Area (0-3 ft.)
- Wetlands

Notes:
amsl=above mean sea level
ft=feet
SWCTLs=Surface Water CleanupTarget Levels - Marine

N

0 35 70 140

Feet

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9/1/2022 TB
Source: HGL, ArcGIS Online Imagery

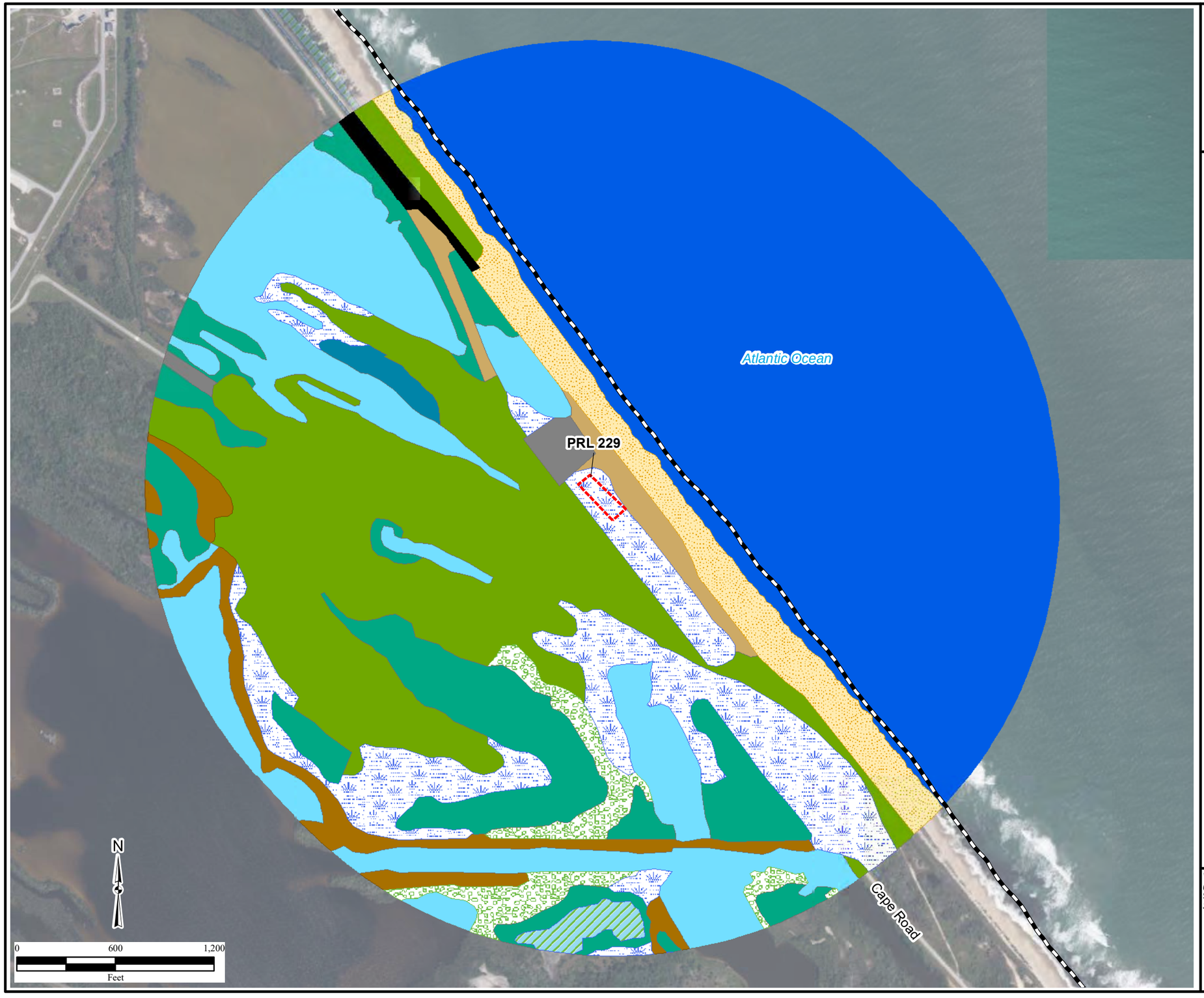

Figure 7
Study Area Vegetative Cover Types
0.5 Mile Radius

Legend

- Kennedy Space Center
- Kennedy Space Center Use
- Herbaceous (Dry Prairie)
- Shrub and Brushland
- Upland Hardwood Forests
- Saltwater Ponds
- Atlantic Ocean
- Mangrove Swamps
- Mixed Wetland Hardwoods
- Saltwater Marshes
- Mixed Scrub-shrub Wetland
- Non-Vegetated Wetlands
- Beaches other than Swimming Beaches
- Railroads
- PRL-229 Boundary

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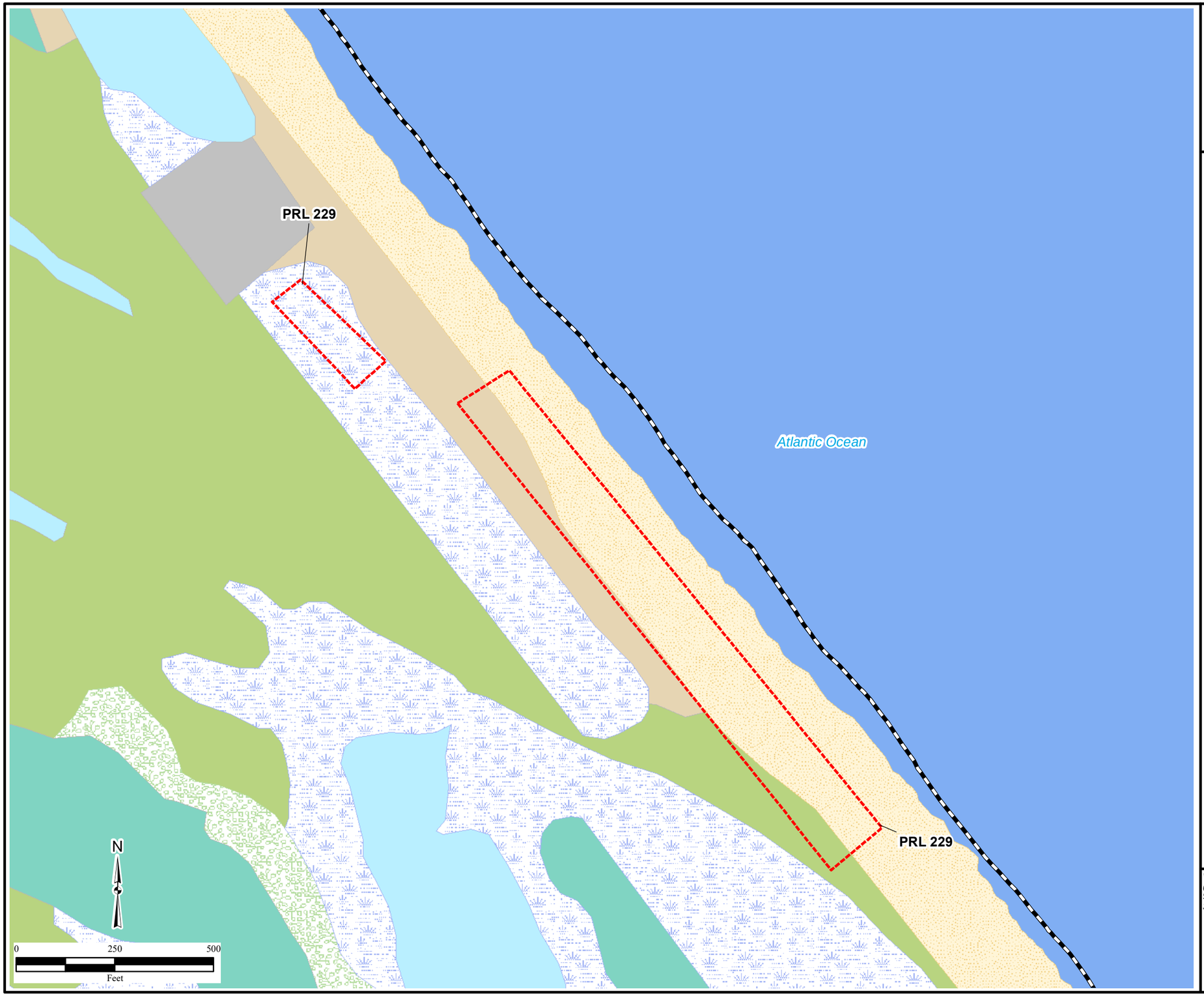
9/1/2022 TB
Source: HGL, FDEP
ArcGIS Online Imagery

HGL HydroGeoLogic, Inc

Figure 8
PRL-229 On-Site Ecological Habitat



Legend

- Kennedy Space Center Use
- Herbaceous (Dry Prairie)
- Shrub and Brushland
- Upland Hardwood Forests
- Saltwater Ponds
- Atlantic Ocean
- Mangrove Swamps
- Mixed Wetland Hardwoods
- Saltwater Marshes
- Mixed Scrub-shrub Wetland
- Non-Vegetated Wetlands
- Beaches other than Swimming Beaches
- Railroads
- PRL-229 Boundary

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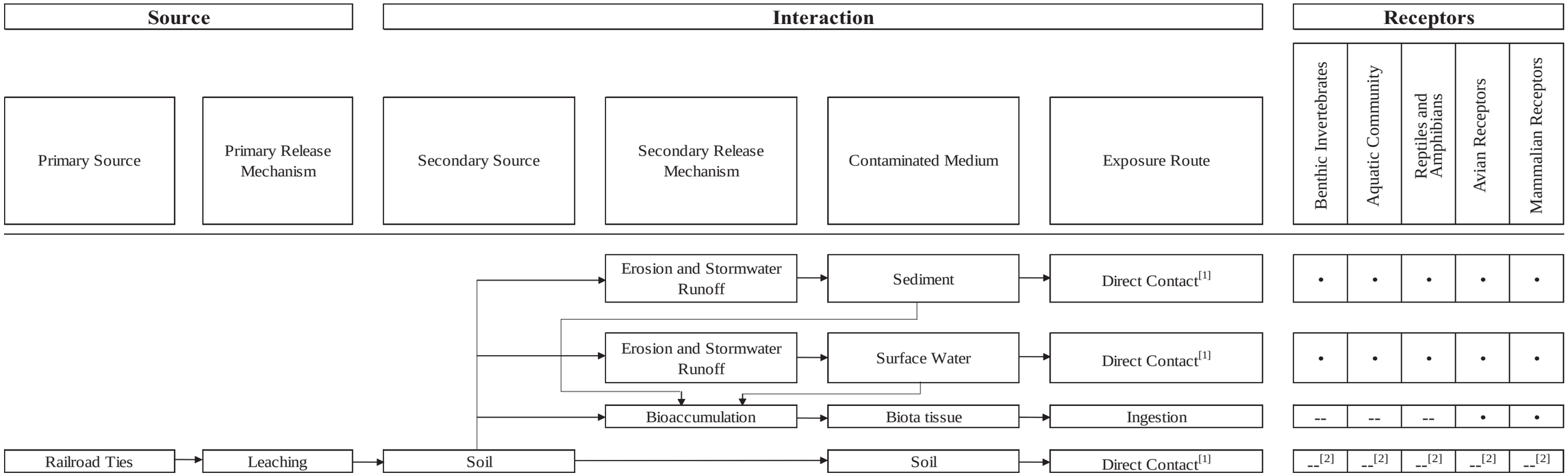
(08)Eco_Habitat.mxd
9/1/2022 TB
Source: HGL, FDEP
ArcGIS Online Imagery

HGL HydroGeoLogic, Inc



[1] Direct contact includes incidental ingestion, dermal contact, and inhalation exposure pathways. Although wildlife receptors may be exposed to chemicals via dermal contact and inhalation, there are no equations or methods available to estimate intake by these exposure routes. Exposure via dermal contact and inhalation will not be quantified or evaluated.

[2] Exposure to terrestrial habitat is outside of the scope of the SLERA.

SLERA=Screening-Level Ecological Risk Assessment

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9/1/22 TB
Source: HGL

HGL HydroGeoLogic, Inc

Legend

• Potentially Complete Exposure Route

-- Incomplete Exposure Route

Figure 9
Conceptual Site Model

APPENDIX A

FIELD DOCUMENTATION

Daily Quality Control Report

HGL HydroGeoLogic, Inc Exceeding Expectations	Daily Quality Control Report
Date:	**12/16/2021**
NASA Remediation Project Manager:	Deda Johansen
HGL Program Manager:	Janardan Patel
HGL Project Manager:	Howard Fowler
Prime Contract No.	80KSC019F0118
Project Name:	PRL 229 (RTDA)
Project No.	NS1005.11.06 (SW) NS1005.11.07 (SD)

Day	S	M	T	W	TH	F	S
					X		

Weather	Bright Sun		Clear	Overcast	Rain	Fog
			X		X	
Temp	Min.			Max.		
	69			80		
Wind	Still	Moderate		High	Gust	
		X				
Humidity	Dry	Moderate		High	Rainfall	
		X				

1. List of On-Site Personnel:

1.1 List of HGL Personnel Onsite

HGL Employee Name	Position	Location	Hours	Non-Hours	Total Hours
Robert Lynch	Staff Scientist	PRL 229 (RTDA)	8	0	8
Brad Mitchell	Construction Manager	PRL 229 (RTDA)	8	0	8
William Duttenhaver	Field Technician	PRL 229 (RTDA)	8	0	8
Dustin Lupis	Field Technician	PRL 229 (RTDA)	8	0	8
Barry Huston	Field Technician	PRL 229 (RTDA)	8	0	8
TOTAL HGL PERSONNEL ONSITE		**5**	**TOTAL HOURS WORKED**		**40**

1.2 List of GOV. Personnel Onsite

Personnel Onsite	Affiliation / Position	Location	Est. Total Hours
Deda Johansen	NASA/RPM	PRL 229 (RTDA)	0.5
TOTAL GOV PERSONNEL ONSITE	**1**		**0.5**

1.3 Subcontractors Onsite

Employee Name	Company / Position	Location	Hours	Non-Hours	Total Hours
					0
TOTAL SUBCONTRACTOR PERSONNEL ONSITE	**0**	**TOTAL HOURS WORKED**			**0**

2. List of Equipment

2.1 Heavy Equipment

Equipment	Date Arrived/Departed	Date of Safety Check	Hours Used	Hours Idle	Hours Repair

2.2 Instrumentation & Equipment

Description Of Instrumentation	Date Arrived/Departed	Pre Calibration Conducted	Cal Form Completed	Pass / Fail	Hours Used
YSI Pro (048513) HACH 2100 Q (042114)	12/6/2021	12/15/2021	Yes	Pass	8

3. Field Activities

DFOW / ACTIVITY / DELIVERIES	S = Start C = Continuing F = Finish	Description of Work Actually Performed / Material Deliveries
Surface Water/Sediment Sampling	**F = Finish**	Collected Co-Located Surface Water and Sediment Samples (10 Locations)

Daily Quality Control Report

4. Testing and Sampling Activities

Inspection Conducted	Fibers/cc	Description of Test Performed

4.2 Sampling Conducted

Location	Analysis	Results - Detected / Not Detected
UNOA-SW0001	VOCs, SVOCs, PAHs, Priority Pollutant Metals plus Barium, Total Hardness	Pending
UNOA-SW0002		
UNOA-SW0003		
UNOA-SW0004		
UNOA-SW0005		
UNOA-SW0006		
UNOA-SW0007		
UNOA-SW0008		
UNOA-SW0009		
UNOA-SW0010		
UNOA-SD0007	SVOCs, PAHs, TRPH, Priority Pollutant Metals plus Barium, Total Organic Carbon	
UNOA-SD0008		
UNOA-SD0009		
UNOA-SD0010		
UNOA-SD0011		
UNOA-SD0012		
UNOA-SD0013		
UNOA-SD0014		
UNOA-SD0015		
UNOA-SD0016		

5. Job Safety: (TGSM Topics, Report violations, instructions given, corrective action taken)

Slips, Trips, and Falls, Biological Hazards, Boat Safety

6. Description of Work Completed

Conducted co-located surface water and sediment sampling at 10 locations at PRL 229 Pond (Railroad Tie Area [RTDA]), KSC, FL. Samples were collected from boat by William D. (Parker) and Rob L. Surface water samples were collected via grab method. Sediment samples were collected using a stainless steel scoop. Water quality parameters were recorded prior to sample collection and are provided on attached field forms. Coordinates were recorded at each location. Samples were kept in coolers with ice until pickup up by lab courier on Friday, 12/17/21.

7. 3-PHASE INSPECTION (Preparatory / Initial / Final Follow-Up)

Name of Inspection Held	Gov. Notified (Y/N)	Definable Feature of Work	Checklist Completed

I Certify that I am the Contractor's Authorized Representative and that the above information stated in this Daily Activity Report is accurate and representative of the work completed.

Printed Name: Robert Lynch	**12/16/2021**
Signature: Lynch, Robert Digitally signed by Lynch, Robert Date: 2021.12.17 14:48:51 -05'00'	**12/16/2021**

I Certify that I am the Contractor's Authorized Quality Control Representative and that this Daily Activity Report conforms with all appropriate and approved Work Plan Statement of Work.

Printed Name: Tim Jellett	**12/16/2021**
Signature: Jellett, Tim Digitally signed by Jellett, Tim Date: 2021.12.17 15:51:51 -05'00'	**12/16/2021**

TAILGATE SAFETY MEETING

DATE: 12-16-21 TIME: 0730

CLIENT: KSC PROJECT NO.: NS1006.02.07

LOCATION: PRL229

SIGNIFICANT SAFETY ISSUES

Wildlife (snakes, alligators, and stinging insects), Poisonous plants, Heat Stress, Dehydration, Sunburn, Inclement weather, High Winds, Noise, Heavy equipment, Pinch points, Chemical exposure, heavy lifting, Slip, trips & falls, Fire and fueling hazards. Emergency call rescue OP's on radio

TYPE OF WORKED BEING PERFROMED

Water levels, GW sampling

EMERGENCY PROCEDURES

For Emergencies (fire/major medical requiring ambulance) dial (321) 853-0911 for Cape Canaveral Emergencies – In it is a Non-Emergency you can contact Cape Support (321) 853-5211

For minor injuries, treat and transport to the nearest medical facility:

Cape Canaveral Hospital
701 W. Cocoa Beach Causeway
Cocoa Beach, Florida 32931

Fire / Police / Ambulance: 911 **Direct Contact: (321) 799-7111**

PERSONAL PROTECTIVE EQUIPMENT

LEVEL D: **Steel-toed work boots, hard hat, safety vest, safety glasses, hearing protection, leather or nitrile gloves.**

SAFETY & SITE EQUIPMENT

First aid kit, radios & cell phones, Eye wash, Fire Extinguishers, and personnel PPE

CHEMICAL HAZARDS

THE FOLLOWING CHEMICAL CONSTITUENTS MAY BE FOUND IN SOIL, DEBRIS, AND/OR GROUNDWATER.

CHEMICALCONSTITUENT	MSDS ON-SITE?	CARCINOGEN	EXPOSURE
VOCs,	Yes	Yes	**Acute**: Very hazardous in case of ingestion, of inhalation. Toxic skin contact (irritant) **Chronic:** Carcinogenic Effects

PHYSICAL HAZARDS

HEAT STRESS, Heavy lifting, Vehicle safety, Uneven Terrain, Inclement Weather, Manual Material Handling, Pinch Points, Heavy Equipment, Blood borne Pathogens, Sun Exposure, Fire, Noise, Snakes, Stinging Insects, Spiders.

EXCLUSION ZONE ENTRY REQUIREMENTS

NO Personnel will enter the work area without proper escort. All personnel shall check in with SSHO or Site Superintendent prior to entering any exclusion zone or work area that presents any potential hazard, no exceptions!! All personnel will have: Verification of OSHA training 40hr initial / 8hr update Cert per 29 CFR 1910.120, and medical work clearance.

TAILGATE SAFETY MEETING

DATE: 12-16-21

TIME: 0730

CLIENT: KSC
LOCATION: PRL229

PROJECT NO.: NS1006.02.07

OTHER SAFTEY TOPICS DISCUSSED TODAY

WET SLIPPERY CONDITIONS, BIOLOGICAL HAZARDS, PINCH POINTS.

TIME IN	PRINTED NAME	COMPANY	SIGNATURE
07:00	William Duttenhaver	HGL	
07:00	Brad Mitchell	HGL	
0800	Robert Lynch	HGL	

MEETING CONDUCTED BY:

Dustin Lupis DATE: 12-16-21
Site Superintendent / Signature

Barry Huston
SSHO /Signature

HGL
HydroGeoLogic, Inc
Exceeding Expectations

Project: PRL229
Location: Kennedy Space center

Contract No.:80KSC019F0224
Client: NASA

Project No.: NS1006.02.07

DAILY EQUIPMENT INSPECTION REPORT

Type of Equipment: CAT 299D3 skid steer

Unit #: LB3010 24 **SN:**

DATE: 12/16/21 **Hour Meter:** 225.8

ITEM	PASS	FAIL	NOT APPLICABLE	REMARKS
Anti-Slip Steps	✓			
Axles/Seals	✓			
Backup Alarm	✓			
Belts and Hoses	✓			
Body	✓			
Boom/Stick	✓			
Bucket/Blade/Thumb			✓	
Controls	✓			
Cutting Edge	✓			
Defroster/Heater	✓			
Engine	✓			
Filters/Separators	✓			
Fire Extinguisher			✓	on site
Fluid Levels	✓			
FOPS/ROPS	✓			
Fuel Level/Tank	✓			3/4
Handholds	✓			
Horn	✓			
Lights	✓			
Mirrors	✓			
Muffler	✓			
Radiator	✓			
Safety Signs			✓	
Seat Belts	✓			
Steering	✓			
Tires/Tracks	✓			left track loose
Windows	✓			
Windshield Wipers	✓			

ADDITIONAL INFO: _____

CONDITION OF THE ABOVE VEHICLE IS SATISFACTORY FOR USE: (Y) N (Circle)

Competent Operator Signature: William Duttenhaver _____

Print Signature

Kennedy Space Center
PRL 229
Contaminated Soil Removal

INITIAL SITE SAFETY ORIENTATION ACKNOWLEDGMENT FORM

Topics Covered (Please initial each):

1. RL Names of personnel responsible for site safety;
2. RL Report unsafe conditions and unsafe actions, wear assigned PPE, sign in and out daily, attend morning tailgate meetings, assist co-workers with tasks, and maintain safe and healthful work environment;
3. RL Existing known safety and health hazards on site including potential exposure to PCBs, Asbestos, Lead, Mercury, and Silica;
4. RL Required PPE, use and care;
5. RL Provisions for medical care and facilities;
6. RL Hazard Communication Program, includes discussion of Safety Data Sheets (SDS) location for hazardous chemicals currently used/stored on site;
7. RL Location of safety equipment (e.g., fire extinguishers, first aid kits, AED's, etc.);
8. RL Site emergency evacuation procedures, Rally Points, and route location;
9. RL Heat/Cold Stress monitoring/response procedures;
10. RL Components and structure of the Site Health and Safety Program including the SSHP and AHAs
11. RL I understand that I have 100% "Stop Work Authority" for safety-related issues identified;
12. RL Procedures for reporting and correcting unsafe conditions or practices;
13. RL Designated Smoking areas;
14. RL Responsibilities for reporting all accidents and illnesses;
15. RL Names of cardiopulmonary resuscitation (CPR) and first-aid trained personnel assigned to the project;
16. RL Review of applicable AHAs; List: _____
17. RL Identification of the Emergency Contact Information;
18. RL Locations of functioning communication devices for personnel not equipped with cellular telephones and for personnel working in areas with limited or no cellular telephone reception;
19. RL Locations of emergency medical facilities;
20. RL Spill response procedures;
21. RL Provided current copies licensing, certifications, and/or clearances, as applicable for individual responsible work activity.

Orientation Conducted By: BARRY HUSTON
Planned Work Activities: Surface Water/Sediment Sampling
Attendee Name Printed: Robert Lynch **Date:** 12-16-2021
Signature: [signature] **Employer:** HGL

List known allergens and/or adverse health conditions Safety personnel should be aware of:

Voluntary Information: Any diseases or previous injuries you would like Safety to know about?

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL 407-425-6700 FAX: 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 1 OF 2

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: HGL, Inc.
Address: 2405 N. Courtney Parkway, STE 203
City: Merrit Island State: FL Zip:32937
Project Contact: Denise Rivers Email:drivers@hgl.com
Phone #:910-233-8460
Sampler(s) Name(s) (Printed)
Sampler 1: Howard Fowler Sampler 2:

Project Information

Project Name: PRL 229, RTDA Pond Sampling
Street Kennedy Space Center
City Merritt Island State FL
Project # NS1005.11.04
Fax #
Client Purchase Order #

Analytical Information

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; OI - Oil; LIQ - Other Liquid; AIR - Air

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NaOH+ZnAc	DI WATER	MEOH	VOCs (8260SL)	AB8270SL	BLV8270SIMPAH	HRD	PM13, Ba	TOC	FLPRO					LAB USE ONLY
	UNOA-SW0001-000.5-20211216	12/16/21	1040	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0002-000.5-20211216	12/16/21	1105	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0003-000.5-20211216	12/16/21	1135	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0004-000.5-20211216	12/16/21	1200	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0005-000.5-20211216	12/16/21	1220	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0006-000.5-20211216	12/16/21	1300	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0007-000.5-20211216	12/16/21	1325	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0008-000.5-20211216	12/16/21	1350	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0009-000.5-20211216	12/16/21	1415	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SW0010-000.5-20211216	12/16/21	1435	RL	SW	9			X		X					X	X	X	X	X							
	UNOA-SD0007-000.5-20211216	12/16/21	1045	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0008-000.5-20211216	12/16/21	1110	RL	SO	2		X									X	X		X	X	X					

Turnaround Time (Business days)

X 10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- ☐ COMMERCIAL "A" (RESULTS ONLY)
- ☐ COMMERCIAL "B" (RESULTS PLUS QC)
- ☐ REDT1 (EPA LEVEL 3)
- ☐ FULLT1 (EPA LEVEL 4)
- ☐ EDD'S

Comments / Remarks

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1		12/17/21 1400	2	3		4
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected):

http://www.sgs.com/en/terms-and-conditions

SGS North America Inc - Orlando

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SGS - ORLANDO JOB # : PAGE 2 OF 2

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	UNOA-SD0009-000.5-20211216	12/16/21	1140	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0010-000.5-20211216	12/16/21	1205	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0011-000.5-20211216	12/16/21	1225	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0012-000.5-20211216	12/16/21	1305	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0013-000.5-20211216	12/16/21	1330	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0014-000.5-20211216	12/16/21	1355	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0015-000.5-20211216	12/16/21	1420	RL	SO	2		X									X	X		X	X	X					
	UNOA-SD0016-000.5-20211216	12/16/21	1440	RL	SO	2		X									X	X		X	X	X					
	UNOA-TB-20211216-01	12/16/21	1030	RL	WW	2			X							X											

Turnaround Time (Business days)

X 10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

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Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1	12/17/21 1402	2	3		4
Relinquished by/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
5		6	7		8

Lab Use Only : Cooler Temperature (s) Celsius (corrected):

HGL HydroGeoLogic, Inc. Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	1 of 10

Time/Date: 12/16/21 1025 Elevation:

Sample No.: SW0001-000.5 Weather: Partly Cloudy, some rain

Location: Amb. Temp (°F): 75°

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 21.8°C °C Method of Measurement: YSI & Turbidimeter

Specific Conductance: 1903 µS/cm micromhos Method of Measurement:

pH: 8.31 Method of Measurement:

Containers Used (VOA Vial, 1 liter jar, etc.):

Physical Appearance:

Contamination Observed:

Remarks:

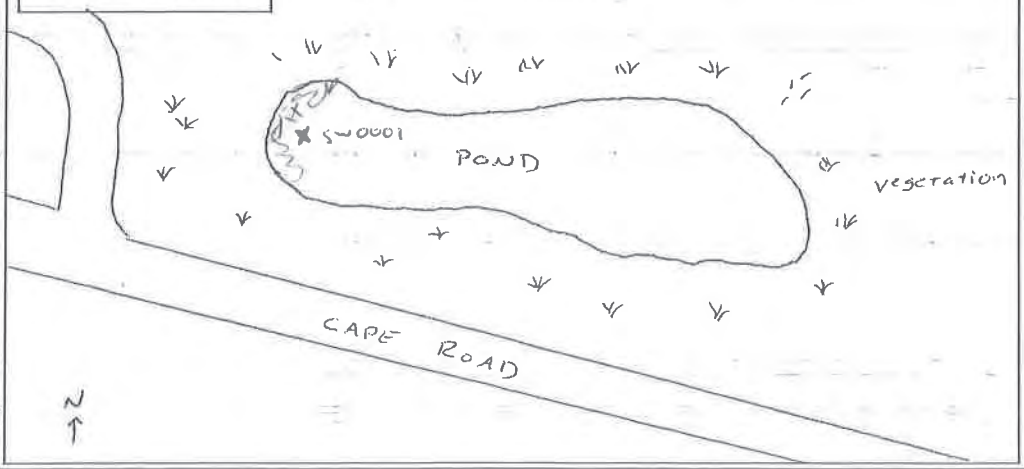
TURBIDITY: 4.70

SALINITY: 1.03 ppt

ORP - 81.1 mV

DO - 5.58 mg/L

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob L.	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	2 of 10

Time/Date: 12/16/21 1101 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0002 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 22.6 °C Method of Measurement: _____

Specific Conductance: 1994 µS/cm micromhos Method of Measurement: _____

pH: 8.29 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

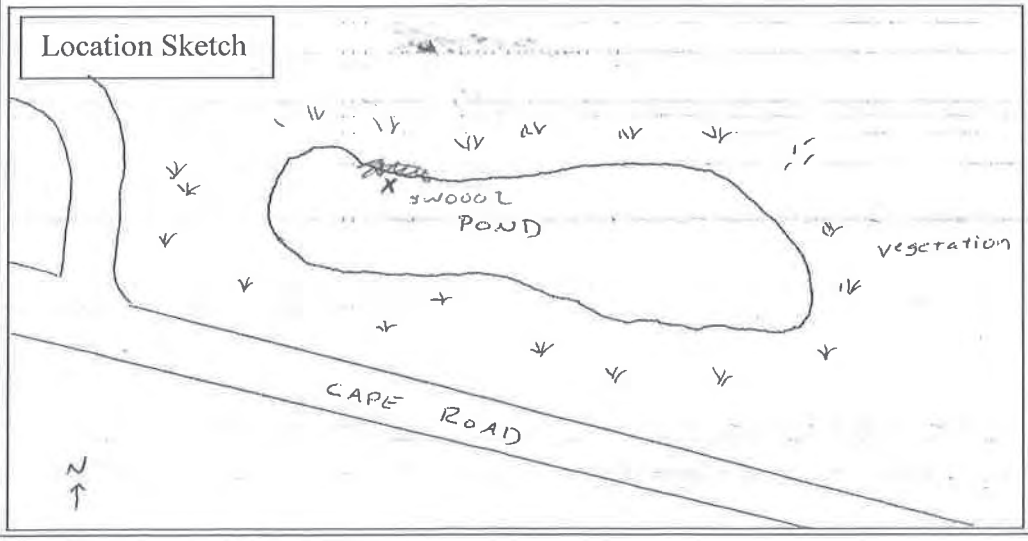
TURBIDITY - 5.92 NTU

SALINITY 1.07 ppt

DO - 6.23 mg/L

ORP - -17.7 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
RoyL	12/16/21		

HGL

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	3 of 10

Time/Date: 12/16/21 1131 Elevation:

Sample No.: Weather:

Location: SW0003 Amb. Temp (°F):

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 23.0°C °C Method of Measurement:

Specific Conductance: 1970 µS/cm ~~micromhos~~ Method of Measurement:

pH: 8.42 Method of Measurement:

Containers Used (VOA Vial, 1 liter jar, etc.):

Physical Appearance:

Contamination Observed:

Remarks:

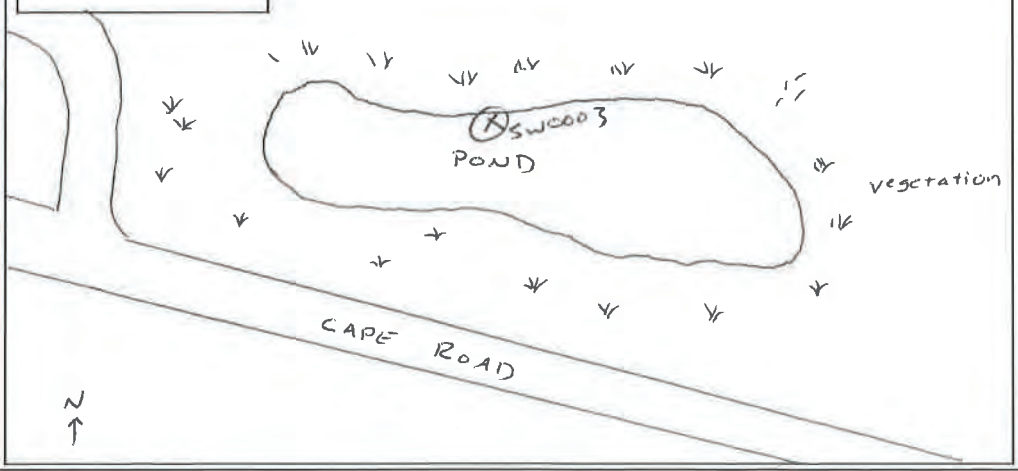
TURBIDITY - 4.66 NTU

SALINITY - 1.04 ppt

DO - 7.26 mg/L

ORP - 60.5 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob L	12/16/21		

HGL HydroGeoLogic, Inc. Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	4 of 10

Time/Date: 12/16/21 1154 Elevation:

Sample No.: Weather:

Location: SW0004 Amb. Temp (°F):

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 23.5° C °C Method of Measurement:

Specific Conductance: 2055 ~~micromhos~~ µS/cm Method of Measurement:

pH: 8.37 Method of Measurement:

Containers Used (VOA Vial, 1 liter jar, etc.):

Physical Appearance:

Contamination Observed:

Remarks:

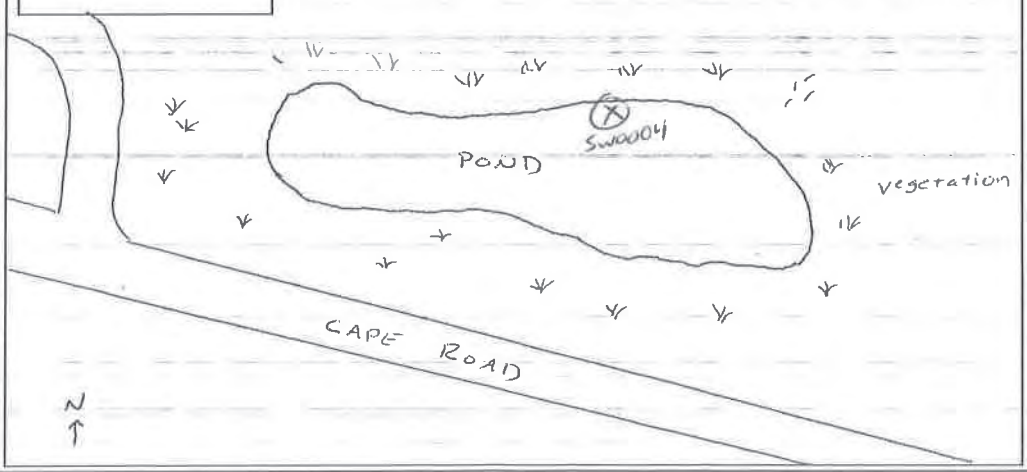
TURBIDITY - 6.67 NTU

SALINITY - 1.08 PPT

DO - 6.34 mg/L

ORP - 18.5 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob Lynch	12/16/21		

HGL HydroGeoLogic, Inc. Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	5 of 10

Time/Date: 12/16/21 1217 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0005 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 24.1 °C °C Method of Measurement: _____

Specific Conductance: 2067 ~~micromhos~~ µS/cm Method of Measurement: _____

pH: 8.38 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

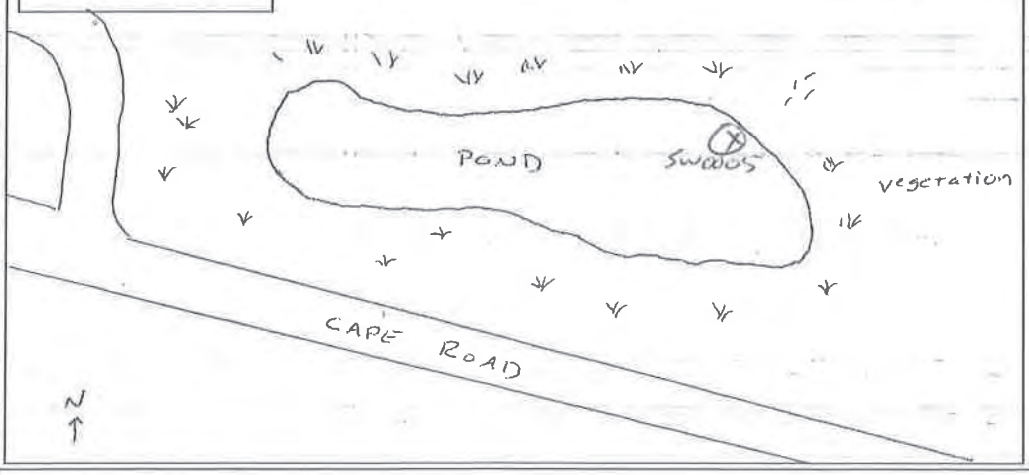
TURBIDITY - 4.68 NTU

SALINITY - 1.07 ppt

DO - 6.75 mg/L

ORP - 76.6 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob Lynch	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005, 11.06	RTDA SW Sampling	6 of 10

Time/Date: 12/16/21 1256 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0006 Amb. Temp (°F): _____

Sampling Method: _____

WATER SAMPLE DATA

Water Temp: 23.8 °C °C Method of Measurement: _____

Specific Conductance: 2149 mS/cm ~~micromhos~~ Method of Measurement: _____

pH: 8.08 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

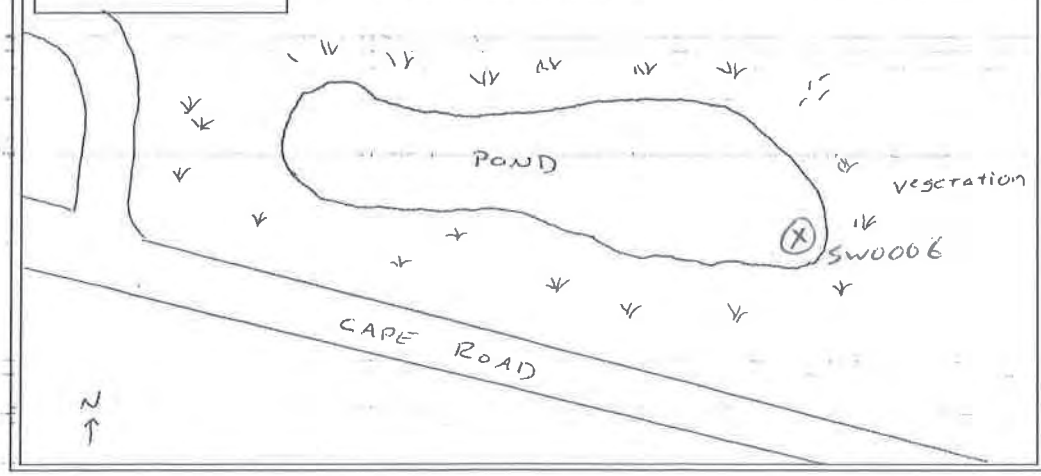
TURBIDITY - 11.6 NTU

SALINITY - 1.13 PPT

DO - 6.87 mg/L

ORP - -40.7 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob Lynn	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	7 of 10

Time/Date: 12/16/21 1321 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0007 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 24.9 °C °C Method of Measurement: _____

Specific Conductance: 2439 ~~micromhos~~ mS/cm Method of Measurement: _____

pH: 8.58 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

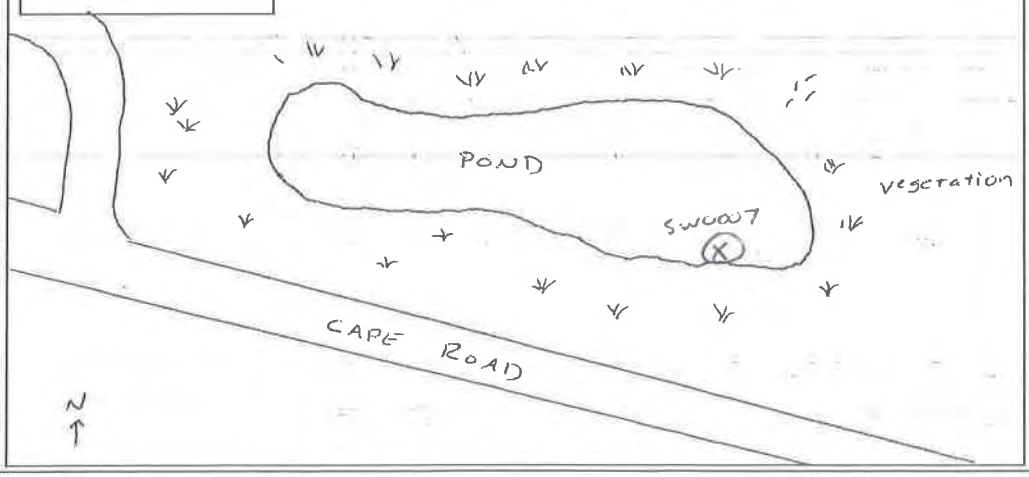
TURBIDITY - 4.43 NTU

SALINITY - 1.21 ppt

DO - 11.03 mg/L

ORP - 15.7 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob L.	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	8 of 10

Time/Date: 12/16/21 1343 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0008 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 24.6 °C °C Method of Measurement: _____

Specific Conductance: 2164 micromhos Method of Measurement: _____

pH: 8.47 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

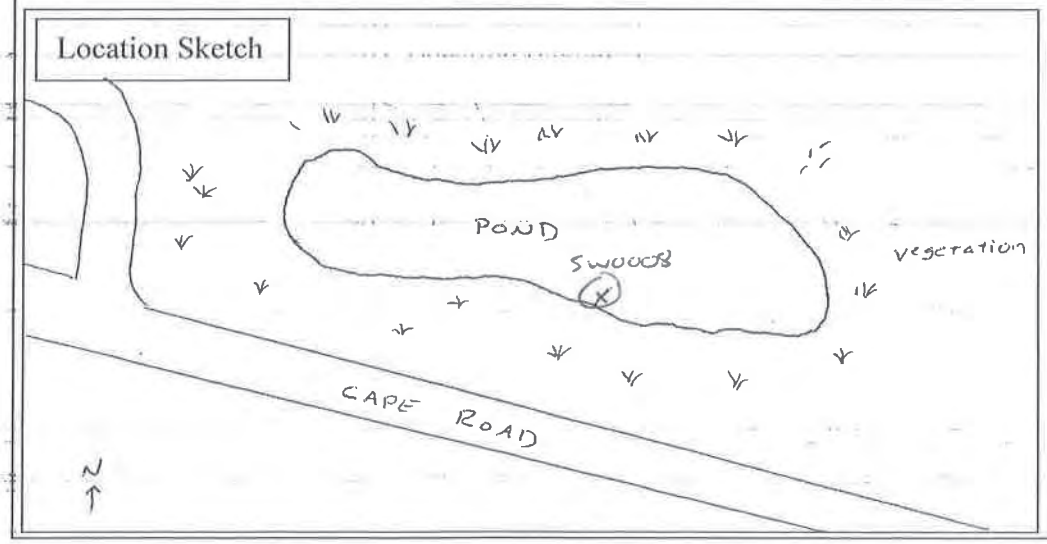
TURBIDITY - 5.06 NTU

SALINITY - 1.11 ppt

DO - 7.79 mg/L

ORP - 37.1 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob L.	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	9 of 10

Time/Date: 12/16/21 1410 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0009 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 25.4 °C °C Method of Measurement: _____

Specific Conductance: 2170 mS/cm micromhos Method of Measurement: _____

pH: 8.54 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

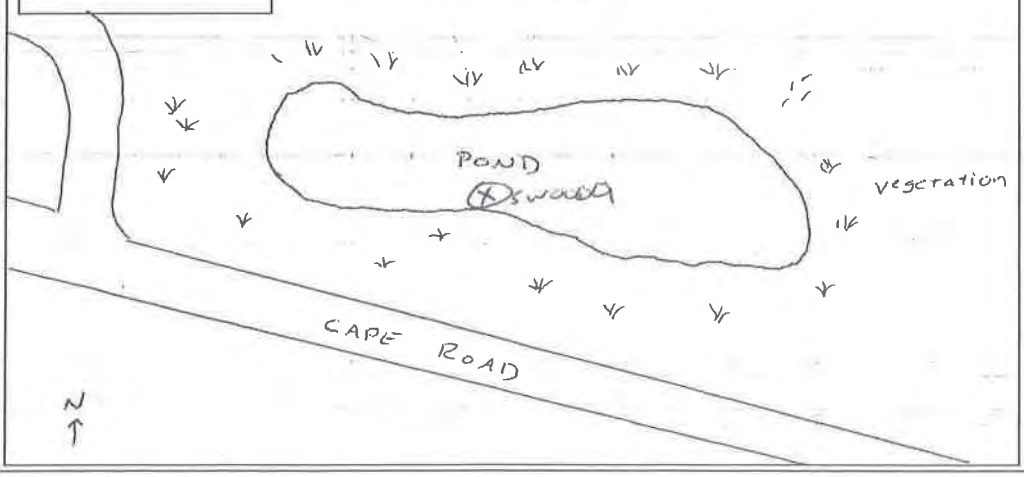
TURBIDITY - 5.29 NTU

SALINITY - 1.10 PPT

DO - 9.10 mg/L

ORP - 67.7 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob L	12/16/21		

HydroGeoLogic, Inc
Exceeding Expectations

Surface Water Sampling Data

Records Management Data

Project Number	Project Name	Page
NS1005.11.06	RTDA SW Sampling	10 of 10

Time/Date: 12/16/21 1431 Elevation: _____

Sample No.: _____ Weather: _____

Location: SW0010 Amb. Temp (°F): _____

Sampling Method: Grab

WATER SAMPLE DATA

Water Temp: 25.7 °C °C Method of Measurement: _____

Specific Conductance: 2189 ~~micromhos~~ mS/cm Method of Measurement: _____

pH: 8.59 Method of Measurement: _____

Containers Used (VOA Vial, 1 liter jar, etc.): _____

Physical Appearance: _____

Contamination Observed: _____

Remarks: _____

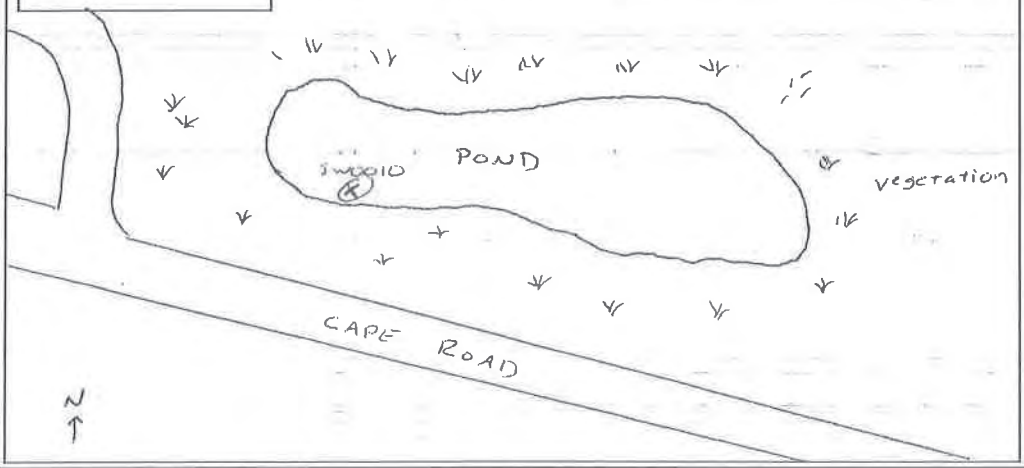
TURBIDITY - 5.69 NTU

SALINITY - 1.10 PPT

DO - 7.91 mg/L

ORP - 57.9 mV

Location Sketch



Recorded By:	Date	Checked By:	Date:
Rob C.	12/16/21		

HGL HydroGeoLogic, Inc

CALIBRATION LOG

Project Name: PRL 229 SW/Sediment Sampling By: William Duttenhaver

Project No.: NS1006.02.10 Page 1 of 1

Date/Time	Instrument	STD	STD CONC ppm	Meter Reading	Comments
12/15/21 5:30	YSI Pro-48513	DO	SAT Air	99.8	Pass
11		conductivity	1.413 mS/cm	1.49	Pass
11		ORP	240.0 mV	238.9	Pass
11		PH	4	3.96	Pass
11		pH	7	7.09	Pass
11		pH	10	10.02	Pass
11	HACH 2100Q-042114	NTU	20	19.9	Pass
11		NTU	100	98.9	Pass
11		NTU	800	802	Pass
11		NTU	10	9.99	Pass

Location PRL 229 UNOA Date 12/16/21

Project / Client KSC/NASA

NS1005.11.06 / NS1005.11.07.

Purpose-Finish enclosing excavation sites and surface water sample and sediment sample PRL229 pond

Personnel-Dustin L, Parker D., Barry H., Brad M., Rob L.

Equipment-Logbook, figures, SSSP, work trucks, boats, YSI, Turbidity meter, Sampling gear, Safety gear.

Weather - Hi-80° Lo-69° partly cloudy wind-5mph N

0700-Calibrated YSI and turbidity meter. Loaded sampling gear. Mob out to PRL 229.

0730-All employees on site, conducted TGSM.

0800-Prepped boat and sampling gear for surface water and sediment sampling. Stopped work for rain delay.

1000-Deda J. on site. Walk excavation areas 1 and 2. Note: significant amount of RR ties along pond bank and in the pond as well, Deda concurs that this is outside of scope and HGL is to remove all material within excavation boundary. RR ties along the bank will be removed as long as surface waters are not disturbed.

1020-Rob and Parker launched boat and prepared to mob to the first SW sample location, Deda J. off site.

1030-Began collecting SW/SD sampling and reading Sr.

1040-RL collected sample UNOA-SW0001-000.0-20211216

1045-RL collected sample UNOA-SD0007-000.5-20211216

1105-RL collected sample UNOA-SW0002-000.5-20211216

Location PRL 229 UNOA Date 12/16/21

Project / Client KSC/NASA

NS1005.11.06 / NS1005.11.07.

1110-RL collected sample UNOA-SD0008-000.5-20211216

1135-RL collected sample UNOA-~~000.5~~ SW0003-000.5-20211216

1140-RL collected sample UNOA-SD0009-000.5-20211216

1200-RL collected sample UNOA-SW0004-000.5-20211216

1205-RL collected sample UNOA-SD0010-000.5-20211216

1220-RL collected sample UNOA-SW0005-000.5-20211216

1225-RL collected sample UNOA-SD0011-000.5-20211216

1300-RL collected sample UNOA-SW0006-000.5-20211216

1305-RL collected sample UNOA-SD0012-000.5-20211216

1325-RL collected sample UNOA-SW0007-000.5-20211216

1330-RL collected sample UNOA-SD0013-000.5-20211216

1350-RL collected sample UNOA-SW0008-000.5-20211216

1355-RL collected sample UNOA-SD0014-000.5-20211216

1415-RL collected sample UNOA-SW0009-000.5-20211216

1420-RL collected sample UNOA-SD0015-000.5-20211216

1435-RL collected sample UNOA-SW0010-000.5-20211216

1440-RL collected sample UNOA-SD0016-000.5-20211216

1455-Finished packing samples in cooler on ice and placed in the truck. Cleaned site.

1530-Secured site. All employees off site.

APPENDIX B

LABORATORY ANALYTICAL REPORT

National Aeronautics and
Space Administration

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Signature

12-1-20

Date

Company Name: SGS North America, Inc.
Company Representative Name: Caitlin Brice
Company Representative Title: General Manager
Company Address: 4405 Vineland Rd, Orlando, FL 32811
Company Representative Phone: 1-408-472-4663
Company Representative E-Mail: Caitlin.Brice@sgs.com

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Hydrogeologic, Inc.

TQN 118 NASA PRLs; KSC, FL

NS1005.11.04

SGS Job Number: FA91824

Sampling Date: 12/16/21

Report to:

HGL, Inc
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Merritt Island, FL 32953
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ATTN: Denise Rivers

Total number of pages in report: **301**

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Norm Farmer
Technical Director

Client Service contact: Jean Dent-Smith 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001) DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177), AL, AK, AR, CT, IA, KY, MA, MI. MS, ND, NH, NV, OK, OR, IL, UT, VT, WA, WI, WV

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SGS North America Inc.

Sample Summary

Hydrogeologic, Inc.

Job No: FA91824

TQN 118 NASA PRLs; KSC, FL
Project No: NS1005.11.04

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA91824-1	12/16/21	10:40	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0001-000.5-20211216
FA91824-2	12/16/21	11:05	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0002-000.5-20211216
FA91824-3	12/16/21	11:35	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0003-000.5-20211216
FA91824-4	12/16/21	12:00	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0004-000.5-20211216
FA91824-5	12/16/21	12:20	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0005-000.5-20211216
FA91824-6	12/16/21	13:00	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0006-000.5-20211216
FA91824-7	12/16/21	13:25	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0007-000.5-20211216
FA91824-8	12/16/21	13:50	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0008-000.5-20211216
FA91824-9	12/16/21	14:15	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0009-000.5-20211216
FA91824-10	12/16/21	14:35	RLHF	12/17/21	AQ	Surface Water	UNOA-SW0010-000.5-20211216
FA91824-11	12/16/21	10:45	RLHF	12/17/21	SO	Soil	UNOA-SD0007-000.5-20211216
FA91824-12	12/16/21	11:10	RLHF	12/17/21	SO	Soil	UNOA-SD0008-000.5-20211216
FA91824-13	12/16/21	11:40	RLHF	12/17/21	SO	Soil	UNOA-SD0009-000.5-20211216

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SGS North America Inc.

Sample Summary
(continued)

Hydrogeologic, Inc.

Job No: FA91824

TQN 118 NASA PRLs; KSC, FL
Project No: NS1005.11.04

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
FA91824-14	12/16/21	12:05	RLHF	12/17/21	SO	Soil	UNOA-SD0010-000.5-20211216
FA91824-15	12/16/21	12:25	RLHF	12/17/21	SO	Soil	UNOA-SD0011-000.5-20211216
FA91824-16	12/16/21	13:05	RLHF	12/17/21	SO	Soil	UNOA-SD0012-000.5-20211216
FA91824-17	12/16/21	13:30	RLHF	12/17/21	SO	Soil	UNOA-SD0013-000.5-20211216
FA91824-18	12/16/21	13:55	RLHF	12/17/21	SO	Soil	UNOA-SD0014-000.5-20211216
FA91824-19	12/16/21	14:20	RLHF	12/17/21	SO	Soil	UNOA-SD0015-000.5-20211216
FA91824-20	12/16/21	14:40	RLHF	12/17/21	SO	Soil	UNOA-SD0016-000.5-20211216
FA91824-21	12/16/21	10:30	RLHF	12/17/21	AQ	Trip Blank Water	UNOA-TB-20211216

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Hydrogeologic, Inc. **Job No:** FA91824

Site: TQN 118 NASA PRLs; KSC, FL **Report Date:** 1/11/2022 1:43:48

On 12/17/2021, 20 Sample(s), 1 Trip Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of FA91824 was Assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

MS Volatiles By Method SW846 8260B

Matrix: AQ **Batch ID:** V2P3363

Sample(s) FA91807-5MS, FA91807-5MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA91824-21.

Matrix Spike Recovery(s) for Methylene Chloride are outside control limits. Probable cause is due to matrix interference.

Matrix Spike Duplicate Recovery(s) for Methylene Chloride are outside control limits. Probable cause is due to matrix interference.

FA91824-21: Sample analyzed beyond 336 hour holdtime, but within 14 days.

Matrix: AQ **Batch ID:** VI2420

Sample(s) FA91843-8MS, FA91843-8MSD were used as the QC samples indicated.

The following samples were run outside of holding time for method SW846 8260B: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10.

Matrix Spike/Matrix Spike Duplicate Recovery(s) for cis-1,2-Dichloroethylene are outside control limits. Outside control limits due to high level in sample relative to spike amount.

RPD(s) for MSD for Methyl Bromide are outside control limits for sample FA91843-8MSD. Probable cause is due to sample non-homogeneity.

FA91824-1: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-2: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-3: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-4: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-5: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-6: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-7: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-8: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-9: Sample analyzed beyond 336 hour holdtime, but within 14 days.

FA91824-10: Sample analyzed beyond 336 hour holdtime, but within 14 days.

MS Semi-volatiles By Method SW846 8270D

Matrix: AQ **Batch ID:** OP88981

Sample(s) FA91824-4MS, FA91824-4MSD were used as the QC samples indicated.

Blank Spike Recovery(s) for 1,3-Dichlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane are outside control limits.

Matrix Spike Recovery(s) for 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Chloronaphthalene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane are outside control limits. Probable cause is due to matrix interference.

Matrix Spike Duplicate Recovery(s) for 1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, Hexachlorobutadiene, Hexachlorocyclopentadiene, Hexachloroethane are outside control limits. Probable cause is due to matrix interference.

Sample(s) FA91824-1, FA91824-10, FA91824-2 have surrogates outside control limits.

FA91824-1: Confirmed ND by re-extraction and reanalysis beyond hold time.

FA91824-2: Confirmed ND by re-extraction and reanalysis beyond hold time.

FA91824-10: Confirmed ND by re-extraction and reanalysis beyond hold time.

MS Semi-volatiles By Method SW846 8270D

Matrix: AQ **Batch ID:** OP89110

The following samples were extracted outside of holding time for method SW846 8270D: FA91824-1, FA91824-10, FA91824-2.

Sample(s) FA91824-1, FA91824-10 have surrogates outside control limits.

FA91824-1: Sample re-extracted beyond hold time. Confirmation run.

FA91824-2: Sample re-extracted beyond hold time. Confirmation run.

FA91824-10: Sample re-extracted beyond hold time. Confirmation run.

Matrix: SO **Batch ID:** OP88994

Sample(s) FA91814-2MS, FA91814-2MSD were used as the QC samples indicated.

Matrix Spike Duplicate Recovery(s) for 4,6-Dinitro-o-cresol, Pentachlorophenol are outside control limits. Dilution required due to matrix interference.

RPD(s) for MSD for Pentachlorophenol are outside control limits for sample OP88994-MSD. Probable cause is due to sample non-homogeneity.

For Sample(s) FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20 are associated with an CCV that has a recovery for 2,2'-Oxybis(1-chloropropane) outside low control limit.

FA91824-11 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-11 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-11 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-11 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-11 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-11 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-12 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-12 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-12 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-12 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-12 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-12 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-13 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-13 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-13 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-13 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-13 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-13 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-14 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-14 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-14 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-14 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-14 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-14 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-15 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-15 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-15 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-15 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-15 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-15 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-16 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-16 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-16 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-16 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-16 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-16 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-17 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-17 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-17 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-17 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

MS Semi-volatiles By Method SW846 8270D

Matrix: SO **Batch ID:** OP88994

FA91824-17 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-17 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-18 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-18 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-18 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-18 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-18 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-18 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-19 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-19 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-19 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-19 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-19 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-19 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-20 for 2,2'-Oxybis(1-chloropropane): Associated CCV outside of control limits low.

FA91824-20 for 2,4-Dinitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-20 for 4-Nitrophenol: Associated CCV outside of control limits high, sample was ND.

FA91824-20 for Hexachlorobutadiene: Associated CCV outside of control limits high, sample was ND.

FA91824-20 for Hexachlorocyclopentadiene: Dilution required due to matrix interference.

FA91824-20 for Pentachlorophenol: Associated CCV outside of control limits high, sample was ND.

MS Semi-volatiles By Method SW846 8270D BY SIM

Matrix: AQ **Batch ID:** OP88990

Sample(s) FA91824-7MS, FA91824-7MSD were used as the QC samples indicated.

Matrix: SO **Batch ID:** OP88907

Sample(s) FA91824-11MS, FA91824-11MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene are outside control limits. Probable cause is due to matrix interference.

Matrix Spike Duplicate Recovery(s) for 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene are outside control limits. Probable cause is due to matrix interference.

Sample(s) FA91824-11 have surrogates outside control limits.

FA91824-11: Confirmation run.

Matrix: SO **Batch ID:** OP88982

Sample(s) FA91824-11MS, FA91824-11MSD were used as the QC samples indicated.

Matrix Spike Recovery(s) for Anthracene are outside control limits. Probable cause is due to matrix interference.

Matrix Spike Duplicate Recovery(s) for 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene, Dibenzo(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Phenanthrene, Pyrene are outside control limits. Probable cause is due to matrix interference.

