Final

Facility-wide Groundwater Monitoring Program
RVAAP-66 Facility-wide Groundwater
Semi-Annual Report for Spring 2020 Sampling Event

Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

Contract No. W912QR-16-D-0003
Delivery Order No. W912QR-18-F-0337

Prepared for:

United States Army Corps of Engineers
Louisville District

Prepared by:

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8866 Commons Boulevard, Suite 201
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March 10, 2021

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REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

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1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
10-03-2021	Technical	Sep 2004-Mar 2021

4. TITLE AND SUBTITLE

Final
Facility-wide Groundwater Monitoring Program
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Former Ravenna Army Ammunition Plant
Portage and Trumbull Counties, Ohio

5a. CONTRACT NUMBER
W912QR-16-D-0003, DOW912QR-18-F-0337

5b. GRANT NUMBER
NA

5c. PROGRAM ELEMENT NUMBER
NA

6. AUTHOR(S)
Stefansky, Jasmine

5d. PROJECT NUMBER
NA

5e. TASK NUMBER
NA

5f. WORK UNIT NUMBER
NA

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)

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8. PERFORMING ORGANIZATION REPORT NUMBER
NA

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

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10. SPONSOR/MONITOR'S ACRONYM(S)
USACE

11. SPONSOR/MONITOR'S REPORT NUMBER(S)
NA

12. DISTRIBUTION/AVAILABILITY STATEMENT

Reference distribution page.

13. SUPPLEMENTARY NOTES

None.

14. ABSTRACT

This Semi-annual Report summarizes activities conducted in spring 2020 as part of the Facility-wide Groundwater Monitoring Program (FWGWMP) in support of the Ravenna Army Ammunition Plant Restoration Program. This report provides a description of field activities performed, presents field and analytical results, and analyzes chemical data collected per the sampling scheme specified in the Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2020.

15. SUBJECT TERMS

groundwater, monitoring well, data quality, sampling

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Jay Trumble
U	U	U	U	600	19b. TELEPHONE NUMBER *(Include area code)* 502.315.6349

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Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

March 23, 2021

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installation and Environment
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IPA Designation
1438 State Route 534 SW
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RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

Subject: Approval of the "RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event"

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "RVAAP-66 Facility-Wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio, dated March 10, 2021. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on March 10, 2021. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final document was reviewed by personnel from Ohio EPA, DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

RECEIVED
MAR 23 2021

If you have any questions, please contact me by email at kevin.palombo@epa.ohio.gov, or call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

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CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW

Leidos has completed the Facility-wide Groundwater Monitoring Program, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event for the Ravenna Army Ammunition Plant Restoration Program. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing United States Army Corps of Engineers (USACE) policy.

March 10, 2021

Jasmine Stefansky — Date

Study/Design Team Leader

March 10, 2021

Heather Adams, P.G. — Date

Independent Technical Review Team Leader

Significant concerns and the explanation of the resolution are documented within the project file. As noted above, all concerns resulting from independent technical review of the project have been considered.

March 10, 2021

Lisa Jones-Bateman, PMP — Date

Senior Program Manager

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March 10, 2021

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ARNG = Army National Guard
I&E = Installations and Environment
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OHARNG = Ohio Army National Guard
Ohio EPA = Ohio Environmental Protection Agency
SWDO = Southwest District Office
USACE = U.S. Army Corps of Engineers

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
Army	U.S. Department of the Army
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJAG	Camp James A. Garfield
COPC	Chemical of Potential Concern
DFFO	Director's Final Findings and Orders
DoD	U.S. Department of Defense
DQA	Data Quality Assessment
FCR	Field Change Request
FS	Feasibility Study
FWCUG	Facility-wide Cleanup Goal
FWGW	Facility-wide Groundwater
FWGWMP	Facility-wide Groundwater Monitoring Program
IDW	Investigation-derived Waste
IRP	Installation Restoration Program
MCL	Maximum Contaminant Level
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NTU	Nephelometric Turbidity Unit
Ohio EPA	Ohio Environmental Protection Agency
P.G.	Professional Geologist
PCB	Polychlorinated Biphenyl
PMP	Project Management Professional
PP	Proposed Plan
PWS	Performance Work Statement
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
ROD	Record of Decision
RSL	Regional Screening Level
RVAAP	Ravenna Army Ammunition Plant
SAP	Sampling and Analysis Plan
SVOC	Semi-volatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

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1.0 INTRODUCTION

Leidos has been contracted by the U.S. Army Corps of Engineers (USACE), Louisville District to execute the performance work statement (PWS) titled "Groundwater Investigation and Reporting Services, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Camp James A. Garfield (CJAG) Joint Military Training Center, Portage and Trumbull Counties, Ohio." This work is being performed under a firm-fixed price basis in accordance with USACE, Louisville District Contract No. W912QR-16-D-0003, Delivery Order No. W912QR-18-F-0337. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation and cleanup are occurring under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP). Activities include monitoring an extensive network of groundwater monitoring wells to determine nature and extent of groundwater impacts, providing additional information in support of hydrogeologic and fate and transport models, evaluating potential exit pathways, and evaluating vertical contaminant distribution and/or particle inflow/outflow through the facility. The former RVAAP/CJAG is located in Portage and Trumbull Counties, Ohio (Figure 1-1).

1.1 PURPOSE

The Director's Final Findings and Orders (DFFO) was issued to the U.S. Department of the Army (Army) on June 10, 2004. The purpose of the DFFO is for the Army to develop and implement:

- A Remedial Investigation/Feasibility Study (RI/FS), Proposed Plan (PP), Record of Decision (ROD), or other appropriate document and remedy for each area of concern (AOC) or appropriate group of AOCs at the former RVAAP; and
- A Facility-wide Groundwater (FWGW) investigation, monitoring, and remediation program at the former RVAAP.

Section 15 of the DFFO outlines the requirements of the Facility-wide Groundwater Monitoring Program (FWGWMP). The purpose of the *RVAAP-66 Facility-wide Groundwater Addendum for 2020* (Leidos 2020a) (herein referred to as the 2020 Addendum) is to satisfy the requirements of Section 15d, which specifies the FWGWMP Plan will "utilize an iterative process, with an annual review and revision cycle to accommodate the addition or deletion of wells from the groundwater monitoring network." This semi-annual report provides results of the spring 2020 sampling performed in accordance with the 2020 Addendum. These results also were used to supplement the findings and conclusions provided in the *Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater* (Leidos 2020b).

1.2 OBJECTIVES

The primary objectives of the 2020 Addendum and subsequent sampling in spring and fall 2020 are to use the facility-wide monitoring well network to assess potential exit pathways, assess nature and extent data gaps, and monitor contaminant concentrations related to historical RVAAP activities (e.g., explosives/propellants, volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], pesticides, polychlorinated biphenyls [PCBs]) at selected source area wells for trend analysis.

The 2020 Addendum supplements the FWGWMP Plan and discusses the subset of wells at the former RVAAP that will be monitored on a semi-annual basis (spring and fall 2020) and the chemicals of potential concern (COPCs) that will be evaluated at each selected well.

1.3 REPORT ORGANIZATION

The remaining sections of this semi-annual report are organized as follows:

- Section 2.0. Background
- Section 3.0. Spring 2020 Monitoring Event
- Section 4.0. Results
- Section 5.0 Data Quality Assessment
- Section 6.0 Well Redevelopment
- Section 7.0. References.

2.0 BACKGROUND

In 2004, the Army and Ohio Environmental Protection Agency (Ohio EPA) finalized the *Facility-wide Groundwater Monitoring Program Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (Portage Environmental 2004) for the former RVAAP, now known as CJAG Joint Military Training Center. The FWGWMP was initiated in April 2005 with quarterly sampling of 36 FWGWMP monitoring wells. Five Resource Conservation and Recovery Act (RCRA) wells (RQLmw-007, RQLmw-008, RQLmw-009, DETmw-003, DETmw-004) were incorporated into the FWGWMP after May 2005 and are sampled semi-annually. Beginning in 2008, the FWGWMP was expanded to include the characterization of groundwater from 243 existing monitoring wells at the facility.

Since 2005, annual addendums have been developed to specify the sampling scheme for each year. The annual sampling approach has been summarized in an annual report. In 2016, the *Remedial Investigation Work Plan for Groundwater and Environmental Services for RVAAP-66 Facility-Wide Groundwater* (herein referred to as the RIWP; TEC-Weston 2016) was developed. This RIWP serves as a supplement to the FWGWMP Plan and specifies aspects of the RI with the goal of adequately characterizing pertinent physical and chemical groundwater conditions in the multi-aquifer hydrostratigraphic units variably present across CJAG, so that potential current and future risks to potential human and environmental receptors can be ascertained, effectively managed, and mitigated as needed.

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3.0 SPRING 2020 MONITORING EVENT

The 2020 Addendum further addressed AOC-specific nature and extent data gaps in the historical sampling dataset, as indicated by an analysis of results through 2019. To this end, 47 wells (including 5 RCRA wells) were selected for sampling during the semi-annual events in 2020. These wells are depicted in Figure 3-1 and presented in Table 3-1.

Monitoring well sampling and analytical testing are conducted in accordance with the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) updates provided with the RIWP (TEC-Weston 2016) and subsequent Field Change Requests (FCRs). The following subsections summarize the activities completed in spring 2020 as they relate to the FWGWMP. The primary activity was groundwater sampling.

3.1 GROUNDWATER ELEVATION MONITORING

A comprehensive facility-wide groundwater level measurement event was conducted between April 13 and 16, 2020. The depth to water in each monitoring well was measured from the top of the inner casing-level indicator. Depth to water measurements at wells SCLmw-001 and SCLmw-002 could not be measured during the comprehensive gauging event because water levels were below the top of permanently installed sampling pumps.

Measured depths to water during this gauging event are presented in Appendix A. The calculated groundwater elevations and potentiometric surface maps generated from this comprehensive facility-wide event will be presented in the 2020 Annual Report.

3.2 MONITORING WELL INSPECTION AND REPAIRS

Each monitoring well was inspected during the April 2020 comprehensive groundwater level measurement event. Maintenance was not performed at any monitoring wells during the well gauging and inspection activities. However, the Army is conducting well repair activities throughout 2020, such as painting the wells and bollards and re-stenciling the well identifications. These repairs will be summarized in the 2020 Annual Report.

Detailed well inspection forms and photographs were provided to the Army in the *2020 Annual Monitoring Well Inspection Report* (Leidos 2020c). The groundwater monitoring well conditions and repairs recommendation are summarized in Appendix B.

3.3 SPRING 2020 MONITORING WELL SAMPLING EVENT

From April 20 to April 30, 2020, and on June 11, 2020, all 47 wells specified in the 2020 Addendum were sampled. These wells are depicted in Figure 3-1 and presented in Table 3-1.

Monitoring wells were purged and sampled using low-flow methods. Purging and sampling were completed using dedicated bladder pumps and tubing. The sampling was performed in accordance with the RIWP and FCRs.

Sampling of each monitoring well began immediately after purging. Samples were placed into iced coolers once collected and maintained under chain of custody until shipped to the Eurofins TestAmerica Laboratory in North Canton, Ohio, via courier.

Table 3-1 summarizes the analyses completed for each monitoring well. The quality assurance/quality control (QA/QC) samples consisted of field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples. Rinsate QA/QC samples were not required because of the use of dedicated and disposable equipment. In addition, USACE split samples were collected from wells DETmw-003, RQLmw-007, FBQmw-175, LL1mw-089, LL1mw-087, FWGmw-021, and RQLmw-011 and shipped to CT Laboratories in Baraboo, Wisconsin.

Appendix D includes the Task Team Activity Log Sheets, Well Purge Forms, Chains of Custody, and Calibration Logs.

3.4 FIELD CHANGE REQUESTS

While no new FCRs were necessary during the spring 2020 sampling event, the existing FCRs related to the work are summarized below and presented in Appendix C:

- LEIDOS_FWGW_001 – Specifies that, due to the permanent bladder pumps, total depths of wells will not be collected during the facility-wide comprehensive water level measurements.
- LEIDOS_FWGW_004 – Specifies the field QC sampling frequency.
- LEIDOS_FWGW_006 – Documents the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.
- LEIDOS_FWGW_010 – Specifies that post-sample water quality parameters may not be an accurate characterization of groundwater, and water quality parameters recorded at the time of stabilization (before sampling) are the parameters used for evaluation.

3.5 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) was generated during the field activities. Fifteen 55-gallon drums were used to containerize the estimated 661 gallons of liquid IDW generated. A composite IDW sample was collected on April 30, 2020 and analyzed for toxicity characteristic leaching procedure (TCLP) VOCs, TCLP SVOCs, TCLP pesticides, TCLP herbicides, TCLP metals, total PCBs, ignitability, pH, nitrate, nitrite, cyanide, and sulfide. On June 25, 2020, Leidos submitted an IDW Report containing a characterization and disposal plan. The plan recommended that the liquid IDW be characterized as non-hazardous, non-contaminated under Clean Harbors Profile No. CH2041062 and be removed offsite and disposed of at a permitted water treatment or waste facility. This plan was approved by the Army.

On August 13, 2020, the 15 drums containing the IDW were picked up and transported for disposal. Appendix E contains the IDW Report and waste manifest used to document proper transport and disposal of the waste.

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Table 3-1. FWGWMP Wells with Analytical Testing Suite

Well ID	VOCs	SVOCs	PCBs	Explosives	Pesticides	Cyanide	Other	Metals, Total
RQLmw-007	X	X[1,2,3,4]	X	X	X	X	phosphorus	X
RQLmw-008	X	X[1,2,3,4]	X	X	X	X		X
RQLmw-009	X	X[1,2,3,4]	X	X	X	X		X
RQLmw-011							anions, alkalinity	
RQLmw-013							anions, alkalinity	
DETmw-003	X	X[1,2,3,4]	X	X	X	X		X
DETmw-004	X	X[1,2,3,4]	X	X	X	X		X
WBGmw-006				X				
WBGmw-009				X				
WBGmw-020				X				
WBGmw-021				X				
LL1mw-063				X			anions, alkalinity	
LL1mw-064				X				X
LL1mw-080				X				
LL1mw-081				X				
LL1mw-083				X			anions, alkalinity	
LL1mw-084				X				
LL1mw-086							anions, alkalinity	X[7]
LL1mw-087				X			perchlorate	X
LL1mw-089				X			anions, alkalinity	X
LL2mw-059				X				
LL2mw-267				X				
LL3mw-237				X				
LL3mw-238				X				
LL3mw-239				X				
LL3mw-241				X				
LL12mw-185							nitrate, ammonia	
LL12mw-187							nitrate, ammonia	
FBQmw-168				X				
FBQmw-170				X				
FBQmw-171				X				
FBQmw-174				X				
FBQmw-175				X				
FBQmw-176				X				
FBQmw-177				X				

Table 3-1. FWGWMP Wells with Analytical Testing Suite (Continued)

Well ID	VOCs	SVOCs	PCBs	Explosives	Pesticides	Cyanide	Other	Metals, Total
LL10mw-003	X[5]							
FWGmw-004				X				X
FWGmw-007				X				X
FWGmw-011				X				X
FWGmw-012				X				X
FWGmw-015				X				X
FWGmw-016				X				X
FWGmw-018	X							X
FWGmw-020	X							X[6]
FWGmw-021				X				X
FWGmw-024				X				X
SCFmw-004				X				X

Notes:

X = Indicates well or constituent to be sampled as part of the 2020 FWGWMP. Wells and constituents will be sampled semi-annually unless indicated by the footnotes below.
[1] SVOCs: phthalates
[2] SVOCs: nitroaromatics
[3] SVOCs: polycyclic aromatic hydrocarbons
[4] SVOCs: phenols
[5] VOC sample only included carbon tetrachloride
[6] Filtered metals sample collected in addition to unfiltered due to high turbidity
[7] Metal analyses at LL1mw-086 was not specified in the 2020 Addendum. However, metal analyses were performed and are summarized in this report.

FWGWMP = Facility-wide Groundwater Monitoring Program
ID = Identification
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
VOC = Volatile Organic Compound

4.0 RESULTS

Table 4-1 presents the 2020 FWGWMP sampling recommendations for each individual well, as presented in the 2020 Addendum. In addition, this table provides a discussion of the results for each well. The concentrations are compared to the applicable screening criteria for each chemical. The screening criteria are the highest concentration amongst the aquifer-specific background concentration for metals, maximum contaminant level (MCL), Resident facility-wide cleanup goal (FWCUG), or U.S. Environmental Protection Agency (USEPA) Residential tap water regional screening level (RSL).

Appendix F.1 contains a table with all analytical results from the wells sampled in spring 2020, Appendix F.2 contains the chemical-specific screening criteria, and Appendix F.3 contains a summary of results that exceeded the applicable screening criteria. The laboratory data packages are presented in Appendix G.

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Table 4-1. FWGWMP Wells for 2020

No	RVAAP-66 Area	Well Name	Aquifer	2020 FWGWMP Sampling Recommendations	Spring 2020 Sampling Results
1	RVAAP-01 Ramsdell Quarry	RQLmw-007	Upper Sharon	• In the absence of VOCs, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and phosphorus, additional sampling of these parameters is not warranted for the CERCLA investigation. • However, in accordance with the DFFO, analytical parameters for this RCRA well in 2020 include VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, phosphorus, and metals.	• Phthalates, PAHs, phenols, PCBs, explosives, pesticides, and cyanide were not detected. • Phosphorus was detected at a concentration of 0.031J mg/L in the primary sample and 0.033J mg/L in the duplicate sample. Phosphorus does not have an RSL, background concentration, or FWCUG. • Acetone was detected at a concentration of 0.080 mg/L, below the screening level. • All metal concentrations were below the screening level or background concentration, with the exception of manganese and nickel. Manganese was detected at estimated concentrations of 2.0J mg/L in the primary sample and 1.8J mg/L in the field duplicate sample, exceeding the background concentration of 0.198 mg/L. Nickel was detected at an estimated concentration of 0.039J mg/L, meeting the RSL of 0.039 mg/L.
2	RVAAP-01 Ramsdell Quarry	RQLmw-008	Upper Sharon	• In the absence of VOCs, phthalates, PAHs, phenols, PCBs, explosives, and pesticides, additional sampling of these parameters is not warranted for the CERCLA investigation. • However, in accordance with the DFFO, analytical parameters for this RCRA well in 2020 include VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals.	• VOCs, phthalates, phenols, PCBs, cyanide, explosives, and pesticides were not detected. • Acenaphthene and fluorine were detected at low, estimated concentrations below the screening level. • All metal concentrations were below the screening level or background concentration, with the exception of arsenic and manganese. Arsenic was detected at a concentration of 0.016 mg/L, exceeding the MCL of 0.01 mg/L. Manganese was detected at a concentration of 0.84 mg/L exceeding the background concentration of 0.198 mg/L.
3	RVAAP-01 Ramsdell Quarry	RQLmw-009	Upper Sharon	• In the absence of VOCs, phthalates, PAHs, phenols, PCBs, explosives, and pesticides, additional sampling of these parameters is not warranted for the CERCLA investigation. • However, in accordance with the DFFO, analytical parameters for this RCRA well in 2020 include VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals.	• VOCs, phthalates, PAHs, phenols, PCBs, explosives, cyanide, and pesticides were not detected. • All metal concentrations were below the screening level or background concentration.
4	RVAAP-01 Ramsdell Quarry	RQLmw-011	Upper Sharon	• In consideration of the pH anomalies, continue to monitor for anions, pH, and alkalinity.	• Nitrate, nitrite, sulfide, and alkalinity were not detected. • Sulfate does not have a screening level and was detected at an estimated concentration of 87J mg/L. • pH was 4.01 S.U. at the time of sample collection.
5	RVAAP-01 Ramsdell Quarry	RQLmw-013	Upper Sharon	• In consideration of the pH anomalies, continue to monitor for anions, pH, and alkalinity.	• Alkalinity, nitrate, nitrite, and sulfide were not detected. • Sulfate does not have a screening level and was detected at a concentration of 140 mg/L. • pH was 4.23 S.U. at the time of sample collection.
6	RVAAP-04 Demolition Area 2	DETmw-003	Unconsolidated	• In the absence of phthalates, nitroaromatics, SVOCs, phenols, PCBs, PAHs, explosives, or pesticides, additional sampling of these parameters is not warranted for the CERCLA investigation. • However, in accordance with the DFFO, analytical parameters for this RCRA well in 2020 include VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals.	• Phthalates, nitroaromatics, SVOCs, VOCs, PCBs, explosives, or pesticides were not detected. • Cyanide was detected at a low, estimated concentration, below the screening level. • Phenol was detected at a low, estimated concentration, below the screening level. • All metal concentrations were below the screening level or background concentration, with the exception of manganese. Manganese was detected at an estimated concentration of 0.26J mg/L, exceeding the background concentration of 0.075 mg/L.
7	RVAAP-04 Demolition Area 2	DETmw-004	Unconsolidated	• In accordance with the DFFO, analytical parameters for this RCRA well in 2020 include VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals.	• VOCs, pesticides, phthalates, nitroaromatics, PAHs, and PCBs were not detected. • Cyanide was detected at a low, estimated concentration, below the screening level. • Phenol was detected at a low concentration, below the screening level. • All metal concentrations were below the screening level or background concentration. • No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening level. The RDX concentration of 0.0015 mg/L exceeded the RSL of 0.00097 mg/L.
8	RVAAP-05 Winklepeck Burning Grounds	WBGmw-006	Unconsolidated	• Continue to monitor for explosives.	• No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening level. The RDX concentration of 0.013 mg/L exceeded the RSL of 0.00097 mg/L.

Table 4-1. FWGWMP Wells for 2020 (Continued)

No	RVAAP-66 Area	Well Name	Aquifer	2020 FWGWMP Sampling Recommendations	Spring 2020 Sampling Results
9	RVAAP-05 Winklepeck Burning Grounds	WBGmw-009	Unconsolidated	• Continue to monitor for explosives.	• No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening level. The RDX concentration of 0.0019 mg/L exceeded the RSL of 0.00097 mg/L.
10	RVAAP-05 Winklepeck Burning Grounds	WBGmw-020	Upper Sharon	• Continue to monitor for explosives.	• Explosives were not detected.
11	RVAAP-05 Winklepeck Burning Grounds	WBGmw-021	Upper Sharon	• Continue to monitor for explosives.	• Explosives were not detected.
12	RVAAP-08 Load Line 1	LL1mw-063	Unconsolidated	• Continue to monitor for explosives. • In consideration of the pH anomalies, continue to monitor for anions, pH, and alkalinity.	• Nitrite and sulfide were not detected. Nitrate was detected at a concentration of 0.7 mg/L, below the screening level. • Alkalinity and sulfate do not have screening levels but were detected at concentrations of 6.1J mg/L and 100 mg/L, respectively. • No explosives were detected with the exception of HMX. The HMX concentration was below the screening level. • pH was 4.82 S.U. at the time of sample collection.
13	RVAAP-08 Load Line 1 (east of Load Line 1 fence)	LL1mw-064	Unconsolidated	• Continue to monitor for explosives and metals to monitor migration potential.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration with the exception of manganese. The manganese concentration of 0.12 mg/L exceeded the background concentration of 0.075 mg/L.
14	RVAAP-08 Load Line 1	LL1mw-080	Upper Sharon	• Continue to monitor for explosives.	• The explosives 1,3-DNB; 2-amino-4,6-DNT; 4-amino-2,6-DNT; HMX; and RDX were detected; however, only RDX exceeded the RSL of 0.00097 mg/L at a concentration of 0.011 mg/L.
15	RVAAP-08 Load Line 1	LL1mw-081	Upper Sharon	• Continue to monitor for explosives.	• All explosive concentrations were not detected or were below the screening level.
16	RVAAP-08 Load Line 1	LL1mw-083	Upper Sharon	• Continue to monitor for explosives, anions, and alkalinity.	• Nitrite, sulfide, and alkalinity were not detected. • Nitrate was detected at an estimated concentration of 0.43J mg/L, below the screening level. • Sulfate does not have a screening level and was detected at a concentration of 100 mg/L. • TNT; 1,3-DNB; 2,4-DNT; 2-amino-4,6-DNT; and 4-amino-2,6-DNT were detected and exceeded the screening levels. All other explosives were below the screening level.
17	RVAAP-08 Load Line 1	LL1mw-084	Upper Sharon	• Continue to monitor for explosives.	• 1,3-DNB; TNT; 2,4-DNT; 2-amino-4,6-DNT; 4-amino-2,6-DNT; and RDX were detected and exceeded the screening levels. All other explosives were below the screening level. • pH was 5.78 S.U. at the time of sample collection.
18	RVAAP-08 Load Line 1 (southeast of Load Line 1 fence)	LL1mw-086	Unconsolidated	• In consideration of the pH anomalies, continue to monitor for anions, pH, and alkalinity.	• Nitrate, nitrite, and sulfide were not detected. • Sulfate has no screening level and was detected at a concentration of 89 mg/L. • Alkalinity does not have a screening level, but was detected at a concentration of 190 mg/L. • pH was 7.53 S.U. at the time of sample collection. • Manganese was the only metal sampled and was detected at concentrations of 0.45 mg/L (dissolved) and 0.57 mg/L (total), exceeding the background concentration of 0.075 mg/L.
19	RVAAP-08 Load Line 1 (southeast of Load Line 1 fence)	LL1mw-087	Unconsolidated	• Continue to monitor for explosives and metals to monitor migration. • Analyze for perchlorate, as this is identified as a potential data gap in the RIWP (TEC-Weston 2016).	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration. • Perchlorate was detected at an estimated concentration of 0.000015J mg/L, below the screening level.
20	RVAAP-08 Load Line 1	LL1mw-089	Unconsolidated	• Continue to monitor for explosives and metals in this exit pathway well. • In consideration of the pH anomalies, continue to monitor for anions, pH, and alkalinity.	• Explosives were not detected. • Nitrite and sulfide were not detected. • Nitrate was detected at an estimated concentration of 0.12J mg/L, below the screening level. • Alkalinity and sulfate do not have screening levels but were detected at concentrations of 8.8J and 25 mg/L, respectively. • All metal concentrations were below the screening level or background concentration. • pH was 4.59 S.U. at time of sample collection.

Table 4-1. FWGWMP Wells for 2020 (Continued)

No	RVAAP-66 Area	Well Name	Aquifer	2020 FWGWMP Sampling Recommendations	Spring 2020 Sampling Results
21	RVAAP-09 Load Line 2 South	LL2mw-059	Upper Sharon	• Continue to monitor for explosives.	• All explosive concentrations were below screening levels with the exception of 2,4-DNT. 2,4-DNT was detected at a concentration of 0.47 mg/L, exceeding the RSL of 0.24 mg/L.
22	RVAAP-09 Load Line 2	LL2mw-267	Upper Sharon	• Continue to monitor for explosives. • Although explosives never exceeded their screening levels in 2019, explosive exceedances were in the 2011-2016 datasets.	• All explosive concentrations were below screening levels. • Manganese was the only metal sampled and was detected at an estimated concentration of 0.56J mg/L, exceeding the background concentration of 0.198 mg/L.
23	RVAAP-10 Load Line 3	LL3mw-237	Upper Sharon	• Continue to monitor for explosives.	• All explosive concentrations were below screening levels.
24	RVAAP-11 Load Line 3	LL3mw-238	Upper Sharon	• Monitor for explosives. • Provide supplemental data for the RI regarding explosives at Load Line 3.	• All explosive concentrations were below screening levels with the exceptions of TNT, 2-Amino-4,6-DNT, 4-Amino-2,6-DNT, and RDX. TNT was detected at a concentration of 0.024 mg/L, exceeding the RSL of 0.00098 mg/L. 2-Amino-4,6-DNT was detected at a concentration of 0.0066 mg/L, exceeding the RSL of 0.0039 mg/L. 4-Amino-2,6-DNT was detected at a concentration of 0.015 mg/L, exceeding the RSL of 0.0039 mg/L. RDX was detected at a concentration of 0.003 mg/L, exceeding the RSL of 0.00097 mg/L.
25	RVAAP-11 Load Line 3	LL3mw-239	Upper Sharon	• Monitor for explosives. • Provide supplemental data for the RI regarding explosives at Load Line 3.	• All explosive concentrations were below screening levels with the exception of RDX. RDX was detected at a concentration of 0.0011 mg/L, exceeding the RSL of 0.00097 mg/L.
26	RVAAP-11 Load Line 3	LL3mw-241	Upper Sharon	• Monitor for explosives. • Provide supplemental data for the RI regarding explosives at Load Line 3.	• All explosive concentrations were below screening levels with the exception of RDX and TNT. RDX was detected at a concentration of 0.001 mg/L, exceeding the RSL of 0.00097 mg/L. TNT was detected at a concentration of 0.0054 mg/L, exceeding the RSL of 0.00098 mg/L.
27	RVAAP-12 Load Line 12	LL12mw-185	Unconsolidated	• Continue to monitor for nitrate. • Analyze for ammonia to provide supplemental data for the RI.	• Nitrate was detected at a concentration of 69 mg/L, exceeding the MCL of 10 mg/L. • Ammonia was not detected.
28	RVAAP-12 Load Line 12	LL12mw-187	Unconsolidated	• Continue to monitor for nitrate. • Analyze for ammonia to provide supplemental data for the RI.	• Nitrate was detected at an estimated concentration of 1,600J mg/L, exceeding the MCL of 10 mg/L. • Ammonia has no screening level, but was detected at a concentration of 720 mg/L.
29	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-168	Unconsolidated	• Monitor for explosives. • Most recent sample for explosives analysis was October 2016. Historical concentrations are all below the screening level.	• Explosives were not detected.
30	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-170	Homewood	• Monitor for explosives. • Most recent sample for explosives analysis was October 2011. Historical concentrations are all below the screening level.	• Explosives were not detected.
31	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-171	Homewood	• Monitor for explosives. • Most recent sample for explosives analysis was October 2011. Historical concentrations are all below the screening level.	• Explosives were not detected. • pH was 5.80 S.U. at the time of sample collection.
32	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-174	Homewood	• Continue to monitor for explosives.	• The explosives TNT; 2,4-DNT; 2-amino-4,6-DNT; 4-amino-2,6-DNT; and RDX exceeded screening levels. TNT was detected at a concentration of 0.016 mg/L, exceeding the RSL of 0.00098 mg/L. 2,4-DNT was detected at a concentration of 0.00047 mg/L, exceeding the RSL of 0.00024 mg/L. 2-amino-2,4-DNT and 4-amino-2,6-DNT were detected at a concentration of 0.018 mg/L, exceeding the RSL of 0.0039 mg/L. RDX was detected at an estimated concentration of 0.001J mg/L, exceeding the RSL of 0.00097 mg/L. • pH was 4.05 S.U. at the time of sample collection.
33	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-175	Homewood	• Monitor for explosives.	• Explosives were not detected. • pH was 4.27 S.U. at the time of sample collection.
34	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-176	Unconsolidated	• Monitor for explosives.	• Explosives were not detected.
35	RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-177	Unconsolidated	• Monitor for explosives. • Most recent sample for explosives analysis was October 2011. Historical concentrations are all below the screening level.	• Explosives were not detected.
36	RVAAP-43 Load Line 10	LL10mw-003	Homewood	• Continue to monitor for carbon tetrachloride to verify recent reduced concentrations.	• Carbon tetrachloride was detected at an estimated concentration of 0.0013J mg/L, below the MCL of 0.005 mg/L.

Table 4-1. FWGWMP Wells for 2020 (Continued)

No	RVAAP-66 Area	Well Name	Aquifer	2020 FWGWMP Sampling Recommendations	Spring 2020 Sampling Results
37	RVAAP-66 Facility-wide Groundwater (southern portion of Administration Area)	FWGmw-004	Unconsolidated	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metals were below the screening level or background concentration.
38	RVAAP-66 Facility-wide Groundwater (southwestern portion of facility, south of NACA Test Area)	FWGmw-007	Unconsolidated	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.21 mg/L, exceeding the background concentration of 0.075 mg/L.
39	RVAAP-66 Facility-wide Groundwater (near East Classification Yard)	FWGmw-011	Unconsolidated	• Continue to monitor for explosives and metals in this exit pathway well.	• All explosive concentrations were below screening levels with the exception of 4-nitrotoluene. 4-Nitrotoluene was detected at a concentration of 0.017 mg/L, exceeding the screening level of 0.00501 mg/L. • All metal concentrations were below the screening level or background concentration with the exception of manganese. Manganese was detected at an estimated concentration of 0.29J mg/L, which exceeded the background concentration of 0.075 mg/L.
40	RVAAP-66 Facility-wide Groundwater (near East Classification Yard)	FWGmw-012	Upper Sharon	• Continue to monitor for explosives and metals for migration potential.	• All explosive concentrations were below screening levels with the exception of 4-nitrotoluene. 4-Nitrotoluene was detected at a concentration of 0.011 mg/L, which exceeded the screening level of 0.00501 mg/L. • All metal concentrations were below the screening level or background concentration.
41	RVAAP-66 Facility-wide Groundwater (southeast of Administration Area)	FWGmw-015	Unconsolidated	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration.
42	RVAAP-66 Facility-wide Groundwater (southeast of Administration Area)	FWGmw-016	Upper Sharon	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.22 mg/L, exceeding the background concentration of 0.198 mg/L.
43	RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 12)	FWGmw-018	Basal Sharon	• Continue to monitor for VOCs and metals in this exit pathway well.	• VOCs were not detected. • All metal concentrations were below the screening level or background concentration.
44	RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 12)	FWGmw-020	Upper Sharon	• Continue to monitor for VOCs and metals in this exit pathway well.	• VOCs were not detected. • All metal concentrations were below the screening level or background concentration with the exception of arsenic. Arsenic was detected at concentrations of 0.045 mg/L in the dissolved sample and 0.044 mg/L in the total sample, which exceeded the MCL of 0.01 mg/L in both samples.
45	RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 3)	FWGmw-021	Upper Sharon	• Continue to monitor for explosives and metals in this exit pathway well.	• All explosive concentrations were below screening level. • All metal concentrations were below the screening level or background concentration with the exception of manganese. Manganese was detected at estimated concentrations of 0.62J mg/L in the field duplicate sample 0.61J mg/L in the primary sample, which exceeded the background concentration of 0.198 mg/L in both samples.
46	RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 2)	FWGmw-024	Upper Sharon	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration with the exception of manganese. Manganese was detected at an estimated concentration of 0.33J mg/L, which exceeded the background concentration of 0.198 mg/L.
47	RVAAP-66 Facility-wide Groundwater (southeast portion of facility)	SCFmw-004	Basal Sharon	• Continue to monitor for explosives and metals in this exit pathway well.	• Explosives were not detected. • All metal concentrations were below the screening level or background concentration.

Table 4-1. FWGWMP Wells for 2020 (Continued)

Note: Background concentrations for metals vary by aquifer.

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act
DFFO = Director's Final Findings and Orders
DNB = Dinitrobenzene
DNT = Dinitrotoluene
FWCUG = Facility-wide Cleanup Goal
FWGWMP = Facility-wide Groundwater Monitoring Plan
HMX = Octahydro-1,3,5,7- tetranitro-1,3,5,7-tetrazocine
MCL = Maximum Contaminant Level
mg/L = Milligrams per Liter
NACA = National Advisory Committee for Aeronautics
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
RCRA = Resource Conservation and Recovery Act
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine
RI = Remedial Investigation
RIWP = Remedial Investigation Work Plan
RSL = Regional Screening Level
RVAAP = Ravenna Army Ammunition Plant
S.U. = Standard Unit
SVOC = Semi-volatile Organic Compound
TNT = 2,4,6-Trinitrotoluene
VOC = Volatile Organic Compound

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5.0 DATA QUALITY ASSESSMENT

A data quality assessment was performed to support the results of the spring 2020 sampling event. The purpose of this data quality assessment (DQA) report is to document the following:

- The QC procedures followed to ensure data generated by Leidos, during the implementation of the April 2020 sampling event to support the FWGWMP at the former RVAAP, meet project requirements;
- The quality of the data collected; and
- Any problems encountered during the course of the study and their solutions.

The entire data quality assessment report is presented in Appendix H.

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6.0 WELL REDEVELOPMENT

During the spring 2020 sampling event, nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, LL3mw-241) were redeveloped following Section 3.5.2 of the RIWP and Appendix A.1, Section 4.6 (TEC-Weston 2016), and in accordance with the *Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment* (Ohio EPA 2009).

Redevelopment occurred prior to sampling these nine wells (April 20-28, 2020). During redevelopment, a whaler pump was used to surge water in and out of the well screen, allowing fine sediments to be removed while pumping. Redevelopment was considered complete when five well volumes were removed, turbidity was below 10.0 nephelometric turbidity units (NTUs), and quality parameters stabilized over three consecutive readings. Well development logs are located in Appendix I. Monitoring wells FBQmw-175, FBQmw-177, LL1mw-087, and LL3mw-238 were pumped dry during redevelopment. These wells were allowed to recharge above the screened interval, resurged, and pumped dry multiple times to remove additional fine sediments. However, the water generally remained turbid as each well went dry again, and water quality parameter stabilization could not be obtained. Therefore, redevelopment was concluded. Turbidity values post redevelopment and at the time of sample collection are shown in Table 6-1.

Table 6-1. Turbidity Values Post Redevelopment

Well ID	Redevelopment Date	Turbidity Post Redevelopment (NTU)	Sampling Date	Turbidity at Time of Sample Collection Spring 2020 (NTU)
LL1mw-086	4/27/2020	0	4/29/2020	1,238.8
LL1mw-087	4/22/2020	Well went dry, NM	4/27/2020	17.95
LL3mw-238	4/28/2020	Well went dry, NM	4/30/2020	0.24
LL3mw-239	4/27/2020	2.72	4/30/2020	3.74
LL3mw-241	4/27/2020	3.7	4/30/2020	2.73
FBQmw-168	4/22/2020	0	4/27/2020	3.53
FBQmw-170	4/21/2020	0.4	4/28/2020	0.04
FBQmw-175	4/22/2020	Well went dry, NM	4/27/2020	35.7
FBQmw-177	4/21/2020	Well went dry, NM	4/29/2020	47.8

ID = Identification
NM = Not Measured
NTU = Nephelometric Turbidity Unit

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7.0 REFERENCES

Leidos 2020a. *Facility-wide Groundwater Monitoring Program RVAAP-66 Facility-wide Groundwater Addendum for 2020.* June 2020.

Leidos 2020b. *Draft Remedial Investigation Report for RVAAP-66 Facility-wide Groundwater*. July 2020.

Leidos 2020c. *2020 Annual Monitoring Well Inspection Report for the Groundwater Investigation and Reporting Services Former Ravenna Army Ammunition Plant Restoration Program*. July 2020.

Ohio EPA (Ohio Environmental Protection Agency) 2009. *Technical Guidance Manual for Hydrogeologic Investigations and Ground Water Monitoring – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment*. Revision 2. February 2009.

Portage Environmental 2004. *Facility-wide Groundwater Monitoring Program Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio*. September 2004.

TEC-Weston 2016. *Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-Wide Groundwater*. December 2016.