GC/LC Semi-volatiles By Method FLORIDA-PRO 2018

Matrix: SO **Batch ID:** OP88983

Sample(s) FA91780-1MS, FA91780-1MSD were used as the QC samples indicated.

Metals Analysis By Method SW846 6010C

Matrix: AQ **Batch ID:** MP40088

Sample(s) FA91807-5DUP, FA91807-5MS, FA91807-5MSD, FA91807-5PS, FA91807-5SDL were used as the QC samples.

Matrix Spike Duplicate Recovery(s) for Calcium are outside control limits. Probable cause is due to matrix interference.

RPD(s) for Duplicate for Antimony, Silver are outside control limits for sample MP40088-D1. RPD acceptable due to low duplicate and sample concentrations.

Metals Analysis By Method SW846 6010C

Matrix: AQ **Batch ID:** MP40088

RPD(s) for Serial Dilution for Antimony, Chromium, Lead, Nickel, Silver, Thallium, Zinc are outside control limits for sample MP40088-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

MP40088-PS1 for Magnesium: Spike recovery indicates matrix interference and/or outside control limits due to high level in sample relative to spike amount.

MP40088-PS1 for Calcium: Spike recovery indicates matrix interference and/or outside control limits due to high level in sample relative to spike amount.

Matrix: SO **Batch ID:** MP40090

Sample(s) FA91926-1DUP, FA91926-1MS, FA91926-1MSD, FA91926-1PS, FA91926-1SDL were used as the QC samples.

Matrix Spike /Matrix Spike Duplicate Recovery(s) for Antimony are outside control limits. Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

RPD(s) for Duplicate for Antimony, Selenium are outside control limits for sample MP40090-D1. RPD acceptable due to low duplicate and sample concentrations.

RPD(s) for Serial Dilution for Antimony, Arsenic, Cadmium, Copper, Selenium, Barium, Chromium, Lead, Nickel, Zinc are outside control limits for sample MP40090-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

MP40090-PS1 for Selenium: Spike recovery indicates matrix interference and/or outside control limits due to high level in sample relative to spike amount.

MP40090-SD1 for Barium: Serial dilution indicates possible matrix interference.

MP40090-SD1 for Chromium: Serial dilution indicates possible matrix interference.

MP40090-SD1 for Zinc: Serial dilution indicates possible matrix interference.

MP40090-SD1 for Nickel: Serial dilution indicates possible matrix interference.

MP40090-SD1 for Lead: Serial dilution indicates possible matrix interference.

Matrix: SO **Batch ID:** MP40091

Sample(s) FA91965-1DUP, FA91965-1MS, FA91965-1MSD, FA91965-1PS, FA91965-1SDL were used as the QC samples.

Matrix Spike Recovery(s) for Antimony are outside control limits. Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

Matrix Spike Duplicate Recovery(s) for Antimony are outside control limits. Probable cause is due to matrix interference.

RPD(s) for Duplicate for Arsenic are outside control limits for sample MP40091-D1. RPD acceptable due to low duplicate and sample concentrations.

RPD(s) for Serial Dilution for Arsenic, Beryllium, Zinc are outside control limits for sample MP40091-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals Analysis By Method SW846 7470A

Matrix: AQ **Batch ID:** MP40066

Sample(s) FA91824-1DUP, FA91824-1MS, FA91824-1MSD, FA91824-1SDL were used as the QC samples for metals.

Metals Analysis By Method SW846 7471B

Matrix: SO **Batch ID:** MP40061

Sample(s) FA91727-4DUP, FA91727-4MS, FA91727-4MSD, FA91727-4SDL were used as the QC samples for metals.

RPD(s) for Serial Dilution for Mercury are outside control limits for sample MP40061-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

General Chemistry By Method SM19 2340B

Matrix: AQ **Batch ID:** R55558

FA91824-2 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55559

FA91824-1 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55560

FA91824-3 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55561

FA91824-4 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55562

FA91824-5 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55563

FA91824-6 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

General Chemistry By Method SM19 2340B

Matrix: AQ **Batch ID:** R55564

FA91824-7 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55565

FA91824-8 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55566

FA91824-9 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

Matrix: AQ **Batch ID:** R55567

FA91824-10 for Hardness, Total as CaCO3: Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

General Chemistry By Method SM19 2540G

Matrix: SO **Batch ID:** GN90127

Sample(s) FA91770-1DUP were used as the QC samples for Solids, Percent.

General Chemistry By Method SW846 9060A

Matrix: SO **Batch ID:** N:GP37806

FA91824-11 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-12 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-13 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-14 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-15 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-16 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-17 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-18 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-19 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

FA91824-20 for Total Organic Carbon: Analysis performed at SGS Dayton, NJ

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

_____

Kim Benham, Client Services *(Signature on File)*

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	SGS Orlando, FL	**Job No:**	FA91824
Site:	HGLFLMI: TQN 118 NASA PRLs; KSC, FL	**Report Date**	1/10/2022 8:26:24 AM

On 12/22/2021, 10 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.3 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of FA91824 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

General Chemistry By Method SW846 9060A

Matrix: SO **Batch ID:** GP37806

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) FA91824-20MS, FA91824-20MSD were used as the QC samples for Total Organic Carbon.
- FA91824-11 for Total Organic Carbon: TOC Replicate Range: 201000 - 213000 mg/kg
- FA91824-12 for Total Organic Carbon: TOC Replicate Range: 283000 - 366000 mg/kg
- FA91824-13 for Total Organic Carbon: TOC Replicate Range: 220000 - 292000 mg/kg
- FA91824-14 for Total Organic Carbon: TOC Replicate Range: 63100 - 76500 mg/kg
- FA91824-15 for Total Organic Carbon: TOC Replicate Range: 188000 - 234000 mg/kg
- FA91824-16 for Total Organic Carbon: TOC Replicate Range: 170000 - 225000 mg/kg
- FA91824-17 for Total Organic Carbon: TOC Replicate Range: 55600 - 71400 mg/kg
- FA91824-18 for Total Organic Carbon: TOC Replicate Range: 170000 - 194000 mg/kg
- FA91824-19 for Total Organic Carbon: TOC Replicate Range: 111000 - 154000 mg/kg
- FA91824-20 for Total Organic Carbon: TOC Replicate Range: 133000 - 155000 mg/kg

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA91824-1	**UNOA-SW0001-000.5-20211216**					
Antimony		2.4 J	6.0	5.0	ug/l	SW846 6010C
Calcium		64400	1000	100	ug/l	SW846 6010C
Lead		2.4 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		59200	5000	100	ug/l	SW846 6010C
Thallium		1.4 J	10	2.0	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		405	23	0.66	mg/l	SM19 2340B
FA91824-2	**UNOA-SW0002-000.5-20211216**					
Antimony		1.9 J	6.0	5.0	ug/l	SW846 6010C
Barium		5.2 J	200	5.0	ug/l	SW846 6010C
Calcium		66400	1000	100	ug/l	SW846 6010C
Lead		2.1 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		59600	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		411	23	0.66	mg/l	SM19 2340B
FA91824-3	**UNOA-SW0003-000.5-20211216**					
Antimony		1.1 J	6.0	5.0	ug/l	SW846 6010C
Calcium		67900	1000	100	ug/l	SW846 6010C
Lead		2.4 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		58300	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		410	23	0.66	mg/l	SM19 2340B
FA91824-4	**UNOA-SW0004-000.5-20211216**					
Antimony		1.8 J	6.0	5.0	ug/l	SW846 6010C
Calcium		68500	1000	100	ug/l	SW846 6010C
Lead		1.8 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		62000	5000	100	ug/l	SW846 6010C
Zinc		7.5 J	20	5.0	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		426	23	0.66	mg/l	SM19 2340B
FA91824-5	**UNOA-SW0005-000.5-20211216**					
Anthracene		0.21 J	0.80	0.40	ug/l	SW846 8270D BY SIM
Benzo(a)anthracene		0.19	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(a)pyrene		0.18	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(b)fluoranthene		0.34	0.080	0.040	ug/l	SW846 8270D BY SIM
Benzo(g,h,i)perylene		0.12 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(k)fluoranthene		0.11	0.080	0.040	ug/l	SW846 8270D BY SIM
Chrysene		0.21	0.16	0.080	ug/l	SW846 8270D BY SIM
Fluoranthene		0.28 J	0.80	0.40	ug/l	SW846 8270D BY SIM

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Indeno(1,2,3-cd)pyrene		0.14 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Pyrene		0.30 J	0.80	0.40	ug/l	SW846 8270D BY SIM
Calcium		70600	1000	100	ug/l	SW846 6010C
Lead		2.2 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		61900	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		431	23	0.66	mg/l	SM19 2340B
FA91824-6	**UNOA-SW0006-000.5-20211216**					
Benzo(b)fluoranthene		0.037 J	0.080	0.040	ug/l	SW846 8270D BY SIM
Arsenic		2.0 J	10	5.0	ug/l	SW846 6010C
Barium		1.9 J	200	5.0	ug/l	SW846 6010C
Calcium		76800	1000	100	ug/l	SW846 6010C
Copper		3.0 J	25	2.0	ug/l	SW846 6010C
Lead		2.3 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		57000	5000	100	ug/l	SW846 6010C
Zinc		7.3 J	20	5.0	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		426	23	0.66	mg/l	SM19 2340B
FA91824-7	**UNOA-SW0007-000.5-20211216**					
Benzo(b)fluoranthene		0.048 J	0.080	0.040	ug/l	SW846 8270D BY SIM
Antimony		1.5 J	6.0	5.0	ug/l	SW846 6010C
Calcium		68300	1000	100	ug/l	SW846 6010C
Lead		3.1 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		61400	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		423	23	0.66	mg/l	SM19 2340B
FA91824-8	**UNOA-SW0008-000.5-20211216**					
Benzo(a)anthracene		0.051 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(a)pyrene		0.037 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(b)fluoranthene		0.092	0.080	0.040	ug/l	SW846 8270D BY SIM
Benzo(g,h,i)perylene		0.061 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(k)fluoranthene		0.052 J	0.080	0.040	ug/l	SW846 8270D BY SIM
Chrysene		0.057 J	0.16	0.080	ug/l	SW846 8270D BY SIM
Dibenzo(a,h)anthracene		0.044 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		0.070 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Antimony		2.2 J	6.0	5.0	ug/l	SW846 6010C
Calcium		67000	1000	100	ug/l	SW846 6010C
Lead		2.2 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		61100	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		419	23	0.66	mg/l	SM19 2340B

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA91824-9	**UNOA-SW0009-000.5-20211216**					
Benzo(b)fluoranthene		0.034 J	0.080	0.040	ug/l	SW846 8270D BY SIM
Antimony		1.0 J	6.0	5.0	ug/l	SW846 6010C
Calcium		66100	1000	100	ug/l	SW846 6010C
Lead		2.2 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		60200	5000	100	ug/l	SW846 6010C
Thallium		1.4 J	10	2.0	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		413	23	0.66	mg/l	SM19 2340B
FA91824-10	**UNOA-SW0010-000.5-20211216**					
Benzo(a)anthracene		0.080 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(a)pyrene		0.051 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(b)fluoranthene		0.16	0.080	0.040	ug/l	SW846 8270D BY SIM
Benzo(g,h,i)perylene		0.12 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Benzo(k)fluoranthene		0.095	0.080	0.040	ug/l	SW846 8270D BY SIM
Chrysene		0.095 J	0.16	0.080	ug/l	SW846 8270D BY SIM
Dibenzo(a,h)anthracene		0.089 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		0.14 J	0.16	0.040	ug/l	SW846 8270D BY SIM
Calcium		68200	1000	100	ug/l	SW846 6010C
Lead		2.7 J	5.0	2.0	ug/l	SW846 6010C
Magnesium		62400	5000	100	ug/l	SW846 6010C
Hardness, Total as CaCO3 [a]		427	23	0.66	mg/l	SM19 2340B
FA91824-11	**UNOA-SD0007-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.040		[c]	mg/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		66.2 J	120	61	ug/kg	SW846 8270D BY SIM
Chrysene		38.2 J	120	61	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		37.8 J	63	47	mg/kg	FLORIDA-PRO 2018
Arsenic		3.9 J	4.6	2.3	mg/kg	SW846 6010C
Barium		16.0 J	92	0.92	mg/kg	SW846 6010C
Cadmium		0.23 J	1.8	0.46	mg/kg	SW846 6010C
Chromium		7.0	4.6	0.92	mg/kg	SW846 6010C
Copper		8.5 J	11	0.92	mg/kg	SW846 6010C
Lead		7.5 J	9.2	1.8	mg/kg	SW846 6010C
Mercury		0.12 J	0.35	0.14	mg/kg	SW846 7471B
Nickel		3.3 J	18	0.46	mg/kg	SW846 6010C
Zinc		169	9.2	2.3	mg/kg	SW846 6010C
Total Organic Carbon [d]		204000	9300	8300	mg/kg	SW846 9060A
FA91824-12	**UNOA-SD0008-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.12		[c]	mg/kg	SW846 8270D BY SIM

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Benzo(a)anthracene		75.5 J	130	65	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		77.3 J	130	65	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		165	130	65	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		53.5 J	130	65	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		53.6 J	130	65	ug/kg	SW846 8270D BY SIM
Chrysene		97.1 J	130	65	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		61.3 J	130	65	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		89.9	66	50	mg/kg	FLORIDA-PRO 2018
Antimony		1.2 J	9.2	2.3	mg/kg	SW846 6010C
Arsenic		5.5	4.6	2.3	mg/kg	SW846 6010C
Barium		6.8 J	92	0.92	mg/kg	SW846 6010C
Cadmium		0.23 J	1.8	0.46	mg/kg	SW846 6010C
Chromium		8.2	4.6	0.92	mg/kg	SW846 6010C
Copper		13.1	12	0.92	mg/kg	SW846 6010C
Lead		7.3 J	9.2	1.8	mg/kg	SW846 6010C
Mercury		0.15 J	0.37	0.15	mg/kg	SW846 7471B
Nickel		4.0 J	18	0.46	mg/kg	SW846 6010C
Zinc		213	9.2	2.3	mg/kg	SW846 6010C
Total Organic Carbon [e]		312000	9800	8800	mg/kg	SW846 9060A
FA91824-13	**UNOA-SD0009-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.081		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		42.0 J	110	56	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		47.9 J	110	56	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		103 J	110	56	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		33.5 J	110	56	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		30.7 J	110	56	ug/kg	SW846 8270D BY SIM
Chrysene		57.8 J	110	56	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		39.3 J	110	56	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		64.0	57	43	mg/kg	FLORIDA-PRO 2018
Antimony		0.77 J	8.1	2.0	mg/kg	SW846 6010C
Arsenic		8.2	4.0	2.0	mg/kg	SW846 6010C
Barium		7.1 J	81	0.81	mg/kg	SW846 6010C
Cadmium		0.20 J	1.6	0.40	mg/kg	SW846 6010C
Chromium		5.5	4.0	0.81	mg/kg	SW846 6010C
Copper		7.2 J	10	0.81	mg/kg	SW846 6010C
Lead		7.5 J	8.1	1.6	mg/kg	SW846 6010C
Mercury		0.12 J	0.31	0.12	mg/kg	SW846 7471B
Nickel		2.7 J	16	0.40	mg/kg	SW846 6010C
Zinc		113	8.1	2.0	mg/kg	SW846 6010C
Total Organic Carbon [f]		248000	8500	7600	mg/kg	SW846 9060A

Summary of Hits

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Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
FA91824-14	**UNOA-SD0010-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.066		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		42.3 J	45	23	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		43.4 J	45	23	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		88.9	45	23	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		31.3 J	45	23	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		26.2 J	45	23	ug/kg	SW846 8270D BY SIM
Chrysene		51.0	45	23	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		34.0 J	45	23	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		22.0 J	23	17	mg/kg	FLORIDA-PRO 2018
Arsenic		1.6	1.5	0.76	mg/kg	SW846 6010C
Barium		3.8 J	31	0.31	mg/kg	SW846 6010C
Beryllium		0.076 J	0.76	0.15	mg/kg	SW846 6010C
Cadmium		0.076 J	0.61	0.15	mg/kg	SW846 6010C
Chromium		2.8	1.5	0.31	mg/kg	SW846 6010C
Copper		2.9 J	3.8	0.31	mg/kg	SW846 6010C
Lead		2.9 J	3.1	0.61	mg/kg	SW846 6010C
Mercury		0.034 J	0.12	0.048	mg/kg	SW846 7471B
Nickel		1.2 J	6.1	0.15	mg/kg	SW846 6010C
Zinc		41.9	3.1	0.76	mg/kg	SW846 6010C
Total Organic Carbon [g]		70300	3400	3100	mg/kg	SW846 9060A
FA91824-15	**UNOA-SD0011-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.79		[c]	mg/kg	SW846 8270D BY SIM
Anthracene		225 J	620	310	ug/kg	SW846 8270D BY SIM
Benzo(a)anthracene		513	120	62	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		504	120	62	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		1120	120	62	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		303	120	62	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		335	120	62	ug/kg	SW846 8270D BY SIM
Chrysene		651	120	62	ug/kg	SW846 8270D BY SIM
Dibenzo(a,h)anthracene		85.2 J	120	62	ug/kg	SW846 8270D BY SIM
Fluoranthene		621	620	310	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		364	120	62	ug/kg	SW846 8270D BY SIM
Pyrene		738	620	310	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		74.2	64	48	mg/kg	FLORIDA-PRO 2018
Antimony		0.76 J	8.4	2.1	mg/kg	SW846 6010C
Arsenic		7.1	4.2	2.1	mg/kg	SW846 6010C
Barium		10.8 J	84	0.84	mg/kg	SW846 6010C
Beryllium		0.21 J	2.1	0.42	mg/kg	SW846 6010C
Cadmium		0.34 J	1.7	0.42	mg/kg	SW846 6010C
Chromium		10.4	4.2	0.84	mg/kg	SW846 6010C
Copper		12.3	11	0.84	mg/kg	SW846 6010C

Summary of Hits

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Account: Hydrogeologic, Inc.
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Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Lead		12.1	8.4	1.7	mg/kg	SW846 6010C
Mercury		0.14 J	0.31	0.13	mg/kg	SW846 7471B
Nickel		4.0 J	17	0.42	mg/kg	SW846 6010C
Thallium		0.46 J	4.2	2.1	mg/kg	SW846 6010C
Zinc		241	8.4	2.1	mg/kg	SW846 6010C
Total Organic Carbon [h]		214000	9400	8500	mg/kg	SW846 9060A
FA91824-16	**UNOA-SD0012-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.34		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		192	100	50	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		221	100	50	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		457	100	50	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		145	100	50	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		148	100	50	ug/kg	SW846 8270D BY SIM
Chrysene		230	100	50	ug/kg	SW846 8270D BY SIM
Dibenzo(a,h)anthracene		39.9 J	100	50	ug/kg	SW846 8270D BY SIM
Fluoranthene		211 J	500	250	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		170	100	50	ug/kg	SW846 8270D BY SIM
Pyrene		242 J	500	250	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		56.2	51	38	mg/kg	FLORIDA-PRO 2018
Arsenic		6.6	3.7	1.8	mg/kg	SW846 6010C
Barium		8.4 J	73	0.73	mg/kg	SW846 6010C
Beryllium		0.18 J	1.8	0.37	mg/kg	SW846 6010C
Cadmium		0.18 J	1.5	0.37	mg/kg	SW846 6010C
Chromium		7.8	3.7	0.73	mg/kg	SW846 6010C
Copper		10.8	9.2	0.73	mg/kg	SW846 6010C
Lead		15.3	7.3	1.5	mg/kg	SW846 6010C
Mercury		0.15 J	0.28	0.11	mg/kg	SW846 7471B
Nickel		3.0 J	15	0.37	mg/kg	SW846 6010C
Selenium		1.0 J	7.3	1.8	mg/kg	SW846 6010C
Thallium		0.51 J	3.7	1.8	mg/kg	SW846 6010C
Zinc		136	7.3	1.8	mg/kg	SW846 6010C
Total Organic Carbon [i]		197000	7600	6900	mg/kg	SW846 9060A
FA91824-17	**UNOA-SD0013-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.040		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		23.8 J	34	17	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		26.5 J	34	17	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		51.6	34	17	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		17.5 J	34	17	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		16.4 J	34	17	ug/kg	SW846 8270D BY SIM
Chrysene		29.5 J	34	17	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		19.9 J	34	17	ug/kg	SW846 8270D BY SIM

Summary of Hits

Job Number: FA91824
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Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
TPH (C8-C40)		10.7 J	17	13	mg/kg	FLORIDA-PRO 2018
Antimony		0.14 J	2.0	0.50	mg/kg	SW846 6010C
Arsenic		1.4	1.0	0.50	mg/kg	SW846 6010C
Barium		2.6 J	20	0.20	mg/kg	SW846 6010C
Beryllium		0.070 J	0.50	0.10	mg/kg	SW846 6010C
Chromium		2.9	1.0	0.20	mg/kg	SW846 6010C
Copper		1.9 J	2.5	0.20	mg/kg	SW846 6010C
Lead		6.8	2.0	0.40	mg/kg	SW846 6010C
Mercury		0.036 J	0.088	0.035	mg/kg	SW846 7471B
Nickel		1.1 J	4.0	0.10	mg/kg	SW846 6010C
Thallium		0.11 J	1.0	0.50	mg/kg	SW846 6010C
Zinc		19.3	2.0	0.50	mg/kg	SW846 6010C
Total Organic Carbon [j]		60900	2600	2300	mg/kg	SW846 9060A
FA91824-18	**UNOA-SD0014-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.076		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		39.7 J	71	35	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		48.6 J	71	35	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		98.1	71	35	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		39.3 J	71	35	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		31.5 J	71	35	ug/kg	SW846 8270D BY SIM
Chrysene		58.6 J	71	35	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		44.2 J	71	35	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		19.3 J	36	27	mg/kg	FLORIDA-PRO 2018
Antimony		0.43 J	4.1	1.0	mg/kg	SW846 6010C
Arsenic		3.8	2.1	1.0	mg/kg	SW846 6010C
Barium		4.9 J	41	0.41	mg/kg	SW846 6010C
Beryllium		0.14 J	1.0	0.21	mg/kg	SW846 6010C
Chromium		5.6	2.1	0.41	mg/kg	SW846 6010C
Copper		4.3 J	5.2	0.41	mg/kg	SW846 6010C
Lead		10.5	4.1	0.83	mg/kg	SW846 6010C
Mercury		0.094 J	0.23	0.090	mg/kg	SW846 7471B
Nickel		2.3 J	8.3	0.21	mg/kg	SW846 6010C
Selenium		0.62 J	4.1	1.0	mg/kg	SW846 6010C
Zinc		40.5	4.1	1.0	mg/kg	SW846 6010C
Total Organic Carbon [k]		182000	5400	4900	mg/kg	SW846 9060A
FA91824-19	**UNOA-SD0015-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.019		[c]	mg/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		24.8 J	61	31	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		33.8	31	23	mg/kg	FLORIDA-PRO 2018
Antimony		0.47 J	4.1	1.0	mg/kg	SW846 6010C
Arsenic		5.6	2.0	1.0	mg/kg	SW846 6010C

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Barium		5.6 J	41	0.41	mg/kg	SW846 6010C
Beryllium		0.14 J	1.0	0.20	mg/kg	SW846 6010C
Cadmium		0.14 J	0.81	0.20	mg/kg	SW846 6010C
Chromium		5.3	2.0	0.41	mg/kg	SW846 6010C
Copper		11.2	5.1	0.41	mg/kg	SW846 6010C
Lead		9.6	4.1	0.81	mg/kg	SW846 6010C
Mercury		0.085 J	0.15	0.062	mg/kg	SW846 7471B
Nickel		2.2 J	8.1	0.20	mg/kg	SW846 6010C
Zinc		107	4.1	1.0	mg/kg	SW846 6010C
Total Organic Carbon [l]		128000	4600	4100	mg/kg	SW846 9060A
FA91824-20	**UNOA-SD0016-000.5-20211216**					
Benzo(a)pyrene Equivalents [b]		0.038		[c]	mg/kg	SW846 8270D BY SIM
Benzo(a)anthracene		21.9 J	56	28	ug/kg	SW846 8270D BY SIM
Benzo(a)pyrene		22.2 J	56	28	ug/kg	SW846 8270D BY SIM
Benzo(b)fluoranthene		46.0 J	56	28	ug/kg	SW846 8270D BY SIM
Benzo(g,h,i)perylene		15.3 J	56	28	ug/kg	SW846 8270D BY SIM
Benzo(k)fluoranthene		15.3 J	56	28	ug/kg	SW846 8270D BY SIM
Chrysene		25.4 J	56	28	ug/kg	SW846 8270D BY SIM
Indeno(1,2,3-cd)pyrene		17.6 J	56	28	ug/kg	SW846 8270D BY SIM
TPH (C8-C40)		16.0 J	29	22	mg/kg	FLORIDA-PRO 2018
Antimony		0.23 J	3.5	0.88	mg/kg	SW846 6010C
Arsenic		3.3	1.8	0.88	mg/kg	SW846 6010C
Barium		5.6 J	35	0.35	mg/kg	SW846 6010C
Beryllium		0.12 J	0.88	0.18	mg/kg	SW846 6010C
Cadmium		0.11 J	0.70	0.18	mg/kg	SW846 6010C
Chromium		5.6	1.8	0.35	mg/kg	SW846 6010C
Copper		4.6	4.4	0.35	mg/kg	SW846 6010C
Lead		6.4	3.5	0.70	mg/kg	SW846 6010C
Mercury		0.065 J	0.14	0.056	mg/kg	SW846 7471B
Nickel		2.0 J	7.0	0.18	mg/kg	SW846 6010C
Selenium		0.47 J	3.5	0.88	mg/kg	SW846 6010C
Zinc		68.8	3.5	0.88	mg/kg	SW846 6010C
Total Organic Carbon [m]		142000	4200	3800	mg/kg	SW846 9060A
FA91824-21	**UNOA-TB-20211216**					

No hits reported in this sample.

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)
(b) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]
(c) Value reported is laboratory DL (MDL).
(d) TOC Replicate Range: 201000 - 213000 mg/kg Analysis performed at SGS Dayton, NJ.
(e) TOC Replicate Range: 283000 - 366000 mg/kg Analysis performed at SGS Dayton, NJ.

Summary of Hits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

Lab Sample ID	Client Sample ID	Result/				
Analyte		Qual	LOQ	LOD	Units	Method

(f) TOC Replicate Range: 220000 - 292000 mg/kg Analysis performed at SGS Dayton, NJ.
(g) TOC Replicate Range: 63100 - 76500 mg/kg Analysis performed at SGS Dayton, NJ.
(h) TOC Replicate Range: 188000 - 234000 mg/kg Analysis performed at SGS Dayton, NJ.
(i) TOC Replicate Range: 170000 - 225000 mg/kg Analysis performed at SGS Dayton, NJ.
(j) TOC Replicate Range: 55600 - 71400 mg/kg Analysis performed at SGS Dayton, NJ.
(k) TOC Replicate Range: 170000 - 194000 mg/kg Analysis performed at SGS Dayton, NJ.
(l) TOC Replicate Range: 111000 - 154000 mg/kg Analysis performed at SGS Dayton, NJ.
(m) TOC Replicate Range: 133000 - 155000 mg/kg Analysis performed at SGS Dayton, NJ.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73117.D	1	12/30/21 15:04	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	101%		83-118%
17060-07-0	1,2-Dichloroethane-D4	114%		79-125%
2037-26-5	Toluene-D8	94%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6F12679.D	1	12/23/21 14:26	WH	12/23/21 10:00	OP88981	S6F469
Run #2 [b]	X079514.D	1	01/05/22 16:38	WH	01/05/22 07:52	OP89110	SX3200

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2	1050 ml	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	23%	12% [c]	14-67%
4165-62-2	Phenol-d5	15%	15%	10-50%
118-79-6	2,4,6-Tribromophenol	70%	39%	33-118%
4165-60-0	Nitrobenzene-d5	69%	46%	42-108%
321-60-8	2-Fluorobiphenyl	72%	56%	40-106%
1718-51-0	Terphenyl-d14	30% [c]	62%	39-121%

(a) Confirmed ND by re-extraction and reanalysis beyond hold time.
(b) Sample re-extracted beyond hold time. Confirmation run.
(c) Outside control limits.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0001-000.5-20211216
Lab Sample ID: FA91824-1
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057554.D	1	12/27/21 15:25	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	59%		50-150%
93951-69-0	Fluoranthene-d10	70%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0001-000.5-20211216
Lab Sample ID: FA91824-1
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	2.4 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	64400	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.4 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	59200	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	1.4 J	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0001-000.5-20211216		
Lab Sample ID:	FA91824-1	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	405	23	0.66	0.27	mg/l	1	12/29/21 12:23	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73118.D	1	12/30/21 15:28	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

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E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	114%		79-125%
2037-26-5	Toluene-D8	94%		85-112%

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	95%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6F12680.D	1	12/23/21 14:51	WH	12/23/21 10:00	OP88981	S6F469
Run #2 [b]	X079515.D	1	01/05/22 17:03	WH	01/05/22 07:52	OP89110	SX3200

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2	1050 ml	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	26%	14%	14-67%
4165-62-2	Phenol-d5	17%	17%	10-50%
118-79-6	2,4,6-Tribromophenol	74%	43%	33-118%
4165-60-0	Nitrobenzene-d5	70%	48%	42-108%
321-60-8	2-Fluorobiphenyl	70%	59%	40-106%
1718-51-0	Terphenyl-d14	29% c	64%	39-121%

(a) Confirmed ND by re-extraction and reanalysis beyond hold time.
(b) Sample re-extracted beyond hold time. Confirmation run.
(c) Outside control limits.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0002-000.5-20211216
Lab Sample ID: FA91824-2
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057555.D	1	12/27/21 15:58	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	68%		50-150%
93951-69-0	Fluoranthene-d10	79%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0002-000.5-20211216
Lab Sample ID: FA91824-2
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.9 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.2 J	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	66400	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.1 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	59600	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0002-000.5-20211216		
Lab Sample ID:	FA91824-2	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	411	23	0.66	0.27	mg/l	1	12/29/21 12:28	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73119.D	1	12/30/21 15:53	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	115%		79-125%
2037-26-5	Toluene-D8	94%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12681.D	1	12/23/21 15:16	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.6	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.96 U	4.8	0.96	0.57	ug/l	
95-57-8	2-Chlorophenol	0.96 U	4.8	0.96	0.61	ug/l	
120-83-2	2,4-Dichlorophenol	0.96 U	4.8	0.96	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.71	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.6	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.96 U	4.8	0.96	0.54	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.94	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.82	ug/l	
100-02-7	4-Nitrophenol	9.6 U	24	9.6	4.8	ug/l	
87-86-5	Pentachlorophenol	9.6 U	24	9.6	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.71	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.96 U	4.8	0.96	0.59	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.96 U	4.8	0.96	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
86-74-8	Carbazole	0.96 U	4.8	0.96	0.58	ug/l	
106-47-8	4-Chloroaniline	0.96 U	4.8	0.96	0.61	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.78	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.96 U	4.8	0.96	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.96 U	4.8	0.96	0.73	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.96 U	4.8	0.96	0.52	ug/l	
132-64-9	Dibenzofuran	0.96 U	4.8	0.96	0.58	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.62	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
121-14-2	2,4-Dinitrotoluene	0.96 U	4.8	0.96	0.78	ug/l	
606-20-2	2,6-Dinitrotoluene	0.96 U	4.8	0.96	0.69	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.96	ug/l	
118-74-1	Hexachlorobenzene	0.96 U	4.8	0.96	0.67	ug/l	
87-68-3	Hexachlorobutadiene	0.96 U	4.8	0.96	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.4 U	4.8	3.4	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.96 U	4.8	0.96	0.75	ug/l	
88-74-4	2-Nitroaniline	3.4 U	4.8	3.4	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.85	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.90	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.78	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	20%		14-67%
4165-62-2	Phenol-d5	14%		10-50%
118-79-6	2,4,6-Tribromophenol	67%		33-118%
4165-60-0	Nitrobenzene-d5	67%		42-108%
321-60-8	2-Fluorobiphenyl	72%		40-106%
1718-51-0	Terphenyl-d14	68%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0003-000.5-20211216
Lab Sample ID: FA91824-3
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057556.D	1	12/27/21 16:32	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	71%		50-150%
93951-69-0	Fluoranthene-d10	80%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0003-000.5-20211216
Lab Sample ID: FA91824-3
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.1 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	67900	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.4 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	58300	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0003-000.5-20211216		
Lab Sample ID:	FA91824-3	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	410	23	0.66	0.27	mg/l	1	12/29/21 12:33	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73120.D	1	12/30/21 16:17	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		83-118%
17060-07-0	1,2-Dichloroethane-D4	115%		79-125%
2037-26-5	Toluene-D8	93%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12682.D	1	12/23/21 15:40	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.6	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.96 U	4.8	0.96	0.57	ug/l	
95-57-8	2-Chlorophenol	0.96 U	4.8	0.96	0.61	ug/l	
120-83-2	2,4-Dichlorophenol	0.96 U	4.8	0.96	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.71	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.6	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.96 U	4.8	0.96	0.54	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.94	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.82	ug/l	
100-02-7	4-Nitrophenol	9.6 U	24	9.6	4.8	ug/l	
87-86-5	Pentachlorophenol	9.6 U	24	9.6	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.71	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.96 U	4.8	0.96	0.59	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.96 U	4.8	0.96	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
86-74-8	Carbazole	0.96 U	4.8	0.96	0.58	ug/l	
106-47-8	4-Chloroaniline	0.96 U	4.8	0.96	0.61	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.78	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.96 U	4.8	0.96	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.96 U	4.8	0.96	0.73	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.96 U	4.8	0.96	0.52	ug/l	
132-64-9	Dibenzofuran	0.96 U	4.8	0.96	0.58	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.62	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
121-14-2	2,4-Dinitrotoluene	0.96 U	4.8	0.96	0.78	ug/l	
606-20-2	2,6-Dinitrotoluene	0.96 U	4.8	0.96	0.69	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.96	ug/l	
118-74-1	Hexachlorobenzene	0.96 U	4.8	0.96	0.67	ug/l	
87-68-3	Hexachlorobutadiene	0.96 U	4.8	0.96	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.4 U	4.8	3.4	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.96 U	4.8	0.96	0.75	ug/l	
88-74-4	2-Nitroaniline	3.4 U	4.8	3.4	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.85	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.90	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.78	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	25%		14-67%
4165-62-2	Phenol-d5	26%		10-50%
118-79-6	2,4,6-Tribromophenol	68%		33-118%
4165-60-0	Nitrobenzene-d5	66%		42-108%
321-60-8	2-Fluorobiphenyl	71%		40-106%
1718-51-0	Terphenyl-d14	76%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0004-000.5-20211216
Lab Sample ID: FA91824-4
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057557.D	1	12/27/21 17:06	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	68%		50-150%
93951-69-0	Fluoranthene-d10	78%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0004-000.5-20211216
Lab Sample ID: FA91824-4
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.8 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	68500	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	1.8 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	62000	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	7.5 J	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0004-000.5-20211216		
Lab Sample ID:	FA91824-4	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	426	23	0.66	0.27	mg/l	1	12/29/21 12:38	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73121.D	1	12/30/21 16:41	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	117%		79-125%
2037-26-5	Toluene-D8	93%		85-112%

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12683.D	1	12/23/21 16:05	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.6	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.96 U	4.8	0.96	0.57	ug/l	
95-57-8	2-Chlorophenol	0.96 U	4.8	0.96	0.61	ug/l	
120-83-2	2,4-Dichlorophenol	0.96 U	4.8	0.96	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.71	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.6	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.96 U	4.8	0.96	0.54	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.94	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.82	ug/l	
100-02-7	4-Nitrophenol	9.6 U	24	9.6	4.8	ug/l	
87-86-5	Pentachlorophenol	9.6 U	24	9.6	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.71	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.96 U	4.8	0.96	0.59	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.96 U	4.8	0.96	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
86-74-8	Carbazole	0.96 U	4.8	0.96	0.58	ug/l	
106-47-8	4-Chloroaniline	0.96 U	4.8	0.96	0.61	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.78	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.96 U	4.8	0.96	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.96 U	4.8	0.96	0.73	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.96 U	4.8	0.96	0.52	ug/l	
132-64-9	Dibenzofuran	0.96 U	4.8	0.96	0.58	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.62	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
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Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
121-14-2	2,4-Dinitrotoluene	0.96 U	4.8	0.96	0.78	ug/l	
606-20-2	2,6-Dinitrotoluene	0.96 U	4.8	0.96	0.69	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.96	ug/l	
118-74-1	Hexachlorobenzene	0.96 U	4.8	0.96	0.67	ug/l	
87-68-3	Hexachlorobutadiene	0.96 U	4.8	0.96	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.4 U	4.8	3.4	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.96 U	4.8	0.96	0.75	ug/l	
88-74-4	2-Nitroaniline	3.4 U	4.8	3.4	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.85	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.90	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.78	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	22%		14-67%
4165-62-2	Phenol-d5	15%		10-50%
118-79-6	2,4,6-Tribromophenol	73%		33-118%
4165-60-0	Nitrobenzene-d5	70%		42-108%
321-60-8	2-Fluorobiphenyl	75%		40-106%
1718-51-0	Terphenyl-d14	70%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0005-000.5-20211216
Lab Sample ID: FA91824-5
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057558.D	1	12/27/21 17:39	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.21	0.80	0.40	0.20	ug/l	J
56-55-3	Benzo(a)anthracene	0.19	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.18	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.34	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.12	0.16	0.040	0.032	ug/l	J
207-08-9	Benzo(k)fluoranthene	0.11	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.21	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.28	0.80	0.40	0.20	ug/l	J
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.14	0.16	0.040	0.032	ug/l	J
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.30	0.80	0.40	0.20	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	75%		50-150%
93951-69-0	Fluoranthene-d10	85%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0005-000.5-20211216
Lab Sample ID: FA91824-5
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	5.0 U	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	70600	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.2 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	61900	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0005-000.5-20211216		
Lab Sample ID:	FA91824-5	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	431	23	0.66	0.27	mg/l	1	12/29/21 12:43	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0006-000.5-20211216		
Lab Sample ID:	FA91824-6	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73122.D	1	12/30/21 17:05	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0006-000.5-20211216		
Lab Sample ID:	FA91824-6	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	117%		79-125%
2037-26-5	Toluene-D8	93%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0006-000.5-20211216		
Lab Sample ID:	FA91824-6	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	96%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0006-000.5-20211216		
Lab Sample ID:	FA91824-6	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12684.D	1	12/23/21 16:30	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1040 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.6	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.96 U	4.8	0.96	0.57	ug/l	
95-57-8	2-Chlorophenol	0.96 U	4.8	0.96	0.61	ug/l	
120-83-2	2,4-Dichlorophenol	0.96 U	4.8	0.96	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.71	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.6	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.96 U	4.8	0.96	0.54	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.94	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.82	ug/l	
100-02-7	4-Nitrophenol	9.6 U	24	9.6	4.8	ug/l	
87-86-5	Pentachlorophenol	9.6 U	24	9.6	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.71	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.96 U	4.8	0.96	0.59	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.96 U	4.8	0.96	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
86-74-8	Carbazole	0.96 U	4.8	0.96	0.58	ug/l	
106-47-8	4-Chloroaniline	0.96 U	4.8	0.96	0.61	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.78	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.96 U	4.8	0.96	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.96 U	4.8	0.96	0.73	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.96 U	4.8	0.96	0.52	ug/l	
132-64-9	Dibenzofuran	0.96 U	4.8	0.96	0.58	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.62	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0006-000.5-20211216
Lab Sample ID: FA91824-6
Matrix: AQ - Surface Water
Method: SW846 8270D SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.96	ug/l	
121-14-2	2,4-Dinitrotoluene	0.96 U	4.8	0.96	0.78	ug/l	
606-20-2	2,6-Dinitrotoluene	0.96 U	4.8	0.96	0.69	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.96	ug/l	
118-74-1	Hexachlorobenzene	0.96 U	4.8	0.96	0.67	ug/l	
87-68-3	Hexachlorobutadiene	0.96 U	4.8	0.96	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.4 U	4.8	3.4	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.96 U	4.8	0.96	0.75	ug/l	
88-74-4	2-Nitroaniline	3.4 U	4.8	3.4	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.85	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.90	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.78	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	18%		14-67%
4165-62-2	Phenol-d5	13%		10-50%
118-79-6	2,4,6-Tribromophenol	52%		33-118%
4165-60-0	Nitrobenzene-d5	63%		42-108%
321-60-8	2-Fluorobiphenyl	58%		40-106%
1718-51-0	Terphenyl-d14	49%		39-121%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0006-000.5-20211216
Lab Sample ID: FA91824-6
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057559.D	1	12/27/21 18:12	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.037	0.080	0.040	0.032	ug/l	J
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	57%		50-150%
93951-69-0	Fluoranthene-d10	65%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0006-000.5-20211216
Lab Sample ID: FA91824-6
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	5.0 U	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	2.0 J	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	1.9 J	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	76800	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	3.0 J	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.3 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	57000	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	7.3 J	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0006-000.5-20211216		
Lab Sample ID:	FA91824-6	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	426	23	0.66	0.27	mg/l	1	12/29/21 12:48	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73123.D	1	12/30/21 17:29	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	117%		79-125%
2037-26-5	Toluene-D8	94%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	95%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12685.D	1	12/23/21 16:55	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	21%		14-67%
4165-62-2	Phenol-d5	19%		10-50%
118-79-6	2,4,6-Tribromophenol	66%		33-118%
4165-60-0	Nitrobenzene-d5	70%		42-108%
321-60-8	2-Fluorobiphenyl	74%		40-106%
1718-51-0	Terphenyl-d14	76%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0007-000.5-20211216
Lab Sample ID: FA91824-7
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057560.D	1	12/27/21 18:45	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.048	0.080	0.040	0.032	ug/l	J
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	51%		50-150%
93951-69-0	Fluoranthene-d10	60%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0007-000.5-20211216
Lab Sample ID: FA91824-7
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.5 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	68300	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	3.1 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	61400	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0007-000.5-20211216		
Lab Sample ID:	FA91824-7	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	423	23	0.66	0.27	mg/l	1	12/29/21 13:03	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0008-000.5-20211216		
Lab Sample ID:	FA91824-8	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73124.D	1	12/30/21 17:54	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0008-000.5-20211216		
Lab Sample ID:	FA91824-8	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	117%		79-125%
2037-26-5	Toluene-D8	93%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0008-000.5-20211216		
Lab Sample ID:	FA91824-8	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	95%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0008-000.5-20211216
Lab Sample ID: FA91824-8
Matrix: AQ - Surface Water
Method: SW846 8270D SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12686.D	1	12/23/21 17:20	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0008-000.5-20211216		
Lab Sample ID:	FA91824-8	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	20%		14-67%
4165-62-2	Phenol-d5	15%		10-50%
118-79-6	2,4,6-Tribromophenol	68%		33-118%
4165-60-0	Nitrobenzene-d5	66%		42-108%
321-60-8	2-Fluorobiphenyl	72%		40-106%
1718-51-0	Terphenyl-d14	72%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0008-000.5-20211216
Lab Sample ID: FA91824-8
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057561.D	1	12/27/21 19:18	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.051	0.16	0.040	0.032	ug/l	J
50-32-8	Benzo(a)pyrene	0.037	0.16	0.040	0.032	ug/l	J
205-99-2	Benzo(b)fluoranthene	0.092	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.061	0.16	0.040	0.032	ug/l	J
207-08-9	Benzo(k)fluoranthene	0.052	0.080	0.040	0.032	ug/l	J
218-01-9	Chrysene	0.057	0.16	0.080	0.032	ug/l	J
53-70-3	Dibenzo(a,h)anthracene	0.044	0.16	0.040	0.032	ug/l	J
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.070	0.16	0.040	0.032	ug/l	J
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	56%		50-150%
93951-69-0	Fluoranthene-d10	63%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0008-000.5-20211216
Lab Sample ID: FA91824-8
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	2.2 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	67000	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.2 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	61100	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0008-000.5-20211216		
Lab Sample ID:	FA91824-8	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	419	23	0.66	0.27	mg/l	1	12/29/21 13:08	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0009-000.5-20211216		
Lab Sample ID:	FA91824-9	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73125.D	1	12/30/21 18:18	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0009-000.5-20211216
Lab Sample ID: FA91824-9
Matrix: AQ - Surface Water
Method: SW846 8260B
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	103%		83-118%
17060-07-0	1,2-Dichloroethane-D4	117%		79-125%
2037-26-5	Toluene-D8	94%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0009-000.5-20211216		
Lab Sample ID:	FA91824-9	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	95%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0009-000.5-20211216		
Lab Sample ID:	FA91824-9	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	6F12687.D	1	12/23/21 17:45	WH	12/23/21 10:00	OP88981	S6F469
Run #2							

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0009-000.5-20211216		
Lab Sample ID:	FA91824-9	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	24%		14-67%
4165-62-2	Phenol-d5	16%		10-50%
118-79-6	2,4,6-Tribromophenol	75%		33-118%
4165-60-0	Nitrobenzene-d5	72%		42-108%
321-60-8	2-Fluorobiphenyl	76%		40-106%
1718-51-0	Terphenyl-d14	67%		39-121%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0009-000.5-20211216
Lab Sample ID: FA91824-9 **Date Sampled:** 12/16/21
Matrix: AQ - Surface Water **Date Received:** 12/17/21
Method: SW846 8270D BY SIM SW846 3510C **Percent Solids:** n/a
Project: TQN 118 NASA PRLs; KSC, FL

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057562.D	1	12/27/21 19:52	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
50-32-8	Benzo(a)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	0.034	0.080	0.040	0.032	ug/l	J
191-24-2	Benzo(g,h,i)perylene	0.040 U	0.16	0.040	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	0.040 U	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.080 U	0.16	0.080	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	0.040 U	0.16	0.040	0.032	ug/l	
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.040 U	0.16	0.040	0.032	ug/l	
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	67%		50-150%
93951-69-0	Fluoranthene-d10	78%		50-150%

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LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0009-000.5-20211216
Lab Sample ID: FA91824-9
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.0 J	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	66100	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.2 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	60200	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	1.4 J	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0009-000.5-20211216		
Lab Sample ID:	FA91824-9	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	413	23	0.66	0.27	mg/l	1	12/29/21 13:13	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	I73126.D	1	12/30/21 18:42	CF	n/a	n/a	VI2420
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone [b]	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

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E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene [c]	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		83-118%
17060-07-0	1,2-Dichloroethane-D4	118%		79-125%
2037-26-5	Toluene-D8	93%		85-112%

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E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	95%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated ICV outside DoD control limits high, however sample ND.
(c) Associated CCV outside of DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	6F12688.D	1	12/23/21 18:10	WH	12/23/21 10:00	OP88981	S6F469
Run #2 [b]	X079516.D	1	01/05/22 17:28	WH	01/05/22 07:52	OP89110	SX3200

	Initial Volume	Final Volume
Run #1	1050 ml	1.0 ml
Run #2	1050 ml	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	24 U	48	24	9.5	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	0.95 U	4.8	0.95	0.56	ug/l	
95-57-8	2-Chlorophenol	0.95 U	4.8	0.95	0.60	ug/l	
120-83-2	2,4-Dichlorophenol	0.95 U	4.8	0.95	0.80	ug/l	
105-67-9	2,4-Dimethylphenol	1.9 U	4.8	1.9	0.70	ug/l	
51-28-5	2,4-Dinitrophenol	19 U	24	19	4.8	ug/l	
534-52-1	4,6-Dinitro-o-cresol	3.8 U	9.5	3.8	1.9	ug/l	
95-48-7	2-Methylphenol	0.95 U	4.8	0.95	0.53	ug/l	
	3&4-Methylphenol	1.9 U	4.8	1.9	0.93	ug/l	
88-75-5	2-Nitrophenol	1.9 U	4.8	1.9	0.81	ug/l	
100-02-7	4-Nitrophenol	9.5 U	24	9.5	4.8	ug/l	
87-86-5	Pentachlorophenol	9.5 U	24	9.5	4.8	ug/l	
108-95-2	Phenol	1.9 U	4.8	1.9	0.48	ug/l	
95-95-4	2,4,5-Trichlorophenol	1.9 U	4.8	1.9	0.70	ug/l	
88-06-2	2,4,6-Trichlorophenol	1.9 U	4.8	1.9	0.72	ug/l	
100-51-6	Benzyl Alcohol	0.95 U	4.8	0.95	0.58	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	0.95 U	4.8	0.95	0.81	ug/l	
85-68-7	Butyl Benzyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
86-74-8	Carbazole	0.95 U	4.8	0.95	0.57	ug/l	
106-47-8	4-Chloroaniline	0.95 U	4.8	0.95	0.60	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	1.9 U	4.8	1.9	0.77	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.95 U	4.8	0.95	0.70	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	0.95 U	4.8	0.95	0.72	ug/l	
91-58-7	2-Chloronaphthalene	1.9 U	4.8	1.9	0.48	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	0.95 U	4.8	0.95	0.51	ug/l	
132-64-9	Dibenzofuran	0.95 U	4.8	0.95	0.57	ug/l	
95-50-1	1,2-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
541-73-1	1,3-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
106-46-7	1,4-Dichlorobenzene	1.9 U	4.8	1.9	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	1.9 U	4.8	1.9	0.61	ug/l	
84-66-2	Diethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
131-11-3	Dimethyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
84-74-2	Di-n-butyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
117-84-0	Di-n-octyl Phthalate	1.9 U	4.8	1.9	0.95	ug/l	
121-14-2	2,4-Dinitrotoluene	0.95 U	4.8	0.95	0.77	ug/l	
606-20-2	2,6-Dinitrotoluene	0.95 U	4.8	0.95	0.68	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	1.9 U	4.8	1.9	0.95	ug/l	
118-74-1	Hexachlorobenzene	0.95 U	4.8	0.95	0.66	ug/l	
87-68-3	Hexachlorobutadiene	0.95 U	4.8	0.95	0.48	ug/l	
77-47-4	Hexachlorocyclopentadiene	3.3 U	4.8	3.3	1.7	ug/l	
67-72-1	Hexachloroethane	1.9 U	4.8	1.9	1.6	ug/l	
78-59-1	Isophorone	0.95 U	4.8	0.95	0.74	ug/l	
88-74-4	2-Nitroaniline	3.3 U	4.8	3.3	1.7	ug/l	
99-09-2	3-Nitroaniline	1.9 U	4.8	1.9	0.84	ug/l	
100-01-6	4-Nitroaniline	1.9 U	4.8	1.9	1.1	ug/l	
98-95-3	Nitrobenzene	1.9 U	4.8	1.9	0.89	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	1.9 U	4.8	1.9	0.64	ug/l	
86-30-6	N-Nitrosodiphenylamine	1.9 U	4.8	1.9	0.77	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.9 U	4.8	1.9	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	23%	9% [c]	14-67%
4165-62-2	Phenol-d5	15%	7% [c]	10-50%
118-79-6	2,4,6-Tribromophenol	69%	37%	33-118%
4165-60-0	Nitrobenzene-d5	69%	47%	42-108%
321-60-8	2-Fluorobiphenyl	69%	59%	40-106%
1718-51-0	Terphenyl-d14	30% [c]	62%	39-121%

(a) Confirmed ND by re-extraction and reanalysis beyond hold time.
(b) Sample re-extracted beyond hold time. Confirmation run.
(c) Outside control limits.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0010-000.5-20211216
Lab Sample ID: FA91824-10
Matrix: AQ - Surface Water
Method: SW846 8270D BY SIM SW846 3510C
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	T057563.D	1	12/27/21 20:26	LR	12/23/21 10:00	OP88990	ST1980
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	0.40 U	0.80	0.40	0.32	ug/l	
208-96-8	Acenaphthylene	0.40 U	0.80	0.40	0.32	ug/l	
120-12-7	Anthracene	0.40 U	0.80	0.40	0.20	ug/l	
56-55-3	Benzo(a)anthracene	0.080	0.16	0.040	0.032	ug/l	J
50-32-8	Benzo(a)pyrene	0.051	0.16	0.040	0.032	ug/l	J
205-99-2	Benzo(b)fluoranthene	0.16	0.080	0.040	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	0.12	0.16	0.040	0.032	ug/l	J
207-08-9	Benzo(k)fluoranthene	0.095	0.080	0.040	0.032	ug/l	
218-01-9	Chrysene	0.095	0.16	0.080	0.032	ug/l	J
53-70-3	Dibenzo(a,h)anthracene	0.089	0.16	0.040	0.032	ug/l	J
206-44-0	Fluoranthene	0.40 U	0.80	0.40	0.20	ug/l	
86-73-7	Fluorene	0.40 U	0.80	0.40	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	0.14	0.16	0.040	0.032	ug/l	J
90-12-0	1-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-57-6	2-Methylnaphthalene	0.40 U	0.80	0.40	0.32	ug/l	
91-20-3	Naphthalene	0.40 U	0.80	0.40	0.32	ug/l	
85-01-8	Phenanthrene	0.40 U	0.80	0.40	0.20	ug/l	
129-00-0	Pyrene	0.40 U	0.80	0.40	0.20	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	74%		50-150%
93951-69-0	Fluoranthene-d10	89%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SW0010-000.5-20211216
Lab Sample ID: FA91824-10
Matrix: AQ - Surface Water
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

Total Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	5.0 U	6.0	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Arsenic	5.0 U	10	5.0	1.3	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Barium	5.0 U	200	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Beryllium	1.0 U	4.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Cadmium	1.0 U	5.0	1.0	0.20	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Calcium	68200	1000	100	50	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Chromium	5.0 U	10	5.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Copper	2.0 U	25	2.0	1.0	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Lead	2.7 J	5.0	2.0	1.1	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Magnesium	62400	5000	100	35	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Mercury	0.10 U	0.50	0.10	0.030	ug/l	1	12/21/21	12/21/21	JC	SW846 7470A [1]	SW846 7470A [3]
Nickel	1.0 U	40	1.0	0.40	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Selenium	5.0 U	10	5.0	2.9	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Silver	2.0 U	10	2.0	0.70	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Thallium	2.0 U	10	2.0	1.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]
Zinc	5.0 U	20	5.0	4.4	ug/l	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3010A [4]

(1) Instrument QC Batch: MA18334
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40066
(4) Prep QC Batch: MP40088

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SW0010-000.5-20211216		
Lab Sample ID:	FA91824-10	**Date Sampled:**	12/16/21
Matrix:	AQ - Surface Water	**Date Received:**	12/17/21
		Percent Solids:	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Hardness, Total as CaCO3 [a]	427	23	0.66	0.27	mg/l	1	12/29/21 13:18	DM	SM19 2340B

(a) Calculated as: (Calcium * 2.497) + (Magnesium * 4.118)

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0007-000.5-20211216		
Lab Sample ID:	FA91824-11	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079463.D	1	01/04/22 16:22	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12731.D	4	12/28/21 03:38	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2	30.2 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	3100 U	7700	3100	1500	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	310 U	1500	310	170	ug/kg	
95-57-8	2-Chlorophenol	310 U	1500	310	190	ug/kg	
120-83-2	2,4-Dichlorophenol	310 U	1500	310	180	ug/kg	
105-67-9	2,4-Dimethylphenol	610 U	1500	610	410	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	4600 U	7700	4600	1500	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	1200 U	3100	1200	610	ug/kg	
95-48-7	2-Methylphenol	310 U	1500	310	180	ug/kg	
	3&4-Methylphenol	610 U	1500	610	250	ug/kg	
88-75-5	2-Nitrophenol	310 U	1500	310	170	ug/kg	
100-02-7	4-Nitrophenol [a]	3100 U	7700	3100	1500	ug/kg	
87-86-5	Pentachlorophenol [a]	3100 U	7700	3100	1500	ug/kg	
108-95-2	Phenol	310 U	1500	310	150	ug/kg	
95-95-4	2,4,5-Trichlorophenol	310 U	1500	310	250	ug/kg	
88-06-2	2,4,6-Trichlorophenol	310 U	1500	310	180	ug/kg	
100-51-6	Benzyl Alcohol	310 U	1500	310	150	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	310 U	1500	310	160	ug/kg	
85-68-7	Butyl benzyl phthalate	610 U	1500	610	310	ug/kg	
86-74-8	Carbazole	310 U	1500	310	210	ug/kg	
106-47-8	4-Chloroaniline	610 U	1500	610	390	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	310 U	1500	310	150	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	310 U	1500	310	180	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	310 U	1500	310	190	ug/kg	
91-58-7	2-Chloronaphthalene	310 U	1500	310	150	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	310 U	1500	310	150	ug/kg	
132-64-9	Dibenzofuran	310 U	1500	310	150	ug/kg	
95-50-1	1,2-Dichlorobenzene	610 U	1500	610	150	ug/kg	
541-73-1	1,3-Dichlorobenzene	610 U	1500	610	170	ug/kg	
106-46-7	1,4-Dichlorobenzene	610 U	1500	610	200	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	610 U	1500	610	360	ug/kg	
84-66-2	Diethyl Phthalate	1100 U	3100	1100	310	ug/kg	
131-11-3	Dimethyl Phthalate	610 U	1500	610	310	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0007-000.5-20211216		
Lab Sample ID:	FA91824-11	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.8
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	610 U	1500	610	310	ug/kg	
84-74-2	Di-n-butyl Phthalate	1100 U	3100	1100	610	ug/kg	
121-14-2	2,4-Dinitrotoluene	310 U	1500	310	150	ug/kg	
606-20-2	2,6-Dinitrotoluene	310 U	1500	310	200	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	1100 U	3100	1100	310	ug/kg	
118-74-1	Hexachlorobenzene	310 U	1500	310	160	ug/kg	
87-68-3	Hexachlorobutadiene [a]	610 U	1500	610	160	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	2500 U [d]	6100	2500	1200	ug/kg	
67-72-1	Hexachloroethane	610 U	1500	610	180	ug/kg	
78-59-1	Isophorone	310 U	1500	310	150	ug/kg	
88-74-4	2-Nitroaniline	610 U	1500	610	360	ug/kg	
99-09-2	3-Nitroaniline	610 U	1500	610	180	ug/kg	
100-01-6	4-Nitroaniline	610 U	1500	610	440	ug/kg	
98-95-3	Nitrobenzene	310 U	1500	310	150	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	310 U	1500	310	150	ug/kg	
86-30-6	N-Nitrosodiphenylamine	610 U	1500	610	160	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	310 U	1500	310	180	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	57%	59%	40-102%
4165-62-2	Phenol-d5	66%	71%	41-100%
118-79-6	2,4,6-Tribromophenol	101%	86%	42-108%
4165-60-0	Nitrobenzene-d5	59%	61%	40-105%
321-60-8	2-Fluorobiphenyl	77%	75%	43-107%
1718-51-0	Terphenyl-d14	93%	86%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0007-000.5-20211216		
Lab Sample ID:	FA91824-11	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	10.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17128.D	1	12/23/21 21:55	MF	12/23/21 11:00	OP88982	S7G729
Run #2 [a]	7G17094.D	1	12/21/21 14:46	MF	12/20/21 08:30	OP88907	S7G728

	Initial Weight	Final Volume
Run #1	15.1 g	1.0 ml
Run #2	15.1 g	1.0 ml

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	310 U	610	310	250	ug/kg	
208-96-8	Acenaphthylene	310 U	610	310	250	ug/kg	
120-12-7	Anthracene	310 U	610	310	150	ug/kg	
56-55-3	Benzo(a)anthracene	61 U	120	61	31	ug/kg	
50-32-8	Benzo(a)pyrene	61 U	120	61	31	ug/kg	
205-99-2	Benzo(b)fluoranthene	66.2	120	61	31	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	61 U	120	61	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	61 U	120	61	31	ug/kg	
218-01-9	Chrysene	38.2	120	61	31	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	61 U	120	61	31	ug/kg	
206-44-0	Fluoranthene	310 U	610	310	150	ug/kg	
86-73-7	Fluorene	310 U	610	310	250	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	61 U	120	61	31	ug/kg	
90-12-0	1-Methylnaphthalene	310 U	610	310	250	ug/kg	
91-57-6	2-Methylnaphthalene	310 U	610	310	250	ug/kg	
91-20-3	Naphthalene	310 U	610	310	250	ug/kg	
85-01-8	Phenanthrene	310 U	610	310	150	ug/kg	
129-00-0	Pyrene	310 U	610	310	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	71%	53%	50-150%
93951-69-0	Fluoranthene-d10	75%	49% [b]	50-150%

(a) Confirmation run.
(b) Outside control limits.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0007-000.5-20211216		
Lab Sample ID:	FA91824-11	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	10.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 14:46	MF	n/a	n/a	R55522
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.040				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0007-000.5-20211216
Lab Sample ID: FA91824-11
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087021.D	1	12/23/21 18:56	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	37.8	63	47	31	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	80%		66-136%
7194-86-7	Nonatriacontane	81%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0007-000.5-20211216
Lab Sample ID: FA91824-11
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.8

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	2.3 U	9.2	2.3	0.60	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	3.9 J	4.6	2.3	0.92	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	16.0 J	92	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.46 U	2.3	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.23 J	1.8	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	7.0	4.6	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	8.5 J	11	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	7.5 J	9.2	1.8	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.12 J	0.35	0.14	0.035	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	3.3 J	18	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	2.3 U	9.2	2.3	1.1	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.92 U	4.6	0.92	0.38	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	2.3 U	4.6	2.3	0.50	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	169	9.2	2.3	1.4	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40090

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0007-000.5-20211216		
Lab Sample ID:	FA91824-11	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	10.8
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	10.8				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	204000	9300	8300	8000	mg/kg	1	01/07/22 11:15	ANJ	SW846 9060A

(a) TOC Replicate Range: 201000 - 213000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0008-000.5-20211216		
Lab Sample ID:	FA91824-12	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.2
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079464.D	1	01/04/22 16:47	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12732.D	4	12/28/21 04:03	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2	30.1 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	3300 U	8100	3300	1600	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	330 U	1600	330	180	ug/kg	
95-57-8	2-Chlorophenol	330 U	1600	330	200	ug/kg	
120-83-2	2,4-Dichlorophenol	330 U	1600	330	190	ug/kg	
105-67-9	2,4-Dimethylphenol	650 U	1600	650	430	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	4900 U	8100	4900	1600	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	1300 U	3300	1300	650	ug/kg	
95-48-7	2-Methylphenol	330 U	1600	330	200	ug/kg	
	3&4-Methylphenol	650 U	1600	650	270	ug/kg	
88-75-5	2-Nitrophenol	330 U	1600	330	180	ug/kg	
100-02-7	4-Nitrophenol [a]	3300 U	8100	3300	1600	ug/kg	
87-86-5	Pentachlorophenol [a]	3300 U	8100	3300	1600	ug/kg	
108-95-2	Phenol	330 U	1600	330	160	ug/kg	
95-95-4	2,4,5-Trichlorophenol	330 U	1600	330	260	ug/kg	
88-06-2	2,4,6-Trichlorophenol	330 U	1600	330	190	ug/kg	
100-51-6	Benzyl Alcohol	330 U	1600	330	160	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	330 U	1600	330	170	ug/kg	
85-68-7	Butyl benzyl phthalate	650 U	1600	650	330	ug/kg	
86-74-8	Carbazole	330 U	1600	330	230	ug/kg	
106-47-8	4-Chloroaniline	650 U	1600	650	410	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	330 U	1600	330	160	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	330 U	1600	330	190	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	330 U	1600	330	200	ug/kg	
91-58-7	2-Chloronaphthalene	330 U	1600	330	160	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	330 U	1600	330	160	ug/kg	
132-64-9	Dibenzofuran	330 U	1600	330	160	ug/kg	
95-50-1	1,2-Dichlorobenzene	650 U	1600	650	160	ug/kg	
541-73-1	1,3-Dichlorobenzene	650 U	1600	650	180	ug/kg	
106-46-7	1,4-Dichlorobenzene	650 U	1600	650	220	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	650 U	1600	650	390	ug/kg	
84-66-2	Diethyl Phthalate	1100 U	3300	1100	330	ug/kg	
131-11-3	Dimethyl Phthalate	650 U	1600	650	330	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0008-000.5-20211216		
Lab Sample ID:	FA91824-12	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.2
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	650 U	1600	650	330	ug/kg	
84-74-2	Di-n-butyl Phthalate	1100 U	3300	1100	650	ug/kg	
121-14-2	2,4-Dinitrotoluene	330 U	1600	330	160	ug/kg	
606-20-2	2,6-Dinitrotoluene	330 U	1600	330	210	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	1100 U	3300	1100	330	ug/kg	
118-74-1	Hexachlorobenzene	330 U	1600	330	170	ug/kg	
87-68-3	Hexachlorobutadiene [a]	650 U	1600	650	160	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	2600 U [d]	6500	2600	1300	ug/kg	
67-72-1	Hexachloroethane	650 U	1600	650	190	ug/kg	
78-59-1	Isophorone	330 U	1600	330	160	ug/kg	
88-74-4	2-Nitroaniline	650 U	1600	650	380	ug/kg	
99-09-2	3-Nitroaniline	650 U	1600	650	190	ug/kg	
100-01-6	4-Nitroaniline	650 U	1600	650	470	ug/kg	
98-95-3	Nitrobenzene	330 U	1600	330	160	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	330 U	1600	330	160	ug/kg	
86-30-6	N-Nitrosodiphenylamine	650 U	1600	650	180	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	330 U	1600	330	190	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	60%	58%	40-102%
4165-62-2	Phenol-d5	67%	67%	41-100%
118-79-6	2,4,6-Tribromophenol	93%	76%	42-108%
4165-60-0	Nitrobenzene-d5	63%	59%	40-105%
321-60-8	2-Fluorobiphenyl	77%	69%	43-107%
1718-51-0	Terphenyl-d14	85%	77%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0008-000.5-20211216		
Lab Sample ID:	FA91824-12	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	10.2
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17095.D	1	12/21/21 15:09	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	330 U	650	330	260	ug/kg	
208-96-8	Acenaphthylene	330 U	650	330	260	ug/kg	
120-12-7	Anthracene	330 U	650	330	160	ug/kg	
56-55-3	Benzo(a)anthracene	75.5	130	65	33	ug/kg	J
50-32-8	Benzo(a)pyrene	77.3	130	65	33	ug/kg	J
205-99-2	Benzo(b)fluoranthene	165	130	65	33	ug/kg	
191-24-2	Benzo(g,h,i)perylene	53.5	130	65	33	ug/kg	J
207-08-9	Benzo(k)fluoranthene	53.6	130	65	33	ug/kg	J
218-01-9	Chrysene	97.1	130	65	33	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	65 U	130	65	33	ug/kg	
206-44-0	Fluoranthene	330 U	650	330	160	ug/kg	
86-73-7	Fluorene	330 U	650	330	260	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	61.3	130	65	33	ug/kg	J
90-12-0	1-Methylnaphthalene	330 U	650	330	260	ug/kg	
91-57-6	2-Methylnaphthalene	330 U	650	330	260	ug/kg	
91-20-3	Naphthalene	330 U	650	330	260	ug/kg	
85-01-8	Phenanthrene	330 U	650	330	160	ug/kg	
129-00-0	Pyrene	330 U	650	330	160	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	80%		50-150%
93951-69-0	Fluoranthene-d10	85%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0008-000.5-20211216		
Lab Sample ID:	FA91824-12	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	10.2
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 15:09	MF	n/a	n/a	R55531
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.12				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0008-000.5-20211216
Lab Sample ID: FA91824-12
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.2

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087022.D	1	12/23/21 19:16	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	89.9	66	50	33	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		66-136%
7194-86-7	Nonatriacontane	87%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0008-000.5-20211216
Lab Sample ID: FA91824-12
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.2

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.2 J	9.2	2.3	0.60	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	5.5	4.6	2.3	0.92	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	6.8 J	92	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.46 U	2.3	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.23 J	1.8	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	8.2	4.6	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	13.1	12	0.92	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	7.3 J	9.2	1.8	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.15 J	0.37	0.15	0.037	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	4.0 J	18	0.46	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	2.3 U	9.2	2.3	1.1	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.92 U	4.6	0.92	0.38	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	2.3 U	4.6	2.3	0.51	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	213	9.2	2.3	1.4	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40090

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0008-000.5-20211216		
Lab Sample ID:	FA91824-12	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	10.2
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	10.2				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	312000	9800	8800	8400	mg/kg	1	01/07/22 11:44	ANJ	SW846 9060A

(a) TOC Replicate Range: 283000 - 366000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0009-000.5-20211216		
Lab Sample ID:	FA91824-13	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	11.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079465.D	1	01/04/22 17:11	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12733.D	4	12/28/21 04:28	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.4 g	1.0 ml
Run #2	30.4 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	2800 U	7000	2800	1400	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	280 U	1400	280	160	ug/kg	
95-57-8	2-Chlorophenol	280 U	1400	280	170	ug/kg	
120-83-2	2,4-Dichlorophenol	280 U	1400	280	160	ug/kg	
105-67-9	2,4-Dimethylphenol	560 U	1400	560	370	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	4200 U	7000	4200	1400	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	1100 U	2800	1100	560	ug/kg	
95-48-7	2-Methylphenol	280 U	1400	280	170	ug/kg	
	3&4-Methylphenol	560 U	1400	560	230	ug/kg	
88-75-5	2-Nitrophenol	280 U	1400	280	150	ug/kg	
100-02-7	4-Nitrophenol [a]	2800 U	7000	2800	1400	ug/kg	
87-86-5	Pentachlorophenol [a]	2800 U	7000	2800	1400	ug/kg	
108-95-2	Phenol	280 U	1400	280	140	ug/kg	
95-95-4	2,4,5-Trichlorophenol	280 U	1400	280	220	ug/kg	
88-06-2	2,4,6-Trichlorophenol	280 U	1400	280	160	ug/kg	
100-51-6	Benzyl Alcohol	280 U	1400	280	140	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	280 U	1400	280	140	ug/kg	
85-68-7	Butyl benzyl phthalate	560 U	1400	560	280	ug/kg	
86-74-8	Carbazole	280 U	1400	280	190	ug/kg	
106-47-8	4-Chloroaniline	560 U	1400	560	350	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	280 U	1400	280	140	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	280 U	1400	280	160	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	280 U	1400	280	180	ug/kg	
91-58-7	2-Chloronaphthalene	280 U	1400	280	140	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	280 U	1400	280	140	ug/kg	
132-64-9	Dibenzofuran	280 U	1400	280	140	ug/kg	
95-50-1	1,2-Dichlorobenzene	560 U	1400	560	140	ug/kg	
541-73-1	1,3-Dichlorobenzene	560 U	1400	560	150	ug/kg	
106-46-7	1,4-Dichlorobenzene	560 U	1400	560	190	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	560 U	1400	560	330	ug/kg	
84-66-2	Diethyl Phthalate	980 U	2800	980	280	ug/kg	
131-11-3	Dimethyl Phthalate	560 U	1400	560	280	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0009-000.5-20211216		
Lab Sample ID:	FA91824-13	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	11.8
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	560 U	1400	560	280	ug/kg	
84-74-2	Di-n-butyl Phthalate	980 U	2800	980	560	ug/kg	
121-14-2	2,4-Dinitrotoluene	280 U	1400	280	140	ug/kg	
606-20-2	2,6-Dinitrotoluene	280 U	1400	280	180	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	980 U	2800	980	280	ug/kg	
118-74-1	Hexachlorobenzene	280 U	1400	280	140	ug/kg	
87-68-3	Hexachlorobutadiene [a]	560 U	1400	560	140	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	2200 U [d]	5600	2200	1100	ug/kg	
67-72-1	Hexachloroethane	560 U	1400	560	160	ug/kg	
78-59-1	Isophorone	280 U	1400	280	140	ug/kg	
88-74-4	2-Nitroaniline	560 U	1400	560	320	ug/kg	
99-09-2	3-Nitroaniline	560 U	1400	560	160	ug/kg	
100-01-6	4-Nitroaniline	560 U	1400	560	400	ug/kg	
98-95-3	Nitrobenzene	280 U	1400	280	140	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	280 U	1400	280	140	ug/kg	
86-30-6	N-Nitrosodiphenylamine	560 U	1400	560	150	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	280 U	1400	280	160	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	61%	59%	40-102%
4165-62-2	Phenol-d5	68%	67%	41-100%
118-79-6	2,4,6-Tribromophenol	94%	76%	42-108%
4165-60-0	Nitrobenzene-d5	63%	60%	40-105%
321-60-8	2-Fluorobiphenyl	76%	70%	43-107%
1718-51-0	Terphenyl-d14	86%	76%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0009-000.5-20211216
Lab Sample ID: FA91824-13
Matrix: SO - Soil
Method: SW846 8270D BY SIM SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 11.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17096.D	1	12/21/21 15:32	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	280 U	560	280	230	ug/kg	
208-96-8	Acenaphthylene	280 U	560	280	230	ug/kg	
120-12-7	Anthracene	280 U	560	280	140	ug/kg	
56-55-3	Benzo(a)anthracene	42.0	110	56	28	ug/kg	J
50-32-8	Benzo(a)pyrene	47.9	110	56	28	ug/kg	J
205-99-2	Benzo(b)fluoranthene	103	110	56	28	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	33.5	110	56	28	ug/kg	J
207-08-9	Benzo(k)fluoranthene	30.7	110	56	28	ug/kg	J
218-01-9	Chrysene	57.8	110	56	28	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	56 U	110	56	28	ug/kg	
206-44-0	Fluoranthene	280 U	560	280	140	ug/kg	
86-73-7	Fluorene	280 U	560	280	230	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	39.3	110	56	28	ug/kg	J
90-12-0	1-Methylnaphthalene	280 U	560	280	230	ug/kg	
91-57-6	2-Methylnaphthalene	280 U	560	280	230	ug/kg	
91-20-3	Naphthalene	280 U	560	280	230	ug/kg	
85-01-8	Phenanthrene	280 U	560	280	140	ug/kg	
129-00-0	Pyrene	280 U	560	280	140	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	78%		50-150%
93951-69-0	Fluoranthene-d10	79%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0009-000.5-20211216		
Lab Sample ID:	FA91824-13	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	11.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 15:32	MF	n/a	n/a	R55523
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.081				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0009-000.5-20211216
Lab Sample ID: FA91824-13
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 11.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087023.D	1	12/23/21 19:36	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	64.0	57	43	28	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		66-136%
7194-86-7	Nonatriacontane	87%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0009-000.5-20211216
Lab Sample ID: FA91824-13
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 11.8

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.77 J	8.1	2.0	0.52	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	8.2	4.0	2.0	0.81	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	7.1 J	81	0.81	0.40	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.40 U	2.0	0.40	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.20 J	1.6	0.40	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	5.5	4.0	0.81	0.40	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	7.2 J	10	0.81	0.40	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	7.5 J	8.1	1.6	0.40	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.12 J	0.31	0.12	0.031	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	2.7 J	16	0.40	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	2.0 U	8.1	2.0	0.97	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.81 U	4.0	0.81	0.33	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	2.0 U	4.0	2.0	0.44	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	113	8.1	2.0	1.2	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40090

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0009-000.5-20211216		
Lab Sample ID:	FA91824-13	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	11.8
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	11.8				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	248000	8500	7600	7300	mg/kg	1	01/07/22 12:09	ANJ	SW846 9060A

(a) TOC Replicate Range: 220000 - 292000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0010-000.5-20211216		
Lab Sample ID:	FA91824-14	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	29.5
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079466.D	1	01/04/22 17:36	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12734.D	4	12/28/21 04:53	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2	30.0 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	1100 U	2800	1100	560	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	110 U	560	110	64	ug/kg	
95-57-8	2-Chlorophenol	110 U	560	110	69	ug/kg	
120-83-2	2,4-Dichlorophenol	110 U	560	110	65	ug/kg	
105-67-9	2,4-Dimethylphenol	230 U	560	230	150	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	1700 U	2800	1700	560	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	450 U	1100	450	230	ug/kg	
95-48-7	2-Methylphenol	110 U	560	110	68	ug/kg	
	3&4-Methylphenol	230 U	560	230	93	ug/kg	
88-75-5	2-Nitrophenol	110 U	560	110	61	ug/kg	
100-02-7	4-Nitrophenol [a]	1100 U	2800	1100	560	ug/kg	
87-86-5	Pentachlorophenol [a]	1100 U	2800	1100	560	ug/kg	
108-95-2	Phenol	110 U	560	110	56	ug/kg	
95-95-4	2,4,5-Trichlorophenol	110 U	560	110	91	ug/kg	
88-06-2	2,4,6-Trichlorophenol	110 U	560	110	65	ug/kg	
100-51-6	Benzyl Alcohol	110 U	560	110	56	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	110 U	560	110	59	ug/kg	
85-68-7	Butyl benzyl phthalate	230 U	560	230	110	ug/kg	
86-74-8	Carbazole	110 U	560	110	79	ug/kg	
106-47-8	4-Chloroaniline	230 U	560	230	140	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	110 U	560	110	56	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	110 U	560	110	65	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	110 U	560	110	71	ug/kg	
91-58-7	2-Chloronaphthalene	110 U	560	110	56	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	110 U	560	110	56	ug/kg	
132-64-9	Dibenzofuran	110 U	560	110	56	ug/kg	
95-50-1	1,2-Dichlorobenzene	230 U	560	230	56	ug/kg	
541-73-1	1,3-Dichlorobenzene	230 U	560	230	61	ug/kg	
106-46-7	1,4-Dichlorobenzene	230 U	560	230	75	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	230 U	560	230	130	ug/kg	
84-66-2	Diethyl Phthalate	400 U	1100	400	110	ug/kg	
131-11-3	Dimethyl Phthalate	230 U	560	230	110	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0010-000.5-20211216		
Lab Sample ID:	FA91824-14	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	29.5
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	230 U	560	230	110	ug/kg	
84-74-2	Di-n-butyl Phthalate	400 U	1100	400	230	ug/kg	
121-14-2	2,4-Dinitrotoluene	110 U	560	110	56	ug/kg	
606-20-2	2,6-Dinitrotoluene	110 U	560	110	73	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	400 U	1100	400	110	ug/kg	
118-74-1	Hexachlorobenzene	110 U	560	110	58	ug/kg	
87-68-3	Hexachlorobutadiene [a]	230 U	560	230	57	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	900 U [d]	2300	900	450	ug/kg	
67-72-1	Hexachloroethane	230 U	560	230	67	ug/kg	
78-59-1	Isophorone	110 U	560	110	56	ug/kg	
88-74-4	2-Nitroaniline	230 U	560	230	130	ug/kg	
99-09-2	3-Nitroaniline	230 U	560	230	66	ug/kg	
100-01-6	4-Nitroaniline	230 U	560	230	160	ug/kg	
98-95-3	Nitrobenzene	110 U	560	110	56	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	110 U	560	110	56	ug/kg	
86-30-6	N-Nitrosodiphenylamine	230 U	560	230	61	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	110 U	560	110	67	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	54%	49%	40-102%
4165-62-2	Phenol-d5	60%	56%	41-100%
118-79-6	2,4,6-Tribromophenol	81%	65%	42-108%
4165-60-0	Nitrobenzene-d5	54%	50%	40-105%
321-60-8	2-Fluorobiphenyl	68%	59%	43-107%
1718-51-0	Terphenyl-d14	75%	64%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0010-000.5-20211216		
Lab Sample ID:	FA91824-14	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	29.5
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17097.D	1	12/21/21 15:55	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	110 U	230	110	90	ug/kg	
208-96-8	Acenaphthylene	110 U	230	110	90	ug/kg	
120-12-7	Anthracene	110 U	230	110	56	ug/kg	
56-55-3	Benzo(a)anthracene	42.3	45	23	11	ug/kg	J
50-32-8	Benzo(a)pyrene	43.4	45	23	11	ug/kg	J
205-99-2	Benzo(b)fluoranthene	88.9	45	23	11	ug/kg	
191-24-2	Benzo(g,h,i)perylene	31.3	45	23	11	ug/kg	J
207-08-9	Benzo(k)fluoranthene	26.2	45	23	11	ug/kg	J
218-01-9	Chrysene	51.0	45	23	11	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	23 U	45	23	11	ug/kg	
206-44-0	Fluoranthene	110 U	230	110	56	ug/kg	
86-73-7	Fluorene	110 U	230	110	90	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	34.0	45	23	11	ug/kg	J
90-12-0	1-Methylnaphthalene	110 U	230	110	90	ug/kg	
91-57-6	2-Methylnaphthalene	110 U	230	110	90	ug/kg	
91-20-3	Naphthalene	110 U	230	110	90	ug/kg	
85-01-8	Phenanthrene	110 U	230	110	56	ug/kg	
129-00-0	Pyrene	110 U	230	110	56	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	80%		50-150%
93951-69-0	Fluoranthene-d10	81%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0010-000.5-20211216		
Lab Sample ID:	FA91824-14	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	29.5
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 15:55	MF	n/a	n/a	R55526
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.066				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0010-000.5-20211216
Lab Sample ID: FA91824-14
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 29.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087024.D	1	12/23/21 19:55	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	22.0	23	17	11	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		66-136%
7194-86-7	Nonatriacontane	87%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0010-000.5-20211216
Lab Sample ID: FA91824-14
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 29.5

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.76 U	3.1	0.76	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	1.6	1.5	0.76	0.31	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	3.8 J	31	0.31	0.15	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.076 J	0.76	0.15	0.076	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.076 J	0.61	0.15	0.076	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	2.8	1.5	0.31	0.15	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	2.9 J	3.8	0.31	0.15	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	2.9 J	3.1	0.61	0.15	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.034 J	0.12	0.048	0.012	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	1.2 J	6.1	0.15	0.076	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.76 U	3.1	0.76	0.37	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.31 U	1.5	0.31	0.13	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.76 U	1.5	0.76	0.17	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	41.9	3.1	0.76	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0010-000.5-20211216		
Lab Sample ID:	FA91824-14	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	29.5
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	29.5				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	70300	3400	3100	2900	mg/kg	1	01/07/22 12:37	ANJ	SW846 9060A

(a) TOC Replicate Range: 63100 - 76500 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0011-000.5-20211216		
Lab Sample ID:	FA91824-15	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079467.D	1	01/04/22 18:00	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12735.D	4	12/28/21 05:17	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2	30.0 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	3100 U	7900	3100	1600	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	310 U	1600	310	180	ug/kg	
95-57-8	2-Chlorophenol	310 U	1600	310	190	ug/kg	
120-83-2	2,4-Dichlorophenol	310 U	1600	310	180	ug/kg	
105-67-9	2,4-Dimethylphenol	630 U	1600	630	420	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	4700 U	7900	4700	1600	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	1300 U	3100	1300	630	ug/kg	
95-48-7	2-Methylphenol	310 U	1600	310	190	ug/kg	
	3&4-Methylphenol	630 U	1600	630	260	ug/kg	
88-75-5	2-Nitrophenol	310 U	1600	310	170	ug/kg	
100-02-7	4-Nitrophenol [a]	3100 U	7900	3100	1600	ug/kg	
87-86-5	Pentachlorophenol [a]	3100 U	7900	3100	1600	ug/kg	
108-95-2	Phenol	310 U	1600	310	160	ug/kg	
95-95-4	2,4,5-Trichlorophenol	310 U	1600	310	250	ug/kg	
88-06-2	2,4,6-Trichlorophenol	310 U	1600	310	180	ug/kg	
100-51-6	Benzyl Alcohol	310 U	1600	310	160	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	310 U	1600	310	160	ug/kg	
85-68-7	Butyl benzyl phthalate	630 U	1600	630	310	ug/kg	
86-74-8	Carbazole	310 U	1600	310	220	ug/kg	
106-47-8	4-Chloroaniline	630 U	1600	630	400	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	310 U	1600	310	160	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	310 U	1600	310	180	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	310 U	1600	310	200	ug/kg	
91-58-7	2-Chloronaphthalene	310 U	1600	310	160	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	310 U	1600	310	160	ug/kg	
132-64-9	Dibenzofuran	310 U	1600	310	160	ug/kg	
95-50-1	1,2-Dichlorobenzene	630 U	1600	630	160	ug/kg	
541-73-1	1,3-Dichlorobenzene	630 U	1600	630	170	ug/kg	
106-46-7	1,4-Dichlorobenzene	630 U	1600	630	210	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	630 U	1600	630	370	ug/kg	
84-66-2	Diethyl Phthalate	1100 U	3100	1100	310	ug/kg	
131-11-3	Dimethyl Phthalate	630 U	1600	630	310	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0011-000.5-20211216		
Lab Sample ID:	FA91824-15	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	10.6
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	630 U	1600	630	310	ug/kg	
84-74-2	Di-n-butyl Phthalate	1100 U	3100	1100	630	ug/kg	
121-14-2	2,4-Dinitrotoluene	310 U	1600	310	160	ug/kg	
606-20-2	2,6-Dinitrotoluene	310 U	1600	310	200	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	1100 U	3100	1100	310	ug/kg	
118-74-1	Hexachlorobenzene	310 U	1600	310	160	ug/kg	
87-68-3	Hexachlorobutadiene [a]	630 U	1600	630	160	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	2500 U [d]	6300	2500	1300	ug/kg	
67-72-1	Hexachloroethane	630 U	1600	630	190	ug/kg	
78-59-1	Isophorone	310 U	1600	310	160	ug/kg	
88-74-4	2-Nitroaniline	630 U	1600	630	360	ug/kg	
99-09-2	3-Nitroaniline	630 U	1600	630	180	ug/kg	
100-01-6	4-Nitroaniline	630 U	1600	630	450	ug/kg	
98-95-3	Nitrobenzene	310 U	1600	310	160	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	310 U	1600	310	160	ug/kg	
86-30-6	N-Nitrosodiphenylamine	630 U	1600	630	170	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	310 U	1600	310	190	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	46%	42%	40-102%
4165-62-2	Phenol-d5	51%	49%	41-100%
118-79-6	2,4,6-Tribromophenol	75%	59%	42-108%
4165-60-0	Nitrobenzene-d5	47%	44%	40-105%
321-60-8	2-Fluorobiphenyl	60%	51%	43-107%
1718-51-0	Terphenyl-d14	70%	59%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0011-000.5-20211216		
Lab Sample ID:	FA91824-15	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	10.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17098.D	1	12/21/21 16:18	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	310 U	620	310	250	ug/kg	
208-96-8	Acenaphthylene	310 U	620	310	250	ug/kg	
120-12-7	Anthracene	225	620	310	160	ug/kg	J
56-55-3	Benzo(a)anthracene	513	120	62	31	ug/kg	
50-32-8	Benzo(a)pyrene	504	120	62	31	ug/kg	
205-99-2	Benzo(b)fluoranthene	1120	120	62	31	ug/kg	
191-24-2	Benzo(g,h,i)perylene	303	120	62	31	ug/kg	
207-08-9	Benzo(k)fluoranthene	335	120	62	31	ug/kg	
218-01-9	Chrysene	651	120	62	31	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	85.2	120	62	31	ug/kg	J
206-44-0	Fluoranthene	621	620	310	160	ug/kg	
86-73-7	Fluorene	310 U	620	310	250	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	364	120	62	31	ug/kg	
90-12-0	1-Methylnaphthalene	310 U	620	310	250	ug/kg	
91-57-6	2-Methylnaphthalene	310 U	620	310	250	ug/kg	
91-20-3	Naphthalene	310 U	620	310	250	ug/kg	
85-01-8	Phenanthrene	310 U	620	310	160	ug/kg	
129-00-0	Pyrene	738	620	310	160	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	85%		50-150%
93951-69-0	Fluoranthene-d10	87%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0011-000.5-20211216		
Lab Sample ID:	FA91824-15	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	10.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 16:18	MF	n/a	n/a	R55525
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.79				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0011-000.5-20211216
Lab Sample ID: FA91824-15
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087025.D	1	12/23/21 20:15	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	74.2	64	48	32	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		66-136%
7194-86-7	Nonatriacontane	88%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0011-000.5-20211216
Lab Sample ID: FA91824-15
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 10.6

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.76 J	8.4	2.1	0.55	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	7.1	4.2	2.1	0.84	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	10.8 J	84	0.84	0.42	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.21 J	2.1	0.42	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.34 J	1.7	0.42	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	10.4	4.2	0.84	0.42	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	12.3	11	0.84	0.42	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	12.1	8.4	1.7	0.42	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.14 J	0.31	0.13	0.031	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	4.0 J	17	0.42	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	2.1 U	8.4	2.1	1.0	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.84 U	4.2	0.84	0.35	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.46 J	4.2	2.1	0.46	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	241	8.4	2.1	1.3	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0011-000.5-20211216		
Lab Sample ID:	FA91824-15	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	10.6
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	10.6				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	214000	9400	8500	8100	mg/kg	1	01/07/22 13:03	ANJ	SW846 9060A

(a) TOC Replicate Range: 188000 - 234000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0012-000.5-20211216		
Lab Sample ID:	FA91824-16	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	13.1
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079468.D	1	01/04/22 18:25	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12736.D	4	12/28/21 05:42	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2	30.1 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	2500 U	6300	2500	1300	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	250 U	1300	250	140	ug/kg	
95-57-8	2-Chlorophenol	250 U	1300	250	160	ug/kg	
120-83-2	2,4-Dichlorophenol	250 U	1300	250	150	ug/kg	
105-67-9	2,4-Dimethylphenol	510 U	1300	510	340	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	3800 U	6300	3800	1300	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	1000 U	2500	1000	510	ug/kg	
95-48-7	2-Methylphenol	250 U	1300	250	150	ug/kg	
	3&4-Methylphenol	510 U	1300	510	210	ug/kg	
88-75-5	2-Nitrophenol	250 U	1300	250	140	ug/kg	
100-02-7	4-Nitrophenol [a]	2500 U	6300	2500	1300	ug/kg	
87-86-5	Pentachlorophenol [a]	2500 U	6300	2500	1300	ug/kg	
108-95-2	Phenol	250 U	1300	250	130	ug/kg	
95-95-4	2,4,5-Trichlorophenol	250 U	1300	250	200	ug/kg	
88-06-2	2,4,6-Trichlorophenol	250 U	1300	250	150	ug/kg	
100-51-6	Benzyl Alcohol	250 U	1300	250	130	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	250 U	1300	250	130	ug/kg	
85-68-7	Butyl benzyl phthalate	510 U	1300	510	250	ug/kg	
86-74-8	Carbazole	250 U	1300	250	180	ug/kg	
106-47-8	4-Chloroaniline	510 U	1300	510	320	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	250 U	1300	250	130	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	250 U	1300	250	150	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	250 U	1300	250	160	ug/kg	
91-58-7	2-Chloronaphthalene	250 U	1300	250	130	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	250 U	1300	250	130	ug/kg	
132-64-9	Dibenzofuran	250 U	1300	250	130	ug/kg	
95-50-1	1,2-Dichlorobenzene	510 U	1300	510	130	ug/kg	
541-73-1	1,3-Dichlorobenzene	510 U	1300	510	140	ug/kg	
106-46-7	1,4-Dichlorobenzene	510 U	1300	510	170	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	510 U	1300	510	300	ug/kg	
84-66-2	Diethyl Phthalate	890 U	2500	890	250	ug/kg	
131-11-3	Dimethyl Phthalate	510 U	1300	510	250	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0012-000.5-20211216		
Lab Sample ID:	FA91824-16	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	13.1
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	510 U	1300	510	250	ug/kg	
84-74-2	Di-n-butyl Phthalate	890 U	2500	890	510	ug/kg	
121-14-2	2,4-Dinitrotoluene	250 U	1300	250	130	ug/kg	
606-20-2	2,6-Dinitrotoluene	250 U	1300	250	160	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	890 U	2500	890	250	ug/kg	
118-74-1	Hexachlorobenzene	250 U	1300	250	130	ug/kg	
87-68-3	Hexachlorobutadiene [a]	510 U	1300	510	130	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	2000 U [d]	5100	2000	1000	ug/kg	
67-72-1	Hexachloroethane	510 U	1300	510	150	ug/kg	
78-59-1	Isophorone	250 U	1300	250	130	ug/kg	
88-74-4	2-Nitroaniline	510 U	1300	510	290	ug/kg	
99-09-2	3-Nitroaniline	510 U	1300	510	150	ug/kg	
100-01-6	4-Nitroaniline	510 U	1300	510	370	ug/kg	
98-95-3	Nitrobenzene	250 U	1300	250	130	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	250 U	1300	250	130	ug/kg	
86-30-6	N-Nitrosodiphenylamine	510 U	1300	510	140	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	250 U	1300	250	150	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	55%	51%	40-102%
4165-62-2	Phenol-d5	62%	59%	41-100%
118-79-6	2,4,6-Tribromophenol	88%	68%	42-108%
4165-60-0	Nitrobenzene-d5	58%	52%	40-105%
321-60-8	2-Fluorobiphenyl	70%	61%	43-107%
1718-51-0	Terphenyl-d14	81%	69%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0012-000.5-20211216		
Lab Sample ID:	FA91824-16	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	13.1
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17099.D	1	12/21/21 16:41	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	250 U	500	250	200	ug/kg	
208-96-8	Acenaphthylene	250 U	500	250	200	ug/kg	
120-12-7	Anthracene	250 U	500	250	130	ug/kg	
56-55-3	Benzo(a)anthracene	192	100	50	25	ug/kg	
50-32-8	Benzo(a)pyrene	221	100	50	25	ug/kg	
205-99-2	Benzo(b)fluoranthene	457	100	50	25	ug/kg	
191-24-2	Benzo(g,h,i)perylene	145	100	50	25	ug/kg	
207-08-9	Benzo(k)fluoranthene	148	100	50	25	ug/kg	
218-01-9	Chrysene	230	100	50	25	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	39.9	100	50	25	ug/kg	J
206-44-0	Fluoranthene	211	500	250	130	ug/kg	J
86-73-7	Fluorene	250 U	500	250	200	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	170	100	50	25	ug/kg	
90-12-0	1-Methylnaphthalene	250 U	500	250	200	ug/kg	
91-57-6	2-Methylnaphthalene	250 U	500	250	200	ug/kg	
91-20-3	Naphthalene	250 U	500	250	200	ug/kg	
85-01-8	Phenanthrene	250 U	500	250	130	ug/kg	
129-00-0	Pyrene	242	500	250	130	ug/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	84%		50-150%
93951-69-0	Fluoranthene-d10	84%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0012-000.5-20211216		
Lab Sample ID:	FA91824-16	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	13.1
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 16:41	MF	n/a	n/a	R55528
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.34				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0012-000.5-20211216
Lab Sample ID: FA91824-16
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 13.1

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087026.D	1	12/23/21 20:34	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	56.2	51	38	26	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	95%		66-136%
7194-86-7	Nonatriacontane	97%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0012-000.5-20211216
Lab Sample ID: FA91824-16
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 13.1

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	1.8 U	7.3	1.8	0.48	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	6.6	3.7	1.8	0.73	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	8.4 J	73	0.73	0.37	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.18 J	1.8	0.37	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.18 J	1.5	0.37	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	7.8	3.7	0.73	0.37	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	10.8	9.2	0.73	0.37	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	15.3	7.3	1.5	0.37	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.15 J	0.28	0.11	0.028	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	3.0 J	15	0.37	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	1.0 J	7.3	1.8	0.88	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.73 U	3.7	0.73	0.30	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.51 J	3.7	1.8	0.40	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	136	7.3	1.8	1.1	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0012-000.5-20211216		
Lab Sample ID:	FA91824-16	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	13.1
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	13.1				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	197000	7600	6900	6600	mg/kg	1	01/07/22 15:15	ANJ	SW846 9060A

(a) TOC Replicate Range: 170000 - 225000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0013-000.5-20211216		
Lab Sample ID:	FA91824-17	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	38.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079469.D	1	01/04/22 18:50	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12737.D	4	12/28/21 06:07	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2	30.0 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	860 U	2200	860	430	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	86 U	430	86	49	ug/kg	
95-57-8	2-Chlorophenol	86 U	430	86	53	ug/kg	
120-83-2	2,4-Dichlorophenol	86 U	430	86	50	ug/kg	
105-67-9	2,4-Dimethylphenol	170 U	430	170	110	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	1300 U	2200	1300	430	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	350 U	860	350	170	ug/kg	
95-48-7	2-Methylphenol	86 U	430	86	52	ug/kg	
	3&4-Methylphenol	170 U	430	170	71	ug/kg	
88-75-5	2-Nitrophenol	86 U	430	86	47	ug/kg	
100-02-7	4-Nitrophenol [a]	860 U	2200	860	430	ug/kg	
87-86-5	Pentachlorophenol [a]	860 U	2200	860	430	ug/kg	
108-95-2	Phenol	86 U	430	86	43	ug/kg	
95-95-4	2,4,5-Trichlorophenol	86 U	430	86	69	ug/kg	
88-06-2	2,4,6-Trichlorophenol	86 U	430	86	50	ug/kg	
100-51-6	Benzyl Alcohol	86 U	430	86	43	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	86 U	430	86	45	ug/kg	
85-68-7	Butyl benzyl phthalate	170 U	430	170	86	ug/kg	
86-74-8	Carbazole	86 U	430	86	60	ug/kg	
106-47-8	4-Chloroaniline	170 U	430	170	110	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	86 U	430	86	43	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	86 U	430	86	50	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	86 U	430	86	54	ug/kg	
91-58-7	2-Chloronaphthalene	86 U	430	86	43	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	86 U	430	86	43	ug/kg	
132-64-9	Dibenzofuran	86 U	430	86	43	ug/kg	
95-50-1	1,2-Dichlorobenzene	170 U	430	170	43	ug/kg	
541-73-1	1,3-Dichlorobenzene	170 U	430	170	47	ug/kg	
106-46-7	1,4-Dichlorobenzene	170 U	430	170	58	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	170 U	430	170	100	ug/kg	
84-66-2	Diethyl Phthalate	300 U	860	300	86	ug/kg	
131-11-3	Dimethyl Phthalate	170 U	430	170	86	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0013-000.5-20211216		
Lab Sample ID:	FA91824-17	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	38.6
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	170 U	430	170	86	ug/kg	
84-74-2	Di-n-butyl Phthalate	300 U	860	300	170	ug/kg	
121-14-2	2,4-Dinitrotoluene	86 U	430	86	43	ug/kg	
606-20-2	2,6-Dinitrotoluene	86 U	430	86	56	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	300 U	860	300	86	ug/kg	
118-74-1	Hexachlorobenzene	86 U	430	86	44	ug/kg	
87-68-3	Hexachlorobutadiene [a]	170 U	430	170	44	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	690 U [d]	1700	690	350	ug/kg	
67-72-1	Hexachloroethane	170 U	430	170	51	ug/kg	
78-59-1	Isophorone	86 U	430	86	43	ug/kg	
88-74-4	2-Nitroaniline	170 U	430	170	100	ug/kg	
99-09-2	3-Nitroaniline	170 U	430	170	50	ug/kg	
100-01-6	4-Nitroaniline	170 U	430	170	120	ug/kg	
98-95-3	Nitrobenzene	86 U	430	86	43	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	86 U	430	86	43	ug/kg	
86-30-6	N-Nitrosodiphenylamine	170 U	430	170	46	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	86 U	430	86	51	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%	54%	40-102%
4165-62-2	Phenol-d5	65%	61%	41-100%
118-79-6	2,4,6-Tribromophenol	91%	69%	42-108%
4165-60-0	Nitrobenzene-d5	58%	54%	40-105%
321-60-8	2-Fluorobiphenyl	72%	63%	43-107%
1718-51-0	Terphenyl-d14	83%	70%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0013-000.5-20211216
Lab Sample ID: FA91824-17
Matrix: SO - Soil
Method: SW846 8270D BY SIM SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 38.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17100.D	1	12/21/21 17:04	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.2 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	85 U	170	85	68	ug/kg	
208-96-8	Acenaphthylene	85 U	170	85	68	ug/kg	
120-12-7	Anthracene	85 U	170	85	43	ug/kg	
56-55-3	Benzo(a)anthracene	23.8	34	17	8.5	ug/kg	J
50-32-8	Benzo(a)pyrene	26.5	34	17	8.5	ug/kg	J
205-99-2	Benzo(b)fluoranthene	51.6	34	17	8.5	ug/kg	
191-24-2	Benzo(g,h,i)perylene	17.5	34	17	8.5	ug/kg	J
207-08-9	Benzo(k)fluoranthene	16.4	34	17	8.5	ug/kg	J
218-01-9	Chrysene	29.5	34	17	8.5	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	17 U	34	17	8.5	ug/kg	
206-44-0	Fluoranthene	85 U	170	85	43	ug/kg	
86-73-7	Fluorene	85 U	170	85	68	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	19.9	34	17	8.5	ug/kg	J
90-12-0	1-Methylnaphthalene	85 U	170	85	68	ug/kg	
91-57-6	2-Methylnaphthalene	85 U	170	85	68	ug/kg	
91-20-3	Naphthalene	85 U	170	85	68	ug/kg	
85-01-8	Phenanthrene	85 U	170	85	43	ug/kg	
129-00-0	Pyrene	85 U	170	85	43	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	93%		50-150%
93951-69-0	Fluoranthene-d10	96%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0013-000.5-20211216		
Lab Sample ID:	FA91824-17	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	38.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 17:04	MF	n/a	n/a	R55527
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.040				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0013-000.5-20211216
Lab Sample ID: FA91824-17
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 38.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087027.D	1	12/23/21 20:54	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.4 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	10.7	17	13	8.6	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	82%		66-136%
7194-86-7	Nonatriacontane	83%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0013-000.5-20211216
Lab Sample ID: FA91824-17
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 38.6

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.14 J	2.0	0.50	0.13	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	1.4	1.0	0.50	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	2.6 J	20	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.070 J	0.50	0.10	0.050	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.10 U	0.40	0.10	0.050	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	2.9	1.0	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	1.9 J	2.5	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	6.8	2.0	0.40	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.036 J	0.088	0.035	0.0088	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	1.1 J	4.0	0.10	0.050	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.50 U	2.0	0.50	0.24	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.20 U	1.0	0.20	0.082	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.11 J	1.0	0.50	0.11	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	19.3	2.0	0.50	0.30	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0013-000.5-20211216		
Lab Sample ID:	FA91824-17	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	38.6
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	38.6				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	60900	2600	2300	2200	mg/kg	1	01/07/22 15:42	ANJ	SW846 9060A

(a) TOC Replicate Range: 55600 - 71400 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0014-000.5-20211216		
Lab Sample ID:	FA91824-18	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	18.5
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079470.D	1	01/04/22 19:14	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12738.D	4	12/28/21 06:32	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.3 g	1.0 ml
Run #2	30.3 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	1800 U	4500	1800	890	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	180 U	890	180	100	ug/kg	
95-57-8	2-Chlorophenol	180 U	890	180	110	ug/kg	
120-83-2	2,4-Dichlorophenol	180 U	890	180	100	ug/kg	
105-67-9	2,4-Dimethylphenol	360 U	890	360	240	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	2700 U	4500	2700	890	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	710 U	1800	710	360	ug/kg	
95-48-7	2-Methylphenol	180 U	890	180	110	ug/kg	
	3&4-Methylphenol	360 U	890	360	150	ug/kg	
88-75-5	2-Nitrophenol	180 U	890	180	97	ug/kg	
100-02-7	4-Nitrophenol [a]	1800 U	4500	1800	890	ug/kg	
87-86-5	Pentachlorophenol [a]	1800 U	4500	1800	890	ug/kg	
108-95-2	Phenol	180 U	890	180	89	ug/kg	
95-95-4	2,4,5-Trichlorophenol	180 U	890	180	140	ug/kg	
88-06-2	2,4,6-Trichlorophenol	180 U	890	180	100	ug/kg	
100-51-6	Benzyl Alcohol	180 U	890	180	89	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	180 U	890	180	93	ug/kg	
85-68-7	Butyl benzyl phthalate	360 U	890	360	180	ug/kg	
86-74-8	Carbazole	180 U	890	180	120	ug/kg	
106-47-8	4-Chloroaniline	360 U	890	360	220	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	180 U	890	180	89	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	180 U	890	180	100	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	180 U	890	180	110	ug/kg	
91-58-7	2-Chloronaphthalene	180 U	890	180	89	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	180 U	890	180	89	ug/kg	
132-64-9	Dibenzofuran	180 U	890	180	89	ug/kg	
95-50-1	1,2-Dichlorobenzene	360 U	890	360	89	ug/kg	
541-73-1	1,3-Dichlorobenzene	360 U	890	360	96	ug/kg	
106-46-7	1,4-Dichlorobenzene	360 U	890	360	120	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	360 U	890	360	210	ug/kg	
84-66-2	Diethyl Phthalate	620 U	1800	620	180	ug/kg	
131-11-3	Dimethyl Phthalate	360 U	890	360	180	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0014-000.5-20211216		
Lab Sample ID:	FA91824-18	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	18.5
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	360 U	890	360	180	ug/kg	
84-74-2	Di-n-butyl Phthalate	620 U	1800	620	360	ug/kg	
121-14-2	2,4-Dinitrotoluene	180 U	890	180	89	ug/kg	
606-20-2	2,6-Dinitrotoluene	180 U	890	180	120	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	620 U	1800	620	180	ug/kg	
118-74-1	Hexachlorobenzene	180 U	890	180	91	ug/kg	
87-68-3	Hexachlorobutadiene [a]	360 U	890	360	90	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	1400 U [d]	3600	1400	710	ug/kg	
67-72-1	Hexachloroethane	360 U	890	360	110	ug/kg	
78-59-1	Isophorone	180 U	890	180	89	ug/kg	
88-74-4	2-Nitroaniline	360 U	890	360	210	ug/kg	
99-09-2	3-Nitroaniline	360 U	890	360	100	ug/kg	
100-01-6	4-Nitroaniline	360 U	890	360	260	ug/kg	
98-95-3	Nitrobenzene	180 U	890	180	89	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	180 U	890	180	89	ug/kg	
86-30-6	N-Nitrosodiphenylamine	360 U	890	360	96	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	180 U	890	180	110	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	59%	55%	40-102%
4165-62-2	Phenol-d5	65%	62%	41-100%
118-79-6	2,4,6-Tribromophenol	96%	75%	42-108%
4165-60-0	Nitrobenzene-d5	63%	56%	40-105%
321-60-8	2-Fluorobiphenyl	76%	65%	43-107%
1718-51-0	Terphenyl-d14	88%	74%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0014-000.5-20211216
Lab Sample ID: FA91824-18
Matrix: SO - Soil
Method: SW846 8270D BY SIM SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 18.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17101.D	1	12/21/21 17:27	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.3 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	180 U	350	180	140	ug/kg	
208-96-8	Acenaphthylene	180 U	350	180	140	ug/kg	
120-12-7	Anthracene	180 U	350	180	88	ug/kg	
56-55-3	Benzo(a)anthracene	39.7	71	35	18	ug/kg	J
50-32-8	Benzo(a)pyrene	48.6	71	35	18	ug/kg	J
205-99-2	Benzo(b)fluoranthene	98.1	71	35	18	ug/kg	
191-24-2	Benzo(g,h,i)perylene	39.3	71	35	18	ug/kg	J
207-08-9	Benzo(k)fluoranthene	31.5	71	35	18	ug/kg	J
218-01-9	Chrysene	58.6	71	35	18	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	35 U	71	35	18	ug/kg	
206-44-0	Fluoranthene	180 U	350	180	88	ug/kg	
86-73-7	Fluorene	180 U	350	180	140	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	44.2	71	35	18	ug/kg	J
90-12-0	1-Methylnaphthalene	180 U	350	180	140	ug/kg	
91-57-6	2-Methylnaphthalene	180 U	350	180	140	ug/kg	
91-20-3	Naphthalene	180 U	350	180	140	ug/kg	
85-01-8	Phenanthrene	180 U	350	180	88	ug/kg	
129-00-0	Pyrene	180 U	350	180	88	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	83%		50-150%
93951-69-0	Fluoranthene-d10	89%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0014-000.5-20211216		
Lab Sample ID:	FA91824-18	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	18.5
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 17:27	MF	n/a	n/a	R55530
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.076				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0014-000.5-20211216
Lab Sample ID: FA91824-18
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 18.5

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087028.D	1	12/23/21 21:14	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.3 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	19.3	36	27	18	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	81%		66-136%
7194-86-7	Nonatriacontane	81%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0014-000.5-20211216
Lab Sample ID: FA91824-18
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 18.5

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.43 J	4.1	1.0	0.27	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	3.8	2.1	1.0	0.41	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	4.9 J	41	0.41	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.14 J	1.0	0.21	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.21 U	0.83	0.21	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	5.6	2.1	0.41	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	4.3 J	5.2	0.41	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	10.5	4.1	0.83	0.21	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.094 J	0.23	0.090	0.023	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	2.3 J	8.3	0.21	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.62 J	4.1	1.0	0.50	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.41 U	2.1	0.41	0.17	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	1.0 U	2.1	1.0	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	40.5	4.1	1.0	0.62	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0014-000.5-20211216		
Lab Sample ID:	FA91824-18	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	18.5
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	18.5				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	182000	5400	4900	4600	mg/kg	1	01/07/22 16:08	ANJ	SW846 9060A

(a) TOC Replicate Range: 170000 - 194000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0015-000.5-20211216		
Lab Sample ID:	FA91824-19	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	21.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079471.D	1	01/04/22 19:39	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12739.D	4	12/28/21 06:57	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2	30.2 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	1500 U	3800	1500	760	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	150 U	760	150	86	ug/kg	
95-57-8	2-Chlorophenol	150 U	760	150	93	ug/kg	
120-83-2	2,4-Dichlorophenol	150 U	760	150	87	ug/kg	
105-67-9	2,4-Dimethylphenol	300 U	760	300	200	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	2300 U	3800	2300	760	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	610 U	1500	610	300	ug/kg	
95-48-7	2-Methylphenol	150 U	760	150	91	ug/kg	
	3&4-Methylphenol	300 U	760	300	130	ug/kg	
88-75-5	2-Nitrophenol	150 U	760	150	82	ug/kg	
100-02-7	4-Nitrophenol [a]	1500 U	3800	1500	760	ug/kg	
87-86-5	Pentachlorophenol [a]	1500 U	3800	1500	760	ug/kg	
108-95-2	Phenol	150 U	760	150	76	ug/kg	
95-95-4	2,4,5-Trichlorophenol	150 U	760	150	120	ug/kg	
88-06-2	2,4,6-Trichlorophenol	150 U	760	150	88	ug/kg	
100-51-6	Benzyl Alcohol	150 U	760	150	76	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	150 U	760	150	79	ug/kg	
85-68-7	Butyl benzyl phthalate	300 U	760	300	150	ug/kg	
86-74-8	Carbazole	150 U	760	150	110	ug/kg	
106-47-8	4-Chloroaniline	300 U	760	300	190	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	150 U	760	150	76	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	150 U	760	150	88	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	150 U	760	150	96	ug/kg	
91-58-7	2-Chloronaphthalene	150 U	760	150	76	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	150 U	760	150	76	ug/kg	
132-64-9	Dibenzofuran	150 U	760	150	76	ug/kg	
95-50-1	1,2-Dichlorobenzene	300 U	760	300	76	ug/kg	
541-73-1	1,3-Dichlorobenzene	300 U	760	300	82	ug/kg	
106-46-7	1,4-Dichlorobenzene	300 U	760	300	100	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	300 U	760	300	180	ug/kg	
84-66-2	Diethyl Phthalate	530 U	1500	530	150	ug/kg	
131-11-3	Dimethyl Phthalate	300 U	760	300	150	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0015-000.5-20211216		
Lab Sample ID:	FA91824-19	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	21.8
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	300 U	760	300	150	ug/kg	
84-74-2	Di-n-butyl Phthalate	530 U	1500	530	300	ug/kg	
121-14-2	2,4-Dinitrotoluene	150 U	760	150	76	ug/kg	
606-20-2	2,6-Dinitrotoluene	150 U	760	150	98	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	530 U	1500	530	150	ug/kg	
118-74-1	Hexachlorobenzene	150 U	760	150	77	ug/kg	
87-68-3	Hexachlorobutadiene [a]	300 U	760	300	77	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	1200 U [d]	3000	1200	610	ug/kg	
67-72-1	Hexachloroethane	300 U	760	300	89	ug/kg	
78-59-1	Isophorone	150 U	760	150	76	ug/kg	
88-74-4	2-Nitroaniline	300 U	760	300	180	ug/kg	
99-09-2	3-Nitroaniline	300 U	760	300	89	ug/kg	
100-01-6	4-Nitroaniline	300 U	760	300	220	ug/kg	
98-95-3	Nitrobenzene	150 U	760	150	76	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	150 U	760	150	76	ug/kg	
86-30-6	N-Nitrosodiphenylamine	300 U	760	300	82	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	150 U	760	150	89	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%	41%	40-102%
4165-62-2	Phenol-d5	49%	47%	41-100%
118-79-6	2,4,6-Tribromophenol	74%	59%	42-108%
4165-60-0	Nitrobenzene-d5	46%	42%	40-105%
321-60-8	2-Fluorobiphenyl	57%	49%	43-107%
1718-51-0	Terphenyl-d14	70%	60%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0015-000.5-20211216
Lab Sample ID: FA91824-19
Matrix: SO - Soil
Method: SW846 8270D BY SIM SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 21.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17102.D	1	12/21/21 17:50	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	150 U	310	150	120	ug/kg	
208-96-8	Acenaphthylene	150 U	310	150	120	ug/kg	
120-12-7	Anthracene	150 U	310	150	76	ug/kg	
56-55-3	Benzo(a)anthracene	31 U	61	31	15	ug/kg	
50-32-8	Benzo(a)pyrene	31 U	61	31	15	ug/kg	
205-99-2	Benzo(b)fluoranthene	24.8	61	31	15	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	31 U	61	31	15	ug/kg	
207-08-9	Benzo(k)fluoranthene	31 U	61	31	15	ug/kg	
218-01-9	Chrysene	31 U	61	31	15	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	31 U	61	31	15	ug/kg	
206-44-0	Fluoranthene	150 U	310	150	76	ug/kg	
86-73-7	Fluorene	150 U	310	150	120	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	31 U	61	31	15	ug/kg	
90-12-0	1-Methylnaphthalene	150 U	310	150	120	ug/kg	
91-57-6	2-Methylnaphthalene	150 U	310	150	120	ug/kg	
91-20-3	Naphthalene	150 U	310	150	120	ug/kg	
85-01-8	Phenanthrene	150 U	310	150	76	ug/kg	
129-00-0	Pyrene	150 U	310	150	76	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	84%		50-150%
93951-69-0	Fluoranthene-d10	90%		50-150%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0015-000.5-20211216		
Lab Sample ID:	FA91824-19	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	21.8
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 17:50	MF	n/a	n/a	R55529
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.019				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0015-000.5-20211216
Lab Sample ID: FA91824-19
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 21.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087029.D	1	12/23/21 21:33	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.2 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	33.8	31	23	15	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	87%		66-136%
7194-86-7	Nonatriacontane	88%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0015-000.5-20211216
Lab Sample ID: FA91824-19
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 21.8

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.47 J	4.1	1.0	0.26	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	5.6	2.0	1.0	0.41	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	5.6 J	41	0.41	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.14 J	1.0	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.14 J	0.81	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	5.3	2.0	0.41	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	11.2	5.1	0.41	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	9.6	4.1	0.81	0.20	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.085 J	0.15	0.062	0.015	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	2.2 J	8.1	0.20	0.10	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	1.0 U	4.1	1.0	0.49	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.41 U	2.0	0.41	0.17	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	1.0 U	2.0	1.0	0.22	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	107	4.1	1.0	0.61	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0015-000.5-20211216		
Lab Sample ID:	FA91824-19	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	21.8
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	21.8				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	128000	4600	4100	3900	mg/kg	1	01/07/22 16:37	ANJ	SW846 9060A

(a) TOC Replicate Range: 111000 - 154000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0016-000.5-20211216		
Lab Sample ID:	FA91824-20	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	23.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X079472.D	1	01/04/22 20:03	WH	12/27/21 07:00	OP88994	SX3199
Run #2	6F12740.D	4	12/28/21 07:22	NJ	12/27/21 07:00	OP88994	S6F470

	Initial Weight	Final Volume
Run #1	30.2 g	1.0 ml
Run #2	30.2 g	1.0 ml

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
65-85-0	Benzoic Acid	1400 U	3500	1400	700	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	140 U	700	140	79	ug/kg	
95-57-8	2-Chlorophenol	140 U	700	140	86	ug/kg	
120-83-2	2,4-Dichlorophenol	140 U	700	140	81	ug/kg	
105-67-9	2,4-Dimethylphenol	280 U	700	280	190	ug/kg	
51-28-5	2,4-Dinitrophenol [a]	2100 U	3500	2100	700	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	560 U	1400	560	280	ug/kg	
95-48-7	2-Methylphenol	140 U	700	140	84	ug/kg	
	3&4-Methylphenol	280 U	700	280	120	ug/kg	
88-75-5	2-Nitrophenol	140 U	700	140	76	ug/kg	
100-02-7	4-Nitrophenol [a]	1400 U	3500	1400	700	ug/kg	
87-86-5	Pentachlorophenol [a]	1400 U	3500	1400	700	ug/kg	
108-95-2	Phenol	140 U	700	140	70	ug/kg	
95-95-4	2,4,5-Trichlorophenol	140 U	700	140	110	ug/kg	
88-06-2	2,4,6-Trichlorophenol	140 U	700	140	81	ug/kg	
100-51-6	Benzyl Alcohol	140 U	700	140	70	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	140 U	700	140	73	ug/kg	
85-68-7	Butyl benzyl phthalate	280 U	700	280	140	ug/kg	
86-74-8	Carbazole	140 U	700	140	98	ug/kg	
106-47-8	4-Chloroaniline	280 U	700	280	180	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	140 U	700	140	70	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	140 U	700	140	81	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane) [b]	140 U	700	140	88	ug/kg	
91-58-7	2-Chloronaphthalene	140 U	700	140	70	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	140 U	700	140	70	ug/kg	
132-64-9	Dibenzofuran	140 U	700	140	70	ug/kg	
95-50-1	1,2-Dichlorobenzene	280 U	700	280	70	ug/kg	
541-73-1	1,3-Dichlorobenzene	280 U	700	280	76	ug/kg	
106-46-7	1,4-Dichlorobenzene	280 U	700	280	93	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	280 U	700	280	170	ug/kg	
84-66-2	Diethyl Phthalate	490 U	1400	490	140	ug/kg	
131-11-3	Dimethyl Phthalate	280 U	700	280	140	ug/kg	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0016-000.5-20211216		
Lab Sample ID:	FA91824-20	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	23.6
Project:	TQN 118 NASA PRLs; KSC, FL		

ABN Full List w/o PAHs

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
117-84-0	Di-n-octyl Phthalate	280 U	700	280	140	ug/kg	
84-74-2	Di-n-butyl Phthalate	490 U	1400	490	280	ug/kg	
121-14-2	2,4-Dinitrotoluene	140 U	700	140	70	ug/kg	
606-20-2	2,6-Dinitrotoluene	140 U	700	140	90	ug/kg	
117-81-7	bis(2-Ethylhexyl)phthalate	490 U	1400	490	140	ug/kg	
118-74-1	Hexachlorobenzene	140 U	700	140	71	ug/kg	
87-68-3	Hexachlorobutadiene [a]	280 U	700	280	71	ug/kg	
77-47-4	Hexachlorocyclopentadiene [c]	1100 U [d]	2800	1100	560	ug/kg	
67-72-1	Hexachloroethane	280 U	700	280	83	ug/kg	
78-59-1	Isophorone	140 U	700	140	70	ug/kg	
88-74-4	2-Nitroaniline	280 U	700	280	160	ug/kg	
99-09-2	3-Nitroaniline	280 U	700	280	82	ug/kg	
100-01-6	4-Nitroaniline	280 U	700	280	200	ug/kg	
98-95-3	Nitrobenzene	140 U	700	140	70	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	140 U	700	140	70	ug/kg	
86-30-6	N-Nitrosodiphenylamine	280 U	700	280	75	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	140 U	700	140	83	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	44%	41%	40-102%
4165-62-2	Phenol-d5	48%	46%	41-100%
118-79-6	2,4,6-Tribromophenol	69%	52%	42-108%
4165-60-0	Nitrobenzene-d5	47%	41%	40-105%
321-60-8	2-Fluorobiphenyl	55%	49%	43-107%
1718-51-0	Terphenyl-d14	65%	53%	45-119%

(a) Associated CCV outside of control limits high, sample was ND.
(b) Associated CCV outside of control limits low.
(c) Dilution required due to matrix interference.
(d) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0016-000.5-20211216		
Lab Sample ID:	FA91824-20	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM SW846 3546	**Percent Solids:**	23.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	7G17103.D	1	12/21/21 18:13	MF	12/20/21 08:30	OP88907	S7G728
Run #2							

	Initial Weight	Final Volume
Run #1	15.0 g	1.0 ml
Run #2		

BN PAH List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
83-32-9	Acenaphthene	140 U	280	140	110	ug/kg	
208-96-8	Acenaphthylene	140 U	280	140	110	ug/kg	
120-12-7	Anthracene	140 U	280	140	71	ug/kg	
56-55-3	Benzo(a)anthracene	21.9	56	28	14	ug/kg	J
50-32-8	Benzo(a)pyrene	22.2	56	28	14	ug/kg	J
205-99-2	Benzo(b)fluoranthene	46.0	56	28	14	ug/kg	J
191-24-2	Benzo(g,h,i)perylene	15.3	56	28	14	ug/kg	J
207-08-9	Benzo(k)fluoranthene	15.3	56	28	14	ug/kg	J
218-01-9	Chrysene	25.4	56	28	14	ug/kg	J
53-70-3	Dibenzo(a,h)anthracene	28 U	56	28	14	ug/kg	
206-44-0	Fluoranthene	140 U	280	140	71	ug/kg	
86-73-7	Fluorene	140 U	280	140	110	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	17.6	56	28	14	ug/kg	J
90-12-0	1-Methylnaphthalene	140 U	280	140	110	ug/kg	
91-57-6	2-Methylnaphthalene	140 U	280	140	110	ug/kg	
91-20-3	Naphthalene	140 U	280	140	110	ug/kg	
85-01-8	Phenanthrene	140 U	280	140	71	ug/kg	
129-00-0	Pyrene	140 U	280	140	71	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
7297-45-2	2-Methylnaphthalene-d10	81%		50-150%
93951-69-0	Fluoranthene-d10	87%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-SD0016-000.5-20211216		
Lab Sample ID:	FA91824-20	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
Method:	SW846 8270D BY SIM	**Percent Solids:**	23.6
Project:	TQN 118 NASA PRLs; KSC, FL		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1		1	12/21/21 18:13	MF	n/a	n/a	R55524
Run #2							

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	Benzo(a)pyrene Equivalents [a]	0.038				mg/kg	

(a) Total Benzo(a)pyrene Equivalents calculated as per FDEP Conversion Table [Revised 11-26-07]

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0016-000.5-20211216
Lab Sample ID: FA91824-20
Matrix: SO - Soil
Method: FLORIDA-PRO 2018 SW846 3546
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 23.6

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JR0087030.D	1	12/23/21 21:53	KA	12/23/21 11:00	OP88983	GJR393
Run #2							

	Initial Weight	Final Volume
Run #1	20.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
	TPH (C8-C40)	16.0	29	22	14	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	84%		66-136%
7194-86-7	Nonatriacontane	85%		36-132%

U = Not detected LOD = Limit of Detection
LOQ = Limit of Quantitation DL = Detection Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: UNOA-SD0016-000.5-20211216
Lab Sample ID: FA91824-20
Matrix: SO - Soil
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: 23.6

Metals Analysis

Analyte	Result	LOQ	LOD	DL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Antimony	0.23 J	3.5	0.88	0.23	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Arsenic	3.3	1.8	0.88	0.35	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Barium	5.6 J	35	0.35	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Beryllium	0.12 J	0.88	0.18	0.088	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Cadmium	0.11 J	0.70	0.18	0.088	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Chromium	5.6	1.8	0.35	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Copper	4.6	4.4	0.35	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Lead	6.4	3.5	0.70	0.18	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Mercury	0.065 J	0.14	0.056	0.014	mg/kg	1	12/20/21	12/20/21	JC	SW846 7471B [1]	SW846 7471B [3]
Nickel	2.0 J	7.0	0.18	0.088	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Selenium	0.47 J	3.5	0.88	0.42	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Silver	0.35 U	1.8	0.35	0.14	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Thallium	0.88 U	1.8	0.88	0.19	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]
Zinc	68.8	3.5	0.88	0.53	mg/kg	1	12/29/21	12/29/21	DM	SW846 6010C [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA18329
(2) Instrument QC Batch: MA18352
(3) Prep QC Batch: MP40061
(4) Prep QC Batch: MP40091

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID:	UNOA-SD0016-000.5-20211216		
Lab Sample ID:	FA91824-20	**Date Sampled:**	12/16/21
Matrix:	SO - Soil	**Date Received:**	12/17/21
		Percent Solids:	23.6
Project:	TQN 118 NASA PRLs; KSC, FL		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Solids, Percent	23.6				%	1	12/21/21	AK	SM19 2540G
Total Organic Carbon [a]	142000	4200	3800	3600	mg/kg	1	01/07/22 17:02	ANJ	SW846 9060A

(a) TOC Replicate Range: 133000 - 155000 mg/kg Analysis performed at SGS Dayton, NJ.