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FIGURES

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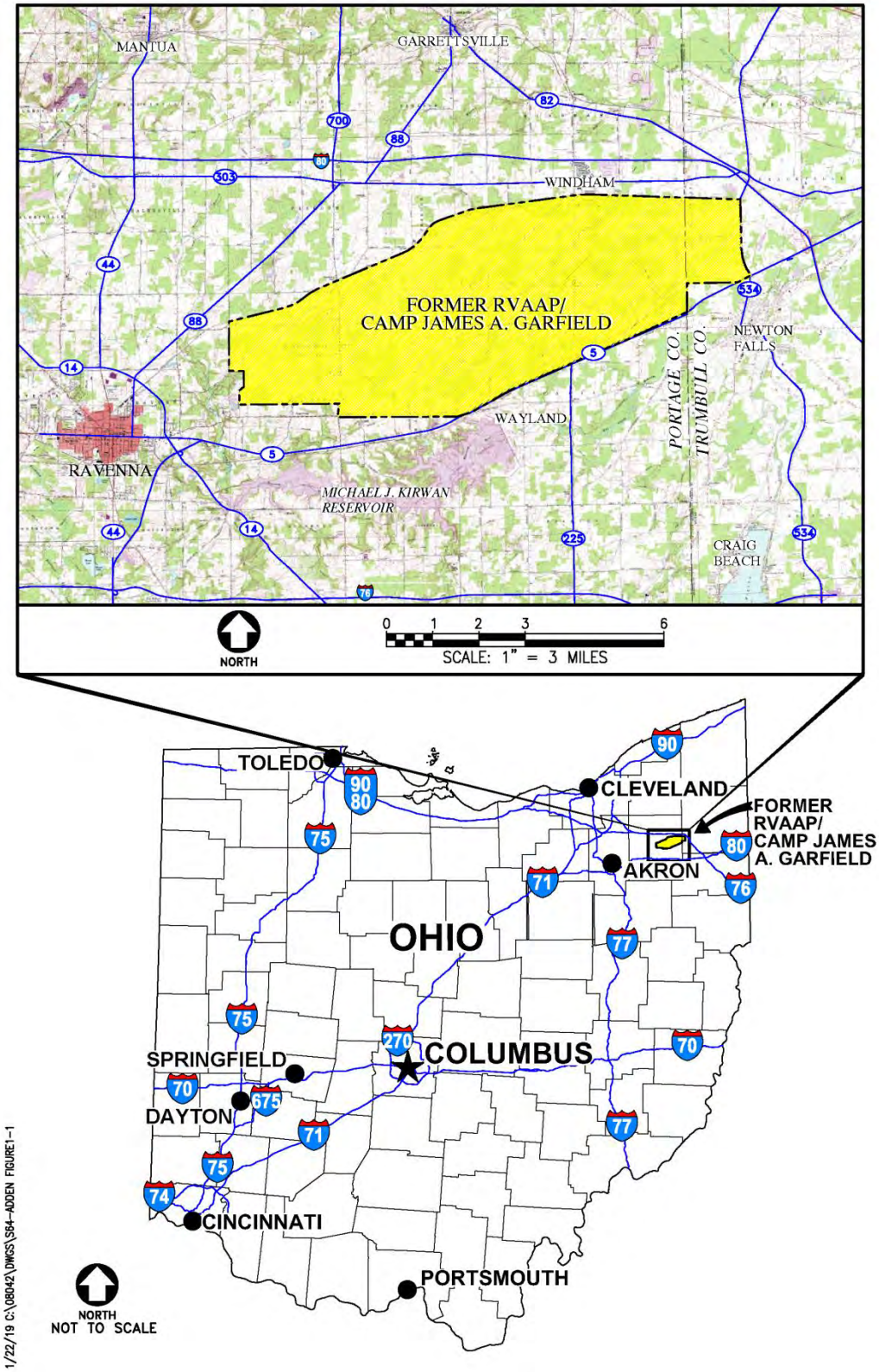

Figure 1-1. General Location and Orientation of the Former RVAAP/CJAG

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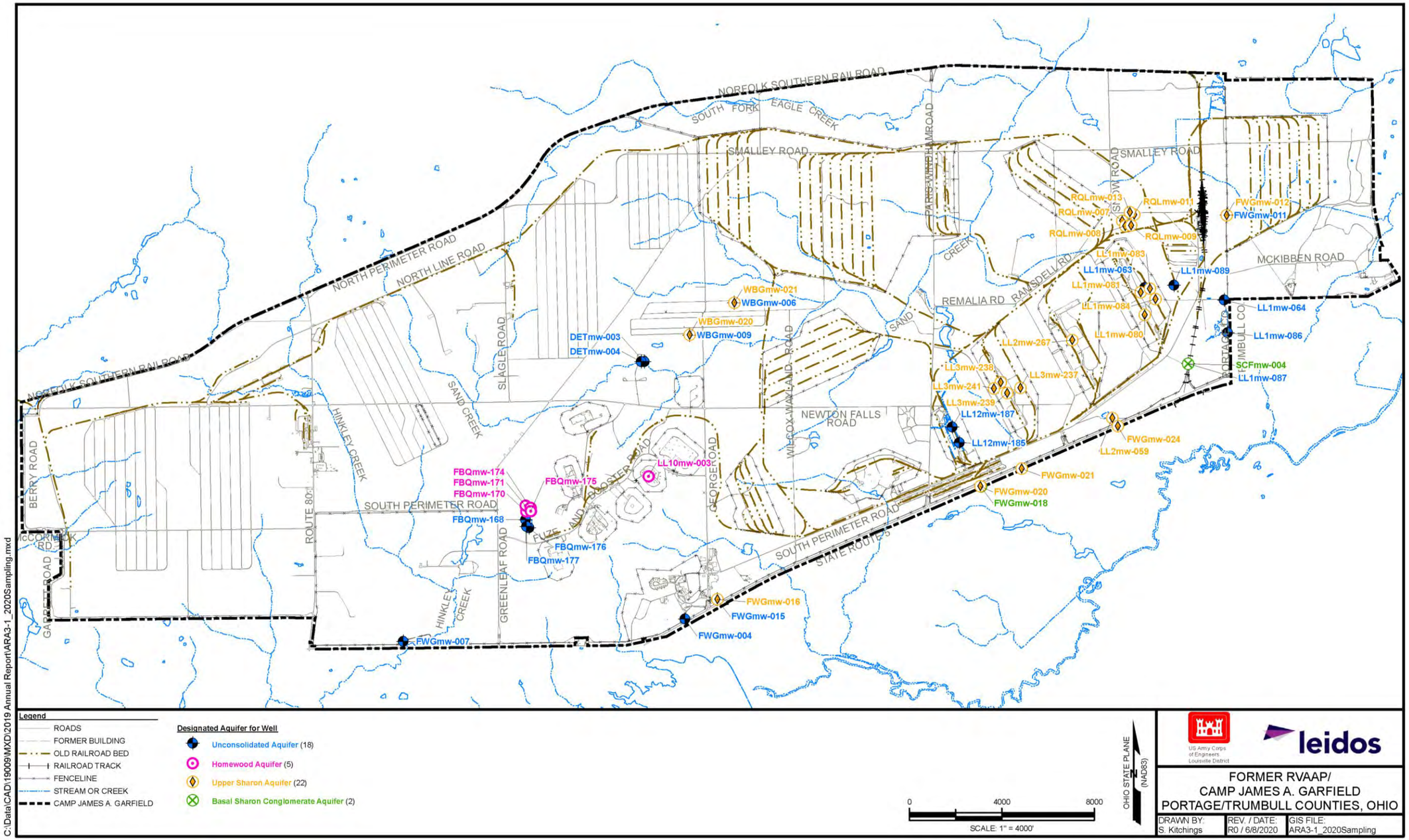

Figure 3-1. 2020 FWGWMP Wells

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APPENDIX A

Well Gauging Results

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RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-006	4/15/2020	33.51
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-007	4/15/2020	4.64
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-008	4/15/2020	4.72
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-009	4/15/2020	3.55
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-010	4/15/2020	23.85
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-011	4/15/2020	20.12
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-012	4/15/2020	19.75
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-013	4/15/2020	23.56
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-014	4/15/2020	17.92
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-015	4/15/2020	30.4
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-016	4/15/2020	34.6
RVAAP-01 Ramsdell Quarry Landfill	RQLmw-017	4/15/2020	28.57
RVAAP-02 Erie Burning Grounds	EBGmw-123	4/14/2020	9.8
RVAAP-02 Erie Burning Grounds	EBGmw-124	4/14/2020	3.51
RVAAP-02 Erie Burning Grounds	EBGmw-125	4/14/2020	12.08
RVAAP-02 Erie Burning Grounds	EBGmw-126	4/14/2020	2.03
RVAAP-02 Erie Burning Grounds	EBGmw-127	4/14/2020	4.16
RVAAP-02 Erie Burning Grounds	EBGmw-128	4/14/2020	6.62
RVAAP-02 Erie Burning Grounds	EBGmw-129	4/14/2020	5.9
RVAAP-02 Erie Burning Grounds	EBGmw-130	4/14/2020	6.1
RVAAP-02 Erie Burning Grounds	EBGmw-131	4/14/2020	8.5
RVAAP-04 Open Demolition Area #2	DA2mw-104	4/14/2020	20.42
RVAAP-04 Open Demolition Area #2	DA2mw-105	4/15/2020	2.91
RVAAP-04 Open Demolition Area #2	DA2mw-106	4/14/2020	3.48
RVAAP-04 Open Demolition Area #2	DA2mw-107	4/14/2020	6.11
RVAAP-04 Open Demolition Area #2	DA2mw-108	4/14/2020	5.72
RVAAP-04 Open Demolition Area #2	DA2mw-109	4/14/2020	10.98
RVAAP-04 Open Demolition Area #2	DA2mw-110	4/14/2020	6.01
RVAAP-04 Open Demolition Area #2	DA2mw-111	4/14/2020	6.67
RVAAP-04 Open Demolition Area #2	DA2mw-112	4/14/2020	6
RVAAP-04 Open Demolition Area #2	DA2mw-113	4/14/2020	6.49
RVAAP-04 Open Demolition Area #2	DA2mw-114	4/14/2020	4.64
RVAAP-04 Open Demolition Area #2	DA2mw-115	4/14/2020	5.4
RVAAP-04 Open Demolition Area #2	DETmw-001B	4/14/2020	23.5
RVAAP-04 Open Demolition Area #2	DETmw-002	4/14/2020	23.4
RVAAP-04 Open Demolition Area #2	DETmw-003	4/14/2020	8.68
RVAAP-04 Open Demolition Area #2	DETmw-004	4/14/2020	9.45
RVAAP-05 Winklepeck Burning Grounds	WBGmw-005	4/14/2020	4.42
RVAAP-05 Winklepeck Burning Grounds	WBGmw-006	4/14/2020	5.35
RVAAP-05 Winklepeck Burning Grounds	WBGmw-007	4/14/2020	16.07
RVAAP-05 Winklepeck Burning Grounds	WBGmw-008	4/14/2020	13.83
RVAAP-05 Winklepeck Burning Grounds	WBGmw-009	4/14/2020	11.22
RVAAP-05 Winklepeck Burning Grounds	WBGmw-010	4/14/2020	6.48

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-05 Winklepeck Burning Grounds	WBGmw-011	4/14/2020	9.3
RVAAP-05 Winklepeck Burning Grounds	WBGmw-012	4/14/2020	10.96
RVAAP-05 Winklepeck Burning Grounds	WBGmw-013	4/14/2020	9.54
RVAAP-05 Winklepeck Burning Grounds	WBGmw-014	4/14/2020	15
RVAAP-05 Winklepeck Burning Grounds	WBGmw-015	4/14/2020	12.09
RVAAP-05 Winklepeck Burning Grounds	WBGmw-016	4/14/2020	15.5
RVAAP-05 Winklepeck Burning Grounds	WBGmw-017	4/14/2020	7.45
RVAAP-05 Winklepeck Burning Grounds	WBGmw-018	4/14/2020	12.93
RVAAP-05 Winklepeck Burning Grounds	WBGmw-019	4/14/2020	16.2
RVAAP-05 Winklepeck Burning Grounds	WBGmw-020	4/14/2020	10.96
RVAAP-05 Winklepeck Burning Grounds	WBGmw-021	4/14/2020	8.09
RVAAP-06 C Block Quarry	CBLmw-001	4/13/2020	39.24
RVAAP-06 C Block Quarry	CBLmw-002	4/13/2020	33.74
RVAAP-06 C Block Quarry	CBLmw-003	4/13/2020	30.4
RVAAP-06 C Block Quarry	CBLmw-004	4/13/2020	31.8
RVAAP-06 C Block Quarry	CBLmw-005	4/13/2020	23.81
RVAAP-08 Load Line 1	LL1mw-063	4/16/2020	21.47
RVAAP-08 Load Line 1	LL1mw-064	4/15/2020	0
RVAAP-08 Load Line 1	LL1mw-065	4/15/2020	9.84
RVAAP-08 Load Line 1	LL1mw-067	4/16/2020	16.72
RVAAP-08 Load Line 1	LL1mw-078	4/16/2020	30.59
RVAAP-08 Load Line 1	LL1mw-079	4/16/2020	29.81
RVAAP-08 Load Line 1	LL1mw-080	4/16/2020	9.45
RVAAP-08 Load Line 1	LL1mw-081	4/16/2020	27.45
RVAAP-08 Load Line 1	LL1mw-082	4/16/2020	26.61
RVAAP-08 Load Line 1	LL1mw-083	4/16/2020	30.05
RVAAP-08 Load Line 1	LL1mw-084	4/16/2020	25.23
RVAAP-08 Load Line 1	LL1mw-085	4/16/2020	34.3
RVAAP-08 Load Line 1	LL1mw-086	4/15/2020	6.11
RVAAP-08 Load Line 1	LL1mw-087	4/15/2020	4.45
RVAAP-08 Load Line 1	LL1mw-088	4/16/2020	4.2
RVAAP-08 Load Line 1	LL1mw-089	4/16/2020	22.92
RVAAP-09 Load Line 2	LL2mw-059	4/16/2020	12.8
RVAAP-09 Load Line 2	LL2mw-060	4/15/2020	8.82
RVAAP-09 Load Line 2	LL2mw-261	4/16/2020	6.5
RVAAP-09 Load Line 2	LL2mw-262	4/16/2020	7.51
RVAAP-09 Load Line 2	LL2mw-263	4/16/2020	6.85
RVAAP-09 Load Line 2	LL2mw-264	4/16/2020	5.36
RVAAP-09 Load Line 2	LL2mw-265	4/15/2020	8.78
RVAAP-09 Load Line 2	LL2mw-266	4/16/2020	9.81
RVAAP-09 Load Line 2	LL2mw-267	4/16/2020	8.77
RVAAP-09 Load Line 2	LL2mw-268	4/16/2020	14.11
RVAAP-09 Load Line 2	LL2mw-269	4/16/2020	15.82

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-09 Load Line 2	LL2mw-270	4/16/2020	6.5
RVAAP-09 Load Line 2	LL2mw-271	4/16/2020	10.09
RVAAP-09 Load Line 2	LL2mw-272	4/16/2020	7.73
RVAAP-10 Load Line 3	LL3mw-232	4/16/2020	15.62
RVAAP-10 Load Line 3	LL3mw-233	4/16/2020	24.79
RVAAP-10 Load Line 3	LL3mw-234	4/16/2020	9.02
RVAAP-10 Load Line 3	LL3mw-235	4/16/2020	16.05
RVAAP-10 Load Line 3	LL3mw-236	4/16/2020	14.95
RVAAP-10 Load Line 3	LL3mw-237	4/16/2020	13.28
RVAAP-10 Load Line 3	LL3mw-238	4/16/2020	15.27
RVAAP-10 Load Line 3	LL3mw-239	4/16/2020	22
RVAAP-10 Load Line 3	LL3mw-240	4/16/2020	25.4
RVAAP-10 Load Line 3	LL3mw-241	4/16/2020	8.02
RVAAP-10 Load Line 3	LL3mw-242	4/16/2020	13.34
RVAAP-10 Load Line 3	LL3mw-243	4/16/2020	9.32
RVAAP-10 Load Line 3	LL3mw-244	4/16/2020	7.48
RVAAP-10 Load Line 3	LL3mw-245	4/16/2020	11.8
RVAAP-10 Load Line 3	LL3mw-246	4/16/2020	18.19
RVAAP-11 Load Line 4	LL4mw-193	4/16/2020	5.51
RVAAP-11 Load Line 4	LL4mw-194	4/16/2020	6.19
RVAAP-11 Load Line 4	LL4mw-195	4/16/2020	9.46
RVAAP-11 Load Line 4	LL4mw-196	4/16/2020	12.57
RVAAP-11 Load Line 4	LL4mw-197	4/16/2020	13.73
RVAAP-11 Load Line 4	LL4mw-198	4/16/2020	6.03
RVAAP-11 Load Line 4	LL4mw-199	4/16/2020	6.8
RVAAP-11 Load Line 4	LL4mw-200	4/16/2020	17.34
RVAAP-11 Load Line 4	LL4mw-201	4/16/2020	9.24
RVAAP-12 Load Line 12	LL12mw-088	4/15/2020	6.05
RVAAP-12 Load Line 12	LL12mw-107	4/15/2020	8.18
RVAAP-12 Load Line 12	LL12mw-113	4/15/2020	5
RVAAP-12 Load Line 12	LL12mw-128	4/15/2020	8.35
RVAAP-12 Load Line 12	LL12mw-153	4/15/2020	5.3
RVAAP-12 Load Line 12	LL12mw-154	4/15/2020	7.55
RVAAP-12 Load Line 12	LL12mw-182	4/15/2020	7.97
RVAAP-12 Load Line 12	LL12mw-182ss	4/15/2020	8.27
RVAAP-12 Load Line 12	LL12mw-183	4/15/2020	10.78
RVAAP-12 Load Line 12	LL12mw-184	4/15/2020	11.13
RVAAP-12 Load Line 12	LL12mw-185	4/15/2020	6.43
RVAAP-12 Load Line 12	LL12mw-186	4/16/2020	5.54
RVAAP-12 Load Line 12	LL12mw-187	4/15/2020	8.08
RVAAP-12 Load Line 12	LL12mw-188	4/15/2020	4.03
RVAAP-12 Load Line 12	LL12mw-189	4/16/2020	3.52
RVAAP-12 Load Line 12	LL12mw-242	4/15/2020	7.55

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-12 Load Line 12	LL12mw-243	4/15/2020	8.48
RVAAP-12 Load Line 12	LL12mw-244	4/15/2020	8.33
RVAAP-12 Load Line 12	LL12mw-245	4/15/2020	7.21
RVAAP-12 Load Line 12	LL12mw-246	4/15/2020	14.97
RVAAP-12 Load Line 12	LL12mw-247	4/16/2020	4.6
RVAAP-13 Building 1200	B12mw-010	4/14/2020	14.1
RVAAP-13 Building 1200	B12mw-011	4/14/2020	14.85
RVAAP-13 Building 1200	B12mw-012	4/14/2020	14.35
RVAAP-13 Building 1200	B12mw-013	4/14/2020	17.04
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-166	4/16/2020	4.81
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-167	4/16/2020	3.56
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-168	4/16/2020	9.69
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-169	4/16/2020	5.02
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-170	4/16/2020	16.03
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-171	4/16/2020	15.13
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-172	4/16/2020	22.06
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-173	4/16/2020	42.04
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-174	4/16/2020	13.68
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-175	4/16/2020	15.37
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-176	4/16/2020	7.3
RVAAP-16 Fuze and Booster Quarry Landfill/Ponds	FBQmw-177	4/16/2020	10.47
RVAAP-19 Landfill North of Winklepeck Burning Grounds	LNWmw-024	4/14/2020	10.29
RVAAP-19 Landfill North of Winklepeck Burning Grounds	LNWmw-025	4/14/2020	3.95
RVAAP-19 Landfill North of Winklepeck Burning Grounds	LNWmw-026	4/14/2020	3.47
RVAAP-19 Landfill North of Winklepeck Burning Grounds	LNWmw-027	4/14/2020	5.23
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-001	4/16/2020	16.95
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-002	4/16/2020	17.57
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-003	4/16/2020	17.72
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-004	4/16/2020	16.28
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-005	4/16/2020	17.2
RVAAP-28 Suspected Mustard Agent Burial Site	MBSmw-006	4/16/2020	16.58
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-001	4/15/2020	1.17
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-002	4/15/2020	0
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-003	4/15/2020	1.37
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-004	4/14/2020	9.51
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-005	4/14/2020	9.9
RVAAP-29 Upper and Lower Cobbs Ponds	CPmw-006	4/14/2020	7.98
RVAAP-33 Load Line 6	LL6mw-001	4/15/2020	9.58
RVAAP-33 Load Line 6	LL6mw-002	4/15/2020	17.53
RVAAP-33 Load Line 6	LL6mw-003	4/15/2020	13.48
RVAAP-33 Load Line 6	LL6mw-004	4/15/2020	15.01
RVAAP-33 Load Line 6	LL6mw-005	4/15/2020	10.65
RVAAP-33 Load Line 6	LL6mw-006	4/15/2020	8.51

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-33 Load Line 6	LL6mw-007	4/15/2020	2.46
RVAAP-33 Load Line 6	LL6mw-008	4/15/2020	12.52
RVAAP-33 Load Line 6	LL6mw-009	4/15/2020	12.27
RVAAP-34 Sand Creek Disposal Road Landfill	SCLmw-001	4/15/2020	3.18*
RVAAP-34 Sand Creek Disposal Road Landfill	SCLmw-002	4/15/2020	2.2*
RVAAP-34 Sand Creek Disposal Road Landfill	SCLmw-003	4/15/2020	16.49
RVAAP-38 NACA Test Area	NTAmw-107	4/13/2020	11.32
RVAAP-38 NACA Test Area	NTAmw-108	4/13/2020	16.44
RVAAP-38 NACA Test Area	NTAmw-109	4/13/2020	10.85
RVAAP-38 NACA Test Area	NTAmw-110	4/13/2020	12.85
RVAAP-38 NACA Test Area	NTAmw-111	4/13/2020	3.38
RVAAP-38 NACA Test Area	NTAmw-112	4/13/2020	4.7
RVAAP-38 NACA Test Area	NTAmw-113	4/13/2020	5.7
RVAAP-38 NACA Test Area	NTAmw-114	4/13/2020	5.08
RVAAP-38 NACA Test Area	NTAmw-115	4/13/2020	10.35
RVAAP-38 NACA Test Area	NTAmw-116	4/13/2020	4.08
RVAAP-38 NACA Test Area	NTAmw-117	4/13/2020	12.35
RVAAP-38 NACA Test Area	NTAmw-118	4/13/2020	7.6
RVAAP-38 NACA Test Area	NTAmw-119	4/13/2020	11.25
RVAAP-38 NACA Test Area	NTAmw-120	4/13/2020	32.55
RVAAP-39 Load Line 5	LL5mw-001	4/15/2020	17.7
RVAAP-39 Load Line 5	LL5mw-002	4/15/2020	18.11
RVAAP-39 Load Line 5	LL5mw-003	4/15/2020	16.46
RVAAP-39 Load Line 5	LL5mw-004	4/15/2020	15.42
RVAAP-39 Load Line 5	LL5mw-005	4/15/2020	19.8
RVAAP-39 Load Line 5	LL5mw-006	4/15/2020	17.75
RVAAP-40 Load Line 7	LL7mw-001	4/15/2020	18.28
RVAAP-40 Load Line 7	LL7mw-002	4/15/2020	13.49
RVAAP-40 Load Line 7	LL7mw-003	4/15/2020	9.32
RVAAP-40 Load Line 7	LL7mw-004	4/15/2020	12.86
RVAAP-40 Load Line 7	LL7mw-005	4/15/2020	19.56
RVAAP-40 Load Line 7	LL7mw-006	4/15/2020	8.63
RVAAP-41 Load Line 8	LL8mw-001	4/15/2020	8.55
RVAAP-41 Load Line 8	LL8mw-002	4/15/2020	15.21
RVAAP-41 Load Line 8	LL8mw-003	4/15/2020	9.9
RVAAP-41 Load Line 8	LL8mw-004	4/15/2020	5.32
RVAAP-41 Load Line 8	LL8mw-005	4/15/2020	8.77
RVAAP-41 Load Line 8	LL8mw-006	4/15/2020	17.82
RVAAP-42 Load Line 9	LL9mw-001	4/15/2020	12.79
RVAAP-42 Load Line 9	LL9mw-002	4/15/2020	6.75
RVAAP-42 Load Line 9	LL9mw-003	4/15/2020	10.55
RVAAP-42 Load Line 9	LL9mw-004	4/15/2020	17.44
RVAAP-42 Load Line 9	LL9mw-005	4/15/2020	13.24

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-42 Load Line 9	LL9mw-006	4/15/2020	15.53
RVAAP-42 Load Line 9	LL9mw-007	4/15/2020	6.84
RVAAP-43 Load Line 10	LL10mw-001	4/15/2020	21.26
RVAAP-43 Load Line 10	LL10mw-002	4/15/2020	13.81
RVAAP-43 Load Line 10	LL10mw-003	4/15/2020	16.45
RVAAP-43 Load Line 10	LL10mw-004	4/15/2020	9.79
RVAAP-43 Load Line 10	LL10mw-005	4/15/2020	12.05
RVAAP-43 Load Line 10	LL10mw-006	4/15/2020	9.01
RVAAP-44 Load Line 11	LL11mw-001	4/15/2020	7.84
RVAAP-44 Load Line 11	LL11mw-002	4/15/2020	0.2
RVAAP-44 Load Line 11	LL11mw-003	4/15/2020	0.3
RVAAP-44 Load Line 11	LL11mw-004	4/15/2020	0.3
RVAAP-44 Load Line 11	LL11mw-005	4/15/2020	4.46
RVAAP-44 Load Line 11	LL11mw-006	4/15/2020	1.51
RVAAP-44 Load Line 11	LL11mw-007	4/15/2020	13.2
RVAAP-44 Load Line 11	LL11mw-008	4/15/2020	0.3
RVAAP-44 Load Line 11	LL11mw-009	4/15/2020	1.39
RVAAP-44 Load Line 11	LL11mw-010	4/15/2020	3.09
RVAAP-44 Load Line 11	LL11mw-011	4/13/2020	7.16
RVAAP-44 Load Line 11	LL11mw-012	4/13/2020	15.3
RVAAP-49 Central Burn Pits	CBPmw-001	4/14/2020	11.97
RVAAP-49 Central Burn Pits	CBPmw-002	4/14/2020	7.42
RVAAP-49 Central Burn Pits	CBPmw-003	4/15/2020	10.85
RVAAP-49 Central Burn Pits	CBPmw-004	4/14/2020	9.72
RVAAP-49 Central Burn Pits	CBPmw-005	4/15/2020	11.1
RVAAP-49 Central Burn Pits	CBPmw-006	4/15/2020	6.82
RVAAP-49 Central Burn Pits	CBPmw-007	4/15/2020	14.1
RVAAP-49 Central Burn Pits	CBPmw-008	4/14/2020	14.88
RVAAP-49 Central Burn Pits	CBPmw-009	4/14/2020	9.12
RVAAP-50 Atlas Scrap Yard	ASYmw-001	4/16/2020	10.21
RVAAP-50 Atlas Scrap Yard	ASYmw-002	4/16/2020	13.26
RVAAP-50 Atlas Scrap Yard	ASYmw-003	4/16/2020	11.14
RVAAP-50 Atlas Scrap Yard	ASYmw-004	4/16/2020	8.27
RVAAP-50 Atlas Scrap Yard	ASYmw-005	4/16/2020	7.04
RVAAP-50 Atlas Scrap Yard	ASYmw-006	4/16/2020	13
RVAAP-50 Atlas Scrap Yard	ASYmw-007	4/16/2020	14.6
RVAAP-50 Atlas Scrap Yard	ASYmw-008	4/16/2020	4.61
RVAAP-50 Atlas Scrap Yard	ASYmw-009	4/16/2020	10.46
RVAAP-50 Atlas Scrap Yard	ASYmw-010	4/16/2020	11.37
RVAAP-66 Facility-wide Groundwater	FWGmw-001	4/14/2020	8.08
RVAAP-66 Facility-wide Groundwater	FWGmw-002	4/14/2020	22.5
RVAAP-66 Facility-wide Groundwater	FWGmw-003	4/13/2020	4.64
RVAAP-66 Facility-wide Groundwater	FWGmw-004	4/13/2020	10.85

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-66 Facility-wide Groundwater	FWGmw-005	4/13/2020	20.35
RVAAP-66 Facility-wide Groundwater	FWGmw-006	4/13/2020	3.28
RVAAP-66 Facility-wide Groundwater	FWGmw-007	4/13/2020	23.35
RVAAP-66 Facility-wide Groundwater	FWGmw-008	4/13/2020	4.76
RVAAP-66 Facility-wide Groundwater	FWGmw-009	4/13/2020	1.15
RVAAP-66 Facility-wide Groundwater	FWGmw-010	4/15/2020	9.06
RVAAP-66 Facility-wide Groundwater	FWGmw-011	4/15/2020	1.4
RVAAP-66 Facility-wide Groundwater	FWGmw-012	4/15/2020	0
RVAAP-66 Facility-wide Groundwater	FWGmw-013	4/13/2020	18.32
RVAAP-66 Facility-wide Groundwater	FWGmw-014	4/13/2020	2.87
RVAAP-66 Facility-wide Groundwater	FWGmw-015	4/13/2020	3.68
RVAAP-66 Facility-wide Groundwater	FWGmw-016	4/13/2020	15.65
RVAAP-66 Facility-wide Groundwater	FWGmw-018	4/16/2020	19.88
RVAAP-66 Facility-wide Groundwater	FWGmw-019	4/15/2020	114.09
RVAAP-66 Facility-wide Groundwater	FWGmw-020	4/16/2020	20.73
RVAAP-66 Facility-wide Groundwater	FWGmw-021	4/16/2020	18.43
RVAAP-66 Facility-wide Groundwater	FWGmw-022	4/15/2020	113.21
RVAAP-66 Facility-wide Groundwater	FWGmw-023	4/15/2020	116.08
RVAAP-66 Facility-wide Groundwater	FWGmw-024	4/16/2020	13.11
RVAAP-66 Facility-wide Groundwater	SCFmw-001	4/15/2020	88.24
RVAAP-66 Facility-wide Groundwater	SCFmw-002	4/16/2020	18.22
RVAAP-66 Facility-wide Groundwater	SCFmw-003	4/15/2020	7.34
RVAAP-66 Facility-wide Groundwater	SCFmw-004	4/15/2020	0
RVAAP-66 Facility-wide Groundwater	SCFmw-005	4/15/2020	9.02
RVAAP-66 Facility-wide Groundwater	SCFmw-006	4/14/2020	17
RVAAP-66 Facility-wide Groundwater	BKGmw-004	4/14/2020	12.41
RVAAP-66 Facility-wide Groundwater	BKGmw-005	4/13/2020	9.87
RVAAP-66 Facility-wide Groundwater	BKGmw-006	4/14/2020	23.45
RVAAP-66 Facility-wide Groundwater	BKGmw-008	4/14/2020	15.15
RVAAP-66 Facility-wide Groundwater	BKGmw-010	4/14/2020	13.31
RVAAP-66 Facility-wide Groundwater	BKGmw-012	4/14/2020	8.08
RVAAP-66 Facility-wide Groundwater	BKGmw-013	4/16/2020	11.54
RVAAP-66 Facility-wide Groundwater	BKGmw-015	4/14/2020	48.62
RVAAP-66 Facility-wide Groundwater	BKGmw-016	4/13/2020	5.28
RVAAP-66 Facility-wide Groundwater	BKGmw-017	4/13/2020	17.7
RVAAP-66 Facility-wide Groundwater	BKGmw-018	4/14/2020	15.5
RVAAP-66 Facility-wide Groundwater	BKGmw-019	4/13/2020	18.8
RVAAP-66 Facility-wide Groundwater	BKGmw-020	4/13/2020	6.98
RVAAP-66 Facility-wide Groundwater	BKGmw-021	4/15/2020	12.08
RVAAP-66 Facility-wide Groundwater	BKGmw-022	4/13/2020	13.94
RVAAP-66 Facility-wide Groundwater	BKGmw-023	4/13/2020	3.59
RVAAP-66 Facility-wide Groundwater	BKGmw-024	4/14/2020	10.17
RVAAP-66 Facility-wide Groundwater	BKGmw-025	4/13/2020	40.97

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

RVAAP Facility Wide Monitoring Well Gauging Results			
April 2020			
RVAAP Area	Well ID	Date Gauged	Depth to Water (below TOC)
RVAAP-69 Building 1048 Fire Station	069mw-001	4/13/2020	5.72
RVAAP-69 Building 1048 Fire Station	069mw-002	4/13/2020	5.94
RVAAP-69 Building 1048 Fire Station	069mw-003	4/13/2020	12.57
RVAAP-69 Building 1048 Fire Station	069mw-004	4/13/2020	9.78
RVAAP-69 Building 1048 Fire Station	069mw-005	4/13/2020	8.67
RVAAP-69 Building 1048 Fire Station	069mw-006	4/13/2020	10.53
RVAAP-69 Building 1048 Fire Station	069mw-007	4/13/2020	11.63
RVAAP-69 Building 1048 Fire Station	069mw-008	4/13/2020	9.37
RVAAP-69 Building 1048 Fire Station	069mw-009	4/13/2020	6.03
RVAAP-74 Building 1034 Motor Pool Hydraulic Lift	074mw-001	4/13/2020	10.57
RVAAP-74 Building 1034 Motor Pool Hydraulic Lift	074mw-002	4/13/2020	10.45
RVAAP-74 Building 1034 Motor Pool Hydraulic Lift	074mw-003	4/13/2020	12.5

Note: *indicates depth to top of pump, groundwater was below top of pump and could not be gauged

APPENDIX B

Summary of Groundwater Monitoring Well Conditions and Repair Recommendations

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RVAAP Facility-Wide Monitoring Well Conditions April 2020

Well ID	Date Gauged	Repairs Needed
RQLmw-006	4/15/2020	Metal box top hinge is rusted off of casing, but still secured by lock.
RQLmw-007	4/15/2020	None
RQLmw-008	4/15/2020	Metal box top hing is rusted off of casing, but still secured by lock.
RQLmw-009	4/15/2020	Metal box top hinge is rusted off of casing, but still secured by lock.
RQLmw-010	4/15/2020	Metal box top hinge is rusted off of casing, but still secured by lock.
RQLmw-011	4/15/2020	Concrete pad is cracked, metal box hinge is rusted off of casing but is still secured with lock.
RQLmw-012	4/15/2020	None
RQLmw-013	4/15/2020	None
RQLmw-014	4/15/2020	None
RQLmw-015	4/15/2020	None
RQLmw-016	4/15/2020	None
RQLmw-017	4/15/2020	None
EBGmw-123	4/14/2020	None
EBGmw-124	4/14/2020	None
EBGmw-125	4/14/2020	None
EBGmw-126	4/14/2020	Repaint casing and ID.
EBGmw-127	4/14/2020	None
EBGmw-128	4/14/2020	None
EBGmw-129	4/14/2020	None
EBGmw-130	4/14/2020	None
EBGmw-131	4/14/2020	None
DA2mw-104	4/14/2020	Concrete pad removed, posts heaved. Repaint casing and ID.
DA2mw-105	4/15/2020	Concrete pad is heaved. Repaint casing and ID.
DA2mw-106	4/14/2020	One post is leaning, concrete pad is heaved
DA2mw-107	4/14/2020	None
DA2mw-108	4/14/2020	Repaint casing and ID.
DA2mw-109	4/14/2020	No concrete pad. Repaint casing and ID.
DA2mw-110	4/14/2020	Concrete pad removed. Repaint casing and ID.
DA2mw-111	4/14/2020	Concrete pad is heaved. Repaint casing and ID.
DA2mw-112	4/14/2020	Repaint casing and ID.
DA2mw-113	4/14/2020	Repaint casing and ID.
DA2mw-114	4/14/2020	Casing and posts are painted white.
DA2mw-115	4/14/2020	Casing and posts are painted white.
DETmw-001B	4/14/2020	Concrete pad removed. Repaint casing and ID.
DETmw-002	4/14/2020	One post is leaning.
DETmw-003	4/14/2020	Repaint casing and ID.
DETmw-004	4/14/2020	None
WBGmw-005	4/14/2020	Metal box hinge is rusted and does not close properly.
WBGmw-006	4/14/2020	Repaint casing and ID.
WBGmw-007	4/14/2020	No ID on ballistics casing, metal box hinge is rusted and does not close properly.
WBGmw-008	4/14/2020	No ID on ballistics casing.
WBGmw-009	4/14/2020	Repaint ID on ballistics casing. Metal box hinge is rusted and does not close properly.
WBGmw-010	4/14/2020	One post is leaning over. Concrete pad is heaved. Repaint casing and ID.
WBGmw-011	4/14/2020	Repaint ID on ballistics casing.
WBGmw-012	4/14/2020	One post leaning over, concrete pad is frost heaved.
WBGmw-013	4/14/2020	Repaint casing and ID.
WBGmw-014	4/14/2020	Posts are bent, concrete pad is heaved no ID on ballistics casing.
WBGmw-015	4/14/2020	One post is bent, concrete pad is heaved no ID on ballistics casing.
WBGmw-016	4/14/2020	Repaint casing and ID.
WBGmw-017	4/14/2020	Concrete pad is heaved, repaint casing and ID.
WBGmw-018	4/14/2020	Concrete pad is cracked, no ID present.
WBGmw-019	4/14/2020	Concrete pad is cracked, no ID present.
WBGmw-020	4/14/2020	No ID present.
WBGmw-021	4/14/2020	No ID present.
CBLmw-001	4/13/2020	None
CBLmw-002	4/13/2020	None
CBLmw-003	4/13/2020	None
CBLmw-004	4/13/2020	None
CBLmw-005	4/13/2020	None
LL1mw-063	4/16/2020	None
LL1mw-064	4/15/2020	Potentially replace top of PVC where chunk is missing.
LL1mw-065	4/15/2020	None
LL1mw-067	4/16/2020	None

RVAAP Facility-Wide Monitoring Well Conditions April 2020

Well ID	Date Gauged	Repairs Needed
LL1mw-078	4/16/2020	None
LL1mw-079	4/16/2020	One post is leaning, concrete pad is cracked, repaint casing and ID.
LL1mw-080	4/16/2020	None
LL1mw-081	4/16/2020	Repaint casing and ID.
LL1mw-082	4/16/2020	Repaint casing and ID.
LL1mw-083	4/16/2020	Repaint casing and ID.
LL1mw-084	4/16/2020	Repaint casing and ID.
LL1mw-085	4/16/2020	None
LL1mw-086	4/15/2020	None
LL1mw-087	4/15/2020	Repaint casing and ID.
LL1mw-088	4/16/2020	No paint or ID present on casing.
LL1mw-089	4/16/2020	None
LL2mw-059	4/16/2020	None
LL2mw-060	4/15/2020	None
LL2mw-261	4/16/2020	None
LL2mw-262	4/16/2020	None
LL2mw-263	4/16/2020	Concrete pad heaved.
LL2mw-264	4/16/2020	Repaint casing and ID.
LL2mw-265	4/15/2020	None
LL2mw-266	4/16/2020	None
LL2mw-267	4/16/2020	Repaint casing and ID.
LL2mw-268	4/16/2020	One post is leaning.
LL2mw-269	4/16/2020	None
LL2mw-270	4/16/2020	Repaint casing and ID.
LL2mw-271	4/16/2020	None
LL2mw-272	4/16/2020	None
LL3mw-232	4/16/2020	Repaint casing and ID.
LL3mw-233	4/16/2020	Repaint casing and ID.
LL3mw-234	4/16/2020	Repaint casing and ID.
LL3mw-235	4/16/2020	Repaint casing and ID.
LL3mw-236	4/16/2020	Repaint casing and ID.
LL3mw-237	4/16/2020	Repaint casing and ID.
LL3mw-238	4/16/2020	Repaint casing and ID.
LL3mw-239	4/16/2020	Repaint ID.
LL3mw-240	4/16/2020	One post is leaning. Concrete pad heaved.
LL3mw-241	4/16/2020	Repaint casing and ID.
LL3mw-242	4/16/2020	Concrete pad heaved.
LL3mw-243	4/16/2020	None
LL3mw-244	4/16/2020	None
LL3mw-245	4/16/2020	None
LL3mw-246	4/16/2020	None
LL4mw-193	4/16/2020	None
LL4mw-194	4/16/2020	None
LL4mw-195	4/16/2020	None
LL4mw-196	4/16/2020	One post is leaning.
LL4mw-197	4/16/2020	One post is leaning.
LL4mw-198	4/16/2020	None
LL4mw-199	4/16/2020	None
LL4mw-200	4/16/2020	None
LL4mw-201	4/16/2020	None
LL12mw-088	4/15/2020	None
LL12mw-107	4/15/2020	None
LL12mw-113	4/15/2020	Repaint ID.
LL12mw-128	4/15/2020	None
LL12mw-153	4/15/2020	Concrete pad is heaved.
LL12mw-154	4/15/2020	None
LL12mw-182	4/15/2020	None
LL12mw-182ss	4/15/2020	None
LL12mw-183	4/15/2020	One post leaning over.
LL12mw-184	4/15/2020	Clear vegetation surrounding well.
LL12mw-185	4/15/2020	None
LL12mw-186	4/16/2020	None
LL12mw-187	4/15/2020	None
LL12mw-188	4/15/2020	None
LL12mw-189	4/16/2020	None

RVAAP Facility-Wide Monitoring Well Conditions April 2020

Well ID	Date Gauged	Repairs Needed
LL12mw-242	4/15/2020	Repaint casing and ID.
LL12mw-243	4/15/2020	None
LL12mw-244	4/15/2020	Concrete pad heaved.
LL12mw-245	4/15/2020	None
LL12mw-246	4/15/2020	None
LL12mw-247	4/16/2020	None
B12mw-010	4/14/2020	One post is leaning, repaint casing and ID.
B12mw-011	4/14/2020	Repaint casing and ID.
B12mw-012	4/14/2020	Repaint casing and ID.
B12mw-013	4/14/2020	None
FBQmw-166	4/16/2020	Concrete pad heaved.
FBQmw-167	4/16/2020	None
FBQmw-168	4/16/2020	None
FBQmw-169	4/16/2020	None
FBQmw-170	4/16/2020	Concrete pad heaved.
FBQmw-171	4/16/2020	None
FBQmw-172	4/16/2020	Repaint casing and ID, clear fallen trees in area.
FBQmw-173	4/16/2020	Repaint casing and ID, clear fallen trees in area.
FBQmw-174	4/16/2020	Concrete pad heaved.
FBQmw-175	4/16/2020	None
FBQmw-176	4/16/2020	Concrete pad heaved.
FBQmw-177	4/16/2020	Concrete pad heaved.
LNWmw-024	4/14/2020	Repaint casing and ID.
LNWmw-025	4/14/2020	Repaint casing and ID.
LNWmw-026	4/14/2020	Repaint casing and ID.
LNWmw-027	4/14/2020	None
MBSmw-001	4/16/2020	None
MBSmw-002	4/16/2020	Repaint casing and ID. Concrete pad is loose.
MBSmw-003	4/16/2020	Concrete at posts heaved.
MBSmw-004	4/16/2020	Concrete pad heaved. Repaint casing and ID.
MBSmw-005	4/16/2020	Concrete pad heaved. Repaint casing and ID.
MBSmw-006	4/16/2020	Repaint casing and ID. Repaint posts.
CPmw-001	4/15/2020	None
CPmw-002	4/15/2020	Concrete pad heaved. Well vault needs replaced, hole in vault is letting surface water in.
CPmw-003	4/15/2020	Concrete pad heaved. Flushmount bolt holders are stripped, need re-threading and bolts.
CPmw-004	4/14/2020	None
CPmw-005	4/14/2020	Concrete pad is heaving.
CPmw-006	4/14/2020	None
LL6mw-001	4/15/2020	Repaint casing and ID for post (flushmount well).
LL6mw-002	4/15/2020	Repaint casing and ID.
LL6mw-003	4/15/2020	Repaint casing and ID.
LL6mw-004	4/15/2020	Repaint casing and ID.
LL6mw-005	4/15/2020	Repaint casing and ID.
LL6mw-006	4/15/2020	Flushmount bolt holders are stripped, need re-threading and bolts. Repaint posts and ID.
LL6mw-007	4/15/2020	Flushmount bolt holders are stripped, need re-threading and bolts.
LL6mw-008	4/15/2020	None
LL6mw-009	4/15/2020	None
SCLmw-001	4/15/2020	None
SCLmw-002	4/15/2020	None
SCLmw-003	4/15/2020	None
NTAmw-107	4/13/2020	None
NTAmw-108	4/13/2020	None
NTAmw-109	4/13/2020	Concrete pad heaved and loose. Repaint casing and ID.
NTAmw-110	4/13/2020	Repaint casing and ID.
NTAmw-111	4/13/2020	Repaint casing and ID.
NTAmw-112	4/13/2020	One Post is leaning. Repaint casing and ID.
NTAmw-113	4/13/2020	Repaint casing and ID.
NTAmw-114	4/13/2020	Repaint casing and ID.
NTAmw-115	4/13/2020	None
NTAmw-116	4/13/2020	Repaint casing and ID.
NTAmw-117	4/13/2020	Repaint casing and ID.
NTAmw-118	4/13/2020	Repaint casing and ID.