LOQ = Limit of Quantitation DL = Detection Limit U = Indicates a result < LOD
LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = DL (MDL) but < LOQ

Report of Analysis

Client Sample ID: UNOA-TB-20211216
Lab Sample ID: FA91824-21
Matrix: AQ - Trip Blank Water
Method: SW846 8260B
Project: TQN 118 NASA PRLs; KSC, FL

Date Sampled: 12/16/21
Date Received: 12/17/21
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2P84293.D	1	12/30/21 14:50	CF	n/a	n/a	V2P3363
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
67-64-1	Acetone	20 U	25	20	10	ug/l	
71-43-2	Benzene	0.50 U	1.0	0.50	0.31	ug/l	
108-86-1	Bromobenzene	0.50 U	1.0	0.50	0.37	ug/l	
74-97-5	Bromochloromethane	0.50 U	1.0	0.50	0.45	ug/l	
75-27-4	Bromodichloromethane	0.50 U	1.0	0.50	0.24	ug/l	
75-25-2	Bromoform	0.50 U	1.0	0.50	0.41	ug/l	
78-93-3	2-Butanone (MEK)	3.5 U	5.0	3.5	2.0	ug/l	
104-51-8	n-Butylbenzene	0.50 U	1.0	0.50	0.23	ug/l	
135-98-8	sec-Butylbenzene	0.50 U	1.0	0.50	0.24	ug/l	
98-06-6	tert-Butylbenzene	0.50 U	1.0	0.50	0.31	ug/l	
75-15-0	Carbon Disulfide	1.0 U	2.0	1.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	0.50 U	1.0	0.50	0.36	ug/l	
108-90-7	Chlorobenzene	0.50 U	1.0	0.50	0.20	ug/l	
75-00-3	Chloroethane	1.0 U	2.0	1.0	0.67	ug/l	
67-66-3	Chloroform	0.50 U	1.0	0.50	0.30	ug/l	
95-49-8	o-Chlorotoluene	0.50 U	1.0	0.50	0.22	ug/l	
106-43-4	p-Chlorotoluene	0.50 U	1.0	0.50	0.31	ug/l	
124-48-1	Dibromochloromethane	0.50 U	1.0	0.50	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	2.0 U	5.0	2.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	1.0 U	2.0	1.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	0.50 U	1.0	0.50	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	0.50 U	1.0	0.50	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	0.50 U	1.0	0.50	0.26	ug/l	
75-34-3	1,1-Dichloroethane	0.50 U	1.0	0.50	0.34	ug/l	
107-06-2	1,2-Dichloroethane	0.50 U	1.0	0.50	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	0.50 U	1.0	0.50	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
78-87-5	1,2-Dichloropropane	0.50 U	1.0	0.50	0.43	ug/l	
142-28-9	1,3-Dichloropropane	0.50 U	1.0	0.50	0.31	ug/l	
594-20-7	2,2-Dichloropropane	0.50 U	1.0	0.50	0.24	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-TB-20211216		
Lab Sample ID:	FA91824-21	**Date Sampled:**	12/16/21
Matrix:	AQ - Trip Blank Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
563-58-6	1,1-Dichloropropene	0.50 U	1.0	0.50	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	0.50 U	1.0	0.50	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	0.50 U	1.0	0.50	0.21	ug/l	
100-41-4	Ethylbenzene	0.50 U	1.0	0.50	0.36	ug/l	
87-68-3	Hexachlorobutadiene	1.0 U	2.0	1.0	0.30	ug/l	
591-78-6	2-Hexanone	5.0 U	10	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	0.50 U	1.0	0.50	0.22	ug/l	
99-87-6	p-Isopropyltoluene	0.50 U	1.0	0.50	0.21	ug/l	
74-83-9	Methyl Bromide	4.0 U	5.0	4.0	2.0	ug/l	
74-87-3	Methyl Chloride	1.0 U	2.0	1.0	0.50	ug/l	
74-95-3	Methylene Bromide	0.50 U	2.0	0.50	0.37	ug/l	
75-09-2	Methylene Chloride [b]	4.0 U	5.0	4.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	2.0 U	5.0	2.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	0.50 U	1.0	0.50	0.23	ug/l	
91-20-3	Naphthalene	2.0 U	5.0	2.0	1.0	ug/l	
103-65-1	n-Propylbenzene	0.50 U	1.0	0.50	0.29	ug/l	
100-42-5	Styrene	0.50 U	1.0	0.50	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	0.50 U	1.0	0.50	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	0.50 U	1.0	0.50	0.30	ug/l	
127-18-4	Tetrachloroethylene	0.50 U	1.0	0.50	0.22	ug/l	
108-88-3	Toluene	0.50 U	1.0	0.50	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	1.0 U	2.0	1.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	1.0 U	2.0	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	0.50 U	1.0	0.50	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	0.50 U	1.0	0.50	0.47	ug/l	
79-01-6	Trichloroethylene	0.50 U	1.0	0.50	0.35	ug/l	
75-69-4	Trichlorofluoromethane	1.0 U	2.0	1.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	1.0 U	2.0	1.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	0.50 U	1.0	0.50	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	0.50 U	1.0	0.50	0.27	ug/l	
108-05-4	Vinyl Acetate	5.0 U	10	5.0	2.0	ug/l	
75-01-4	Vinyl Chloride	0.50 U	1.0	0.50	0.41	ug/l	
	m,p-Xylene	1.0 U	2.0	1.0	0.47	ug/l	
95-47-6	o-Xylene	0.50 U	1.0	0.50	0.26	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	97%		83-118%
17060-07-0	1,2-Dichloroethane-D4	96%		79-125%
2037-26-5	Toluene-D8	102%		85-112%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	UNOA-TB-20211216		
Lab Sample ID:	FA91824-21	**Date Sampled:**	12/16/21
Matrix:	AQ - Trip Blank Water	**Date Received:**	12/17/21
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	TQN 118 NASA PRLs; KSC, FL		

VOA 8260 List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	103%		83-118%

(a) Sample analyzed beyond 336 hour holdtime, but within 14 days.
(b) Associated CCV and BS recovery outside DOD QSM control limits low.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL 407-425-6700 FAX 407-425-0707
www.sgs.com

FA91824

SGS - ORLANDO JOB # : PAGE 1 OF 2

SGS - ORLANDO Quote # SKIFF #

Client / Reporting Information

Company Name: HGL, Inc.
Address: 2405 N. Courtney Parkway, STE 203
City: Merrit Island State: FL Zip:32937
Project Contact: Denise Rivers Email:drivers@hgl.com
Phone #:910-233-8460

Project Information

Project Name: PRL 229, RTDA Pond Sampling
Street Kennedy Space Center
City Merritt Island State FL
Project # NS1005.11.04
Fax #
Client Purchase Order #

Sampler(s) Name(s) (Printed)
Sampler 1: Howard Fowler Sampler 2:

Analytical Information

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; OI - Oil; LIQ - Other Liquid; AIR - Air

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY	MATRIX	TOTAL # OF BOTTLES	OTHER	NONE	HCl	NaOH	HNO3	H2SO4	MeOH-ZNA	DI WATER	MEOH	VOCs (8260SL)	AB8270SL	BLV8270SIMPAH	HRD	PM13, Ba	TOC	FLPRO					LAB USE ONLY
1	UNOA-SW0001-000.5-20211216	12/16/21	1040	RL	SW	9			X		X					X	X	X	X	X							
2	UNOA-SW0002-000.5-20211216	12/16/21	1105	RL	SW	9			X		X					X	X	X	X	X							
3	UNOA-SW0003-000.5-20211216	12/16/21	1135	RL	SW	9			X		X					X	X	X	X	X							
4	UNOA-SW0004-000.5-20211216	12/16/21	1200	RL	SW	9			X		X					X	X	X	X	X							
5	UNOA-SW0005-000.5-20211216	12/16/21	1220	RL	SW	9			X		X					X	X	X	X	X							
6	UNOA-SW0006-000.5-20211216	12/16/21	1300	RL	SW	9			X		X					X	X	X	X	X							
7	UNOA-SW0007-000.5-20211216	12/16/21	1325	RL	SW	9			X		X					X	X	X	X	X							
8	UNOA-SW0008-000.5-20211216	12/16/21	1350	RL	SW	9			X		X					X	X	X	X	X							
9	UNOA-SW0009-000.5-20211216	12/16/21	1415	RL	SW	9			X		X					X	X	X	X	X							
10	UNOA-SW0010-000.5-20211216	12/16/21	1435	RL	SW	9			X		X					X	X	X	X	X							
11	UNOA-SD0007-000.5-20211216	12/16/21	1045	RL	SO	2		X									X	X		X	X	X					
12	UNOA-SD0008-000.5-20211216	12/16/21	1110	RL	SO	2		X									X	X		X	X	X					

Turnaround Time (Business days)

X 10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- [ ] COMMERCIAL "A" (RESULTS ONLY)
- [ ] COMMERCIAL "B" (RESULTS PLUS QC)
- [ ] REDT1 (EPA LEVEL 3)
- [ ] FULLT1 (EPA LEVEL 4)
- [ ] EDD'S

Comments / Remarks

INITIAL ASSESSMENT
LABEL VERIFICATION SM

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1		12/17/21 1400	2	3	12/17/21 17:12	4 12/17/21 17:12
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected): 0.4C, 2.8C, 1.4C, 1.4C, 2.0 C IR1 3.2, 2.4

http://www.sgs.com/en/terms-and-conditions

COC PRL-229 Rev 031318

FA91824

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL 407-425-6700 FAX 407-425-0707
www.sgs.com

SGS - ORLANDO JOB # : PAGE 2 OF 2

SGS - ORLANDO Quote # | SKIFF #

Client / Reporting Information

Company Name: HGL, Inc.
Address: 2405 N. Courtney Parkway, STE 203
City: Merrit Island State: FL Zip:32937
Project Contact: Denise Rivers Email:drivers@hgl.com
Phone #:910-233-8460
Sampler(s) Name(s) (Printed)
Sampler 1: Howard Fowler Sampler 2:

Project Information

Project Name: PRL 229, RTDA Pond Sampling
Street Kennedy Space Center
City Merritt Island State FL
Project # NS1005.11.04
Fax #
Client Purchase Order #

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL- Sludge; OI - Oil; LIQ - Other Liquid; AIR - Air

SGS Orlando Sample #	Field ID / Point of Collection	COLLECTION DATE	TIME	SAMPLED BY:	MATRIX	TOTAL # OF BOTTLES	CONTAINER INFORMATION: OTHER	NONE	HCl	NaOH	HNO3	H2SO4	NAOH+ZNA	DI WATER	MEOH	Analytical Information: VOCs (8260SL)	AB8270SL	BLV8270SIMPAH	HRD	PM13, Ba	TOC	FLPRO	LAB USE ONLY
13	UNOA-SD0009-000.5-20211216	12/16/21	1140	RL	SO	2		x									x	x		x	x	x	
14	UNOA-SD0010-000.5-20211216	12/16/21	1205	RL	SO	2		x									x	x		x	x	x	
15	UNOA-SD0011-000.5-20211216	12/16/21	1225	RL	SO	2		x									x	x		x	x	x	
16	UNOA-SD0012-000.5-20211216	12/16/21	1305	RL	SO	2		x									x	x		x	x	x	
17	UNOA-SD0013-000.5-20211216	12/16/21	1330	RL	SO	2		x									x	x		x	x	x	
18	UNOA-SD0014-000.5-20211216	12/16/21	1355	RL	SO	2		x									x	x		x	x	x	
19	UNOA-SD0015-000.5-20211216	12/16/21	1420	RL	SO	2		x									x	x		x	x	x	
20	UNOA-SD0016-000.5-20211216	12/16/21	1440	RL	SO	2		x									x	x		x	x	x	
21	UNOA-TB-20211216-01	12/16/21	1030	RL	WW	2			X							X							

Turnaround Time (Business days)

X 10 Day (Business) Approved By: / Date:
7 Day
5 Day
3 Day *RUSH*
2 Day *RUSH*
1 Day *RUSH*
Other
Rush T/A Data Available VIA Email or Lablink

Data Deliverable Information

- ☐ COMMERCIAL "A" (RESULTS ONLY)
- ☐ COMMERCIAL "B" (RESULTS PLUS QC)
- ☐ REDT1 (EPA LEVEL 3)
- ☐ FULLT1 (EPA LEVEL 4)
- ☐ EDD'S

Comments / Remarks

Sample Custody must be documented below each time samples change possession, including courier delivery.

	Relinquished by Sampler/Affiliation	Date Time:	Received By/Affiliation	Relinquished By/Affiliation	Date Time:	Received By/Affiliation
1		12/17/21 1402	2	3	12/17/21 17:12	4 12/17/21 1712
5	Relinquished by/Affiliation	Date Time:	6 Received By/Affiliation	7 Relinquished By/Affiliation	Date Time:	8 Received By/Affiliation

Lab Use Only : Cooler Temperature (s) Celsius (corrected):

http://www.sgs.com/en/terms-and-conditions

COC PRL-229 Rev 031318

SGS Sample Receipt Summary

Job Number: FA91824 **Client:** HGL **Project:** PRL 229, RTDA POND SAMPLING

Date / Time Received: 12/17/2021 5:12:00 PM **Delivery Method:** COURIER **Airbill #'s:**

Therm ID: IR 1; **Therm CF:** 0.2; **# of Coolers:** 7

Cooler Temps (Raw Measured) °C: Cooler 1: (0.4); Cooler 2: (2.8); Cooler 3: (1.4); Cooler 4: (1.4); Cooler 5: (2.0); Cooler 6: (3.2); Cooler 7: (2.4);

Cooler Temps (Corrected) °C: Cooler 1: (0.6); Cooler 2: (3.0); Cooler 3: (1.6); Cooler 4: (1.6); Cooler 5: (2.2); Cooler 6: (3.4); Cooler 7: (2.6);

Cooler Information	Y	or	N
1. Custody Seals Present	☑		☐
2. Custody Seals Intact	☑		☐
3. Temp criteria achieved	☑		☐
4. Cooler temp verification	IR Gun		
5. Cooler media	Ice (Bag)		

Trip Blank Information	Y	or	N	N/A
1. Trip Blank present / cooler	☐		☐	☑
2. Trip Blank listed on COC	☐		☐	☑

	W	or	S	N/A
3. Type Of TB Received	☐		☐	☑

Sample Information	Y	or	N	N/A
1. Sample labels present on bottles	☑		☐	
2. Samples preserved properly	☑		☐	
3. Sufficient volume/containers recvd for analysis:	☑		☐	
4. Condition of sample	Intact			
5. Sample recvd within HT	☑		☐	
6. Dates/Times/IDs on COC match Sample Label	☑		☐	
7. VOCs have headspace	☐		☑	☐
8. Bottles received for unspecified tests	☐		☑	
9. Compositing instructions clear	☐		☐	☑
10. Voa Soil Kits/Jars received past 48hrs?	☐		☐	☑
11. % Solids Jar received?	☐		☐	☑
12. Residual Chlorine Present?	☐		☐	☑

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____ Number of 5035 Field Kits: _____ Number of Lab Filtered Metals: _____

Test Strip Lot #s: pH 0-3 230315 pH 10-12 219813A Other: (Specify) _____ _____

Residual Chlorine Test Strip Lot #: _____

Comments

SM001
Rev. Date 05/24/17

Technician: NATHANS Date: 12/17/2021 5:12:00 P Reviewer: _____ Date: _____

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
V2P3363	SW846 8260B						
V2P3363-BS	67-64-1	Acetone	BSP	REC	89	%	39-160
V2P3363-BS	71-43-2	Benzene	BSP	REC	101	%	79-120
V2P3363-BS	108-86-1	Bromobenzene	BSP	REC	106	%	80-120
V2P3363-BS	74-97-5	Bromochloromethane	BSP	REC	89	%	78-123
V2P3363-BS	75-27-4	Bromodichloromethane	BSP	REC	96	%	79-125
V2P3363-BS	75-25-2	Bromoform	BSP	REC	94	%	66-130
V2P3363-BS	78-93-3	2-Butanone (MEK)	BSP	REC	87	%	56-143
V2P3363-BS	104-51-8	n-Butylbenzene	BSP	REC	99	%	75-128
V2P3363-BS	135-98-8	sec-Butylbenzene	BSP	REC	111	%	77-126
V2P3363-BS	98-06-6	tert-Butylbenzene	BSP	REC	111	%	78-124
V2P3363-BS	75-15-0	Carbon Disulfide	BSP	REC	84	%	64-133
V2P3363-BS	56-23-5	Carbon Tetrachloride	BSP	REC	103	%	72-136
V2P3363-BS	108-90-7	Chlorobenzene	BSP	REC	104	%	82-118
V2P3363-BS	75-00-3	Chloroethane	BSP	REC	134	%	60-138
V2P3363-BS	67-66-3	Chloroform	BSP	REC	98	%	79-124
V2P3363-BS	95-49-8	o-Chlorotoluene	BSP	REC	107	%	79-122
V2P3363-BS	106-43-4	p-Chlorotoluene	BSP	REC	105	%	78-122
V2P3363-BS	124-48-1	Dibromochloromethane	BSP	REC	97	%	74-126
V2P3363-BS	96-12-8	1,2-Dibromo-3-chloropropane	BSP	REC	94	%	62-128
V2P3363-BS	106-93-4	1,2-Dibromoethane	BSP	REC	102	%	77-121
V2P3363-BS	75-71-8	Dichlorodifluoromethane	BSP	REC	80	%	32-152
V2P3363-BS	95-50-1	1,2-Dichlorobenzene	BSP	REC	107	%	80-119
V2P3363-BS	541-73-1	1,3-Dichlorobenzene	BSP	REC	110	%	80-119
V2P3363-BS	106-46-7	1,4-Dichlorobenzene	BSP	REC	105	%	79-118
V2P3363-BS	75-34-3	1,1-Dichloroethane	BSP	REC	98	%	77-125
V2P3363-BS	107-06-2	1,2-Dichloroethane	BSP	REC	99	%	73-128
V2P3363-BS	75-35-4	1,1-Dichloroethylene	BSP	REC	102	%	71-131
V2P3363-BS	156-59-2	cis-1,2-Dichloroethylene	BSP	REC	100	%	78-123
V2P3363-BS	156-60-5	trans-1,2-Dichloroethylene	BSP	REC	100	%	75-124
V2P3363-BS	78-87-5	1,2-Dichloropropane	BSP	REC	94	%	78-122
V2P3363-BS	142-28-9	1,3-Dichloropropane	BSP	REC	99	%	80-119
V2P3363-BS	594-20-7	2,2-Dichloropropane	BSP	REC	90	%	60-139
V2P3363-BS	563-58-6	1,1-Dichloropropene	BSP	REC	102	%	79-125
V2P3363-BS	10061-01-5	cis-1,3-Dichloropropene	BSP	REC	93	%	75-124
V2P3363-BS	10061-02-6	trans-1,3-Dichloropropene	BSP	REC	99	%	73-127
V2P3363-BS	100-41-4	Ethylbenzene	BSP	REC	108	%	79-121
V2P3363-BS	87-68-3	Hexachlorobutadiene	BSP	REC	111	%	66-134
V2P3363-BS	591-78-6	2-Hexanone	BSP	REC	94	%	57-139
V2P3363-BS	98-82-8	Isopropylbenzene	BSP	REC	106	%	72-131
V2P3363-BS	99-87-6	p-Isopropyltoluene	BSP	REC	109	%	77-127
V2P3363-BS	74-83-9	Methyl Bromide	BSP	REC	83	%	53-141
V2P3363-BS	74-87-3	Methyl Chloride	BSP	REC	79	%	50-139

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
V2P3363-BS	74-95-3	Methylene Bromide	BSP	REC	90	%	79-123
V2P3363-BS	75-09-2	Methylene Chloride	BSP	REC	72	%	74-124
V2P3363-BS	108-10-1	4-Methyl-2-pentanone (MIBK)	BSP	REC	94	%	67-130
V2P3363-BS	1634-04-4	Methyl Tert Butyl Ether	BSP	REC	90	%	71-124
V2P3363-BS	91-20-3	Naphthalene	BSP	REC	104	%	61-128
V2P3363-BS	103-65-1	n-Propylbenzene	BSP	REC	106	%	76-126
V2P3363-BS	100-42-5	Styrene	BSP	REC	104	%	78-123
V2P3363-BS	630-20-6	1,1,1,2-Tetrachloroethane	BSP	REC	109	%	78-124
V2P3363-BS	79-34-5	1,1,2,2-Tetrachloroethane	BSP	REC	101	%	71-121
V2P3363-BS	127-18-4	Tetrachloroethylene	BSP	REC	112	%	74-129
V2P3363-BS	108-88-3	Toluene	BSP	REC	107	%	80-121
V2P3363-BS	87-61-6	1,2,3-Trichlorobenzene	BSP	REC	108	%	69-129
V2P3363-BS	120-82-1	1,2,4-Trichlorobenzene	BSP	REC	106	%	69-130
V2P3363-BS	71-55-6	1,1,1-Trichloroethane	BSP	REC	100	%	74-131
V2P3363-BS	79-00-5	1,1,2-Trichloroethane	BSP	REC	104	%	80-119
V2P3363-BS	79-01-6	Trichloroethylene	BSP	REC	96	%	79-123
V2P3363-BS	75-69-4	Trichlorofluoromethane	BSP	REC	118	%	65-141
V2P3363-BS	96-18-4	1,2,3-Trichloropropane	BSP	REC	104	%	73-122
V2P3363-BS	95-63-6	1,2,4-Trimethylbenzene	BSP	REC	106	%	76-124
V2P3363-BS	108-67-8	1,3,5-Trimethylbenzene	BSP	REC	109	%	75-124
V2P3363-BS	108-05-4	Vinyl Acetate	BSP	REC	90	%	54-146
V2P3363-BS	75-01-4	Vinyl Chloride	BSP	REC	91	%	58-137
V2P3363-BS		m,p-Xylene	BSP	REC	107	%	80-121
V2P3363-BS	95-47-6	o-Xylene	BSP	REC	106	%	78-122
V2P3363-BS	1868-53-7	Dibromofluoromethane	BSP	SURR	100	%	80-119
V2P3363-BS	17060-07-0	1,2-Dichloroethane-D4	BSP	SURR	102	%	81-118
V2P3363-BS	2037-26-5	Toluene-D8	BSP	SURR	103	%	89-112
V2P3363-BS	460-00-4	4-Bromofluorobenzene	BSP	SURR	101	%	85-114
FA91807-5MS*	67-64-1	Acetone	MS	REC	87	%	39-160
FA91807-5MS*	71-43-2	Benzene	MS	REC	100	%	79-120
FA91807-5MS*	108-86-1	Bromobenzene	MS	REC	110	%	80-120
FA91807-5MS*	74-97-5	Bromochloromethane	MS	REC	90	%	78-123
FA91807-5MS*	75-27-4	Bromodichloromethane	MS	REC	95	%	79-125
FA91807-5MS*	75-25-2	Bromoform	MS	REC	99	%	66-130
FA91807-5MS*	78-93-3	2-Butanone (MEK)	MS	REC	85	%	56-143
FA91807-5MS*	104-51-8	n-Butylbenzene	MS	REC	96	%	75-128
FA91807-5MS*	135-98-8	sec-Butylbenzene	MS	REC	108	%	77-126
FA91807-5MS*	98-06-6	tert-Butylbenzene	MS	REC	105	%	78-124
FA91807-5MS*	75-15-0	Carbon Disulfide	MS	REC	85	%	64-133
FA91807-5MS*	56-23-5	Carbon Tetrachloride	MS	REC	102	%	72-136
FA91807-5MS*	108-90-7	Chlorobenzene	MS	REC	105	%	82-118
FA91807-5MS*	75-00-3	Chloroethane	MS	REC	127	%	60-138
FA91807-5MS*	67-66-3	Chloroform	MS	REC	97	%	79-124
FA91807-5MS*	95-49-8	o-Chlorotoluene	MS	REC	102	%	79-122
FA91807-5MS*	106-43-4	p-Chlorotoluene	MS	REC	103	%	78-122

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91807-5MS*	124-48-1	Dibromochloromethane	MS	REC	99	%	74-126
FA91807-5MS*	96-12-8	1,2-Dibromo-3-chloropropane	MS	REC	95	%	62-128
FA91807-5MS*	106-93-4	1,2-Dibromoethane	MS	REC	102	%	77-121
FA91807-5MS*	75-71-8	Dichlorodifluoromethane	MS	REC	81	%	32-152
FA91807-5MS*	95-50-1	1,2-Dichlorobenzene	MS	REC	106	%	80-119
FA91807-5MS*	541-73-1	1,3-Dichlorobenzene	MS	REC	110	%	80-119
FA91807-5MS*	106-46-7	1,4-Dichlorobenzene	MS	REC	104	%	79-118
FA91807-5MS*	75-34-3	1,1-Dichloroethane	MS	REC	95	%	77-125
FA91807-5MS*	107-06-2	1,2-Dichloroethane	MS	REC	98	%	73-128
FA91807-5MS*	75-35-4	1,1-Dichloroethylene	MS	REC	99	%	71-131
FA91807-5MS*	156-59-2	cis-1,2-Dichloroethylene	MS	REC	98	%	78-123
FA91807-5MS*	156-60-5	trans-1,2-Dichloroethylene	MS	REC	95	%	75-124
FA91807-5MS*	78-87-5	1,2-Dichloropropane	MS	REC	94	%	78-122
FA91807-5MS*	142-28-9	1,3-Dichloropropane	MS	REC	97	%	80-119
FA91807-5MS*	594-20-7	2,2-Dichloropropane	MS	REC	90	%	60-139
FA91807-5MS*	563-58-6	1,1-Dichloropropene	MS	REC	98	%	79-125
FA91807-5MS*	10061-01-5	cis-1,3-Dichloropropene	MS	REC	92	%	75-124
FA91807-5MS*	10061-02-6	trans-1,3-Dichloropropene	MS	REC	98	%	73-127
FA91807-5MS*	100-41-4	Ethylbenzene	MS	REC	106	%	79-121
FA91807-5MS*	87-68-3	Hexachlorobutadiene	MS	REC	109	%	66-134
FA91807-5MS*	591-78-6	2-Hexanone	MS	REC	94	%	57-139
FA91807-5MS*	98-82-8	Isopropylbenzene	MS	REC	105	%	72-131
FA91807-5MS*	99-87-6	p-Isopropyltoluene	MS	REC	106	%	77-127
FA91807-5MS*	74-83-9	Methyl Bromide	MS	REC	89	%	53-141
FA91807-5MS*	74-87-3	Methyl Chloride	MS	REC	82	%	50-139
FA91807-5MS*	74-95-3	Methylene Bromide	MS	REC	91	%	79-123
FA91807-5MS*	75-09-2	Methylene Chloride	MS	REC	67	%	74-124
FA91807-5MS*	108-10-1	4-Methyl-2-pentanone (MIBK)	MS	REC	92	%	67-130
FA91807-5MS*	1634-04-4	Methyl Tert Butyl Ether	MS	REC	89	%	71-124
FA91807-5MS*	91-20-3	Naphthalene	MS	REC	105	%	61-128
FA91807-5MS*	103-65-1	n-Propylbenzene	MS	REC	103	%	76-126
FA91807-5MS*	100-42-5	Styrene	MS	REC	104	%	78-123
FA91807-5MS*	630-20-6	1,1,1,2-Tetrachloroethane	MS	REC	109	%	78-124
FA91807-5MS*	79-34-5	1,1,2,2-Tetrachloroethane	MS	REC	98	%	71-121
FA91807-5MS*	127-18-4	Tetrachloroethylene	MS	REC	104	%	74-129
FA91807-5MS*	108-88-3	Toluene	MS	REC	105	%	80-121
FA91807-5MS*	87-61-6	1,2,3-Trichlorobenzene	MS	REC	110	%	69-129
FA91807-5MS*	120-82-1	1,2,4-Trichlorobenzene	MS	REC	108	%	69-130
FA91807-5MS*	71-55-6	1,1,1-Trichloroethane	MS	REC	101	%	74-131
FA91807-5MS*	79-00-5	1,1,2-Trichloroethane	MS	REC	102	%	80-119
FA91807-5MS*	79-01-6	Trichloroethylene	MS	REC	98	%	79-123
FA91807-5MS*	75-69-4	Trichlorofluoromethane	MS	REC	120	%	65-141
FA91807-5MS*	96-18-4	1,2,3-Trichloropropane	MS	REC	102	%	73-122
FA91807-5MS*	95-63-6	1,2,4-Trimethylbenzene	MS	REC	101	%	76-124
FA91807-5MS*	108-67-8	1,3,5-Trimethylbenzene	MS	REC	107	%	75-124

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91807-5MS*	108-05-4	Vinyl Acetate	MS	REC	89	%	54-146
FA91807-5MS*	75-01-4	Vinyl Chloride	MS	REC	92	%	58-137
FA91807-5MS*		m,p-Xylene	MS	REC	106	%	80-121
FA91807-5MS*	95-47-6	o-Xylene	MS	REC	106	%	78-122
FA91807-5MS*	1868-53-7	Dibromofluoromethane	MS	SURR	101	%	80-119
FA91807-5MS*	17060-07-0	1,2-Dichloroethane-D4	MS	SURR	101	%	81-118
FA91807-5MS*	2037-26-5	Toluene-D8	MS	SURR	100	%	89-112
FA91807-5MS*	460-00-4	4-Bromofluorobenzene	MS	SURR	103	%	85-114
FA91807-5MSD*	67-64-1	Acetone	MSD	REC	90	%	39-160
FA91807-5MSD*	67-64-1	Acetone	MSD	RPD	3	%	20
FA91807-5MSD*	71-43-2	Benzene	MSD	REC	100	%	79-120
FA91807-5MSD*	71-43-2	Benzene	MSD	RPD	0	%	20
FA91807-5MSD*	108-86-1	Bromobenzene	MSD	REC	108	%	80-120
FA91807-5MSD*	108-86-1	Bromobenzene	MSD	RPD	2	%	20
FA91807-5MSD*	74-97-5	Bromochloromethane	MSD	REC	89	%	78-123
FA91807-5MSD*	74-97-5	Bromochloromethane	MSD	RPD	2	%	20
FA91807-5MSD*	75-27-4	Bromodichloromethane	MSD	REC	96	%	79-125
FA91807-5MSD*	75-27-4	Bromodichloromethane	MSD	RPD	1	%	20
FA91807-5MSD*	75-25-2	Bromoform	MSD	REC	95	%	66-130
FA91807-5MSD*	75-25-2	Bromoform	MSD	RPD	4	%	20
FA91807-5MSD*	78-93-3	2-Butanone (MEK)	MSD	REC	87	%	56-143
FA91807-5MSD*	78-93-3	2-Butanone (MEK)	MSD	RPD	3	%	20
FA91807-5MSD*	104-51-8	n-Butylbenzene	MSD	REC	95	%	75-128
FA91807-5MSD*	104-51-8	n-Butylbenzene	MSD	RPD	1	%	20
FA91807-5MSD*	135-98-8	sec-Butylbenzene	MSD	REC	108	%	77-126
FA91807-5MSD*	135-98-8	sec-Butylbenzene	MSD	RPD	0	%	20
FA91807-5MSD*	98-06-6	tert-Butylbenzene	MSD	REC	107	%	78-124
FA91807-5MSD*	98-06-6	tert-Butylbenzene	MSD	RPD	2	%	20
FA91807-5MSD*	75-15-0	Carbon Disulfide	MSD	REC	84	%	64-133
FA91807-5MSD*	75-15-0	Carbon Disulfide	MSD	RPD	1	%	20
FA91807-5MSD*	56-23-5	Carbon Tetrachloride	MSD	REC	104	%	72-136
FA91807-5MSD*	56-23-5	Carbon Tetrachloride	MSD	RPD	2	%	20
FA91807-5MSD*	108-90-7	Chlorobenzene	MSD	REC	104	%	82-118
FA91807-5MSD*	108-90-7	Chlorobenzene	MSD	RPD	1	%	20
FA91807-5MSD*	75-00-3	Chloroethane	MSD	REC	127	%	60-138
FA91807-5MSD*	75-00-3	Chloroethane	MSD	RPD	0	%	20
FA91807-5MSD*	67-66-3	Chloroform	MSD	REC	95	%	79-124
FA91807-5MSD*	67-66-3	Chloroform	MSD	RPD	2	%	20
FA91807-5MSD*	95-49-8	o-Chlorotoluene	MSD	REC	102	%	79-122
FA91807-5MSD*	95-49-8	o-Chlorotoluene	MSD	RPD	0	%	20
FA91807-5MSD*	106-43-4	p-Chlorotoluene	MSD	REC	102	%	78-122
FA91807-5MSD*	106-43-4	p-Chlorotoluene	MSD	RPD	1	%	20
FA91807-5MSD*	124-48-1	Dibromochloromethane	MSD	REC	97	%	74-126
FA91807-5MSD*	124-48-1	Dibromochloromethane	MSD	RPD	2	%	20
FA91807-5MSD*	96-12-8	1,2-Dibromo-3-chloropropane	MSD	REC	94	%	62-128

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91807-5MSD*	96-12-8	1,2-Dibromo-3-chloropropane	MSD	RPD	2	%	20
FA91807-5MSD*	106-93-4	1,2-Dibromoethane	MSD	REC	104	%	77-121
FA91807-5MSD*	106-93-4	1,2-Dibromoethane	MSD	RPD	2	%	20
FA91807-5MSD*	75-71-8	Dichlorodifluoromethane	MSD	REC	80	%	32-152
FA91807-5MSD*	75-71-8	Dichlorodifluoromethane	MSD	RPD	0	%	20
FA91807-5MSD*	95-50-1	1,2-Dichlorobenzene	MSD	REC	106	%	80-119
FA91807-5MSD*	95-50-1	1,2-Dichlorobenzene	MSD	RPD	0	%	20
FA91807-5MSD*	541-73-1	1,3-Dichlorobenzene	MSD	REC	108	%	80-119
FA91807-5MSD*	541-73-1	1,3-Dichlorobenzene	MSD	RPD	1	%	20
FA91807-5MSD*	106-46-7	1,4-Dichlorobenzene	MSD	REC	104	%	79-118
FA91807-5MSD*	106-46-7	1,4-Dichlorobenzene	MSD	RPD	0	%	20
FA91807-5MSD*	75-34-3	1,1-Dichloroethane	MSD	REC	96	%	77-125
FA91807-5MSD*	75-34-3	1,1-Dichloroethane	MSD	RPD	0	%	20
FA91807-5MSD*	107-06-2	1,2-Dichloroethane	MSD	REC	97	%	73-128
FA91807-5MSD*	107-06-2	1,2-Dichloroethane	MSD	RPD	1	%	20
FA91807-5MSD*	75-35-4	1,1-Dichloroethylene	MSD	REC	98	%	71-131
FA91807-5MSD*	75-35-4	1,1-Dichloroethylene	MSD	RPD	1	%	20
FA91807-5MSD*	156-59-2	cis-1,2-Dichloroethylene	MSD	REC	99	%	78-123
FA91807-5MSD*	156-59-2	cis-1,2-Dichloroethylene	MSD	RPD	1	%	20
FA91807-5MSD*	156-60-5	trans-1,2-Dichloroethylene	MSD	REC	95	%	75-124
FA91807-5MSD*	156-60-5	trans-1,2-Dichloroethylene	MSD	RPD	0	%	20
FA91807-5MSD*	78-87-5	1,2-Dichloropropane	MSD	REC	94	%	78-122
FA91807-5MSD*	78-87-5	1,2-Dichloropropane	MSD	RPD	1	%	20
FA91807-5MSD*	142-28-9	1,3-Dichloropropane	MSD	REC	98	%	80-119
FA91807-5MSD*	142-28-9	1,3-Dichloropropane	MSD	RPD	0	%	20
FA91807-5MSD*	594-20-7	2,2-Dichloropropane	MSD	REC	87	%	60-139
FA91807-5MSD*	594-20-7	2,2-Dichloropropane	MSD	RPD	3	%	20
FA91807-5MSD*	563-58-6	1,1-Dichloropropene	MSD	REC	99	%	79-125
FA91807-5MSD*	563-58-6	1,1-Dichloropropene	MSD	RPD	0	%	20
FA91807-5MSD*	10061-01-5	cis-1,3-Dichloropropene	MSD	REC	90	%	75-124
FA91807-5MSD*	10061-01-5	cis-1,3-Dichloropropene	MSD	RPD	2	%	20
FA91807-5MSD*	10061-02-6	trans-1,3-Dichloropropene	MSD	REC	96	%	73-127
FA91807-5MSD*	10061-02-6	trans-1,3-Dichloropropene	MSD	RPD	1	%	20
FA91807-5MSD*	100-41-4	Ethylbenzene	MSD	REC	104	%	79-121
FA91807-5MSD*	100-41-4	Ethylbenzene	MSD	RPD	2	%	20
FA91807-5MSD*	87-68-3	Hexachlorobutadiene	MSD	REC	110	%	66-134
FA91807-5MSD*	87-68-3	Hexachlorobutadiene	MSD	RPD	0	%	20
FA91807-5MSD*	591-78-6	2-Hexanone	MSD	REC	95	%	57-139
FA91807-5MSD*	591-78-6	2-Hexanone	MSD	RPD	2	%	20
FA91807-5MSD*	98-82-8	Isopropylbenzene	MSD	REC	104	%	72-131
FA91807-5MSD*	98-82-8	Isopropylbenzene	MSD	RPD	1	%	20
FA91807-5MSD*	99-87-6	p-Isopropyltoluene	MSD	REC	105	%	77-127
FA91807-5MSD*	99-87-6	p-Isopropyltoluene	MSD	RPD	1	%	20
FA91807-5MSD*	74-83-9	Methyl Bromide	MSD	REC	94	%	53-141
FA91807-5MSD*	74-83-9	Methyl Bromide	MSD	RPD	5	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91807-5MSD*	74-87-3	Methyl Chloride	MSD	REC	81	%	50-139
FA91807-5MSD*	74-87-3	Methyl Chloride	MSD	RPD	2	%	20
FA91807-5MSD*	74-95-3	Methylene Bromide	MSD	REC	89	%	79-123
FA91807-5MSD*	74-95-3	Methylene Bromide	MSD	RPD	3	%	20
FA91807-5MSD*	75-09-2	Methylene Chloride	MSD	REC	68	%	74-124
FA91807-5MSD*	75-09-2	Methylene Chloride	MSD	RPD	2	%	20
FA91807-5MSD*	108-10-1	4-Methyl-2-pentanone (MIBK)	MSD	REC	95	%	67-130
FA91807-5MSD*	108-10-1	4-Methyl-2-pentanone (MIBK)	MSD	RPD	3	%	20
FA91807-5MSD*	1634-04-4	Methyl Tert Butyl Ether	MSD	REC	90	%	71-124
FA91807-5MSD*	1634-04-4	Methyl Tert Butyl Ether	MSD	RPD	0	%	20
FA91807-5MSD*	91-20-3	Naphthalene	MSD	REC	102	%	61-128
FA91807-5MSD*	91-20-3	Naphthalene	MSD	RPD	3	%	20
FA91807-5MSD*	103-65-1	n-Propylbenzene	MSD	REC	102	%	76-126
FA91807-5MSD*	103-65-1	n-Propylbenzene	MSD	RPD	1	%	20
FA91807-5MSD*	100-42-5	Styrene	MSD	REC	102	%	78-123
FA91807-5MSD*	100-42-5	Styrene	MSD	RPD	1	%	20
FA91807-5MSD*	630-20-6	1,1,1,2-Tetrachloroethane	MSD	REC	106	%	78-124
FA91807-5MSD*	630-20-6	1,1,1,2-Tetrachloroethane	MSD	RPD	2	%	20
FA91807-5MSD*	79-34-5	1,1,2,2-Tetrachloroethane	MSD	REC	100	%	71-121
FA91807-5MSD*	79-34-5	1,1,2,2-Tetrachloroethane	MSD	RPD	2	%	20
FA91807-5MSD*	127-18-4	Tetrachloroethylene	MSD	REC	106	%	74-129
FA91807-5MSD*	127-18-4	Tetrachloroethylene	MSD	RPD	2	%	20
FA91807-5MSD*	108-88-3	Toluene	MSD	REC	104	%	80-121
FA91807-5MSD*	108-88-3	Toluene	MSD	RPD	1	%	20
FA91807-5MSD*	87-61-6	1,2,3-Trichlorobenzene	MSD	REC	108	%	69-129
FA91807-5MSD*	87-61-6	1,2,3-Trichlorobenzene	MSD	RPD	2	%	20
FA91807-5MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	REC	104	%	69-130
FA91807-5MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	RPD	4	%	20
FA91807-5MSD*	71-55-6	1,1,1-Trichloroethane	MSD	REC	100	%	74-131
FA91807-5MSD*	71-55-6	1,1,1-Trichloroethane	MSD	RPD	1	%	20
FA91807-5MSD*	79-00-5	1,1,2-Trichloroethane	MSD	REC	102	%	80-119
FA91807-5MSD*	79-00-5	1,1,2-Trichloroethane	MSD	RPD	1	%	20
FA91807-5MSD*	79-01-6	Trichloroethylene	MSD	REC	95	%	79-123
FA91807-5MSD*	79-01-6	Trichloroethylene	MSD	RPD	3	%	20
FA91807-5MSD*	75-69-4	Trichlorofluoromethane	MSD	REC	116	%	65-141
FA91807-5MSD*	75-69-4	Trichlorofluoromethane	MSD	RPD	3	%	20
FA91807-5MSD*	96-18-4	1,2,3-Trichloropropane	MSD	REC	101	%	73-122
FA91807-5MSD*	96-18-4	1,2,3-Trichloropropane	MSD	RPD	1	%	20
FA91807-5MSD*	95-63-6	1,2,4-Trimethylbenzene	MSD	REC	102	%	76-124
FA91807-5MSD*	95-63-6	1,2,4-Trimethylbenzene	MSD	RPD	0	%	20
FA91807-5MSD*	108-67-8	1,3,5-Trimethylbenzene	MSD	REC	107	%	75-124
FA91807-5MSD*	108-67-8	1,3,5-Trimethylbenzene	MSD	RPD	0	%	20
FA91807-5MSD*	108-05-4	Vinyl Acetate	MSD	REC	90	%	54-146
FA91807-5MSD*	108-05-4	Vinyl Acetate	MSD	RPD	2	%	20
FA91807-5MSD*	75-01-4	Vinyl Chloride	MSD	REC	92	%	58-137

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91807-5MSD*	75-01-4	Vinyl Chloride	MSD	RPD	0	%	20
FA91807-5MSD*		m,p-Xylene	MSD	REC	104	%	80-121
FA91807-5MSD*		m,p-Xylene	MSD	RPD	2	%	20
FA91807-5MSD*	95-47-6	o-Xylene	MSD	REC	104	%	78-122
FA91807-5MSD*	95-47-6	o-Xylene	MSD	RPD	1	%	20
FA91807-5MSD*	1868-53-7	Dibromofluoromethane	MSD	SURR	101	%	80-119
FA91807-5MSD*	17060-07-0	1,2-Dichloroethane-D4	MSD	SURR	101	%	81-118
FA91807-5MSD*	2037-26-5	Toluene-D8	MSD	SURR	102	%	89-112
FA91807-5MSD*	460-00-4	4-Bromofluorobenzene	MSD	SURR	103	%	85-114
V2P3363-MB	1868-53-7	Dibromofluoromethane	MB	SURR	95	%	80-119
V2P3363-MB	17060-07-0	1,2-Dichloroethane-D4	MB	SURR	102	%	81-118
V2P3363-MB	2037-26-5	Toluene-D8	MB	SURR	105	%	89-112
V2P3363-MB	460-00-4	4-Bromofluorobenzene	MB	SURR	102	%	85-114
FA91824-21	1868-53-7	Dibromofluoromethane	SAMP	SURR	97	%	80-119
FA91824-21	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	96	%	81-118
FA91824-21	2037-26-5	Toluene-D8	SAMP	SURR	102	%	89-112
FA91824-21	460-00-4	4-Bromofluorobenzene	SAMP	SURR	103	%	85-114
VI2420	SW846 8260B						
VI2420-BS	67-64-1	Acetone	BSP	REC	123	%	39-160
VI2420-BS	71-43-2	Benzene	BSP	REC	104	%	79-120
VI2420-BS	108-86-1	Bromobenzene	BSP	REC	91	%	80-120
VI2420-BS	74-97-5	Bromochloromethane	BSP	REC	84	%	78-123
VI2420-BS	75-27-4	Bromodichloromethane	BSP	REC	94	%	79-125
VI2420-BS	75-25-2	Bromoform	BSP	REC	78	%	66-130
VI2420-BS	78-93-3	2-Butanone (MEK)	BSP	REC	114	%	56-143
VI2420-BS	104-51-8	n-Butylbenzene	BSP	REC	86	%	75-128
VI2420-BS	135-98-8	sec-Butylbenzene	BSP	REC	94	%	77-126
VI2420-BS	98-06-6	tert-Butylbenzene	BSP	REC	90	%	78-124
VI2420-BS	75-15-0	Carbon Disulfide	BSP	REC	86	%	64-133
VI2420-BS	56-23-5	Carbon Tetrachloride	BSP	REC	98	%	72-136
VI2420-BS	108-90-7	Chlorobenzene	BSP	REC	92	%	82-118
VI2420-BS	75-00-3	Chloroethane	BSP	REC	115	%	60-138
VI2420-BS	67-66-3	Chloroform	BSP	REC	96	%	79-124
VI2420-BS	95-49-8	o-Chlorotoluene	BSP	REC	92	%	79-122
VI2420-BS	106-43-4	p-Chlorotoluene	BSP	REC	88	%	78-122
VI2420-BS	124-48-1	Dibromochloromethane	BSP	REC	81	%	74-126
VI2420-BS	96-12-8	1,2-Dibromo-3-chloropropane	BSP	REC	84	%	62-128
VI2420-BS	106-93-4	1,2-Dibromoethane	BSP	REC	83	%	77-121
VI2420-BS	75-71-8	Dichlorodifluoromethane	BSP	REC	78	%	32-152
VI2420-BS	95-50-1	1,2-Dichlorobenzene	BSP	REC	89	%	80-119
VI2420-BS	541-73-1	1,3-Dichlorobenzene	BSP	REC	92	%	80-119
VI2420-BS	106-46-7	1,4-Dichlorobenzene	BSP	REC	89	%	79-118
VI2420-BS	75-34-3	1,1-Dichloroethane	BSP	REC	102	%	77-125

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
VI2420-BS	107-06-2	1,2-Dichloroethane	BSP	REC	106	%	73-128
VI2420-BS	75-35-4	1,1-Dichloroethylene	BSP	REC	100	%	71-131
VI2420-BS	156-59-2	cis-1,2-Dichloroethylene	BSP	REC	96	%	78-123
VI2420-BS	156-60-5	trans-1,2-Dichloroethylene	BSP	REC	102	%	75-124
VI2420-BS	78-87-5	1,2-Dichloropropane	BSP	REC	99	%	78-122
VI2420-BS	142-28-9	1,3-Dichloropropane	BSP	REC	88	%	80-119
VI2420-BS	594-20-7	2,2-Dichloropropane	BSP	REC	101	%	60-139
VI2420-BS	563-58-6	1,1-Dichloropropene	BSP	REC	101	%	79-125
VI2420-BS	10061-01-5	cis-1,3-Dichloropropene	BSP	REC	94	%	75-124
VI2420-BS	10061-02-6	trans-1,3-Dichloropropene	BSP	REC	90	%	73-127
VI2420-BS	100-41-4	Ethylbenzene	BSP	REC	96	%	79-121
VI2420-BS	87-68-3	Hexachlorobutadiene	BSP	REC	97	%	66-134
VI2420-BS	591-78-6	2-Hexanone	BSP	REC	111	%	57-139
VI2420-BS	98-82-8	Isopropylbenzene	BSP	REC	92	%	72-131
VI2420-BS	99-87-6	p-Isopropyltoluene	BSP	REC	89	%	77-127
VI2420-BS	74-83-9	Methyl Bromide	BSP	REC	92	%	53-141
VI2420-BS	74-87-3	Methyl Chloride	BSP	REC	97	%	50-139
VI2420-BS	74-95-3	Methylene Bromide	BSP	REC	86	%	79-123
VI2420-BS	75-09-2	Methylene Chloride	BSP	REC	96	%	74-124
VI2420-BS	108-10-1	4-Methyl-2-pentanone (MIBK)	BSP	REC	110	%	67-130
VI2420-BS	1634-04-4	Methyl Tert Butyl Ether	BSP	REC	87	%	71-124
VI2420-BS	91-20-3	Naphthalene	BSP	REC	72	%	61-128
VI2420-BS	103-65-1	n-Propylbenzene	BSP	REC	91	%	76-126
VI2420-BS	100-42-5	Styrene	BSP	REC	86	%	78-123
VI2420-BS	630-20-6	1,1,1,2-Tetrachloroethane	BSP	REC	92	%	78-124
VI2420-BS	79-34-5	1,1,2,2-Tetrachloroethane	BSP	REC	90	%	71-121
VI2420-BS	127-18-4	Tetrachloroethylene	BSP	REC	94	%	74-129
VI2420-BS	108-88-3	Toluene	BSP	REC	90	%	80-121
VI2420-BS	87-61-6	1,2,3-Trichlorobenzene	BSP	REC	85	%	69-129
VI2420-BS	120-82-1	1,2,4-Trichlorobenzene	BSP	REC	85	%	69-130
VI2420-BS	71-55-6	1,1,1-Trichloroethane	BSP	REC	99	%	74-131
VI2420-BS	79-00-5	1,1,2-Trichloroethane	BSP	REC	91	%	80-119
VI2420-BS	79-01-6	Trichloroethylene	BSP	REC	100	%	79-123
VI2420-BS	75-69-4	Trichlorofluoromethane	BSP	REC	115	%	65-141
VI2420-BS	96-18-4	1,2,3-Trichloropropane	BSP	REC	89	%	73-122
VI2420-BS	95-63-6	1,2,4-Trimethylbenzene	BSP	REC	89	%	76-124
VI2420-BS	108-67-8	1,3,5-Trimethylbenzene	BSP	REC	92	%	75-124
VI2420-BS	108-05-4	Vinyl Acetate	BSP	REC	111	%	54-146
VI2420-BS	75-01-4	Vinyl Chloride	BSP	REC	101	%	58-137
VI2420-BS		m,p-Xylene	BSP	REC	95	%	80-121
VI2420-BS	95-47-6	o-Xylene	BSP	REC	90	%	78-122
VI2420-BS	1868-53-7	Dibromofluoromethane	BSP	SURR	105	%	80-119
VI2420-BS	17060-07-0	1,2-Dichloroethane-D4	BSP	SURR	113	%	81-118
VI2420-BS	2037-26-5	Toluene-D8	BSP	SURR	94	%	89-112
VI2420-BS	460-00-4	4-Bromofluorobenzene	BSP	SURR	96	%	85-114

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91843-8MS*	67-64-1	Acetone	MS	REC	119	%	39-160
FA91843-8MS*	71-43-2	Benzene	MS	REC	114	%	79-120
FA91843-8MS*	108-86-1	Bromobenzene	MS	REC	94	%	80-120
FA91843-8MS*	74-97-5	Bromochloromethane	MS	REC	91	%	78-123
FA91843-8MS*	75-27-4	Bromodichloromethane	MS	REC	101	%	79-125
FA91843-8MS*	75-25-2	Bromoform	MS	REC	78	%	66-130
FA91843-8MS*	78-93-3	2-Butanone (MEK)	MS	REC	111	%	56-143
FA91843-8MS*	104-51-8	n-Butylbenzene	MS	REC	82	%	75-128
FA91843-8MS*	135-98-8	sec-Butylbenzene	MS	REC	92	%	77-126
FA91843-8MS*	98-06-6	tert-Butylbenzene	MS	REC	88	%	78-124
FA91843-8MS*	75-15-0	Carbon Disulfide	MS	REC	90	%	64-133
FA91843-8MS*	56-23-5	Carbon Tetrachloride	MS	REC	105	%	72-136
FA91843-8MS*	108-90-7	Chlorobenzene	MS	REC	97	%	82-118
FA91843-8MS*	75-00-3	Chloroethane	MS	REC	125	%	60-138
FA91843-8MS*	67-66-3	Chloroform	MS	REC	104	%	79-124
FA91843-8MS*	95-49-8	o-Chlorotoluene	MS	REC	92	%	79-122
FA91843-8MS*	106-43-4	p-Chlorotoluene	MS	REC	89	%	78-122
FA91843-8MS*	124-48-1	Dibromochloromethane	MS	REC	83	%	74-126
FA91843-8MS*	96-12-8	1,2-Dibromo-3-chloropropane	MS	REC	82	%	62-128
FA91843-8MS*	106-93-4	1,2-Dibromoethane	MS	REC	86	%	77-121
FA91843-8MS*	75-71-8	Dichlorodifluoromethane	MS	REC	74	%	32-152
FA91843-8MS*	95-50-1	1,2-Dichlorobenzene	MS	REC	90	%	80-119
FA91843-8MS*	541-73-1	1,3-Dichlorobenzene	MS	REC	91	%	80-119
FA91843-8MS*	106-46-7	1,4-Dichlorobenzene	MS	REC	91	%	79-118
FA91843-8MS*	75-34-3	1,1-Dichloroethane	MS	REC	111	%	77-125
FA91843-8MS*	107-06-2	1,2-Dichloroethane	MS	REC	118	%	73-128
FA91843-8MS*	75-35-4	1,1-Dichloroethylene	MS	REC	106	%	71-131
FA91843-8MS*	156-59-2	cis-1,2-Dichloroethylene	MS	REC	36 [a]	%	78-123
FA91843-8MS*	156-60-5	trans-1,2-Dichloroethylene	MS	REC	113	%	75-124
FA91843-8MS*	78-87-5	1,2-Dichloropropane	MS	REC	104	%	78-122
FA91843-8MS*	142-28-9	1,3-Dichloropropane	MS	REC	92	%	80-119
FA91843-8MS*	594-20-7	2,2-Dichloropropane	MS	REC	98	%	60-139
FA91843-8MS*	563-58-6	1,1-Dichloropropene	MS	REC	106	%	79-125
FA91843-8MS*	10061-01-5	cis-1,3-Dichloropropene	MS	REC	82	%	75-124
FA91843-8MS*	10061-02-6	trans-1,3-Dichloropropene	MS	REC	88	%	73-127
FA91843-8MS*	100-41-4	Ethylbenzene	MS	REC	99	%	79-121
FA91843-8MS*	87-68-3	Hexachlorobutadiene	MS	REC	91	%	66-134
FA91843-8MS*	591-78-6	2-Hexanone	MS	REC	110	%	57-139
FA91843-8MS*	98-82-8	Isopropylbenzene	MS	REC	92	%	72-131
FA91843-8MS*	99-87-6	p-Isopropyltoluene	MS	REC	86	%	77-127
FA91843-8MS*	74-83-9	Methyl Bromide	MS	REC	63	%	53-141
FA91843-8MS*	74-87-3	Methyl Chloride	MS	REC	94	%	50-139
FA91843-8MS*	74-95-3	Methylene Bromide	MS	REC	93	%	79-123
FA91843-8MS*	75-09-2	Methylene Chloride	MS	REC	106	%	74-124
FA91843-8MS*	108-10-1	4-Methyl-2-pentanone (MIBK)	MS	REC	107	%	67-130

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91843-8MS*	1634-04-4	Methyl Tert Butyl Ether	MS	REC	88	%	71-124
FA91843-8MS*	91-20-3	Naphthalene	MS	REC	67	%	61-128
FA91843-8MS*	103-65-1	n-Propylbenzene	MS	REC	91	%	76-126
FA91843-8MS*	100-42-5	Styrene	MS	REC	87	%	78-123
FA91843-8MS*	630-20-6	1,1,1,2-Tetrachloroethane	MS	REC	94	%	78-124
FA91843-8MS*	79-34-5	1,1,2,2-Tetrachloroethane	MS	REC	98	%	71-121
FA91843-8MS*	127-18-4	Tetrachloroethylene	MS	REC	93	%	74-129
FA91843-8MS*	108-88-3	Toluene	MS	REC	94	%	80-121
FA91843-8MS*	87-61-6	1,2,3-Trichlorobenzene	MS	REC	82	%	69-129
FA91843-8MS*	120-82-1	1,2,4-Trichlorobenzene	MS	REC	77	%	69-130
FA91843-8MS*	71-55-6	1,1,1-Trichloroethane	MS	REC	106	%	74-131
FA91843-8MS*	79-00-5	1,1,2-Trichloroethane	MS	REC	98	%	80-119
FA91843-8MS*	79-01-6	Trichloroethylene	MS	REC	103	%	79-123
FA91843-8MS*	75-69-4	Trichlorofluoromethane	MS	REC	118	%	65-141
FA91843-8MS*	96-18-4	1,2,3-Trichloropropane	MS	REC	94	%	73-122
FA91843-8MS*	95-63-6	1,2,4-Trimethylbenzene	MS	REC	89	%	76-124
FA91843-8MS*	108-67-8	1,3,5-Trimethylbenzene	MS	REC	92	%	75-124
FA91843-8MS*	108-05-4	Vinyl Acetate	MS	REC	118	%	54-146
FA91843-8MS*	75-01-4	Vinyl Chloride	MS	REC	97	%	58-137
FA91843-8MS*		m,p-Xylene	MS	REC	98	%	80-121
FA91843-8MS*	95-47-6	o-Xylene	MS	REC	90	%	78-122
FA91843-8MS*	1868-53-7	Dibromofluoromethane	MS	SURR	108	%	80-119
FA91843-8MS*	17060-07-0	1,2-Dichloroethane-D4	MS	SURR	117	%	81-118
FA91843-8MS*	2037-26-5	Toluene-D8	MS	SURR	91	%	89-112
FA91843-8MS*	460-00-4	4-Bromofluorobenzene	MS	SURR	92	%	85-114
FA91843-8MSD*	67-64-1	Acetone	MSD	REC	113	%	39-160
FA91843-8MSD*	67-64-1	Acetone	MSD	RPD	5	%	20
FA91843-8MSD*	71-43-2	Benzene	MSD	REC	114	%	79-120
FA91843-8MSD*	71-43-2	Benzene	MSD	RPD	1	%	20
FA91843-8MSD*	108-86-1	Bromobenzene	MSD	REC	95	%	80-120
FA91843-8MSD*	108-86-1	Bromobenzene	MSD	RPD	2	%	20
FA91843-8MSD*	74-97-5	Bromochloromethane	MSD	REC	89	%	78-123
FA91843-8MSD*	74-97-5	Bromochloromethane	MSD	RPD	3	%	20
FA91843-8MSD*	75-27-4	Bromodichloromethane	MSD	REC	102	%	79-125
FA91843-8MSD*	75-27-4	Bromodichloromethane	MSD	RPD	2	%	20
FA91843-8MSD*	75-25-2	Bromoform	MSD	REC	80	%	66-130
FA91843-8MSD*	75-25-2	Bromoform	MSD	RPD	3	%	20
FA91843-8MSD*	78-93-3	2-Butanone (MEK)	MSD	REC	106	%	56-143
FA91843-8MSD*	78-93-3	2-Butanone (MEK)	MSD	RPD	4	%	20
FA91843-8MSD*	104-51-8	n-Butylbenzene	MSD	REC	82	%	75-128
FA91843-8MSD*	104-51-8	n-Butylbenzene	MSD	RPD	0	%	20
FA91843-8MSD*	135-98-8	sec-Butylbenzene	MSD	REC	94	%	77-126
FA91843-8MSD*	135-98-8	sec-Butylbenzene	MSD	RPD	3	%	20
FA91843-8MSD*	98-06-6	tert-Butylbenzene	MSD	REC	90	%	78-124
FA91843-8MSD*	98-06-6	tert-Butylbenzene	MSD	RPD	2	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91843-8MSD*	75-15-0	Carbon Disulfide	MSD	REC	93	%	64-133
FA91843-8MSD*	75-15-0	Carbon Disulfide	MSD	RPD	3	%	20
FA91843-8MSD*	56-23-5	Carbon Tetrachloride	MSD	REC	108	%	72-136
FA91843-8MSD*	56-23-5	Carbon Tetrachloride	MSD	RPD	3	%	20
FA91843-8MSD*	108-90-7	Chlorobenzene	MSD	REC	98	%	82-118
FA91843-8MSD*	108-90-7	Chlorobenzene	MSD	RPD	1	%	20
FA91843-8MSD*	75-00-3	Chloroethane	MSD	REC	136	%	60-138
FA91843-8MSD*	75-00-3	Chloroethane	MSD	RPD	9	%	20
FA91843-8MSD*	67-66-3	Chloroform	MSD	REC	105	%	79-124
FA91843-8MSD*	67-66-3	Chloroform	MSD	RPD	1	%	20
FA91843-8MSD*	95-49-8	o-Chlorotoluene	MSD	REC	94	%	79-122
FA91843-8MSD*	95-49-8	o-Chlorotoluene	MSD	RPD	2	%	20
FA91843-8MSD*	106-43-4	p-Chlorotoluene	MSD	REC	90	%	78-122
FA91843-8MSD*	106-43-4	p-Chlorotoluene	MSD	RPD	2	%	20
FA91843-8MSD*	124-48-1	Dibromochloromethane	MSD	REC	85	%	74-126
FA91843-8MSD*	124-48-1	Dibromochloromethane	MSD	RPD	2	%	20
FA91843-8MSD*	96-12-8	1,2-Dibromo-3-chloropropane	MSD	REC	82	%	62-128
FA91843-8MSD*	96-12-8	1,2-Dibromo-3-chloropropane	MSD	RPD	0	%	20
FA91843-8MSD*	106-93-4	1,2-Dibromoethane	MSD	REC	86	%	77-121
FA91843-8MSD*	106-93-4	1,2-Dibromoethane	MSD	RPD	1	%	20
FA91843-8MSD*	75-71-8	Dichlorodifluoromethane	MSD	REC	82	%	32-152
FA91843-8MSD*	75-71-8	Dichlorodifluoromethane	MSD	RPD	10	%	20
FA91843-8MSD*	95-50-1	1,2-Dichlorobenzene	MSD	REC	91	%	80-119
FA91843-8MSD*	95-50-1	1,2-Dichlorobenzene	MSD	RPD	1	%	20
FA91843-8MSD*	541-73-1	1,3-Dichlorobenzene	MSD	REC	93	%	80-119
FA91843-8MSD*	541-73-1	1,3-Dichlorobenzene	MSD	RPD	2	%	20
FA91843-8MSD*	106-46-7	1,4-Dichlorobenzene	MSD	REC	92	%	79-118
FA91843-8MSD*	106-46-7	1,4-Dichlorobenzene	MSD	RPD	1	%	20
FA91843-8MSD*	75-34-3	1,1-Dichloroethane	MSD	REC	113	%	77-125
FA91843-8MSD*	75-34-3	1,1-Dichloroethane	MSD	RPD	1	%	20
FA91843-8MSD*	107-06-2	1,2-Dichloroethane	MSD	REC	119	%	73-128
FA91843-8MSD*	107-06-2	1,2-Dichloroethane	MSD	RPD	1	%	20
FA91843-8MSD*	75-35-4	1,1-Dichloroethylene	MSD	REC	110	%	71-131
FA91843-8MSD*	75-35-4	1,1-Dichloroethylene	MSD	RPD	4	%	20
FA91843-8MSD*	156-59-2	cis-1,2-Dichloroethylene	MSD	REC	62 [a]	%	78-123
FA91843-8MSD*	156-59-2	cis-1,2-Dichloroethylene	MSD	RPD	3	%	20
FA91843-8MSD*	156-60-5	trans-1,2-Dichloroethylene	MSD	REC	113	%	75-124
FA91843-8MSD*	156-60-5	trans-1,2-Dichloroethylene	MSD	RPD	0	%	20
FA91843-8MSD*	78-87-5	1,2-Dichloropropane	MSD	REC	105	%	78-122
FA91843-8MSD*	78-87-5	1,2-Dichloropropane	MSD	RPD	1	%	20
FA91843-8MSD*	142-28-9	1,3-Dichloropropane	MSD	REC	92	%	80-119
FA91843-8MSD*	142-28-9	1,3-Dichloropropane	MSD	RPD	0	%	20
FA91843-8MSD*	594-20-7	2,2-Dichloropropane	MSD	REC	100	%	60-139
FA91843-8MSD*	594-20-7	2,2-Dichloropropane	MSD	RPD	2	%	20
FA91843-8MSD*	563-58-6	1,1-Dichloropropene	MSD	REC	108	%	79-125

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91843-8MSD*	563-58-6	1,1-Dichloropropene	MSD	RPD	1	%	20
FA91843-8MSD*	10061-01-5	cis-1,3-Dichloropropene	MSD	REC	84	%	75-124
FA91843-8MSD*	10061-01-5	cis-1,3-Dichloropropene	MSD	RPD	3	%	20
FA91843-8MSD*	10061-02-6	trans-1,3-Dichloropropene	MSD	REC	89	%	73-127
FA91843-8MSD*	10061-02-6	trans-1,3-Dichloropropene	MSD	RPD	1	%	20
FA91843-8MSD*	100-41-4	Ethylbenzene	MSD	REC	100	%	79-121
FA91843-8MSD*	100-41-4	Ethylbenzene	MSD	RPD	1	%	20
FA91843-8MSD*	87-68-3	Hexachlorobutadiene	MSD	REC	94	%	66-134
FA91843-8MSD*	87-68-3	Hexachlorobutadiene	MSD	RPD	3	%	20
FA91843-8MSD*	591-78-6	2-Hexanone	MSD	REC	102	%	57-139
FA91843-8MSD*	591-78-6	2-Hexanone	MSD	RPD	8	%	20
FA91843-8MSD*	98-82-8	Isopropylbenzene	MSD	REC	94	%	72-131
FA91843-8MSD*	98-82-8	Isopropylbenzene	MSD	RPD	3	%	20
FA91843-8MSD*	99-87-6	p-Isopropyltoluene	MSD	REC	89	%	77-127
FA91843-8MSD*	99-87-6	p-Isopropyltoluene	MSD	RPD	3	%	20
FA91843-8MSD*	74-83-9	Methyl Bromide	MSD	REC	89	%	53-141
FA91843-8MSD*	74-83-9	Methyl Bromide	MSD	RPD	34	%	20
FA91843-8MSD*	74-87-3	Methyl Chloride	MSD	REC	105	%	50-139
FA91843-8MSD*	74-87-3	Methyl Chloride	MSD	RPD	11	%	20
FA91843-8MSD*	74-95-3	Methylene Bromide	MSD	REC	94	%	79-123
FA91843-8MSD*	74-95-3	Methylene Bromide	MSD	RPD	1	%	20
FA91843-8MSD*	75-09-2	Methylene Chloride	MSD	REC	106	%	74-124
FA91843-8MSD*	75-09-2	Methylene Chloride	MSD	RPD	0	%	20
FA91843-8MSD*	108-10-1	4-Methyl-2-pentanone (MIBK)	MSD	REC	104	%	67-130
FA91843-8MSD*	108-10-1	4-Methyl-2-pentanone (MIBK)	MSD	RPD	3	%	20
FA91843-8MSD*	1634-04-4	Methyl Tert Butyl Ether	MSD	REC	91	%	71-124
FA91843-8MSD*	1634-04-4	Methyl Tert Butyl Ether	MSD	RPD	4	%	20
FA91843-8MSD*	91-20-3	Naphthalene	MSD	REC	70	%	61-128
FA91843-8MSD*	91-20-3	Naphthalene	MSD	RPD	4	%	20
FA91843-8MSD*	103-65-1	n-Propylbenzene	MSD	REC	93	%	76-126
FA91843-8MSD*	103-65-1	n-Propylbenzene	MSD	RPD	2	%	20
FA91843-8MSD*	100-42-5	Styrene	MSD	REC	88	%	78-123
FA91843-8MSD*	100-42-5	Styrene	MSD	RPD	1	%	20
FA91843-8MSD*	630-20-6	1,1,1,2-Tetrachloroethane	MSD	REC	97	%	78-124
FA91843-8MSD*	630-20-6	1,1,1,2-Tetrachloroethane	MSD	RPD	3	%	20
FA91843-8MSD*	79-34-5	1,1,2,2-Tetrachloroethane	MSD	REC	98	%	71-121
FA91843-8MSD*	79-34-5	1,1,2,2-Tetrachloroethane	MSD	RPD	0	%	20
FA91843-8MSD*	127-18-4	Tetrachloroethylene	MSD	REC	94	%	74-129
FA91843-8MSD*	127-18-4	Tetrachloroethylene	MSD	RPD	1	%	20
FA91843-8MSD*	108-88-3	Toluene	MSD	REC	94	%	80-121
FA91843-8MSD*	108-88-3	Toluene	MSD	RPD	1	%	20
FA91843-8MSD*	87-61-6	1,2,3-Trichlorobenzene	MSD	REC	83	%	69-129
FA91843-8MSD*	87-61-6	1,2,3-Trichlorobenzene	MSD	RPD	2	%	20
FA91843-8MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	REC	80	%	69-130
FA91843-8MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	RPD	3	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91843-8MSD*	71-55-6	1,1,1-Trichloroethane	MSD	REC	108	%	74-131
FA91843-8MSD*	71-55-6	1,1,1-Trichloroethane	MSD	RPD	1	%	20
FA91843-8MSD*	79-00-5	1,1,2-Trichloroethane	MSD	REC	98	%	80-119
FA91843-8MSD*	79-00-5	1,1,2-Trichloroethane	MSD	RPD	1	%	20
FA91843-8MSD*	79-01-6	Trichloroethylene	MSD	REC	105	%	79-123
FA91843-8MSD*	79-01-6	Trichloroethylene	MSD	RPD	2	%	20
FA91843-8MSD*	75-69-4	Trichlorofluoromethane	MSD	REC	126	%	65-141
FA91843-8MSD*	75-69-4	Trichlorofluoromethane	MSD	RPD	7	%	20
FA91843-8MSD*	96-18-4	1,2,3-Trichloropropane	MSD	REC	93	%	73-122
FA91843-8MSD*	96-18-4	1,2,3-Trichloropropane	MSD	RPD	1	%	20
FA91843-8MSD*	95-63-6	1,2,4-Trimethylbenzene	MSD	REC	90	%	76-124
FA91843-8MSD*	95-63-6	1,2,4-Trimethylbenzene	MSD	RPD	2	%	20
FA91843-8MSD*	108-67-8	1,3,5-Trimethylbenzene	MSD	REC	94	%	75-124
FA91843-8MSD*	108-67-8	1,3,5-Trimethylbenzene	MSD	RPD	2	%	20
FA91843-8MSD*	108-05-4	Vinyl Acetate	MSD	REC	119	%	54-146
FA91843-8MSD*	108-05-4	Vinyl Acetate	MSD	RPD	1	%	20
FA91843-8MSD*	75-01-4	Vinyl Chloride	MSD	REC	110	%	58-137
FA91843-8MSD*	75-01-4	Vinyl Chloride	MSD	RPD	13	%	20
FA91843-8MSD*		m,p-Xylene	MSD	REC	100	%	80-121
FA91843-8MSD*		m,p-Xylene	MSD	RPD	2	%	20
FA91843-8MSD*	95-47-6	o-Xylene	MSD	REC	92	%	78-122
FA91843-8MSD*	95-47-6	o-Xylene	MSD	RPD	3	%	20
FA91843-8MSD*	1868-53-7	Dibromofluoromethane	MSD	SURR	107	%	80-119
FA91843-8MSD*	17060-07-0	1,2-Dichloroethane-D4	MSD	SURR	115	%	81-118
FA91843-8MSD*	2037-26-5	Toluene-D8	MSD	SURR	91	%	89-112
FA91843-8MSD*	460-00-4	4-Bromofluorobenzene	MSD	SURR	93	%	85-114
VI2420-MB	1868-53-7	Dibromofluoromethane	MB	SURR	100	%	80-119
VI2420-MB	17060-07-0	1,2-Dichloroethane-D4	MB	SURR	114	%	81-118
VI2420-MB	2037-26-5	Toluene-D8	MB	SURR	94	%	89-112
VI2420-MB	460-00-4	4-Bromofluorobenzene	MB	SURR	96	%	85-114
FA91824-1	1868-53-7	Dibromofluoromethane	SAMP	SURR	101	%	80-119
FA91824-1	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	114	%	81-118
FA91824-1	2037-26-5	Toluene-D8	SAMP	SURR	94	%	89-112
FA91824-1	460-00-4	4-Bromofluorobenzene	SAMP	SURR	96	%	85-114
FA91824-2	1868-53-7	Dibromofluoromethane	SAMP	SURR	102	%	80-119
FA91824-2	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	114	%	81-118
FA91824-2	2037-26-5	Toluene-D8	SAMP	SURR	94	%	89-112
FA91824-2	460-00-4	4-Bromofluorobenzene	SAMP	SURR	95	%	85-114
FA91824-3	1868-53-7	Dibromofluoromethane	SAMP	SURR	102	%	80-119
FA91824-3	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	115	%	81-118
FA91824-3	2037-26-5	Toluene-D8	SAMP	SURR	94	%	89-112
FA91824-3	460-00-4	4-Bromofluorobenzene	SAMP	SURR	96	%	85-114
FA91824-4	1868-53-7	Dibromofluoromethane	SAMP	SURR	102	%	80-119
FA91824-4	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	115	%	81-118
FA91824-4	2037-26-5	Toluene-D8	SAMP	SURR	93	%	89-112

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91824-4	460-00-4	4-Bromofluorobenzene	SAMP	SURR	96	%	85-114
FA91824-5	1868-53-7	Dibromofluoromethane	SAMP	SURR	104	%	80-119
FA91824-5	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	117	%	81-118
FA91824-5	2037-26-5	Toluene-D8	SAMP	SURR	93	%	89-112
FA91824-5	460-00-4	4-Bromofluorobenzene	SAMP	SURR	96	%	85-114
FA91824-6	1868-53-7	Dibromofluoromethane	SAMP	SURR	103	%	80-119
FA91824-6	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	117	%	81-118
FA91824-6	2037-26-5	Toluene-D8	SAMP	SURR	93	%	89-112
FA91824-6	460-00-4	4-Bromofluorobenzene	SAMP	SURR	96	%	85-114
FA91824-7	1868-53-7	Dibromofluoromethane	SAMP	SURR	104	%	80-119
FA91824-7	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	117	%	81-118
FA91824-7	2037-26-5	Toluene-D8	SAMP	SURR	94	%	89-112
FA91824-7	460-00-4	4-Bromofluorobenzene	SAMP	SURR	95	%	85-114
FA91824-8	1868-53-7	Dibromofluoromethane	SAMP	SURR	104	%	80-119
FA91824-8	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	117	%	81-118
FA91824-8	2037-26-5	Toluene-D8	SAMP	SURR	93	%	89-112
FA91824-8	460-00-4	4-Bromofluorobenzene	SAMP	SURR	95	%	85-114
FA91824-9	1868-53-7	Dibromofluoromethane	SAMP	SURR	103	%	80-119
FA91824-9	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	117	%	81-118
FA91824-9	2037-26-5	Toluene-D8	SAMP	SURR	94	%	89-112
FA91824-9	460-00-4	4-Bromofluorobenzene	SAMP	SURR	95	%	85-114
FA91824-10	1868-53-7	Dibromofluoromethane	SAMP	SURR	104	%	80-119
FA91824-10	17060-07-0	1,2-Dichloroethane-D4	SAMP	SURR	118	%	81-118
FA91824-10	2037-26-5	Toluene-D8	SAMP	SURR	93	%	89-112
FA91824-10	460-00-4	4-Bromofluorobenzene	SAMP	SURR	95	%	85-114
OP88907	SW846 8270D BY SIM						
OP88907-BS	83-32-9	Acenaphthene	BSP	REC	77	%	44-111
OP88907-BS	208-96-8	Acenaphthylene	BSP	REC	74	%	39-116
OP88907-BS	120-12-7	Anthracene	BSP	REC	75	%	50-114
OP88907-BS	56-55-3	Benzo(a)anthracene	BSP	REC	76	%	54-122
OP88907-BS	50-32-8	Benzo(a)pyrene	BSP	REC	80	%	50-125
OP88907-BS	205-99-2	Benzo(b)fluoranthene	BSP	REC	83	%	53-128
OP88907-BS	191-24-2	Benzo(g,h,i)perylene	BSP	REC	79	%	49-127
OP88907-BS	207-08-9	Benzo(k)fluoranthene	BSP	REC	84	%	56-123
OP88907-BS	218-01-9	Chrysene	BSP	REC	84	%	57-118
OP88907-BS	53-70-3	Dibenzo(a,h)anthracene	BSP	REC	80	%	50-129
OP88907-BS	206-44-0	Fluoranthene	BSP	REC	81	%	55-119
OP88907-BS	86-73-7	Fluorene	BSP	REC	80	%	47-114
OP88907-BS	193-39-5	Indeno(1,2,3-cd)pyrene	BSP	REC	81	%	49-130
OP88907-BS	90-12-0	1-Methylnaphthalene	BSP	REC	67	%	43-111
OP88907-BS	91-57-6	2-Methylnaphthalene	BSP	REC	69	%	39-114
OP88907-BS	91-20-3	Naphthalene	BSP	REC	71	%	38-111
OP88907-BS	85-01-8	Phenanthrene	BSP	REC	83	%	49-113

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88907-BS	129-00-0	Pyrene	BSP	REC	83	%	55-117
OP88907-BS	7297-45-2	2-Methylnaphthalene-d10	BSP	SURR	85	%	50-150
OP88907-BS	93951-69-0	Fluoranthene-d10	BSP	SURR	95	%	50-150
OP88907-MS	83-32-9	Acenaphthene	MS	REC	45	%	44-111
OP88907-MS	208-96-8	Acenaphthylene	MS	REC	43	%	39-116
OP88907-MS	120-12-7	Anthracene	MS	REC	41	%	50-114
OP88907-MS	56-55-3	Benzo(a)anthracene	MS	REC	42	%	54-122
OP88907-MS	50-32-8	Benzo(a)pyrene	MS	REC	42	%	50-125
OP88907-MS	205-99-2	Benzo(b)fluoranthene	MS	REC	43	%	53-128
OP88907-MS	191-24-2	Benzo(g,h,i)perylene	MS	REC	37	%	49-127
OP88907-MS	207-08-9	Benzo(k)fluoranthene	MS	REC	42	%	56-123
OP88907-MS	218-01-9	Chrysene	MS	REC	45	%	57-118
OP88907-MS	53-70-3	Dibenzo(a,h)anthracene	MS	REC	41	%	50-129
OP88907-MS	206-44-0	Fluoranthene	MS	REC	41	%	55-119
OP88907-MS	86-73-7	Fluorene	MS	REC	46	%	47-114
OP88907-MS	193-39-5	Indeno(1,2,3-cd)pyrene	MS	REC	40	%	49-130
OP88907-MS	90-12-0	1-Methylnaphthalene	MS	REC	40	%	43-111
OP88907-MS	91-57-6	2-Methylnaphthalene	MS	REC	41	%	39-114
OP88907-MS	91-20-3	Naphthalene	MS	REC	44	%	38-111
OP88907-MS	85-01-8	Phenanthrene	MS	REC	44	%	49-113
OP88907-MS	129-00-0	Pyrene	MS	REC	44	%	55-117
OP88907-MS	7297-45-2	2-Methylnaphthalene-d10	MS	SURR	54	%	50-150
OP88907-MS	93951-69-0	Fluoranthene-d10	MS	SURR	51	%	50-150
OP88907-MSD	83-32-9	Acenaphthene	MSD	REC	47	%	44-111
OP88907-MSD	83-32-9	Acenaphthene	MSD	RPD	6	%	20
OP88907-MSD	208-96-8	Acenaphthylene	MSD	REC	45	%	39-116
OP88907-MSD	208-96-8	Acenaphthylene	MSD	RPD	6	%	20
OP88907-MSD	120-12-7	Anthracene	MSD	REC	44	%	50-114
OP88907-MSD	120-12-7	Anthracene	MSD	RPD	8	%	20
OP88907-MSD	56-55-3	Benzo(a)anthracene	MSD	REC	45	%	54-122
OP88907-MSD	56-55-3	Benzo(a)anthracene	MSD	RPD	9	%	20
OP88907-MSD	50-32-8	Benzo(a)pyrene	MSD	REC	46	%	50-125
OP88907-MSD	50-32-8	Benzo(a)pyrene	MSD	RPD	9	%	20
OP88907-MSD	205-99-2	Benzo(b)fluoranthene	MSD	REC	47	%	53-128
OP88907-MSD	205-99-2	Benzo(b)fluoranthene	MSD	RPD	9	%	20
OP88907-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	REC	41	%	49-127
OP88907-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	RPD	9	%	20
OP88907-MSD	207-08-9	Benzo(k)fluoranthene	MSD	REC	47	%	56-123
OP88907-MSD	207-08-9	Benzo(k)fluoranthene	MSD	RPD	11	%	20
OP88907-MSD	218-01-9	Chrysene	MSD	REC	48	%	57-118
OP88907-MSD	218-01-9	Chrysene	MSD	RPD	8	%	20
OP88907-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	REC	45	%	50-129
OP88907-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	RPD	11	%	20
OP88907-MSD	206-44-0	Fluoranthene	MSD	REC	46	%	55-119
OP88907-MSD	206-44-0	Fluoranthene	MSD	RPD	12	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88907-MSD	86-73-7	Fluorene	MSD	REC	48	%	47-114
OP88907-MSD	86-73-7	Fluorene	MSD	RPD	6	%	20
OP88907-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	REC	45	%	49-130
OP88907-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	RPD	11	%	20
OP88907-MSD	90-12-0	1-Methylnaphthalene	MSD	REC	43	%	43-111
OP88907-MSD	90-12-0	1-Methylnaphthalene	MSD	RPD	6	%	20
OP88907-MSD	91-57-6	2-Methylnaphthalene	MSD	REC	44	%	39-114
OP88907-MSD	91-57-6	2-Methylnaphthalene	MSD	RPD	6	%	20
OP88907-MSD	91-20-3	Naphthalene	MSD	REC	46	%	38-111
OP88907-MSD	91-20-3	Naphthalene	MSD	RPD	7	%	20
OP88907-MSD	85-01-8	Phenanthrene	MSD	REC	47	%	49-113
OP88907-MSD	85-01-8	Phenanthrene	MSD	RPD	9	%	20
OP88907-MSD	129-00-0	Pyrene	MSD	REC	49	%	55-117
OP88907-MSD	129-00-0	Pyrene	MSD	RPD	12	%	20
OP88907-MSD	7297-45-2	2-Methylnaphthalene-d10	MSD	SURR	69	%	50-150
OP88907-MSD	93951-69-0	Fluoranthene-d10	MSD	SURR	69	%	50-150
OP88907-MB	7297-45-2	2-Methylnaphthalene-d10	MB	SURR	92	%	50-150
OP88907-MB	93951-69-0	Fluoranthene-d10	MB	SURR	104	%	50-150
FA91824-11	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	53	%	50-150
FA91824-11	93951-69-0	Fluoranthene-d10	SAMP	SURR	49 [b]	%	50-150
FA91824-12	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	80	%	50-150
FA91824-12	93951-69-0	Fluoranthene-d10	SAMP	SURR	85	%	50-150
FA91824-13	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	78	%	50-150
FA91824-13	93951-69-0	Fluoranthene-d10	SAMP	SURR	79	%	50-150
FA91824-14	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	80	%	50-150
FA91824-14	93951-69-0	Fluoranthene-d10	SAMP	SURR	81	%	50-150
FA91824-15	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	85	%	50-150
FA91824-15	93951-69-0	Fluoranthene-d10	SAMP	SURR	87	%	50-150
FA91824-16	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	84	%	50-150
FA91824-16	93951-69-0	Fluoranthene-d10	SAMP	SURR	84	%	50-150
FA91824-17	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	93	%	50-150
FA91824-17	93951-69-0	Fluoranthene-d10	SAMP	SURR	96	%	50-150
FA91824-18	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	83	%	50-150
FA91824-18	93951-69-0	Fluoranthene-d10	SAMP	SURR	89	%	50-150
FA91824-19	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	84	%	50-150
FA91824-19	93951-69-0	Fluoranthene-d10	SAMP	SURR	90	%	50-150
FA91824-20	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	81	%	50-150
FA91824-20	93951-69-0	Fluoranthene-d10	SAMP	SURR	87	%	50-150
OP88981	SW846 8270D						
OP88981-BS	59-50-7	4-Chloro-3-methyl Phenol	BSP	REC	84	%	52-119
OP88981-BS	95-57-8	2-Chlorophenol	BSP	REC	76	%	38-117
OP88981-BS	120-83-2	2,4-Dichlorophenol	BSP	REC	88	%	47-121
OP88981-BS	105-67-9	2,4-Dimethylphenol	BSP	REC	77	%	31-124

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88981-BS	51-28-5	2,4-Dinitrophenol	BSP	REC	91	%	23-143
OP88981-BS	534-52-1	4,6-Dinitro-o-cresol	BSP	REC	101	%	44-137
OP88981-BS	95-48-7	2-Methylphenol	BSP	REC	64	%	30-117
OP88981-BS		3&4-Methylphenol	BSP	REC	60	%	29-110
OP88981-BS	88-75-5	2-Nitrophenol	BSP	REC	88	%	47-123
OP88981-BS	87-86-5	Pentachlorophenol	BSP	REC	97	%	35-138
OP88981-BS	95-95-4	2,4,5-Trichlorophenol	BSP	REC	95	%	53-123
OP88981-BS	88-06-2	2,4,6-Trichlorophenol	BSP	REC	91	%	50-123
OP88981-BS	100-51-6	Benzyl Alcohol	BSP	REC	67	%	31-112
OP88981-BS	101-55-3	4-Bromophenyl Phenyl Ether	BSP	REC	81	%	55-124
OP88981-BS	85-68-7	Butyl Benzyl Phthalate	BSP	REC	93	%	53-134
OP88981-BS	86-74-8	Carbazole	BSP	REC	89	%	60-122
OP88981-BS	106-47-8	4-Chloroaniline	BSP	REC	72	%	33-117
OP88981-BS	111-91-1	bis(2-Chloroethoxy)methane	BSP	REC	83	%	48-120
OP88981-BS	111-44-4	bis(2-Chloroethyl)ether	BSP	REC	79	%	43-118
OP88981-BS	108-60-1	2,2'-Oxybis(1-chloropropane)	BSP	REC	79	%	37-130
OP88981-BS	91-58-7	2-Chloronaphthalene	BSP	REC	65	%	40-116
OP88981-BS	7005-72-3	4-Chlorophenyl Phenyl Ether	BSP	REC	77	%	53-121
OP88981-BS	132-64-9	Dibenzofuran	BSP	REC	77	%	53-118
OP88981-BS	95-50-1	1,2-Dichlorobenzene	BSP	REC	50	%	32-111
OP88981-BS	541-73-1	1,3-Dichlorobenzene	BSP	REC	43	%	28-110
OP88981-BS	106-46-7	1,4-Dichlorobenzene	BSP	REC	45	%	29-112
OP88981-BS	91-94-1	3,3'-Dichlorobenzidine	BSP	REC	74	%	27-129
OP88981-BS	84-66-2	Diethyl Phthalate	BSP	REC	89	%	56-125
OP88981-BS	131-11-3	Dimethyl Phthalate	BSP	REC	87	%	45-127
OP88981-BS	84-74-2	Di-n-butyl Phthalate	BSP	REC	91	%	59-127
OP88981-BS	117-84-0	Di-n-octyl Phthalate	BSP	REC	97	%	51-140
OP88981-BS	121-14-2	2,4-Dinitrotoluene	BSP	REC	101	%	57-128
OP88981-BS	606-20-2	2,6-Dinitrotoluene	BSP	REC	94	%	57-124
OP88981-BS	117-81-7	bis(2-Ethylhexyl)phthalate	BSP	REC	93	%	55-135
OP88981-BS	118-74-1	Hexachlorobenzene	BSP	REC	80	%	53-125
OP88981-BS	87-68-3	Hexachlorobutadiene	BSP	REC	31	%	22-124
OP88981-BS	67-72-1	Hexachloroethane	BSP	REC	31	%	21-115
OP88981-BS	78-59-1	Isophorone	BSP	REC	87	%	42-124
OP88981-BS	88-74-4	2-Nitroaniline	BSP	REC	88	%	55-127
OP88981-BS	99-09-2	3-Nitroaniline	BSP	REC	79	%	41-128
OP88981-BS	98-95-3	Nitrobenzene	BSP	REC	82	%	45-121
OP88981-BS	621-64-7	N-Nitrosodi-n-propylamine	BSP	REC	84	%	49-119
OP88981-BS	86-30-6	N-Nitrosodiphenylamine	BSP	REC	80	%	51-123
OP88981-BS	120-82-1	1,2,4-Trichlorobenzene	BSP	REC	47	%	29-116
OP88981-BS	367-12-4	2-Fluorophenol	BSP	SURR	45	%	19-119
OP88981-BS	118-79-6	2,4,6-Tribromophenol	BSP	SURR	91	%	43-140
OP88981-BS	4165-60-0	Nitrobenzene-d5	BSP	SURR	80	%	44-120
OP88981-BS	321-60-8	2-Fluorobiphenyl	BSP	SURR	85	%	44-119
OP88981-BS	1718-51-0	Terphenyl-d14	BSP	SURR	47	%	50-134

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88981-MS	59-50-7	4-Chloro-3-methyl Phenol	MS	REC	79	%	52-119
OP88981-MS	95-57-8	2-Chlorophenol	MS	REC	71	%	38-117
OP88981-MS	120-83-2	2,4-Dichlorophenol	MS	REC	82	%	47-121
OP88981-MS	105-67-9	2,4-Dimethylphenol	MS	REC	73	%	31-124
OP88981-MS	51-28-5	2,4-Dinitrophenol	MS	REC	86	%	23-143
OP88981-MS	534-52-1	4,6-Dinitro-o-cresol	MS	REC	95	%	44-137
OP88981-MS	95-48-7	2-Methylphenol	MS	REC	61	%	30-117
OP88981-MS		3&4-Methylphenol	MS	REC	58	%	29-110
OP88981-MS	88-75-5	2-Nitrophenol	MS	REC	82	%	47-123
OP88981-MS	87-86-5	Pentachlorophenol	MS	REC	96	%	35-138
OP88981-MS	95-95-4	2,4,5-Trichlorophenol	MS	REC	89	%	53-123
OP88981-MS	88-06-2	2,4,6-Trichlorophenol	MS	REC	85	%	50-125
OP88981-MS	100-51-6	Benzyl Alcohol	MS	REC	68	%	31-112
OP88981-MS	101-55-3	4-Bromophenyl Phenyl Ether	MS	REC	80	%	55-124
OP88981-MS	85-68-7	Butyl Benzyl Phthalate	MS	REC	88	%	53-134
OP88981-MS	86-74-8	Carbazole	MS	REC	88	%	60-122
OP88981-MS	106-47-8	4-Chloroaniline	MS	REC	61	%	33-117
OP88981-MS	111-91-1	bis(2-Chloroethoxy)methane	MS	REC	80	%	48-120
OP88981-MS	111-44-4	bis(2-Chloroethyl)ether	MS	REC	77	%	43-118
OP88981-MS	108-60-1	2,2'-Oxybis(1-chloropropane)	MS	REC	76	%	37-130
OP88981-MS	91-58-7	2-Chloronaphthalene	MS	REC	55	%	40-116
OP88981-MS	7005-72-3	4-Chlorophenyl Phenyl Ether	MS	REC	75	%	53-121
OP88981-MS	132-64-9	Dibenzofuran	MS	REC	71	%	53-118
OP88981-MS	95-50-1	1,2-Dichlorobenzene	MS	REC	42	%	32-111
OP88981-MS	541-73-1	1,3-Dichlorobenzene	MS	REC	38	%	28-110
OP88981-MS	106-46-7	1,4-Dichlorobenzene	MS	REC	39	%	29-112
OP88981-MS	91-94-1	3,3'-Dichlorobenzidine	MS	REC	71	%	27-129
OP88981-MS	84-66-2	Diethyl Phthalate	MS	REC	86	%	56-125
OP88981-MS	131-11-3	Dimethyl Phthalate	MS	REC	84	%	45-127
OP88981-MS	84-74-2	Di-n-butyl Phthalate	MS	REC	89	%	59-127
OP88981-MS	117-84-0	Di-n-octyl Phthalate	MS	REC	95	%	51-140
OP88981-MS	121-14-2	2,4-Dinitrotoluene	MS	REC	98	%	57-128
OP88981-MS	606-20-2	2,6-Dinitrotoluene	MS	REC	89	%	57-124
OP88981-MS	117-81-7	bis(2-Ethylhexyl)phthalate	MS	REC	88	%	55-135
OP88981-MS	118-74-1	Hexachlorobenzene	MS	REC	77	%	53-125
OP88981-MS	87-68-3	Hexachlorobutadiene	MS	REC	32	%	22-124
OP88981-MS	67-72-1	Hexachloroethane	MS	REC	33	%	21-115
OP88981-MS	78-59-1	Isophorone	MS	REC	83	%	42-124
OP88981-MS	88-74-4	2-Nitroaniline	MS	REC	88	%	55-127
OP88981-MS	99-09-2	3-Nitroaniline	MS	REC	75	%	41-128
OP88981-MS	98-95-3	Nitrobenzene	MS	REC	78	%	45-121
OP88981-MS	621-64-7	N-Nitrosodi-n-propylamine	MS	REC	80	%	49-119
OP88981-MS	86-30-6	N-Nitrosodiphenylamine	MS	REC	79	%	51-123
OP88981-MS	120-82-1	1,2,4-Trichlorobenzene	MS	REC	38	%	29-116
OP88981-MS	367-12-4	2-Fluorophenol	MS	SURR	44	%	19-119

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88981-MS	118-79-6	2,4,6-Tribromophenol	MS	SURR	85	%	43-140
OP88981-MS	4165-60-0	Nitrobenzene-d5	MS	SURR	78	%	44-120
OP88981-MS	321-60-8	2-Fluorobiphenyl	MS	SURR	81	%	44-119
OP88981-MS	1718-51-0	Terphenyl-d14	MS	SURR	46	%	50-134
OP88981-MSD	59-50-7	4-Chloro-3-methyl Phenol	MSD	REC	78	%	52-119
OP88981-MSD	59-50-7	4-Chloro-3-methyl Phenol	MSD	RPD	2	%	20
OP88981-MSD	95-57-8	2-Chlorophenol	MSD	REC	68	%	38-117
OP88981-MSD	95-57-8	2-Chlorophenol	MSD	RPD	4	%	20
OP88981-MSD	120-83-2	2,4-Dichlorophenol	MSD	REC	80	%	47-121
OP88981-MSD	120-83-2	2,4-Dichlorophenol	MSD	RPD	3	%	20
OP88981-MSD	105-67-9	2,4-Dimethylphenol	MSD	REC	72	%	31-124
OP88981-MSD	105-67-9	2,4-Dimethylphenol	MSD	RPD	2	%	20
OP88981-MSD	51-28-5	2,4-Dinitrophenol	MSD	REC	87	%	23-143
OP88981-MSD	51-28-5	2,4-Dinitrophenol	MSD	RPD	1	%	20
OP88981-MSD	534-52-1	4,6-Dinitro-o-cresol	MSD	REC	94	%	44-137
OP88981-MSD	534-52-1	4,6-Dinitro-o-cresol	MSD	RPD	1	%	20
OP88981-MSD	95-48-7	2-Methylphenol	MSD	REC	60	%	30-117
OP88981-MSD	95-48-7	2-Methylphenol	MSD	RPD	2	%	20
OP88981-MSD		3&4-Methylphenol	MSD	REC	57	%	29-110
OP88981-MSD		3&4-Methylphenol	MSD	RPD	2	%	20
OP88981-MSD	88-75-5	2-Nitrophenol	MSD	REC	80	%	47-123
OP88981-MSD	88-75-5	2-Nitrophenol	MSD	RPD	2	%	20
OP88981-MSD	87-86-5	Pentachlorophenol	MSD	REC	95	%	35-138
OP88981-MSD	87-86-5	Pentachlorophenol	MSD	RPD	1	%	20
OP88981-MSD	95-95-4	2,4,5-Trichlorophenol	MSD	REC	89	%	53-123
OP88981-MSD	95-95-4	2,4,5-Trichlorophenol	MSD	RPD	0	%	20
OP88981-MSD	88-06-2	2,4,6-Trichlorophenol	MSD	REC	84	%	50-125
OP88981-MSD	88-06-2	2,4,6-Trichlorophenol	MSD	RPD	1	%	20
OP88981-MSD	100-51-6	Benzyl Alcohol	MSD	REC	68	%	31-112
OP88981-MSD	100-51-6	Benzyl Alcohol	MSD	RPD	0	%	20
OP88981-MSD	101-55-3	4-Bromophenyl Phenyl Ether	MSD	REC	82	%	55-124
OP88981-MSD	101-55-3	4-Bromophenyl Phenyl Ether	MSD	RPD	3	%	20
OP88981-MSD	85-68-7	Butyl Benzyl Phthalate	MSD	REC	92	%	53-134
OP88981-MSD	85-68-7	Butyl Benzyl Phthalate	MSD	RPD	4	%	20
OP88981-MSD	86-74-8	Carbazole	MSD	REC	88	%	60-122
OP88981-MSD	86-74-8	Carbazole	MSD	RPD	0	%	20
OP88981-MSD	106-47-8	4-Chloroaniline	MSD	REC	62	%	33-117
OP88981-MSD	106-47-8	4-Chloroaniline	MSD	RPD	2	%	20
OP88981-MSD	111-91-1	bis(2-Chloroethoxy)methane	MSD	REC	81	%	48-120
OP88981-MSD	111-91-1	bis(2-Chloroethoxy)methane	MSD	RPD	1	%	20
OP88981-MSD	111-44-4	bis(2-Chloroethyl)ether	MSD	REC	74	%	43-118
OP88981-MSD	111-44-4	bis(2-Chloroethyl)ether	MSD	RPD	3	%	20
OP88981-MSD	108-60-1	2,2'-Oxybis(1-chloropropane)	MSD	REC	73	%	37-130
OP88981-MSD	108-60-1	2,2'-Oxybis(1-chloropropane)	MSD	RPD	3	%	20
OP88981-MSD	91-58-7	2-Chloronaphthalene	MSD	REC	59	%	40-116

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88981-MSD	91-58-7	2-Chloronaphthalene	MSD	RPD	6	%	20
OP88981-MSD	7005-72-3	4-Chlorophenyl Phenyl Ether	MSD	REC	77	%	53-121
OP88981-MSD	7005-72-3	4-Chlorophenyl Phenyl Ether	MSD	RPD	3	%	20
OP88981-MSD	132-64-9	Dibenzofuran	MSD	REC	79	%	53-118
OP88981-MSD	132-64-9	Dibenzofuran	MSD	RPD	10	%	20
OP88981-MSD	95-50-1	1,2-Dichlorobenzene	MSD	REC	43	%	32-111
OP88981-MSD	95-50-1	1,2-Dichlorobenzene	MSD	RPD	2	%	20
OP88981-MSD	541-73-1	1,3-Dichlorobenzene	MSD	REC	40	%	28-110
OP88981-MSD	541-73-1	1,3-Dichlorobenzene	MSD	RPD	3	%	20
OP88981-MSD	106-46-7	1,4-Dichlorobenzene	MSD	REC	40	%	29-112
OP88981-MSD	106-46-7	1,4-Dichlorobenzene	MSD	RPD	4	%	20
OP88981-MSD	91-94-1	3,3'-Dichlorobenzidine	MSD	REC	78	%	27-129
OP88981-MSD	91-94-1	3,3'-Dichlorobenzidine	MSD	RPD	8	%	20
OP88981-MSD	84-66-2	Diethyl Phthalate	MSD	REC	88	%	56-125
OP88981-MSD	84-66-2	Diethyl Phthalate	MSD	RPD	3	%	20
OP88981-MSD	131-11-3	Dimethyl Phthalate	MSD	REC	87	%	45-127
OP88981-MSD	131-11-3	Dimethyl Phthalate	MSD	RPD	3	%	20
OP88981-MSD	84-74-2	Di-n-butyl Phthalate	MSD	REC	91	%	59-127
OP88981-MSD	84-74-2	Di-n-butyl Phthalate	MSD	RPD	3	%	20
OP88981-MSD	117-84-0	Di-n-octyl Phthalate	MSD	REC	98	%	51-140
OP88981-MSD	117-84-0	Di-n-octyl Phthalate	MSD	RPD	4	%	20
OP88981-MSD	121-14-2	2,4-Dinitrotoluene	MSD	REC	101	%	57-128
OP88981-MSD	121-14-2	2,4-Dinitrotoluene	MSD	RPD	3	%	20
OP88981-MSD	606-20-2	2,6-Dinitrotoluene	MSD	REC	92	%	57-124
OP88981-MSD	606-20-2	2,6-Dinitrotoluene	MSD	RPD	4	%	20
OP88981-MSD	117-81-7	bis(2-Ethylhexyl)phthalate	MSD	REC	92	%	55-135
OP88981-MSD	117-81-7	bis(2-Ethylhexyl)phthalate	MSD	RPD	5	%	20
OP88981-MSD	118-74-1	Hexachlorobenzene	MSD	REC	79	%	53-125
OP88981-MSD	118-74-1	Hexachlorobenzene	MSD	RPD	2	%	20
OP88981-MSD	87-68-3	Hexachlorobutadiene	MSD	REC	36	%	22-124
OP88981-MSD	87-68-3	Hexachlorobutadiene	MSD	RPD	13	%	20
OP88981-MSD	67-72-1	Hexachloroethane	MSD	REC	35	%	21-115
OP88981-MSD	67-72-1	Hexachloroethane	MSD	RPD	7	%	20
OP88981-MSD	78-59-1	Isophorone	MSD	REC	84	%	42-124
OP88981-MSD	78-59-1	Isophorone	MSD	RPD	1	%	20
OP88981-MSD	88-74-4	2-Nitroaniline	MSD	REC	88	%	55-127
OP88981-MSD	88-74-4	2-Nitroaniline	MSD	RPD	0	%	20
OP88981-MSD	99-09-2	3-Nitroaniline	MSD	REC	75	%	41-128
OP88981-MSD	99-09-2	3-Nitroaniline	MSD	RPD	1	%	20
OP88981-MSD	98-95-3	Nitrobenzene	MSD	REC	77	%	45-121
OP88981-MSD	98-95-3	Nitrobenzene	MSD	RPD	2	%	20
OP88981-MSD	621-64-7	N-Nitrosodi-n-propylamine	MSD	REC	80	%	49-119
OP88981-MSD	621-64-7	N-Nitrosodi-n-propylamine	MSD	RPD	0	%	20
OP88981-MSD	86-30-6	N-Nitrosodiphenylamine	MSD	REC	81	%	51-123
OP88981-MSD	86-30-6	N-Nitrosodiphenylamine	MSD	RPD	3	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88981-MSD	120-82-1	1,2,4-Trichlorobenzene	MSD	REC	41	%	29-116
OP88981-MSD	120-82-1	1,2,4-Trichlorobenzene	MSD	RPD	8	%	20
OP88981-MSD	367-12-4	2-Fluorophenol	MSD	SURR	43	%	19-119
OP88981-MSD	118-79-6	2,4,6-Tribromophenol	MSD	SURR	83	%	43-140
OP88981-MSD	4165-60-0	Nitrobenzene-d5	MSD	SURR	75	%	44-120
OP88981-MSD	321-60-8	2-Fluorobiphenyl	MSD	SURR	81	%	44-119
OP88981-MSD	1718-51-0	Terphenyl-d14	MSD	SURR	58	%	50-134
OP88981-MB	367-12-4	2-Fluorophenol	MB	SURR	39	%	19-119
OP88981-MB	118-79-6	2,4,6-Tribromophenol	MB	SURR	84	%	43-140
OP88981-MB	4165-60-0	Nitrobenzene-d5	MB	SURR	71	%	44-120
OP88981-MB	321-60-8	2-Fluorobiphenyl	MB	SURR	76	%	44-119
OP88981-MB	1718-51-0	Terphenyl-d14	MB	SURR	66	%	50-134
FA91824-1	367-12-4	2-Fluorophenol	SAMP	SURR	23	%	19-119
FA91824-1	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	70	%	43-140
FA91824-1	4165-60-0	Nitrobenzene-d5	SAMP	SURR	69	%	44-120
FA91824-1	321-60-8	2-Fluorobiphenyl	SAMP	SURR	72	%	44-119
FA91824-1	1718-51-0	Terphenyl-d14	SAMP	SURR	30 [b]	%	50-134
FA91824-2	367-12-4	2-Fluorophenol	SAMP	SURR	26	%	19-119
FA91824-2	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	74	%	43-140
FA91824-2	4165-60-0	Nitrobenzene-d5	SAMP	SURR	70	%	44-120
FA91824-2	321-60-8	2-Fluorobiphenyl	SAMP	SURR	70	%	44-119
FA91824-2	1718-51-0	Terphenyl-d14	SAMP	SURR	29 [b]	%	50-134
FA91824-3	367-12-4	2-Fluorophenol	SAMP	SURR	20	%	19-119
FA91824-3	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	67	%	43-140
FA91824-3	4165-60-0	Nitrobenzene-d5	SAMP	SURR	67	%	44-120
FA91824-3	321-60-8	2-Fluorobiphenyl	SAMP	SURR	72	%	44-119
FA91824-3	1718-51-0	Terphenyl-d14	SAMP	SURR	68	%	50-134
FA91824-4	367-12-4	2-Fluorophenol	SAMP	SURR	25	%	19-119
FA91824-4	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	68	%	43-140
FA91824-4	4165-60-0	Nitrobenzene-d5	SAMP	SURR	66	%	44-120
FA91824-4	321-60-8	2-Fluorobiphenyl	SAMP	SURR	71	%	44-119
FA91824-4	1718-51-0	Terphenyl-d14	SAMP	SURR	76	%	50-134
FA91824-5	367-12-4	2-Fluorophenol	SAMP	SURR	22	%	19-119
FA91824-5	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	73	%	43-140
FA91824-5	4165-60-0	Nitrobenzene-d5	SAMP	SURR	70	%	44-120
FA91824-5	321-60-8	2-Fluorobiphenyl	SAMP	SURR	75	%	44-119
FA91824-5	1718-51-0	Terphenyl-d14	SAMP	SURR	70	%	50-134
FA91824-6	367-12-4	2-Fluorophenol	SAMP	SURR	18	%	19-119
FA91824-6	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	52	%	43-140
FA91824-6	4165-60-0	Nitrobenzene-d5	SAMP	SURR	63	%	44-120
FA91824-6	321-60-8	2-Fluorobiphenyl	SAMP	SURR	58	%	44-119
FA91824-6	1718-51-0	Terphenyl-d14	SAMP	SURR	49	%	50-134
FA91824-7	367-12-4	2-Fluorophenol	SAMP	SURR	21	%	19-119
FA91824-7	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	66	%	43-140
FA91824-7	4165-60-0	Nitrobenzene-d5	SAMP	SURR	70	%	44-120

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91824-7	321-60-8	2-Fluorobiphenyl	SAMP	SURR	74	%	44-119
FA91824-7	1718-51-0	Terphenyl-d14	SAMP	SURR	76	%	50-134
FA91824-8	367-12-4	2-Fluorophenol	SAMP	SURR	20	%	19-119
FA91824-8	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	68	%	43-140
FA91824-8	4165-60-0	Nitrobenzene-d5	SAMP	SURR	66	%	44-120
FA91824-8	321-60-8	2-Fluorobiphenyl	SAMP	SURR	72	%	44-119
FA91824-8	1718-51-0	Terphenyl-d14	SAMP	SURR	72	%	50-134
FA91824-9	367-12-4	2-Fluorophenol	SAMP	SURR	24	%	19-119
FA91824-9	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	75	%	43-140
FA91824-9	4165-60-0	Nitrobenzene-d5	SAMP	SURR	72	%	44-120
FA91824-9	321-60-8	2-Fluorobiphenyl	SAMP	SURR	76	%	44-119
FA91824-9	1718-51-0	Terphenyl-d14	SAMP	SURR	67	%	50-134
FA91824-10	367-12-4	2-Fluorophenol	SAMP	SURR	23	%	19-119
FA91824-10	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	69	%	43-140
FA91824-10	4165-60-0	Nitrobenzene-d5	SAMP	SURR	69	%	44-120
FA91824-10	321-60-8	2-Fluorobiphenyl	SAMP	SURR	69	%	44-119
FA91824-10	1718-51-0	Terphenyl-d14	SAMP	SURR	30 [b]	%	50-134
OP88982	SW846 8270D BY SIM						
OP88982-BS	83-32-9	Acenaphthene	BSP	REC	80	%	44-111
OP88982-BS	208-96-8	Acenaphthylene	BSP	REC	78	%	39-116
OP88982-BS	120-12-7	Anthracene	BSP	REC	78	%	50-114
OP88982-BS	56-55-3	Benzo(a)anthracene	BSP	REC	80	%	54-122
OP88982-BS	50-32-8	Benzo(a)pyrene	BSP	REC	83	%	50-125
OP88982-BS	205-99-2	Benzo(b)fluoranthene	BSP	REC	87	%	53-128
OP88982-BS	191-24-2	Benzo(g,h,i)perylene	BSP	REC	82	%	49-127
OP88982-BS	207-08-9	Benzo(k)fluoranthene	BSP	REC	83	%	56-123
OP88982-BS	218-01-9	Chrysene	BSP	REC	87	%	57-118
OP88982-BS	53-70-3	Dibenzo(a,h)anthracene	BSP	REC	83	%	50-129
OP88982-BS	206-44-0	Fluoranthene	BSP	REC	83	%	55-119
OP88982-BS	86-73-7	Fluorene	BSP	REC	79	%	47-114
OP88982-BS	193-39-5	Indeno(1,2,3-cd)pyrene	BSP	REC	86	%	49-130
OP88982-BS	90-12-0	1-Methylnaphthalene	BSP	REC	71	%	43-111
OP88982-BS	91-57-6	2-Methylnaphthalene	BSP	REC	72	%	39-114
OP88982-BS	91-20-3	Naphthalene	BSP	REC	75	%	38-111
OP88982-BS	85-01-8	Phenanthrene	BSP	REC	82	%	49-113
OP88982-BS	129-00-0	Pyrene	BSP	REC	79	%	55-117
OP88982-BS	7297-45-2	2-Methylnaphthalene-d10	BSP	SURR	95	%	50-150
OP88982-BS	93951-69-0	Fluoranthene-d10	BSP	SURR	103	%	50-150
OP88982-MS	83-32-9	Acenaphthene	MS	REC	63	%	44-111
OP88982-MS	208-96-8	Acenaphthylene	MS	REC	61	%	39-116
OP88982-MS	120-12-7	Anthracene	MS	REC	59	%	50-114
OP88982-MS	56-55-3	Benzo(a)anthracene	MS	REC	65	%	54-122
OP88982-MS	50-32-8	Benzo(a)pyrene	MS	REC	67	%	50-125

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88982-MS	205-99-2	Benzo(b)fluoranthene	MS	REC	70	%	53-128
OP88982-MS	191-24-2	Benzo(g,h,i)perylene	MS	REC	57	%	49-127
OP88982-MS	207-08-9	Benzo(k)fluoranthene	MS	REC	69	%	56-123
OP88982-MS	218-01-9	Chrysene	MS	REC	68	%	57-118
OP88982-MS	53-70-3	Dibenzo(a,h)anthracene	MS	REC	59	%	50-129
OP88982-MS	206-44-0	Fluoranthene	MS	REC	66	%	55-119
OP88982-MS	86-73-7	Fluorene	MS	REC	63	%	47-114
OP88982-MS	193-39-5	Indeno(1,2,3-cd)pyrene	MS	REC	61	%	49-130
OP88982-MS	90-12-0	1-Methylnaphthalene	MS	REC	56	%	43-111
OP88982-MS	91-57-6	2-Methylnaphthalene	MS	REC	56	%	39-114
OP88982-MS	91-20-3	Naphthalene	MS	REC	58	%	38-111
OP88982-MS	85-01-8	Phenanthrene	MS	REC	65	%	49-113
OP88982-MS	129-00-0	Pyrene	MS	REC	66	%	55-117
OP88982-MS	7297-45-2	2-Methylnaphthalene-d10	MS	SURR	74	%	50-150
OP88982-MS	93951-69-0	Fluoranthene-d10	MS	SURR	80	%	50-150
OP88982-MSD	83-32-9	Acenaphthene	MSD	REC	51	%	44-111
OP88982-MSD	83-32-9	Acenaphthene	MSD	RPD	23	%	20
OP88982-MSD	208-96-8	Acenaphthylene	MSD	REC	49	%	39-116
OP88982-MSD	208-96-8	Acenaphthylene	MSD	RPD	23	%	20
OP88982-MSD	120-12-7	Anthracene	MSD	REC	47	%	50-114
OP88982-MSD	120-12-7	Anthracene	MSD	RPD	23	%	20
OP88982-MSD	56-55-3	Benzo(a)anthracene	MSD	REC	50	%	54-122
OP88982-MSD	56-55-3	Benzo(a)anthracene	MSD	RPD	27	%	20
OP88982-MSD	50-32-8	Benzo(a)pyrene	MSD	REC	50	%	50-125
OP88982-MSD	50-32-8	Benzo(a)pyrene	MSD	RPD	29	%	20
OP88982-MSD	205-99-2	Benzo(b)fluoranthene	MSD	REC	55	%	53-128
OP88982-MSD	205-99-2	Benzo(b)fluoranthene	MSD	RPD	24	%	20
OP88982-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	REC	42	%	49-127
OP88982-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	RPD	31	%	20
OP88982-MSD	207-08-9	Benzo(k)fluoranthene	MSD	REC	52	%	56-123
OP88982-MSD	207-08-9	Benzo(k)fluoranthene	MSD	RPD	30	%	20
OP88982-MSD	218-01-9	Chrysene	MSD	REC	52	%	57-118
OP88982-MSD	218-01-9	Chrysene	MSD	RPD	26	%	20
OP88982-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	REC	45	%	50-129
OP88982-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	RPD	29	%	20
OP88982-MSD	206-44-0	Fluoranthene	MSD	REC	52	%	55-119
OP88982-MSD	206-44-0	Fluoranthene	MSD	RPD	23	%	20
OP88982-MSD	86-73-7	Fluorene	MSD	REC	50	%	47-114
OP88982-MSD	86-73-7	Fluorene	MSD	RPD	25	%	20
OP88982-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	REC	45	%	49-130
OP88982-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	RPD	31	%	20
OP88982-MSD	90-12-0	1-Methylnaphthalene	MSD	REC	46	%	43-111
OP88982-MSD	90-12-0	1-Methylnaphthalene	MSD	RPD	21	%	20
OP88982-MSD	91-57-6	2-Methylnaphthalene	MSD	REC	46	%	39-114
OP88982-MSD	91-57-6	2-Methylnaphthalene	MSD	RPD	20	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88982-MSD	91-20-3	Naphthalene	MSD	REC	50	%	38-111
OP88982-MSD	91-20-3	Naphthalene	MSD	RPD	17	%	20
OP88982-MSD	85-01-8	Phenanthrene	MSD	REC	51	%	49-113
OP88982-MSD	85-01-8	Phenanthrene	MSD	RPD	25	%	20
OP88982-MSD	129-00-0	Pyrene	MSD	REC	51	%	55-117
OP88982-MSD	129-00-0	Pyrene	MSD	RPD	27	%	20
OP88982-MSD	7297-45-2	2-Methylnaphthalene-d10	MSD	SURR	63	%	50-150
OP88982-MSD	93951-69-0	Fluoranthene-d10	MSD	SURR	65	%	50-150
OP88982-MB	7297-45-2	2-Methylnaphthalene-d10	MB	SURR	90	%	50-150
OP88982-MB	93951-69-0	Fluoranthene-d10	MB	SURR	93	%	50-150
FA91824-11	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	71	%	50-150
FA91824-11	93951-69-0	Fluoranthene-d10	SAMP	SURR	75	%	50-150
OP88990	SW846 8270D BY SIM						
OP88990-BS	83-32-9	Acenaphthene	BSP	REC	83	%	48-114
OP88990-BS	208-96-8	Acenaphthylene	BSP	REC	80	%	35-121
OP88990-BS	120-12-7	Anthracene	BSP	REC	78	%	53-119
OP88990-BS	56-55-3	Benzo(a)anthracene	BSP	REC	88	%	59-120
OP88990-BS	50-32-8	Benzo(a)pyrene	BSP	REC	85	%	53-120
OP88990-BS	205-99-2	Benzo(b)fluoranthene	BSP	REC	90	%	53-126
OP88990-BS	191-24-2	Benzo(g,h,i)perylene	BSP	REC	83	%	44-128
OP88990-BS	207-08-9	Benzo(k)fluoranthene	BSP	REC	88	%	54-125
OP88990-BS	218-01-9	Chrysene	BSP	REC	88	%	57-120
OP88990-BS	53-70-3	Dibenzo(a,h)anthracene	BSP	REC	85	%	44-131
OP88990-BS	206-44-0	Fluoranthene	BSP	REC	83	%	58-120
OP88990-BS	86-73-7	Fluorene	BSP	REC	84	%	50-118
OP88990-BS	193-39-5	Indeno(1,2,3-cd)pyrene	BSP	REC	90	%	48-130
OP88990-BS	90-12-0	1-Methylnaphthalene	BSP	REC	75	%	41-115
OP88990-BS	91-57-6	2-Methylnaphthalene	BSP	REC	75	%	39-114
OP88990-BS	91-20-3	Naphthalene	BSP	REC	79	%	43-114
OP88990-BS	85-01-8	Phenanthrene	BSP	REC	84	%	53-115
OP88990-BS	129-00-0	Pyrene	BSP	REC	86	%	53-121
OP88990-BS	7297-45-2	2-Methylnaphthalene-d10	BSP	SURR	79	%	50-150
OP88990-BS	93951-69-0	Fluoranthene-d10	BSP	SURR	84	%	50-150
OP88990-MS	83-32-9	Acenaphthene	MS	REC	85	%	48-114
OP88990-MS	208-96-8	Acenaphthylene	MS	REC	83	%	35-121
OP88990-MS	120-12-7	Anthracene	MS	REC	82	%	53-119
OP88990-MS	56-55-3	Benzo(a)anthracene	MS	REC	90	%	59-120
OP88990-MS	50-32-8	Benzo(a)pyrene	MS	REC	88	%	53-120
OP88990-MS	205-99-2	Benzo(b)fluoranthene	MS	REC	92	%	53-126
OP88990-MS	191-24-2	Benzo(g,h,i)perylene	MS	REC	84	%	44-128
OP88990-MS	207-08-9	Benzo(k)fluoranthene	MS	REC	86	%	54-125
OP88990-MS	218-01-9	Chrysene	MS	REC	90	%	57-120
OP88990-MS	53-70-3	Dibenzo(a,h)anthracene	MS	REC	88	%	44-131