RVAAP Facility-Wide Monitoring Well Conditions April 2020

Well ID	Date Gauged	Repairs Needed
NTAmw-119	4/13/2020	Repaint casing and ID.
NTAmw-120	4/13/2020	None
LL5mw-001	4/15/2020	Repaint ID.
LL5mw-002	4/15/2020	Repaint ID
LL5mw-003	4/15/2020	Repaint ID
LL5mw-004	4/15/2020	Repaint ID, replace compression cap.
LL5mw-005	4/15/2020	Repaint ID.
LL5mw-006	4/15/2020	Repaint ID.
LL7mw-001	4/15/2020	Repaint ID.
LL7mw-002	4/15/2020	Repaint ID.
LL7mw-003	4/15/2020	Repaint ID.
LL7mw-004	4/15/2020	One post is leaning. Repaint ID.
LL7mw-005	4/15/2020	Repaint ID.
LL7mw-006	4/15/2020	Repaint ID.
LL8mw-001	4/15/2020	One post heaved.
LL8mw-002	4/15/2020	Repaint ID.
LL8mw-003	4/15/2020	None
LL8mw-004	4/15/2020	None
LL8mw-005	4/15/2020	Repaint ID.
LL8mw-006	4/15/2020	Repaint ID.
LL9mw-001	4/15/2020	None
LL9mw-002	4/15/2020	Repaint casing and ID.
LL9mw-003	4/15/2020	One post is leaning, pad is heaved. Repaint casing and ID.
LL9mw-004	4/15/2020	Well casing is loose at surface, repaint casing and ID.
LL9mw-005	4/15/2020	One post is leaning, repaint casing and ID.
LL9mw-006	4/15/2020	Repaint casing and ID.
LL9mw-007	4/15/2020	Repaint ID.
LL10mw-001	4/15/2020	Repaint ID.
LL10mw-002	4/15/2020	Repaint ID.
LL10mw-003	4/15/2020	Posts are rusted, leaning, and frost heaved. Repaint posts and ID on casing.
LL10mw-004	4/15/2020	Concrete pad is cracked in half. Repaint ID.
LL10mw-005	4/15/2020	Repaint posts and ID on casing.
LL10mw-006	4/15/2020	Concrete pad is cracked.
LL11mw-001	4/15/2020	Repaint ID. Well casing loose at surface.
LL11mw-002	4/15/2020	Repaint posts and ID.
LL11mw-003	4/15/2020	Repaint ID on posts.
LL11mw-004	4/15/2020	None
LL11mw-005	4/15/2020	Repaint posts and ID.
LL11mw-006	4/15/2020	Repaint posts and ID.
LL11mw-007	4/15/2020	Repaint ID.
LL11mw-008	4/15/2020	Repaint posts and ID.
LL11mw-009	4/15/2020	Repaint posts and ID. Well casing is not painted.
LL11mw-010	4/15/2020	Repaint casing and ID.
LL11mw-011	4/13/2020	None
LL11mw-012	4/13/2020	Concrete Pad is cracked.
CBPmw-001	4/14/2020	Clear access road priot to next event.
CBPmw-002	4/14/2020	Clear access road priot to next event.
CBPmw-003	4/15/2020	Repaint ID.
CBPmw-004	4/14/2020	Clear access road priot to next event.
CBPmw-005	4/15/2020	Replace weatherproof lock. Repaint ID.
CBPmw-006	4/15/2020	Repaint casing and ID.
CBPmw-007	4/15/2020	Concrete pad is heaved.
CBPmw-008	4/14/2020	Clear vegetation in rail bed leading to well prior to next event.
CBPmw-009	4/14/2020	Clear access road priot to next event. Well casing and posts are white paint.
ASYmw-001	4/16/2020	Dent in well casing, not affecting integrity.
ASYmw-002	4/16/2020	Concrete pad heaved.
ASYmw-003	4/16/2020	None
ASYmw-004	4/16/2020	None
ASYmw-005	4/16/2020	None
ASYmw-006	4/16/2020	None
ASYmw-007	4/16/2020	None
ASYmw-008	4/16/2020	None
ASYmw-009	4/16/2020	None
ASYmw-010	4/16/2020	None
FWGmw-001	4/14/2020	None

RVAAP Facility-Wide Monitoring Well Conditions April 2020

Well ID	Date Gauged	Repairs Needed
FWGmw-002	4/14/2020	Repaint casing and posts yellow (currently white).
FWGmw-003	4/13/2020	Repaint casing and ID.
FWGmw-004	4/13/2020	Repaint casing and ID.
FWGmw-005	4/13/2020	None
FWGmw-006	4/13/2020	None
FWGmw-007	4/13/2020	Concrete pad is cracked. Repaint casing and ID.
FWGmw-008	4/13/2020	Repaint casing and ID.
FWGmw-009	4/13/2020	Repaint casing and ID.
FWGmw-010	4/15/2020	Repaint casing and ID.
FWGmw-011	4/15/2020	Repaint casing and posts yellow (currently white).
FWGmw-012	4/15/2020	Repaint casing and posts yellow (currently white).
FWGmw-013	4/13/2020	Concrete pad is cracked.
FWGmw-014	4/13/2020	None
FWGmw-015	4/13/2020	Repaint casing and ID.
FWGmw-016	4/13/2020	None
FWGmw-018	4/16/2020	None
FWGmw-019	4/15/2020	None
FWGmw-020	4/16/2020	None
FWGmw-021	4/16/2020	None
FWGmw-022	4/15/2020	None
FWGmw-023	4/15/2020	None
FWGmw-024	4/16/2020	None
SCFmw-001	4/15/2020	None
SCFmw-002	4/16/2020	None
SCFmw-003	4/15/2020	None
SCFmw-004	4/15/2020	Need vegetation clearing around well prior to next event. Repaint casing and ID.
SCFmw-005	4/15/2020	None
SCFmw-006	4/14/2020	None
BKGmw-004	4/14/2020	Repaint casing and ID.
BKGmw-005	4/13/2020	Blue QED cap is cracked.
BKGmw-006	4/14/2020	Repaint casing and ID. Clear fallen trees on Wadsworth Rd.
BKGmw-008	4/14/2020	None
BKGmw-010	4/14/2020	None
BKGmw-012	4/14/2020	None
BKGmw-013	4/16/2020	None
BKGmw-015	4/14/2020	Repaint casing and ID.
BKGmw-016	4/13/2020	None
BKGmw-017	4/13/2020	Repaint casing and ID.
BKGmw-018	4/14/2020	Repaint posts, casing, and ID.
BKGmw-019	4/13/2020	None
BKGmw-020	4/13/2020	None
BKGmw-021	4/15/2020	Repaint casing and ID.
BKGmw-022	4/13/2020	None
BKGmw-023	4/13/2020	None
BKGmw-024	4/14/2020	None
BKGmw-025	4/13/2020	None
069mw-001	4/13/2020	None
069mw-002	4/13/2020	Concrete pad is heaved and cracked. Repaint ID.
069mw-003	4/13/2020	None
069mw-004	4/13/2020	Bolt holders stripped, need re-threading. No ID. Bentonite/sand are built up in well vault.
069mw-005	4/13/2020	Bolt holders stripped. No ID.
069mw-006	4/13/2020	Concrete pad heaved.
069mw-007	4/13/2020	Concrete pad heaved.
069mw-008	4/13/2020	No ID.
069mw-009	4/13/2020	None
074mw-001	4/13/2020	None
074mw-002	4/13/2020	None
074mw-003	4/13/2020	No ID.

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APPENDIX C

Field Change Requests

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FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_001
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Monitoring Well Total Depth Collection

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802

SIGNATURE 10/4/18 DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)
Section 3.8 Monitoring Well Network Review

DESCRIPTION OF CHANGE:
Section 3.8 of the RI Work Plan specifies that total well depths will be measured during the annual, comprehensive water level measurements at each monitoring well within Camp Ravenna. However, permanent bladder pumps have been placed in monitoring wells. Therefore, total depths of the wells will not be collected during the comprehensive water level measurements for each well within the network.

JUSTIFICATION:
Removal of the permanent bladder pumps during the comprehensive annual water level measurement activity may disturb the groundwater within the monitoring well prior to sampling.

IMPACT OF NOT IMPLEMENTING REQUEST:
See justification.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Leidos field teams.

COST ESTIMATE: $0 (No cost impact to USACE)

Estimator Signature: Not applicable DATE

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

APPROVAL SIGNATURES:

USACE Representative TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2018.10.10 09:26:27 -04'00' 10 Oct 2018 DATE

Ohio EPA Project Coordinator 11-7-18 DATE

Leidos H&S Manager (if applicable) Not applicable DATE

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_004
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Groundwater Quality Control (QC) Sampling Frequency

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802

SIGNATURE 10/4/18 DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)

DESCRIPTION OF CHANGE:
Worksheet 20 of the RI Work Plan QAPP discusses the Field Quality Control Sample Summary. This section indicates that "The frequency and location of field quality control samples (e.g. field duplicates, MS/MSD samples, etc.) are specified in Section 3.0 of the WP."

However, Section 3.0 of the RI Work Plan does not discuss field quality control samples. For documentation purposes, below is what will be collected with respect to field quality control samples. This is consistent with the specifications provided in the Facility-wide Sampling and Analysis Plan.

- Field duplicate – collected at 10% frequency
- Split samples – collected at 10% frequency
- MS/MSD samples – collected at 5% frequency
- Equipment rinsate – not required due to use of dedicated equipment (e.g., in place bladder pumps).

JUSTIFICATION:
The justification for this field change request is to document and obtain concurrence of the frequency at which groundwater quality control samples will be collected and analyzed.

IMPACT OF NOT IMPLEMENTING REQUEST:
The impact of not implementing the request is potential disagreement regarding the quality control sample collection requirements.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Leidos field teams and laboratory.

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_004
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Groundwater Quality Control (QC) Sampling Frequency

COST ESTIMATE: $0 (No cost impact to USACE)

Estimator Signature:	Not applicable	DATE

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

APPROVAL SIGNATURES:

USACE Representative	TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2018.10.10 09:20:11 -04'00'	10 Oct 2018 DATE
Ohio EPA Project Coordinator	[signature]	11-7-18 DATE
Leidos H&S Manager (if applicable)	Not applicable	DATE

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_006
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Micro-Purge Procedure

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802

SIGNATURE 10/26/18 DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)
Main Text: Section 3.7 2016 FWGW Monitoring Program and RI Groundwater Sampling
Appendix A: Sampling and Analysis Plan, Section 4.9.1 Micro-Purge Procedure

DESCRIPTION OF CHANGE:
Section 3.7 of the Main Text and Section 4.9.1 of Appendix A have some variances regarding the micro-purge procedure and stabilization parameters. This request is to document the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.

Micro-purge Procedure
Step 1. Connect all applicable hoses at the surface.

Step 2. Turn the pump on and begin purging two times the amount of any stagnant water in the pump and tubing. (This purging does not represent a parameter for sampling.) For micro-purging, the pumping rate will not exceed 100 milliliters per minute (mL/min), unless it can be shown that higher purge rates (maximum of 500 mL/min) will not result in a drawdown greater than 0.3 ft. The pump rate is established once drawdown has been stabilized.

Step 3. After two times the amount of stagnant water has been purged from the pump and tubing and water level drawdown has been stabilized, begin recording water quality parameters every 3 to 5 minutes on the Groundwater Sample Form.

Step 4. Continue purging until water quality parameters have stabilized. Stabilization of water quality parameters is defined as three consecutive readings shown in Table 1.

Step 5. Collect sample immediately after micro-purging.

Additional Guidance
Minimum purging – A minimum of two times the volume of the pump and tubing quantity containing stagnant water must be purged.

Turbidity - If the turbidity cannot be reduced to less than or equal to 10 NTUs after 2 hours of purging and if all other parameters are stable, the well will be sampled.

Sample Collection for Metals - If turbidity is below 50 NTUs at the time of sampling, the sample collected for metals will not require filtering. If the turbidity cannot be brought below 50 NTUs, then both an unfiltered and a filtered sample will be collected for metals analysis, each in their own separate pre-preserved container. The unfiltered sample will be collected first. The filtered sample will be collected through a 5-micron filter.

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_006
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Micro-Purge Procedure

Table 1. Water Quality Stabilization Requirements for Micro-purging

Water Quality Parameter	Stabilization Requirement
pH	± 0.1 SU
Conductivity	± 3%
ORP	± 20mV
Turbidity	≤ 10 NTU
DO	± 10% or 0.2 mg/L (whichever is greater)
Temperature	± 0.5 degC

JUSTIFICATION:
Section 3.7 of the Main Text and Section 4.9.1 of Appendix A have some variances regarding the micro-purge procedure and stabilization parameters.

IMPACT OF NOT IMPLEMENTING REQUEST:
The field teams implementing micro-purge groundwater sampling may use different stabilization requirements for guidance regarding when a groundwater sample can be collected.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Groundwater sampling staff.

COST ESTIMATE: $0 (No cost impact to USACE)

Estimator Signature: Not applicable DATE

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

APPROVAL SIGNATURES:

USACE Representative TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2018.11.08 06:40:45 -05'00' 7 Nov 2018 DATE

Ohio EPA Project Coordinator [signature] 11-7-18 DATE

Leidos H&S Manager (if applicable) Not applicable DATE

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_010
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Post-Sample Water Quality Measurements

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802

SIGNATURE 10/2/19
DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Revised Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-Wide Groundwater (dated 9/21/16), Section 3.7 2016 FWGW Monitoring Program and RI Groundwater Sampling

DESCRIPTION OF CHANGE:
Section 3.7 of the RI Work Plan specifies that "Following completion of groundwater sampling, a final set of groundwater quality parameters will be measured and recorded." These post-sample water quality parameters are not used and may not be an accurate characterization of the groundwater samples. Rather, the water quality parameters recorded at the time stabilization is achieved (immediately before sampling) are the parameters entered into the database and used for evaluation.

To ensure the appropriate water quality parameters are entered in the database, this FCR removes the requirement to collect a final set of groundwater quality parameters following the completion of groundwater sampling.

JUSTIFICATION:
The water quality parameters recorded at the time stabilization is achieved (immediately before sampling) are the parameters entered into the database and used for evaluation. The post-sample water quality parameters are not entered in the database, nor are they used for any evaluation of groundwater characteristics. Recording the post-sample water quality parameters may result in an incorrect data entry.

IMPACT OF NOT IMPLEMENTING REQUEST:
See justification.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Leidos

FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_010
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Post-Sample Water Quality Measurements

COST ESTIMATE: $0 (No cost impact to USACE)		
Estimator Signature:	Not applicable	DATE
PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.		
APPROVAL SIGNATURES:		
USACE Representative	TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2019.10.07 07:18:45 -04'00'	7 Oct 2019 DATE
Ohio EPA Project Coordinator	[signature]	10-8-19 DATE
Leidos H&S Manager (if applicable)	Not applicable	DATE

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APPENDIX D

Field Forms

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D.1 Task Team Activity Log Sheets

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater **PROJECT NO:** April 2020 Sampling Event
RVAAP-66

Date: (mm/dd/yy): 04/13/2020 Page 1 of 1

Task Team Members:

Heather Adams
Ryan Laurich
Rich Sprinzl
Danielle Anderson

Narrative (include time and location):

0700 Heather & Ryan onsite to meet Kevin and get keys.
0715 Kevin departs and Heather & Ryan ~~depart~~ 4/13/20 begin prep for well gauging. Kevin took photo of gas meter.
0740 Heather heads to range control for access approval. All areas open no restrictions.
0755 Rich & Danielle onsite and load trucks.
0815 Conduct HRS brief and daily tailgate.
0850 Vista onsite talked about restricting access to area will assess tomorrow, but Leidos requested that they stay clear of 1036 and use face covering if entering.
0900 Crews depart 1036 to begin gauging.
0905 Pine onsite, Heather heads out to pick-up 3 drums and one Horiba from the Bullpin.
0915 Heather back onsite.
0940 Lab called and wants to come earlier to prop-off bottles. Heavy rain has started.
1120 Bottle order arrives Brent will be our sample pick-up contact for the project
1300 Wind is starting to pick-up called CNWS to make sure they are working in open areas. Crews have been moved to locations w/ open areas not near woods. (Admin Area).
1600. Call range control off site end of day.

Daily Weather Condition: A.M. 59°F overcast/raining.

P.M. 40°F rainy, very windy, cool.

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/13/20 Page 1 of 1

Task Team Members:

Ryan Laurich
Heather Adams
Rich Sprinzl
Danielle Anderson

Narrative (include time and location):

0755 arrive at building 1036 and load Truck
0815 H+S Tailgate
~~0850~~ 0900 DA 04/13/20 Depart Building 1036 for perimeter wells
0915 Danielle and Rich arrive at FWG-007 → DA 04/13/20 1300 Heather calls Rich tells us to work our way Back to 1036
DA 04/13/20 ~~0~~1313 Danielle and Rich complete west perimeter wells
1315 Danielle and Rich Guage LL11-011 and LL11-012 wells
1335 Danielle and Rich Guage BKG-020
1430 Danielle and Rich Building 1048 Fire Station wells
1545 Danielle and Rich Complete Building 1048 Fire Station wells
1550 Danielle and Rich return to 1036 to demobilize
~~1551~~ 1600 Danielle offsite for the day
DA 04/13/20

DA 04/13/20

Daily Weather Condition: A.M. 59°F Cloudy Humid rain
P.M. 48°F Cloudy Humid windy

Recorded By: [signature] (Signature) QC Checked by: [signature]

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 4/13/20 Page 1 of 1

Task Team Members:

Ryan Laurich

RL 4/13/20 RL 4/13/20

Narrative (include time and location):

0845 - COMPLETE H+S TAILGATE

0855 - DEPART 1036.

0910 - ARRIVE AT C-BLOCK QUARRY

1034 ~~1018~~ - DEPART C-BLOCK QUARRY, GAUGING COMPLETE.

1040 - ARRIVE AT NACA TEST AREA

1410 - GAUGING COMPLETE AT NACA.

1411 - TRY TO ACCESS MUSTARD BURIAL SITE BUT THERE IS A LARGE TREE BLOCKING THE ACCESS PATH.

1430 - RETURN TO 1036 TO NOTIFY HEATHER, GET LIST OF ADDITIONAL WELLS TO GAUGE.

1535 - RETURN TO 1036 + DEMOB, FINISHED GAUGING FWG MW -015, -016 AND -004, AND BUILDING 1034.

1550 - DEPART SITE.

RL 4/15/20

Daily Weather Condition: A.M. 60°F, CLOUDY, LT. RAIN

P.M. 57°F, CLOUDY

Recorded By: [signature] (Signature) QC Checked by: [signature] 7/7/2020 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater
RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/2020

Page 1 of 2

Task Team Members:

HEATHER ADAMS
DANIELLE ANDERSON
Ryan LAURICH
Rich SPRINZL

Narrative (include time and location):

0655 HEATHER & DANIELLE ONSITE.
0705 HEATHER HEADS TO RANGE CONTROL FOR DAILY ACCESS APPROVAL.
-ALL AREAS OPEN, NO RESTRICTIONS.
RICH - EBG and WELLS NORTH OF SMALLEY & BIRCH.
Ryan & DANIELLE - DAZ, WBG, & LMWBG.
0740 Ryan & RICH ONSITE.
0715 CONDUCT H&S TAILGATE ATTENDED BY ALL.
0740 CREWS DEPART 1036.
0805 HEATHER CALLS Range Control TO HAVE GATE TO WBG OPENED.
ALSO SENT TEXT TO CREWS about REVISED PLAN FOR TASK ACTIVITY LOGS AND INSPECTION CHECKLIST QA/REVIEW PLAN in light of COVID SAFETY MEASURES AND WORKS ON PAPER WORK.
0855 Ryan CALLS TO SAY THAT DANIELLE'S TRUCK IS STUCK IN DITCH AT DAZ MW-111. HEATHER CALLS AL w/ VISTA TO REQUEST TOW AND LEFT VOICMAIL.
0907 AL RETURN call and says THAT HE WILL SEND GARY TO ASSESS. MEANWHILE HEATHER HEADS TO THE SITE W/ TOW STRAPS.
0915 BEGIN pulling TRUCK OUT (HEATHER AND DANIELLE).
0954 TRUCK IS OUT HEATHER CALLS AL TO INFORM SINCE GARY DID NOT SHOW UP YET. CONDUCT lessons LEARNED W/ DANNIELLE AND RYAN.
1015 HEATHER RETURN TO 1036. RICH TEXT ABOUT WELLS @ EBG THAT DO NOT HAVE WEEP HOLES and QUESTIONS IF THIS IS A REPAIR THAT

Daily Weather Condition: A.M. 35°F, SUNNY, COOL, NO WIND OR RAIN.

P.M. —

Recorded By: (Signature)

QC Checked by: (Signature)

07-162(NE)/102507

FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater
RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/2020ED

Page 2 of 2

Task Team Members:

SEE PAGE 1

Narrative (include time and location):

VISTA WILL DO IN THE FUTURE. EMAIL SENT TO JED.
1130 Email Project Team WELL INSPECTION NOTES FROM TODAY
1535 RYAN AND DANIELLE RETURN TO 1036. END OFF DAY.
1540 RICH RETURNS TO 1036.
1600 All CREWS OFF SITE END OF DAY. HEATHER calls Range Control TO NOTIFY OFF SITE.

04/14/2020

Daily Weather Condition: A.M. 35°F Sunny, cool, no wind or Rain.

P.M. 40°F PM Sunny, cool

Recorded By: (Signature)

QC Checked by: (Signature)

07-162(NE)/102507

FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/20 Page 1 of 2

Task Team Members:

Danielle Anderson Rich Sprinzl

Heather Adams

Ryan Laurich

Narrative (include time and location):

0650 Arrive at RVAAP Gate

0700 Arrive at 1036 and mobilize for the day

0715 Attend H&S meeting presented by Heather

0745 Depart from 1036 with Ryan

0755 Arrive at WBG gate to check if unlocked, it was locked, Ryan informed Heather

0800 Enter DA2 gate with Ryan

0805 Arrive at first well in DA2

0900 Truck stuck contacted Heather

DA 04/14/20

~~0900~~ 1000 Truck free, went to clear wheels (exit DA2)

1015 Back gauging wells (enter DA2 gate)

1040 Arrive at DA2mw105, wasp nest inside, informed Heather

1115 Exit DA2 with Ryan then wait on email to Ryan

1130 Enter WBG with Ryan

1225 While gauging WBGmw007, the steel casing cover lid broke off ~~white~~ DA 04/14/20 due to rust. Informed Heather and relocked/taped well closed

1400 Exit WBG with Ryan and enter LNW

1440 Complete LNW wells and re-enter WBG with Ryan

1445 Exit WBG with Ryan and Continue to CP wells

1500 Arrive at CP wells

1530 Complete CP wells 004 and 005

Daily Weather Condition: A.M. 39°F ~~cloudy~~ DA 04/15/20 Sunny

P.M. 42°F Cloudy slight wind

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/20

Page 2 of 2

Task Team Members:

Danielle Anderson

Ryan Laurich

Narrative (include time and location):

DA 04/14/20

~~3~~ 1540 arrive at 1036 and demobilize

1558 Danielle offsite for the day

DA 04/14/20

Daily Weather Condition: A.M. 39°F sunny

P.M. 42°F Cloudy Slight wind

Recorded By: [signature] (Signature)

QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/20 Page 1 of 1

Task Team Members:

Rich Sprinzl

Narrative (include time and location):

0700 onsite @ B1036. H+S Briefing + Gather Decon Chem/Gauging Supplies
Plan: Gauge EBG then North-East Perimeter FW/BKG MWs then B1200
0745 Depart B1036.
0810 Arrive @ EBG. Note several parked cars on access roads. Begin MW gauging
0955 EBG gauging completed. Depart EBG. Head toward Northern BKG/FWG MWs
1005 Arrived @ BKGmw-008. Begin gauging BKG/FWG/SCF MWs in Northern (East) area
1055 BKGmw-021 → ACTIVE WASP NEST INSIDE – NO WL TAKEN. INFORMED HEATHER (PM)
Also FWGmw-002 (adjacent) is white color + appears to have New Well ID paint.
1215 Access to BKGmw-006 restricted along Wadsworth Rd (N of Smalley Rd). Few trees have fallen. Inform PM.
1230 Found way around to access BKGmw-006 (RR tracks to West)
1245 Finished with Northern BKG/FWS MWs. Head to Bldg 1200.
1255 Arrived @ B1200. Begin gauging MWs (5x).
1410 Gauging completed @ B1200, Depart B1200.
1415 Arrived @ BKGmw-012. Gauge WL.
1430 Arrived @ FWGmw-001. Gauge WL.
1445. Arrived @ CBP. Begin gauging WLs. Note Both Access Roads will need clearing for future event.
1532 Stop gauging for today. Depart CBP for B1036.
1540 Arrived @ B1036. Empty IDW (decon) container into Existing IDW Drum (~1L)
1558 Depart RVAAP/CJAG! Return to Leidos office.
1640 End of Day.

Daily Weather Condition: A.M. 34° Sunny.

P.M. 45° sunny → cloudy

Recorded By: RS 04/14/20 (Signature) QC Checked by: 04/17/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/14/20 Page 1 of 1

Task Team Members:

Ryan Lanning

Danielle Anderson

RL / 4/14/20

RL / 4/14/20

Narrative (include time and location):

0735 - Complete H+S Tailgate at 1036.

0745 - Depart 1036

0751 - Stop at Winklepeck Burning Grounds - Gate locked, notify Heather Adams

0800 - Arrive at DAZA Start Gauging, Danielle will gauge west side of AOC, Ryan East.

0900 - Danielle vehicle got stuck, notify Heather Adams to get assistance

1000 - Heather offsite, Danielle's truck ~~is not~~ RL 4/14/20 has been removed.

1109 - Gauging complete at DAZA, notified tree down at road to 108 + 114.

1116 - Depart DAZA - Lock gate on way out.

1119 - Arrive at WBG

1439 - Gauging complete at WBG + LNW.

1442 - Exit Winklepeck Burning Grounds, ~~Lock gate on way out.~~ RL 4/14/20 The lock on gate was not left open, it was locked on the chain. Notified Heather to call range control so they could secure the WBG gate.

1500 - Arrive at Cobbs Pond to start gauging.

1526 - Depart Cobbs Pond, CPmw -001, -002, + -003 were not gauged.

1546 - Return to 1036.

1555 - Off site.

RL 4/14/20

Daily Weather Condition: A.M. 46°F, Sunny Clear

P.M. 45°F, P. Cloudy

Recorded By: RL (Signature) QC Checked by: Daniel Anderson 7/7/2020 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/2020 Page 1 of 1

Task Team Members:

Heather Adams
Ryan Laurich
Rich Sprinzl
Danielle Anderson
Gabby Gromofsky

Narrative (include time and location):

0700 Heather, Danielle, & Gabby onsite to load trucks for day.
0705 Heather heads to Range Control for access aproval.
- Gabby & Danielle FB Hill Sites
- Rich - CBP, SCL, Cobbs & LL12 & Atlas
- Ryan - RQL and South Perimeter (inside).
0715 - Rich onsite.
0737 - Conduct H&S tailgate w/ Gabby, ~~Ryan~~ 4/15/2020, & Rich & Danielle.
0745 - 1st team heads out
0748 - Ryan onsite, conduct 2nd H&S brief.
0800 - Ryan heads out.
0820 - Ryan calls needs decon tub so Heather heads to RQL.
0845 - Heather returns to 1036.
1400 - Sent draft 4.1 report to team to review.
1540 - Ryan and Rich return to 1036
1545 - Danielle & Gabby return to 1036.
1600 - All crews offsite Heather calls Range Control to notify end of day.

04/15/2020

Daily Weather Condition: A.M. 40°F Sunny, no wind or rain
P.M. 35°F Snow/Rain mix overcast

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/20 Page 1 of 2

Task Team Members:

Danielle Anderson
Heather Adams
Gabby Gromofsky
Ryan Laurich
Rich Sprinzl

Narrative (include time and location):

0700 Arrive onsite at 1036 and mobilize for day
0735 Attend Health and Safety Tailgate presented by Heather
0750 Depart from 1036 with Gabby
0757 Enter LL9 gate with Gabby and gauge wells
0850 Danielle Exit LL9 Gate
0900 Danielle complete her LL9 wells
0905 Danielle enter LL10 gate, Gabby enters later
DA 04/15/20
~~0100~~ 1000 Danielle exit LL10 gate after completing LL10 wells with Gabby
1005 Enter LL5 gate and gauge wells with Gabby
1040 Exit LL5 gate after completing LL5 wells
1055 Enter LL7 gate and gauge wells with Gabby
1138 Exit LL7 with all wells completed
1140 Enter LL6 gate and gauge wells with Gabby
1300 Exit LL6 gate and meet up with Gabby
1315 Enter LL11 gate and gauge wells with Gabby
1440 Exit LL11 gate with Gabby and all wells completed
1443 Enter LL8 gate and gauge wells with Gabby
1526 Exit LL8 gate with Gabby and all wells completed
1532 Enter DA2 gate with Gabby to gauge DA2mw105
1545 Exit DA2 gate with Gabby
1550 Arrive at 1036 and Demobilize

Daily Weather Condition: A.M. 32°F Sunny 64% Humidity
P.M. 46°F cloudy low Humidity

Recorded By: Danielle Adams (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/20

Page 2 of 2

Task Team Members:

Danielle Anderson

Gabby Gromofsky

Narrative (include time and location):

1600 Offsite for the day

DA 04/15/20

Daily Weather Condition: A.M. 32°F Sunny Humid

P.M. 46°F Cloudy

Recorded By: Danielle Anderson (Signature)

QC Checked by: (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/2020 Page 1 of 2

Task Team Members:

GABBY GROMOFSKY
DANIELLE ANDERSON
HEATHER ADAMS
RICH SPRINZI
RYAN LAURICH
[illegible] 04/15/20

Narrative (include time and location):

0703 GABBY ARRIVES @ CJALG.
0710 ATTEND FIRST DAY BREIFING. TODAY'S TASK → WELL GAUGING.
* GATHER EQUIPMENT.
0737 ATTEND HEALTH AND SAFETY TAILGATE. [illegible] 04/15/20
0750 GABBY AND DANIELLE DEPART 1036.
0755 ARRIVE @ LL9. TEAM SPLITS UP TO GAUGE WELLS.
0802 GABBY GAUGE LL9-MW003.
0820 GAUGE LL9-MW002.
0835 GAUGE LL9-MW005.
0850 DEPART LOAD LINE9.
0856 GAUGE FWG-MW019 AND FWG-MW022.
0920 GAUGE LL10-MW003.
0935 GAUGE LL10-MW001.
0950 GAUGE LL5-MW002
1000 GAUGE LL5MW-003.
1010 GAUGE LL5MW-004.
1025 GAUGE LL5MW-006.
1041 GAUGE SCFMW-001.
1055 GAUGE FWGMW-023.
1120 GAUGE LL7MW-003.
1134 GAUGE LL7 MW-004.
1140 GAUGE LL7MW-005.

Daily Weather Condition: A.M. 34°F, MOSTLY SUNNY

P.M. 46 °F ; SUNNY

Recorded By: [illegible] 04/15/20 (Signature) QC Checked by: [illegible] 04/17/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/20 Page 2 of 2

Task Team Members:

SEE P. 1

JJS 04/15/20

Narrative (include time and location):

1200 GAUGE LL6MW-001.
1215 GAUGE LL6MW-002.
1230 GAUGE LL6MW-004
1238 GAUGE LL6MW-008 AND LL6MW-009.
1305 MEET UP WITH DANIELLE TO GET DI WATER FOR DECON (RAN OUT AFTER LL6MW-008 DECON). GO OVER COMPLETED WELLS | CROSS CHECK.
1320 GAUGE ~~LL6~~ JJS 04/15/20 LL11MW-002.
1345 GAUGE LL11MW-005.
1400 GAUGE LL11MW-006.
1415 GAUGE LL11MW-007.
1425 GAUGE LL11MW-010.
1449 GAUGE LL8MW-001
1500 GAUGE LL8MW-003.
1515 GAUGE LL8MW-002.
1525 DEPART LL8 TO MEET DANIELLE @ DA2MW-105.
1530 GAUGE (GABBY + DANIELLE) DA2MW-105.
1538 DEPART DA2 FOR 1036.
1545 ARRIVE @ 1036, DEMOBILIZE EQUIPMENT, ETC. JJS 4/15/20
1558 GABBY DEPART CJAG FOR E.O.D.