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88990-MS	206-44-0	Fluoranthene	MS	REC	86	%	58-120
OP88990-MS	86-73-7	Fluorene	MS	REC	87	%	50-118
OP88990-MS	193-39-5	Indeno(1,2,3-cd)pyrene	MS	REC	94	%	48-130
OP88990-MS	90-12-0	1-Methylnaphthalene	MS	REC	79	%	41-115
OP88990-MS	91-57-6	2-Methylnaphthalene	MS	REC	79	%	39-114
OP88990-MS	91-20-3	Naphthalene	MS	REC	81	%	43-114
OP88990-MS	85-01-8	Phenanthrene	MS	REC	88	%	53-115
OP88990-MS	129-00-0	Pyrene	MS	REC	88	%	53-121
OP88990-MS	7297-45-2	2-Methylnaphthalene-d10	MS	SURR	82	%	50-150
OP88990-MS	93951-69-0	Fluoranthene-d10	MS	SURR	87	%	50-150
OP88990-MSD	83-32-9	Acenaphthene	MSD	REC	79	%	48-114
OP88990-MSD	83-32-9	Acenaphthene	MSD	RPD	7	%	20
OP88990-MSD	208-96-8	Acenaphthylene	MSD	REC	76	%	35-121
OP88990-MSD	208-96-8	Acenaphthylene	MSD	RPD	9	%	20
OP88990-MSD	120-12-7	Anthracene	MSD	REC	74	%	53-119
OP88990-MSD	120-12-7	Anthracene	MSD	RPD	9	%	20
OP88990-MSD	56-55-3	Benzo(a)anthracene	MSD	REC	85	%	59-120
OP88990-MSD	56-55-3	Benzo(a)anthracene	MSD	RPD	5	%	20
OP88990-MSD	50-32-8	Benzo(a)pyrene	MSD	REC	83	%	53-120
OP88990-MSD	50-32-8	Benzo(a)pyrene	MSD	RPD	6	%	20
OP88990-MSD	205-99-2	Benzo(b)fluoranthene	MSD	REC	88	%	53-126
OP88990-MSD	205-99-2	Benzo(b)fluoranthene	MSD	RPD	4	%	20
OP88990-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	REC	79	%	44-128
OP88990-MSD	191-24-2	Benzo(g,h,i)perylene	MSD	RPD	6	%	20
OP88990-MSD	207-08-9	Benzo(k)fluoranthene	MSD	REC	83	%	54-125
OP88990-MSD	207-08-9	Benzo(k)fluoranthene	MSD	RPD	4	%	20
OP88990-MSD	218-01-9	Chrysene	MSD	REC	86	%	57-120
OP88990-MSD	218-01-9	Chrysene	MSD	RPD	4	%	20
OP88990-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	REC	82	%	44-131
OP88990-MSD	53-70-3	Dibenzo(a,h)anthracene	MSD	RPD	7	%	20
OP88990-MSD	206-44-0	Fluoranthene	MSD	REC	79	%	58-120
OP88990-MSD	206-44-0	Fluoranthene	MSD	RPD	9	%	20
OP88990-MSD	86-73-7	Fluorene	MSD	REC	79	%	50-118
OP88990-MSD	86-73-7	Fluorene	MSD	RPD	9	%	20
OP88990-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	REC	88	%	48-130
OP88990-MSD	193-39-5	Indeno(1,2,3-cd)pyrene	MSD	RPD	7	%	20
OP88990-MSD	90-12-0	1-Methylnaphthalene	MSD	REC	74	%	41-115
OP88990-MSD	90-12-0	1-Methylnaphthalene	MSD	RPD	6	%	20
OP88990-MSD	91-57-6	2-Methylnaphthalene	MSD	REC	73	%	39-114
OP88990-MSD	91-57-6	2-Methylnaphthalene	MSD	RPD	7	%	20
OP88990-MSD	91-20-3	Naphthalene	MSD	REC	77	%	43-114
OP88990-MSD	91-20-3	Naphthalene	MSD	RPD	5	%	20
OP88990-MSD	85-01-8	Phenanthrene	MSD	REC	80	%	53-115
OP88990-MSD	85-01-8	Phenanthrene	MSD	RPD	9	%	20
OP88990-MSD	129-00-0	Pyrene	MSD	REC	84	%	53-121

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88990-MSD	129-00-0	Pyrene	MSD	RPD	5	%	20
OP88990-MSD	7297-45-2	2-Methylnaphthalene-d10	MSD	SURR	78	%	50-150
OP88990-MSD	93951-69-0	Fluoranthene-d10	MSD	SURR	81	%	50-150
OP88990-MB	7297-45-2	2-Methylnaphthalene-d10	MB	SURR	67	%	50-150
OP88990-MB	93951-69-0	Fluoranthene-d10	MB	SURR	77	%	50-150
FA91824-1	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	59	%	50-150
FA91824-1	93951-69-0	Fluoranthene-d10	SAMP	SURR	70	%	50-150
FA91824-2	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	68	%	50-150
FA91824-2	93951-69-0	Fluoranthene-d10	SAMP	SURR	79	%	50-150
FA91824-3	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	71	%	50-150
FA91824-3	93951-69-0	Fluoranthene-d10	SAMP	SURR	80	%	50-150
FA91824-4	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	68	%	50-150
FA91824-4	93951-69-0	Fluoranthene-d10	SAMP	SURR	78	%	50-150
FA91824-5	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	75	%	50-150
FA91824-5	93951-69-0	Fluoranthene-d10	SAMP	SURR	85	%	50-150
FA91824-6	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	57	%	50-150
FA91824-6	93951-69-0	Fluoranthene-d10	SAMP	SURR	65	%	50-150
FA91824-7	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	51	%	50-150
FA91824-7	93951-69-0	Fluoranthene-d10	SAMP	SURR	60	%	50-150
FA91824-8	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	56	%	50-150
FA91824-8	93951-69-0	Fluoranthene-d10	SAMP	SURR	63	%	50-150
FA91824-9	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	67	%	50-150
FA91824-9	93951-69-0	Fluoranthene-d10	SAMP	SURR	78	%	50-150
FA91824-10	7297-45-2	2-Methylnaphthalene-d10	SAMP	SURR	74	%	50-150
FA91824-10	93951-69-0	Fluoranthene-d10	SAMP	SURR	89	%	50-150
OP88994	SW846 8270D						
OP88994-BS	59-50-7	4-Chloro-3-methyl Phenol	BSP	REC	88	%	45-122
OP88994-BS	95-57-8	2-Chlorophenol	BSP	REC	77	%	34-121
OP88994-BS	120-83-2	2,4-Dichlorophenol	BSP	REC	86	%	40-122
OP88994-BS	105-67-9	2,4-Dimethylphenol	BSP	REC	77	%	30-127
OP88994-BS	534-52-1	4,6-Dinitro-o-cresol	BSP	REC	99	%	29-132
OP88994-BS	95-48-7	2-Methylphenol	BSP	REC	76	%	32-122
OP88994-BS		3&4-Methylphenol	BSP	REC	80	%	34-119
OP88994-BS	88-75-5	2-Nitrophenol	BSP	REC	80	%	36-123
OP88994-BS	100-02-7	4-Nitrophenol	BSP	REC	89	%	30-132
OP88994-BS	87-86-5	Pentachlorophenol	BSP	REC	100	%	25-133
OP88994-BS	108-95-2	Phenol	BSP	REC	78	%	34-121
OP88994-BS	95-95-4	2,4,5-Trichlorophenol	BSP	REC	93	%	41-124
OP88994-BS	88-06-2	2,4,6-Trichlorophenol	BSP	REC	87	%	39-126
OP88994-BS	100-51-6	Benzyl Alcohol	BSP	REC	78	%	29-122
OP88994-BS	101-55-3	4-Bromophenyl phenyl ether	BSP	REC	83	%	46-124
OP88994-BS	85-68-7	Butyl benzyl phthalate	BSP	REC	91	%	48-132
OP88994-BS	86-74-8	Carbazole	BSP	REC	85	%	50-123

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88994-BS	106-47-8	4-Chloroaniline	BSP	REC	71	%	17-106
OP88994-BS	111-91-1	bis(2-Chloroethoxy)methane	BSP	REC	73	%	36-121
OP88994-BS	111-44-4	bis(2-Chloroethyl)ether	BSP	REC	68	%	31-120
OP88994-BS	108-60-1	2,2'-Oxybis(1-chloropropane)	BSP	REC	66	%	33-131
OP88994-BS	91-58-7	2-Chloronaphthalene	BSP	REC	80	%	41-114
OP88994-BS	7005-72-3	4-Chlorophenyl phenyl ether	BSP	REC	83	%	45-121
OP88994-BS	132-64-9	Dibenzofuran	BSP	REC	80	%	44-120
OP88994-BS	95-50-1	1,2-Dichlorobenzene	BSP	REC	71	%	33-117
OP88994-BS	541-73-1	1,3-Dichlorobenzene	BSP	REC	68	%	30-115
OP88994-BS	106-46-7	1,4-Dichlorobenzene	BSP	REC	69	%	31-115
OP88994-BS	91-94-1	3,3'-Dichlorobenzidine	BSP	REC	85	%	22-121
OP88994-BS	84-66-2	Diethyl Phthalate	BSP	REC	86	%	50-124
OP88994-BS	131-11-3	Dimethyl Phthalate	BSP	REC	85	%	48-124
OP88994-BS	117-84-0	Di-n-octyl Phthalate	BSP	REC	96	%	45-140
OP88994-BS	84-74-2	Di-n-butyl Phthalate	BSP	REC	90	%	51-128
OP88994-BS	121-14-2	2,4-Dinitrotoluene	BSP	REC	98	%	48-126
OP88994-BS	606-20-2	2,6-Dinitrotoluene	BSP	REC	89	%	46-124
OP88994-BS	117-81-7	bis(2-Ethylhexyl)phthalate	BSP	REC	91	%	51-133
OP88994-BS	118-74-1	Hexachlorobenzene	BSP	REC	80	%	45-122
OP88994-BS	87-68-3	Hexachlorobutadiene	BSP	REC	74	%	32-123
OP88994-BS	67-72-1	Hexachloroethane	BSP	REC	68	%	28-117
OP88994-BS	78-59-1	Isophorone	BSP	REC	78	%	30-122
OP88994-BS	88-74-4	2-Nitroaniline	BSP	REC	80	%	44-127
OP88994-BS	99-09-2	3-Nitroaniline	BSP	REC	79	%	33-119
OP88994-BS	98-95-3	Nitrobenzene	BSP	REC	71	%	34-122
OP88994-BS	621-64-7	N-Nitrosodi-n-propylamine	BSP	REC	73	%	36-120
OP88994-BS	86-30-6	N-Nitrosodiphenylamine	BSP	REC	79	%	38-127
OP88994-BS	120-82-1	1,2,4-Trichlorobenzene	BSP	REC	73	%	34-118
OP88994-BS	367-12-4	2-Fluorophenol	BSP	SURR	72	%	35-115
OP88994-BS	4165-62-2	Phenol-d5	BSP	SURR	75	%	33-122
OP88994-BS	118-79-6	2,4,6-Tribromophenol	BSP	SURR	88	%	39-132
OP88994-BS	4165-60-0	Nitrobenzene-d5	BSP	SURR	67	%	37-122
OP88994-BS	321-60-8	2-Fluorobiphenyl	BSP	SURR	77	%	44-115
OP88994-BS	1718-51-0	Terphenyl-d14	BSP	SURR	85	%	54-127
OP88994-MS*	59-50-7	4-Chloro-3-methyl Phenol	MS	REC	77	%	45-122
OP88994-MS*	95-57-8	2-Chlorophenol	MS	REC	72	%	34-121
OP88994-MS*	120-83-2	2,4-Dichlorophenol	MS	REC	78	%	40-122
OP88994-MS*	105-67-9	2,4-Dimethylphenol	MS	REC	67	%	30-127
OP88994-MS*	534-52-1	4,6-Dinitro-o-cresol	MS	REC	67	%	29-132
OP88994-MS*	95-48-7	2-Methylphenol	MS	REC	71	%	32-122
OP88994-MS*		3&4-Methylphenol	MS	REC	75	%	34-119
OP88994-MS*	88-75-5	2-Nitrophenol	MS	REC	74	%	36-123
OP88994-MS*	100-02-7	4-Nitrophenol	MS	REC	72	%	30-132
OP88994-MS*	87-86-5	Pentachlorophenol	MS	REC	65	%	25-133
OP88994-MS*	108-95-2	Phenol	MS	REC	74	%	34-121

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88994-MS*	95-95-4	2,4,5-Trichlorophenol	MS	REC	77	%	41-124
OP88994-MS*	88-06-2	2,4,6-Trichlorophenol	MS	REC	73	%	39-126
OP88994-MS*	100-51-6	Benzyl Alcohol	MS	REC	70	%	29-122
OP88994-MS*	101-55-3	4-Bromophenyl phenyl ether	MS	REC	73	%	46-124
OP88994-MS*	85-68-7	Butyl benzyl phthalate	MS	REC	81	%	48-132
OP88994-MS*	86-74-8	Carbazole	MS	REC	74	%	50-123
OP88994-MS*	106-47-8	4-Chloroaniline	MS	REC	71	%	17-106
OP88994-MS*	111-91-1	bis(2-Chloroethoxy)methane	MS	REC	69	%	36-121
OP88994-MS*	111-44-4	bis(2-Chloroethyl)ether	MS	REC	63	%	31-120
OP88994-MS*	108-60-1	2,2'-Oxybis(1-chloropropane)	MS	REC	61	%	33-131
OP88994-MS*	91-58-7	2-Chloronaphthalene	MS	REC	74	%	41-114
OP88994-MS*	7005-72-3	4-Chlorophenyl phenyl ether	MS	REC	72	%	45-121
OP88994-MS*	132-64-9	Dibenzofuran	MS	REC	72	%	44-120
OP88994-MS*	95-50-1	1,2-Dichlorobenzene	MS	REC	67	%	33-117
OP88994-MS*	541-73-1	1,3-Dichlorobenzene	MS	REC	65	%	30-115
OP88994-MS*	106-46-7	1,4-Dichlorobenzene	MS	REC	65	%	31-115
OP88994-MS*	91-94-1	3,3'-Dichlorobenzidine	MS	REC	81	%	22-121
OP88994-MS*	84-66-2	Diethyl Phthalate	MS	REC	74	%	50-124
OP88994-MS*	131-11-3	Dimethyl Phthalate	MS	REC	72	%	48-124
OP88994-MS*	117-84-0	Di-n-octyl Phthalate	MS	REC	80	%	45-140
OP88994-MS*	84-74-2	Di-n-butyl Phthalate	MS	REC	77	%	51-128
OP88994-MS*	121-14-2	2,4-Dinitrotoluene	MS	REC	79	%	48-126
OP88994-MS*	606-20-2	2,6-Dinitrotoluene	MS	REC	75	%	46-124
OP88994-MS*	117-81-7	bis(2-Ethylhexyl)phthalate	MS	REC	79	%	51-133
OP88994-MS*	118-74-1	Hexachlorobenzene	MS	REC	72	%	45-122
OP88994-MS*	87-68-3	Hexachlorobutadiene	MS	REC	71	%	32-123
OP88994-MS*	67-72-1	Hexachloroethane	MS	REC	57	%	28-117
OP88994-MS*	78-59-1	Isophorone	MS	REC	68	%	30-122
OP88994-MS*	88-74-4	2-Nitroaniline	MS	REC	67	%	44-127
OP88994-MS*	99-09-2	3-Nitroaniline	MS	REC	72	%	33-119
OP88994-MS*	98-95-3	Nitrobenzene	MS	REC	65	%	34-122
OP88994-MS*	621-64-7	N-Nitrosodi-n-propylamine	MS	REC	65	%	36-120
OP88994-MS*	86-30-6	N-Nitrosodiphenylamine	MS	REC	69	%	38-127
OP88994-MS*	120-82-1	1,2,4-Trichlorobenzene	MS	REC	70	%	34-118
OP88994-MS*	367-12-4	2-Fluorophenol	MS	SURR	65	%	35-115
OP88994-MS*	4165-62-2	Phenol-d5	MS	SURR	72	%	33-122
OP88994-MS*	118-79-6	2,4,6-Tribromophenol	MS	SURR	75	%	39-132
OP88994-MS*	4165-60-0	Nitrobenzene-d5	MS	SURR	63	%	37-122
OP88994-MS*	321-60-8	2-Fluorobiphenyl	MS	SURR	71	%	44-115
OP88994-MS*	1718-51-0	Terphenyl-d14	MS	SURR	73	%	54-127
OP88994-MSD*	59-50-7	4-Chloro-3-methyl Phenol	MSD	REC	73	%	45-122
OP88994-MSD*	59-50-7	4-Chloro-3-methyl Phenol	MSD	RPD	5	%	20
OP88994-MSD*	95-57-8	2-Chlorophenol	MSD	REC	70	%	34-121
OP88994-MSD*	95-57-8	2-Chlorophenol	MSD	RPD	3	%	20
OP88994-MSD*	120-83-2	2,4-Dichlorophenol	MSD	REC	75	%	40-122

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88994-MSD*	120-83-2	2,4-Dichlorophenol	MSD	RPD	4	%	20
OP88994-MSD*	105-67-9	2,4-Dimethylphenol	MSD	REC	62	%	30-127
OP88994-MSD*	105-67-9	2,4-Dimethylphenol	MSD	RPD	8	%	20
OP88994-MSD*	534-52-1	4,6-Dinitro-o-cresol	MSD	REC	56	%	29-132
OP88994-MSD*	534-52-1	4,6-Dinitro-o-cresol	MSD	RPD	18	%	20
OP88994-MSD*	95-48-7	2-Methylphenol	MSD	REC	66	%	32-122
OP88994-MSD*	95-48-7	2-Methylphenol	MSD	RPD	7	%	20
OP88994-MSD*		3&4-Methylphenol	MSD	REC	71	%	34-119
OP88994-MSD*		3&4-Methylphenol	MSD	RPD	6	%	20
OP88994-MSD*	88-75-5	2-Nitrophenol	MSD	REC	68	%	36-123
OP88994-MSD*	88-75-5	2-Nitrophenol	MSD	RPD	8	%	20
OP88994-MSD*	100-02-7	4-Nitrophenol	MSD	REC	68	%	30-132
OP88994-MSD*	100-02-7	4-Nitrophenol	MSD	RPD	6	%	20
OP88994-MSD*	87-86-5	Pentachlorophenol	MSD	REC	41	%	25-133
OP88994-MSD*	87-86-5	Pentachlorophenol	MSD	RPD	47	%	20
OP88994-MSD*	108-95-2	Phenol	MSD	REC	68	%	34-121
OP88994-MSD*	108-95-2	Phenol	MSD	RPD	8	%	20
OP88994-MSD*	95-95-4	2,4,5-Trichlorophenol	MSD	REC	72	%	41-124
OP88994-MSD*	95-95-4	2,4,5-Trichlorophenol	MSD	RPD	7	%	20
OP88994-MSD*	88-06-2	2,4,6-Trichlorophenol	MSD	REC	71	%	39-126
OP88994-MSD*	88-06-2	2,4,6-Trichlorophenol	MSD	RPD	2	%	20
OP88994-MSD*	100-51-6	Benzyl Alcohol	MSD	REC	68	%	29-122
OP88994-MSD*	100-51-6	Benzyl Alcohol	MSD	RPD	3	%	20
OP88994-MSD*	101-55-3	4-Bromophenyl phenyl ether	MSD	REC	69	%	46-124
OP88994-MSD*	101-55-3	4-Bromophenyl phenyl ether	MSD	RPD	6	%	20
OP88994-MSD*	85-68-7	Butyl benzyl phthalate	MSD	REC	77	%	48-132
OP88994-MSD*	85-68-7	Butyl benzyl phthalate	MSD	RPD	6	%	20
OP88994-MSD*	86-74-8	Carbazole	MSD	REC	69	%	50-123
OP88994-MSD*	86-74-8	Carbazole	MSD	RPD	7	%	20
OP88994-MSD*	106-47-8	4-Chloroaniline	MSD	REC	64	%	17-106
OP88994-MSD*	106-47-8	4-Chloroaniline	MSD	RPD	10	%	20
OP88994-MSD*	111-91-1	bis(2-Chloroethoxy)methane	MSD	REC	64	%	36-121
OP88994-MSD*	111-91-1	bis(2-Chloroethoxy)methane	MSD	RPD	8	%	20
OP88994-MSD*	111-44-4	bis(2-Chloroethyl)ether	MSD	REC	60	%	31-120
OP88994-MSD*	111-44-4	bis(2-Chloroethyl)ether	MSD	RPD	6	%	20
OP88994-MSD*	108-60-1	2,2'-Oxybis(1-chloropropane)	MSD	REC	57	%	33-131
OP88994-MSD*	108-60-1	2,2'-Oxybis(1-chloropropane)	MSD	RPD	6	%	20
OP88994-MSD*	91-58-7	2-Chloronaphthalene	MSD	REC	70	%	41-114
OP88994-MSD*	91-58-7	2-Chloronaphthalene	MSD	RPD	6	%	20
OP88994-MSD*	7005-72-3	4-Chlorophenyl phenyl ether	MSD	REC	68	%	45-121
OP88994-MSD*	7005-72-3	4-Chlorophenyl phenyl ether	MSD	RPD	6	%	20
OP88994-MSD*	132-64-9	Dibenzofuran	MSD	REC	67	%	44-120
OP88994-MSD*	132-64-9	Dibenzofuran	MSD	RPD	7	%	20
OP88994-MSD*	95-50-1	1,2-Dichlorobenzene	MSD	REC	65	%	33-117
OP88994-MSD*	95-50-1	1,2-Dichlorobenzene	MSD	RPD	4	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88994-MSD*	541-73-1	1,3-Dichlorobenzene	MSD	REC	61	%	30-115
OP88994-MSD*	541-73-1	1,3-Dichlorobenzene	MSD	RPD	6	%	20
OP88994-MSD*	106-46-7	1,4-Dichlorobenzene	MSD	REC	63	%	31-115
OP88994-MSD*	106-46-7	1,4-Dichlorobenzene	MSD	RPD	3	%	20
OP88994-MSD*	91-94-1	3,3'-Dichlorobenzidine	MSD	REC	77	%	22-121
OP88994-MSD*	91-94-1	3,3'-Dichlorobenzidine	MSD	RPD	5	%	20
OP88994-MSD*	84-66-2	Diethyl Phthalate	MSD	REC	70	%	50-124
OP88994-MSD*	84-66-2	Diethyl Phthalate	MSD	RPD	5	%	20
OP88994-MSD*	131-11-3	Dimethyl Phthalate	MSD	REC	70	%	48-124
OP88994-MSD*	131-11-3	Dimethyl Phthalate	MSD	RPD	4	%	20
OP88994-MSD*	117-84-0	Di-n-octyl Phthalate	MSD	REC	76	%	45-140
OP88994-MSD*	117-84-0	Di-n-octyl Phthalate	MSD	RPD	5	%	20
OP88994-MSD*	84-74-2	Di-n-butyl Phthalate	MSD	REC	73	%	51-128
OP88994-MSD*	84-74-2	Di-n-butyl Phthalate	MSD	RPD	6	%	20
OP88994-MSD*	121-14-2	2,4-Dinitrotoluene	MSD	REC	76	%	48-126
OP88994-MSD*	121-14-2	2,4-Dinitrotoluene	MSD	RPD	4	%	20
OP88994-MSD*	606-20-2	2,6-Dinitrotoluene	MSD	REC	70	%	46-124
OP88994-MSD*	606-20-2	2,6-Dinitrotoluene	MSD	RPD	7	%	20
OP88994-MSD*	117-81-7	bis(2-Ethylhexyl)phthalate	MSD	REC	75	%	51-133
OP88994-MSD*	117-81-7	bis(2-Ethylhexyl)phthalate	MSD	RPD	6	%	20
OP88994-MSD*	118-74-1	Hexachlorobenzene	MSD	REC	68	%	45-122
OP88994-MSD*	118-74-1	Hexachlorobenzene	MSD	RPD	6	%	20
OP88994-MSD*	87-68-3	Hexachlorobutadiene	MSD	REC	66	%	32-123
OP88994-MSD*	87-68-3	Hexachlorobutadiene	MSD	RPD	7	%	20
OP88994-MSD*	67-72-1	Hexachloroethane	MSD	REC	55	%	28-117
OP88994-MSD*	67-72-1	Hexachloroethane	MSD	RPD	4	%	20
OP88994-MSD*	78-59-1	Isophorone	MSD	REC	65	%	30-122
OP88994-MSD*	78-59-1	Isophorone	MSD	RPD	5	%	20
OP88994-MSD*	88-74-4	2-Nitroaniline	MSD	REC	62	%	44-127
OP88994-MSD*	88-74-4	2-Nitroaniline	MSD	RPD	8	%	20
OP88994-MSD*	99-09-2	3-Nitroaniline	MSD	REC	65	%	33-119
OP88994-MSD*	99-09-2	3-Nitroaniline	MSD	RPD	10	%	20
OP88994-MSD*	98-95-3	Nitrobenzene	MSD	REC	60	%	34-122
OP88994-MSD*	98-95-3	Nitrobenzene	MSD	RPD	9	%	20
OP88994-MSD*	621-64-7	N-Nitrosodi-n-propylamine	MSD	REC	62	%	36-120
OP88994-MSD*	621-64-7	N-Nitrosodi-n-propylamine	MSD	RPD	6	%	20
OP88994-MSD*	86-30-6	N-Nitrosodiphenylamine	MSD	REC	67	%	38-127
OP88994-MSD*	86-30-6	N-Nitrosodiphenylamine	MSD	RPD	4	%	20
OP88994-MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	REC	66	%	34-118
OP88994-MSD*	120-82-1	1,2,4-Trichlorobenzene	MSD	RPD	6	%	20
OP88994-MSD*	367-12-4	2-Fluorophenol	MSD	SURR	60	%	35-115
OP88994-MSD*	4165-62-2	Phenol-d5	MSD	SURR	68	%	33-122
OP88994-MSD*	118-79-6	2,4,6-Tribromophenol	MSD	SURR	68	%	39-132
OP88994-MSD*	4165-60-0	Nitrobenzene-d5	MSD	SURR	58	%	37-122
OP88994-MSD*	321-60-8	2-Fluorobiphenyl	MSD	SURR	67	%	44-115

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
OP88994-MSD*	1718-51-0	Terphenyl-d14	MSD	SURR	70	%	54-127
OP88994-MB	367-12-4	2-Fluorophenol	MB	SURR	54	%	35-115
OP88994-MB	367-12-4	2-Fluorophenol	MB	SURR	55	%	35-115
OP88994-MB	4165-62-2	Phenol-d5	MB	SURR	62	%	33-122
OP88994-MB	4165-62-2	Phenol-d5	MB	SURR	61	%	33-122
OP88994-MB	118-79-6	2,4,6-Tribromophenol	MB	SURR	89	%	39-132
OP88994-MB	118-79-6	2,4,6-Tribromophenol	MB	SURR	74	%	39-132
OP88994-MB	4165-60-0	Nitrobenzene-d5	MB	SURR	54	%	37-122
OP88994-MB	4165-60-0	Nitrobenzene-d5	MB	SURR	54	%	37-122
OP88994-MB	321-60-8	2-Fluorobiphenyl	MB	SURR	67	%	44-115
OP88994-MB	321-60-8	2-Fluorobiphenyl	MB	SURR	62	%	44-115
OP88994-MB	1718-51-0	Terphenyl-d14	MB	SURR	88	%	54-127
OP88994-MB	1718-51-0	Terphenyl-d14	MB	SURR	81	%	54-127
FA91824-11	367-12-4	2-Fluorophenol	SAMP	SURR	59	%	35-115
FA91824-11	367-12-4	2-Fluorophenol	SAMP	SURR	57	%	35-115
FA91824-11	4165-62-2	Phenol-d5	SAMP	SURR	66	%	33-122
FA91824-11	4165-62-2	Phenol-d5	SAMP	SURR	71	%	33-122
FA91824-11	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	86	%	39-132
FA91824-11	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	101	%	39-132
FA91824-11	4165-60-0	Nitrobenzene-d5	SAMP	SURR	59	%	37-122
FA91824-11	4165-60-0	Nitrobenzene-d5	SAMP	SURR	61	%	37-122
FA91824-11	321-60-8	2-Fluorobiphenyl	SAMP	SURR	75	%	44-115
FA91824-11	321-60-8	2-Fluorobiphenyl	SAMP	SURR	77	%	44-115
FA91824-11	1718-51-0	Terphenyl-d14	SAMP	SURR	86	%	54-127
FA91824-11	1718-51-0	Terphenyl-d14	SAMP	SURR	93	%	54-127
FA91824-12	367-12-4	2-Fluorophenol	SAMP	SURR	58	%	35-115
FA91824-12	367-12-4	2-Fluorophenol	SAMP	SURR	60	%	35-115
FA91824-12	4165-62-2	Phenol-d5	SAMP	SURR	67	%	33-122
FA91824-12	4165-62-2	Phenol-d5	SAMP	SURR	67	%	33-122
FA91824-12	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	76	%	39-132
FA91824-12	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	93	%	39-132
FA91824-12	4165-60-0	Nitrobenzene-d5	SAMP	SURR	63	%	37-122
FA91824-12	4165-60-0	Nitrobenzene-d5	SAMP	SURR	59	%	37-122
FA91824-12	321-60-8	2-Fluorobiphenyl	SAMP	SURR	69	%	44-115
FA91824-12	321-60-8	2-Fluorobiphenyl	SAMP	SURR	77	%	44-115
FA91824-12	1718-51-0	Terphenyl-d14	SAMP	SURR	77	%	54-127
FA91824-12	1718-51-0	Terphenyl-d14	SAMP	SURR	85	%	54-127
FA91824-13	367-12-4	2-Fluorophenol	SAMP	SURR	59	%	35-115
FA91824-13	367-12-4	2-Fluorophenol	SAMP	SURR	61	%	35-115
FA91824-13	4165-62-2	Phenol-d5	SAMP	SURR	68	%	33-122
FA91824-13	4165-62-2	Phenol-d5	SAMP	SURR	67	%	33-122
FA91824-13	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	76	%	39-132
FA91824-13	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	94	%	39-132
FA91824-13	4165-60-0	Nitrobenzene-d5	SAMP	SURR	63	%	37-122
FA91824-13	4165-60-0	Nitrobenzene-d5	SAMP	SURR	60	%	37-122

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91824-13	321-60-8	2-Fluorobiphenyl	SAMP	SURR	70	%	44-115
FA91824-13	321-60-8	2-Fluorobiphenyl	SAMP	SURR	76	%	44-115
FA91824-13	1718-51-0	Terphenyl-d14	SAMP	SURR	76	%	54-127
FA91824-13	1718-51-0	Terphenyl-d14	SAMP	SURR	86	%	54-127
FA91824-14	367-12-4	2-Fluorophenol	SAMP	SURR	49	%	35-115
FA91824-14	367-12-4	2-Fluorophenol	SAMP	SURR	54	%	35-115
FA91824-14	4165-62-2	Phenol-d5	SAMP	SURR	60	%	33-122
FA91824-14	4165-62-2	Phenol-d5	SAMP	SURR	56	%	33-122
FA91824-14	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	65	%	39-132
FA91824-14	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	81	%	39-132
FA91824-14	4165-60-0	Nitrobenzene-d5	SAMP	SURR	54	%	37-122
FA91824-14	4165-60-0	Nitrobenzene-d5	SAMP	SURR	50	%	37-122
FA91824-14	321-60-8	2-Fluorobiphenyl	SAMP	SURR	59	%	44-115
FA91824-14	321-60-8	2-Fluorobiphenyl	SAMP	SURR	68	%	44-115
FA91824-14	1718-51-0	Terphenyl-d14	SAMP	SURR	64	%	54-127
FA91824-14	1718-51-0	Terphenyl-d14	SAMP	SURR	75	%	54-127
FA91824-15	367-12-4	2-Fluorophenol	SAMP	SURR	42	%	35-115
FA91824-15	367-12-4	2-Fluorophenol	SAMP	SURR	46	%	35-115
FA91824-15	4165-62-2	Phenol-d5	SAMP	SURR	51	%	33-122
FA91824-15	4165-62-2	Phenol-d5	SAMP	SURR	49	%	33-122
FA91824-15	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	59	%	39-132
FA91824-15	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	75	%	39-132
FA91824-15	4165-60-0	Nitrobenzene-d5	SAMP	SURR	47	%	37-122
FA91824-15	4165-60-0	Nitrobenzene-d5	SAMP	SURR	44	%	37-122
FA91824-15	321-60-8	2-Fluorobiphenyl	SAMP	SURR	51	%	44-115
FA91824-15	321-60-8	2-Fluorobiphenyl	SAMP	SURR	60	%	44-115
FA91824-15	1718-51-0	Terphenyl-d14	SAMP	SURR	59	%	54-127
FA91824-15	1718-51-0	Terphenyl-d14	SAMP	SURR	70	%	54-127
FA91824-16	367-12-4	2-Fluorophenol	SAMP	SURR	51	%	35-115
FA91824-16	367-12-4	2-Fluorophenol	SAMP	SURR	55	%	35-115
FA91824-16	4165-62-2	Phenol-d5	SAMP	SURR	62	%	33-122
FA91824-16	4165-62-2	Phenol-d5	SAMP	SURR	59	%	33-122
FA91824-16	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	68	%	39-132
FA91824-16	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	88	%	39-132
FA91824-16	4165-60-0	Nitrobenzene-d5	SAMP	SURR	58	%	37-122
FA91824-16	4165-60-0	Nitrobenzene-d5	SAMP	SURR	52	%	37-122
FA91824-16	321-60-8	2-Fluorobiphenyl	SAMP	SURR	61	%	44-115
FA91824-16	321-60-8	2-Fluorobiphenyl	SAMP	SURR	70	%	44-115
FA91824-16	1718-51-0	Terphenyl-d14	SAMP	SURR	69	%	54-127
FA91824-16	1718-51-0	Terphenyl-d14	SAMP	SURR	81	%	54-127
FA91824-17	367-12-4	2-Fluorophenol	SAMP	SURR	54	%	35-115
FA91824-17	367-12-4	2-Fluorophenol	SAMP	SURR	59	%	35-115
FA91824-17	4165-62-2	Phenol-d5	SAMP	SURR	61	%	33-122
FA91824-17	4165-62-2	Phenol-d5	SAMP	SURR	65	%	33-122
FA91824-17	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	91	%	39-132

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
FA91824-17	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	69	%	39-132
FA91824-17	4165-60-0	Nitrobenzene-d5	SAMP	SURR	58	%	37-122
FA91824-17	4165-60-0	Nitrobenzene-d5	SAMP	SURR	54	%	37-122
FA91824-17	321-60-8	2-Fluorobiphenyl	SAMP	SURR	72	%	44-115
FA91824-17	321-60-8	2-Fluorobiphenyl	SAMP	SURR	63	%	44-115
FA91824-17	1718-51-0	Terphenyl-d14	SAMP	SURR	83	%	54-127
FA91824-17	1718-51-0	Terphenyl-d14	SAMP	SURR	70	%	54-127
FA91824-18	367-12-4	2-Fluorophenol	SAMP	SURR	59	%	35-115
FA91824-18	367-12-4	2-Fluorophenol	SAMP	SURR	55	%	35-115
FA91824-18	4165-62-2	Phenol-d5	SAMP	SURR	65	%	33-122
FA91824-18	4165-62-2	Phenol-d5	SAMP	SURR	62	%	33-122
FA91824-18	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	96	%	39-132
FA91824-18	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	75	%	39-132
FA91824-18	4165-60-0	Nitrobenzene-d5	SAMP	SURR	56	%	37-122
FA91824-18	4165-60-0	Nitrobenzene-d5	SAMP	SURR	63	%	37-122
FA91824-18	321-60-8	2-Fluorobiphenyl	SAMP	SURR	65	%	44-115
FA91824-18	321-60-8	2-Fluorobiphenyl	SAMP	SURR	76	%	44-115
FA91824-18	1718-51-0	Terphenyl-d14	SAMP	SURR	88	%	54-127
FA91824-18	1718-51-0	Terphenyl-d14	SAMP	SURR	74	%	54-127
FA91824-19	367-12-4	2-Fluorophenol	SAMP	SURR	44	%	35-115
FA91824-19	367-12-4	2-Fluorophenol	SAMP	SURR	41	%	35-115
FA91824-19	4165-62-2	Phenol-d5	SAMP	SURR	49	%	33-122
FA91824-19	4165-62-2	Phenol-d5	SAMP	SURR	47	%	33-122
FA91824-19	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	74	%	39-132
FA91824-19	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	59	%	39-132
FA91824-19	4165-60-0	Nitrobenzene-d5	SAMP	SURR	42	%	37-122
FA91824-19	4165-60-0	Nitrobenzene-d5	SAMP	SURR	46	%	37-122
FA91824-19	321-60-8	2-Fluorobiphenyl	SAMP	SURR	49	%	44-115
FA91824-19	321-60-8	2-Fluorobiphenyl	SAMP	SURR	57	%	44-115
FA91824-19	1718-51-0	Terphenyl-d14	SAMP	SURR	70	%	54-127
FA91824-19	1718-51-0	Terphenyl-d14	SAMP	SURR	60	%	54-127
FA91824-20	367-12-4	2-Fluorophenol	SAMP	SURR	41	%	35-115
FA91824-20	367-12-4	2-Fluorophenol	SAMP	SURR	44	%	35-115
FA91824-20	4165-62-2	Phenol-d5	SAMP	SURR	46	%	33-122
FA91824-20	4165-62-2	Phenol-d5	SAMP	SURR	48	%	33-122
FA91824-20	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	69	%	39-132
FA91824-20	118-79-6	2,4,6-Tribromophenol	SAMP	SURR	52	%	39-132
FA91824-20	4165-60-0	Nitrobenzene-d5	SAMP	SURR	47	%	37-122
FA91824-20	4165-60-0	Nitrobenzene-d5	SAMP	SURR	41	%	37-122
FA91824-20	321-60-8	2-Fluorobiphenyl	SAMP	SURR	49	%	44-115
FA91824-20	321-60-8	2-Fluorobiphenyl	SAMP	SURR	55	%	44-115
FA91824-20	1718-51-0	Terphenyl-d14	SAMP	SURR	65	%	54-127
FA91824-20	1718-51-0	Terphenyl-d14	SAMP	SURR	53	%	54-127

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40061	SW846 7471B						
MP40061-B1	7439-97-6	Mercury	BSP	REC	96	%	80-124
MP40061-S1*	7439-97-6	Mercury	MS	REC	89	%	80-124
MP40061-S2*	7439-97-6	Mercury	MSD	REC	92	%	80-124
MP40061-S2*	7439-97-6	Mercury	MSD	RPD	12.9	%	20
MP40061-D1*	7439-97-6	Mercury	DUP	RPD	8	%	20
MP40066	SW846 7470A						
MP40066-B1	7439-97-6	Mercury	BSP	REC	96.7	%	82-119
MP40066-S1	7439-97-6	Mercury	MS	REC	90	%	82-119
MP40066-S2	7439-97-6	Mercury	MSD	REC	90	%	82-119
MP40066-S2	7439-97-6	Mercury	MSD	RPD	0	%	20
MP40066-D1	7439-97-6	Mercury	DUP	RPD	0	%	20
MP40088	SW846 6010C						
MP40088-B1	7440-36-0	Antimony	BSP	REC	98.4	%	88-113
MP40088-B1	7440-38-2	Arsenic	BSP	REC	97.5	%	87-113
MP40088-B1	7440-39-3	Barium	BSP	REC	100	%	88-113
MP40088-B1	7440-41-7	Beryllium	BSP	REC	102.4	%	89-112
MP40088-B1	7440-43-9	Cadmium	BSP	REC	99.2	%	88-113
MP40088-B1	7440-70-2	Calcium	BSP	REC	103.2	%	87-113
MP40088-B1	7440-47-3	Chromium	BSP	REC	100.5	%	90-113
MP40088-B1	7440-50-8	Copper	BSP	REC	100.8	%	86-114
MP40088-B1	7439-92-1	Lead	BSP	REC	96.8	%	86-113
MP40088-B1	7439-95-4	Magnesium	BSP	REC	101.6	%	85-113
MP40088-B1	7440-02-0	Nickel	BSP	REC	99	%	88-113
MP40088-B1	7782-49-2	Selenium	BSP	REC	93	%	83-114
MP40088-B1	7440-22-4	Silver	BSP	REC	96.6	%	84-115
MP40088-B1	7440-28-0	Thallium	BSP	REC	98.5	%	85-114
MP40088-B1	7440-66-6	Zinc	BSP	REC	99.6	%	87-115
MP40088-S1*	7440-36-0	Antimony	MS	REC	99.4	%	88-113
MP40088-S1*	7440-38-2	Arsenic	MS	REC	98.5	%	87-113
MP40088-S1*	7440-39-3	Barium	MS	REC	102.6	%	88-113
MP40088-S1*	7440-41-7	Beryllium	MS	REC	105.8	%	89-112
MP40088-S1*	7440-43-9	Cadmium	MS	REC	95.8	%	88-113
MP40088-S1*	7440-70-2	Calcium	MS	REC	100	%	87-113
MP40088-S1*	7440-47-3	Chromium	MS	REC	100.7	%	90-113
MP40088-S1*	7440-50-8	Copper	MS	REC	106.4	%	86-114
MP40088-S1*	7439-92-1	Lead	MS	REC	97.3	%	86-113
MP40088-S1*	7439-95-4	Magnesium	MS	REC	101.6	%	85-113
MP40088-S1*	7440-02-0	Nickel	MS	REC	94.4	%	88-113

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40088-S1*	7782-49-2	Selenium	MS	REC	93	%	83-114
MP40088-S1*	7440-22-4	Silver	MS	REC	101	%	84-115
MP40088-S1*	7440-28-0	Thallium	MS	REC	98.1	%	85-114
MP40088-S1*	7440-66-6	Zinc	MS	REC	95.7	%	87-115
MP40088-S2*	7440-36-0	Antimony	MSD	REC	101.2	%	88-113
MP40088-S2*	7440-36-0	Antimony	MSD	RPD	1.8	%	20
MP40088-S2*	7440-38-2	Arsenic	MSD	REC	100.5	%	87-113
MP40088-S2*	7440-38-2	Arsenic	MSD	RPD	1.9	%	20
MP40088-S2*	7440-39-3	Barium	MSD	REC	100.6	%	88-113
MP40088-S2*	7440-39-3	Barium	MSD	RPD	1.7	%	20
MP40088-S2*	7440-41-7	Beryllium	MSD	REC	105.2	%	89-112
MP40088-S2*	7440-41-7	Beryllium	MSD	RPD	.6	%	20
MP40088-S2*	7440-43-9	Cadmium	MSD	REC	98	%	88-113
MP40088-S2*	7440-43-9	Cadmium	MSD	RPD	2.3	%	20
MP40088-S2*	7440-70-2	Calcium	MSD	REC	76 [c]	%	87-113
MP40088-S2*	7440-70-2	Calcium	MSD	RPD	3.4	%	20
MP40088-S2*	7440-47-3	Chromium	MSD	REC	100.7	%	90-113
MP40088-S2*	7440-47-3	Chromium	MSD	RPD	0	%	20
MP40088-S2*	7440-50-8	Copper	MSD	REC	105.6	%	86-114
MP40088-S2*	7440-50-8	Copper	MSD	RPD	.8	%	20
MP40088-S2*	7439-92-1	Lead	MSD	REC	99.1	%	86-113
MP40088-S2*	7439-92-1	Lead	MSD	RPD	1.8	%	20
MP40088-S2*	7439-95-4	Magnesium	MSD	REC	90.4	%	85-113
MP40088-S2*	7439-95-4	Magnesium	MSD	RPD	3.5	%	20
MP40088-S2*	7440-02-0	Nickel	MSD	REC	96	%	88-113
MP40088-S2*	7440-02-0	Nickel	MSD	RPD	1.7	%	20
MP40088-S2*	7782-49-2	Selenium	MSD	REC	95	%	83-114
MP40088-S2*	7782-49-2	Selenium	MSD	RPD	2.1	%	20
MP40088-S2*	7440-22-4	Silver	MSD	REC	100.2	%	84-115
MP40088-S2*	7440-22-4	Silver	MSD	RPD	.8	%	20
MP40088-S2*	7440-28-0	Thallium	MSD	REC	100.1	%	85-114
MP40088-S2*	7440-28-0	Thallium	MSD	RPD	2	%	20
MP40088-S2*	7440-66-6	Zinc	MSD	REC	97.5	%	87-115
MP40088-S2*	7440-66-6	Zinc	MSD	RPD	1.8	%	20
MP40088-D1*	7440-36-0	Antimony	DUP	RPD	40 [d]	%	20
MP40088-D1*	7440-38-2	Arsenic	DUP	RPD	4.9	%	20
MP40088-D1*	7440-39-3	Barium	DUP	RPD	.9	%	20
MP40088-D1*	7440-41-7	Beryllium	DUP	RPD	0	%	20
MP40088-D1*	7440-43-9	Cadmium	DUP	RPD	0	%	20
MP40088-D1*	7440-70-2	Calcium	DUP	RPD	.7	%	20
MP40088-D1*	7440-47-3	Chromium	DUP	RPD	12.5	%	20
MP40088-D1*	7440-50-8	Copper	DUP	RPD	0	%	20
MP40088-D1*	7439-92-1	Lead	DUP	RPD	5.7	%	20
MP40088-D1*	7439-95-4	Magnesium	DUP	RPD	.5	%	20
MP40088-D1*	7440-02-0	Nickel	DUP	RPD	0	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40088-D1*	7782-49-2	Selenium	DUP	RPD	0	%	20
MP40088-D1*	7440-22-4	Silver	DUP	RPD	200 [d]	%	20
MP40088-D1*	7440-28-0	Thallium	DUP	RPD	14.7	%	20
MP40088-D1*	7440-66-6	Zinc	DUP	RPD	1.6	%	20
MP40090	SW846 6010C						
MP40090-B1	7440-36-0	Antimony	BSP	REC	95.2	%	79-114
MP40090-B1	7440-38-2	Arsenic	BSP	REC	97	%	82-111
MP40090-B1	7440-39-3	Barium	BSP	REC	99.8	%	83-113
MP40090-B1	7440-41-7	Beryllium	BSP	REC	100	%	83-113
MP40090-B1	7440-43-9	Cadmium	BSP	REC	96	%	82-113
MP40090-B1	7440-47-3	Chromium	BSP	REC	101	%	85-113
MP40090-B1	7440-50-8	Copper	BSP	REC	99.2	%	81-117
MP40090-B1	7439-92-1	Lead	BSP	REC	94.8	%	81-112
MP40090-B1	7440-02-0	Nickel	BSP	REC	98.8	%	83-113
MP40090-B1	7782-49-2	Selenium	BSP	REC	91.8	%	78-111
MP40090-B1	7440-22-4	Silver	BSP	REC	96	%	82-112
MP40090-B1	7440-28-0	Thallium	BSP	REC	95.8	%	83-111
MP40090-B1	7440-66-6	Zinc	BSP	REC	98.4	%	82-113
MP40090-S1*	7440-36-0	Antimony	MS	REC	54.5 [e]	%	79-114
MP40090-S1*	7440-38-2	Arsenic	MS	REC	88.8	%	82-111
MP40090-S1*	7440-39-3	Barium	MS	REC	94.3	%	83-113
MP40090-S1*	7440-41-7	Beryllium	MS	REC	93.4	%	83-113
MP40090-S1*	7440-43-9	Cadmium	MS	REC	90.6	%	82-113
MP40090-S1*	7440-47-3	Chromium	MS	REC	98	%	85-113
MP40090-S1*	7440-50-8	Copper	MS	REC	98.2	%	81-117
MP40090-S1*	7439-92-1	Lead	MS	REC	97.1	%	81-112
MP40090-S1*	7440-02-0	Nickel	MS	REC	91.6	%	83-113
MP40090-S1*	7782-49-2	Selenium	MS	REC	84.4	%	78-111
MP40090-S1*	7440-22-4	Silver	MS	REC	91.6	%	82-112
MP40090-S1*	7440-28-0	Thallium	MS	REC	95.3	%	83-111
MP40090-S1*	7440-66-6	Zinc	MS	REC	96.7	%	82-113
MP40090-S2*	7440-36-0	Antimony	MSD	REC	52.8 [e]	%	79-114
MP40090-S2*	7440-36-0	Antimony	MSD	RPD	4.1	%	20
MP40090-S2*	7440-38-2	Arsenic	MSD	REC	87.9	%	82-111
MP40090-S2*	7440-38-2	Arsenic	MSD	RPD	2	%	20
MP40090-S2*	7440-39-3	Barium	MSD	REC	95.3	%	83-113
MP40090-S2*	7440-39-3	Barium	MSD	RPD	0	%	20
MP40090-S2*	7440-41-7	Beryllium	MSD	REC	94.3	%	83-113
MP40090-S2*	7440-41-7	Beryllium	MSD	RPD	0	%	20
MP40090-S2*	7440-43-9	Cadmium	MSD	REC	87.8	%	82-113
MP40090-S2*	7440-43-9	Cadmium	MSD	RPD	4.1	%	20
MP40090-S2*	7440-47-3	Chromium	MSD	REC	99	%	85-113
MP40090-S2*	7440-47-3	Chromium	MSD	RPD	0	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40090-S2*	7440-50-8	Copper	MSD	REC	97.7	%	81-117
MP40090-S2*	7440-50-8	Copper	MSD	RPD	1.3	%	20
MP40090-S2*	7439-92-1	Lead	MSD	REC	96.6	%	81-112
MP40090-S2*	7439-92-1	Lead	MSD	RPD	1.2	%	20
MP40090-S2*	7440-02-0	Nickel	MSD	REC	89.5	%	83-113
MP40090-S2*	7440-02-0	Nickel	MSD	RPD	3.1	%	20
MP40090-S2*	7782-49-2	Selenium	MSD	REC	83.9	%	78-111
MP40090-S2*	7782-49-2	Selenium	MSD	RPD	1.5	%	20
MP40090-S2*	7440-22-4	Silver	MSD	REC	92.5	%	82-112
MP40090-S2*	7440-22-4	Silver	MSD	RPD	0	%	20
MP40090-S2*	7440-28-0	Thallium	MSD	REC	94.3	%	83-111
MP40090-S2*	7440-28-0	Thallium	MSD	RPD	1.9	%	20
MP40090-S2*	7440-66-6	Zinc	MSD	REC	95.1	%	82-113
MP40090-S2*	7440-66-6	Zinc	MSD	RPD	1.9	%	20
MP40090-D1*	7440-36-0	Antimony	DUP	RPD	200 [d]	%	20
MP40090-D1*	7440-38-2	Arsenic	DUP	RPD	0	%	20
MP40090-D1*	7440-39-3	Barium	DUP	RPD	1.6	%	20
MP40090-D1*	7440-41-7	Beryllium	DUP	RPD	5.9	%	20
MP40090-D1*	7440-43-9	Cadmium	DUP	RPD	16.7	%	20
MP40090-D1*	7440-47-3	Chromium	DUP	RPD	0	%	20
MP40090-D1*	7440-50-8	Copper	DUP	RPD	9.5	%	20
MP40090-D1*	7439-92-1	Lead	DUP	RPD	2.6	%	20
MP40090-D1*	7440-02-0	Nickel	DUP	RPD	0	%	20
MP40090-D1*	7782-49-2	Selenium	DUP	RPD	33.3 [d]	%	20
MP40090-D1*	7440-22-4	Silver	DUP	RPD	0	%	20
MP40090-D1*	7440-28-0	Thallium	DUP	RPD	0	%	20
MP40090-D1*	7440-66-6	Zinc	DUP	RPD	7.4	%	20
MP40091	SW846 6010C						
MP40091-B1	7440-36-0	Antimony	BSP	REC	98	%	79-114
MP40091-B1	7440-38-2	Arsenic	BSP	REC	98.5	%	82-111
MP40091-B1	7440-39-3	Barium	BSP	REC	102	%	83-113
MP40091-B1	7440-41-7	Beryllium	BSP	REC	104	%	83-113
MP40091-B1	7440-43-9	Cadmium	BSP	REC	100	%	82-113
MP40091-B1	7440-47-3	Chromium	BSP	REC	103	%	85-113
MP40091-B1	7440-50-8	Copper	BSP	REC	102.4	%	81-117
MP40091-B1	7439-92-1	Lead	BSP	REC	97.2	%	81-112
MP40091-B1	7440-02-0	Nickel	BSP	REC	100	%	83-113
MP40091-B1	7782-49-2	Selenium	BSP	REC	93.5	%	78-111
MP40091-B1	7440-22-4	Silver	BSP	REC	96	%	82-112
MP40091-B1	7440-28-0	Thallium	BSP	REC	98.9	%	83-111
MP40091-B1	7440-66-6	Zinc	BSP	REC	100.8	%	82-113
MP40091-S1*	7440-36-0	Antimony	MS	REC	67.9 [e]	%	79-114
MP40091-S1*	7440-38-2	Arsenic	MS	REC	89.8	%	82-111

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40091-S1*	7440-39-3	Barium	MS	REC	99	%	83-113
MP40091-S1*	7440-41-7	Beryllium	MS	REC	100.4	%	83-113
MP40091-S1*	7440-43-9	Cadmium	MS	REC	93.5	%	82-113
MP40091-S1*	7440-47-3	Chromium	MS	REC	100.6	%	85-113
MP40091-S1*	7440-50-8	Copper	MS	REC	100.5	%	81-117
MP40091-S1*	7439-92-1	Lead	MS	REC	95.5	%	81-112
MP40091-S1*	7440-02-0	Nickel	MS	REC	95.6	%	83-113
MP40091-S1*	7782-49-2	Selenium	MS	REC	87.4	%	78-111
MP40091-S1*	7440-22-4	Silver	MS	REC	93.5	%	82-112
MP40091-S1*	7440-28-0	Thallium	MS	REC	96.2	%	83-111
MP40091-S1*	7440-66-6	Zinc	MS	REC	99.6	%	82-113
MP40091-S2*	7440-36-0	Antimony	MSD	REC	69.1 [e]	%	79-114
MP40091-S2*	7440-36-0	Antimony	MSD	RPD	7.5	%	20
MP40091-S2*	7440-38-2	Arsenic	MSD	REC	89.6	%	82-111
MP40091-S2*	7440-38-2	Arsenic	MSD	RPD	5.5	%	20
MP40091-S2*	7440-39-3	Barium	MSD	REC	97.6	%	83-113
MP40091-S2*	7440-39-3	Barium	MSD	RPD	4.2	%	20
MP40091-S2*	7440-41-7	Beryllium	MSD	REC	98.7	%	83-113
MP40091-S2*	7440-41-7	Beryllium	MSD	RPD	3.9	%	20
MP40091-S2*	7440-43-9	Cadmium	MSD	REC	96	%	82-113
MP40091-S2*	7440-43-9	Cadmium	MSD	RPD	8.3	%	20
MP40091-S2*	7440-47-3	Chromium	MSD	REC	100.8	%	85-113
MP40091-S2*	7440-47-3	Chromium	MSD	RPD	5	%	20
MP40091-S2*	7440-50-8	Copper	MSD	REC	99.5	%	81-117
MP40091-S2*	7440-50-8	Copper	MSD	RPD	4.6	%	20
MP40091-S2*	7439-92-1	Lead	MSD	REC	94.8	%	81-112
MP40091-S2*	7439-92-1	Lead	MSD	RPD	4.7	%	20
MP40091-S2*	7440-02-0	Nickel	MSD	REC	94.9	%	83-113
MP40091-S2*	7440-02-0	Nickel	MSD	RPD	4.9	%	20
MP40091-S2*	7782-49-2	Selenium	MSD	REC	86.8	%	78-111
MP40091-S2*	7782-49-2	Selenium	MSD	RPD	5	%	20
MP40091-S2*	7440-22-4	Silver	MSD	REC	92.1	%	82-112
MP40091-S2*	7440-22-4	Silver	MSD	RPD	4.3	%	20
MP40091-S2*	7440-28-0	Thallium	MSD	REC	95.3	%	83-111
MP40091-S2*	7440-28-0	Thallium	MSD	RPD	4.7	%	20
MP40091-S2*	7440-66-6	Zinc	MSD	REC	95.6	%	82-113
MP40091-S2*	7440-66-6	Zinc	MSD	RPD	1.5	%	20
MP40091-D1*	7440-36-0	Antimony	DUP	RPD	0	%	20
MP40091-D1*	7440-38-2	Arsenic	DUP	RPD	20.7 [d]	%	20
MP40091-D1*	7440-39-3	Barium	DUP	RPD	0	%	20
MP40091-D1*	7440-41-7	Beryllium	DUP	RPD	14.3	%	20
MP40091-D1*	7440-43-9	Cadmium	DUP	RPD	0	%	20
MP40091-D1*	7440-47-3	Chromium	DUP	RPD	0	%	20
MP40091-D1*	7440-50-8	Copper	DUP	RPD	13.7	%	20
MP40091-D1*	7439-92-1	Lead	DUP	RPD	0	%	20

* Sample used for QC is not from job FA91824

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits
MP40091-D1*	7440-02-0	Nickel	DUP	RPD	2.1	%	20
MP40091-D1*	7782-49-2	Selenium	DUP	RPD	0	%	20
MP40091-D1*	7440-22-4	Silver	DUP	RPD	0	%	20
MP40091-D1*	7440-28-0	Thallium	DUP	RPD	0	%	20
MP40091-D1*	7440-66-6	Zinc	DUP	RPD	5.7	%	20

(a) Outside control limits due to high level in sample relative to spike amount.
(b) Outside control limits.
(c) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
(d) RPD acceptable due to low duplicate and sample concentrations.
(e) Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

* Sample used for QC is not from job FA91824

MS Volatiles

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QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-MB	2P84289.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
108-86-1	Bromobenzene	ND	1.0	0.37	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.45	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	0.23	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	0.24	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	0.31	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	0.22	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	0.31	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	0.31	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	0.24	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-MB	2P84289.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	Result	RL	MDL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	0.30	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.22	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	0.21	ug/l	
74-83-9	Methyl Bromide	ND	5.0	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
74-95-3	Methylene Bromide	ND	2.0	0.37	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.23	ug/l	
91-20-3	Naphthalene	ND	5.0	1.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	0.29	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	0.27	ug/l	
108-05-4	Vinyl Acetate	ND	10	2.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	95%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-MB	2P84289.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Surrogate Recoveries		Limits
2037-26-5	Toluene-D8	105%	85-112%
460-00-4	4-Bromofluorobenzene	102%	83-118%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-MB	I73116.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	25	10	ug/l	
71-43-2	Benzene	ND	1.0	0.31	ug/l	
108-86-1	Bromobenzene	ND	1.0	0.37	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.45	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.24	ug/l	
75-25-2	Bromoform	ND	1.0	0.41	ug/l	
78-93-3	2-Butanone (MEK)	ND	5.0	2.0	ug/l	
104-51-8	n-Butylbenzene	ND	1.0	0.23	ug/l	
135-98-8	sec-Butylbenzene	ND	1.0	0.24	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	0.31	ug/l	
75-15-0	Carbon Disulfide	ND	2.0	0.53	ug/l	
56-23-5	Carbon Tetrachloride	ND	1.0	0.36	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.20	ug/l	
75-00-3	Chloroethane	ND	2.0	0.67	ug/l	
67-66-3	Chloroform	ND	1.0	0.30	ug/l	
95-49-8	o-Chlorotoluene	ND	1.0	0.22	ug/l	
106-43-4	p-Chlorotoluene	ND	1.0	0.31	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.28	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.0	1.0	ug/l	
106-93-4	1,2-Dibromoethane	ND	2.0	0.28	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	0.50	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.32	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.22	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.26	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.34	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.31	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	0.32	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	0.28	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	0.22	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.43	ug/l	
142-28-9	1,3-Dichloropropane	ND	1.0	0.31	ug/l	
594-20-7	2,2-Dichloropropane	ND	1.0	0.24	ug/l	
563-58-6	1,1-Dichloropropene	ND	1.0	0.34	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.29	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.21	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.36	ug/l	

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-MB	I73116.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Result	RL	MDL	Units	Q
87-68-3	Hexachlorobutadiene	ND	2.0	0.30	ug/l	
591-78-6	2-Hexanone	ND	10	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.22	ug/l	
99-87-6	p-Isopropyltoluene	ND	1.0	0.21	ug/l	
74-83-9	Methyl Bromide	ND	5.0	2.0	ug/l	
74-87-3	Methyl Chloride	ND	2.0	0.50	ug/l	
74-95-3	Methylene Bromide	ND	2.0	0.37	ug/l	
75-09-2	Methylene Chloride	ND	5.0	2.0	ug/l	
108-10-1	4-Methyl-2-pentanone (MIBK)	ND	5.0	1.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.23	ug/l	
91-20-3	Naphthalene	ND	5.0	1.0	ug/l	
103-65-1	n-Propylbenzene	ND	1.0	0.29	ug/l	
100-42-5	Styrene	ND	1.0	0.22	ug/l	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	0.28	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.30	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	0.22	ug/l	
108-88-3	Toluene	ND	1.0	0.30	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	2.0	0.61	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	2.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.25	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.47	ug/l	
79-01-6	Trichloroethylene	ND	1.0	0.35	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.50	ug/l	
96-18-4	1,2,3-Trichloropropane	ND	2.0	0.63	ug/l	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	0.32	ug/l	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	0.27	ug/l	
108-05-4	Vinyl Acetate	ND	10	2.0	ug/l	
75-01-4	Vinyl Chloride	ND	1.0	0.41	ug/l	
	m,p-Xylene	ND	2.0	0.47	ug/l	
95-47-6	o-Xylene	ND	1.0	0.26	ug/l	