JJS 04/15/20

Daily Weather Condition: A.M. SEE P. 1

P.M. SEE P. 1

ecorded By: [signature] 04/15/20 QC Checked by: [signature] 04/17/20
(Signature) (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/20 Page 1 of 1

Task Team Members:

Rich Sprinzl

Narrative (include time and location):

0715 Rich onsite @ RVAAP/Main Gate Entry then B1036.
0730 Loaded decon chemicals/WL meter for gauging MWs. Today's plan: Finish CBP MWs, Sand Creek Landfill, Cobbs Pond (finish), LL12/SCFmw-002, Atlas Scrap Yard.
0737 H+S Briefing by FM/SSHO.
0750 Depart B1036.
0805 Arrived @ CBP. Continue Gauging last 4 MWs.
0910 CBP gauging completed. Depart CBP
0920 Arrived @ SCL. Gauge 3 MWs
1000 Gauging completed @ SCL: FM informed of suspect ACM (transite) near SCLmw-002. FM also informed Rich to return to BKGmw-021 (nest removed). Depart SCL.
1022 Arrived @ BKGmw-021 to gauge WL.
1050 Arrived @ Cobbs Ponds. Gauge last 3 of 6 MWs
1200 Done @ Cobbs Ponds. CPmw-002 needs clearing / full of water (vault/casing). Depart for LL12
1220 Arrive @ LL12 gate. Sign into LUC access log.
1400 LL12 Main access Road near LL12mw-088 is completely rutted → suggest Gravel.
1535 Gauging stopped @ LL12 (finished last MW inside AOC fence ~3 left outside fence)
1545 Arrived @ B1036. Manage Decon IDW into Drum (~1L) + update FM w/ status.
1600 Offsite. Return to Leidos office.
1645 End of Day

RS 4/15/20

Daily Weather Condition: A.M. 30° sunny, frost

P.M. 45 cloudy

Recorded By: RSprinzl 4/15/20 (Signature) QC Checked by: Daill Ad 7/7/2020 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/15/20 Page 1 of 1

Task Team Members:

Ryan Lavrich

RL 4/15/20 RL 4/15/20

Narrative (include time and location):

0755 - COMPLETE H+S TAILGATE W/ HEATHER ADAMS AT 1036.
0800 - DEPART 1036 FOR RQL GAUGING.
0815 - ARRIVE AT RQL, SIGN IN AT GATE.
0835 - HEATHER DROPS OFF DECON KIT, LEFT 1036 W/O IT.
0940 - FINISHED GAUGING WELLS INSIDE FENCE AT RQL, LOCK GATES + SIGN OUT. CONTINUE GAUGING WELLS OUTSIDE FENCE AT RQL.
1212 - GAUGING COMPLETE AT RQL, PROCEED TO WELLS ON PERIMETER, EAST SIDE OF RVAAP.
1349 - NOTIFIED HEATHER THAT THE ROAD TO FWGMW-011 + FWGMW-012 IS NOT ~~DRIVEABLE~~ 4/15/20 DRIVABLE, WASHED OUT + STANDING WATER
- ALSO NOTED ROAD NORTH OF LL1MW-086 IS FLOODED.
1445 - NOTIFIED H. ADAMS THAT LL1MW-086 + LL1MW-065 ARE ONLY ACCESSIBLE FROM THE SOUTH.
1500 - ARRIVE AT LL2 WELLS BY RVAAP PERIMETER
1530 - RETURN TO BUILDING 1036.
1545 - OFFSITE.

RL 4/15/20

Daily Weather Condition: A.M. 28°F, SUNNY

P.M. 45°F, CLOUDY / OVERCAST

Recorded By: [signature] (Signature) QC Checked by: [signature] 7/7/2020 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/2020 Page 1 of 2

Task Team Members:

HEATHER Adams
Ryan LAURICH
Rich SPRINZI
DANIELLE Anderson
GABBY GROMOFSKY

Narrative (include time and location):

0700 HEATHER, DANIELLE & GABBY ONSITE. VERY ICY SENT TEXT TO TEAM.
0705 HEATHER GOES TO Range Control FOR ACCESS APPROVAL (GAURD FELL getting out of his truck on the ice. He was ok, but hit hard)
- GABBY - RT 5, FBQ, MBS (w/ HEATHER)
- Ryan - SOUTH SERVICE, LL1
- DANIELLE - LL4, ASY
- RICH - LL12, LL3, LL2

HA 4/16 ~~020~~ 0720 H&S w/ Ryan, GABBY, and DANIELLE.
0730 FIRST CREW HEADS OUT.
0745 RICH ONSITE
0755 H&S w/ Rich.
0805 RICH HEADS OUT
0820 Gabby calls to report accident on RT 5 w/ a deer and car right next to her well. Ryan also called he is inside the fence but both could see the accident. Heather stops work and asks both crews to leave the area for safety. Heather emails accident and stop work detailes to PMS and Steve.
1430 Ryan returns to 1036 and heads to FWGMW-020 to install pump for sampling.
1500 All other crews return, all wells gauged. Rich completes weekly IDW inspection and submits.
1533 Ryan calls to say he is stuck in ditch on RT. 5 partialy in road. He is instructed to call State Highway patrol and GABBY and HEATHER

Daily Weather Condition: A.M. 29°F, Sunny wet from snow icy.
P.M. 50°F, overcast, LT Rain windy

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater
..VAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/2020

Page 2 of 2

Task Team Members:

SEE Page 1

Narrative (include time and location):

HEAD OUT TO ASSIST. Rich and Danielle STAY BEHIND TO CLOSE UP
1030. HEATHER & STATE TROOPER DISCUSS plan FOR pulling Ryan out.
TROOPER STOPS TRAFFIC WHILE WE INSTALL TOW STRAPS. Ryan IS pulled
OUT and all CREWS MEET IN Bullpen area. HEATHER RETURNS TO 1036.
1100 HEATHER calls Range control and locks up. Rich and Danielle
OFFSITE.
1115 HEATHER, Ryan & GABRI SETTLE and CHECK TRUCK FOR Damage.
THERE WAS NONE. LEAVE Bullpen area OFF SITE. EM 4/16/20.
1120 HEATHER calls JED TO Discuss concerns w/ sampling on RT. 5.
THE WET/MUDDY CONDITIONS ARE NOT SAFE FOR TRUCKS, SO
a REVISED plan WILL BE NEEDED BEFORE WE CAN sample. Rt. 5 WILLS.
1145 END OF DAY.

4/16/2020

Daily Weather Condition: A.M. —

R.M. 45°F, overcast, Lt Rain

Recorded By: (Signature)

QC Checked by: (Signature)

07-162(NE)/102507

FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/2020 Page 1 of 2

Task Team Members:

GABBY GROMOFSKY RICH SPRINZL

RYAN LAURICH DANIELLE ANDERSON

HEATHER ADAMS [illegible] 4/16/20

Narrative (include time and location):

0705 GABBY ARRIVES @ CJAG. GATHER EQUIPMENT.

0720 ATTEND HEALTH AND SAFETY TAILGATE. [illegible] 04/16/20

0730 DEPART FIELD OFFICE FOR WELL GAUGING (RT. 5 WELLS).

0740 GAUGE FWGMW-018 AND FWGMW-020.

0810 GAUGE FWGMW-021.

~DEER HIT IN ROAD. NOTIFY H. ADAMS.

0835 GAUGE FWGMW-024.

0850 GAUGE LL2MW-271.

0910 GAUGE LL1MW-088

0935 GAUGE LL3MW-246.

1000 RETURN TO CJAG FACILITY.

1010 GAUGE FBQMW-177. NO PUMP IN WELL AND IS GETTING SAMPLED. NOTIFY HEATHER.

1025 GAUGE FBQMW-176.

1040 GAUGE FBQMW-166.

1050 GAUGE FBQMW-168.

1100 GAUGE FBQMW-170. NO PUMP IN WELL AND IS TO BE SAMPLED. NOTIFY HEATHER.

1115 GAUGE FBQMW-175. *HAY WADDLES AROUND NORTH POND / RECENT CLEARING OF TREES / BRUSH.

1135 ARRIVE @ FBQMW-171. CAUTION TAPE AROUND WELL.

*NOTIFY HEATHER. CAUTION TAPE MAY BE DUE TO RECENT CLEARING ACTIVITIES @ SITE. SKIP WELL UNTIL CLEARED BY HEATHER.

1150 GAUGE FBQMW-172. HEATHER CLEARS FBQMW-171. CAUTION TAPE FOR RECENT ACTIVITIES.

1210 GAUGE FBQMW-173.

Daily Weather Condition: A.M. 50°F PARTLY CLOUDY

P.M. 43°F CLOUDY

Recorded By: [illegible] 04/16/20 (Signature) QC Checked by: [illegible] 04/17/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/20 Page 2 of 2

Task Team Members:

04/16/20

04/16/20

Narrative (include time and location):

1225 GAUGE FBQMW-171.
1240 GAUGE FBQ MW-167 AND FBQ MW-169.
1320 DANIELLE ARRIVES @ FBQ AND FOLLOWS ME TO MBS.
1325 ARRIVE @ MBS.
1350 GAUGE MBSMW-004.
1400 GAUGE MBSMW-003.
1410 GAUGE MBSMW-002.
1420 GAUGE MBSMW-005.
1430 GAUGE MBSMW-001.
1435 GAUGE MBSMW-006.
1510 RETURN TO VEHICLES. NOTIFY HEATHER SITE COMPLETE.
1520 DEPART MBS.
1530 ARRIVE @ 1036. DEMOBILIZE. HEATHER RECIEVES NOTIFICATION THAT RYAN IS STUCK ON RT. 5 (TRUCK IN DITCH).
1540 DEPART 1036 TO HELP RYAN. GABBY, HEATHER, RYAN GET VEHICLE OUT OF DITCH. POLICE OFFICER STOPS TRAFFIC FOR US.
1600 RETURN TO CJAG OUTSIDE OF GATE (HEATHER/RYAN/GABBY). ALL IS OK WITH FORD F150.
1615 DEPART CJAG FOR E.O.D.

04/16/20

Daily Weather Condition: A.M. SEE P. 1

P.M. SEE P. 1

ecorded By: 04/16/20 (Signature) QC Checked by: 04/17/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/20 Page 1 of 1

Task Team Members:

Danielle Anderson
Heather Adams
Ryan Laurch
Rich Sprinzl
Gabby Gromofsky

Narrative (include time and location):

0700 Arrive onsite at 1036 and mobilize for day
0720 Attend Health and Safety Tailgate presented by Heather
0730 Depart from 1036 for LL4
0735 Arrive at LL4, started gauging wells outside AOC
0800 Enter LL4 Gate complete wells 195 - 197
0830 The road in the southern part of LL4 is out
0833 Exit LL4 Gate to find the other entrance
0835 Enter LL4 at different gate
1040 Exit LL4 with all wells completed
1045 Arrive at ASY and gauge wells
1300 Complete wells at ASY
1305 Arrive at BKGmw013 for gauging
1315 Complete BKGmw013 and Head to FBQ to meet up with Gabby to go to MBS
1325 Arrive with Gabby at MBS and gauge wells
1500 Back at the trucks after Completing MBS wells with Gabby
1505 Gabby contacted Heather to ask if any more wells need done
1530 Arrive back at 1036 with Gabby and demobilize
1540 Help Rich get sampling materials ready for next week
1600 offsite for the day

DA 04/16/20

Daily Weather Condition: A.M. 28°F Partly Cloudy
P.M. 39°F Cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/20

Page 1 of 1

Task Team Members:

Rich Sprinzl

Ryan Laurich.

Narrative (include time and location):

0735 Arrived RVAAP Main Gate then B1036.
0755 H&S Briefing w/ FM/SSHO. Plan: Finish LL12 (Northern), LL3, + LL2.
0800 Depart B1036 for LL12
0805 Arrived north side of LL12 (for-189/1896) & Begin gauging WLs.
0828 Depart LL12. Head toward LL3 (Gauge LL3mw-245 prior to entering LL3)
0845 Arrived @ LL3 gate. Begin MW WL gauging inside AOC fence.
1055 MWs inside LL3 fence completed. Depart LL3 to gauge last 2 MWs just south of LL3.
1115 LL3 MWs completed. Head to LL2.
1120 Arrived @ LL2. FM determined 1 MW (LL3-232) was overlooked on large map.
1140 Returned to LL3/LL3mw-232 - gauge WL. Tree fallen across road near well
1200 Depart LL3/Return to LL2 Begin LL2 MW Gauging
1425 LL3 gauging Completed. Ryan Laurich assisted w/ LL3mw-272/267. Inform FM.
1442 Arrived @ B1036. Manage IDW into Drum #26 (~1L). Unload vehicle.
1500 Perform weekly IDW Inspection + update IDW logs.
1540 Hookup Marine Batteries to charge.
1600 Depart B1036 / RVAAP.
1645 Arrived @ Leidos office. Check logs & scan logs from this week
1700 End of day.

RS 4/16/20

Daily Weather Condition: A.M. 28° Sunny (overnight snow 1/4" ice

P.M. 40° sunny breezy

Recorded By: RS 4/16/20 (Signature)

QC Checked by: 04/17/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/16/20 Page 1 of 1

Task Team Members:

Ryan Laurich

RL / 4/16/20

RL / 4/16/20

Narrative (include time and location):

0725 - COMPLETE H+S BRIEF AT 1036 w/ H. ADAMS.
0755 - ARRIVE AT LL2, CONTINUE TO GAUGE SOUTHERN PERIMETER INSIDE RVAAP FENCE.
0858 - FINISHED GAUGING OUTLIER WELLS ON SOUTH EAST PERIMETER INSIDE RVAAP ~~FENCE~~ FENCE
0936 - REMOVE WELL PACKER + INSTALL PUMP AT SCFmw-004.
0950 - ARRIVE AT LL1 FOR GAUGING.
1315 - GAUGING COMPLETE AT LL1.
1330 - ARRIVE AT LL2 TO HELP RICH FINISH GAUGING.
1425 - GAUGING COMPLETE AT LL2.
1436 - RETURN TO 1036,
1600 - OFFSITE.

RL
4/16/20

Daily Weather Condition: A.M. 28°F, CLEAR + SUNNY

P.M. 39°F, CLEAR + SUNNY

Recorded By: [signature] (Signature) QC Checked by: [signature] 7/7/2020 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/20/2020 Page 1 of 1

Task Team Members:

Heather Adams
Ryan Laurich
Rich Sprinzl
Danielle Anderson
Gabby Gromofsky

Narrative (include time and location):

0700 Heather, Ryan, ~~Danielle~~ HA 4/20/2020 Gabby, and Rich onsite.
0710 Heather heads to Range Control for access approval. All areas open for west area open for turkey hunting.
0740 Danielle onsite w/ ice delivery. Team works on calibration, ask crews about Covid safety. All are good no issues.
0815 Monday tailgate @ H&S tailgate w/ entire team.
0845 Sample team heads out, Rich works on pump decon.
0900 Attend H&S call w/ JED, Vasu and Steve to go over and assess Covid measures and concerns w/ base and other contractors lack of face coverings. All agree to keep moving forward.
1020 Rich heads to FBQ for well development, Heather works on bottle prep and COCs.
1430 Gabby and Danielle return to 1030 both completed sampling @ WBG.
1450 Ryan returns to 1036 LL12 sampling complete.
1500 Sample pick up one cooler 6 COCs
~~1552 Rich~~ HA 04/20/2020 1525 Gabby and Daniell of offsite end of day
1345 Ryan off site end of day.
1525 Rich returns 1030.
1600 Heather calls Range Control off site end of day.
~~[signature] 4/20/2020~~

Daily Weather Condition: A.M. 35°F Sunny
P.M. 60°F Sunny

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/20/20 Page 1 of 2

Task Team Members:

Danielle Anderson
Heather Adams
Ryan Laurich
Rich Sprinzl
Gabby Gromofsky

Narrative (include time and location):

0700 pick up ice and travel to CJAG.
0745 Arrive at 1036 and mobilize for day
0820 H+S tailgate presented by Heather
0845 Depart from 1036 with Gabby
0850 Enter WBG gate with Gabby
0852 Arrive at WBG mw-020 and begin setting up for sampling
- starting water level 10.58
Aqua Troll: 513586 QED Well wizard: 22487
water level: 41832 QED ~~0~~ DA MP10: 1723
04/20/20
Purge rate: 100 mL/min Purge volume: 2,254.62 mL
0958 Start Purge (initial)
Initial Purge water description, water is clear with a yellow tint, no biologicals, there are suspended black solids
1024 Initial Purge Complete, water level: 10.70
Flow rate: 100 mL/min
CPM: 2 28: 2
* change sample interval to 3 minutes
DA 04/20/20
1038 ~~Fast~~ DA 04/20/20 False Turbidity reading: Real time readings below 10~~%~~ NTU
1048 well stable, taking explosives samples 2x Amber jars
11:50 sent Heather log from WBG mw-020 and finished packing up.
1230 Arrive at WBG mw 006 - starting water level ~~5~~ DA 4.99
04/20/20
1250 Purge volume 1,719.104 mL 18 psi DA ~~200~~ 175 mL/min CPM: 2 28: 2
04/20/20

Daily Weather Condition: A.M. 39°F Sunny

P.M. 52°F Sunny

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/20/20 Page 2 of 2

Task Team Members:

Danielle Anderson

Gabby Gromofsky

Narrative (include time and location):

1302 start purge water level 5.18 CPM 2 28:2 Flow rate 175 mL/min water is clear, colorless, odorless with no solids.

1314 Collect samples 2x amber jars for explosives WBGmw006-200401-GW

1400 Complete report and email to Heather

~~1415 DA~~ 04/20/20

1405 Contact Heather to see if she wanted me to sample anywhere else

1410 Exit WBG gate with Gabby and return to 1036 as Heather instructed.

1415 Arrive at 1036.

1420 sent on a wellfare check up on Rich

1435 Arrive at FBQ to check on Rich "says "its slow going" but he was okay otherwise. I checked if there was anything I could do and informed Heather that Rich was okay and of his status. ~~I then headed back to~~ DA 04/20/20

1440 Departed from FBQ

1450 Arrived back at 1036 and demobilized.

1515 Help get bottles ready for tomorrow

1530 Depart 1036 and exit CJAG for the day

DA 04/20/20

Daily Weather Condition: A.M. see first page

P.M. see first page

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/20/2020 Page 1 of 1

Task Team Members:

GABBY GROMOFSKY

DANIELLE ANDERSON

DA 4/20/20

Narrative (include time and location):

0658 GABBY ARRIVES @ CJAG GATE

0659 ARRIVE @ 1036, LOAD AND CALIBRATE EQUIPMENT.

0820 ATTEND H+S TAILGATE PRESENTED BY HEATHER.

0848 DEPART (GABBY AND DANIELLE) FOR WBG.

0855 ARRIVE @ WBGMW-009 AND WBGMW-020.

0952 GABBY - BEGIN LOW FLOW PURGE @ WBGMW-009.

1001 INITIAL PURGE COMPLETE, BEGIN COLLECTING PARAMETER READINGS.

1122 STABLE.

1130 COLLECT SAMPLE WBGMW-009-200104-GW FOR EXPLOSIVES.

1215 ARRIVE @ WBGMW-006 AND WBGMW-021.

1330 COLLECT SAMPLE WBGMW-021-200104-GW FOR EXPLOSIVES.

1400 DEPART WBG AOC.

1415 ARRIVE @ 1036. DEMOBILIZE.

1525 DEPART CJAG E.O.D.

DA 04/20/20

Daily Weather Condition: A.M. 38°F, SUNNY

P.M. 56°F, SUNNY

Recorded By: (Signature) 04/20/20 QC Checked by: (Signature) 04/27/20

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/20/20 Page 1 of 1

Task Team Members:

Ryan Laurich

Narrative (include time and location):

0820 - Complete H&S tailgate at 1036 w/ Heather Adams.
0856 - Enter LL12, sign in at South Gate.
0939 - WL 055178 from pine is not working - notified H. Adams.
1000 - Start purge at LL12mw-187 cpm 1 4>56 PSI=22 ~175ml/min
1017 - End pre-purge. 1305 - End pre purge, 1320 - Switch to 3 min intervals. 4020 - Noticed bubbles in flow cell, possible causing high turbidity, - tightened in + out flow lines. Turbidity dropped from 551.75 to 0.00 NTU, turbidity started to increase up to previous readings.
1151 (01:51:34) - Stable, collect sample LL12mw-187-200401-GW at ~~LL12-18~~ LL12mw-187 for ~~Amon~~ Ammonia + Nitrate.
01:54:34 - Flow cell empty, 01:57:34 - Flow cell empty, 02:00:34 Final reading - post sample.
1252 Start purge at LL12mw-185 cpm 1 2>58 PSI=20
00:19:51 End pre purge, 00:20:19 Switch to 3 minute intervals
1315 - Lowered flow to cpm 1 1>59 PSI=18 due to drawdown.
1334 (00:41:19) - Stable, collect sample LL12mw-185-200401-GW at LL12mw-185 for Ammonia + Nitrate.
1415 - Exit LL12 and sign out at South Gate.
1420 - Return to 1036, demobilize.
1550 - Offsite

Daily Weather Condition: A.M. 37°F, clear, sunny

P.M. 54°F, clear, sunny

Recorded By: (Signature) QC Checked by: (Signature) 04/24/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 4/20/20 Page 1 of 1

Task Team Members:
Rich Spring

Narrative (include time and location):

0700 Rich arrive @ RVAAP Main Gate/B1036. Load up equipment/gorBox for well development.
0745 Calibrate Horiba U-52 (Pine #34027)
0820 H+S Briefing by FM/SSHO. Plan: Redevelop 4 MWs @ FBQ (-168/170/175/177), -2 MWs have pumps, 2 MWs will have rental pumps deployed (-170/177)
0845 Decon pumps w/ Liquinox, DI water, Nitric Acid, Isopropanol, + DI Rinses.
0930 Depart B1036 w/ spare WL meter
0935 Arrived @ LL12 mw-187, Drop off WL meter to Ryan Laurich
0945 Returned to B1036. Reassemble pumps with new bladders and wrap in foil.
1025 UPS delivered compressors to B1036.
1032 Depart B1036.
1040 Arrived @ FBQ. Setup pump @ FBQ mw-177.
1210 Start testing pump @ FBQ mw-177
1220 Test pumping worked (WL initial -9.95 ft BTOC, same as prior to install of pump). Disconnect MPID.
1235 Arrived @ FBQ mw-170. Setup pump.
1400 Begin redeveloping MW (presurged w/ pump prior to purging).
1540 Stop purging. Remove pump + secure MW.
1545 Depart FBQ
1550 Arrived @ B1036. Manage IDW/unload truck.
1600 Depart B1036, Main Gate.
1640 Returned to Main Office (Twinsburg).
End of Day.

Daily Weather Condition: A.M. 33° sunny
P.M. 55° sunny

Recorded By: RS 4/20/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/2020 Page 1 of 1

Task Team Members:

Heather Adams
Ryan Larich
Rich Sprinzl
Danielle Anderson
Gabby Gromofsky.

Narrative (include time and location):

0700 Gabby, Heather & Danielle onsite to calibrate equipment.
0710 Heather heads to range control for access approval, all sites clear.
0718 Ryan onsite.
0730 Rich onsite.
0735 H&S tailgate.
0751 Danielle & Gabby head to ODAZ for sampling and to fix puts at DARMW-111.
0825 ~~Ryan~~ HA 4/21/2020 Ryan heads to RQL for sampling.
0837 Rich heads to FBQ for well development. Heather begins bottle prep.
1320 Gabby and Rich return to 1036. Gabby helps w/ packing coolers and Rich empty purge water.
1345 ~~Danni~~ HA 4/21 Danielle heads to FWGMW-015.
1400 Ryan returns to 1036.
1435 Rich heads out for ice.
1500 Test America onsite for sample pick-up 7 coolers w/ 4 COOs. Ryan ordered more drums to be dropped off Twins office.
1505 Ryan offsite to get supplies and drop off 1 cooler @ UPS for CT tracking 12764 49F01 9978 1165.
1508 Rich returns w/ ice.
1520 Gabby offsite
1538 Rich offsite Danielle returns to 1036.
1550 Danielle offsite Heather calls range control end of day.

Daily Weather Condition: A.M. 45°F, overcast pt. sunny.
P.M. 40°F, overcast & snowy.

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/20 Page 1 of 2

Task Team Members:

Danielle Anderson
Gabby Gromofsky
Heather Adams
Ryan Laurich
Rich Sprinzl

Narrative (include time and location):

0700 Arrive at 1036 and mobilize for the day.
0735 Attend H&S tailgate presented by Heather.
0740 Depart from 1036 with Gabby.
0745 Enter DA2 gate with Gabby.
0750 Arrive at DET-004 and set up for sampling
0833 Begin initial Purge, Depth to water is 9.96 → could not obtain reading from water level meter due to close proximity to pump. However water could be seen on the metal probe, so a manual measurment was taken. CPM 2 29:1 Purge Rate: 50mL/min 15psi
Purge volume 1,280.71 mL
water is clear, colorless, + odorless.
0902 Start Purge. Flow rate: 50 mL/min
water level: Top of pump
CPM2 29:1 15psi
water is clear, with a slight yellow tint, and has no odor
0928 ~~Stable~~ DA 04/21/20 well is stable. Began collecting samples
Sample ID: DET-004-200421-GW
for: VOCs, Phthalates/Nitroaromatics/Phenols, LLPAHs,
1 PCBs, Pesticides, Explosives, + Cyanide, and TAL metals DA 04/21/20 → began filling in ruts from where I was stuck.
1238 Sampling and QA complete. Informed to check on Rich by Heather
1309 Called Rich, says that he "no longer needs purge buckets

Daily Weather Condition: A.M. 46°F partly cloudy
P.M. 39°F partly sunny, snowing, and windy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/20 Page 2 of 2

Task Team Members:

Danielle Anderson

Gabby Gromofsky

Narrative (include time and location):

1335 Completed filling in ruts at DA2
1340 Depart from DA2 and lock gate
1345 Return to 1036 to pick up bottles
1350 Depart from 1036 for FWGmw-015 and set up.
1418 initial Purge starts.
Depth to water: 4.19
Flow Rate: 125 mL/min Purge Calculation: 1,888.69
CPM: 2 27:3 15psi
water is clear, colorless, odorless
1441 Initial Purge done. Purge began
Depth to water: 5.59
Flow Rate 50 mL/min
CPM: 2 28:2 13psi Total Purge volume: 4.18L
water is clear, colorless, odorless
1453 Collect Samples: FWGmw-015-200401-GW for explosives and ~~cyanide~~ DA 04/21/20 TAL Metals.
1529 Finish sampling and pack up supplies then head back to 1036
1538 Arrive back at 1036 and demobilize
1600 Offsite for end of day

DA 04/21/20

Daily Weather Condition: A.M. 46°F partly cloudy

P.M. 39°F partly sunny, snowy, and windy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/2020 Page 1 of 1

Task Team Members:

GABBY GROMOFSKY

DANIELLE ANDERSON

GG 4/21/20

Narrative (include time and location):

0658 ARRIVE @ CJAG.

0700 ARRIVE @ 1036. GATHER/CALIBRATE EQUIPMENT.

0735 ATTEND H+S TAILGATE.

0755 DEPART (GABBY + DANIELLE) 1036 FOR DET WELLS.

0800 GABBY SET UP ON DETMW-003 AND DANIELLE ON DETMW-004.

0838 BEGIN LOW FLOW PURGE ON DETMW-003.

0845 STAGNANT WATER REMOVED.

0933 STABLE.

0935 COLLECT PRIMARY SAMPLE (DET-003-200401-GW) MS/MSD (DET-003-200401-GW MSD), DUPLICATE (DET-003-200402-GW), AND SPLIT SAMPLE (DET-003-200403-GW) AT DETMW-003.

* PERFORM QA/QC ON DETMW-003 AND -004 SAMPLES AND PACK FOR SHIPMENT.

1315 GABBY DEPART WITH ALL SAMPLES AND DANIELLE STAYS TO MAINTAIN RUTS IN PATH.

1320 ARRIVE @ 1036. DEMOBILIZE AND ASSIST WITH SAMPLE MANAGEMENT.

1520 DEPART CJAG E.O.D.

GG 04/21/20

Daily Weather Condition: A.M. 42 °F; CLOUDY; MODERATE WINDS.

P.M. 43 °F; MOSTLY CLOUDY.

Recorded By: [signature] 04/21/20 (Signature) QC Checked by: [signature] 04/27/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/20

Page 1 of 1

Task Team Members:

Ryan Lanham

Narrative (include time and location):

0750 - Complete HAS Brief at 1058 w/ Heather Adams.

0850 - Depart 1058

0845 - Arrive at RQL + Sign In. Collect TB FWG TB-200403-TB

0917 ~~0910~~ - Start Purge at RQLmw-007. CPM 1 9 > 51 PSI = 15

00:10:22 - Set to 3 minute interval.

0954 (00:37:22) Stable. Collect RQLmw-007-200401-GW for VOCs, Phthalates/Phenols/Nitro, LL PAHs, PCBs, Pesticides, Explosives, Cyanide, TAL Metals + Phosphorus. RQLmw-007-200401-GWMSD for Explosives, Cyanide, TAL Metals, + Phosphorus. RQLmw-007-200402-GW for Explosives, Cyanide, TAL Metals, + Phosphorus. RQLmw-007-200403-GW for Explosives, Cyanide, TAL Metals, + Phosphorus at RQLmw-007.

1144 - Sampling Complete at RQLmw-007.

1206 - Start Purge at RQLmw-011 CPM 1 6/54 PSI = 20.

00:17:26 - End Pre-Purge. 00:17:40 - Switch to 3 minute intervals.

1245 (00:38:40) Stable Collect RQLmw-007 RQLmw-011-200401-GW for Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity. RQLmw-011-200401-GWMSD for Sulfide, Nitrate/Nitrite/Sulfate, + Alkalinity. RQLmw-011-200402-GW for Sulfide, Nitrate/Nitrite/Sulfate, + Alkalinity and RQLmw-011-200403-GW for Sulfide, Nitrate/Nitrite/Sulfate, + Alkalinity.

1510 - Sampling Complete at RQLmw-011.

1545 - Exit RQL + Sign out/Lock Gate.

1400 - Return to 1058 + Demob.

1545 - Offsite.

Daily Weather Condition: A.M. 45°F, P. Cloudy w/ Sun

P.M. 50°F, P Cloudy Light Snow

Recorded By: _____ (Signature)

QC Checked by: _____ (Signature) 04/24/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/20 Page 1 of 1

Task Team Members:

Rich Sponed

Narrative (include time and location):

0730 Arrived @ RVAAP/B1036.
0745 H&S Briefing w/FM/SSHO.
0755 Calibrate Horiba U52(#34027)
0815 Decon whaler pump then loadup equipment.
0835 Depart B1036
0845 Arrived @ FBQ, Continue redeveloping FBQmw-170. (pull QED pump/tubing + setup whaler pump. WL initial = 15.85 ftBTOC
0915 Surged well. WL = 15.85 ftBTOC.
0920 Begin pumping. Stopped & flowing (tubing disconnected) → reattach w/clamp.
0942 Restarted pumping.
1023 Removed 5x well volumes.
1038 3 stabilized readings, well developed, Remove pump/decon.
1100 Re-install QED pump into MW. Intake depth ~27.59 ftBTOC
1110 Depart FBQmw-170, Setup @ FBQmw-177. Remove QED pump + install whaler pump.
WL initial = 9.95 ftBTOC TD = 24.67 ftBTOC.
1150 Begin redeveloping MW (surged w/pump prior to purging).
1258 Well went dry after 43.25 gal removed (1.5x well volumes)
1330 Depart FBQ. (Did not reinstall Bladder pump).
1340 Arrived @ B1036, Manage IDW (~72 gal) into drums.
1500 IDW logs updated. Decon pumps.
1545 Depart B1036 / Main gate.
1630 Returned to Twinsburg office. End of day.

Daily Weather Condition: A.M. 35° mostly cloudy
P.M. 50° mostly cloudy

Recorded By: RS 4/21/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/2020 Page 1 of 1

Task Team Members:

Heather Adams
Danielle Anderson
Ryan Laurich
Gabby Gromofsky
Rich Sprinzl

Narrative (include time and location):

0700 Heather, Gabby & Danielle onsite.
0705 Heather heads to Range control for access approval. All areas are clear for today.
0720 Rich and Ryan onsite w/ drums.
0735 Conduct daily H&S tailgate with all teams.
0755 Gabby, Danielle & Rich head out to RQL & FBQ for the day.
0815 Ryan heads to RQL
1500 TA onsite for sample pick-up 3 coolers. TA delivered more bottles including IDW. Crews begin to return to manage IDW.
1530 Danielle offsite for end of day.
1555 Ryan and Gabby offsite
1605 Rich & Heather offsite late due to extra time needed to manage IDW. Heather calls Range control for offsite notice.

04/22/2020

Daily Weather Condition: A.M. 28°F, Sunny, no wind.

P.M. 41°F mostly cloudy.

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/20 Page 1 of 3

Task Team Members:

Danielle Anderson, Ryan Laurich
Heather Adams, Rich Sprinzl
Gabby Gromofsky

Narrative (include time and location):

0700 Arrive at 1036 and mobilize for day.
0735 Attend H&S tailgate presented by Heather.
0740 Depart from 1036 to head to RQL.
0755 Arrive at RQLmw-013 and set up.
0833 Start initial purge. Depth to water: 23.68
Flow Rate: 100mL/min
CPM 2 27:3 27psi
initial Purge Calculation: 1,675.10mL
Water is clear, colorless, with slight acidic scent.
0850 Start Purge. Depth to water: 23.73
Flow Rate: 125mL/min
CPM 2 27:3 28psi
0904 Well is stable, begin sampling for Sulfide and Alkalinity, sulfate.
Sample ID: RQLMW-013-200401-GW
0913 Sampling Complete, started packing up.
0940 Sent well log to Heather
0945 Left RQLmw-013 for LLI
1010 Enter LLI gate
1030 Found LLImw-063 and set up.
1035 Realized I was supposed to be at LLImw-064 packed up and exited LLI gate.
1045 Arrive at LLImw-064 and set up. (steel casing, full of water)

Daily Weather Condition: A.M. 36°F Sunny
P.M. 41°F mostly Cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/20 Page 2 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1114 Start initial Purge: water is orange and Turbid, with no odor
CPM: 2 27:3 16psi
Flow Rate: 450mL/min
Depth to water: 0.07
initial Purge Calculation: 1,774.77
1119 start purge water is still orange with biologicals.
CPM: 2 27:3 16psi
Flow Rate: 450mL/min
Depth to water: 0.25 Total Purge: 21.88L
1148 well is stable started sampling LLIMW-064-200401-GW for explosives and TAL metals
1152 Sampling complete, begin to pack up. Informed by Heather to go back to 1036 to pick up bottles when finished at LLI.
1220 Completed packing up, writing report and sending it to Heather. Now Headed back to 1036.
1235 Arrive back at 1036 to pick up bottles and drop off samples.
1240 Depart from 1036 for FWGmw-016
1252 Start initial purge. ~~CPM: 4 14.0:1.0~~ DA 04/22/20 CPM 2 27:3 40psi
Flow Rate: 125 ml/min
Depth to water: 15.74

Daily Weather Condition: A.M. 36°F Sunny

P.M. 41°F mostly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/20 Page 3 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1252 continued: Initial Purge Calculation: 3,134.06
1316 Begin Purge: Water level: 15.78
CPM: 2 27:3 40psi
Flow Rate: 150 mL/min Total Purge: 6.655 L
1328 well is stable, began collecting sample FWGmw-016-200401-GW for explosives and TAL Metals
1356 Done sampling well and packing supplies.
~~13 DA 04/22/20~~
1400 Arrive back at 1036 and demobilize.
1415 Complete report for FWGmw-016
1425 Report complete and sent to Heather. Now, Heather has asked for help with bottle prep.
1530 Depart from 1036 and go offsite for end of day.

DA 04/22/20

Daily Weather Condition: A.M. 36°F sunny

P.M. 41°F mostly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/2020 Page 1 of 2

Task Team Members:

GABBY GROMOFSKY

BD 04/22/20

Narrative (include time and location):

0659 ARRIVE @ LAG GATE

0700 ARRIVE @ 1036, GATHER / CALIBRATE EQUIPMENT.

0735 ATTEND H+S TAILGATE GIVEN BY H. ADAMS.

0800 DEPART 1036

0810 ARRIVE @ RQL AND SIGN INTO AOC.

0815 ARRIVE @ RQLMW-009.

0852 BEGIN LOW FLOW PURGE.

0901 STAGNANT WATER REMOVED

0947 PARAMETERS STABLE.

0950 SAMPLE RQL-009-200401-GW FOR EXPLOSIVES, VOCS, SVOCS, PCB, LL PAHS, PESTICIDES, CYANIDE + TAL METALS.

1015 COMPLETE SAMPLING.

1030 SIGN OUT OF RQL AOC.

1040 DEPART RQL. LEAVE SAMPLES @ LL2 GATE FOR HEATHER.

1100 ARRIVE @ LL2MW-267.

* HOLE IN AIR TUBING DEDICATED IN WELL. NOTIFY HEATHER. CALL RYAN FOR ASSISSTANCE.

1150 RYAN ARRIVES @ LL2MW-267, TROUBLESHOOT EQUIPMENT, DECIDE TO USE PUMP AND REMOVE FROM WELL FOR REPAIR.

1202 RYAN DEPART LL2.

1153 BEGIN LOW FLOW PURGE.

1202 STAGNANT WATER REMOVED.

BD 04/22/20

Daily Weather Condition: A.M. 28 °F SUNNY.

P.M. 40 °F SUN / PARTLY CLOUDY

ecorded By: 04/22/20 (Signature) QC Checked by: 04/27/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/2020 Page 2 of 2

Task Team Members:

Narrative (include time and location):

1357 PARAMETERS STABLE - NOTIFY HEATHER THAT TURBIDITY IS BETWEEN 50 NTU AND 10 NTU AND NO FILTERING IS NEEDED.

1400 SAMPLE LL2MW-267-200401-GW FOR EXPLOSIVES AND TAL METALS.

*BREAK DOWN EQUIPMENT AND REMOVE DEDICATED PUMP AND TUBING TO REPAIR HOLE IN TUBING.

1450 DEPART LL2 AOC.

1458 ARRIVE @ 1030, DEMOBILIZE, CLEAN EQUIPMENT. DRUM APPROX. 10.5 GAL PURGE WATER IN DRUM.

1355 GABBY OFFSITE E.O.D.

04/22/20

Daily Weather Condition: A.M. SEE P.1

P.M. SEE P.1

Recorded By: 04/22/20 (Signature) QC Checked by: 04/27/20 (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 4/22/20 Page 1 of 1

Task Team Members:

Ryan Lawrence

RL / 4/22/20 RL / 4/22/20

Narrative (include time and location):

0755 - COMPLETE H+S TAILGATE w/ H. ADAMS AT 1036.
0820 - DEPART 1036. TRIP BLANK FWGTB - 200404 - TB
0835 - SIGN IN AT RQL.
0857 - START PRE-PURGE AT RQLmw-008. CPM 2 6 > 24 PSI = 10
0905 - SWITCH TO 3 MINUTE INTERVALS (00:07:49), END PRE-PURGE.
0914 (00:16:49) RQLmw-008 STABLE, SAMPLE RQLmw-008-200401-GW
FOR VOCs, PHTHALATES / PHENOLS / NITRO, LL PAHs, PCBs, PESTICIDES
EXPLOSIVES, CYANIDE, + TAL METALS.
0938 - SAMPLE COLLECTION COMPLETE
1000 - SIGN OUT AT RQL - GABBY GROMOFSKY IS STILL PRESENT
SAMPLING RQLmw-009.
1040 - COLLECT GRAB SAMPLE AT SCFmw-004, WELL IS ARTESIAN
SCFmw-004-200401-GW FOR EXPLOSIVES + TAL METALS.
REMOVE PUMP + INSTALL WELL PACKER.
1200 - STOP AT LL2 TO HELP GABBY w/ EQUIPMENT ISSUES.
1215 - ENTER LL3
1301 - START PRE-PURGE AT LL3mw-237 CPM 1 ~~8 > 55~~ 8 > 52 RL 4/22/20 PSI = 20
1317 - END PRE PURGE (00:05:45), SET TO 3 MINUTE INTERVALS (00:06:00)
1322 - (00:19:00) LOWERED FLOW TO CPM 1 6 > 54 PSI = 20 DUE TO DRAWDOWN
1326 - LL3mw-237 STABLE (00:25:00), COLLECT LL3mw-237-200401-GW FOR EXPLOSIVES
1339 - SAMPLE COLLECTION COMPLETE
1406 - RETURN TO 1036.
1530 - OFF SITE.