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	114%	79-125%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-MB	I73116.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Surrogate Recoveries		Limits
2037-26-5	Toluene-D8	94%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-BS	I73114.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	154	123	50-147
71-43-2	Benzene	25	26.0	104	81-122
108-86-1	Bromobenzene	25	22.8	91	80-121
74-97-5	Bromochloromethane	25	21.1	84	76-123
75-27-4	Bromodichloromethane	25	23.4	94	79-123
75-25-2	Bromoform	25	19.6	78	66-123
78-93-3	2-Butanone (MEK)	125	142	114	56-143
104-51-8	n-Butylbenzene	25	21.5	86	79-126
135-98-8	sec-Butylbenzene	25	23.5	94	83-133
98-06-6	tert-Butylbenzene	25	22.6	90	80-133
75-15-0	Carbon Disulfide	25	21.5	86	66-148
56-23-5	Carbon Tetrachloride	25	24.5	98	76-136
108-90-7	Chlorobenzene	25	23.0	92	82-124
75-00-3	Chloroethane	25	28.7	115	62-144
67-66-3	Chloroform	25	24.0	96	80-124
95-49-8	o-Chlorotoluene	25	22.9	92	81-127
106-43-4	p-Chlorotoluene	25	22.1	88	83-130
124-48-1	Dibromochloromethane	25	20.2	81	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	21.1	84	64-123
106-93-4	1,2-Dibromoethane	25	20.8	83	75-120
75-71-8	Dichlorodifluoromethane	25	19.5	78	42-167
95-50-1	1,2-Dichlorobenzene	25	22.3	89	82-124
541-73-1	1,3-Dichlorobenzene	25	23.0	92	84-125
106-46-7	1,4-Dichlorobenzene	25	22.2	89	78-120
75-34-3	1,1-Dichloroethane	25	25.4	102	81-122
107-06-2	1,2-Dichloroethane	25	26.5	106	75-125
75-35-4	1,1-Dichloroethylene	25	24.9	100	78-137
156-59-2	cis-1,2-Dichloroethylene	25	24.0	96	78-120
156-60-5	trans-1,2-Dichloroethylene	25	25.4	102	76-127
78-87-5	1,2-Dichloropropane	25	24.7	99	76-124
142-28-9	1,3-Dichloropropane	25	21.9	88	80-118
594-20-7	2,2-Dichloropropane	25	25.3	101	74-139
563-58-6	1,1-Dichloropropene	25	25.3	101	79-131
10061-01-5	cis-1,3-Dichloropropene	25	23.6	94	75-118
10061-02-6	trans-1,3-Dichloropropene	25	22.5	90	80-120
100-41-4	Ethylbenzene	25	23.9	96	81-121

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-BS	I73114.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	24.2	97	75-142
591-78-6	2-Hexanone	125	139	111	61-129
98-82-8	Isopropylbenzene	25	23.0	92	83-132
99-87-6	p-Isopropyltoluene	25	22.3	89	79-130
74-83-9	Methyl Bromide	25	22.9	92	59-143
74-87-3	Methyl Chloride	25	24.2	97	50-159
74-95-3	Methylene Bromide	25	21.5	86	78-119
75-09-2	Methylene Chloride	25	24.0	96	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	138	110	66-122
1634-04-4	Methyl Tert Butyl Ether	25	21.7	87	72-117
91-20-3	Naphthalene	25	17.9	72	63-132
103-65-1	n-Propylbenzene	25	22.8	91	82-133
100-42-5	Styrene	25	21.4	86	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	22.9	92	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	22.6	90	72-120
127-18-4	Tetrachloroethylene	25	23.5	94	76-135
108-88-3	Toluene	25	22.6	90	80-120
87-61-6	1,2,3-Trichlorobenzene	25	21.2	85	68-131
120-82-1	1,2,4-Trichlorobenzene	25	21.2	85	73-129
71-55-6	1,1,1-Trichloroethane	25	24.8	99	75-130
79-00-5	1,1,2-Trichloroethane	25	22.8	91	76-119
79-01-6	Trichloroethylene	25	24.9	100	81-126
75-69-4	Trichlorofluoromethane	25	28.7	115	71-156
96-18-4	1,2,3-Trichloropropane	25	22.3	89	77-120
95-63-6	1,2,4-Trimethylbenzene	25	22.2	89	79-120
108-67-8	1,3,5-Trimethylbenzene	25	23.0	92	79-120
108-05-4	Vinyl Acetate	125	139	111	43-154
75-01-4	Vinyl Chloride	25	25.3	101	69-159
	m,p-Xylene	50	47.6	95	79-126
95-47-6	o-Xylene	25	22.5	90	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	83-118%
17060-07-0	1,2-Dichloroethane-D4	113%	79-125%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VI2420-BS	I73114.D	1	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	94%	85-112%
460-00-4	4-Bromofluorobenzene	96%	83-118%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-BS	2P84319.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
67-64-1	Acetone	125	111	89	50-147
71-43-2	Benzene	25	25.3	101	81-122
108-86-1	Bromobenzene	25	26.5	106	80-121
74-97-5	Bromochloromethane	25	22.3	89	76-123
75-27-4	Bromodichloromethane	25	23.9	96	79-123
75-25-2	Bromoform	25	23.6	94	66-123
78-93-3	2-Butanone (MEK)	125	109	87	56-143
104-51-8	n-Butylbenzene	25	24.7	99	79-126
135-98-8	sec-Butylbenzene	25	27.8	111	83-133
98-06-6	tert-Butylbenzene	25	27.7	111	80-133
75-15-0	Carbon Disulfide	25	21.0	84	66-148
56-23-5	Carbon Tetrachloride	25	25.7	103	76-136
108-90-7	Chlorobenzene	25	26.1	104	82-124
75-00-3	Chloroethane	25	33.4	134	62-144
67-66-3	Chloroform	25	24.4	98	80-124
95-49-8	o-Chlorotoluene	25	26.7	107	81-127
106-43-4	p-Chlorotoluene	25	26.3	105	83-130
124-48-1	Dibromochloromethane	25	24.2	97	78-122
96-12-8	1,2-Dibromo-3-chloropropane	25	23.4	94	64-123
106-93-4	1,2-Dibromoethane	25	25.5	102	75-120
75-71-8	Dichlorodifluoromethane	25	20.0	80	42-167
95-50-1	1,2-Dichlorobenzene	25	26.8	107	82-124
541-73-1	1,3-Dichlorobenzene	25	27.4	110	84-125
106-46-7	1,4-Dichlorobenzene	25	26.3	105	78-120
75-34-3	1,1-Dichloroethane	25	24.5	98	81-122
107-06-2	1,2-Dichloroethane	25	24.8	99	75-125
75-35-4	1,1-Dichloroethylene	25	25.4	102	78-137
156-59-2	cis-1,2-Dichloroethylene	25	24.9	100	78-120
156-60-5	trans-1,2-Dichloroethylene	25	24.9	100	76-127
78-87-5	1,2-Dichloropropane	25	23.5	94	76-124
142-28-9	1,3-Dichloropropane	25	24.7	99	80-118
594-20-7	2,2-Dichloropropane	25	22.6	90	74-139
563-58-6	1,1-Dichloropropene	25	25.5	102	79-131
10061-01-5	cis-1,3-Dichloropropene	25	23.3	93	75-118
10061-02-6	trans-1,3-Dichloropropene	25	24.7	99	80-120
100-41-4	Ethylbenzene	25	27.0	108	81-121

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-BS	2P84319.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
87-68-3	Hexachlorobutadiene	25	27.7	111	75-142
591-78-6	2-Hexanone	125	117	94	61-129
98-82-8	Isopropylbenzene	25	26.4	106	83-132
99-87-6	p-Isopropyltoluene	25	27.3	109	79-130
74-83-9	Methyl Bromide	25	20.7	83	59-143
74-87-3	Methyl Chloride	25	19.7	79	50-159
74-95-3	Methylene Bromide	25	22.5	90	78-119
75-09-2	Methylene Chloride	25	18.0	72	69-135
108-10-1	4-Methyl-2-pentanone (MIBK)	125	118	94	66-122
1634-04-4	Methyl Tert Butyl Ether	25	22.6	90	72-117
91-20-3	Naphthalene	25	25.9	104	63-132
103-65-1	n-Propylbenzene	25	26.4	106	82-133
100-42-5	Styrene	25	25.9	104	78-119
630-20-6	1,1,1,2-Tetrachloroethane	25	27.3	109	77-122
79-34-5	1,1,2,2-Tetrachloroethane	25	25.3	101	72-120
127-18-4	Tetrachloroethylene	25	28.1	112	76-135
108-88-3	Toluene	25	26.7	107	80-120
87-61-6	1,2,3-Trichlorobenzene	25	27.0	108	68-131
120-82-1	1,2,4-Trichlorobenzene	25	26.4	106	73-129
71-55-6	1,1,1-Trichloroethane	25	25.0	100	75-130
79-00-5	1,1,2-Trichloroethane	25	25.9	104	76-119
79-01-6	Trichloroethylene	25	24.1	96	81-126
75-69-4	Trichlorofluoromethane	25	29.6	118	71-156
96-18-4	1,2,3-Trichloropropane	25	26.1	104	77-120
95-63-6	1,2,4-Trimethylbenzene	25	26.5	106	79-120
108-67-8	1,3,5-Trimethylbenzene	25	27.2	109	79-120
108-05-4	Vinyl Acetate	125	113	90	43-154
75-01-4	Vinyl Chloride	25	22.7	91	69-159
	m,p-Xylene	50	53.5	107	79-126
95-47-6	o-Xylene	25	26.4	106	80-127

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	83-118%
17060-07-0	1,2-Dichloroethane-D4	102%	79-125%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V2P3363-BS	2P84319.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	103%	85-112%
460-00-4	4-Bromofluorobenzene	101%	83-118%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91843-8MS	I73135.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8MSD	I73136.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8	I73127.D	5	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	FA91843-8 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	ND		625	741	119	625	706	113	5	50-147/21
71-43-2	Benzene	ND		125	143	114	125	142	114	1	81-122/14
108-86-1	Bromobenzene	ND		125	117	94	125	119	95	2	80-121/14
74-97-5	Bromochloromethane	ND		125	114	91	125	111	89	3	76-123/14
75-27-4	Bromodichloromethane	ND		125	126	101	125	128	102	2	79-123/19
75-25-2	Bromoform	ND		125	97.1	78	125	99.8	80	3	66-123/21
78-93-3	2-Butanone (MEK)	ND		625	693	111	625	663	106	4	56-143/18
104-51-8	n-Butylbenzene	ND		125	102	82	125	102	82	0	79-126/16
135-98-8	sec-Butylbenzene	ND		125	115	92	125	118	94	3	83-133/16
98-06-6	tert-Butylbenzene	ND		125	110	88	125	112	90	2	80-133/16
75-15-0	Carbon Disulfide	ND		125	113	90	125	116	93	3	66-148/23
56-23-5	Carbon Tetrachloride	ND		125	131	105	125	135	108	3	76-136/23
108-90-7	Chlorobenzene	ND		125	121	97	125	122	98	1	82-124/14
75-00-3	Chloroethane	ND		125	156	125	125	170	136	9	62-144/20
67-66-3	Chloroform	ND		125	130	104	125	131	105	1	80-124/15
95-49-8	o-Chlorotoluene	ND		125	115	92	125	117	94	2	81-127/15
106-43-4	p-Chlorotoluene	ND		125	111	89	125	113	90	2	83-130/15
124-48-1	Dibromochloromethane	ND		125	104	83	125	106	85	2	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	ND		125	102	82	125	102	82	0	64-123/18
106-93-4	1,2-Dibromoethane	ND		125	107	86	125	108	86	1	75-120/13
75-71-8	Dichlorodifluoromethane	ND		125	92.2	74	125	102	82	10	42-167/19
95-50-1	1,2-Dichlorobenzene	ND		125	113	90	125	114	91	1	82-124/14
541-73-1	1,3-Dichlorobenzene	ND		125	114	91	125	116	93	2	84-125/14
106-46-7	1,4-Dichlorobenzene	ND		125	114	91	125	115	92	1	78-120/15
75-34-3	1,1-Dichloroethane	2.7	J	125	142	111	125	144	113	1	81-122/15
107-06-2	1,2-Dichloroethane	ND		125	148	118	125	149	119	1	75-125/14
75-35-4	1,1-Dichloroethylene	3.9	J	125	137	106	125	142	110	4	78-137/18
156-59-2	cis-1,2-Dichloroethylene	920	E	125	965	36* [a]	125	997	62* [a]	3	78-120/15
156-60-5	trans-1,2-Dichloroethylene	ND		125	141	113	125	141	113	0	76-127/17
78-87-5	1,2-Dichloropropane	ND		125	130	104	125	131	105	1	76-124/14
142-28-9	1,3-Dichloropropane	ND		125	115	92	125	115	92	0	80-118/13
594-20-7	2,2-Dichloropropane	ND		125	123	98	125	125	100	2	74-139/17
563-58-6	1,1-Dichloropropene	ND		125	133	106	125	135	108	1	79-131/16
10061-01-5	cis-1,3-Dichloropropene	ND		125	102	82	125	105	84	3	75-118/23
10061-02-6	trans-1,3-Dichloropropene	ND		125	110	88	125	111	89	1	80-120/22
100-41-4	Ethylbenzene	ND		125	124	99	125	125	100	1	81-121/14

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91843-8MS	I73135.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8MSD	I73136.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8	I73127.D	5	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	FA91843-8 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
87-68-3	Hexachlorobutadiene	ND		125	114	91	125	117	94	3	75-142/19
591-78-6	2-Hexanone	ND		625	689	110	625	637	102	8	61-129/18
98-82-8	Isopropylbenzene	ND		125	115	92	125	118	94	3	83-132/15
99-87-6	p-Isopropyltoluene	ND		125	108	86	125	111	89	3	79-130/16
74-83-9	Methyl Bromide	ND		125	78.7	63	125	111	89	34*	59-143/19
74-87-3	Methyl Chloride	ND		125	117	94	125	131	105	11	50-159/19
74-95-3	Methylene Bromide	ND		125	116	93	125	117	94	1	78-119/14
75-09-2	Methylene Chloride	ND		125	133	106	125	133	106	0	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	ND		625	670	107	625	653	104	3	66-122/16
1634-04-4	Methyl Tert Butyl Ether	ND		125	110	88	125	114	91	4	72-117/14
91-20-3	Naphthalene	ND		125	83.9	67	125	87.2	70	4	63-132/25
103-65-1	n-Propylbenzene	ND		125	114	91	125	116	93	2	82-133/15
100-42-5	Styrene	ND		125	109	87	125	110	88	1	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	ND		125	118	94	125	121	97	3	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	ND		125	123	98	125	123	98	0	72-120/14
127-18-4	Tetrachloroethylene	63.3		125	180	93	125	181	94	1	76-135/16
108-88-3	Toluene	ND		125	117	94	125	118	94	1	80-120/14
87-61-6	1,2,3-Trichlorobenzene	ND		125	102	82	125	104	83	2	68-131/25
120-82-1	1,2,4-Trichlorobenzene	ND		125	96.8	77	125	99.9	80	3	73-129/20
71-55-6	1,1,1-Trichloroethane	ND		125	133	106	125	135	108	1	75-130/16
79-00-5	1,1,2-Trichloroethane	ND		125	123	98	125	122	98	1	76-119/14
79-01-6	Trichloroethylene	66.5		125	195	103	125	198	105	2	81-126/15
75-69-4	Trichlorofluoromethane	ND		125	148	118	125	158	126	7	71-156/21
96-18-4	1,2,3-Trichloropropane	ND		125	117	94	125	116	93	1	77-120/16
95-63-6	1,2,4-Trimethylbenzene	ND		125	111	89	125	113	90	2	79-120/18
108-67-8	1,3,5-Trimethylbenzene	ND		125	115	92	125	117	94	2	79-120/19
108-05-4	Vinyl Acetate	ND		625	738	118	625	744	119	1	43-154/14
75-01-4	Vinyl Chloride	ND		125	121	97	125	138	110	13	69-159/18
	m,p-Xylene	ND		250	245	98	250	249	100	2	79-126/15
95-47-6	o-Xylene	ND		125	112	90	125	115	92	3	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA91843-8	Limits
1868-53-7	Dibromofluoromethane	108%	107%	105%	83-118%
17060-07-0	1,2-Dichloroethane-D4	117%	115%	115%	79-125%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91843-8MS	I73135.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8MSD	I73136.D	5	12/30/21	CF	n/a	n/a	VI2420
FA91843-8	I73127.D	5	12/30/21	CF	n/a	n/a	VI2420

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Surrogate Recoveries	MS	MSD	FA91843-8	Limits
2037-26-5	Toluene-D8	91%	91%	94%	85-112%
460-00-4	4-Bromofluorobenzene	92%	93%	93%	83-118%

(a) Outside control limits due to high level in sample relative to spike amount.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91807-5MS	2P84321.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5MSD	2P84323.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5	2P84301.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	FA91807-5 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
67-64-1	Acetone	25 U		125	109	87	125	112	90	3	50-147/21
71-43-2	Benzene	1.0 U		25	25.1	100	25	25.1	100	0	81-122/14
108-86-1	Bromobenzene	1.0 U		25	27.6	110	25	27.1	108	2	80-121/14
74-97-5	Bromochloromethane	1.0 U		25	22.6	90	25	22.2	89	2	76-123/14
75-27-4	Bromodichloromethane	1.0 U		25	23.8	95	25	24.1	96	1	79-123/19
75-25-2	Bromoform	1.0 U		25	24.7	99	25	23.7	95	4	66-123/21
78-93-3	2-Butanone (MEK)	5.0 U		125	106	85	125	109	87	3	56-143/18
104-51-8	n-Butylbenzene	1.0 U		25	24.1	96	25	23.8	95	1	79-126/16
135-98-8	sec-Butylbenzene	1.0 U		25	27.1	108	25	27.0	108	0	83-133/16
98-06-6	tert-Butylbenzene	1.0 U		25	26.2	105	25	26.8	107	2	80-133/16
75-15-0	Carbon Disulfide	2.0 U		25	21.2	85	25	21.0	84	1	66-148/23
56-23-5	Carbon Tetrachloride	1.0 U		25	25.6	102	25	26.1	104	2	76-136/23
108-90-7	Chlorobenzene	1.0 U		25	26.2	105	25	25.9	104	1	82-124/14
75-00-3	Chloroethane	2.0 U		25	31.7	127	25	31.7	127	0	62-144/20
67-66-3	Chloroform	1.0 U		25	24.2	97	25	23.7	95	2	80-124/15
95-49-8	o-Chlorotoluene	1.0 U		25	25.6	102	25	25.5	102	0	81-127/15
106-43-4	p-Chlorotoluene	1.0 U		25	25.7	103	25	25.4	102	1	83-130/15
124-48-1	Dibromochloromethane	1.0 U		25	24.7	99	25	24.2	97	2	78-122/19
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		25	23.8	95	25	23.4	94	2	64-123/18
106-93-4	1,2-Dibromoethane	2.0 U		25	25.6	102	25	26.0	104	2	75-120/13
75-71-8	Dichlorodifluoromethane	2.0 U		25	20.2	81	25	20.1	80	0	42-167/19
95-50-1	1,2-Dichlorobenzene	1.0 U		25	26.5	106	25	26.6	106	0	82-124/14
541-73-1	1,3-Dichlorobenzene	1.0 U		25	27.4	110	25	27.0	108	1	84-125/14
106-46-7	1,4-Dichlorobenzene	1.0 U		25	26.0	104	25	25.9	104	0	78-120/15
75-34-3	1,1-Dichloroethane	1.0 U		25	23.8	95	25	23.9	96	0	81-122/15
107-06-2	1,2-Dichloroethane	1.0 U		25	24.6	98	25	24.3	97	1	75-125/14
75-35-4	1,1-Dichloroethylene	1.0 U		25	24.7	99	25	24.5	98	1	78-137/18
156-59-2	cis-1,2-Dichloroethylene	1.0 U		25	24.6	98	25	24.8	99	1	78-120/15
156-60-5	trans-1,2-Dichloroethylene	1.0 U		25	23.8	95	25	23.7	95	0	76-127/17
78-87-5	1,2-Dichloropropane	1.0 U		25	23.4	94	25	23.6	94	1	76-124/14
142-28-9	1,3-Dichloropropane	1.0 U		25	24.3	97	25	24.4	98	0	80-118/13
594-20-7	2,2-Dichloropropane	1.0 U		25	22.4	90	25	21.7	87	3	74-139/17
563-58-6	1,1-Dichloropropene	1.0 U		25	24.6	98	25	24.7	99	0	79-131/16
10061-01-5	cis-1,3-Dichloropropene	1.0 U		25	23.0	92	25	22.6	90	2	75-118/23
10061-02-6	trans-1,3-Dichloropropene	1.0 U		25	24.4	98	25	24.1	96	1	80-120/22
100-41-4	Ethylbenzene	1.0 U		25	26.5	106	25	26.1	104	2	81-121/14

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91807-5MS	2P84321.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5MSD	2P84323.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5	2P84301.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Compound	FA91807-5 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
87-68-3	Hexachlorobutadiene	2.0 U		25	27.3	109	25	27.4	110	0	75-142/19
591-78-6	2-Hexanone	10 U		125	117	94	125	119	95	2	61-129/18
98-82-8	Isopropylbenzene	1.0 U		25	26.2	105	25	26.0	104	1	83-132/15
99-87-6	p-Isopropyltoluene	1.0 U		25	26.4	106	25	26.2	105	1	79-130/16
74-83-9	Methyl Bromide	5.0 U		25	22.3	89	25	23.4	94	5	59-143/19
74-87-3	Methyl Chloride	2.0 U		25	20.6	82	25	20.2	81	2	50-159/19
74-95-3	Methylene Bromide	2.0 U		25	22.8	91	25	22.2	89	3	78-119/14
75-09-2	Methylene Chloride	5.0 U		25	16.7	67*	25	17.1	68*	2	69-135/16
108-10-1	4-Methyl-2-pentanone (MIBK)	5.0 U		125	115	92	125	119	95	3	66-122/16
1634-04-4	Methyl Tert Butyl Ether	1.0 U		25	22.3	89	25	22.4	90	0	72-117/14
91-20-3	Naphthalene	5.0 U		25	26.3	105	25	25.6	102	3	63-132/25
103-65-1	n-Propylbenzene	1.0 U		25	25.7	103	25	25.5	102	1	82-133/15
100-42-5	Styrene	1.0 U		25	25.9	104	25	25.6	102	1	78-119/23
630-20-6	1,1,1,2-Tetrachloroethane	1.0 U		25	27.2	109	25	26.6	106	2	77-122/19
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		25	24.6	98	25	25.0	100	2	72-120/14
127-18-4	Tetrachloroethylene	1.0 U		25	26.0	104	25	26.4	106	2	76-135/16
108-88-3	Toluene	1.0 U		25	26.2	105	25	25.9	104	1	80-120/14
87-61-6	1,2,3-Trichlorobenzene	2.0 U		25	27.4	110	25	26.9	108	2	68-131/25
120-82-1	1,2,4-Trichlorobenzene	2.0 U		25	26.9	108	25	25.9	104	4	73-129/20
71-55-6	1,1,1-Trichloroethane	1.0 U		25	25.2	101	25	25.0	100	1	75-130/16
79-00-5	1,1,2-Trichloroethane	1.0 U		25	25.4	102	25	25.6	102	1	76-119/14
79-01-6	Trichloroethylene	1.0 U		25	24.4	98	25	23.7	95	3	81-126/15
75-69-4	Trichlorofluoromethane	2.0 U		25	29.9	120	25	29.0	116	3	71-156/21
96-18-4	1,2,3-Trichloropropane	2.0 U		25	25.5	102	25	25.3	101	1	77-120/16
95-63-6	1,2,4-Trimethylbenzene	1.0 U		25	25.3	101	25	25.4	102	0	79-120/18
108-67-8	1,3,5-Trimethylbenzene	1.0 U		25	26.7	107	25	26.7	107	0	79-120/19
108-05-4	Vinyl Acetate	10 U		125	111	89	125	113	90	2	43-154/14
75-01-4	Vinyl Chloride	1.0 U		25	23.0	92	25	22.9	92	0	69-159/18
	m,p-Xylene	2.0 U		50	53.2	106	50	52.2	104	2	79-126/15
95-47-6	o-Xylene	1.0 U		25	26.4	106	25	26.1	104	1	80-127/14

CAS No.	Surrogate Recoveries	MS	MSD	FA91807-5	Limits
1868-53-7	Dibromofluoromethane	101%	101%	96%	83-118%
17060-07-0	1,2-Dichloroethane-D4	101%	101%	100%	79-125%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
FA91807-5MS	2P84321.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5MSD	2P84323.D	1	12/30/21	CF	n/a	n/a	V2P3363
FA91807-5	2P84301.D	1	12/30/21	CF	n/a	n/a	V2P3363

The QC reported here applies to the following samples: **Method:** SW846 8260B

FA91824-21

CAS No.	Surrogate Recoveries	MS	MSD	FA91807-5	Limits
2037-26-5	Toluene-D8	100%	102%	103%	85-112%
460-00-4	4-Bromofluorobenzene	103%	103%	107%	83-118%

* = Outside of Control Limits.

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-MB	6F12678.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	50	10	ug/l	
59-50-7	4-Chloro-3-methyl Phenol	ND	5.0	0.59	ug/l	
95-57-8	2-Chlorophenol	ND	5.0	0.63	ug/l	
120-83-2	2,4-Dichlorophenol	ND	5.0	0.84	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	0.74	ug/l	
51-28-5	2,4-Dinitrophenol	ND	25	5.0	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	10	2.0	ug/l	
95-48-7	2-Methylphenol	ND	5.0	0.56	ug/l	
	3&4-Methylphenol	ND	5.0	0.98	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	0.85	ug/l	
100-02-7	4-Nitrophenol	ND	25	5.0	ug/l	
87-86-5	Pentachlorophenol	ND	25	5.0	ug/l	
108-95-2	Phenol	ND	5.0	0.50	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	0.74	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	0.75	ug/l	
100-51-6	Benzyl Alcohol	ND	5.0	0.61	ug/l	
101-55-3	4-Bromophenyl Phenyl Ether	ND	5.0	0.85	ug/l	
85-68-7	Butyl Benzyl Phthalate	ND	5.0	1.0	ug/l	
86-74-8	Carbazole	ND	5.0	0.60	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.63	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	5.0	0.81	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	5.0	0.73	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	5.0	0.76	ug/l	
91-58-7	2-Chloronaphthalene	ND	5.0	0.50	ug/l	
7005-72-3	4-Chlorophenyl Phenyl Ether	ND	5.0	0.54	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.60	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	0.50	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	0.50	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	0.50	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	5.0	0.64	ug/l	
84-66-2	Diethyl Phthalate	ND	5.0	1.0	ug/l	
131-11-3	Dimethyl Phthalate	ND	5.0	1.0	ug/l	
84-74-2	Di-n-butyl Phthalate	ND	5.0	1.0	ug/l	
117-84-0	Di-n-octyl Phthalate	ND	5.0	1.0	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	5.0	0.81	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	5.0	0.71	ug/l	

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-MB	6F12678.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Result	RL	MDL	Units	Q
117-81-7	bis(2-Ethylhexyl)phthalate	ND	5.0	1.0	ug/l	
118-74-1	Hexachlorobenzene	ND	5.0	0.69	ug/l	
87-68-3	Hexachlorobutadiene	ND	5.0	0.50	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	5.0	1.8	ug/l	
67-72-1	Hexachloroethane	ND	5.0	1.6	ug/l	
78-59-1	Isophorone	ND	5.0	0.78	ug/l	
88-74-4	2-Nitroaniline	ND	5.0	1.8	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.88	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	1.2	ug/l	
98-95-3	Nitrobenzene	ND	5.0	0.93	ug/l	
621-64-7	N-Nitrosodi-n-propylamine	ND	5.0	0.67	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.81	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	1.1	ug/l	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	39%	14-67%
4165-62-2	Phenol-d5	29%	10-50%
118-79-6	2,4,6-Tribromophenol	84%	33-118%
4165-60-0	Nitrobenzene-d5	71%	42-108%
321-60-8	2-Fluorobiphenyl	76%	40-106%
1718-51-0	Terphenyl-d14	66%	39-121%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MB	6F12722.D	1	12/27/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	830	170	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	ND	170	19	ug/kg	
95-57-8	2-Chlorophenol	ND	170	20	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	170	19	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	170	44	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	830	170	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	330	67	ug/kg	
95-48-7	2-Methylphenol	ND	170	20	ug/kg	
	3&4-Methylphenol	ND	170	27	ug/kg	
88-75-5	2-Nitrophenol	ND	170	18	ug/kg	
100-02-7	4-Nitrophenol	ND	830	170	ug/kg	
87-86-5	Pentachlorophenol	ND	830	170	ug/kg	
108-95-2	Phenol	ND	170	17	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	27	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	19	ug/kg	
100-51-6	Benzyl Alcohol	ND	170	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	17	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	170	33	ug/kg	
86-74-8	Carbazole	ND	170	23	ug/kg	
106-47-8	4-Chloroaniline	ND	170	42	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	17	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	19	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	170	21	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	17	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	17	ug/kg	
132-64-9	Dibenzofuran	ND	170	17	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	17	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	18	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	22	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	170	40	ug/kg	
84-66-2	Diethyl Phthalate	ND	330	33	ug/kg	
131-11-3	Dimethyl Phthalate	ND	170	33	ug/kg	
117-84-0	Di-n-octyl Phthalate	ND	170	33	ug/kg	
84-74-2	Di-n-butyl Phthalate	ND	330	67	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	17	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	170	21	ug/kg	

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MB	6F12722.D	1	12/27/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
117-81-7	bis(2-Ethylhexyl)phthalate	ND	330	33	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	17	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	17	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	33	ug/kg	
67-72-1	Hexachloroethane	ND	170	20	ug/kg	
78-59-1	Isophorone	ND	170	17	ug/kg	
88-74-4	2-Nitroaniline	ND	170	39	ug/kg	
99-09-2	3-Nitroaniline	ND	170	19	ug/kg	
100-01-6	4-Nitroaniline	ND	170	48	ug/kg	
98-95-3	Nitrobenzene	ND	170	17	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	ND	170	17	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	18	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	20	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	54%	40-102%
4165-62-2	Phenol-d5	62%	41-100%
118-79-6	2,4,6-Tribromophenol	74%	42-108%
4165-60-0	Nitrobenzene-d5	54%	40-105%
321-60-8	2-Fluorobiphenyl	62%	43-107%
1718-51-0	Terphenyl-d14	81%	45-119%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MB	X079462.D	1	01/04/22	WH	12/27/21	OP88994	SX3199

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
65-85-0	Benzoic Acid	ND	830	170	ug/kg	
59-50-7	4-Chloro-3-methyl Phenol	ND	170	19	ug/kg	
95-57-8	2-Chlorophenol	ND	170	20	ug/kg	
120-83-2	2,4-Dichlorophenol	ND	170	19	ug/kg	
105-67-9	2,4-Dimethylphenol	ND	170	44	ug/kg	
51-28-5	2,4-Dinitrophenol	ND	830	170	ug/kg	
534-52-1	4,6-Dinitro-o-cresol	ND	330	67	ug/kg	
95-48-7	2-Methylphenol	ND	170	20	ug/kg	
	3&4-Methylphenol	ND	170	27	ug/kg	
88-75-5	2-Nitrophenol	ND	170	18	ug/kg	
100-02-7	4-Nitrophenol	ND	830	170	ug/kg	
87-86-5	Pentachlorophenol	ND	830	170	ug/kg	
108-95-2	Phenol	ND	170	17	ug/kg	
95-95-4	2,4,5-Trichlorophenol	ND	170	27	ug/kg	
88-06-2	2,4,6-Trichlorophenol	ND	170	19	ug/kg	
100-51-6	Benzyl Alcohol	ND	170	17	ug/kg	
101-55-3	4-Bromophenyl phenyl ether	ND	170	17	ug/kg	
85-68-7	Butyl benzyl phthalate	ND	170	33	ug/kg	
86-74-8	Carbazole	ND	170	23	ug/kg	
106-47-8	4-Chloroaniline	ND	170	42	ug/kg	
111-91-1	bis(2-Chloroethoxy)methane	ND	170	17	ug/kg	
111-44-4	bis(2-Chloroethyl)ether	ND	170	19	ug/kg	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	170	21	ug/kg	
91-58-7	2-Chloronaphthalene	ND	170	17	ug/kg	
7005-72-3	4-Chlorophenyl phenyl ether	ND	170	17	ug/kg	
132-64-9	Dibenzofuran	ND	170	17	ug/kg	
95-50-1	1,2-Dichlorobenzene	ND	170	17	ug/kg	
541-73-1	1,3-Dichlorobenzene	ND	170	18	ug/kg	
106-46-7	1,4-Dichlorobenzene	ND	170	22	ug/kg	
91-94-1	3,3'-Dichlorobenzidine	ND	170	40	ug/kg	
84-66-2	Diethyl Phthalate	ND	330	33	ug/kg	
131-11-3	Dimethyl Phthalate	ND	170	33	ug/kg	
117-84-0	Di-n-octyl Phthalate	ND	170	33	ug/kg	
84-74-2	Di-n-butyl Phthalate	ND	330	67	ug/kg	
121-14-2	2,4-Dinitrotoluene	ND	170	17	ug/kg	
606-20-2	2,6-Dinitrotoluene	ND	170	21	ug/kg	

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MB	X079462.D	1	01/04/22	WH	12/27/21	OP88994	SX3199

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
117-81-7	bis(2-Ethylhexyl)phthalate	ND	330	33	ug/kg	
118-74-1	Hexachlorobenzene	ND	170	17	ug/kg	
87-68-3	Hexachlorobutadiene	ND	170	17	ug/kg	
77-47-4	Hexachlorocyclopentadiene	ND	170	33	ug/kg	
67-72-1	Hexachloroethane	ND	170	20	ug/kg	
78-59-1	Isophorone	ND	170	17	ug/kg	
88-74-4	2-Nitroaniline	ND	170	39	ug/kg	
99-09-2	3-Nitroaniline	ND	170	19	ug/kg	
100-01-6	4-Nitroaniline	ND	170	48	ug/kg	
98-95-3	Nitrobenzene	ND	170	17	ug/kg	
621-64-7	N-Nitrosodi-n-propylamine	ND	170	17	ug/kg	
86-30-6	N-Nitrosodiphenylamine	ND	170	18	ug/kg	
120-82-1	1,2,4-Trichlorobenzene	ND	170	20	ug/kg	

CAS No.	Surrogate Recoveries		Limits
367-12-4	2-Fluorophenol	55%	40-102%
4165-62-2	Phenol-d5	61%	41-100%
118-79-6	2,4,6-Tribromophenol	89%	42-108%
4165-60-0	Nitrobenzene-d5	54%	40-105%
321-60-8	2-Fluorobiphenyl	67%	43-107%
1718-51-0	Terphenyl-d14	88%	45-119%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88907-MB	7G17084.D	1	12/21/21	MF	12/20/21	OP88907	S7G728

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	66	26	ug/kg	
208-96-8	Acenaphthylene	ND	66	26	ug/kg	
120-12-7	Anthracene	ND	66	16	ug/kg	
56-55-3	Benzo(a)anthracene	ND	13	3.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	13	3.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	13	3.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	13	3.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	13	3.3	ug/kg	
218-01-9	Chrysene	ND	13	3.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	3.3	ug/kg	
206-44-0	Fluoranthene	ND	66	16	ug/kg	
86-73-7	Fluorene	ND	66	26	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	13	3.3	ug/kg	
90-12-0	1-Methylnaphthalene	ND	66	26	ug/kg	
91-57-6	2-Methylnaphthalene	ND	66	26	ug/kg	
91-20-3	Naphthalene	ND	66	26	ug/kg	
85-01-8	Phenanthrene	ND	66	16	ug/kg	
129-00-0	Pyrene	ND	66	16	ug/kg	

CAS No.	Surrogate Recoveries		Limits
7297-45-2	2-Methylnaphthalene-d10	92%	50-150%
93951-69-0	Fluoranthene-d10	104%	50-150%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88982-MB	7G17126.D	1	12/23/21	MF	12/23/21	OP88982	S7G729

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-11

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	65	26	ug/kg	
208-96-8	Acenaphthylene	ND	65	26	ug/kg	
120-12-7	Anthracene	ND	65	16	ug/kg	
56-55-3	Benzo(a)anthracene	ND	13	3.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	13	3.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	13	3.3	ug/kg	
191-24-2	Benzo(g,h,i)perylene	ND	13	3.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	13	3.3	ug/kg	
218-01-9	Chrysene	ND	13	3.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	13	3.3	ug/kg	
206-44-0	Fluoranthene	ND	65	16	ug/kg	
86-73-7	Fluorene	ND	65	26	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	13	3.3	ug/kg	
90-12-0	1-Methylnaphthalene	ND	65	26	ug/kg	
91-57-6	2-Methylnaphthalene	ND	65	26	ug/kg	
91-20-3	Naphthalene	ND	65	26	ug/kg	
85-01-8	Phenanthrene	ND	65	16	ug/kg	
129-00-0	Pyrene	ND	65	16	ug/kg	

CAS No.	Surrogate Recoveries		Limits
7297-45-2	2-Methylnaphthalene-d10	90%	50-150%
93951-69-0	Fluoranthene-d10	93%	50-150%

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88990-MB	T057553.D	1	12/27/21	LR	12/23/21	OP88990	ST1980

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.80	0.32	ug/l	
208-96-8	Acenaphthylene	ND	0.80	0.32	ug/l	
120-12-7	Anthracene	ND	0.80	0.20	ug/l	
56-55-3	Benzo(a)anthracene	ND	0.16	0.032	ug/l	
50-32-8	Benzo(a)pyrene	ND	0.16	0.032	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	0.080	0.032	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	0.16	0.032	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	0.080	0.032	ug/l	
218-01-9	Chrysene	ND	0.16	0.032	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	0.16	0.032	ug/l	
206-44-0	Fluoranthene	ND	0.80	0.20	ug/l	
86-73-7	Fluorene	ND	0.80	0.20	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.16	0.032	ug/l	
90-12-0	1-Methylnaphthalene	ND	0.80	0.32	ug/l	
91-57-6	2-Methylnaphthalene	ND	0.80	0.32	ug/l	
91-20-3	Naphthalene	ND	0.80	0.32	ug/l	
85-01-8	Phenanthrene	ND	0.80	0.20	ug/l	
129-00-0	Pyrene	ND	0.80	0.20	ug/l	

CAS No.	Surrogate Recoveries		Limits
7297-45-2	2-Methylnaphthalene-d10	67%	50-150%
93951-69-0	Fluoranthene-d10	77%	50-150%

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-BS	6F12677.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
65-85-0	Benzoic Acid	100	35.5	36	10-69
59-50-7	4-Chloro-3-methyl Phenol	50	42.1	84	54-103
95-57-8	2-Chlorophenol	50	38.0	76	52-98
120-83-2	2,4-Dichlorophenol	50	44.2	88	53-103
105-67-9	2,4-Dimethylphenol	50	38.6	77	43-90
51-28-5	2,4-Dinitrophenol	100	90.5	91	44-112
534-52-1	4,6-Dinitro-o-cresol	100	101	101	66-121
95-48-7	2-Methylphenol	50	31.8	64	43-90
	3&4-Methylphenol	100	60.4	60	36-88
88-75-5	2-Nitrophenol	50	43.8	88	53-102
100-02-7	4-Nitrophenol	100	40.4	40	18-62
87-86-5	Pentachlorophenol	100	97.3	97	61-115
108-95-2	Phenol	50	16.3	33	19-56
95-95-4	2,4,5-Trichlorophenol	50	47.4	95	62-109
88-06-2	2,4,6-Trichlorophenol	50	45.3	91	59-107
100-51-6	Benzyl Alcohol	50	33.5	67	46-94
101-55-3	4-Bromophenyl Phenyl Ether	50	40.6	81	65-109
85-68-7	Butyl Benzyl Phthalate	50	46.6	93	65-112
86-74-8	Carbazole	50	44.6	89	59-113
106-47-8	4-Chloroaniline	50	36.0	72	49-105
111-91-1	bis(2-Chloroethoxy)methane	50	41.6	83	51-102
111-44-4	bis(2-Chloroethyl)ether	50	39.7	79	53-100
108-60-1	2,2'-Oxybis(1-chloropropane)	50	39.7	79	45-106
91-58-7	2-Chloronaphthalene	50	32.6	65	57-103
7005-72-3	4-Chlorophenyl Phenyl Ether	50	38.6	77	62-105
132-64-9	Dibenzofuran	50	38.5	77	61-106
95-50-1	1,2-Dichlorobenzene	50	25.1	50	48-97
541-73-1	1,3-Dichlorobenzene	50	21.6	43*	45-95
106-46-7	1,4-Dichlorobenzene	50	22.6	45	45-98
91-94-1	3,3'-Dichlorobenzidine	50	37.2	74	46-117
84-66-2	Diethyl Phthalate	50	44.7	89	64-108
131-11-3	Dimethyl Phthalate	50	43.6	87	63-106
84-74-2	Di-n-butyl Phthalate	50	45.6	91	65-107
117-84-0	Di-n-octyl Phthalate	50	48.5	97	62-118
121-14-2	2,4-Dinitrotoluene	50	50.7	101	61-110
606-20-2	2,6-Dinitrotoluene	50	46.8	94	63-108

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-BS	6F12677.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
117-81-7	bis(2-Ethylhexyl)phthalate	50	46.3	93	61-117
118-74-1	Hexachlorobenzene	50	40.2	80	63-108
87-68-3	Hexachlorobutadiene	50	15.5	31*	42-102
77-47-4	Hexachlorocyclopentadiene	50	12.9	26*	39-102
67-72-1	Hexachloroethane	50	15.3	31*	42-100
78-59-1	Isophorone	50	43.3	87	43-87
88-74-4	2-Nitroaniline	50	43.8	88	54-128
99-09-2	3-Nitroaniline	50	39.7	79	56-106
100-01-6	4-Nitroaniline	50	43.0	86	55-120
98-95-3	Nitrobenzene	50	40.9	82	50-104
621-64-7	N-Nitrosodi-n-propylamine	50	41.9	84	52-104
86-30-6	N-Nitrosodiphenylamine	50	39.8	80	64-108
120-82-1	1,2,4-Trichlorobenzene	50	23.5	47	45-97

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	45%	14-67%
4165-62-2	Phenol-d5	32%	10-50%
118-79-6	2,4,6-Tribromophenol	91%	33-118%
4165-60-0	Nitrobenzene-d5	80%	42-108%
321-60-8	2-Fluorobiphenyl	85%	40-106%
1718-51-0	Terphenyl-d14	47%	39-121%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-BS	6F12721.D	1	12/27/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
65-85-0	Benzoic Acid	3330	3100	93	36-118
59-50-7	4-Chloro-3-methyl Phenol	1670	1460	88	52-108
95-57-8	2-Chlorophenol	1670	1280	77	48-104
120-83-2	2,4-Dichlorophenol	1670	1440	86	51-105
105-67-9	2,4-Dimethylphenol	1670	1280	77	43-96
51-28-5	2,4-Dinitrophenol	3330	3000	90	40-119
534-52-1	4,6-Dinitro-o-cresol	3330	3290	99	64-121
95-48-7	2-Methylphenol	1670	1270	76	46-107
	3&4-Methylphenol	3330	2670	80	44-111
88-75-5	2-Nitrophenol	1670	1340	80	49-104
100-02-7	4-Nitrophenol	3330	2960	89	56-116
87-86-5	Pentachlorophenol	3330	3330	100	61-114
108-95-2	Phenol	1670	1300	78	45-110
95-95-4	2,4,5-Trichlorophenol	1670	1550	93	58-112
88-06-2	2,4,6-Trichlorophenol	1670	1450	87	56-109
100-51-6	Benzyl Alcohol	1670	1300	78	53-108
101-55-3	4-Bromophenyl phenyl ether	1670	1390	83	62-110
85-68-7	Butyl benzyl phthalate	1670	1510	91	65-113
86-74-8	Carbazole	1670	1420	85	60-111
106-47-8	4-Chloroaniline	1670	1180	71	30-115
111-91-1	bis(2-Chloroethoxy)methane	1670	1220	73	48-105
111-44-4	bis(2-Chloroethyl)ether	1670	1130	68	46-103
108-60-1	2,2'-Oxybis(1-chloropropane)	1670	1100	66	40-110
91-58-7	2-Chloronaphthalene	1670	1330	80	53-106
7005-72-3	4-Chlorophenyl phenyl ether	1670	1380	83	58-106
132-64-9	Dibenzofuran	1670	1340	80	57-108
95-50-1	1,2-Dichlorobenzene	1670	1180	71	44-102
541-73-1	1,3-Dichlorobenzene	1670	1140	68	42-100
106-46-7	1,4-Dichlorobenzene	1670	1150	69	40-106
91-94-1	3,3'-Dichlorobenzidine	1670	1410	85	36-114
84-66-2	Diethyl Phthalate	1670	1440	86	61-109
131-11-3	Dimethyl Phthalate	1670	1410	85	59-108
117-84-0	Di-n-octyl Phthalate	1670	1600	96	64-119
84-74-2	Di-n-butyl Phthalate	1670	1500	90	63-108
121-14-2	2,4-Dinitrotoluene	1670	1640	98	59-109
606-20-2	2,6-Dinitrotoluene	1670	1490	89	61-107

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-BS	6F12721.D	1	12/27/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
117-81-7	bis(2-Ethylhexyl)phthalate	1670	1510	91	64-115
118-74-1	Hexachlorobenzene	1670	1330	80	59-111
87-68-3	Hexachlorobutadiene	1670	1230	74	41-108
77-47-4	Hexachlorocyclopentadiene	1670	1350	81	49-110
67-72-1	Hexachloroethane	1670	1130	68	40-105
78-59-1	Isophorone	1670	1300	78	42-89
88-74-4	2-Nitroaniline	1670	1330	80	56-123
99-09-2	3-Nitroaniline	1670	1310	79	41-111
100-01-6	4-Nitroaniline	1670	1390	83	54-113
98-95-3	Nitrobenzene	1670	1190	71	43-108
621-64-7	N-Nitrosodi-n-propylamine	1670	1210	73	48-108
86-30-6	N-Nitrosodiphenylamine	1670	1320	79	62-110
120-82-1	1,2,4-Trichlorobenzene	1670	1210	73	45-100

CAS No.	Surrogate Recoveries	BSP	Limits
367-12-4	2-Fluorophenol	72%	40-102%
4165-62-2	Phenol-d5	75%	41-100%
118-79-6	2,4,6-Tribromophenol	88%	42-108%
4165-60-0	Nitrobenzene-d5	67%	40-105%
321-60-8	2-Fluorobiphenyl	77%	43-107%
1718-51-0	Terphenyl-d14	85%	45-119%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88907-BS	7G17085.D	1	12/21/21	MF	12/20/21	OP88907	S7G728

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	667	511	77	53-100
208-96-8	Acenaphthylene	667	494	74	51-100
120-12-7	Anthracene	333	250	75	60-102
56-55-3	Benzo(a)anthracene	333	255	76	60-106
50-32-8	Benzo(a)pyrene	333	268	80	58-105
205-99-2	Benzo(b)fluoranthene	333	278	83	59-112
191-24-2	Benzo(g,h,i)perylene	333	263	79	56-109
207-08-9	Benzo(k)fluoranthene	333	279	84	58-109
218-01-9	Chrysene	333	280	84	62-104
53-70-3	Dibenzo(a,h)anthracene	333	266	80	55-110
206-44-0	Fluoranthene	667	543	81	59-109
86-73-7	Fluorene	667	531	80	56-104
193-39-5	Indeno(1,2,3-cd)pyrene	333	270	81	54-110
90-12-0	1-Methylnaphthalene	667	450	67	50-101
91-57-6	2-Methylnaphthalene	667	459	69	49-100
91-20-3	Naphthalene	667	476	71	49-101
85-01-8	Phenanthrene	667	551	83	57-104
129-00-0	Pyrene	667	552	83	58-106

CAS No.	Surrogate Recoveries	BSP	Limits
7297-45-2	2-Methylnaphthalene-d10	85%	50-150%
93951-69-0	Fluoranthene-d10	95%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88982-BS	7G17127.D	1	12/23/21	MF	12/23/21	OP88982	S7G729

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-11

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	649	521	80	53-100
208-96-8	Acenaphthylene	649	504	78	51-100
120-12-7	Anthracene	325	253	78	60-102
56-55-3	Benzo(a)anthracene	325	261	80	60-106
50-32-8	Benzo(a)pyrene	325	269	83	58-105
205-99-2	Benzo(b)fluoranthene	325	283	87	59-112
191-24-2	Benzo(g,h,i)perylene	325	265	82	56-109
207-08-9	Benzo(k)fluoranthene	325	270	83	58-109
218-01-9	Chrysene	325	283	87	62-104
53-70-3	Dibenzo(a,h)anthracene	325	271	83	55-110
206-44-0	Fluoranthene	649	538	83	59-109
86-73-7	Fluorene	649	514	79	56-104
193-39-5	Indeno(1,2,3-cd)pyrene	325	278	86	54-110
90-12-0	1-Methylnaphthalene	649	462	71	50-101
91-57-6	2-Methylnaphthalene	649	467	72	49-100
91-20-3	Naphthalene	649	484	75	49-101
85-01-8	Phenanthrene	649	533	82	57-104
129-00-0	Pyrene	649	510	79	58-106

CAS No.	Surrogate Recoveries	BSP	Limits
7297-45-2	2-Methylnaphthalene-d10	95%	50-150%
93951-69-0	Fluoranthene-d10	103%	50-150%

* = Outside of Control Limits.

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88990-BS	T057552.D	1	12/27/21	LR	12/23/21	OP88990	ST1980

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
83-32-9	Acenaphthene	8	6.6	83	54-128
208-96-8	Acenaphthylene	8	6.4	80	55-128
120-12-7	Anthracene	4	3.1	78	57-129
56-55-3	Benzo(a)anthracene	4	3.5	88	60-134
50-32-8	Benzo(a)pyrene	4	3.4	85	58-131
205-99-2	Benzo(b)fluoranthene	4	3.6	90	62-139
191-24-2	Benzo(g,h,i)perylene	4	3.3	83	48-136
207-08-9	Benzo(k)fluoranthene	4	3.5	88	60-139
218-01-9	Chrysene	4	3.5	88	64-136
53-70-3	Dibenzo(a,h)anthracene	4	3.4	85	46-131
206-44-0	Fluoranthene	8	6.6	83	59-140
86-73-7	Fluorene	8	6.7	84	55-129
193-39-5	Indeno(1,2,3-cd)pyrene	4	3.6	90	46-139
90-12-0	1-Methylnaphthalene	8	6.0	75	52-128
91-57-6	2-Methylnaphthalene	8	6.0	75	50-117
91-20-3	Naphthalene	8	6.3	79	52-124
85-01-8	Phenanthrene	8	6.7	84	60-130
129-00-0	Pyrene	8	6.9	86	53-134

CAS No.	Surrogate Recoveries	BSP	Limits
7297-45-2	2-Methylnaphthalene-d10	79%	50-150%
93951-69-0	Fluoranthene-d10	84%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-MS	6F12690.D	1	12/23/21	WH	12/23/21	OP88981	S6F469
OP88981-MSD	6F12691.D	1	12/23/21	WH	12/23/21	OP88981	S6F469
FA91824-4	6F12682.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	FA91824-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
65-85-0	Benzoic Acid	48 U		200	79.7	40	200	84.2	42	5	10-69/39
59-50-7	4-Chloro-3-methyl Phenol	4.8 U		100	79.4	79	100	78.2	78	2	54-103/23
95-57-8	2-Chlorophenol	4.8 U		100	71.0	71	100	68.0	68	4	52-98/25
120-83-2	2,4-Dichlorophenol	4.8 U		100	82.3	82	100	79.8	80	3	53-103/26
105-67-9	2,4-Dimethylphenol	4.8 U		100	73.4	73	100	71.7	72	2	43-90/27
51-28-5	2,4-Dinitrophenol	24 U		200	172	86	200	174	87	1	44-112/25
534-52-1	4,6-Dinitro-o-cresol	9.6 U		200	190	95	200	188	94	1	66-121/23
95-48-7	2-Methylphenol	4.8 U		100	61.4	61	100	60.2	60	2	43-90/28
	3&4-Methylphenol	4.8 U		200	116	58	200	114	57	2	36-88/28
88-75-5	2-Nitrophenol	4.8 U		100	81.6	82	100	79.7	80	2	53-102/29
100-02-7	4-Nitrophenol	24 U		200	84.6	42	200	87.5	44	3	18-62/33
87-86-5	Pentachlorophenol	24 U		200	192	96	200	190	95	1	61-115/26
108-95-2	Phenol	4.8 U		100	32.8	33	100	33.1	33	1	19-56/35
95-95-4	2,4,5-Trichlorophenol	4.8 U		100	89.1	89	100	89.4	89	0	62-109/22
88-06-2	2,4,6-Trichlorophenol	4.8 U		100	84.9	85	100	84.1	84	1	59-107/23
100-51-6	Benzyl Alcohol	4.8 U		100	67.8	68	100	67.7	68	0	46-94/27
101-55-3	4-Bromophenyl Phenyl Ether	4.8 U		100	79.7	80	100	82.3	82	3	65-109/23
85-68-7	Butyl Benzyl Phthalate	4.8 U		100	88.4	88	100	92.2	92	4	65-112/24
86-74-8	Carbazole	4.8 U		100	87.5	88	100	87.7	88	0	59-113/21
106-47-8	4-Chloroaniline	4.8 U		100	61.1	61	100	62.4	62	2	49-105/27
111-91-1	bis(2-Chloroethoxy)methane	4.8 U		100	79.9	80	100	80.5	81	1	51-102/28
111-44-4	bis(2-Chloroethyl)ether	4.8 U		100	76.5	77	100	74.0	74	3	53-100/27
108-60-1	2,2'-Oxybis(1-chloropropane)	4.8 U		100	75.7	76	100	73.3	73	3	45-106/26
91-58-7	2-Chloronaphthalene	4.8 U		100	55.2	55*	100	58.5	59	6	57-103/23
7005-72-3	4-Chlorophenyl Phenyl Ether	4.8 U		100	74.9	75	100	77.2	77	3	62-105/20
132-64-9	Dibenzofuran	4.8 U		100	71.3	71	100	78.5	79	10	61-106/21
95-50-1	1,2-Dichlorobenzene	4.8 U		100	42.0	42*	100	42.9	43*	2	48-97/24
541-73-1	1,3-Dichlorobenzene	4.8 U		100	38.4	38*	100	39.5	40*	3	45-95/25
106-46-7	1,4-Dichlorobenzene	4.8 U		100	38.8	39*	100	40.3	40*	4	45-98/25
91-94-1	3,3'-Dichlorobenzidine	4.8 U		100	71.2	71	100	77.5	78	8	46-117/29
84-66-2	Diethyl Phthalate	4.8 U		100	85.5	86	100	88.0	88	3	64-108/21
131-11-3	Dimethyl Phthalate	4.8 U		100	84.2	84	100	86.5	87	3	63-106/22
84-74-2	Di-n-butyl Phthalate	4.8 U		100	88.7	89	100	91.0	91	3	65-107/21
117-84-0	Di-n-octyl Phthalate	4.8 U		100	94.6	95	100	98.4	98	4	62-118/24
121-14-2	2,4-Dinitrotoluene	4.8 U		100	98.4	98	100	101	101	3	61-110/21
606-20-2	2,6-Dinitrotoluene	4.8 U		100	88.6	89	100	92.3	92	4	63-108/21

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88981-MS	6F12690.D	1	12/23/21	WH	12/23/21	OP88981	S6F469
OP88981-MSD	6F12691.D	1	12/23/21	WH	12/23/21	OP88981	S6F469
FA91824-4	6F12682.D	1	12/23/21	WH	12/23/21	OP88981	S6F469

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	FA91824-4 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
117-81-7	bis(2-Ethylhexyl)phthalate	4.8 U		100	88.0	88	100	92.4	92	5	61-117/23
118-74-1	Hexachlorobenzene	4.8 U		100	76.9	77	100	78.7	79	2	63-108/22
87-68-3	Hexachlorobutadiene	4.8 U		100	31.5	32*	100	35.9	36*	13	42-102/28
77-47-4	Hexachlorocyclopentadiene	4.8 U		100	29.1	29*	100	35.5	36*	20	39-102/29
67-72-1	Hexachloroethane	4.8 U		100	32.5	33*	100	34.8	35*	7	42-100/29
78-59-1	Isophorone	4.8 U		100	83.3	83	100	83.8	84	1	43-87/25
88-74-4	2-Nitroaniline	4.8 U		100	87.5	88	100	87.8	88	0	54-128/24
99-09-2	3-Nitroaniline	4.8 U		100	74.6	75	100	75.2	75	1	56-106/27
100-01-6	4-Nitroaniline	4.8 U		100	85.6	86	100	86.5	87	1	55-120/24
98-95-3	Nitrobenzene	4.8 U		100	78.3	78	100	77.0	77	2	50-104/28
621-64-7	N-Nitrosodi-n-propylamine	4.8 U		100	79.7	80	100	79.7	80	0	52-104/25
86-30-6	N-Nitrosodiphenylamine	4.8 U		100	78.9	79	100	81.3	81	3	64-108/23
120-82-1	1,2,4-Trichlorobenzene	4.8 U		100	38.1	38*	100	41.2	41*	8	45-97/28

CAS No.	Surrogate Recoveries	MS	MSD	FA91824-4	Limits
367-12-4	2-Fluorophenol	44%	43%	25%	14-67%
4165-62-2	Phenol-d5	32%	32%	26%	10-50%
118-79-6	2,4,6-Tribromophenol	85%	83%	68%	33-118%
4165-60-0	Nitrobenzene-d5	78%	75%	66%	42-108%
321-60-8	2-Fluorobiphenyl	81%	81%	71%	40-106%
1718-51-0	Terphenyl-d14	46%	58%	76%	39-121%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MS [a]	6F12742.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470
OP88994-MSD [a]	6F12743.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470
FA91814-2 [a]	6F12741.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	FA91814-2 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
59-50-7	4-Chloro-3-methyl Phenol	2300 U		2310	1780	77	2300	1690	73	5	52-108/21
95-57-8	2-Chlorophenol	2300 U		2310	1660	72	2300	1610	70	3	48-104/26
120-83-2	2,4-Dichlorophenol	2300 U		2310	1800	78	2300	1730	75	4	51-105/27
105-67-9	2,4-Dimethylphenol	2300 U		2310	1550	67	2300	1430	62	8	43-96/23
534-52-1	4,6-Dinitro-o-cresol	4600 U		4610	3100	67	4600	2580	56*	18	64-121/29
95-48-7	2-Methylphenol	2300 U		2310	1630	71	2300	1520	66	7	46-107/24
	3&4-Methylphenol	2300 U		4610	3480	75	4600	3270	71	6	44-111/24
88-75-5	2-Nitrophenol	2300 U		2310	1700	74	2300	1570	68	8	49-104/27
100-02-7	4-Nitrophenol	12000 U		4610	3330	72	4600	3150	68	6	56-116/23
87-86-5	Pentachlorophenol	12000 U		4610	3020	65	4600	1900	41*	47*	61-114/23
108-95-2	Phenol	2300 U		2310	1700	74	2300	1570	68	8	45-110/24
95-95-4	2,4,5-Trichlorophenol	2300 U		2310	1770	77	2300	1650	72	7	58-112/22
88-06-2	2,4,6-Trichlorophenol	2300 U		2310	1680	73	2300	1640	71	2	56-109/25
100-51-6	Benzyl Alcohol	2300 U		2310	1620	70	2300	1570	68	3	53-108/24
101-55-3	4-Bromophenyl phenyl ether	2300 U		2310	1680	73	2300	1590	69	6	62-110/21
85-68-7	Butyl benzyl phthalate	2300 U		2310	1860	81	2300	1760	77	6	65-113/20
86-74-8	Carbazole	2300 U		2310	1710	74	2300	1590	69	7	60-111/19
106-47-8	4-Chloroaniline	2300 U		2310	1630	71	2300	1480	64	10	30-115/30
111-91-1	bis(2-Chloroethoxy)methane	2300 U		2310	1590	69	2300	1470	64	8	48-105/24
111-44-4	bis(2-Chloroethyl)ether	2300 U		2310	1460	63	2300	1370	60	6	46-103/27
108-60-1	2,2'-Oxybis(1-chloropropane)	2300 U		2310	1400	61	2300	1320	57	6	40-110/25
91-58-7	2-Chloronaphthalene	2300 U		2310	1700	74	2300	1600	70	6	53-106/23
7005-72-3	4-Chlorophenyl phenyl ether	2300 U		2310	1670	72	2300	1570	68	6	58-106/21
132-64-9	Dibenzofuran	2300 U		2310	1650	72	2300	1540	67	7	57-108/22
95-50-1	1,2-Dichlorobenzene	2300 U		2310	1550	67	2300	1490	65	4	44-102/28
541-73-1	1,3-Dichlorobenzene	2300 U		2310	1500	65	2300	1410	61	6	42-100/30
106-46-7	1,4-Dichlorobenzene	2300 U		2310	1490	65	2300	1440	63	3	40-106/29
91-94-1	3,3'-Dichlorobenzidine	2300 U		2310	1880	81	2300	1780	77	5	36-114/28
84-66-2	Diethyl Phthalate	4600 U		2310	1700	74	2300	1610	70	5	61-109/20
131-11-3	Dimethyl Phthalate	2300 U		2310	1670	72	2300	1610	70	4	59-108/20
117-84-0	Di-n-octyl Phthalate	2300 U		2310	1840	80	2300	1750	76	5	64-119/21
84-74-2	Di-n-butyl Phthalate	4600 U		2310	1770	77	2300	1670	73	6	63-108/19
121-14-2	2,4-Dinitrotoluene	2300 U		2310	1830	79	2300	1750	76	4	59-109/20
606-20-2	2,6-Dinitrotoluene	2300 U		2310	1720	75	2300	1610	70	7	61-107/22
117-81-7	bis(2-Ethylhexyl)phthalate	4600 U		2310	1820	79	2300	1720	75	6	64-115/23
118-74-1	Hexachlorobenzene	2300 U		2310	1650	72	2300	1560	68	6	59-111/21

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88994-MS [a]	6F12742.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470
OP88994-MSD [a]	6F12743.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470
FA91814-2 [a]	6F12741.D	10	12/28/21	NJ	12/27/21	OP88994	S6F470

The QC reported here applies to the following samples: **Method:** SW846 8270D

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	FA91814-2 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
87-68-3	Hexachlorobutadiene	2300	U	2310	1630	71	2300	1520	66	7	41-108/27
67-72-1	Hexachloroethane	2300	U	2310	1320	57	2300	1270	55	4	40-105/32
78-59-1	Isophorone	2300	U	2310	1580	68	2300	1500	65	5	42-89/22
88-74-4	2-Nitroaniline	2300	U	2310	1540	67	2300	1420	62	8	56-123/24
99-09-2	3-Nitroaniline	2300	U	2310	1660	72	2300	1500	65	10	41-111/25
100-01-6	4-Nitroaniline	2300	U	2310	1640	71	2300	1540	67	6	54-113/22
98-95-3	Nitrobenzene	2300	U	2310	1510	65	2300	1380	60	9	43-108/25
621-64-7	N-Nitrosodi-n-propylamine	2300	U	2310	1510	65	2300	1420	62	6	48-108/27
86-30-6	N-Nitrosodiphenylamine	2300	U	2310	1600	69	2300	1540	67	4	62-110/21
120-82-1	1,2,4-Trichlorobenzene	2300	U	2310	1610	70	2300	1520	66	6	45-100/26

CAS No.	Surrogate Recoveries	MS	MSD	FA91814-2	Limits
367-12-4	2-Fluorophenol	65%	60%	60%	40-102%
4165-62-2	Phenol-d5	72%	68%	70%	41-100%
118-79-6	2,4,6-Tribromophenol	75%	68%	68%	42-108%
4165-60-0	Nitrobenzene-d5	63%	58%	59%	40-105%
321-60-8	2-Fluorobiphenyl	71%	67%	67%	43-107%
1718-51-0	Terphenyl-d14	73%	70%	72%	45-119%

(a) Dilution required due to matrix interference.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88907-MS	7G17092.D	1	12/21/21	MF	12/20/21	OP88907	S7G728
OP88907-MSD	7G17093.D	1	12/21/21	MF	12/20/21	OP88907	S7G728
FA91824-11 [a]	7G17094.D	1	12/21/21	MF	12/20/21	OP88907	S7G728

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	FA91824-11 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	610 U		6090	2720	45*	6130	2900	47*	6	53-100/28
208-96-8	Acenaphthylene	610 U		6090	2600	43*	6130	2760	45*	6	51-100/25
120-12-7	Anthracene	610 U		3050	1250	41*	3070	1360	44*	8	60-102/29
56-55-3	Benzo(a)anthracene	120 U		3050	1270	42*	3070	1390	45*	9	60-106/30
50-32-8	Benzo(a)pyrene	120 U		3050	1280	42*	3070	1400	46*	9	58-105/30
205-99-2	Benzo(b)fluoranthene	57.3	J	3050	1360	43*	3070	1490	47*	9	59-112/33
191-24-2	Benzo(g,h,i)perylene	120 U		3050	1140	37*	3070	1250	41*	9	56-109/31
207-08-9	Benzo(k)fluoranthene	120 U		3050	1280	42*	3070	1430	47*	11	58-109/33
218-01-9	Chrysene	120 U		3050	1360	45*	3070	1470	48*	8	62-104/30
53-70-3	Dibenzo(a,h)anthracene	120 U		3050	1240	41*	3070	1390	45*	11	55-110/31
206-44-0	Fluoranthene	610 U		6090	2490	41*	6130	2820	46*	12	59-109/29
86-73-7	Fluorene	610 U		6090	2800	46*	6130	2970	48*	6	56-104/27
193-39-5	Indeno(1,2,3-cd)pyrene	120 U		3050	1230	40*	3070	1370	45*	11	54-110/32
90-12-0	1-Methylnaphthalene	610 U		6090	2450	40*	6130	2610	43*	6	50-101/30
91-57-6	2-Methylnaphthalene	610 U		6090	2520	41*	6130	2680	44*	6	49-100/26
91-20-3	Naphthalene	610 U		6090	2660	44*	6130	2840	46*	7	49-101/28
85-01-8	Phenanthrene	610 U		6090	2660	44*	6130	2900	47*	9	57-104/27
129-00-0	Pyrene	610 U		6090	2690	44*	6130	3020	49*	12	58-106/29

CAS No.	Surrogate Recoveries	MS	MSD	FA91824-11	Limits
7297-45-2	2-Methylnaphthalene-d10	54%	69%	53%	50-150%
93951-69-0	Fluoranthene-d10	51%	69%	49%* [b]	50-150%

(a) Confirmation run.
(b) Outside control limits.