RL / 4/22/20

Daily Weather Condition: A.M. 34° F SUNNY

P.M. 45° F, CLOUDY

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/20 Page 1 of 2

Task Team Members:

Rich Spraul

Narrative (include time and location):

0710 Rich onsite @ RVAAP/B1036. Mobilized 3 of 7 new IDW drums (labeled empty)
0720 Calibrated Horiba #34027 (Pine) then loaded up equipment.
0735 H+S Briefing with FM/SSHO. Plan: Redevelop 2 FBQ MWs (-168/-175)
0810 Depart B1036 for FBQ
0825 Arrived @ FBQmw-177. Setup QED pump (Resecured water line fitting on top of pump).
0900 Pump set @ 19.84 ft BTOC and secure to well cap/post.
0905 Tested pump ok.
0915 Arrived @ FBQmw-168. WL = 9.88 ft BTOC / TD = 21.10 ft BTOC.
0950 Pump installed + tested. Then surged well w/ pump (Typhoon type)
1000 Begin development/purging 5x well volumes
1102 Well stabilized, Development completed.
1125 Pump (QED) reinstalled into FBQmw-168. Secure MW. Depart for FBQmw-175.
1130 Arrived @ FBQmw-175 + setup for redeveloping MW. WL = 15.30 ft BTOC / TD = 23.95 ft BTOC
1158 Begin redeveloping MW (surged with pump).
1218 Pump stopped working, pulled pump + installed backup pump.
1232 Well pumped dry (23.6 x well volumes removed). Development completed. Remove whaler pump and reinstall existing QED Bladder Pump (intake depth ~22.6 ft BTOC).
1300 Depart FBQ for B1036.
1310 Arrived @ B1036. Manage IDW into drums (~45 gal).
1400 Depart B1036
1415 Arrived @ LLImw-087. Setup to redevelop MW. (Removed existing QED pump).
WL initial = 4.58 ft BTOC / TD = 17.78 ft BTOC

Daily Weather Condition: A.M. 30° cloudy

P.M. 42° cloudy

Recorded By: RSpraul 04/22/20 (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/22/20 Page 2 of 2

Task Team Members:

Rich Spnml

Narrative (include time and location):

1438 Begin redeveloping LLmw 087.
1414 Well went dry. very turbid/grey water (lots of fines). Inform FM.
Let well recharged for 5min twice + pumped dry again, then repeated @ 15 + 20 min cycles.
1539 Well went dry. Stopped development. Reinstalled Bladder Pump.
1545 Depart for B1036.
1550 Arrived @ B1036. Manage IDW into Drums (~14.25 gal), unload equipment.
1605 Depart B1036/Main gate.
1645 Returned to Twinsburg office. End of day.

RS 4/22/20

Daily Weather Condition: A.M. 30° cloudy

P.M. 42° cloudy

Recorded By: RS 4/22/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/2020 Page 1 of 1

Task Team Members:

Heather Adams, Danielle Anderson, Ryan Laurich, Gabby Gromofsky, Rich Sprinzl

Narrative (include time and location):

0700 HEATHER, RICH, AND DANIELLE ONSITE
0705 HEATHER HEADS TO Range Control FOR ACCESS APPROVAL. AI AREAS OPEN TURKEY HUNT MAY STILL BE HAPPENING.
0730 GABBY AND Ryan ONSITE. Conduct HIS DAILY TAILGATE FOR AI CREWS.
0745 DANIELLE AND GABBY HEAD OUT.
0805 Ryan HEADS OUT
0830 RICH HEADS OUT IDW MANAGEMENT COMPLETE.
1500 TA ONSITE TO PICK UP TWO COOLERS. CREWS BEGIN TO RETURN FOR END OF DAY.
1520 Ryan OFF SITE END OF DAY. SWITCH ENTRY LINES.
1550 DANIELLE OFF SITE.
1545 RICH OFF SITE, SENDS IDW INSPECTIONS.
1600? HEATHER AND GABBY OFFSITE END OF DAY AND WEEK. HEATHER Calls Range Control TO NOTIFY OFFSITE.

04/23/2020

Daily Weather Condition: A.M. 36°F, OVERCAST

P.M. 40°F, PT. SUNNY

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/20 Page 1 of 3

Task Team Members:

Danielle Anderson
Heather Adams
Gabby Gromofsky
Ryan Laurich
Rich Sprinzl

Narrative (include time and location):

0700 Arrive onsite at CJAG and 1036 to mobilize for the day.
0730 Attend M&S tailgate presented by Heather.
0745 Depart from 1036 for LLI.
0800 Enter LLI gate.
0805 Arrive at LLImw-063 and set up equipment.
0825 Start initial Purge. CPM 2 28/2 25psi
Depth to water 21.19
flow Rate 75 mL/min
initial Purge calculation: 1,396.50
Water is clear, colorless, odorless with suspended feathery solids.
0843 initial Purge complete. Began Purging
CPM 2 28/2 25psi
Depth to water: 21.45
Flow Rate: 75mL/min Total water Purged: 4.33L
water is clear, colorless, odorless with suspended, black and tan feathery solids.
0855 well is stable, begin collecting LLImw-063-200401-GW for explosives, sulfide, and Alkalinity
0940 Finished sampling, packing equipment, and sending report to Heather.
1004 Start initial purge at LLImw-083 CPM 2 27:3 30psi
Depth to water: 30.48

Daily Weather Condition: A.M. 37° cloudy and humid
P.M. 54° partly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/20 Page 2 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1004 continued Flow Rate: 175 mL/min
Initial Purge Calculation: 1,654.81
* water is clear, colorless, odorless
1012 Start purge. CPM 2 27:3 30psi
Depth to water: 30.63
Flow Rate: 200 mL/min Total water Purged: 6.98L
* water is clear, colorless, odorless
1027 ~~SA 04/23/20~~ Well is stable, began sampling LLI-083-200401-GW for explosives, Sulfide and Alkalinity
1057 Sampling completed, materials/equipment packed up.
1105 Report sent to Heather and inform her that I am finished.
1115 exit LLI gate and grab Gabby's Samples. Heading back to 1036
1130 Arrive back at 1036 to drop off and pick up bottles.
11:45 Arrive at FWGmw-004 and begin setting up equipment.
1200 Start initial purge. CPM 2 27:3 20psi
Flow Rate 225mL/min
Depth to water: 11.03
initial Purge Calculation: 1652.65
~~1207 Start purge~~ DA 04/23/20 water is clear, colorless, odorless
1207 Start purge. CPM 2 28:2 21psi
Flow Rate: 150mL/min
Depth to water: 11.35 Total water Purged: 4.93L

Daily Weather Condition: A.M. 37°F cloudy and Humid

P.M. 54°F partly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/20 Page 3 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1226 well is stable, begin collecting samples FWGmw-004-200401-GW for explosives and TAL metals. Water is clear, colorless, odorless.
1253 sampling complete and finished packing equipment.
1318 Arrive at 1036 to drop off samples and pick up a new set.
1320 Depart from 1036.
1335 Arrive at LL10 and enter gate.
1337 Arrive at LL10mw-003 and set up equipment.
1343 Cannot find this well in the tablet, contact Heather. Heather was on a call so I talked to Ryan. I was then told that this is a new well and should head back to 1036.
~~13~~ DA 04/23/20
1405 Finished packing up equipment and Depart from LL10 by exiting gate.
1420 Arrive at 1036 and demobilize.
1450 Depart from 1036 for end of day.

DA 04/23/20

Daily Weather Condition: A.M. 37°F cloudy and humid

P.M. 54°F partly cloudy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 04/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/2020

Page 1 of 2

Task Team Members:

GABBY GROMOFSKY

DANIELLE ANDERSON

RICH SPRINZL

Narrative (include time and location):

0730 ARRIVE @ CJAG BUILDING 1036 | ATTEND H+S TAILGATE PRESENTED BY HEATHER ADAMS.

0805 DEPART 1036.

0813 ARRIVE @ LL1mw-080 | SET UP EQUIPMENT.

0844 BEGIN LOWFLOW PURGE.

0856 STAGNANT WATER VOLUME REMOVED.

0902 STABLE.

0905 SAMPLE LL1MW-080-200401-GW FOR EXPLOSIVES.

0935 DEPART LL1.

0948 ARRIVE @ LL2mw-059

1018 BEGIN LOW FLOW PURGE.

1027 STAGNANT WATER REMOVED.

1036 STABLE.

1040 SAMPLE LL2MW-059-200401-GW FOR EXPLOSIVES.

1105 DEPART LL2mw-059.

1115 MEET DANIELLE @ LL1 GATE AND GIVE HER MY SAMPLES.

1120 CALL WITH HEATHER — PLAN TO MEET RICH AND TRANSFER LL1mw-089 DEVELOPMENT WATER TO 1036.

1140 ARRIVE @ LL1 mw-089.

* TRANFER 55 GALLONS ~~FROM~~ 23 4/23/20 DEVELOPMENT WATER FROM STAGED DRUM INTO DRUM ON TRUCKBED. WAIT FOR RICH TO USE PUMP TO TRANSFER REMAINDER ~~1430 DEPART~~ 23 4/23/20 OF WATER FROM STAGED DRUM INTO TRUCK CONTAINERS.

Daily Weather Condition: A.M. 36°F | OVERCAST | PARTLY SUNNY

P.M. 62°F PARTLY SUNNY

Recorded By: [signature] 04/23/20 (Signature)

QC Checked by: [signature] 04/27/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/2020 Page 2 of 2

Task Team Members:

HH 4/23/2020

Narrative (include time and location):

1430 DEPART LL1MW-0860.
1445 ARRIVE @ 10310/DEMOBILIZE EQUIPMENT.
*TRANSFER 55 GAL DEVELOPMENT WATER INTO 1030 STAGED DRUMS.
1600 DEPART CJAC FOR R.O.D.

DA 4/23/20

Daily Weather Condition: A.M.

P.M. 04/23/20

Recorded By: 04/23/20 (Signature) QC Checked by: 04/27/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater **PROJECT NO:** April 2020 Sampling Event
R VAAP-66

Date: (mm/dd/yy): 04/23/20 Page 1 of 1

Task Team Members:

Ryan Clough

RC / 4/23/20 RC / 4/23/20

Narrative (include time and location):

0730 - H+S TAILGATE AT 1036
0848 - START PRE-PURGE AT LL1mw-084, CPM 1 3>57, PSI = 22
0910 (00:21:22) - END PRE-PURGE, SWITCH TO 3 MINUTE INTERVALS (00:21:36).
0922 - (00:30:6) - STABLE, COLLECT SAMPLE LL1mw-084-200401-GW FOR EXPLOSIVES.
0938 - SAMPLE COLLECTION COMPLETE.
1018 - START PRE-PURGE AT LL1mw-081, CPM2 7>23, PSI = 25.
1029 - END PRE-PURGE (00:11:23), REDUCED FLOW TO CPM 1 3>57 PSI = 25 TO REDUCE DRAWDOWN (00:11:38).
1044 - (00:26:38) INCREASED FLOW TO CPM 2 6>24 PSI = 25.
1229 - (02:11:38) PURGED FOR 2 HOURS (NOT COUNTING PRE-PURGE) TURBIDITY WAS <~~X~~ 50 NTU BUT NOT <~~X~~ 10 NTU, ALL OTHER PARAMETERS ARE STABLE. COLLECT LL1mw-001-200401-GW FOR EXPLOSIVES NO FILTERED SAMPLE REQUIRED.
1243 - SAMPLE COLLECTION COMPLETE
1317 - RETURN TO 1036 - DEMOBILIZE
1420 - OFFSITE.

RC 4/23/20

Daily Weather Condition: A.M. 37° F, CLOUDY

P.M. 57° F, CLOUDY

Recorded By: [signature] (Signature) QC Checked by: [signature] 04/24/20 (Signature)

07-162(NE) 102507 FTP-1215, Revision 0, 4 07 99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/20 Page 1 of 2

Task Team Members:

Rich Sprinzl
Gabby Gromofsky
Heather Adams (FM/SSHO)

Narrative (include time and location):

0700 Arrived @ Main Gate / B1 0360.
0710 Calibrated Horiba U-52 (#34027)
0735 H&S Briefing w/ FM/SSHO. Plan: Redevelop LLmw-0086 (deep ~77 ft)
0750 Decon whaler pumps then load up equipment (2 pumps out of service)
0820 Depart B1 0360.
0835 Arrived @ LLmw-0086. WL = 6.05 TD = 77.95 (Existing Bladder Pump removed)
- top of existing pump: 69.65 + ~3' ~ 72.65' pump intake depth. Well Volume: 40.8 gal.
0915 Inform FM that proper equipment to redevelop may need to be rented due to depth of MW, and one whaler pump is only 40' cable (other 2 may be longer but not working). FM will bring drums and rental bladder pump (to surge if needed) to MW.
1000 Surged MW with weighted bailer. Some fines / white precipitate flakes in bucket (settled out)
1010 Heather Adams (FM) onsite at LLmw-0086, dropped off 4 drums / bladder pump / drum funnel. Discussed how to redevelop due to ~70' depth and ~~limited~~ pump limitations.
1020 1st attempt - setup Existing Bladder Pump
1030 Start purging; however only flowing ~600 mL/min → FM requested to stop and switch to whaler pump. (even though only 40' cable). FM offsite ~1045.
1050 During whaler pump setup, the other whaler pump (75 ft per tag) started to pump / tested ok. Installed 75' pump (~71.50 ft BTOC intake depth)
1108 Begin purging w/ 75' whaler pump (~0.44 gal/min)
1145 Gabby Gromofsky onsite to assist with transferring purge water from drum next to MW into drum on truck.
1205 Begin transferring purge water into 2nd drum (1st drum ~1/3 full)

Daily Weather Condition: A.M. 36° overcast

P.M. 63° sunny

Recorded By: RS 04/23/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/23/20 Page 2 of 2

Task Team Members:
Rich Spinnzl
Gabby Gromofsky

Narrative (include time and location):
1410 Drum in truck full (~55 gal). Stop transfer pump. Move tubing into drum on Rich's truck. Also stopped purging and moved tubing into drum on Rich's truck too.
1417 Restarted purging and transferring water from drum next to MW.
1430 Gabby departs to empty drum into drums at B10036.
1439 FM requested purging to stop for the day. Purging stopped. Remove whaler pump/tubing, reinstalled bladder pump, + load up equipment. Transferred all but ~7 gal in drum next to MW (secured drum to remain onsite). ~21 gal in drum on Rich's truck and ~10 gal between 2 totes.
~~1500~~ 4/23/20 RS
1500 Depart LL1mw-086 for B10036.
1510 Arrived @ B10036. Begin transferring drum/tote water into B10036 drums.
1550 IDW Inspection completed (including Container logs). (~92.5 gal purge water from LL1mw086)
1605 Drums secured, Equipment unloaded. B10036 secured. Depart Main Gate.

RS 4/23/20

Daily Weather Condition: A.M. 36° overcast
P.M. 63° sunny

Recorded By: RS 04/23/20 (Signature) QC Checked by: (Signature) 05/07/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/2020 Page 1 of 1

Task Team Members:

Heather Adams
Ryan Laurich
Rich Sprinzl
Danielle Anderson
Gabby Gromofsky

Narrative (include time and location):

0700 All crews onsite
0705 Heather heads to Range Control for daily site access approval. Only potential turkey hunting on ~~East~~ West side west of 80.
0935 Conduct HCS tailgate and daily brief.
0745 Danielle and Rich head out.
0755 Gabby out to LL3 for well development
0800 Ryan out to LL1 for sampling.
1350 Danielle returns to prop samples off and heads back out to FBQ
1355 Rich returns to 1036 to empty purge water and drop off Ryan's samples.
1500 TA onsite to pick up 2 coolers and 4 COCs.
1515 Danielle returns
1530 Ryan returns w/ Gabby from LL3 development. Rich manages IDW and completes drum log.
1540 Ryan offsite w/ two cooler for UPS.
1550 Danielle offsite
1600 All offsite end of day Heather calls Range Control to notify end of day.

04/27/2020

Daily Weather Condition: A.M. 50°F sunny, no wind
P.M. 60°F sunny, no wind

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 1 of 3

Task Team Members:

Danielle Anderson
Heather Adams
Gabby Gromofsky
Ryan Laurich
Rich Sprinzl

Narrative (include time and location):

0700 Arrive at 1036 and mobilize for the day.
~~0750~~ DA 04/27/20
0735 Attend H&S tailgate presented by Heather.
0750 Depart for FBQ from 1036.
0805 Arrive at FBQmw-175 and set up.
0825 Start initial purge at FBQmw-175.
CPM 2 27:3 25psi
Flow Rate 140mL/min
initial water level 15.48
initial purge calculation 1,444.17
* water is turbid, with a grayish color, and earthy odor.
0835 Start purge. CPM 2 28:2 23psi
depth to water: 15.86
Flow rate: 100mL/min Total volume purged: 16.68L
* water is cloudy with a grayish color, and no odor.
0857 changed to 20psi, Flow rate is now 75mL/min.
water began to get ~~clearer~~ DA 04/27/20 more clear
1035 Take samples. Turbidity <50NTU, no filter required.
FBQmw-175-200401-GW, FBQmw-175-200401-GWMSD, &
FBQmw-175-200402-GW for explosives also CT lab samples
*last reading on log is erroneous, did not complete the test.
Should be disregarded.

Daily Weather Condition: A.M. 41°F mostly sunny with slight wind
P.M. 57°F partly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 2 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1049 Heather asked me to measure the length of the pumps at the FBQ wells I sample.
FBQmw-175 length: 1.92 ft Tubing = ~~1/4 inch~~ 3/8 inch DA 04/27/20
1202 Sampling at FBQmw-175 complete, pack up and move to FBQmw-174.
1230 Start pre purge at FBQmw-174.
CPM2 28:2 20psi
Depth to water: 13.72
Flow Rate 125 mL/min
initial purge calculation 1,501.62
* water is clear, colorless, odorless
1240 initial purge complete, began purging.
CPM2 28:2 20psi
Depth to water: 13.88
Flow Rate: 125mL/min Total volume purged: 5.38L
1258 Collect samples FBQmw-174-200401-GW for explosives.
water is clear, colorless, odorless.
FBQmw-174 pump length: 3.53 ft Tubing: ~~3/8 inch~~ 1/4 inch DA 04/27/20
1330 Depart from well to drive back to 1036 and deliver samples.
1345 Arrive at 1036 to drop off samples and head back to FBQ.
1400 Arrive at FBQmw-168 and set up equipment.
1417 Start initial Purge.

Daily Weather Condition: A.M. 41°F mostly sunny with slight wind

P.M. 57°F partly cloudy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 3 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1417 (cont.) CPM 2 26:4 40psi
Depth to water: 9.86
Flow Rate: 275mL/min
initial purge calculation: ~~275 m~~ DA 04/27/20 1322.33
~~1425~~ DA 04/27/20 water is clear, colorless, odorless.
1425 ~~DA 04/27/20 water~~ * initial purge took longer than projected, But the purge began at 1425.
CPM 2 25:5 40psi
Flow Rate: 325 mL/min
Depth to water: 9.91 Total volume purged: 9.13L
* water is clear, colorless, with a sulfer odor.
1445 Sample well, water is stable. FBQ mw-168-200401-Gw for explosives.
FBQmw-168 pump length: 1.92 ft Tubing = ~~1/4 inch~~ DA 04/27/20 3/8 inch
1520 Complete Sampling, writing report, and packing up equipment. Headed back to 1036.
1535 Arrive at 1036 and demobilize.
1555 Offsite for end of day.

DA 04/27/20

Daily Weather Condition: A.M. 41°F mostly sunny with slight wind
P.M. 57°F partly cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/2020 Page 1 of 2

Task Team Members:

GABBY GROMOFSKY

Narrative (include time and location):

0700 ARRIVE @ CJAG BUILDING 1036.

0730 ATTEND H+S TAILGATE PRESENTED BY HEATHER ADAMS.

0758 DEPART 1036 FOR WELL DEVELOPMENT @ LL3mw-238.

0810 ARRIVE @ LL3mw-238.

0852 BEGIN PURGING WELL.

~DEPTH TO BOTTOM DIFFERS FROM CONSTRUCTION LOG. CALCULATE WELL VOLUME (6.01 GAL).

~PUMP IN WELL IS 2' BLADDER PUMP WITH ~~3/8~~ 1/4" POLY TUBING. GG 4/28/20

0906 WELL DRY – RECHARGE RATE IS 1'/15 MIN.

0938 DEPART LL3mw-238 FOR LL3mw-239.

1020 BEGIN PURGING WELL.

~DEPTH DIFFERS FROM CONSTRUCTION LOG | VERY SOFT BOTTOM AND BIOFOUL ON PUMP. CALCULATE WELL VOLUME (10.91 GAL). GG 4/27/20

~PUMP IS 2" BLADDER PUMP WITH ~~3/8~~ 1/4" TUBING. GG 4/28/20

1120 WELL DRY. DEPART FOR LL3mw-~~0~~238. GG 4/27/20

1138 ARRIVE @ LL3mw-238. GG 4/27/20

1142 ~~BEGIN PUM~~ RESUME DEVELOPMENT. GG 4/27/20

1153 WELL DRY. DEPART FOR LL3mw-241.

1222 BEGIN PURGING LL3mw-241.

~HARD BOTTOM | DEPTH DIFFERS FROM CONSTRUCTION LOG | CALCULATE WELL VOLUME.

~PUMP IS 3' BLADDER PUMP WITH 3/8" POLY TUBING

1352 RYAN ONSITE | DROP OFF PURGE TOTES | GET LOGS FOR LL3mw-238 | 239.

Daily Weather Condition: A.M. 44 °F SUNNY

P.M. 61 °F SUNNY

Recorded By: [signature] 04/27/20 (Signature) QC Checked by: [signature] 05/06/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/21/2020 Page 2 of 2

Task Team Members:

MS 04/27/20

Narrative (include time and location):

1414 5 WELL VOLUMES REMOVED/WATER CLEAR, COLORLESS, ODORLESS

1520 STABLE

1521 REPLACE DEDICATED PUMP/DEPART LL3.

1530 ARRIVE @ 1036, DISCHARGE APPROX. 140 GALLONS DEVELOPMENT/DECON WATER INTO DRUMS STAGED @ 1036.

1600 DEPART CLAG EOD.

MS 04/27/2020

Daily Weather Condition: A.M. SEE P.1

P.M. SEE P.1

Recorded By: 04/21/20 (Signature) QC Checked by: 05/06/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 1 of 2

Task Team Members:

Ryan Lantuch

RL/4/27/20 RL/4/27/20

Narrative (include time and location):

0743 - H+S TAILGATE AT 1036

0814 ~~0800~~ 4/27/20 - ARRIVE AT LL1mw-087.

0833 - START PRE-PURGE AT LL1mw-087, CPM 1 3 > 57 PSI = ~~18~~ 10. RL 4/27/20

0853 - (00:19:55) - END PRE-PURGE. 00:20:09 SWITCH TO 3 MINUTE INTERVALS.

1054 - (02:20:09) - PURGED FOR 2 HOURS, ALL PARAMETERS STABLE EXCEPT TURBIDITY. TURBIDITY DID NOT DROP BELOW 10 NTU. COLLECT SAMPLE LL1mw-087-200401-GW FOR EXPLOSIVES, PERCHLORATE, + TAL METALS. LL1mw-087-200401-GWMSD FOR PERCHLORATE. LL1mw-087-200402-GW FOR PERCHLORATE, AND ~~LL1mw087~~ RL 4/27/20 LL1mw-087-200403-GW FOR PERCHLORATE.

1123 - FINISH SAMPLE COLLECTION.

1228 - START PRE-PURGE AT LL1mw-089 CPM 2 6 > 24 PSI = 25.

1238 (00:08:30) - END PRE-PURGE, SWITCH TO 3 MINUTE INTERVALS. 00:09:01.

1246 (00:18:01) - LL1mw-089 STABLE, COLLECT LL1mw-089-200401-GW FOR EXPLOSIVES SULFIDE, NITRITE/NITRATE/SULFATE, ALKALINITY, TAL METALS. LL1mw-089-200402-GW FOR EXPLOSIVES, AND TAL METALS. LL1mw-089-200403-GW FOR EXPLOSIVES AND TAL METALS.

1320 - SAMPLE COLLECTION COMPLETE.

1400 - MEET RICH SPRINGS TO DROP SAMPLES + PICK UP WELL DEVELOPMENT EQUIP.

1418 - MEET GABBY GROMOFSKY TO DROP OFF PURGE TOTES + GET DEVELOPMENT INSTRUCTIONS.

1420 - CONTINUE DEVELOPMENT AT LL3mw-248

1454 - LL3mw-248 DRY AFTER 6 GAL PURGED.

Daily Weather Condition: A.M. 39° F, CLEAR + SUNNY

P.M. 60° F, CLEAR, SUNNY

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 2 of 2

Task Team Members:

R. Lukich

RL 4/27/20

RL 4/27/20

Narrative (include time and location):

1509 - RESET PUMP AT LL3MW-248 - NEED TO CONTINUE DEVELOPMENT.
1523 - RETURN TO 1036, DEMOBILIZE,
1540 - OFFSITE.
1610 - DROP CT SAMPLES AT UPS.

RL 4/27/20

Daily Weather Condition: A.M. N/A

P.M. 60°F, Sunny

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/27/20 Page 1 of 1

Task Team Members:

Rich Sprinzl

Narrative (include time and location):

0700 Arrived @ RVAAP Main Gate (CJAG) then B1036. Load up equipment/pump/drums
0720 Calibrated Horiba U52 (#34027) (Pine Rental).
0740 H+S Briefing with FM/SSHO.
0745 Depart B1036
0755 Arrived @ LL1 mw-0806. Setup to continue development (Stopped on 4/23/20).
0810 Begin purging (after surging with pump). Initial WL = 6.15 ft BTOC.
1305 Development completed. >5x well volumes removed and 3 stable readings recorded.

1325 Well secured + equipment packed up. (Existing pump reset to previous depth ~13.15 ft BTOC (top pump 69.65 + 3.5' long pump). Depart for LL3.
1330 Meet Ryan Laurich near LL3 - transfer development/whaler pump + containers, and picked up Ryan's samples + purge water containers.
1345 Arrived at B1036. Manage IDW and unload truck.
1515 Manage Gabby's IDW into drums.
1600 Depart RVAAP / CJAG.
1640 Returned to Twinsburg office. End of Day

RS 4/27/20

Daily Weather Condition: A.M. 42° sunny
P.M. 60° sunny

Recorded By: RSprinzl 4/27/20 (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater
RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/2020

Page 1 of 1

Task Team Members:

Heather Adams
Danielle Anderson
Ryan Lauerch
Gabby Gromofsky
Rich Sprinzl

Narrative (include time and location):

0700 All crews onsite.
0705 Heather heads to range control for access aproval. All areas open no range activities.
0735 Conduct H&S and daily tailgate. Danielle heads to FBQ
0800 Gabby heads to LL3 to resume well development. Danielle is having issues w/ Aquatrolls. pH is not calibrating and back-up unit does not have all sensors working. Site is working w/ tech support. Rich continues IDW managiment. Checks pH of all drums and checks water levels. All drums are between 6.26-7.20.
0810 Ryan heads to LL12 for sampling.
0815 Rich heads to load line 3 for development.
1500 TA picks up one sample cooler from 6 wells. Crews start to return for end of day.
1530 Ryan heads off site to drop equipment returns of to ups.
1545 Danielle off site
1600 All other crews off site end of day. Heather checks range control.

04/28/2020

Daily Weather Condition: A.M. 45°F overcast pt. sunny

P.M. 45°F overcast, ct. rain

Recorded By: (Signature)

QC Checked by: (Signature)

07-162(NE)/102507

FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 1 of 3

Task Team Members:

Danielle Anderson, Ryan Laurich
Heather Adams, Rich Sprinzl
Gabby Gromofsky

Narrative (include time and location):

0700 Arrive onsite at CJAG and 1036 to mobilize for the day.
0735 Attend H&S tailgate presented by Heather.
0750 Call tech support due to difficulties calibrating AquaTroll. PH sensor was not calibrating. Told to change the cal solution, this did not work. Then was told to return sensor to factory calibration.
0820 Depart from 1036 for FBQ.
0835 Arrive at FBQ mw-170 and set up equipment.
0848 Start initial purge.
CPM 4 10:5 48psi
Flow Rate: 425mL/min
Depth to water: 16.08
Initial Purge calculation: 1488.45
* water is clear with a slight gray tint and no odor
0852 Start purge. CPM 4 10:5 48psi
Flow Rate: 400 mL/min
Depth to water: 16.12 Total volume purged: 21.73L
* water started clear, colorless, odorless, ~~but became turbid as time went on.~~ DA 04/28/20 Bubbles were trapped in chamber.
0920 AquaTroll disconnected with tablet, but continued pumping. Slightly delayed reading present on the log. DA 04/28/20
0932 Questioned turbidity, water seemed clear, so I shook the Aqua troll and NTU dropped

Daily Weather Condition: A.M. 48° F cloudy and humid
P.M. 61°F cloudy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 2 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

0956 well is stable. Taking sample ~~FBQmw-170~~ FBQmw-170-200401-GW for explosives. DA 04/28/20

1030 Complete report, and packing equipment. Collected pump from FBQmw-170, it is not designated to this well.

1048 Arrive at FBQmw-176 and set up equipment

1105 Start pre purge. CPM 2 24:6 20psi
Flow Rate 250mL/min
Depth to water: 7.25
initial purge calculation: 1,488.28
* water is turbid, orange, and has a sweet odor.

1111 Pre purge complete. CPM 2 24:6 20psi
Flow Rate: 250mL/min
Depth to water: 7.36 Total volume purged: 22.83L
* water is turbid, orange, and no odor

1124 Change CPM to 2 25:5 to help with draw down. New flow Rate: 200mL/min

1206 Lost connection with tablet. Reconnected, slightly off on timing for 3min interval.

1303 Well stable and turbidity below 10 NTU.
Collect sample FBQmw-176-200401-GW for explosives

1340 Report Complete and finished packing up equipment. Return to 1036. to dump purge water and samples.
Pump length: 1.92 ft Tubing: 1/4 inch

1355 Arrive at 1036 and dump purge water.

~~13~~ DA 04/28/20 1400 Talk with Heather about work and she sent me to WBG.

Daily Weather Condition: A.M. 48°F cloudy and Humid

P.M. 61°F cloudy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 3 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1400 continued. to measure the pumps and tubing at sampling wells.
1420 Depart from 1036 with all equipment except water level meter removed from truck.
1425 Arrive at and enter WBG gate. and measure pumps.
WBGmw-020 pump: 3.5ft Tubing: 3/8 inch
WBGmw-009 pump: 3.5ft Tubing: 3/8 inch
WBGmw-021 pump: 3.5ft Tubing: 3/8 inch
WBGmw-006 pump: 3.5ft Tubing: 3/8 inch
1505 Exit WBG gate.
1510 Enter DA2 gate and measure pumps.
DETmw-003 pump: 1.92ft Tubing: 1/4 inch
DETmw-004 pump: 1.92ft Tubing: 1/4 inch
1535 Exit and lock DA2 gate.
1540 Arrive back at 1036 and demobilize.
1545 Depart from 1036 and CJAG for end of day.

DA 04/28/20

Daily Weather Condition: A.M. 48° F cloudy and humid

P.M. 61°F cloudy

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/2020 Page 1 of 1

Task Team Members:

GABBY GROMOFSKY

RICH SPRINZL

RS 4/28/20

RS 04/28/20

Narrative (include time and location):

0700 GABBY ARRIVE @ CJAG BUILDING 1036 MOBILIZE FOR DEVELOPMENT.
0735 ATTEND H+S TAILGATE PRESENTED BY HEATHER ADAMS.
0755 DEPART 1036.
0810 ARRIVE @ LL3mw-238.
0828 BEGIN PURGING WELL (RESUME DEVELOPMENT FROM 04/27/20).
0839 DRY - 4.8 WELL VOLUMES REMOVED. MOVE TO LL3mw-239.
0916 BEGIN PURGING LL3mw-239 (RESUME DEVELOPMENT FROM 04/27/20).
0948 DRY - 2.5 WELL VOLUMES REMOVED.
RS 11/28/20 1050 WATER LEVEL @ TOP OF SCREEN - RESUME PURGING
0945 RICH ONSITE FOR LL3mw-238 WELL LOG | PROCEED TO 238 TO DEVELOP.
1152 WELL DRY - 3.8 WELL VOLUMES REMOVED.
1155 RICH LOADS APPROX. 17 GALLONS PURGE WATER FROM LL3mw-239 DEVELOPMENT TO DISCHARGE @ 1036. RICH DEPARTS LL3.
1309 WATER LEVEL @ TOP OF SCREEN - RESUME PURGING.
1325 WELL DRY - 4.6 WELL VOLUMES REMOVED.
1335 DEPART LL3mw-239 TO CHECK PUMP + TUBING @ LL3mw-237.
1342 ARRIVE @ LL3mw-237.
~2' BLADDER PUMP WITH ~~3/8"~~ 1/4" TUBING. RS 11/28/20
1400 RETURN TO LL3mw-239 | WL = 29.10' | ALLOW TO RECHARGE LONGER.
1420 RESUME PURGE. WATER IS SLIGHTLY CLOUDY WITH A BROWN TINT.
1446 5 WELL VOLUMES REMOVED | WATER CLEAR | COLORLESS.
1456 WELL STABLE 3 CONSECUTIVE READINGS | REPLACE DEDICATED PUMP IN WELL - DEVELOPMENT COMPLETE.
1510 DEPART LL3.

Daily Weather Condition: A.M. 46°F SUNNY | PARTLY CLOUDY

1519 ARRIVE @ 1036 | DEMOBILIZE
1557 DEPART CJAG E.O.D. P.M. 60°F PARTLY CLOUDY

Recorded By: 04/28/20 (Signature) QC Checked by: 05/06/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 1 of 2

Task Team Members:

Ryan Laurich

RL 4/28/20 RL 4/28/20

Narrative (include time and location):

0735 - Complete H+S Tailgate at 1036

0810 - Depart 1036.

0820 - Arrive at LL12 + Sign In at South Gate. 3 > 27

0841 - Start pre-purge at LL12mw-187, Re-sample for Ammonia, CPM 2 ~~4 > 26~~ RL 4/28/20

PSI = 20. Pre-purge complete at 00:13:05.

0855 - Switch to 3 min intervals 00:14:03.

0920 (00:38:03) LL12mw-187 stable, collect LL12mw-187-200401-GW for Ammonia.

0925 - Sample collection complete. LL12mw-187 Tubing = 1/4", Pump = 3'6"

1004 - Start pre-purge at LL12mw-185, Re-sample for Ammonia, CPM 1 3 > 57 PSI = 15

1024 - (00:19:51) Pre-purge complete, 00:20:05 Switch to 3 minute intervals.

1027 - (00:23:05) Lower purge rate to CPM 1 2 > 58 PSI = ~~15~~ 10 RL 4/28/20, due to drawdown.

1039 - (00:35:05) - Lower purge rate to CPM 1 1 > 59 PSI = 10.

1051 (00:47:05) - LL12mw-185 stable, collect LL12mw-185-200401-GW for Ammonia.

1115 - Sample collection complete. LL12mw-185 Tubing = 1/4" Pump = 3'6"

1130 - Exit LL12 - ~~Signout at~~ RL 4/28/20 Sign out at South Gate.

1145 - Return to 1036 + Drop Samples.

~~Start pre-purge at LL10mw-00~~ RL 4/28/20

1215 - Start Trip Blank FWGTB-200406-TB.

1223 - Start pre-purge at LL10mw-003, CPM 2 5 > 25 PSI = 20.

Daily Weather Condition: A.M. 48°F, Cloudy

P.M. 52° F, Cloudy

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 2 of 2

Task Team Members:

R. Launch

RL / 4/28/20

RL / 4/28/20

Narrative (include time and location):

~~103~~ 1232 (00:10:53) PRE-PURGE COMPLETE, 00:10:54 SWITCH TO 3 MINUTE INTERVALS.

1244 - (00:19:54) LL10MW-003 STABLE, COLLECT LL10MW-003-200401-GW FOR VOCs CC14 ONLY

1247 - END SAMPLE COLLECTION. ~~TUBING~~ LL10MW-003 TUBING = 3/8" PUMP = 2'

1326 - RETURN TO 1036 + DROP SAMPLES.

1345 - MOBILIZE TO MEASURE PUMPS + TUBING DIAMETERS.

1452 - RETURN TO 1036

1532 - DEPART SITE.

1556 - DROP EQUIPMENT AT UPS TO SHIP TO OAK RIDGE 2 COMPRESSORS.

4/28/20

Daily Weather Condition: A.M. 48°F, CLOUDY

P.M. 52°F, CLOUDY

Recorded By: 4/28/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/28/20 Page 1 of 1

Task Team Members:

Rich Sprinzl

Narrative (include time and location):

0700 Arrived @ RVAAP/CJAG Main Gate then B1036. Load up equipment.
0715 Begin IDW Management
~~0800~~ H&S Briefing w/ FM/SSHO
0815 Begin testing pH of water IDW in Drums.
0930 pH testing completed. Depart B1036 for LL3.
0945 Arrived at LL3. Brief w/ Gabby Gromofsky regarding redevelopment of LL3mw-238/239.
-238 was pumped dry earlier + pumping 239 dry again.
1000 Arrived at LL3mw-238. Setup pump to continue pumping (WL = 17.23 ft BTOC after recharge)
1045 LL3mw-238 went dry again (5.8 well volumes have been removed) → > 5x well volumes and repeatedly gone dry → Redevelopment concluded. (FM concurred)
1105 Reinstall existing bladder pump (2' long, 1/4"x1/4" tubing) Top of pump 19.95 (+2' → Intake depth = 21.95 ft BTOC)
1120 Depart LL3mw-238. Stop by LL3mw-239 to debrief w/ Gabby
1155 Depart LL3 (transferred some of Gabby's purge water to dump at B1036 (into drums)
1201 Returned to B1036. Manage IDW (~25 gal)
1230 IDW managed. FM assigned sampled wells to check pump length/tubing size (LL1/LL2)
1235 Depart B1036 for LL1.
1245 Arrived @ LL1. Begin verifying pump lengths/tubing size.
Note LL1mw-004 completely flooded (casing + outer casing, large chunk of PVC riser missing)
1305 FWGmw-11/12 could not access due to partial culvert washout - may be able to clear brush
1410 LL1 done.
1420 Arrived at RQL. Sign into LLC access log. Then check pump/tubing specs.
1450 Completed w/ inspection at RQL. Sign out on access log. Depart RQL.
1500 Arrived B1036. Unload equipment. Pack up pumps/supplies that go back to Twinsburg. Update IDW Logs.
1600 Rich departs site.

Daily Weather Condition: A.M. 45 cloudy

P.M. 65° cloudy → sunny

Recorded By: RS 04/28/20 (Signature) QC Checked by: 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 4/29/2020 Page 1 of 1

Task Team Members:

Heather Adams
Danielle Anderson
Gabby Gromofsky

Narrative (include time and location):

0700 All crews on site
0705 Heather heads to range control for access approval @ FBQ and LL3. Areas all clear.
0730 Conduct HCS tailgate and Daily Brief.
0745 Danielle heads to FBQ and Gabby heads to FWGMW-007 for sampling.
1200 Gabby returns to empty purge and recon pumps then heads to LL1MW-086.
1400 Danielle returns to empty purge and heads to LL3.
1500 TA onsite to pick up one cooler from 4-wells.
1530 Danielle returns to 1036 for De-mob.
Gabby ~~returns~~ will HA 4/29/20 to 1036 for end of day. Delay was approved by range control at 1500. Heather called for a 15 minute extention.
1551 Danielle offsite end of day.
1610 Gabby returns to 1036.
1620 Heather and Gabby offsite ~~AAE~~ HA 4/29/2020 end of day. Heather calls range control.

04/29/2020

Daily Weather Condition: A.M. 57°F overcast

P.M. 22°F, overcast lt. rain on and off.

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/29/20 Page 1 of 3

Task Team Members:

Danielle Anderson
Heather Adams
Gabby Gromofsky

Narrative (include time and location):

0655 Arrive at CJAG.
0700 Arrive at 1036 and mobilize for the day.
0730 Attend H&S meeting presented by Heather.
0745 Depart from 1036.
0800 Arrive at FBQmw-177 and set up equipment.
0812 Start pre purge. CPM 4 11:4 20psi
Flow Rate: 300mL/min
Depth to water 10.11
initial purge Calculation: 1,427.33 mL
* water is brown, turbid, and has an earthy scent
0815 pre purge took double the estimated time. I adjusted the CPM to CPM 4 10:5 and the flow Rate changed to 320mL/min
0818 Pre purge complete. CPM 4 11:4 20psi
Flow Rate: 250mL/min
Depth to water: 10.76 Total volume Purged: 31.83L
* water is brown, turbid, and has an earthy scent
0904 Tablet disconnected from AquaTroll. 52:29
1023 Well Stable, except for turbidity, Over 10 but under 50 NTU.
Sample FBQmw-177-200401-GW taken for explosives.
FBQmw-177 pump: portable 12" Tubing: 1/4 inch
1130 Depart from FBQmw-177 after waiting on Gabby
1159 Arrive at FBQmw-171 and set up equipment

Daily Weather Condition: A.M. 57°F cloudy and humid

P.M. 68°F mostly cloudy 60% chance of rain

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/29/20 Page 2 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1205 Start pre purge. CPM 2 27:3 25psi
Flow Rate: 125mL/min
Depth to water: 14.94
Initial purge calculation 1510.02 mL
* water is clear, colorless, odorless
1218 Start purge. CPM 2 27:3 25psi
Flow Rate: ~~15.14~~ DA 04/28/20 125mL/min
Depth to water: 15.13 Total volume purged: 6.655L
1232 ~~ept~~ DA 04/29/20 ~~ep~~ DA 04/29/20 Emptied flow cell due to unexplained high turbidity.
28:19 on the tablet.
* water is clear, colorless, odorless.
1258 Samples taken and well stable. FBQmw-171-200401-GW
for explosives.
1340 Completed with report, packing equipment, and measuring pump.
FBQmw-171 pump: 23inch Tubing: ¼inch Depth to T.O.P.: 25.95ft
Depart from FBQ.
1355 Arrive at 1036 to drop off samples and purge water.
~~13~~ DA 04/29/20
1400 Depart from 1036 for LL3.
1410 Enter LL3 gate and arrive at LL3mw-241.
1420 Equipment is set up, but there is no template for this well in the tablet.
Informed Heather and called Amanda.

Daily Weather Condition: A.M. 57°F cloudy and humid

P.M. 68°F mostly cloudy 60% chance of rain

Recorded By: Danielle Anderson (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/29/20 Page 3 of 3

Task Team Members:

Danielle Anderson

Narrative (include time and location):

1420 (cont.) Pump length: 42 inch Tubing: 3/8 inch.
Asked to get information about other wells.
LL3mw-238 depth to TOP: 19.91 depth to water: 15.97
LL3mw-239 depth to TOP: 31.42 depth to water: 23.26
1515 Exit and lock LL3 gate.
1530 Return to 1036 and demobilize.
1555 Exit CJAG for the ~~project compte~~ DA 04/29/20 rest of the project.

DA 04/29/20

Daily Weather Condition: A.M. 57°F Cloudy and humid

P.M. 68°F mostly cloudy 60% chance of rain

Recorded By: [signature] (Signature) QC Checked by: [signature] 05/07/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/29/2020 Page 1 of 1

Task Team Members:

GABBY GROMOFSKY

DANIELLE ANDERSON

HEATHER ADAMS

Narrative (include time and location):

0700 ARRIVE @ CWAG BUILDING 1036. MOBILIZE FOR GROUNDWATER SAMPLING.

0730 ATTEND H+S TAILGATE PRESENTED BY HEATHER ADAMS.

0744 DEPART 1036.

0800 ARRIVE @ FWGMW-007.

0833 BEGIN LOW FLOW PURGE.

0839 STAGNANT WATER VOLUME REMOVED.

0959 WELL STABLE.

1000 COLLECT FWGMW-007-200401-GW FOR EXPLOSIVES + METALS. 4/29/20

~CHECK PUMP - 2' BLADDER PUMP w/ 1/4" BONDED TUBING.

1115 DEPART FWGMW-007.

1130 STOP @ FBQ FOR DANIELLE'S SAMPLES AND BLADDER PUMP NEEDING DECONNED.

1140 ARRIVE @ 1036. DROP OFF SAMPLES AND DECON BLADDER PUMPS. DEPART 1036.

1255 ARRIVE @ LLIMW-086. 4/29/20

1324 BEGIN LOW FLOW PURGE.

1334 STAGNANT WATER VOLUME REMOVED.

~TURBIDITY READING HIGH (~600NTU) NOTIFY HEATHER THAT I WILL LIKELY HAVE TO WAIT 2 HRS TO SAMPLE AND WILL BE PRESSED FOR TIME.

~HEATHER RECIEVES EXTENSION ON OFFSITE TIME FROM RANGE CONTROL.

1534 COLLECT SAMPLE LLIMW-086-200401-GW FOR NITRATE/NITRITE/ALKALINITY/TAL METALS. COLLECT FILTERED SAMPLE FOR TAL METALS.

1557 DEPART LLIMW-086.

Daily Weather Condition: A.M. 87°F | CLOUDY

1609 ARRIVE @ 1036.

1620 DEPART CWAG E.O.D. P.M. 70°F | OVERCAST | SCATTERED SPRINKLING

Recorded By: (Signature) 04/29/20 QC Checked by: (Signature) 05/06/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 4/30/2020 Page 1 of 1

Task Team Members:

Heather Adams Ryan Laurich
Gabby Gromofsky
Rich Sprinzl

Narrative (include time and location):

0700 Heather & Gabby onsite.
0710 Heather goes to range control for access approval. Approved for LL1, 2, 3, 4 & 12.
0745 H&S tailgate w/ Gabby. She heads to LL3
0750 Ryan & Rich onsite.
0815 H&S tailgate w/ Ryan & Rich.
0830 Ryan & Rich head out.
1030 Ryan returns to 1036 to begin de-mob
1215 Gabby returns from sampling
1330 Rich returns to 1036 begin demob
1415 Ryan heads offsite to ship all equipment back.
1500 TA Ank Kevin onsite. TA took 2 sample cooler. Kevin picking up keys.
1505 Rich completes IDW inspections and begin sweeping the floor.
1530 All off site end of event, Heather calls range control for off site end off day.

4/30/2020

Daily Weather Condition: A.M. 50°F, overcast lt. rain.
P.M. 53°F, lt rain on and off.

Recorded By: (Signature) QC Checked by: (Signature)

07-162(NE)/102507 FTP-1215, Revision 0, 4/07/99

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: April 2020 Sampling Event

Date: (mm/dd/yy): 04/30/20

Page 1 of 1

Task Team Members:

Ryan Laurich

TL / 4/30/20

RL / 4/30/20

Narrative (include time and location):

0828 - Complete H+S briefing at 1036.

0850 - Arrive at LL3

0911 - Start pre-purge at LL3MW-238, CPM 1 6>54, PSI = 18.

0922 - (00:10:47) Pre-purge completed. Switch to 3 minute interval at 00:11:05. Reduce flow rate to CPM 1 3>57 PSI = 18 to reduce drawdown.

0931 (00:20:05) - LL3MW-238 is stable. Collect LL3MW-238-200401-GW for explosives.

0953 - Sample collection complete.

1028 - Return to 1036 begin demobilization.

1430 - Depart site.

TL
4/30/20

Daily Weather Condition: A.M. 51°F, Cloudy

P.M. N/A

Recorded By: (Signature)

QC Checked by: (Signature) 05/07/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2020 Sampling Event

Date: (mm/dd/yy): 04/30/2020 Page 1 of 1

Task Team Members:

GABBY GROMOFSKY

RYAN LAURICH

JJB 04/30/20

04/30/20

Narrative (include time and location):

0700 ARRIVE @ CJAG 1036. MOBILIZE FOR GROUNDWATER SAMPLING.
0740 ATTEND H-S TAILGATE PRESENTED BY HEATHER ADAMS.
0750 DEPART 1036.
0800 ARRIVE @ LL3MW-241.
0824 WELL SET UP AND REALIZE TABLET IS @ 1036. CALL RYAN - HE IS ON HIS WAY OUT AND IS BRINGING IT.
0840 RYAN DROPPS OFF TABLET.
0851 BEGIN LOW FLOW PURGE.
0858 STAGNANT WATER VOLUME REMOVED.
0901 PARAMETERS STABLE.
0910 COLLECT SAMPLE LL3MW-241-200401-GW FOR EXPLOSIVES.
0950 ARRIVE @ LL3MW-239.
1032 BEGIN LOW FLOW PURGE.
1037 STAGNANT WATER VOLUME REMOVED.
1112 PARAMETERS STABLE.
1115 COLLECT SAMPLE LL3MW-239-200401-GW FOR EXPLOSIVES.
~DEMOB/CLEAN EQUIPMENT.
1210 DEPART LL3MW-239.
1215 ARRIVE @ 1036 | DEMOBILIZE | IDW MANAGEMENT | DECON DEV. PUMPS.
1535 DEPART CJAG E.O.D.

04/30/20

Daily Weather Condition: A.M. 54°F OVERCAST

P.M. 57°F OVERCAST | SHOWERS

Recorded By: 04/30/20 (Signature) QC Checked by: 05/06/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/2020 Page 1 of 2

Task Team Members:

GABBY GROMOFSKY
Ryan LAURICH
DANIELLE ANDERSON

Narrative (include time and location):

0700 HEATHER, RYAN, GABBY, AND DANIELLE ONSITE. KEVIN IS ALREADY HEREWITH 1036 OPENED.
0715 HEATHER HEADS TO RANGE CONTROL FOR ACCESS APPROVAL WHILE CREWS CALIBRATE AND LOAD-UP.
0800 CONDUCT H&S TAILGATE WITH CREW. AND KEVIN.
0810 Ryan AND KEVIN HEAD TO FWGMW-011 & 012. AI SAYS THE ROAD IS ACCESSIBLE BEFOR LAST NIGHTS STORMS.
0822 AWP ARRIVES. MEET THEM IN BULLPEN FOR TAILGATE.
0833 GABBY HEADS WITH AWP TO SET UP DANIELLE CONTINUES IDW MANAGEMENT.
0930 DANIELLE HEADS TO RT. 5 FOR SAMPLING.
1100 HEAD TO RT 5 WELLS TO DROP OFF EXRA BOTTLE
1120 RETURN TO 1036.
1200 HEAD TO FWGMW-012 TO TAKE Ryan EXTRA BOTTLES
1250 RETURN TO 1036
1325 Ryan BACK TO 1036 TO START DEMOB.
1530 TEST AMERICA ONSITE TO PICK UP SAMPLES.
1550 DANIELLE OFFSITE TO DROP OFF CT COOLER.
1600 Ryan and HEATHER DEPART RVAAP AND CALL RANGE CONTROL. WILL WAIT IN BULLPEN FOR GABBY TO FINISH SAMPLING.
1630 SAMPLING COMPLETE.
1655 GABBY HEADS TO TEST AMERICA TO DROP OFF SAMPLES. Ryan OFF SITE

Daily Weather Condition: A.M. PT. ~~Cotta~~ 1M 6/11/20 CLOUDY, SUNNY LATER 70°F.

P.M. 75°F Sunny

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66

PROJECT NO: June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/2020

Task Team Members:

SEE PAGE 1

Narrative (include time and location):

1705 HEATHER SIGNS AWP JOB SHEET. AWP OFFSITE. HEATHER OFFSITE
END OF SAMPLE EVENT.

6/11/2020

Daily Weather Condition: A.M. 6/11/2020

P.M. 75°F Sunny

Recorded By: (Signature)

QC Checked by: (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 1 of 3

Task Team Members:

GABBY GROMOFSKY
ALICIA JORDAN (AWP)
DANIELLE ANDERSON
HEATHER ADAMS
TYLOR LANE (AWP)
RYAN CAURICH

Narrative (include time and location):

0700 GABBY ARRIVE @ CJAG B1036. MOBILIZE FOR GW SAMPLING.
0745 H+S TAILGATE W/ H.ADAMS.
0800 BEGIN LABELING DRUMS W/ NON-HAZ LABELS.
~ HEATHER CONTACTING AREA WORKS PROTECTIVE BECAUSE THEY ARE APPROX. 1/2 HR LATE.
0830 HEATHER/DANIELLE/GABBY EXIT CJAG FACILITY - MEET AWP OUTSIDE GATE. DISCUSS H+S AND PLAN FOR ACCESSING WELLS.
~ GABBY TO SHOW AWP ALL 3 WELL LOCATIONS, THEN RETURN TO FWGMW-020 + 018, AND SET UP EXCLUSION ZONE + LANE CLOSURE.
~ DANIELLE TO RETURN W/ HEATHER AND MEET @ FWGMW-020 + 018 WHEN READY.
0840 TAILGATE COMPLETE - GABBY + AWP DEPART.
0910 WELL LOCATIONS COMPLETE + MARKED W/ CONES. AWP BEGINS SETTING UP ROAD SIGNS ~ EVERY 200' LEADING UP TO FWGMW-020 + 018
0935 GABBY/DANIELLE/AWP MEET @ OLD LL2 GATE/ENTRANCE (OFFSITE)
~ PROCEED TO FWGMW-020 + 018.
0945 AWP STOPS TRAFFIC + LEIDOS ENTER WELLS. DANELLE SETS UP ON FWGMW-~~018~~ 020 AND GABBY ON FWGMW-018.
1010 BEGIN LOW FLOW PURGE @ FWGMW-018.
1112 STABLE.

Daily Weather Condition: A.M. 66°F; PARTLY CLOUDY

P.M. 77°F; PARTLY CLOUDY.

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature) 6/24/20

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 2 of 3

Task Team Members:

Narrative (include time and location):

1115 - COLLECT SAMPLE FWGMW-018 - ~~GW~~ SJS 06/11/20 200401-GW FOR EXPLOSIVES/METALS.

1155 DEPART WELLS.

1200 ARRIVE @ FWGMW-021. DANIELLE DEPARTS FOR 1030 W/ SAMPLES

NAWP CLOSES ROAD SO THAT WE CAN PULL IN/OUT OF WELL.

1235 BEGIN LOW FLOW PURGE @ FWGMW-021.

1424. STABLE

1425 COLLECT FWGMW-021-200401-GW, FWGMW-021-200402-GW (DUPLICATE), AND FWGMW-021-200403-GW (SPLIT) FOR METALS + EXPLOSIVES.

~ COLLECT FWGMW-~~020~~ SJS 06/11/20 021-200401-GW MSD (MSMSD) FOR EXPLOSIVES.

* 1420 DANIELLE BACK ONSITE TO HELP W/ EQUIPMENT/SAMPLES.

1450 DANIELLE + GABBY DEPART FOR FWGMW-024. AWP BREAKS DOWN + HEADS TO 024.

1500 AWP SHUTS DOWN LANE SO THAT WE CAN PULL INTO WELL.

1513 BEGIN LOW FLOW PURGE @ FWGMW-024.

1530 DANIELLE OFFSITE W/ SAMPLES FROM 021 + PURGE WATER.

1606 STABLE.

1610 COLLECT SAMPLE FWGMW-024-200401-GW FOR METALS/EXPLOSIVES. BREAK DOWN EQUIPMENT.

1635 AWP CLOSES LANE AS I DEPART SITE. PLAN IS TO MEET BACK

Daily Weather Condition: A.M. SJS 06/11/20

P.M.

Recorded By: [signature] 06/11/20 (Signature) QC Checked by: [signature] 6/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 3 of 3

Task Team Members:

JJS 06/26/20 JJJ 06/26/2020

Narrative (include time and location):

AT CJAG FRONT GATE WHEN THEY ARE COMPLETED W/ GATHERING ROAD SIGNS/ETC.

1642 MEET HEATHER/RYAN @ FRONT GATE WRAP UP EQUIPMENT FOR RYAN TO TAKE TO TWINSBURG + PREP SAMPLES FOR DROPOFF @ TA NORTH CANTON.

~PLAN IS FOR ME TO COME BACK TOMORROW, DEMOB, DUMP IDW WATER, PERFORM IDW INSPECTION. JJS 06/11/20

1706 DEPART CJAG FOR E.O.D.

1738 ARRIVE @ TA, RELINQUISH SAMPLES, UNLOAD UNUSED BOTTLEWARE.

1745 DEPART TESTAMERICA.

JJS 06/11/20

Daily Weather Condition: A.M. JJS 06/11/20

P.M.

Recorded By: JJS 06/11/20 (Signature) QC Checked by: Daill Ad 6/24/20 (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 1 of 3

Task Team Members:

Danielle Anderson Ryan Lavrich
Heather Adams
Gabby Gromofsky

Narrative (include time and location):

0650 Arrive at RVAAP.
0700 Arrive at 1036 and mobilize for day.
0745 Depart from 1036 and check for traffic control.
0800 M+S Tailgate presented by Heather.
0830 Meet with Traffic Control to discuss plan for the day.
0835 Arrive back at 1036 to label IDW Drums.
0930 Depart from 1036 ~~with~~ DA 06/11/20 to meet up with traffic control and Gabby.
0945 Block off road with Traffic Control and arrive at FWG-020.
1016 Start initial Purge.

Water level: 21.01 Ft
Purge rate: 175 mL/min
CPM: 2 26:4 21 PSI
initial Purge calculation: 1,031.73 mL

* water is orange and turbid. no odor.
- ~~water is~~ DA 06/11/20 Air in line, possibly a pump issue.

1025 Initial purge complete.

Water level: 21.36
Purge Rate: 150 mL/min
CPM: 2 26:4 20 PSI
Total Purge: 7.950 L

* water appeared soapy, slightly turbid, with oil odor

Daily Weather Condition: A.M. 67°F Mostly Cloudy
P.M. 70°F Mostly Sunny

Recorded By: [signature] (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 2 of 3

Task Team Members:

Danielle Anderson Ryan Laurich

Gabby Gromofsky

Heather Adams

Narrative (include time and location):

1050 Call Heather about air in the line. She said that if Temp. pH and one other parameter were stable, to sample.

1110 Temp. pH, Conductivity, & OCD stable, sampled well. FWG-020-200401-GW for VOCs and TAL Metals. Took filtered and unfiltered samples of TAL Metals.

1112 Ask Heather to bring extra metals bottles since there needed to be a filtered and unfiltered sample.

1150 Complete sampling and packing up materials.

1155 Depart from FWG-020 with Gabby.

1200 Depart from FWG-021 to run samples back to 1036.

1210 Arrive at 1036 to drop off samples.

1220 Arrive back at FWG-021 and prepare report from FWG-020.

1250 Report Completed and sent to Heather. Then I assisted Gabby with purging, ~~and~~ DA 06/11/20 sampling, and packing up equipment from FWG-021.

1330 Heather asked me to run to the gas station to get ice. I departed from FWG-021.

1405 Arrive back at 1036 to drop off ice and purge water.

1420 Arrive back at FWG-021 to finish assisting Gabby. I put all the purge water in my truck.

1500 Depart from FWG-021 and Arrive at FWG-024. Then I helped Gabby set up the well and begin pre purge.

Daily Weather Condition: A.M. 67°F Mostly Cloudy

P.M. 70°F Mostly Sunny

Recorded By: Daniel Anderson (Signature) QC Checked by: [signature] (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 06/11/20 Page 3 of 3

Task Team Members:

Danielle Anderson Ryan Laurich
Heather Adams
Gabby Gromofsky

Narrative (include time and location):

1530 Depart from FWG-024 with the purge water, as much equipment as possible, and samples.
1540 Arrive at 1036 and demobilize for the day.
1600 Depart from 1036 and CJAG for end of day.
1640 Arrive at UPS store to ship samples and coolers.
1705 Arrive at Twinsburg office to drop off equipment

DA 06/11/20

Daily Weather Condition: A.M. 67°F Mostly Cloudy
P.M. 70°F Mostly Sunny

Recorded By: Danielle Anderson (Signature) QC Checked by: (Signature)

TASK TEAM ACTIVITY LOG SHEET

PROJECT NAME: Facility-wide Groundwater RVAAP-66 **PROJECT NO:** June 2020 Sampling Event

Date: (mm/dd/yy): 6/11/2020 Page 1 of 1

Task Team Members:

Ryan Laurich

RL / 6/11/2020 RL / 6/11/2020

Narrative (include time and location):

0645 - ARRIVE AT RVAAP

0700 - ENTER 1036 + BEGIN MOBILIZATION / CALIBRATION.

0730 - COMPLETE H+S TARGATE AT 1036.

0800 - DEPART 1036.

0912 - START PURGE AT FWGMW-012, CPM 2 9 > 21 PSI = 25

0920 - (00:07:21) END PRE-PURGE, 00:07:34 SWITCH TO 3 MINUTE INTERVALS.

0929 (00:16:34) - FWGMW-012 STABLE, COLLECT SAMPLE FWGMW-012-200401-GW FOR EXPLOSIVES + TAL METALS

0940 - SAMPLE COLLECTION COMPLETE.

1018 - START PRE PURGE AT FWGMW-011, CPM 2 4/26 PSI = 20.

1025 (00:06:28) - PRE-PURGE COMPLETE, 00:06:49 SWITCH TO 3 MINUTE INTERVALS.

1155 ~~1255~~ (01:35:47) - TUBING POPPED OFF FLOW CELL.

1229 - (02:09:47) - PURGED FOR TWO HOURS AT FWGMW-011 ALL PARAMETERS STABLE EXCEPT TURBIDITY. COLLECT FWGMW-011-200401-GW FOR EXPLOSIVES + TAL METALS, TURBIDITY < 50 NTU, NO FILTERED SAMPLE REQUIRED.

1325 - RETURN TO 1036. DEMOBILIZE.

1600 - OFFSITE.

RL 6/11/2020

Daily Weather Condition: A.M. 66°F, CLOUDY

P.M. 66°F, P. CLOUDY w/SUN

Recorded By: RL (Signature) QC Checked by: Daniel Ad 6/17/20 (Signature)

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D.2 Well Purge Forms

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RVAAP-01 RAMSDELL QUARRY LANDFILL

Low-Flow Test Report:

Test Date / Time: 4/21/2020 9:17:10 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: RQLmw-007 **Well Diameter: 2 in** **Initial Depth to Water: 4.54 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 16 ft** **Pump Intake From TOC: 15.9 ft** **Estimated Total Volume Pumped: 5605 ml** **Flow Cell Volume: 130 ml** **Final Flow Rate: 150 ml/min** **Final Draw Down: 0.56 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 51:9, 15 psi, 150mL/min

Weather Conditions:
45°F, cloudy, light rain

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/21/2020 9:17 AM	00:00	6.52 pH	8.79 °C	0.60 mS/cm	2.70 mg/L	6.57 NTU	169.1 mV	4.54 ft	150.00 ml/min
4/21/2020 9:27 AM	09:55	6.32 pH	8.42 °C	0.52 mS/cm	0.15 mg/L	5.51 NTU	92.6 mV	4.54 ft	150.00 ml/min
4/21/2020 9:27 AM	10:22	6.31 pH	8.55 °C	0.51 mS/cm	0.14 mg/L	4.85 NTU	93.0 mV	5.08 ft	150.00 ml/min
4/21/2020 9:30 AM	13:22	6.29 pH	8.44 °C	0.51 mS/cm	0.13 mg/L	1.86 NTU	47.5 mV	5.08 ft	150.00 ml/min
4/21/2020 9:33 AM	16:22	6.28 pH	8.42 °C	0.51 mS/cm	0.11 mg/L	1.78 NTU	30.5 mV	5.08 ft	150.00 ml/min
4/21/2020 9:36 AM	19:22	6.28 pH	8.44 °C	0.50 mS/cm	0.11 mg/L	0.22 NTU	11.4 mV	5.08 ft	150.00 ml/min
4/21/2020 9:39 AM	22:22	6.27 pH	8.40 °C	0.51 mS/cm	0.10 mg/L	0.72 NTU	-9.7 mV	5.08 ft	150.00 ml/min
4/21/2020 9:42 AM	25:22	6.29 pH	8.52 °C	0.50 mS/cm	0.09 mg/L	0.95 NTU	-15.6 mV	5.08 ft	150.00 ml/min
4/21/2020 9:45 AM	28:22	6.28 pH	8.47 °C	0.51 mS/cm	0.10 mg/L	1.95 NTU	-31.0 mV	5.10 ft	150.00 ml/min
4/21/2020 9:48 AM	31:22	6.28 pH	8.48 °C	0.51 mS/cm	0.12 mg/L	2.14 NTU	-43.5 mV	5.10 ft	150.00 ml/min
4/21/2020 9:51 AM	34:22	6.28 pH	8.52 °C	0.51 mS/cm	0.15 mg/L	2.10 NTU	-53.1 mV	5.10 ft	150.00 ml/min
4/21/2020 9:54 AM	37:22	6.29 pH	8.50 °C	0.51 mS/cm	0.19 mg/L	2.15 NTU	-59.7 mV	5.10 ft	150.00 ml/min

Samples

Sample ID:	Description:
RQLmw-007-200401-GW	9:17 AM - Start pre-purge at RQLmw-007. CPM 1 9 > 51, PSI = 15. 9:27 AM (00:10:22) - Pre- purge complete, set to 3 minute intervals. 9:54 AM (00:37:22) - Stable. Collect RQLmw-007-200401-GW for VOCs, phthalates/phenols/nitro, LL PAHs, PCBs, pesticides, explosives, cyanide, TAL metals, and phosphorus. RQLmw-007-200401-GWMSD for explosives, cyanide, TAL metals, and phosphorus. RQLmw-007-200402-GW for explosives, cyanide, TAL metals, and phosphorus. RQLmw-007-200403-GW for explosives, cyanide, TAL metals, and phosphorus. Water is clear, colourless, with a sulfur like odor. Total purge volume = 6,000 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/21/2020

QA Check By: ,5/5/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 8:57:25 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: RQLmw-008 **Well Diameter: 2 in** **Initial Depth to Water: 4.83 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 26 ft** **Pump Intake From TOC: 15.3 ft** **Estimated Total Volume Pumped: 4,204.167 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 250 mL/min** **Final Draw Down: 0.27 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 2, 24:6, 10 psi, 250 mL/min.

Weather Conditions:
37°F, sunny, clear

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 8:57 AM	00:00	6.65 pH	8.12 °C	0.75 mS/cm	4.35 mg/L	141.86 NTU	-41.5 mV	4.83 ft	250.00 ml/min
4/22/2020 9:05 AM	07:35	6.54 pH	8.19 °C	0.89 mS/cm	0.32 mg/L	46.02 NTU	-65.7 mV	4.98 ft	250.00 ml/min
4/22/2020 9:05 AM	07:49	6.54 pH	8.18 °C	0.88 mS/cm	0.32 mg/L	42.42 NTU	-65.7 mV	4.98 ft	250.00 ml/min
4/22/2020 9:08 AM	10:49	6.54 pH	8.21 °C	0.85 mS/cm	0.24 mg/L	18.52 NTU	-67.0 mV	5.10 ft	250.00 ml/min
4/22/2020 9:11 AM	13:49	6.54 pH	8.19 °C	0.84 mS/cm	0.20 mg/L	6.74 NTU	-82.7 mV	5.10 ft	250.00 ml/min
4/22/2020 9:14 AM	16:49	6.54 pH	8.18 °C	0.82 mS/cm	0.17 mg/L	6.00 NTU	-83.4 mV	5.10 ft	250.00 ml/min

Samples

Sample ID:	Description:
RQLmw-008-200401-GW	8:57 AM - Pre-purge started, CPM 2 6 > 24, PSI = 10. 9:05 AM (00:07:49) - Pre-purge end, switch to 3 minute intervals. 9:14 AM (00:16:49) - RQLmw-008 stable, collect sample for VOCs, phthalates/phenols/nitro, LL PAHs, PCBs, pesticides, explosives, cyanide, and TAL metals. Water was reddish/orange and cloudy at start of purge, cleared up once stable. Total purge volume = 4,750 mL.

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Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 8:52:28 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: RQLmw-009 **Well Diameter: 2 in** **Initial Depth to Water: 3.62 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 26 ft** **Pump Intake From TOC: 15 ft** **Estimated Total Volume Pumped: 11,500 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 225 mL/min** **Final Draw Down: 0.94 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 3, 17:3, 17 psi, 225 mL/min

Weather Conditions:
32°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 8:52 AM	00:00	6.58 pH	8.07 °C	0.24 mS/cm	6.37 mg/L	82.29 NTU	54.2 mV	3.62 ft	200.00 ml/min
4/22/2020 9:01 AM	09:06	6.26 pH	8.15 °C	0.20 mS/cm	0.35 mg/L	989.04 NTU	26.7 mV	4.60 ft	200.00 ml/min
4/22/2020 9:06 AM	14:06	6.25 pH	8.11 °C	0.19 mS/cm	0.45 mg/L	373.14 NTU	6.3 mV	4.60 ft	200.00 ml/min
4/22/2020 9:11 AM	19:06	6.21 pH	8.23 °C	0.19 mS/cm	0.52 mg/L	143.80 NTU	-3.2 mV	4.60 ft	200.00 ml/min
4/22/2020 9:16 AM	24:06	6.28 pH	8.16 °C	0.19 mS/cm	0.35 mg/L	59.45 NTU	-15.5 mV	4.60 ft	200.00 ml/min
4/22/2020 9:21 AM	29:06	6.29 pH	8.18 °C	0.19 mS/cm	0.26 mg/L	20.00 NTU	-22.7 mV	4.60 ft	200.00 ml/min
4/22/2020 9:26 AM	34:06	6.28 pH	8.08 °C	0.19 mS/cm	0.22 mg/L	18.14 NTU	-26.0 mV	4.65 ft	210.00 ml/min
4/22/2020 9:31 AM	39:06	6.32 pH	8.20 °C	0.19 mS/cm	0.19 mg/L	34.84 NTU	-31.5 mV	4.60 ft	225.00 ml/min
4/22/2020 9:36 AM	44:06	6.31 pH	8.08 °C	0.19 mS/cm	0.18 mg/L	14.42 NTU	-33.1 mV	4.60 ft	225.00 ml/min
4/22/2020 9:41 AM	49:06	6.35 pH	8.28 °C	0.20 mS/cm	0.17 mg/L	28.54 NTU	-37.7 mV	4.58 ft	225.00 ml/min
4/22/2020 9:44 AM	52:14	6.35 pH	8.32 °C	0.20 mS/cm	0.17 mg/L	21.53 NTU	-39.3 mV	4.56 ft	225.00 ml/min
4/22/2020 9:47 AM	55:14	6.35 pH	8.17 °C	0.20 mS/cm	0.16 mg/L	7.81 NTU	-41.0 mV	4.56 ft	225.00 ml/min

Samples

Sample ID:	Description:
RQLMW-009-200401-GW	Purge start time 8:52 AM (PSI 17/CPM 2/4/26) Stagnant water volume: 1,735 mL Stagnant water removed @ 9:06 AM (00:14:06) Increase flow rate @ 9:21 AM ((00:29:06) CPM 3/3/17) Stable @ 9:47 AM (00:55:14) Water is initially very turbid with biofoul, reddish orange, and odorless. Water clear, colorless, and odorless at the end of purge. Total volume purged: 11,400 mL Sample for VOCs, SVOCs, LLPAHs, explosives, PCBs, pesticides, cyanide, and TAL metals at 0950 on 04/22/20

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Sampled By: ,4/22/2020

QA Check By: ,5/5/2020

Low-Flow Test Report:

Test Date / Time: 4/21/2020 12:07:02 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: RQLmw-011 **Well Diameter: 2 in** **Initial Depth to Water: 19.73 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 59 ft** **Pump Intake From TOC: 31 ft** **Estimated Total Volume Pumped: 5,800 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 150 mL/min** **Final Draw Down: 0.3 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 54:6, 20 psi, 150 mL/min

Weather Conditions:
43°F, partly cloudy, some sun, and windy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/21/2020 12:07 PM	00:00	5.06 pH	10.05 °C	0.27 mS/cm	6.40 mg/L	15.45 NTU	160.0 mV	19.73 ft	150.00 ml/min
4/21/2020 12:24 PM	17:26	3.93 pH	10.21 °C	0.20 mS/cm	4.83 mg/L	33.01 NTU	371.2 mV	19.99 ft	150.00 ml/min
4/21/2020 12:24 PM	17:40	3.94 pH	10.32 °C	0.20 mS/cm	4.82 mg/L	34.95 NTU	367.4 mV	19.99 ft	150.00 ml/min
4/21/2020 12:27 PM	20:40	3.95 pH	10.27 °C	0.19 mS/cm	4.80 mg/L	19.48 NTU	389.9 mV	19.99 ft	150.00 ml/min
4/21/2020 12:30 PM	23:40	3.96 pH	10.16 °C	0.19 mS/cm	4.79 mg/L	12.30 NTU	399.6 mV	20.03 ft	150.00 ml/min
4/21/2020 12:33 PM	26:40	3.97 pH	10.09 °C	0.19 mS/cm	4.79 mg/L	19.54 NTU	410.9 mV	20.03 ft	150.00 ml/min
4/21/2020 12:36 PM	29:40	3.97 pH	10.58 °C	0.19 mS/cm	4.69 mg/L	13.17 NTU	412.6 mV	20.03 ft	150.00 ml/min
4/21/2020 12:39 PM	32:40	3.99 pH	10.60 °C	0.19 mS/cm	4.69 mg/L	8.22 NTU	408.0 mV	20.03 ft	150.00 ml/min
4/21/2020 12:42 PM	35:40	4.00 pH	10.63 °C	0.18 mS/cm	4.66 mg/L	7.73 NTU	414.4 mV	20.03 ft	150.00 ml/min
4/21/2020 12:45 PM	38:40	4.01 pH	10.61 °C	0.19 mS/cm	4.63 mg/L	6.66 NTU	421.0 mV	20.03 ft	150.00 ml/min

Samples

Sample ID:	Description:
RQLmw-011-200401-GW	12:06 PM - Start pre-purge at RQLmw-011, CPM 1 6 > 54, PSI = 20. 12:24 PM (00:17:26) - End pre-purge. 12:24 PM (00:17:40) - Switch to 3 minute intervals. 12:45 PM (00:38:40) - RQLmw-011 stable, collect RQLmw-011-200401-GW for sulfide, nitrate/nitrite/sulfate, and alkalinity. RQLmw-011-200401-GWMSD for sulfide, nitrate/nitrite/sulfate, and alkalinity. RQLmw-011-200402 for sulfide, nitrate/nitrite/sulfate, and alkalinity. RQLmw-011-200403-GW for sulfide, nitrate/nitrite/sulfate, and alkalinity. Water started off with an orange tint, slightly cloudy, with a sulfur like odor. Cleared up during purge. Total purge = 5,550 mL.