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88982-MS	7G17129.D	1	12/23/21	MF	12/23/21	OP88982	S7G729
OP88982-MSD	7G17130.D	1	12/23/21	MF	12/23/21	OP88982	S7G729
FA91824-11	7G17128.D	1	12/23/21	MF	12/23/21	OP88982	S7G729

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-11

CAS No.	Compound	FA91824-11 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	610 U		6090	3860	63	6050	3060	51*	23	53-100/28
208-96-8	Acenaphthylene	610 U		6090	3710	61	6050	2940	49*	23	51-100/25
120-12-7	Anthracene	610 U		3050	1810	59*	3030	1430	47*	23	60-102/29
56-55-3	Benzo(a)anthracene	120 U		3050	1990	65	3030	1520	50*	27	60-106/30
50-32-8	Benzo(a)pyrene	120 U		3050	2040	67	3030	1520	50*	29	58-105/30
205-99-2	Benzo(b)fluoranthene	66.2	J	3050	2200	70	3030	1720	55*	24	59-112/33
191-24-2	Benzo(g,h,i)perylene	120 U		3050	1740	57	3030	1270	42*	31	56-109/31
207-08-9	Benzo(k)fluoranthene	120 U		3050	2110	69	3030	1560	52*	30	58-109/33
218-01-9	Chrysene	38.2	J	3050	2100	68	3030	1610	52*	26	62-104/30
53-70-3	Dibenzo(a,h)anthracene	120 U		3050	1800	59	3030	1350	45*	29	55-110/31
206-44-0	Fluoranthene	610 U		6090	4010	66	6050	3170	52*	23	59-109/29
86-73-7	Fluorene	610 U		6090	3860	63	6050	3010	50*	25	56-104/27
193-39-5	Indeno(1,2,3-cd)pyrene	120 U		3050	1870	61	3030	1370	45*	31	54-110/32
90-12-0	1-Methylnaphthalene	610 U		6090	3420	56	6050	2780	46*	21	50-101/30
91-57-6	2-Methylnaphthalene	610 U		6090	3430	56	6050	2810	46*	20	49-100/26
91-20-3	Naphthalene	610 U		6090	3560	58	6050	3000	50	17	49-101/28
85-01-8	Phenanthrene	610 U		6090	3940	65	6050	3080	51*	25	57-104/27
129-00-0	Pyrene	610 U		6090	4030	66	6050	3070	51*	27	58-106/29

CAS No.	Surrogate Recoveries	MS	MSD	FA91824-11	Limits
7297-45-2	2-Methylnaphthalene-d10	74%	63%	71%	50-150%
93951-69-0	Fluoranthene-d10	80%	65%	75%	50-150%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88990-MS	T057564.D	1	12/27/21	LR	12/23/21	OP88990	ST1980
OP88990-MSD	T057565.D	1	12/27/21	LR	12/23/21	OP88990	ST1980
FA91824-7	T057560.D	1	12/27/21	LR	12/23/21	OP88990	ST1980

The QC reported here applies to the following samples: **Method:** SW846 8270D BY SIM

FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

CAS No.	Compound	FA91824-7 ug/l	Q	Spike ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	0.80	U	16.7	14.2	85	16.7	13.2	79	7	54-128/23
208-96-8	Acenaphthylene	0.80	U	16.7	13.9	83	16.7	12.7	76	9	55-128/23
120-12-7	Anthracene	0.80	U	8.33	6.8	82	8.33	6.2	74	9	57-129/22
56-55-3	Benzo(a)anthracene	0.16	U	8.33	7.5	90	8.33	7.1	85	5	60-134/18
50-32-8	Benzo(a)pyrene	0.16	U	8.33	7.3	88	8.33	6.9	83	6	58-131/20
205-99-2	Benzo(b)fluoranthene	0.048	J	8.33	7.7	92	8.33	7.4	88	4	62-139/21
191-24-2	Benzo(g,h,i)perylene	0.16	U	8.33	7.0	84	8.33	6.6	79	6	48-136/23
207-08-9	Benzo(k)fluoranthene	0.080	U	8.33	7.2	86	8.33	6.9	83	4	60-139/19
218-01-9	Chrysene	0.16	U	8.33	7.5	90	8.33	7.2	86	4	64-136/19
53-70-3	Dibenzo(a,h)anthracene	0.16	U	8.33	7.3	88	8.33	6.8	82	7	46-131/25
206-44-0	Fluoranthene	0.80	U	16.7	14.3	86	16.7	13.1	79	9	59-140/18
86-73-7	Fluorene	0.80	U	16.7	14.5	87	16.7	13.2	79	9	55-129/23
193-39-5	Indeno(1,2,3-cd)pyrene	0.16	U	8.33	7.8	94	8.33	7.3	88	7	46-139/24
90-12-0	1-Methylnaphthalene	0.80	U	16.7	13.2	79	16.7	12.4	74	6	52-128/22
91-57-6	2-Methylnaphthalene	0.80	U	16.7	13.1	79	16.7	12.2	73	7	50-117/23
91-20-3	Naphthalene	0.80	U	16.7	13.5	81	16.7	12.8	77	5	52-124/23
85-01-8	Phenanthrene	0.80	U	16.7	14.6	88	16.7	13.4	80	9	60-130/22
129-00-0	Pyrene	0.80	U	16.7	14.7	88	16.7	14.0	84	5	53-134/18

CAS No.	Surrogate Recoveries	MS	MSD	FA91824-7	Limits
7297-45-2	2-Methylnaphthalene-d10	82%	78%	51%	50-150%
93951-69-0	Fluoranthene-d10	87%	81%	60%	50-150%

* = Outside of Control Limits.

GC/LC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88983-MB	JR0087009.D	1	12/23/21	KA	12/23/21	OP88983	GJR393

The QC reported here applies to the following samples: **Method:** FLORIDA-PRO 2018

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C8-C40)	ND	6.8	3.4	mg/kg	

CAS No.	Surrogate Recoveries		Limits
84-15-1	o-Terphenyl	81%	66-136%
7194-86-7	Nonatriacontane	79%	36-132%

Blank Spike Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88983-BS	JR0087010.D	1	12/23/21	KA	12/23/21	OP88983	GJR393

The QC reported here applies to the following samples: **Method:** FLORIDA-PRO 2018

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C8-C40)	34	25.4	75	65-119

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	77%	66-136%
7194-86-7	Nonatriacontane	78%	36-132%

* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA91824
Account: HGLFLMI Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP88983-MS	JR0087018.D	1	12/23/21	KA	12/23/21	OP88983	GJR393
OP88983-MSD	JR0087019.D	1	12/23/21	KA	12/23/21	OP88983	GJR393
FA91780-1	JR0087011.D	1	12/23/21	KA	12/23/21	OP88983	GJR393

The QC reported here applies to the following samples: **Method:** FLORIDA-PRO 2018

FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

CAS No.	Compound	FA91780-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C8-C40)	7.4	U	37.1	33.4	90	37.1	34.2	92	2	65-119/25

CAS No.	Surrogate Recoveries	MS	MSD	FA91780-1	Limits
84-15-1	o-Terphenyl	88%	91%	84%	66-136%
7194-86-7	Nonatriacontane	92%	96%	82%	36-132%

* = Outside of Control Limits.

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40061 Methods: SW846 7471B
Matrix Type: SOLID Units: mg/kg

Prep Date: 12/20/21

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.042	.0025	.0042	0.0014	<0.042

Associated samples MP40061: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40061
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 12/20/21 12/20/21

Metal	FA91727-4 Original	DUP	RPD	QC Limits	FA91727-4 Original	MS	Spikelot HGFLWS1	% Rec	QC Limits
Mercury	0.026	0.024	8.0	0-20	0.026	0.29	0.296	89.0	80-120

Associated samples MP40061: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40061 Methods: SW846 7471B
Matrix Type: SOLID Units: mg/kg

Prep Date: 12/20/21

Metal	FA91727-4 Original	MSD	Spikelot HGFLWS1	% Rec	MSD RPD	QC Limit
Mercury	0.026	0.33	0.331	92.0	12.9	20

Associated samples MP40061: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40061
Matrix Type: SOLID

Methods: SW846 7471B
Units: mg/kg

Prep Date: 12/20/21

Metal	BSP Result	Spikelot HGFLWS1	% Rec	QC Limits
Mercury	0.24	0.25	96.0	80-120

Associated samples MP40061: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40061
Matrix Type: SOLID

Methods: SW846 7471B
Units: ug/l

Prep Date: 12/20/21

Metal	FA91727-4 Original	SDL 1:5	%DIF	QC Limits
Mercury	0.240	0.00	100.0(a)	0-10

Associated samples MP40061: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40066
Matrix Type: AQUEOUS

Methods: SW846 7470A
Units: ug/l

Prep Date: 12/21/21

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.50	.03	.03	0.0053	<0.50

Associated samples MP40066: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40066
Matrix Type: AQUEOUS

Methods: SW846 7470A
Units: ug/l

Prep Date: 12/21/21 12/21/21

Metal	FA91824-1 Original	DUP	RPD	QC Limits	FA91824-1 Original	MS	Spikelot HGFLWS1	% Rec	QC Limits
Mercury	0.0	0.0	NC	0-20	0.0	2.7	3	90.0	80-120

Associated samples MP40066: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40066
Matrix Type: AQUEOUS

Methods: SW846 7470A
Units: ug/l

Prep Date: 12/21/21

Metal	FA91824-1 Original	MSD	Spikelot HGFLWS1	% Rec	MSD RPD	QC Limit
Mercury	0.0	2.7	3	90.0	0.0	20

Associated samples MP40066: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40066
Matrix Type: AQUEOUS

Methods: SW846 7470A
Units: ug/l

Prep Date: 12/21/21

Metal	BSP Result	Spikelot HGFLWS1	% Rec	QC Limits
Mercury	2.9	3	96.7	80-120

Associated samples MP40066: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40066
Matrix Type: AQUEOUS

Methods: SW846 7470A
Units: ug/l

Prep Date: 12/21/21

Metal	FA91824-1 Original	SDL 1:5	%DIF	QC Limits
Mercury	0.00	0.00	NC	0-10

Associated samples MP40066: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	14	14		
Antimony	6.0	1	1	0.30	<6.0
Arsenic	10	1.3	1.3	0.10	<10
Barium	200	1	1	0.10	<200
Beryllium	4.0	.2	.2	0.0	<4.0
Cadmium	5.0	.2	.2	-0.10	<5.0
Calcium	1000	50	50	15.1	<1000
Chromium	10	1	1	-0.20	<10
Cobalt	50	.2	.2		
Copper	25	1	1	1.0	<25
Iron	300	17	17		
Lead	5.0	1	1.1	1.1	<5.0
Magnesium	5000	35	35	1.7	<5000
Manganese	15	.5	1		
Molybdenum	50	.3	.3		
Nickel	40	.4	.4	0.20	<40
Potassium	10000	200	200		
Selenium	10	2.4	2.9	-0.10	<10
Silver	10	.7	.7	0.0	<10
Sodium	10000	500	500		
Strontium	10	.5	.5		
Thallium	10	1.1	1.4	-0.80	<10
Tin	50	.9	1		
Titanium	10	.5	1		
Vanadium	50	.5	.6		
Zinc	20	3	4.4	2.8	<20

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date:			12/29/21					12/29/21	
Metal	FA91807-5 Original	DUP	RPD	QC Limits	FA91807-5 Original	MS	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum									
Antimony	1.8	1.2	40.0 (a)	0-20	1.8	499	500	99.4	80-120
Arsenic	80.1	84.1	4.9	0-20	80.1	2050	2000	98.5	80-120
Barium	329	332	0.9	0-20	329	2380	2000	102.6	80-120
Beryllium	0.0	0.0	NC	0-20	0.0	52.9	50	105.8	80-120
Cadmium	0.0	0.0	NC	0-20	0.0	47.9	50	95.8	80-120
Calcium	154000	153000	0.7	0-20	154000	179000	25000	100.0	80-120
Chromium	1.7	1.5	12.5	0-20	1.7	203	200	100.7	80-120
Cobalt									
Copper	0.0	0.0	NC	0-20	0.0	266	250	106.4	80-120
Iron									
Lead	1.7	1.8	5.7	0-20	1.7	488	500	97.3	80-120
Magnesium	55300	55600	0.5	0-20	55300	80700	25000	101.6	80-120
Manganese									
Molybdenum									
Nickel	3.2	3.2	0.0	0-20	3.2	475	500	94.4	80-120
Potassium									
Selenium	0.0	0.0	NC	0-20	0.0	1860	2000	93.0	80-120
Silver	0.80	0.0	200.0(a)	0-20	0.80	51.3	50	101.0	80-120
Sodium									
Strontium									
Thallium	7.3	6.3	14.7	0-20	7.3	1970	2000	98.1	80-120
Tin									
Titanium									
Vanadium									
Zinc	12.3	12.1	1.6	0-20	12.3	491	500	95.7	80-120

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) RPD acceptable due to low duplicate and sample concentrations.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088 Methods: SW846 6010C
Matrix Type: AQUEOUS Units: ug/l

Prep Date: 12/29/21

Metal	FA91807-5 Original	MSD	Spikelot MPFLICP2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	1.8	508	500	101.2	1.8	20
Arsenic	80.1	2090	2000	100.5	1.9	20
Barium	329	2340	2000	100.6	1.7	20
Beryllium	0.0	52.6	50	105.2	0.6	20
Cadmium	0.0	49.0	50	98.0	2.3	20
Calcium	154000	173000	25000	76.0 (a)	3.4	20
Chromium	1.7	203	200	100.7	0.0	20
Cobalt						
Copper	0.0	264	250	105.6	0.8	20
Iron						
Lead	1.7	497	500	99.1	1.8	20
Magnesium	55300	77900	25000	90.4	3.5	20
Manganese						
Molybdenum						
Nickel	3.2	483	500	96.0	1.7	20
Potassium						
Selenium	0.0	1900	2000	95.0	2.1	20
Silver	0.80	50.9	50	100.2	0.8	20
Sodium						
Strontium						
Thallium	7.3	2010	2000	100.1	2.0	20
Tin						
Titanium						
Vanadium						
Zinc	12.3	500	500	97.5	1.8	20

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	BSP Result	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum				
Antimony	492	500	98.4	80-120
Arsenic	1950	2000	97.5	80-120
Barium	2000	2000	100.0	80-120
Beryllium	51.2	50	102.4	80-120
Cadmium	49.6	50	99.2	80-120
Calcium	25800	25000	103.2	80-120
Chromium	201	200	100.5	80-120
Cobalt				
Copper	252	250	100.8	80-120
Iron				
Lead	484	500	96.8	80-120
Magnesium	25400	25000	101.6	80-120
Manganese				
Molybdenum				
Nickel	495	500	99.0	80-120
Potassium				
Selenium	1860	2000	93.0	80-120
Silver	48.3	50	96.6	80-120
Sodium				
Strontium				
Thallium	1970	2000	98.5	80-120
Tin				
Titanium				
Vanadium				
Zinc	498	500	99.6	80-120

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	FA91807-5 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	1.80	0.00	100.0(a)	0-10
Arsenic	80.1	83.2	3.9	0-10
Barium	329	336	2.2	0-10
Beryllium	0.00	0.00	NC	0-10
Cadmium	0.00	0.00	NC	0-10
Calcium	154000	160000	3.8	0-10
Chromium	1.70	0.00	100.0(a)	0-10
Cobalt				
Copper	0.00	0.00	NC	0-10
Iron				
Lead	1.70	9.50	458.8(a)	0-10
Magnesium	55300	57500	4.0	0-10
Manganese				
Molybdenum				
Nickel	3.20	4.70	46.9 (a)	0-10
Potassium				
Selenium	0.00	0.00	NC	0-10
Silver	0.800	0.00	100.0(a)	0-10
Sodium				
Strontium				
Thallium	7.30	9.60	31.5 (a)	0-10
Tin				
Titanium				
Vanadium				
Zinc	12.3	0.00	100.0(a)	0-10

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

POST DIGESTATE SPIKE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40088
Matrix Type: AQUEOUS

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	Sample ml	Final ml	FA91807-5 Raw	Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony	9.8	10	1.8	1.764	103.4	0.2	5	100	101.6	80-120
Arsenic	9.8	10	80.1	78.498	176.8	0.2	5	100	98.3	80-120
Barium	9.8	10	329.1	322.518	559.5	0.2	12.5	250	94.8	80-120
Beryllium	9.8	10			51.5	0.2	2.5	50	103.0	80-120
Cadmium	9.8	10			48.9	0.2	2.5	50	97.8	80-120
Calcium	9.8	10	154000	150920	151200	0.2	250	5000	5.6* (a)	80-120
Chromium	9.8	10	1.7	1.666	51.2	0.2	2.5	50	99.1	80-120
Cobalt										
Copper	9.8	10			102.1	0.2	5	100	102.1	80-120
Iron										
Lead	9.8	10	1.7	1.666	50.4	0.2	2.5	50	97.5	80-120
Magnesium	9.8	10	55300	54194	57730	0.2	250	5000	70.7*(a)	80-120
Manganese										
Molybdenum										
Nickel	9.8	10	3.2	3.136	98.3	0.2	5	100	95.2	80-120
Potassium										
Selenium	9.8	10			94.6	0.2	5	100	94.6	80-120
Silver	9.8	10	.8	.784	49.6	0.2	2.5	50	97.6	80-120
Sodium										
Strontium										
Thallium	9.8	10	7.3	7.154	103.2	0.2	5	100	96.0	80-120
Tin										
Titanium										
Vanadium										
Zinc	9.8	10	12.3	12.054	252.5	0.2	12.5	250	96.2	80-120

Associated samples MP40088: FA91824-1, FA91824-2, FA91824-3, FA91824-4, FA91824-5, FA91824-6, FA91824-7, FA91824-8, FA91824-9, FA91824-10

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(**) Corr. sample result = Raw * (sample volume / final volume)
(anr) Analyte not requested
(a) Spike recovery indicates matrix interference and/or outside control limits due to high level in sample relative to spike amount.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/29/21

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.7	1.8		
Antimony	1.0	.05	.065	0.055	<1.0
Arsenic	0.50	.065	.1	0.0	<0.50
Barium	10	.05	.05	0.010	<10
Beryllium	0.25	.01	.025	-0.0050	<0.25
Cadmium	0.20	.01	.025	-0.0050	<0.20
Calcium	250	2.5	2.5		
Chromium	0.50	.05	.05	0.040	<0.50
Cobalt	2.5	.01	.025		
Copper	1.3	.05	.05	0.030	<1.3
Iron	15	.85	.85		
Lead	1.0	.05	.05	0.0050	<1.0
Magnesium	250	1.8	1.8		
Manganese	0.75	.025	.025		
Molybdenum	2.5	.015	.025		
Nickel	2.0	.02	.025	0.030	<2.0
Potassium	500	10	10		
Selenium	1.0	.12	.12	0.045	<1.0
Silver	0.50	.035	.041	-0.015	<0.50
Sodium	500	25	25		
Strontium	0.50	.025	.025		
Thallium	0.50	.055	.055	-0.050	<0.50
Tin	2.5	.045	.045		
Titanium	0.50	.025	.025		
Vanadium	2.5	.025	.025		
Zinc	1.0	.15	.15	0.16	<1.0

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:			12/29/21					12/29/21	
Metal	FA91926-1 Original	DUP	RPD	QC Limits	FA91926-1 Original	MS	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum									
Antimony	0.12	0.0	200.0(a)	0-20	0.12	15.0	27.3	54.5N(b)	80-120
Arsenic	0.57	0.57	0.0	0-20	0.57	97.5	109	88.8	80-120
Barium	19.0	19.3	1.6	0-20	19.0	122	109	94.3	80-120
Beryllium	0.052	0.049	5.9	0-20	0.052	2.6	2.73	93.4	80-120
Cadmium	0.026	0.022	16.7	0-20	0.026	2.5	2.73	90.6	80-120
Calcium									
Chromium	4.6	4.6	0.0	0-20	4.6	15.3	10.9	98.0	80-120
Cobalt									
Copper	2.0	2.2	9.5	0-20	2.0	15.4	13.6	98.2	80-120
Iron									
Lead	7.6	7.8	2.6	0-20	7.6	34.1	27.3	97.1	80-120
Magnesium									
Manganese									
Molybdenum									
Nickel	1.4	1.4	0.0	0-20	1.4	26.4	27.3	91.6	80-120
Potassium									
Selenium	0.21	0.15	33.3 (a)	0-20	0.21	92.3	109	84.4	80-120
Silver	0.0	0.0	NC	0-20	0.0	2.5	2.73	91.6	80-120
Sodium									
Strontium									
Thallium	0.0	0.0	NC	0-20	0.0	104	109	95.3	80-120
Tin									
Titanium									
Vanadium									
Zinc	10.4	11.2	7.4	0-20	10.4	36.8	27.3	96.7	80-120

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) RPD acceptable due to low duplicate and sample concentrations.
(b) Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/29/21

Metal	FA91926-1 Original	MSD	Spikelot MPFLICP2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.12	14.4	27	52.8N(a)	4.1	20
Arsenic	0.57	95.6	108	87.9	2.0	20
Barium	19.0	122	108	95.3	0.0	20
Beryllium	0.052	2.6	2.7	94.3	0.0	20
Cadmium	0.026	2.4	2.7	87.8	4.1	20
Calcium						
Chromium	4.6	15.3	10.8	99.0	0.0	20
Cobalt						
Copper	2.0	15.2	13.5	97.7	1.3	20
Iron						
Lead	7.6	33.7	27	96.6	1.2	20
Magnesium						
Manganese						
Molybdenum						
Nickel	1.4	25.6	27	89.5	3.1	20
Potassium						
Selenium	0.21	90.9	108	83.9	1.5	20
Silver	0.0	2.5	2.7	92.5	0.0	20
Sodium						
Strontium						
Thallium	0.0	102	108	94.3	1.9	20
Tin						
Titanium						
Vanadium						
Zinc	10.4	36.1	27	95.1	1.9	20

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/29/21

Metal	BSP Result	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum				
Antimony	23.8	25	95.2	80-120
Arsenic	97.0	100	97.0	80-120
Barium	99.8	100	99.8	80-120
Beryllium	2.5	2.5	100.0	80-120
Cadmium	2.4	2.5	96.0	80-120
Calcium				
Chromium	10.1	10	101.0	80-120
Cobalt				
Copper	12.4	12.5	99.2	80-120
Iron				
Lead	23.7	25	94.8	80-120
Magnesium				
Manganese				
Molybdenum				
Nickel	24.7	25	98.8	80-120
Potassium				
Selenium	91.8	100	91.8	80-120
Silver	2.4	2.5	96.0	80-120
Sodium				
Strontium				
Thallium	95.8	100	95.8	80-120
Tin				
Titanium				
Vanadium				
Zinc	24.6	25	98.4	80-120

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	FA91926-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	2.30	0.00	100.0(a)	0-10
Arsenic	10.9	13.0	19.3 (a)	0-10
Barium	366	447	22.2*(b)	0-10
Beryllium	1.00	1.10	10.0	0-10
Cadmium	0.500	0.00	100.0(a)	0-10
Calcium				
Chromium	87.8	107	21.3*(b)	0-10
Cobalt				
Copper	38.0	45.7	20.3 (a)	0-10
Iron				
Lead	147	168	14.6*(b)	0-10
Magnesium				
Manganese				
Molybdenum				
Nickel	27.3	34.6	26.7*(b)	0-10
Potassium				
Selenium	4.00	0.00	100.0(a)	0-10
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Vanadium				
Zinc	201	329	64.0*(b)	0-10

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
(b) Serial dilution indicates possible matrix interference.

POST DIGESTATE SPIKE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40090
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	Sample ml	Final ml	FA91926-1 Raw	FA91926-1 Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony	9.8	10	2.3	2.254	90.4	0.2	5	100	88.1	80-120
Arsenic	9.8	10	10.9	10.682	99.3	0.2	5	100	88.6	80-120
Barium	9.8	10	365.9	358.582	584.4	0.2	12.5	250	90.3	80-120
Beryllium	9.8	10	1	.98	47	0.2	2.5	50	92.0	80-120
Cadmium	9.8	10	.5	.49	45.7	0.2	2.5	50	90.4	80-120
Calcium										
Chromium	9.8	10	87.8	86.044	133.1	0.2	2.5	50	94.1	80-120
Cobalt										
Copper	9.8	10	38	37.24	130	0.2	5	100	92.8	80-120
Iron										
Lead	9.8	10	146.8	143.864	193.6	0.2	2.5	50	99.5	80-120
Magnesium										
Manganese										
Molybdenum										
Nickel	9.8	10	27.3	26.754	116.6	0.2	5	100	89.8	80-120
Potassium										
Selenium	9.8	10	4	3.92	83.6	0.2	5	100	79.7*(a)	80-120
Silver	9.8	10			45.3	0.2	2.5	50	90.6	80-120
Sodium										
Strontium										
Thallium	9.8	10			93.1	0.2	5	100	93.1	80-120
Tin										
Titanium										
Vanadium										
Zinc	9.8	10	200.7	196.686	402.4	0.2	12.5	250	82.3	80-120

Associated samples MP40090: FA91824-11, FA91824-12, FA91824-13

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(**) Corr. sample result = Raw * (sample volume / final volume)
(anr) Analyte not requested
(a) Spike recovery indicates matrix interference and/or outside control limits due to high level in sample relative to spike amount.

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/29/21

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.7	1.8		
Antimony	1.0	.05	.065	0.070	<1.0
Arsenic	0.50	.065	.1	-0.015	<0.50
Barium	10	.05	.05	0.14	<10
Beryllium	0.25	.01	.025	0.0	<0.25
Cadmium	0.20	.01	.025	-0.015	<0.20
Calcium	250	2.5	2.5		
Chromium	0.50	.05	.05	0.25	<0.50
Cobalt	2.5	.01	.025		
Copper	1.3	.05	.05	0.090	<1.3
Iron	15	.85	.85		
Lead	1.0	.05	.05	0.25	<1.0
Magnesium	250	1.8	1.8		
Manganese	0.75	.025	.025		
Molybdenum	2.5	.015	.025		
Nickel	2.0	.02	.025	0.14	<2.0
Potassium	500	10	10		
Selenium	1.0	.12	.12	0.12	<1.0
Silver	0.50	.035	.041	-0.010	<0.50
Sodium	500	25	25		
Strontium	0.50	.025	.025		
Thallium	0.50	.055	.055	-0.075	<0.50
Tin	2.5	.045	.045		
Titanium	0.50	.025	.025		
Vanadium	2.5	.025	.025		
Zinc	1.0	.15	.15	-0.0050	<1.0

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date:			12/29/21					12/29/21	
Metal	FA91965-1 Original	DUP	RPD	QC Limits	FA91965-1 Original	MS	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum									
Antimony	0.0	0.0	NC	0-20	0.0	16.7	24.6	67.9N(b)	80-120
Arsenic	0.16	0.13	20.7 (a)	0-20	0.16	88.5	98.4	89.8	80-120
Barium	2.3	2.3	0.0	0-20	2.3	99.7	98.4	99.0	80-120
Beryllium	0.030	0.026	14.3	0-20	0.030	2.5	2.46	100.4	80-120
Cadmium	0.0	0.0	NC	0-20	0.0	2.3	2.46	93.5	80-120
Calcium									
Chromium	1.7	1.7	0.0	0-20	1.7	11.6	9.84	100.6	80-120
Cobalt									
Copper	0.34	0.39	13.7	0-20	0.34	12.7	12.3	100.5	80-120
Iron									
Lead	1.3	1.3	0.0	0-20	1.3	24.8	24.6	95.5	80-120
Magnesium									
Manganese									
Molybdenum									
Nickel	0.48	0.49	2.1	0-20	0.48	24.0	24.6	95.6	80-120
Potassium									
Selenium	0.0	0.0	NC	0-20	0.0	86.0	98.4	87.4	80-120
Silver	0.0	0.0	NC	0-20	0.0	2.3	2.46	93.5	80-120
Sodium									
Strontium									
Thallium	0.0	0.0	NC	0-20	0.0	94.7	98.4	96.2	80-120
Tin									
Titanium									
Vanadium									
Zinc	1.8	1.7	5.7	0-20	1.8	26.3	24.6	99.6	80-120

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) RPD acceptable due to low duplicate and sample concentrations.
(b) Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091 Methods: SW846 6010C
Matrix Type: SOLID Units: mg/kg

Prep Date: 12/29/21

Metal	FA91965-1 Original	MSD	Spikelot MPFLICP2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony	0.0	18.0	26	69.1N(a)	7.5	20
Arsenic	0.16	93.5	104	89.6	5.5	20
Barium	2.3	104	104	97.6	4.2	20
Beryllium	0.030	2.6	2.6	98.7	3.9	20
Cadmium	0.0	2.5	2.6	96.0	8.3	20
Calcium						
Chromium	1.7	12.2	10.4	100.8	5.0	20
Cobalt						
Copper	0.34	13.3	13	99.5	4.6	20
Iron						
Lead	1.3	26.0	26	94.8	4.7	20
Magnesium						
Manganese						
Molybdenum						
Nickel	0.48	25.2	26	94.9	4.9	20
Potassium						
Selenium	0.0	90.4	104	86.8	5.0	20
Silver	0.0	2.4	2.6	92.1	4.3	20
Sodium						
Strontium						
Thallium	0.0	99.3	104	95.3	4.7	20
Tin						
Titanium						
Vanadium						
Zinc	1.8	26.7	26	95.6	1.5	20

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference and/or sample non-homogeneity.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091
Matrix Type: SOLID

Methods: SW846 6010C
Units: mg/kg

Prep Date: 12/29/21

Metal	BSP Result	Spikelot MPFLICP2	% Rec	QC Limits
Aluminum				
Antimony	24.5	25	98.0	80-120
Arsenic	98.5	100	98.5	80-120
Barium	102	100	102.0	80-120
Beryllium	2.6	2.5	104.0	80-120
Cadmium	2.5	2.5	100.0	80-120
Calcium				
Chromium	10.3	10	103.0	80-120
Cobalt				
Copper	12.8	12.5	102.4	80-120
Iron				
Lead	24.3	25	97.2	80-120
Magnesium				
Manganese				
Molybdenum				
Nickel	25.0	25	100.0	80-120
Potassium				
Selenium	93.5	100	93.5	80-120
Silver	2.4	2.5	96.0	80-120
Sodium				
Strontium				
Thallium	98.9	100	98.9	80-120
Tin				
Titanium				
Vanadium				
Zinc	25.2	25	100.8	80-120

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	FA91965-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony	0.00	0.00	NC	0-10
Arsenic	3.20	0.00	100.0(a)	0-10
Barium	46.1	46.2	0.2	0-10
Beryllium	0.600	0.00	100.0(a)	0-10
Cadmium	0.00	0.00	NC	0-10
Calcium				
Chromium	33.8	33.1	2.1	0-10
Cobalt				
Copper	6.90	6.40	7.2	0-10
Iron				
Lead	26.1	24.2	7.3	0-10
Magnesium				
Manganese				
Molybdenum				
Nickel	9.70	9.50	2.1	0-10
Potassium				
Selenium	0.00	0.00	NC	0-10
Silver	0.00	0.00	NC	0-10
Sodium				
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Vanadium				
Zinc	35.6	126	255.1(a)	0-10

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

POST DIGESTATE SPIKE SUMMARY

Login Number: FA91824
Account: HGLFLMI - Hydrogeologic, Inc.
Project: TQN 118 NASA PRLs; KSC, FL

QC Batch ID: MP40091
Matrix Type: SOLID

Methods: SW846 6010C
Units: ug/l

Prep Date: 12/29/21

Metal	Sample ml	Final ml	FA91965-1 Raw	Corr.**	PS ug/l	Spike ml	Spike ug/ml	Spike ug/l	% Rec	QC Limits
Aluminum										
Antimony	9.8	10			91.1	0.2	5	100	91.1	80-120
Arsenic	9.8	10	3.2	3.136	92.5	0.2	5	100	89.4	80-120
Barium	9.8	10	46.1	45.178	276	0.2	12.5	250	92.3	80-120
Beryllium	9.8	10	.6	.588	48.4	0.2	2.5	50	95.6	80-120
Cadmium	9.8	10			46.3	0.2	2.5	50	92.6	80-120
Calcium										
Chromium	9.8	10	33.8	33.124	81.5	0.2	2.5	50	96.8	80-120
Cobalt										
Copper	9.8	10	6.9	6.762	102.4	0.2	5	100	95.6	80-120
Iron										
Lead	9.8	10	26.1	25.578	71.5	0.2	2.5	50	91.8	80-120
Magnesium										
Manganese										
Molybdenum										
Nickel	9.8	10	9.7	9.506	101.2	0.2	5	100	91.7	80-120
Potassium										
Selenium	9.8	10			83.4	0.2	5	100	83.4	80-120
Silver	9.8	10			44.9	0.2	2.5	50	89.8	80-120
Sodium										
Strontium										
Thallium	9.8	10			91.8	0.2	5	100	91.8	80-120
Tin										
Titanium										
Vanadium										
Zinc	9.8	10	35.6	34.888	247.7	0.2	12.5	250	85.1	80-120

Associated samples MP40091: FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(**) Corr. sample result = Raw * (sample volume / final volume)
(anr) Analyte not requested

Misc. Forms

Custody Documents and Other Forms

(SGS Dayton, NJ)

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5.x Limits

SO

CHAIN OF CUSTODY

SGS North America Inc. - Orlando
4405 Vineland Road, Suite C-15 Orlando, Fl 32811
TEL. 407-425-6700 FAX: 407-425-0707
www.sgs.com/ehsusa

FED-EX Tracking # 7081 4514 4668 | Bottle Order Control #
SGS Quote # | SGS Job # FA91824

Client / Reporting Information	Project Information	Requested Analysis (see TEST CODE sheet)	Matrix Codes
Company Name: SGS North America Inc.	Project Name: TQN 118 NASA PRLs; KSC, FL		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL- Sludge SED-Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB- Rinse Blank TB-Trip Blank
Street Address: 4405 Vineland Rd, Suite C-15	Street	Billing Information (if different from Report to)	
City: Orlando State: FL Zip: 32811	City State	Company Name	
Project Contact: jean.dent-smith@sgs.com E-mail	Project #	Street Address	
Phone #: 407-425-6700 Fax #	Client Purchase Order #	City State Zip	
Sampler(s) Name(s): RLHF Phone	Project Manager	Attention:	

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved Bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	TOCSVB46	LAB USE ONLY
11	UNOA-SD0007-000.5-20211216		12/16/21	10:45:00 AM	RLHF	SO	1					X				X	
12	UNOA-SD0008-000.5-20211216		12/16/21	11:10:00 AM	RLHF	SO	1					X				X	
13	UNOA-SD0009-000.5-20211216		12/16/21	11:40:00 AM	RLHF	SO	1					X				X	
14	UNOA-SD0010-000.5-20211216		12/16/21	12:05:00 PM	RLHF	SO	1					X				X	
15	UNOA-SD0011-000.5-20211216		12/16/21	12:25:00 PM	RLHF	SO	1					X				X	
16	UNOA-SD0012-000.5-20211216		12/16/21	1:05:00 PM	RLHF	SO	1					X				X	
17	UNOA-SD0013-000.5-20211216		12/16/21	1:30:00 PM	RLHF	SO	1					X				X	
18	UNOA-SD0014-000.5-20211216		12/16/21	1:55:00 PM	RLHF	SO	1					X				X	
19	UNOA-SD0015-000.5-20211216		12/16/21	2:20:00 PM	RLHF	SO	1					X				X	
20	UNOA-SD0016-000.5-20211216		12/16/21	2:40:00 PM	RLHF	SO	1					X				X	

Turnaround Time (Business days)

Approved By (SGS PM): / Date:

- [ ] Standard 10 Day (business)
- [ ] 5 Business Days RUSH
- [ ] 3 Business Days RUSH
- [ ] 2 Business Days RUSH
- [ ] 1 Business Day EMERGENCY
- [x] other 14

Emergency & Rush T/A data available via Lablink Approval needed for RUSH/Emergency TAT

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] REDT1 (Level 3)
- [ ] FULT1 (Level 4)
- [ ] Commercial "C"
- [ ] State Forms
- [ ] EDD Format
- [ ] Other
- [x] QC

Commercial "A" = Results Only
Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

Please ship samples to SGS Dayton. Thank you.

Initial Assessment 1524

Label Verification

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		1 Fedex	2 Fedex	12/17/21 1202pm	2 Jeemit Patel
3		3	4		4
5		5	Custody Seal # ☐ Intact ☐ Not intact	Preserved where applicable ☐ Therm. ID	On Ice ☑ Cooler Temp. 3.7 4

SGS Sample Receipt Summary

Job Number: FA91824 **Client:** _____ **Project:** _____

Date / Time Received: 12/22/2021 12:00:00 PM **Delivery Method:** _____ **Airbill #'s:** _____

Cooler Temps (Raw Measured) °C: Cooler 1: (3.7);

Cooler Temps (Corrected) °C: Cooler 1: (2.3);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	1	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☐	☐	☑
2. Trip Blank listed on COC:	☐	☐	☑
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☑	☐
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

Test Strip Lot #s: pH 1-12: 231619 pH 12+: 203117A Other: (Specify) _____ _____

Comments

SM089-03
Rev. Date 12/7/17

10.1 10

FA91824: Chain of Custody
Page 2 of 2

QC Evaluation: DOD QSM5.x Limits

Job Number: FA91824
Account: SGS Orlando, FL
Project: HGLFLMI: TQN 118 NASA PRLs; KSC, FL
Collected: 12/16/21

QC Sample ID	CAS#	Analyte	Sample Type	Result Type	Result	Units	Limits

No DOD QSM5.x Limits Found.

* Sample used for QC is not from job FA91824

General Chemistry

QC Data Summaries

(SGS Dayton, NJ)

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: FA91824
Account: ALSE - SGS Orlando, FL
Project: HGLFLMI: TQN 118 NASA PRLs; KSC, FL

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Total Organic Carbon	GP37806/GN25348	1000	0.00	mg/kg	20000	20900	104.5	80-120%

Associated Samples:
Batch GP37806: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20
(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: FA91824
Account: ALSE - SGS Orlando, FL
Project: HGLFLMI: TQN 118 NASA PRLs; KSC, FL

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Total Organic Carbon	GP37806/GN25348	FA91824-20	mg/kg	142000	159000	306000	103.0	10-113%

Associated Samples:
Batch GP37806: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: FA91824
Account: ALSE - SGS Orlando, FL
Project: HGLFLMI: TQN 118 NASA PRLs; KSC, FL

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Total Organic Carbon	GP37806/GN25348	FA91824-20	mg/kg	142000	157000	288000	6.1	31%

Associated Samples:
Batch GP37806: FA91824-11, FA91824-12, FA91824-13, FA91824-14, FA91824-15, FA91824-16, FA91824-17, FA91824-18, FA91824-19, FA91824-20
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits

APPENDIX C

SLERA OUTPUTS

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Brevard County, Florida

Local office

North Florida Ecological Services Field Office

(904) 731-3336
(904) 731-3045

7915 Baymeadows Way, Suite 200
Jacksonville, FL 32256-7517

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

Southeastern Beach Mouse Peromyscus polionotus niveiventris — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/3951

West Indian Manatee Trichechus manatus — Threatened
Wherever found — Marine mammal
There is **final** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/4469

Birds

NAME	STATUS

Eastern Black Rail Laterallus jamaicensis ssp. jamaicensis — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/10477

Florida Scrub-jay Aphelocoma coerulescens — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/6174

Red Knot Calidris canutus rufa — Threatened
Wherever found
There is **proposed** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/1864

Wood Stork Mycteria americana — Threatened
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/8477

Reptiles

NAME	STATUS

Atlantic Salt Marsh Snake Nerodia clarkii taeniata — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/7729

Eastern Indigo Snake Drymarchon corais couperi — Threatened
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/646

Gopher Tortoise Gopherus polyphemus — Candidate
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/6994

Green Sea Turtle Chelonia mydas — Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/6199

Hawksbill Sea Turtle Eretmochelys imbricata — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/3656

Leatherback Sea Turtle Dermochelys coriacea — Endangered
Wherever found
There is **final** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/1493

Loggerhead Sea Turtle Caretta caretta — Threatened
There is **final** critical habitat for this species. The location of the critical habitat is not available.
http://ecos.fws.gov/ecp/species/1110

Insects

NAME	STATUS

Monarch Butterfly Danaus plexippus — Candidate
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/9743

Flowering Plants

NAME	STATUS

Carter's Mustard Warea carteri — Endangered
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/5583

Lewton's Polygala Polygala lewtonii — Endangered
Wherever found
No critical habitat has been designated for this species.
http://ecos.fws.gov/ecp/species/6688

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

American Kestrel Falco sparverius paulus — Breeds Apr 1 to Aug 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
http://ecos.fws.gov/ecp/species/9587

Bald Eagle Haliaeetus leucocephalus — Breeds Sep 1 to Jul 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
http://ecos.fws.gov/ecp/species/1626

Black Skimmer Rynchops niger — Breeds May 20 to Sep 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/5234

Great Blue Heron Ardea herodias occidentalis — Breeds Jan 1 to Dec 31
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Gull-billed Tern Gelochelidon nilotica — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/9501

King Rail Rallus elegans — Breeds May 1 to Sep 5
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
http://ecos.fws.gov/ecp/species/8936

Lesser Yellowlegs Tringa flavipes This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Magnificent Frigatebird Fregata magnificens This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds Oct 1 to Apr 30
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Reddish Egret Egretta rufescens This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/7617	Breeds Mar 1 to Sep 15
Ruddy Turnstone Arenaria interpres morinella This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher Limnodromus griseus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/9480	Breeds elsewhere
Swallow-tailed Kite Elanoides forficatus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. http://ecos.fws.gov/ecp/species/8938	Breeds Mar 10 to Jun 30
Willet Tringa semipalmata This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

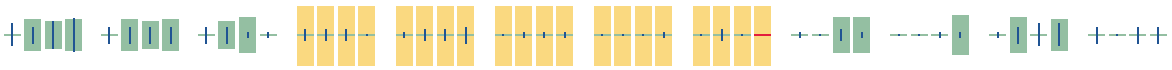
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

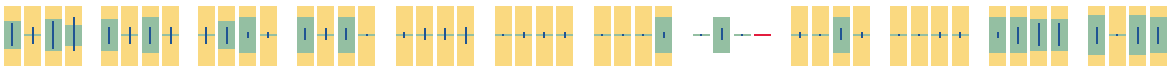
probability of presence | breeding season | survey effort | no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

American Kestrel BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



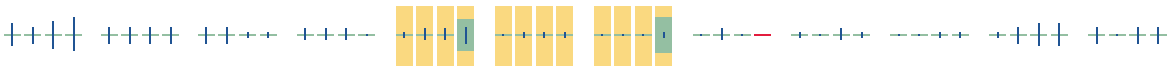
Bald Eagle Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



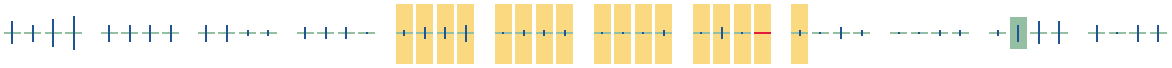
Black Skimmer BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Great Blue Heron BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Gull-billed Tern BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

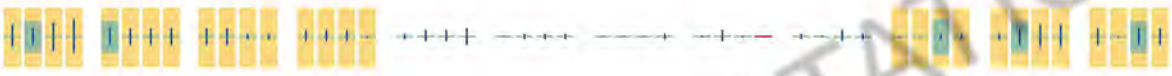


King Rail BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

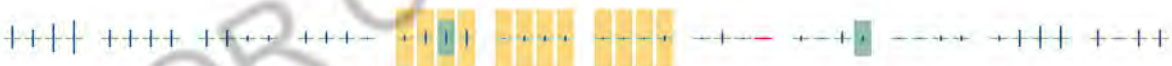


Lesser Yellowlegs BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

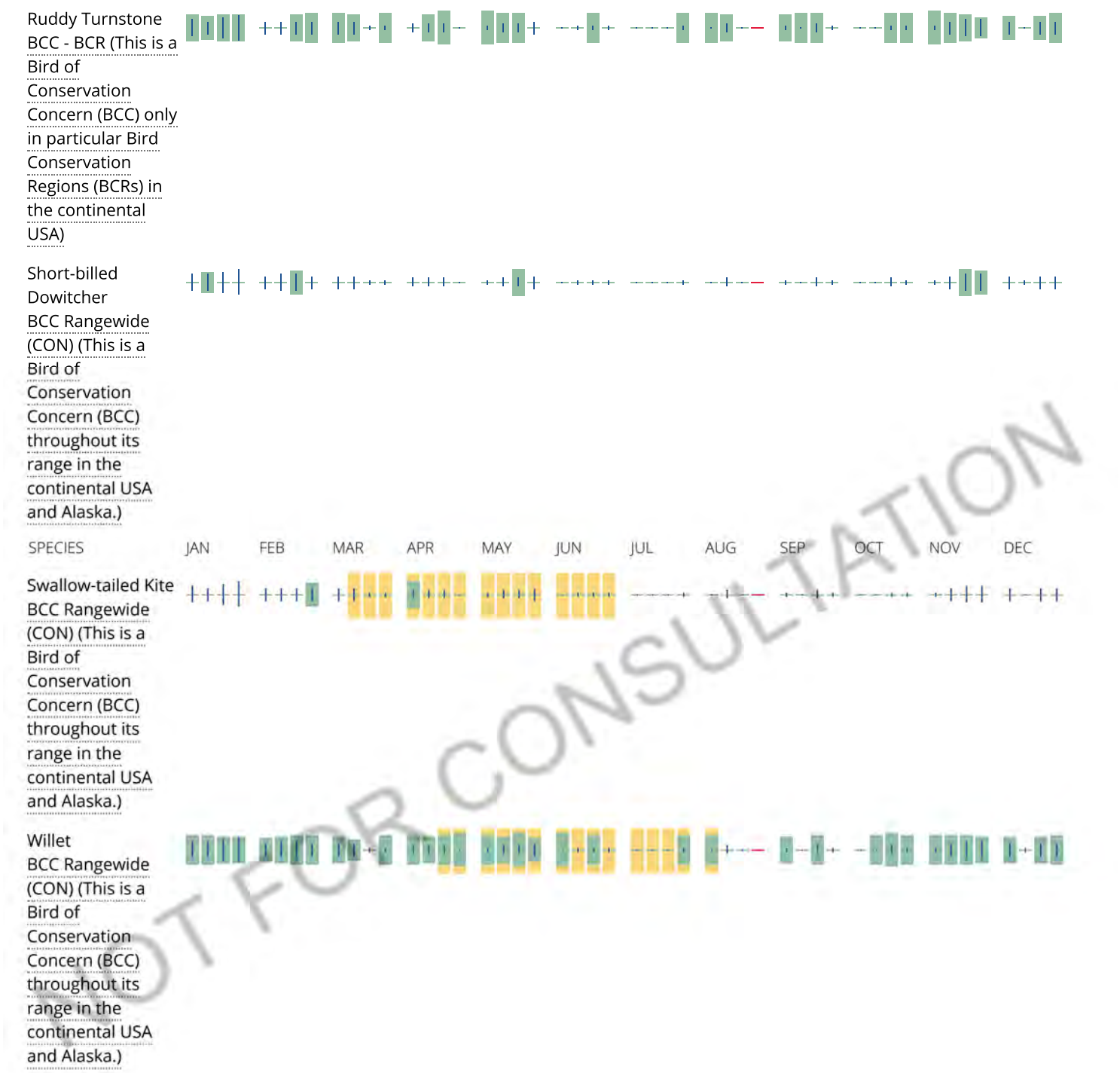
Magnificent Frigatebird BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)



Prairie Warbler BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Reddish Egret BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. *offshore energy development or longline fishing*).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Marine mammals

Marine mammals are protected under the Marine Mammal Protection Act. Some are also protected under the Endangered Species Act[1] and the Convention on International Trade in Endangered Species of Wild Fauna and Flora[2].

The responsibilities for the protection, conservation, and management of marine mammals are shared by the U.S. Fish and Wildlife Service [responsible for otters, walruses, polar bears, manatees, and dugongs] and NOAA Fisheries[3] [responsible for seals, sea lions, whales, dolphins, and porpoises]. Marine mammals under the responsibility of NOAA Fisheries are **not** shown on this list; for additional information on those species please visit the Marine Mammals page of the NOAA Fisheries website.

The Marine Mammal Protection Act prohibits the take (to harass, hunt, capture, kill, or attempt to harass, hunt, capture or kill) of marine mammals and further coordination may be necessary for project evaluation. Please contact the U.S. Fish and Wildlife Service Field Office shown.

1. The Endangered Species Act (ESA) of 1973.
2. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a treaty to ensure that international trade in plants and animals does not threaten their survival in the wild.
3. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following marine mammals under the responsibility of the U.S. Fish and Wildlife Service are potentially affected by activities in this location:

NAME

West Indian Manatee *Trichechus manatus*
http://ecos.fws.gov/ecp/species/4469

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

This location overlaps the following National Wildlife Refuge lands:

LAND	ACRES

MERRITT ISLAND NATIONAL WILDLIFE REFUGE 129,277.02 acres

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal,

state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.15/10/2022 12:08:33 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BENZO(B)FLUORANTHENE

General Statistics

Total Number of Observations	10	Number of Distinct Observations	7
Number of Detects	6	Number of Non-Detects	4
Number of Distinct Detects	6	Number of Distinct Non-Detects	1
Minimum Detect	0.034	Minimum Non-Detect	0.08
Maximum Detect	0.34	Maximum Non-Detect	0.08
Variance Detects	0.014	Percent Non-Detects	40%
Mean Detects	0.119	SD Detects	0.119
Median Detects	0.07	CV Detects	1
Skewness Detects	1.698	Kurtosis Detects	2.726
Mean of Logged Detects	-2.502	SD of Logged Detects	0.914

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.787	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.255	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Detected Data appear Normal at 5% Significance Level

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

KM Mean	0.087	KM Standard Error of Mean	0.0321
KM SD	0.0924	95% KM (BCA) UCL	0.147
95% KM (t) UCL	0.146	95% KM (Percentile Bootstrap) UCL	0.14
95% KM (z) UCL	0.14	95% KM Bootstrap t UCL	0.304
90% KM Chebyshev UCL	0.183	95% KM Chebyshev UCL	0.227
97.5% KM Chebyshev UCL	0.287	99% KM Chebyshev UCL	0.406

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.413	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.708	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.249	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.337	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.499	k star (bias corrected MLE)	0.861
Theta hat (MLE)	0.079	Theta star (bias corrected MLE)	0.138
nu hat (MLE)	17.99	nu star (bias corrected)	10.33
Mean (detects)	0.119		

52	**Gamma ROS Statistics using Imputed Non-Detects**											
53	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
54	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
55	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
56	This is especially true when the sample size is small.											
57	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
58					Minimum	0.01				Mean	0.0852	
59					Maximum	0.34				Median	0.045	
60					SD	0.0998				CV	1.172	
61					k hat (MLE)	1.12				k star (bias corrected MLE)	0.85	
62					Theta hat (MLE)	0.0761				Theta star (bias corrected MLE)	0.1	
63					nu hat (MLE)	22.39				nu star (bias corrected)	17.01	
64					Adjusted Level of Significance (β)	0.0267						
65					Approximate Chi Square Value (17.01, α)	8.679				Adjusted Chi Square Value (17.01, β)	7.666	
66					95% Gamma Approximate UCL (use when n>=50)	0.167				95% Gamma Adjusted UCL (use when n<50)	0.189	
67												
68	**Estimates of Gamma Parameters using KM Estimates**											
69					Mean (KM)	0.087				SD (KM)	0.0924	
70					Variance (KM)	0.00853				SE of Mean (KM)	0.0321	
71					k hat (KM)	0.887				k star (KM)	0.687	
72					nu hat (KM)	17.73				nu star (KM)	13.75	
73					theta hat (KM)	0.0981				theta star (KM)	0.127	
74					80% gamma percentile (KM)	0.143				90% gamma percentile (KM)	0.219	
75					95% gamma percentile (KM)	0.298				99% gamma percentile (KM)	0.486	
76												
77	**Gamma Kaplan-Meier (KM) Statistics**											
78					Approximate Chi Square Value (13.75, α)	6.398				Adjusted Chi Square Value (13.75, β)	5.551	
79					95% Gamma Approximate KM-UCL (use when n>=50)	0.187				95% Gamma Adjusted KM-UCL (use when n<50)	0.215	
80												
81	**Lognormal GOF Test on Detected Observations Only**											
82					Shapiro Wilk Test Statistic	0.909				**Shapiro Wilk GOF Test**		
83					5% Shapiro Wilk Critical Value	0.788				Detected Data appear Lognormal at 5% Significance Level		
84					Lilliefors Test Statistic	0.221				**Lilliefors GOF Test**		
85					5% Lilliefors Critical Value	0.325				Detected Data appear Lognormal at 5% Significance Level		
86	**Detected Data appear Lognormal at 5% Significance Level**											
87												

	A	B	C	D	E	F	G	H	I	J	K	L
88	**Lognormal ROS Statistics Using Imputed Non-Detects**											
89					Mean in Original Scale	0.0885				Mean in Log Scale		-2.793
90					SD in Original Scale	0.0972				SD in Log Scale		0.831
91				95% t UCL (assumes normality of ROS data)		0.145				95% Percentile Bootstrap UCL		0.138
92					95% BCA Bootstrap UCL	0.171				95% Bootstrap t UCL		0.277
93					95% H-UCL (Log ROS)	0.186						
94												
95	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
96					KM Mean (logged)	-2.797				KM Geo Mean		0.061
97					KM SD (logged)	0.746				95% Critical H Value (KM-Log)		2.612
98				KM Standard Error of Mean (logged)		0.263				95% H-UCL (KM -Log)		0.154
99					KM SD (logged)	0.746				95% Critical H Value (KM-Log)		2.612
100				KM Standard Error of Mean (logged)		0.263						
101												
102	**DL/2 Statistics**											
103	**DL/2 Normal**						**DL/2 Log-Transformed**					
104					Mean in Original Scale	0.0871				Mean in Log Scale		-2.789
105					SD in Original Scale	0.0972				SD in Log Scale		0.775
106				95% t UCL (Assumes normality)		0.143				95% H-Stat UCL		0.165
107	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
108												
109	**Nonparametric Distribution Free UCL Statistics**											
110	**Detected Data appear Approximate Normal Distributed at 5% Significance Level**											
111												
112	**Suggested UCL to Use**											
113					95% KM (t) UCL	0.146						
114												
115	When a data set follows an approximate (e.g., normal) distribution passing one of the GOF test											
116	When applicable, it is suggested to use a UCL based upon a distribution (e.g., gamma) passing both GOF tests in ProUCL											
117												
118	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
119	Recommendations are based upon data size, data distribution, and skewness.											
120	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
121	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											