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Sampled By: ,4/21/2020

QA Check By: ,5/5/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 8:32:22 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: RQLmw-013 **Well Diameter: 2 in** **Initial Depth to Water: 23.68 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 62 ft** **Pump Intake From TOC: 33.5 ft** **Estimated Total Volume Pumped: 3,635.417 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.05 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM: 2 27:3 28psi 125 mL/min

Weather Conditions:
36°F and sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 8:32 AM	00:00	3.86 pH	7.52 °C	0.37 mS/cm	9.75 mg/L	0.30 NTU	256.6 mV	23.68 ft	125.00 ml/min
4/22/2020 8:49 AM	17:05	4.26 pH	8.89 °C	0.34 mS/cm	1.29 mg/L	0.00 NTU	296.2 mV	23.73 ft	125.00 ml/min
4/22/2020 8:52 AM	20:05	4.25 pH	8.81 °C	0.34 mS/cm	1.33 mg/L	0.00 NTU	306.5 mV	23.73 ft	125.00 ml/min
4/22/2020 8:55 AM	23:05	4.24 pH	8.74 °C	0.34 mS/cm	1.33 mg/L	0.00 NTU	309.8 mV	23.73 ft	125.00 ml/min
4/22/2020 8:58 AM	26:05	4.23 pH	8.78 °C	0.33 mS/cm	1.24 mg/L	0.00 NTU	314.0 mV	23.73 ft	125.00 ml/min
4/22/2020 9:01 AM	29:05	4.23 pH	8.83 °C	0.33 mS/cm	1.16 mg/L	0.00 NTU	321.0 mV	23.73 ft	125.00 ml/min

Samples

Sample ID:	Description:
RQLmw-013-200401-GW	Initial purge started: 8:33 AM initial water level: 23.68 ft initial flow rate: 100mL/min Initial CPM: 2 27:3 28psi Purge volume calculation: 1,675.10 mL Water description: clear, colorless, with a slight acidic odor Initial purge complete: 8:49 AM (00:17:05) Purge started: 8:49 AM (00:17:05) Purge water level: 23.73 ft Purge CPM: 2 27:3 28 psi Purge flow rate: 125 mL/min Water description: clear, colorless, odorless Samples taken: 0904 Type of samples taken: sulfide, and alkalinity, sulfate Total volume purged: 3,930 mL

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Sampled By: ,4/22/2020

QA Check By: ,5/5/2020

RVAAP-03 OPEN DEMOLITION AREA #2

Low-Flow Test Report:

Test Date / Time: 4/21/2020 8:38:28 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: DET-003
Well Diameter: 2 in
Top of Screen: 7 ft
Total Depth: 15 ft
Initial Depth to Water: 8.85 ft

Pump Type: QED Well Wizard Bladder Pump
Tubing Type: PTFE
Tubing Inner Diameter: 0.25 in
Tubing Length: 12 ft
Pump Intake From TOC: 12.4 ft
Estimated Total Volume Pumped: 12,554.5 mL
Flow Cell Volume: 130 mL
Final Flow Rate: 225 mL/min
Final Draw Down: 1.1 ft

Instruments Used:
Aqua TROLL 600 - 611846
Air Compressor - 25369
Controller (MP10) - 1143
Water Level Meter - 25369

Test Notes:
CPM 2, 25:5, 18 psi, 230 mL/min

Weather Conditions:
43°F cloudy, moderate winds

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/21/2020 8:38 AM	00:00	7.28 pH	8.59 °C	0.68 mS/cm	9.22 mg/L	116.75 NTU	41.7 mV	8.85 ft	230.00 ml/min
4/21/2020 8:45 AM	06:39	7.24 pH	8.66 °C	0.28 mS/cm	3.15 mg/L	29.06 NTU	-46.2 mV	9.91 ft	250.00 ml/min
4/21/2020 8:48 AM	09:39	7.24 pH	8.65 °C	0.15 mS/cm	2.37 mg/L	19.44 NTU	-46.0 mV	9.93 ft	250.00 ml/min
4/21/2020 8:51 AM	12:39	7.23 pH	8.65 °C	0.48 mS/cm	1.26 mg/L	16.24 NTU	-46.7 mV	9.95 ft	250.00 ml/min
4/21/2020 8:54 AM	15:39	7.23 pH	8.62 °C	0.18 mS/cm	1.04 mg/L	16.92 NTU	-43.3 mV	9.94 ft	225.00 ml/min
4/21/2020 8:57 AM	18:39	7.23 pH	8.54 °C	0.21 mS/cm	1.05 mg/L	14.75 NTU	-43.9 mV	9.94 ft	225.00 ml/min
4/21/2020 9:00 AM	21:39	7.23 pH	8.59 °C	0.12 mS/cm	1.28 mg/L	21.30 NTU	-45.6 mV	9.94 ft	225.00 ml/min
4/21/2020 9:03 AM	24:39	7.23 pH	8.59 °C	0.56 mS/cm	0.53 mg/L	0.00 NTU	-47.2 mV	9.94 ft	225.00 ml/min
4/21/2020 9:06 AM	27:39	7.23 pH	8.63 °C	0.70 mS/cm	0.29 mg/L	0.00 NTU	-48.6 mV	9.94 ft	225.00 ml/min
4/21/2020 9:09 AM	30:39	7.22 pH	8.64 °C	0.68 mS/cm	0.24 mg/L	0.00 NTU	-53.0 mV	9.94 ft	225.00 ml/min
4/21/2020 9:12 AM	33:39	7.22 pH	8.65 °C	0.68 mS/cm	0.29 mg/L	24.48 NTU	-50.5 mV	9.94 ft	225.00 ml/min
4/21/2020 9:15 AM	36:39	7.23 pH	8.67 °C	0.66 mS/cm	0.38 mg/L	8.57 NTU	-53.8 mV	9.94 ft	225.00 ml/min

4/21/2020 9:18 AM	39:39	7.23 pH	8.63 °C	0.64 mS/cm	0.19 mg/L	7.46 NTU	-54.9 mV	9.94 ft	225.00 ml/min
4/21/2020 9:21 AM	42:39	7.23 pH	8.67 °C	0.66 mS/cm	0.16 mg/L	7.73 NTU	-55.6 mV	9.94 ft	225.00 ml/min
4/21/2020 9:24 AM	45:39	7.22 pH	8.66 °C	0.67 mS/cm	0.15 mg/L	7.26 NTU	-56.2 mV	9.94 ft	225.00 ml/min
4/21/2020 9:27 AM	48:39	7.22 pH	8.65 °C	0.65 mS/cm	0.14 mg/L	1.78 NTU	-55.5 mV	9.94 ft	225.00 ml/min
4/21/2020 9:30 AM	51:39	7.22 pH	8.67 °C	0.64 mS/cm	0.13 mg/L	7.46 NTU	-56.7 mV	9.94 ft	225.00 ml/min
4/21/2020 9:33 AM	54:39	7.22 pH	8.65 °C	0.64 mS/cm	0.12 mg/L	7.76 NTU	-56.5 mV	9.94 ft	225.00 ml/min

Samples

Sample ID:	Description:
DET-003-200401-GW	Purge start time 8:38 AM (PSI 18/CPM 2/5/25) Stagnant water volume: 1,311 mL Stagnant water removed @ 8:45 AM (00:06:39) Lower flow rate @ 8:51 AM (00:12:39) (CPM 2/4/26) Stable @ 9:33 AM (00:54:39) Initial water is cloudy, has an orange tint, and no odor. Water is clear, colorless, odorless after stagnant water removed. Total volume purged: 13,200 mL Sample at 0935 on 04/21/20. Primary sample: DET-003-200401-GW for VOCs, SVOCs, LL PAHs, PCBs, pesticides, explosives, cyanide, TAL Metals. Duplicate sample: DET-003-200402-GW for VOCs, SVOCs, LL PAHs, PCBs, and pesticides. MSMSD sample: DET-003-200401-GWMSD for VOCs, SVOCs, LL PAHs, PCBs, and pesticides. Split sample: DET-003-200403-GW for VOCs, SVOCs, LL PAHs, PCBs, and pesticides.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/21/2020

QA Check By: ,5/5/2020

Low-Flow Test Report:

Test Date / Time: 4/21/2020 8:33:37 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: DET-004 **Well Diameter: 2 in** **Initial Depth to Water: N/A** **Top of Pump**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 11.9 ft** **Pump Intake From TOC: 11.9 ft** **Estimated Total Volume Pumped: 2,560 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 50 mL/min** **Final Draw Down: 0 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM: 1, 29:1, 20 psi, 50 mL/min

Weather Conditions:
43°F mostly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/21/2020 8:33 AM	00:00	6.65 pH	10.44 °C	0.81 mS/cm	2.94 mg/L	0.00 NTU	234.9 mV	N/A	50.00 ml/min
4/21/2020 9:00 AM	27:12	6.66 pH	8.35 °C	0.69 mS/cm	1.35 mg/L	0.00 NTU	226.3 mV	N/A	50.00 ml/min
4/21/2020 9:03 AM	30:12	6.66 pH	8.50 °C	0.69 mS/cm	1.28 mg/L	0.00 NTU	223.4 mV	N/A	50.00 ml/min
4/21/2020 9:06 AM	33:12	6.65 pH	8.56 °C	0.69 mS/cm	1.21 mg/L	0.00 NTU	216.2 mV	N/A	50.00 ml/min
4/21/2020 9:09 AM	36:12	6.65 pH	8.85 °C	0.69 mS/cm	1.10 mg/L	0.00 NTU	191.5 mV	N/A	50.00 ml/min
4/21/2020 9:12 AM	39:12	6.64 pH	9.20 °C	0.69 mS/cm	0.99 mg/L	0.00 NTU	169.9 mV	N/A	50.00 ml/min
4/21/2020 9:15 AM	42:12	6.64 pH	8.95 °C	0.69 mS/cm	0.91 mg/L	0.06 NTU	162.9 mV	N/A	50.00 ml/min
4/21/2020 9:18 AM	45:12	6.64 pH	8.87 °C	0.69 mS/cm	0.83 mg/L	0.54 NTU	161.5 mV	N/A	50.00 ml/min
4/21/2020 9:21 AM	48:12	6.63 pH	9.10 °C	0.69 mS/cm	0.75 mg/L	1.37 NTU	162.7 mV	N/A	50.00 ml/min
4/21/2020 9:24 AM	51:12	6.63 pH	8.90 °C	0.69 mS/cm	0.70 mg/L	0.19 NTU	164.2 mV	N/A	50.00 ml/min

Samples

Sample ID:	Description:
DET-004-200401-GW	Initial purge started: 8:33 AM initial water level: Top of Pump initial flow rate: 50 mL/min Initial CPM: 1 29:1 20psi Purge volume calculation: 1,280.71 mL Water description: clear, colorless, odorless Initial purge complete: 9:00 AM (00:27:12) Purge started: 9:00 AM (00:27:12) Purge water level: Top of Pump Purge CPM: 1 29:1 Purge flow rate: 50 mL/min Water description: clear, colorless, odorless Samples taken: 0928 Type of samples taken: VOCs, phthalates, PAHs, PCBs and pesticides, explosives, cyanide, and TAL metals Total volume purged: 9,450 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/21/2020

QA Check By: ,5/4/2020

RVAAP-05 WINKLEPECK BURNING GROUNDS

Low-Flow Test Report:

Test Date / Time: 4/20/2020 12:50:41 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: WBGmw-006 **Well Diameter: 2 in** **Initial Depth to Water: 4.99 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 28 ft** **Pump Intake From TOC: 16 ft** **Estimated Total Volume Pumped: 4,159.167 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 175 mL/min** **Final Draw Down: 0.2 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2 28:2, 20 psi, 175mL/min

Weather Conditions:
52°F Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 12:50 PM	00:00	7.55 pH	12.72 °C	0.50 mS/cm	7.94 mg/L	0.18 NTU	111.1 mV	4.99 ft	175.00 ml/min
4/20/2020 1:02 PM	11:46	7.36 pH	9.85 °C	0.51 mS/cm	0.40 mg/L	0.04 NTU	116.7 mV	5.19 ft	175.00 ml/min
4/20/2020 1:05 PM	14:46	7.31 pH	9.96 °C	0.52 mS/cm	0.31 mg/L	0.42 NTU	119.4 mV	5.19 ft	175.00 ml/min
4/20/2020 1:08 PM	17:46	7.32 pH	10.17 °C	0.51 mS/cm	0.27 mg/L	0.36 NTU	119.5 mV	5.19 ft	175.00 ml/min
4/20/2020 1:11 PM	20:46	7.24 pH	10.08 °C	0.51 mS/cm	0.23 mg/L	0.31 NTU	122.9 mV	5.19 ft	175.00 ml/min
4/20/2020 1:14 PM	23:46	7.20 pH	10.01 °C	0.51 mS/cm	0.23 mg/L	0.66 NTU	125.2 mV	5.19 ft	175.00 ml/min

Samples

Sample ID:	Description:
WBGmw-006-200401-GW	initial purge started: 12:50 PM initial water level: 4.99 ft initial flow rate: 175 mL/min Initial CPM: 2 28:2 20psi Purge volume calculation: 1,719.104 mL Water description: clear, colorless, odorless Initial purge complete: 1:02 PM (00:11:46) Purge started: 1:02 PM (00:11:46) Purge water level: 5.19 ft Purge CPM: 2 28:2 psi Purge flow rate: 175 mL/min Water description: clear, colorless, odorless Samples taken: 1314 Type of samples taken: explosives in 2 amber jars Total volume purged: 5,130 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/4/2020

Low-Flow Test Report:

Test Date / Time: 4/20/2020 9:53:02 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: WBGmw-009 **Well Diameter: 2 in** **Initial Depth to Water: 10.9 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 36 ft** **Pump Intake From TOC: 20.05 ft** **Estimated Total Volume Pumped: 13,345.417 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 100 mL/min** **Final Draw Down: 1.85 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 2 28:2, 20 psi, 100mL/min

Weather Conditions:
38°F Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 9:53 AM	00:00	6.74 pH	13.65 °C	0.40 mS/cm	7.09 mg/L	21.97 NTU	173.1 mV	10.09ft	175.00 ml/min
4/20/2020 10:01 AM	08:55	6.29 pH	9.60 °C	0.23 mS/cm	1.15 mg/L	260.48 NTU	195.6 mV	12.37 ft	125.00 ml/min
4/20/2020 10:04 AM	11:55	6.20 pH	9.60 °C	0.19 mS/cm	0.98 mg/L	397.87 NTU	199.7 mV	12.65 ft	125.00 ml/min
4/20/2020 10:07 AM	14:55	6.13 pH	9.59 °C	0.21 mS/cm	0.95 mg/L	721.46 NTU	204.5 mV	12.75 ft	125.00 ml/min
4/20/2020 10:10 AM	17:55	6.05 pH	9.55 °C	0.17 mS/cm	0.84 mg/L	625.98 NTU	210.4 mV	12.75 ft	100.00 ml/min
4/20/2020 10:13 AM	20:55	5.98 pH	10.21 °C	0.23 mS/cm	0.93 mg/L	650.28 NTU	214.4 mV	12.75 ft	100.00 ml/min
4/20/2020 10:16 AM	23:55	5.93 pH	10.04 °C	0.21 mS/cm	0.87 mg/L	609.43 NTU	217.9 mV	12.75 ft	100.00 ml/min
4/20/2020 10:19 AM	26:55	5.89 pH	10.03 °C	0.13 mS/cm	0.91 mg/L	553.88 NTU	220.7 mV	12.75 ft	100.00 ml/min
4/20/2020 10:22 AM	29:55	5.88 pH	10.17 °C	0.26 mS/cm	0.88 mg/L	7.13 NTU	220.9 mV	12.75 ft	100.00 ml/min
4/20/2020 10:25 AM	32:55	5.88 pH	10.29 °C	0.26 mS/cm	0.93 mg/L	23.64 NTU	221.2 mV	12.75 ft	100.00 ml/min
4/20/2020 10:28 AM	35:55	5.88 pH	10.22 °C	0.22 mS/cm	0.86 mg/L	29.36 NTU	221.6 mV	12.75 ft	100.00 ml/min
4/20/2020 10:31 AM	38:55	5.89 pH	10.18 °C	0.29 mS/cm	0.67 mg/L	33.08 NTU	221.5 mV	12.75 ft	100.00 ml/min

4/20/2020 10:34 AM	41:55	5.90 pH	10.67 °C	0.23 mS/cm	2.94 mg/L	0.00 NTU	231.0 mV	12.75 ft	100.00 ml/min
4/20/2020 10:37 AM	44:55	5.90 pH	10.40 °C	0.24 mS/cm	0.88 mg/L	0.00 NTU	229.8 mV	12.75 ft	100.00 ml/min
4/20/2020 10:40 AM	47:55	5.92 pH	10.54 °C	0.27 mS/cm	0.90 mg/L	0.00 NTU	228.6 mV	12.75 ft	100.00 ml/min
4/20/2020 10:43 AM	50:55	5.92 pH	10.81 °C	0.25 mS/cm	0.70 mg/L	0.00 NTU	226.7 mV	12.75 ft	100.00 ml/min
4/20/2020 10:46 AM	53:55	5.93 pH	10.37 °C	0.26 mS/cm	0.62 mg/L	0.00 NTU	226.0 mV	12.75 ft	100.00 ml/min
4/20/2020 10:49 AM	56:55	5.95 pH	10.55 °C	0.29 mS/cm	0.61 mg/L	0.00 NTU	224.5 mV	12.75 ft	100.00 ml/min
4/20/2020 10:52 AM	59:55	5.96 pH	10.56 °C	0.24 mS/cm	0.64 mg/L	0.13 NTU	223.5 mV	12.75 ft	100.00 ml/min
4/20/2020 10:55 AM	01:02:55	5.98 pH	10.61 °C	0.22 mS/cm	0.61 mg/L	0.86 NTU	222.4 mV	12.75 ft	100.00 ml/min
4/20/2020 10:58 AM	01:05:55	6.00 pH	10.75 °C	0.22 mS/cm	0.72 mg/L	2.61 NTU	221.3 mV	12.75 ft	100.00 ml/min
4/20/2020 11:01 AM	01:08:55	6.01 pH	10.71 °C	0.21 mS/cm	1.01 mg/L	11.17 NTU	220.3 mV	12.75 ft	100.00 ml/min
4/20/2020 11:04 AM	01:11:55	6.03 pH	10.82 °C	0.17 mS/cm	0.89 mg/L	33.32 NTU	219.3 mV	12.75 ft	100.00 ml/min
4/20/2020 11:07 AM	01:14:55	6.05 pH	10.62 °C	0.23 mS/cm	0.90 mg/L	42.45 NTU	218.1 mV	12.75 ft	100.00 ml/min
4/20/2020 11:10 AM	01:17:55	6.09 pH	11.29 °C	0.21 mS/cm	0.87 mg/L	94.58 NTU	215.5 mV	12.75 ft	100.00 ml/min
4/20/2020 11:13 AM	01:20:55	6.08 pH	11.63 °C	0.31 mS/cm	3.71 mg/L	0.00 NTU	213.4 mV	12.75 ft	100.00 ml/min
4/20/2020 11:16 AM	01:23:55	6.11 pH	11.18 °C	0.30 mS/cm	0.48 mg/L	0.00 NTU	211.7 mV	12.75 ft	100.00 ml/min
4/20/2020 11:19 AM	01:26:55	6.15 pH	11.08 °C	0.30 mS/cm	0.34 mg/L	0.00 NTU	209.3 mV	12.75 ft	100.00 ml/min
4/20/2020 11:22 AM	01:29:55	6.20 pH	11.21 °C	0.29 mS/cm	0.33 mg/L	0.00 NTU	206.9 mV	12.75 ft	100.00 ml/min

Samples

Sample ID:	Description:
WBGmw-009-200401-GW	Purge start time 9:52 AM (PSI 20/CPM 2/2/28) Stagnant water volume: 1,658 mL Stagnant water removed @ 10:01 AM (00:08:55) (PSI 20/CPM 1/3/57) Shake AquaTroll instrument due to erroneous turbidity @ 10:19 AM (00:26:55) Empty flow cell @ 10:31 AM (00:38:55) Empty flow cell @ 11:10 AM (01:17:55) - elevated turbidity reading although water is clear and colorless Stable @ 11:22 AM (01:29:55) Water is clear, colorless, odorless throughout purge. Total volume purged: 10,175 mL Sample for explosives at 1130 on 04/20/20

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/4/2020

Low-Flow Test Report:

Test Date / Time: 4/20/2020 9:59:22 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: WBGmw-020 **Well Diameter: 2 in** **Initial Depth to Water: 10.58 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 64 ft** **Pump Intake From TOC: 34 ft** **Estimated Total Volume Pumped: 5,650 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 100 mL/min** **Final Draw Down: 0.12 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
100 mL/min CPM 2 28:2 28 psi

Weather Conditions:
39°F Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 9:59 AM	00:00	7.16 pH	13.79 °C	0.26 mS/cm	0.64 mg/L	7.61 NTU	164.1 mV	10.58 ft	100.00 ml/min
4/20/2020 10:22 AM	23:30	7.08 pH	10.59 °C	0.25 mS/cm	0.11 mg/L	87.52 NTU	-59.8 mV	10.58 ft	100.00 ml/min
4/20/2020 10:25 AM	26:30	7.07 pH	10.90 °C	0.25 mS/cm	0.09 mg/L	51.06 NTU	-58.9 mV	10.70 ft	100.00 ml/min
4/20/2020 10:28 AM	29:30	7.08 pH	10.76 °C	0.25 mS/cm	0.10 mg/L	20.97 NTU	-60.8 mV	10.70 ft	100.00 ml/min
4/20/2020 10:31 AM	32:30	7.08 pH	10.78 °C	0.25 mS/cm	0.11 mg/L	11.61 NTU	-63.0 mV	10.70 ft	100.00 ml/min
4/20/2020 10:34 AM	35:30	7.07 pH	10.83 °C	0.25 mS/cm	0.11 mg/L	8.47 NTU	-63.6 mV	10.70 ft	100.00 ml/min
4/20/2020 10:37 AM	38:30	7.05 pH	10.94 °C	0.25 mS/cm	0.11 mg/L	35.44 NTU	-64.4 mV	10.70 ft	100.00 ml/min
4/20/2020 10:40 AM	41:30	7.04 pH	10.94 °C	0.25 mS/cm	0.12 mg/L	4.14 NTU	-64.4 mV	10.70 ft	100.00 ml/min
4/20/2020 10:43 AM	44:30	7.04 pH	11.14 °C	0.25 mS/cm	0.11 mg/L	4.29 NTU	-65.4 mV	10.70 ft	100.00 ml/min
4/20/2020 10:46 AM	47:30	7.06 pH	11.18 °C	0.25 mS/cm	0.11 mg/L	4.80 NTU	-66.8 mV	10.70 ft	100.00 ml/min

Samples

Sample ID:	Description:
WBGmw-020-200401-GW	Initial purge: 9:58 AM 100 mL/min CPM 2 28:2 28 psi Initial purge: water is clear with a yellow tint, suspended black solids and no odor Initial purge complete at 10:22 AM (00:23:30) with more turbid water Water level changed to 10.70 ft Everything else is the same Water clarity improved over time False high turbidity reading at 10:37 AM (00:38:30), real time reading was below 10 NTU Samples taken at 1048 for explosives Total water purged from well: 5,980 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/4/2020

Low-Flow Test Report:

Test Date / Time: 4/20/2020 12:51:21 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: WBGmw-021 **Well Diameter: 2 in** **Initial Depth to Water: 7.73 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 72 ft** **Pump Intake From TOC: 38 ft** **Estimated Total Volume Pumped: 8,918.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 250 mL/min** **Final Draw Down: 0.02 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 1, 54:6, 28 psi

Weather Conditions:
54°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 12:51 PM	00:00	7.15 pH	15.51 °C	0.46 mS/cm	7.48 mg/L	9.69 NTU	168.4 mV	7.73 ft	250.00 ml/min
4/20/2020 1:02 PM	10:50	7.32 pH	11.30 °C	0.42 mS/cm	1.37 mg/L	40.96 NTU	-11.2 mV	7.73 ft	240.00 ml/min
4/20/2020 1:05 PM	13:50	7.28 pH	11.24 °C	0.42 mS/cm	1.74 mg/L	0.06 NTU	-5.3 mV	7.73 ft	240.00 ml/min
4/20/2020 1:08 PM	16:50	7.16 pH	11.17 °C	0.43 mS/cm	1.58 mg/L	30.73 NTU	-1.0 mV	7.73 ft	240.00 ml/min
4/20/2020 1:11 PM	19:50	7.06 pH	11.12 °C	0.43 mS/cm	1.40 mg/L	26.74 NTU	2.6 mV	7.73 ft	225.00 ml/min
4/20/2020 1:14 PM	22:50	6.98 pH	11.07 °C	0.43 mS/cm	1.18 mg/L	3.70 NTU	3.9 mV	7.73 ft	225.00 ml/min
4/20/2020 1:17 PM	25:50	6.94 pH	11.13 °C	0.43 mS/cm	1.25 mg/L	0.46 NTU	5.3 mV	7.73 ft	200.00 ml/min
4/20/2020 1:20 PM	28:50	6.97 pH	11.17 °C	0.43 mS/cm	1.32 mg/L	283.42 NTU	5.4 mV	7.73 ft	225.00 ml/min
4/20/2020 1:23 PM	31:50	6.93 pH	11.17 °C	0.48 mS/cm	1.28 mg/L	0.19 NTU	6.3 mV	7.73 ft	225.00 ml/min
4/20/2020 1:26 PM	34:50	6.91 pH	11.03 °C	0.48 mS/cm	1.10 mg/L	0.12 NTU	5.0 mV	7.73 ft	250.00 ml/min
4/20/2020 1:29 PM	37:50	6.95 pH	11.17 °C	0.48 mS/cm	1.15 mg/L	0.06 NTU	3.6 mV	7.73 ft	250.00 ml/min

Samples

Sample ID:	Description:
WBGmw-021-200401-GW	Purge start time 12:49 PM (PSI 28/CPM 1/6/54) Stagnant water volume: 2,550 mL. Stagnant water removed @ 1:02 PM (00:10:50) (PSI 28/CPM 3/2/18) Erroneous turbidity @ 1:20 PM (00:28:50) - elevated turbidity reading although water is clear and colorless Stable @ 1:29 PM (00:37:50) Initial water is cloudy, has a brown tint, and no odor. Water is clear, colorless, and odorless throughout purge after stagnant water volume is removed. Total volume purged: 9,000 mL Sample for explosives at 1330 on 04/20/20

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/4/2020

RVAAP-08 LOAD LINE 1

Low-Flow Test Report:

Test Date / Time: 4/23/2020 8:25:02 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: LL1mw-063 **Well Diameter: 2 in** **Initial Depth to Water: 21.19 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 29.25 ft** **Pump Intake From TOC: 29.25 ft** **Estimated Total Volume Pumped: 2,066.167 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 75 mL/min** **Final Draw Down: 0.26 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 28:2, 25psi, 75 mL/min

Weather Conditions:
37°F cloudy and humid

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 8:25 AM	00:00	5.47 pH	9.42 °C	0.11 mS/cm	9.26 mg/L	2.57 NTU	227.5 mV	21.19 ft	75.00 ml/min
4/23/2020 8:42 AM	17:31	4.87 pH	8.67 °C	0.25 mS/cm	8.82 mg/L	3.43 NTU	281.4 mV	21.49 ft	75.00 ml/min
4/23/2020 8:45 AM	20:31	4.85 pH	8.68 °C	0.25 mS/cm	8.84 mg/L	4.53 NTU	284.3 mV	21.49 ft	75.00 ml/min
4/23/2020 8:48 AM	23:31	4.82 pH	8.71 °C	0.25 mS/cm	8.84 mg/L	2.16 NTU	288.6 mV	21.49 ft	75.00 ml/min
4/23/2020 8:51 AM	26:31	4.83 pH	8.64 °C	0.25 mS/cm	8.84 mg/L	1.37 NTU	288.0 mV	21.49 ft	75.00 ml/min
4/23/2020 8:54 AM	29:31	4.82 pH	8.62 °C	0.25 mS/cm	8.83 mg/L	0.70 NTU	290.4 mV	21.49 ft	75.00 ml/min

Samples

Sample ID:	Description:
LL1mw-063-200401-GW	Initial purge started: 8:25 AM initial water level: 21.19 ft initial flow rate: 75 mL/min Initial CPM: 2 28:2 Purge volume calculation: 1,396.50 mL Water description: clear, colorless, odorless with suspended feathery solids Initial purge complete: 8:42 AM (00:17:31) Purge started: 8:42 AM (00:17:31) Purge water level: 21.45 ft Purge CPM: 2 28:2 Purge flow rate: 75 mL/min Water description: clear, colorless, odorless with suspended, black and tan feathery solids Samples taken: 0855 Type of samples taken: explosives, sulfide, and alkalinity Total volume purged: 4,330 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 11:16:23 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: LL1mw-064 **Well Diameter: 2 in** **Initial Depth to Water: 0.07 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 22 ft** **Pump Intake From TOC: 13 ft** **Estimated Total Volume Pumped: 11,713.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 450 mL/min** **Final Draw Down: 0.18 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 27:3, 16psi, 450 mL/min

Weather Conditions:
41°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 11:16 AM	00:00	6.56 pH	10.74 °C	0.37 mS/cm	6.14 mg/L	25.00 NTU	73.6 mV	0.07 ft	450.00 ml/min
4/22/2020 11:20 AM	04:31	7.46 pH	10.24 °C	0.38 mS/cm	0.14 mg/L	818.65 NTU	-88.2 mV	0.07 ft	450.00 ml/min
4/22/2020 11:21 AM	05:17	7.49 pH	10.21 °C	0.38 mS/cm	0.12 mg/L	358.68 NTU	-91.0 mV	0.25 ft	450.00 ml/min
4/22/2020 11:24 AM	08:17	7.52 pH	10.29 °C	0.38 mS/cm	0.09 mg/L	250.20 NTU	-95.6 mV	0.25 ft	450.00 ml/min
4/22/2020 11:27 AM	11:17	7.57 pH	10.33 °C	0.38 mS/cm	0.09 mg/L	931.14 NTU	-99.3 mV	0.25 ft	450.00 ml/min
4/22/2020 11:30 AM	14:17	7.57 pH	10.30 °C	0.38 mS/cm	0.07 mg/L	391.97 NTU	-101.3 mV	0.25 ft	450.00 ml/min
4/22/2020 11:33 AM	17:17	7.56 pH	10.31 °C	0.38 mS/cm	0.07 mg/L	43.63 NTU	-102.3 mV	0.25 ft	450.00 ml/min
4/22/2020 11:36 AM	20:17	7.55 pH	10.29 °C	0.38 mS/cm	0.06 mg/L	17.28 NTU	-102.8 mV	0.25 ft	450.00 ml/min
4/22/2020 11:39 AM	23:17	7.55 pH	10.32 °C	0.38 mS/cm	0.06 mg/L	10.27 NTU	-103.6 mV	0.25 ft	450.00 ml/min
4/22/2020 11:42 AM	26:17	7.52 pH	10.33 °C	0.38 mS/cm	0.06 mg/L	11.84 NTU	-102.8 mV	0.25 ft	450.00 ml/min
4/22/2020 11:45 AM	29:17	7.54 pH	10.38 °C	0.38 mS/cm	0.06 mg/L	7.31 NTU	-104.1 mV	0.25 ft	450.00 ml/min

Samples

Sample ID:	Description:
LL1mw-064-200401-GW	Initial purge started: 11:16 AM initial water level: 0.07 ft initial flow rate: 450 mL/min Initial CPM: 2 27:3 16psi Purge volume calculation: 1,774.77 mL Water description: water is orange and turbid due to biofoul Initial purge complete: 11:21 AM (00:05:17) Purge started: 11:21 AM (00:05:17) Purge water level: 0.25 ft Purge CPM: 2 27:3 16 psi Purge flow rate: 450 mL/min Water description: water started out orange and turbid (like the initial purge water) and slowly became clear, colorless, and odorless Samples taken: 1148 Type of samples taken: explosives and TAL metals Total volume purged: 21,880 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

Low-Flow Test Report:

Test Date / Time: 4/23/2020 8:44:10 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL1mw-080 **Well Diameter: 2 in** **Initial Depth to Water: 10.44 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 20 ft** **Pump Intake From TOC: 20.2 ft** **Estimated Total Volume Pumped: 2,781.25 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.61 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 2, 26:4, 20 psi, 125 mL/min

Weather Conditions:
36°F overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 8:44 AM	00:00	6.68 pH	8.67 °C	0.66 mS/cm	10.17 mg/L	0.80 NTU	208.8 mV	10.44 ft	125.00 ml/min
4/23/2020 8:56 AM	12:06	6.61 pH	8.49 °C	0.24 mS/cm	8.73 mg/L	0.60 NTU	234.7 mV	11.05 ft	125.00 ml/min
4/23/2020 8:59 AM	15:06	6.67 pH	8.37 °C	0.24 mS/cm	8.75 mg/L	0.11 NTU	234.6 mV	11.05 ft	125.00 ml/min
4/23/2020 9:02 AM	18:06	6.66 pH	8.45 °C	0.24 mS/cm	8.78 mg/L	0.92 NTU	237.7 mV	11.05 ft	125.00 ml/min

Samples

Sample ID:	Description:
LL1MW-080-200401-GW	Purge start time 8:44 AM ((PSI 20/CPM 2/4/26) Stagnant water volume: 1,429 mL Stagnant water removed @ 8:56 AM (00:12:06) Stable @ 9:02 AM (00:18:06) Water is clear, colorless, odorless throughout purge. Total volume purged: 2,250 mL Sample for explosives at 0905 on 04/23/20

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/23/2020 10:18:10 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL1mw-081 **Well Diameter: 2 in** **Initial Depth to Water: 27.05 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 38.71 ft** **Pump Intake From TOC: 38.71 ft** **Estimated Total Volume Pumped: 13,295 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 100 mL/min** **Final Draw Down: 0.5 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 2, 26:4, 25 psi, 100 mL/min

Weather Conditions:
45°F, partly cloudy, calm.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 10:18 AM	00:00	6.58 pH	10.61 °C	0.38 mS/cm	7.04 mg/L	1,940.1 NTU	80.1 mV	27.05 ft	150.00 ml/min
4/23/2020 10:29 AM	11:23	6.39 pH	10.27 °C	0.37 mS/cm	0.54 mg/L	310.60 NTU	42.7 mV	28.10 ft	150.00 ml/min
4/23/2020 10:29 AM	11:38	6.39 pH	10.28 °C	0.37 mS/cm	0.53 mg/L	306.01 NTU	42.3 mV	28.10 ft	150.00 ml/min
4/23/2020 10:32 AM	14:38	6.42 pH	10.70 °C	0.37 mS/cm	0.61 mg/L	220.25 NTU	37.2 mV	28.10 ft	50.00 ml/min
4/23/2020 10:35 AM	17:38	6.45 pH	11.36 °C	0.37 mS/cm	0.77 mg/L	247.70 NTU	33.9 mV	28.05 ft	50.00 ml/min
4/23/2020 10:38 AM	20:38	6.50 pH	11.40 °C	0.37 mS/cm	0.88 mg/L	226.55 NTU	30.2 mV	28.05 ft	50.00 ml/min
4/23/2020 10:41 AM	23:38	6.51 pH	11.23 °C	0.37 mS/cm	0.91 mg/L	242.75 NTU	28.5 mV	27.40 ft	50.00 ml/min
4/23/2020 10:44 AM	26:38	6.50 pH	10.42 °C	0.37 mS/cm	0.90 mg/L	394.12 NTU	28.7 mV	27.50 ft	100.00 ml/min
4/23/2020 10:47 AM	29:38	6.50 pH	10.50 °C	0.37 mS/cm	0.73 mg/L	341.25 NTU	28.7 mV	27.52 ft	100.00 ml/min
4/23/2020 10:50 AM	32:38	6.51 pH	10.45 °C	0.37 mS/cm	0.72 mg/L	252.64 NTU	27.7 mV	27.53 ft	100.00 ml/min
4/23/2020 10:53 AM	35:38	6.50 pH	10.42 °C	0.37 mS/cm	0.69 mg/L	207.55 NTU	27.7 mV	27.55 ft	100.00 ml/min
4/23/2020 10:56 AM	38:38	6.50 pH	10.37 °C	0.37 mS/cm	0.64 mg/L	190.62 NTU	26.7 mV	27.55 ft	100.00 ml/min

4/23/2020 10:59 AM	41:38	6.50 pH	10.45 °C	0.37 mS/cm	0.64 mg/L	145.97 NTU	25.6 mV	27.55 ft	100.00 ml/min
4/23/2020 11:02 AM	44:38	6.51 pH	10.62 °C	0.37 mS/cm	0.64 mg/L	133.42 NTU	24.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:05 AM	47:38	6.52 pH	10.49 °C	0.37 mS/cm	0.63 mg/L	129.61 NTU	24.2 mV	27.55 ft	100.00 ml/min
4/23/2020 11:08 AM	50:38	6.52 pH	10.44 °C	0.36 mS/cm	0.63 mg/L	143.52 NTU	23.5 mV	27.55 ft	100.00 ml/min
4/23/2020 11:11 AM	53:38	6.51 pH	10.42 °C	0.36 mS/cm	0.63 mg/L	142.90 NTU	23.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:14 AM	56:38	6.50 pH	10.59 °C	0.36 mS/cm	0.60 mg/L	129.59 NTU	23.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:17 AM	59:38	6.51 pH	10.40 °C	0.36 mS/cm	0.56 mg/L	100.66 NTU	23.1 mV	27.55 ft	100.00 ml/min
4/23/2020 11:20 AM	01:02:38	6.52 pH	10.42 °C	0.36 mS/cm	0.50 mg/L	95.13 NTU	21.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:23 AM	01:05:38	6.51 pH	10.36 °C	0.36 mS/cm	0.46 mg/L	81.95 NTU	21.4 mV	27.55 ft	100.00 ml/min
4/23/2020 11:26 AM	01:08:38	6.51 pH	10.63 °C	0.36 mS/cm	0.44 mg/L	61.07 NTU	19.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:29 AM	01:11:38	6.52 pH	10.87 °C	0.36 mS/cm	0.46 mg/L	58.01 NTU	18.8 mV	27.55 ft	100.00 ml/min
4/23/2020 11:32 AM	01:14:38	6.53 pH	10.79 °C	0.36 mS/cm	0.48 mg/L	50.37 NTU	18.6 mV	27.55 ft	100.00 ml/min
4/23/2020 11:35 AM	01:17:38	6.53 pH	10.73 °C	0.36 mS/cm	0.49 mg/L	51.72 NTU	17.9 mV	27.55 ft	100.00 ml/min
4/23/2020 11:38 AM	01:20:38	6.53 pH	10.59 °C	0.37 mS/cm	0.49 mg/L	82.29 NTU	18.0 mV	27.55 ft	100.00 ml/min
4/23/2020 11:41 AM	01:23:38	6.52 pH	10.69 °C	0.37 mS/cm	0.48 mg/L	77.85 NTU	18.2 mV	27.55 ft	100.00 ml/min
4/23/2020 11:44 AM	01:26:38	6.52 pH	10.64 °C	0.37 mS/cm	0.48 mg/L	58.67 NTU	18.1 mV	27.55 ft	100.00 ml/min
4/23/2020 11:47 AM	01:29:38	6.52 pH	10.70 °C	0.37 mS/cm	0.46 mg/L	66.43 NTU	17.5 mV	27.55 ft	100.00 ml/min
4/23/2020 11:50 AM	01:32:38	6.52 pH	10.63 °C	0.36 mS/cm	0.46 mg/L	58.56 NTU	17.6 mV	27.55 ft	100.00 ml/min
4/23/2020 11:53 AM	01:35:38	6.52 pH	10.58 °C	0.36 mS/cm	0.45 mg/L	72.64 NTU	17.0 mV	27.55 ft	100.00 ml/min
4/23/2020 11:56 AM	01:38:38	6.52 pH	10.82 °C	0.36 mS/cm	0.44 mg/L	58.70 NTU	16.7 mV	27.55 ft	100.00 ml/min
4/23/2020 11:59 AM	01:41:38	6.52 pH	10.48 °C	0.36 mS/cm	0.40 mg/L	73.86 NTU	16.5 mV	27.55 ft	100.00 ml/min
4/23/2020 12:02 PM	01:44:38	6.51 pH	10.49 °C	0.36 mS/cm	0.35 mg/L	44.54 NTU	16.4 mV	27.55 ft	100.00 ml/min
4/23/2020 12:05 PM	01:47:38	6.50 pH	10.45 °C	0.36 mS/cm	0.32 mg/L	45.96 NTU	16.0 mV	27.55 ft	100.00 ml/min
4/23/2020 12:08 PM	01:50:38	6.50 pH	10.61 °C	0.36 mS/cm	0.29 mg/L	32.55 NTU	15.3 mV	27.55 ft	100.00 ml/min
4/23/2020 12:11 PM	01:53:38	6.52 pH	10.54 °C	0.36 mS/cm	0.27 mg/L	42.48 NTU	13.1 mV	27.55 ft	100.00 ml/min
4/23/2020 12:14 PM	01:56:38	6.52 pH	10.49 °C	0.37 mS/cm	0.25 mg/L	51.92 NTU	12.9 mV	27.55 ft	100.00 ml/min
4/23/2020 12:17 PM	01:59:38	6.52 pH	10.47 °C	0.37 mS/cm	0.24 mg/L	55.27 NTU	12.3 mV	27.55 ft	100.00 ml/min
4/23/2020 12:20 PM	02:02:38	6.51 pH	10.41 °C	0.37 mS/cm	0.24 mg/L	39.31 NTU	11.9 mV	27.55 ft	100.00 ml/min
4/23/2020 12:23 PM	02:05:38	6.53 pH	10.59 °C	0.37 mS/cm	0.22 mg/L	31.10 NTU	10.9 mV	27.55 ft	100.00 ml/min

4/23/2020 12:26 PM	02:08:38	6.53 pH	10.54 °C	0.37 mS/cm	0.22 mg/L	32.73 NTU	10.6 mV	27.55 ft	100.00 ml/min
4/23/2020 12:29 PM	02:11:38	6.52 pH	10.50 °C	0.37 mS/cm	0.21 mg/L	34.74 NTU	10.1 mV	27.55 ft	100.00 ml/min

Samples

Sample ID:	Description:
LL1mw-081-200401-GW	10:18 AM - Start pre-purge at LL1mw-081, CPM 2 7 > 23, PSI = 25. 10:29 AM (00:11:23) - Pre-purge complete, switch to 3 minute intervals (00:11:38). Flow reduced to CPM 1 3 > 57, PSI = 25 (reduce drawdown). 10:44 AM (00:26:38) - Increased flow to CPM 2 6 > 24, PSI = 25. 12:29 PM (02:11:38) - Purged for 2 hours (not including pre-purge). Turbidity was < 50 NTU, but not < 10 NTU. All other water quality parameters were stable. Collect LL1mw-081-200401-GW for explosives. Field filtered sample not required. Water started bright orange, cloudy, and odorless. Color and cloudiness cleared up but not completely. Total purge volume = 14,650 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/23/2020 10:01:59 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: LL1mw-083 **Well Diameter: 2 in** **Initial Depth to Water: 30.48 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 40 ft** **Pump Intake From TOC: 40 ft** **Estimated Total Volume Pumped: 4,214.583 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 200 mL/min** **Final Draw Down: 0.15 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2 27:3 30psi, 200 mL/min

Weather Conditions:
43°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 10:01 AM	00:00	4.55 pH	10.36 °C	0.28 mS/cm	8.52 mg/L	0.10 NTU	264.9 mV	30.48 ft	175.00 ml/min
4/23/2020 10:11 AM	09:05	4.58 pH	9.91 °C	0.26 mS/cm	3.84 mg/L	3.66 NTU	300.6 mV	30.63 ft	200.00 ml/min
4/23/2020 10:14 AM	12:05	4.58 pH	9.88 °C	0.26 mS/cm	3.66 mg/L	2.03 NTU	308.7 mV	30.63 ft	200.00 ml/min
4/23/2020 10:17 AM	15:05	4.58 pH	9.84 °C	0.26 mS/cm	3.60 mg/L	1.50 NTU	316.1 mV	30.63 ft	200.00 ml/min
4/23/2020 10:20 AM	18:05	4.58 pH	9.80 °C	0.26 mS/cm	3.55 mg/L	0.95 NTU	322.6 mV	30.63 ft	200.00 ml/min
4/23/2020 10:23 AM	21:05	4.57 pH	9.85 °C	0.26 mS/cm	3.52 mg/L	0.56 NTU	329.5 mV	30.63 ft	200.00 ml/min
4/23/2020 10:26 AM	24:05	4.56 pH	9.86 °C	0.26 mS/cm	3.51 mg/L	0.31 NTU	336.5 mV	30.63 ft	200.00 ml/min

Samples

Sample ID:	Description:
LL1-083-200401-GW	Initial purge started: 10:01 AM initial water level: 30.48 ft initial flow rate: 175 mL/min Initial CPM: 2 27:3 30psi Purge volume calculation: 1,654.81 mL Water description: clear, colorless, odorless Initial purge complete: 10:11 AM (00:09:05) Purge started: 10:11 AM (00:09:05) Purge water level: 30.63 ft Purge CPM: 2: 27:3 30 psi Purge flow rate: 200 mL/min Water description: clean, colorless, odorless Samples taken: 1027 Type of samples taken: explosives, sulfide, and alkalinity Total volume purged: 6,980 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/23/2020 8:48:42 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL1mw-084 **Well Diameter: 2 in** **Initial Depth to Water: 24.66 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE Tubing Inner Diameter: 0.375 in Tubing Length: 37 ft** **Pump Intake From TOC: 37 ft** **Estimated Total Volume Pumped: 3,360 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 100 mL/min** **Final Draw Down: 1.39 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 57:3, 22 psi, 100 mL/min

Weather Conditions:
37°F, cloudy, calm.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 8:48 AM	00:00	5.77 pH	8.72 °C	0.30 mS/cm	9.45 mg/L	0.00 NTU	251.1 mV	24.66 ft	100.00 ml/min
4/23/2020 9:10 AM	21:22	5.72 pH	9.25 °C	0.29 mS/cm	5.06 mg/L	0.00 NTU	247.1 mV	26.00 ft	100.00 ml/min
4/23/2020 9:10 AM	21:36	5.73 pH	9.27 °C	0.29 mS/cm	5.05 mg/L	0.00 NTU	247.0 mV	26.00 ft	100.00 ml/min
4/23/2020 9:13 AM	24:36	5.75 pH	9.37 °C	0.28 mS/cm	5.02 mg/L	0.00 NTU	245.9 mV	26.05 ft	100.00 ml/min
4/23/2020 9:16 AM	27:36	5.77 pH	9.39 °C	0.33 mS/cm	5.01 mg/L	4.64 NTU	244.5 mV	26.10 ft	100.00 ml/min
4/23/2020 9:19 AM	30:36	5.78 pH	9.38 °C	0.32 mS/cm	5.03 mg/L	0.00 NTU	239.8 mV	26.05 ft	100.00 ml/min
4/23/2020 9:22 AM	33:36	5.78 pH	9.25 °C	0.32 mS/cm	5.05 mg/L	0.00 NTU	240.0 mV	26.05 ft	100.00 ml/min

Samples

Sample ID:	Description:
LL1mw-084-200401-GW	8:48 AM - Start pre-purge at LL1mw-084, CPM 1 3 > 57, PSI = 22. 9:10 AM (00:21:22) - End pre-purge, switch to 3 minute intervals (00:21:36). 9:22 AM (00:30:36) - LL1mw-084 stable, collect LL1mw-084-200401-GW for explosives. Water is clear, colorless, and odorless. Total purge volume = 3,200 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/29/2020 1:24:57 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL1mw-086 **Well Diameter: 2 in** **Initial Depth to Water: 6.04 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 154 ft** **Pump Intake From TOC: 77 ft** **Estimated Total Volume Pumped: 26,258.334 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 120 mL/min** **Final Draw Down: 0.04 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 3, 16.5:3.5, 40 psi, 120 mL/min

Weather Conditions:
65°F cloudy

Low-Flow Readings:

4/29/2020 1:24 PM	00:00	11.00 pH	14.16 °C	0.42 mS/cm	6.89 mg/L	41.88 NTU	80.5 mV	6.04 ft	500.00 ml/min
4/29/2020 1:34 PM	09:43	8.01 pH	10.90 °C	0.47 mS/cm	0.30 mg/L	151.87 NTU	-173.4 mV	6.14 ft	500.00 ml/min
									n
4/29/2020 1:44 PM	19:43	7.46 pH	11.23 °C	0.48 mS/cm	0.20 mg/L	407.56 NTU	-125.1 mV	6.14 ft	365.00 ml/min
									n
4/29/2020 1:54 PM	29:43	7.41 pH	11.28 °C	0.48 mS/cm	0.18 mg/L	597.18 NTU	-115.3 mV	6.11 ft	335.00 ml/min
									n
4/29/2020 2:04 PM	39:43	7.47 pH	11.58 °C	0.48 mS/cm	0.23 mg/L	773.44 NTU	-113.2 mV	6.08 ft	145.00 ml/min
									n
4/29/2020 2:14 PM	49:43	7.49 pH	11.87 °C	0.48 mS/cm	0.27 mg/L	609.89 NTU	-108.0 mV	6.08 ft	120.00 ml/min
									n

4/29/2020 2:24 PM	59:43	7.50 pH	11.84 °C	0.49 mS/cm	0.26 mg/L	688.17 NTU	-110.3 mV	6.08 ft	120.00 ml/min
4/29/2020 2:29 PM	01:04:43	7.51 pH	12.16 °C	0.49 mS/cm	0.26 mg/L	777.21 NTU	-110.0 mV	6.08 ft	120.00 ml/min
4/29/2020 2:34 PM	01:09:43	7.51 pH	12.03 °C	0.50 mS/cm	0.27 mg/L	889.97 NTU	-111.1 mV	6.08 ft	110.00 ml/min
4/29/2020 2:39 PM	01:14:43	7.52 pH	12.03 °C	0.49 mS/cm	0.26 mg/L	264.92 NTU	-110.4 mV	6.08 ft	110.00 ml/min
4/29/2020 2:44 PM	01:19:43	7.52 pH	12.00 °C	0.48 mS/cm	0.26 mg/L	319.42 NTU	-109.7 mV	6.08 ft	120.00 ml/min
4/29/2020 2:49 PM	01:24:43	7.53 pH	12.01 °C	0.49 mS/cm	0.26 mg/L	267.57 NTU	-112.1 mV	6.08 ft	120.00 ml/min
4/29/2020 2:54 PM	01:29:43	7.52 pH	12.12 °C	0.48 mS/cm	0.25 mg/L	332.56 NTU	-111.4 mV	6.08 ft	120.00 ml/min
4/29/2020 2:59 PM	01:34:43	7.54 pH	11.85 °C	0.48 mS/cm	0.25 mg/L	289.12 NTU	-112.6 mV	6.08 ft	120.00 ml/min
4/29/2020 3:04 PM	01:39:43	7.54 pH	12.05 °C	0.49 mS/cm	0.25 mg/L	324.18 NTU	-113.3 mV	6.08 ft	120.00 ml/min
4/29/2020 3:09 PM	01:44:43	7.53 pH	11.83 °C	0.49 mS/cm	0.24 mg/L	376.41 NTU	-112.0 mV	6.08 ft	120.00 ml/min
4/29/2020 3:14 PM	01:49:43	7.54 pH	11.90 °C	0.50 mS/cm	0.24 mg/L	440.62 NTU	-113.6 mV	6.08 ft	120.00 ml/min
4/29/2020 3:19 PM	01:54:43	7.54 pH	11.82 °C	0.49 mS/cm	0.24 mg/L	552.52 NTU	-113.8 mV	6.08 ft	120.00 ml/min
4/29/2020 3:24 PM	01:59:43	7.54 pH	11.88 °C	0.49 mS/cm	0.23 mg/L	642.23 NTU	-113.7 mV	6.08 ft	120.00 ml/min
4/29/2020 3:29 PM	02:04:43	7.53 pH	11.68 °C	0.49 mS/cm	0.23 mg/L	1,098.1 NTU	-112.0 mV	6.08 ft	120.00 ml/min
4/29/2020 3:34 PM	02:09:43	7.53 pH	11.89 °C	0.49 mS/cm	0.23 mg/L	1,238.8 NTU	-114.9 mV	6.08 ft	120.00 ml/min

Samples

Sample ID:	Description:
LL1mw-086-200401-GW	Begin purge @ 1:24 PM (50 PSI/CPM 3/ 16.5:3.5 Stagnant water volume - 4,306 mL Stagnant water volume removed @ 1:34 PM (00:09:21) (CPM 3/4.5/15.5) Lower PSI to 40 @ 1:49 PM (00:24:43) to reduce turbidity Lower flow rate @ 1:59 PM (00:34:43) to reduce turbidity (CPM 3/3.5/16.5) Parameters stable @ 3:34 PM (02:09:43) - wait 2 hours to collect sample due to turbidity readings greater than 50 NTU Water is very cloudy, has a tannish white tint, odorless throughout purge. Collect sample LL1mw-086-200401-GW for nitrite, nitrate, sulfate, alkalinity, and TAL metals @ 1534 on 04/29/20. Collect filtered sample LL1-086-200401-GW-F for TAL metals due to turbidity readings greater than 50 NTU. Total volume removed - 24,881 mL

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Sampled By: ,4/29/2020

QA Check By: ,5/8/2020

Low-Flow Test Report:

Test Date / Time: 4/27/2020 8:33:50 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL1mw-087 **Well Diameter: 2 in** **Initial Depth to Water: 4.28 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 12 ft** **Pump Intake From TOC: 12 ft** **Estimated Total Volume Pumped: 11,212 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 80 mL/min** **Final Draw Down: 0.82 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 57:3, 10 psi, 80 mL/min

Weather Conditions:
39°F, clear, sunny.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/27/2020 8:33 AM	00:00	7.19 pH	9.56 °C	0.63 mS/cm	8.04 mg/L	590.77 NTU	227.9 mV	4.28 ft	80.00 ml/min
4/27/2020 8:53 AM	19:55	7.03 pH	10.24 °C	0.47 mS/cm	1.04 mg/L	185.01 NTU	226.8 mV	4.90 ft	80.00 ml/min
4/27/2020 8:53 AM	20:09	7.03 pH	10.45 °C	0.47 mS/cm	1.04 mg/L	141.00 NTU	227.6 mV	4.90 ft	80.00 ml/min
4/27/2020 8:56 AM	23:09	7.04 pH	10.22 °C	0.47 mS/cm	0.94 mg/L	127.99 NTU	227.6 mV	4.90 ft	80.00 ml/min
4/27/2020 8:59 AM	26:09	7.05 pH	10.16 °C	0.47 mS/cm	0.85 mg/L	106.21 NTU	223.9 mV	5.00 ft	80.00 ml/min
4/27/2020 9:02 AM	29:09	7.05 pH	10.16 °C	0.47 mS/cm	0.71 mg/L	111.87 NTU	223.7 mV	5.00 ft	80.00 ml/min
4/27/2020 9:05 AM	32:09	7.05 pH	10.10 °C	0.48 mS/cm	0.66 mg/L	81.56 NTU	222.0 mV	5.00 ft	80.00 ml/min
4/27/2020 9:08 AM	35:09	7.04 pH	9.95 °C	0.48 mS/cm	0.59 mg/L	104.21 NTU	221.7 mV	5.00 ft	80.00 ml/min
4/27/2020 9:11 AM	38:09	6.95 pH	11.06 °C	0.48 mS/cm	0.55 mg/L	75.33 NTU	225.2 mV	5.00 ft	80.00 ml/min
4/27/2020 9:14 AM	41:09	7.06 pH	11.03 °C	0.48 mS/cm	0.52 mg/L	25.21 NTU	219.7 mV	5.00 ft	80.00 ml/min
4/27/2020 9:17 AM	44:09	7.07 pH	10.87 °C	0.49 mS/cm	0.46 mg/L	25.26 NTU	219.0 mV	5.00 ft	80.00 ml/min
4/27/2020 9:20 AM	47:09	7.07 pH	10.75 °C	0.49 mS/cm	0.44 mg/L	31.67 NTU	216.0 mV	5.00 ft	80.00 ml/min

4/27/2020 9:23 AM	50:09	7.07 pH	10.63 °C	0.49 mS/cm	0.43 mg/L	32.05 NTU	213.9 mV	5.00 ft	80.00 ml/min
4/27/2020 9:26 AM	53:09	7.07 pH	10.67 °C	0.49 mS/cm	0.42 mg/L	32.05 NTU	212.1 mV	5.10 ft	80.00 ml/min
4/27/2020 9:29 AM	56:09	7.06 pH	10.50 °C	0.49 mS/cm	0.42 mg/L	37.20 NTU	210.7 mV	5.10 ft	80.00 ml/min
4/27/2020 9:32 AM	59:09	7.06 pH	10.48 °C	0.50 mS/cm	0.42 mg/L	48.98 NTU	210.0 mV	5.10 ft	80.00 ml/min
4/27/2020 9:35 AM	01:02:09	7.05 pH	10.45 °C	0.50 mS/cm	0.41 mg/L	47.16 NTU	209.5 mV	5.10 ft	80.00 ml/min
4/27/2020 9:38 AM	01:05:09	7.06 pH	11.69 °C	0.50 mS/cm	0.38 mg/L	25.47 NTU	209.3 mV	5.10 ft	80.00 ml/min
4/27/2020 9:41 AM	01:08:09	7.06 pH	11.74 °C	0.51 mS/cm	0.40 mg/L	28.31 NTU	206.1 mV	5.10 ft	80.00 ml/min
4/27/2020 9:44 AM	01:11:09	7.06 pH	11.42 °C	0.51 mS/cm	0.38 mg/L	33.78 NTU	205.0 mV	5.10 ft	80.00 ml/min
4/27/2020 9:47 AM	01:14:09	7.06 pH	11.16 °C	0.51 mS/cm	0.39 mg/L	51.42 NTU	203.3 mV	5.10 ft	80.00 ml/min
4/27/2020 9:50 AM	01:17:09	7.06 pH	10.93 °C	0.51 mS/cm	0.40 mg/L	52.95 NTU	201.5 mV	5.10 ft	80.00 ml/min
4/27/2020 9:53 AM	01:20:09	7.06 pH	10.92 °C	0.51 mS/cm	0.40 mg/L	50.87 NTU	200.7 mV	5.10 ft	80.00 ml/min
4/27/2020 9:56 AM	01:23:09	7.06 pH	10.88 °C	0.51 mS/cm	0.38 mg/L	61.17 NTU	198.9 mV	5.10 ft	80.00 ml/min
4/27/2020 9:59 AM	01:26:09	7.05 pH	10.83 °C	0.51 mS/cm	0.39 mg/L	79.59 NTU	198.2 mV	5.10 ft	80.00 ml/min
4/27/2020 10:02 AM	01:29:09	7.03 pH	10.89 °C	0.50 mS/cm	0.35 mg/L	67.61 NTU	199.0 mV	5.10 ft	80.00 ml/min
4/27/2020 10:05 AM	01:32:09	7.06 pH	12.03 °C	0.51 mS/cm	0.36 mg/L	39.42 NTU	195.6 mV	5.10 ft	80.00 ml/min
4/27/2020 10:08 AM	01:35:09	7.06 pH	11.92 °C	0.51 mS/cm	0.35 mg/L	42.48 NTU	194.3 mV	5.10 ft	80.00 ml/min
4/27/2020 10:11 AM	01:38:09	7.06 pH	11.67 °C	0.51 mS/cm	0.35 mg/L	40.67 NTU	192.9 mV	5.10 ft	80.00 ml/min
4/27/2020 10:14 AM	01:41:09	7.06 pH	11.52 °C	0.51 mS/cm	0.35 mg/L	46.88 NTU	191.5 mV	5.10 ft	80.00 ml/min
4/27/2020 10:17 AM	01:44:09	7.07 pH	11.49 °C	0.52 mS/cm	0.34 mg/L	51.33 NTU	190.3 mV	5.10 ft	80.00 ml/min
4/27/2020 10:20 AM	01:47:09	7.06 pH	11.39 °C	0.52 mS/cm	0.36 mg/L	59.08 NTU	189.0 mV	5.10 ft	80.00 ml/min
4/27/2020 10:23 AM	01:50:09	7.06 pH	11.22 °C	0.52 mS/cm	0.35 mg/L	72.07 NTU	188.1 mV	5.10 ft	80.00 ml/min
4/27/2020 10:26 AM	01:53:09	7.06 pH	11.09 °C	0.52 mS/cm	0.36 mg/L	86.96 NTU	187.4 mV	5.10 ft	80.00 ml/min
4/27/2020 10:29 AM	01:56:09	7.04 pH	10.97 °C	0.52 mS/cm	0.36 mg/L	44.98 NTU	187.7 mV	5.10 ft	80.00 ml/min
4/27/2020 10:32 AM	01:59:09	7.06 pH	12.39 °C	0.52 mS/cm	0.35 mg/L	35.43 NTU	184.8 mV	5.10 ft	80.00 ml/min
4/27/2020 10:35 AM	02:02:09	7.06 pH	12.31 °C	0.53 mS/cm	0.36 mg/L	35.93 NTU	184.1 mV	5.10 ft	80.00 ml/min
4/27/2020 10:38 AM	02:05:09	7.07 pH	12.19 °C	0.53 mS/cm	0.36 mg/L	10.00 NTU	183.1 mV	5.10 ft	80.00 ml/min
4/27/2020 10:41 AM	02:08:09	7.07 pH	11.93 °C	0.53 mS/cm	0.36 mg/L	11.26 NTU	182.1 mV	5.10 ft	80.00 ml/min
4/27/2020 10:44 AM	02:11:09	7.07 pH	11.86 °C	0.53 mS/cm	0.37 mg/L	13.87 NTU	181.4 mV	5.10 ft	80.00 ml/min
4/27/2020 10:47 AM	02:14:09	7.07 pH	11.66 °C	0.53 mS/cm	0.37 mg/L	16.13 NTU	180.4 mV	5.10 ft	80.00 ml/min

4/27/2020 10:50 AM	02:17:09	7.06 pH	11.56 °C	0.53 mS/cm	0.37 mg/L	15.47 NTU	179.9 mV	5.10 ft	80.00 ml/min
4/27/2020 10:53 AM	02:20:09	7.06 pH	11.43 °C	0.54 mS/cm	0.38 mg/L	17.95 NTU	179.7 mV	5.10 ft	80.00 ml/min

Samples

Sample ID:	Description:
LL1mw-087-200401-GW	8:33 AM - Start pre-purge, CPM 1 3 > 57, PSI = 10. 8:53 AM (00:19:55) - End pre-purge, 00:20:09 switch to three minute intervals. 10:54 AM (02:20:09) - Purged for two hours, all parameters stable except turbidity. Turbidity was < 50 NTU but > 10 NTU. Collect LL1mw-087-200401-GW for explosives, perchlorate, and TAL metals. LL1mw-087-200401-GWMSD for perchlorate. LL1mw-087-200402-GW for perchlorate. LL1mw-087-200403-GW for perchlorate. Water is cloudy, turbid, with a grayish color, and no odor. Cloudiness cleared up during purge. Total purge volume = 111,000 mL.

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Sampled By: ,4/27/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/27/2020 12:28:35 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL1mw-089 **Well Diameter: 2 in** **Initial Depth to Water: 22.51 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 38 ft** **Pump Intake From TOC: 38 ft** **Estimated Total Volume Pumped: 3,603.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 200 mL/min** **Final Draw Down: 0.09 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 2, 24:6, 25 psi, 200 mL/min

Weather Conditions:
55°F, sunny, clear.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/27/2020 12:28 PM	00:00	4.90 pH	13.87 °C	0.09 mS/cm	2.95 mg/L	1.49 NTU	200.7 mV	22.51 ft	200.00 ml/min
4/27/2020 12:37 PM	08:30	4.63 pH	10.72 °C	0.08 mS/cm	0.72 mg/L	0.00 NTU	44.0 mV	22.60 ft	200.00 ml/min
4/27/2020 12:37 PM	09:01	4.62 pH	10.71 °C	0.08 mS/cm	0.72 mg/L	0.00 NTU	47.0 mV	22.60 ft	200.00 ml/min
4/27/2020 12:40 PM	12:01	4.60 pH	11.13 °C	0.08 mS/cm	0.71 mg/L	0.00 NTU	66.7 mV	22.60 ft	200.00 ml/min
4/27/2020 12:43 PM	15:01	4.61 pH	10.98 °C	0.08 mS/cm	0.67 mg/L	0.00 NTU	61.1 mV	22.60 ft	200.00 ml/min
4/27/2020 12:46 PM	18:01	4.59 pH	10.94 °C	0.08 mS/cm	0.65 mg/L	0.00 NTU	55.7 mV	22.60 ft	200.00 ml/min

Samples

Sample ID:	Description:
LL1mw-089-200401-GW	12:28 PM - Start pre-purge at LL1mw-089, CPM 2 6 > 24, PSI = 25. 12:38 PM (00:08:30) - End pre-purge, switch to three minute intervals (00:09:01). 12:46 PM (00:18:01) - LL1mw-089 stable. Collect LL1mw-089-200401-GW for explosives, sulfide, nitrite/nitrate/sulfate, alkalinity, and TAL metals. LL1mw-089-200402-GW for explosives and TAL metals. LL1mw-089-200403-GW for explosives and TAL metals. Water is clear, colorless, and odorless. Total purge volume = 4,500 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/27/2020

QA Check By: ,5/7/2020

RVAAP-09 LOAD LINE 2

Low-Flow Test Report:

Test Date / Time: 4/23/2020 10:17:59 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL2mw-059 **Well Diameter: 2 in** **Initial Depth to Water: 12.53 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 20 ft** **Pump Intake From TOC: 20 ft** **Estimated Total Volume Pumped: 2,652.167 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.36 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 3, 17.5:2.5, 20 psi, 125mL/min

Weather Conditions:
40°F partly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 10:17 AM	00:00	6.20 pH	10.52 °C	0.22 mS/cm	5.00 mg/L	0.67 NTU	235.4 mV	12.53 ft	170.00 ml/min
4/23/2020 10:26 AM	08:59	6.19 pH	9.24 °C	0.24 mS/cm	0.29 mg/L	1.24 NTU	235.0 mV	12.89 ft	125.00 ml/min
4/23/2020 10:29 AM	11:59	6.19 pH	9.26 °C	0.24 mS/cm	0.25 mg/L	1.23 NTU	234.8 mV	12.89 ft	125.00 ml/min
4/23/2020 10:32 AM	14:59	6.16 pH	9.29 °C	0.24 mS/cm	0.22 mg/L	1.74 NTU	235.9 mV	12.89 ft	125.00 ml/min
4/23/2020 10:35 AM	17:59	6.18 pH	9.24 °C	0.24 mS/cm	0.21 mg/L	2.57 NTU	234.3 mV	12.89 ft	125.00 ml/min

Samples

Sample ID:	Description:
LL2MW-059-200401-GW	Purge start time 10:18 AM (PSI 20/CPM 3/3/17) Stagnant water volume: 1,385 mL Stagnant water removed @ 10:26 (00:08:59) (PSI 20/CPM 3/2.5/17.5) Stable @ 10:35 (00:17:59) Water is clear, colorless, odorless throughout purge. Total volume purged: 2,625 mL Sample for explosives at 1040 on 04/23/20

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Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 11:53:47 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL2mw-267 **Well Diameter: 2 in** **Initial Depth to Water: 8.89 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 32 ft** **Pump Intake From TOC: 18.5 ft** **Estimated Total Volume Pumped: 27,458.334 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 200 mL/min** **Final Draw Down: 0.31 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 3, 16.5:3.5, 18 psi, 200mL/min

Weather Conditions:
40°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 11:53 AM	00:00	6.32 pH	9.65 °C	0.26 mS/cm	1.15 mg/L	3,128.0 NTU	74.3 mV	8.89 ft	250.00 ml/min
4/22/2020 12:02 PM	08:20	6.34 pH	9.71 °C	0.25 mS/cm	0.74 mg/L	1,616.2 NTU	64.8 mV	9.10 ft	250.00 ml/min
4/22/2020 12:07 PM	13:20	6.35 pH	9.51 °C	0.26 mS/cm	0.60 mg/L	1,590.3 NTU	62.1 mV	9.13 ft	250.00 ml/min
4/22/2020 12:12 PM	18:20	6.37 pH	9.46 °C	0.27 mS/cm	0.29 mg/L	455.55 NTU	56.2 mV	9.16 ft	250.00 ml/min
4/22/2020 12:17 PM	23:20	6.35 pH	9.45 °C	0.28 mS/cm	0.25 mg/L	242.92 NTU	53.1 mV	9.19 ft	250.00 ml/min
4/22/2020 12:22 PM	28:20	6.39 pH	9.44 °C	0.28 mS/cm	0.20 mg/L	111.60 NTU	48.3 mV	9.22 ft	250.00 ml/min
4/22/2020 12:27 PM	33:20	6.23 pH	9.91 °C	0.27 mS/cm	9.21 mg/L	2,010.0 NTU	87.6 mV	9.23 ft	225.00 ml/min
4/22/2020 12:32 PM	38:20	6.36 pH	9.49 °C	0.28 mS/cm	0.22 mg/L	1,602.8 NTU	58.7 mV	9.23 ft	225.00 ml/min
4/22/2020 12:37 PM	43:20	6.35 pH	9.56 °C	0.28 mS/cm	0.18 mg/L	528.34 NTU	55.8 mV	9.20 ft	225.00 ml/min
4/22/2020 12:42 PM	48:20	6.38 pH	9.47 °C	0.29 mS/cm	0.17 mg/L	295.78 NTU	52.6 mV	9.20 ft	225.00 ml/min
4/22/2020 12:47 PM	53:20	6.37 pH	9.60 °C	0.29 mS/cm	0.19 mg/L	183.32 NTU	51.3 mV	9.20 ft	225.00 ml/min
4/22/2020 12:52 PM	58:20	6.40 pH	9.66 °C	0.29 mS/cm	4.29 mg/L	209.68 NTU	56.8 mV	9.20 ft	225.00 ml/min

4/22/2020 12:57 PM	01:03:20	6.38 pH	9.65 °C	0.30 mS/cm	0.24 mg/L	152.40 NTU	52.7 mV	9.20 ft	225.00 ml/min
4/22/2020 1:02 PM	01:08:20	6.42 pH	9.57 °C	0.30 mS/cm	0.22 mg/L	135.18 NTU	48.1 mV	9.20 ft	225.00 ml/min
4/22/2020 1:07 PM	01:13:20	6.43 pH	9.60 °C	0.30 mS/cm	0.21 mg/L	169.23 NTU	48.0 mV	9.20 ft	225.00 ml/min
4/22/2020 1:12 PM	01:18:20	6.42 pH	9.57 °C	0.30 mS/cm	0.21 mg/L	95.91 NTU	47.4 mV	9.20 ft	200.00 ml/min
4/22/2020 1:17 PM	01:23:20	6.45 pH	9.46 °C	0.30 mS/cm	0.21 mg/L	137.25 NTU	45.3 mV	9.20 ft	200.00 ml/min
4/22/2020 1:22 PM	01:28:20	6.43 pH	9.34 °C	0.30 mS/cm	0.22 mg/L	86.73 NTU	46.3 mV	9.20 ft	200.00 ml/min
4/22/2020 1:27 PM	01:33:20	6.45 pH	9.29 °C	0.31 mS/cm	0.20 mg/L	92.19 NTU	44.3 mV	9.20 ft	200.00 ml/min
4/22/2020 1:32 PM	01:38:20	6.44 pH	9.30 °C	0.31 mS/cm	0.19 mg/L	58.13 NTU	43.7 mV	9.20 ft	200.00 ml/min
4/22/2020 1:37 PM	01:43:20	6.45 pH	9.35 °C	0.31 mS/cm	0.18 mg/L	51.83 NTU	42.5 mV	9.20 ft	200.00 ml/min
4/22/2020 1:42 PM	01:48:20	6.44 pH	9.32 °C	0.31 mS/cm	0.17 mg/L	63.73 NTU	42.3 mV	9.20 ft	200.00 ml/min
4/22/2020 1:47 PM	01:53:20	6.44 pH	9.26 °C	0.31 mS/cm	0.18 mg/L	44.79 NTU	41.7 mV	9.20 ft	200.00 ml/min
4/22/2020 1:52 PM	01:58:20	6.44 pH	9.21 °C	0.31 mS/cm	0.17 mg/L	39.28 NTU	42.0 mV	9.20 ft	200.00 ml/min
4/22/2020 1:57 PM	02:03:20	6.44 pH	9.21 °C	0.31 mS/cm	0.18 mg/L	46.83 NTU	41.3 mV	9.20 ft	200.00 ml/min

Samples

Sample ID:	Description:
LL2MW-267-200401-GW	Purge start time 11:53 AM (PSI 18/CPM 3/3.5/16.5) Stagnant water volume: 1,659 mL Stagnant water removed @ 12:02 PM (00:08:20) Empty flow cell @ 12:22 PM (00:28:20) Empty flow cell @ 12:52 PM (00:58:20) - biofoul accumulated in flow cell Purge well for 2 hours due to turbidity. Stable @ 1:57 PM (02:03:20) (turbidity is greater than 10 NTU and less than 50 NTU - no filtered sample) Water is very turbid with biofoul, reddish orange, and odorless at beginning of purge. Water is cloudy, has a brown tint, and is odorless at end of purge. Total volume purged: 27,175 mL Sample for explosives and TAL metals at 1409 on 04/22/20 Hole in air tubing. Remove pump for repair after sampling.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

RVAAP-10 LOAD LINE 3

Low-Flow Test Report:

Test Date / Time: 4/22/2020 1:01:23 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL3mw-237 **Well Diameter: 2 in** **Initial Depth to Water: 13.25 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 25 ft** **Pump Intake From TOC: 25.55 ft** **Estimated Total Volume Pumped: 2,350 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 75 mL/min** **Final Draw Down: 1.3 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 52:8, 20 psi, 75 mL/min

Weather Conditions:
45°F, partly cloudy, some sun, calm.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 1:01 PM	00:00	6.83 pH	15.46 °C	0.23 mS/cm	6.66 mg/L	0.00 NTU	103.1 mV	13.25 ft	100.00 ml/min
4/22/2020 1:17 PM	15:45	6.20 pH	10.13 °C	0.28 mS/cm	3.31 mg/L	0.06 NTU	149.8 mV	14.48 ft	100.00 ml/min
4/22/2020 1:17 PM	16:00	6.20 pH	10.05 °C	0.28 mS/cm	3.30 mg/L	0.25 NTU	148.9 mV	14.48 ft	100.00 ml/min
4/22/2020 1:20 PM	19:00	6.18 pH	10.06 °C	0.28 mS/cm	3.25 mg/L	0.28 NTU	151.4 mV	14.55 ft	75.00 ml/min
4/22/2020 1:23 PM	22:00	6.16 pH	9.89 °C	0.28 mS/cm	3.22 mg/L	1.35 NTU	153.6 mV	14.55 ft	75.00 ml/min
4/22/2020 1:26 PM	25:00	6.16 pH	9.72 °C	0.28 mS/cm	3.23 mg/L	6.60 NTU	154.1 mV	14.55 ft	75.00 ml/min

Samples

Sample ID:	Description:
LL3mw-237-200401-GW	1:01 PM - Start pre-purge, CPM 1 8 > 52, PSI = 20. 1:17 PM (00:05:45) - End pre-purge, 00:06:00 switch to 3 minute intervals. 1:22 PM (00:19:00) - Lowered flow to CPM 1 6 > 54, PSI = 20 to reduce draw-down. 1:26 PM (00:25:00) - LL3mw-237 stable, collect sample for explosives. Water is clear, colorless, and odorless. Total purge volume = 2,900 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

Low-Flow Test Report:

Test Date / Time: 4/30/2020 9:11:22 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL3mw-238 **Well Diameter: 2 in** **Total Depth: 23.16 ft** **Initial Depth to Water: 14.94 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 20 ft** **Pump Intake From TOC: 19.91 ft** **Estimated Total Volume Pumped: 1,708.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 50 mL/min** **Final Draw Down: 0.26 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 57:3, 18 psi, 50 mL/min

Weather Conditions:
51°F, cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/30/2020 9:11 AM	00:00	6.79 pH	10.46 °C	0.36 mS/cm	9.06 mg/L	51.48 NTU	228.7 mV	14.94 ft	100.00 ml/min
4/30/2020 9:22 AM	10:47	6.68 pH	9.71 °C	0.34 mS/cm	7.66 mg/L	1.10 NTU	230.9 mV	15.20 ft	100.00 ml/min
4/30/2020 9:22 AM	11:05	6.67 pH	9.75 °C	0.34 mS/cm	7.67 mg/L	1.03 NTU	229.3 mV	15.20 ft	100.00 ml/min
4/30/2020 9:25 AM	14:05	6.68 pH	9.88 °C	0.34 mS/cm	7.69 mg/L	0.22 NTU	230.1 mV	15.20 ft	50.00 ml/min
4/30/2020 9:28 AM	17:05	6.69 pH	9.97 °C	0.33 mS/cm	7.70 mg/L	0.39 NTU	228.5 mV	15.20 ft	50.00 ml/min
4/30/2020 9:31 AM	20:05	6.70 pH	9.99 °C	0.33 mS/cm	7.67 mg/L	0.24 NTU	227.5 mV	15.20 ft	50.00 ml/min

Samples

Sample ID:	Description:
LL3mw-238-200401-GW	9:11 AM - Start pre-purge at LL3mw-238, CPM 1 6>54, PSI = 18. 9:22 AM (00:10:47) - Pre-purge complete, switch to 3 minute intervals at 00:11:05. Reduced flow rate to CPM 1 3>57, PSI = 18 to reduce draw-down. 0931 (00:20:05) LL3mw-238 is stable, collect LL3mw-238-200401-GW for explosives. Water is clear, colorless, and odorless. Total purge volume = 1,500 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/30/2020

QA Check By: ,5/11/2020

Low-Flow Test Report:

Test Date / Time: 4/30/2020 10:32:46 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL3mw-239
Well Diameter: 2 in
Total Depth: 36.59 ft
Initial Depth to Water: 23.2 ft

Pump Type: QED Well Wizard Bladder Pump
Tubing Type: PTFE
Tubing Inner Diameter: 0.25 in
Tubing Length: 31.42 ft
Pump Intake From TOC: 31.42 ft
Estimated Total Volume Pumped: 3,010.5 mL
Flow Cell Volume: 130 mL
Final Flow Rate: 50 mL/min
Final Draw Down: 0.88 ft

Instruments Used:
Aqua TROLL 600 - 611846
Air Compressor - 25369
Controller (MP10) - 1143
Water Level Meter - 25369

Test Notes:
CPM 1, 57:3, 25 psi, 50 mL/min

Weather Conditions:
55°F overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/30/2020 10:32 AM	00:00	6.23 pH	9.98 °C	0.19 mS/cm	7.97 mg/L	42.97 NTU	236.5 mV	23.20 ft	210.00 ml/min
4/30/2020 10:37 AM	04:48	6.08 pH	9.53 °C	0.19 mS/cm	2.17 mg/L	7.54 NTU	245.0 mV	24.06 ft	70.00 ml/min
4/30/2020 10:40 AM	07:48	6.07 pH	9.67 °C	0.19 mS/cm	1.85 mg/L	5.94 NTU	245.3 mV	24.10 ft	70.00 ml/min
4/30/2020 10:43 AM	10:48	6.07 pH	9.80 °C	0.19 mS/cm	1.85 mg/L	8.71 NTU	246.1 mV	24.12 ft	70.00 ml/min
4/30/2020 10:46 AM	13:48	6.08 pH	9.99 °C	0.19 mS/cm	1.83 mg/L	10.73 NTU	246.2 mV	24.15 ft	70.00 ml/min
4/30/2020 10:49 AM	16:48	6.07 pH	10.16 °C	0.19 mS/cm	1.79 mg/L	16.72 NTU	245.6 mV	24.11 ft	50.00 ml/min
4/30/2020 10:52 AM	19:48	6.07 pH	10.30 °C	0.19 mS/cm	1.84 mg/L	21.59 NTU	244.7 mV	24.11 ft	50.00 ml/min
4/30/2020 10:52 AM	19:54	6.07 pH	10.32 °C	0.19 mS/cm	1.84 mg/L	21.60 NTU	244.8 mV	24.11 ft	50.00 ml/min
4/30/2020 10:57 AM	24:54	6.13 pH	11.53 °C	0.00 mS/cm	10.19 mg/L	9.37 NTU	242.3 mV	24.11 ft	50.00 ml/min
4/30/2020 11:02 AM	29:54	6.07 pH	10.59 °C	0.19 mS/cm	2.50 mg/L	0.00 NTU	242.7 mV	24.11 ft	50.00 ml/min
4/30/2020 11:06 AM	34:03	6.07 pH	10.38 °C	0.19 mS/cm	2.01 mg/L	0.48 NTU	243.8 mV	24.10 ft	50.00 ml/min
4/30/2020 11:09 AM	37:03	6.07 pH	10.37 °C	0.19 mS/cm	1.96 mg/L	3.66 NTU	244.5 mV	24.10 ft	50.00 ml/min

4/30/2020 11:12 AM	40:03	6.07 pH	10.44 °C	0.19 mS/cm	1.94 mg/L	3.74 NTU	245.1 mV	24.08 ft	50.00 ml/min

Samples

Sample ID:	Description:
LL3mw-239-200401-GW	Begin purge @ 10:32 AM (PSI 25/CPM 2/5/25) Stagnant water volume - 951 mL Stagnant water volume removed @ 10:37 AM (00:04:48) (CPM 2/3/27) Lower flow rate @ 10:40 AM (00:07:48) (CPM 2/2/28) Lower flow rate @ 10:46 AM (00:13:48) (CPM 1/3/57) Switch to 5 minute readings @ 10:52 AM (00:19:54) Empty and clean out flow cell to lower turbidity @ 10:52 AM (00:19:54) Flow cell empty @ 10:57 AM (00:24:54) Switch to 3 minute readings @ 11:06 AM (00:34:03) Parameters stable @ 11:12 AM (00:40:03) Water is slightly cloudy, has an orange tint, odorless initially. Water is clear, colorless, odorless after stagnant water removed. Collect sample LL3mw-239-200401-GW for explosives @ 1115 on 04/30/20. Total volume removed - 2,725 mL

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Sampled By: ,4/30/2020

QA Check By: ,5/11/2020

Low-Flow Test Report:

Test Date / Time: 4/30/2020 8:51:29 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: LL3mw-241 **Well Diameter: 2 in** **Total Depth: 25.36 ft** **Initial Depth to Water: 6.43 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 36 ft** **Pump Intake From TOC: 17.94 ft** **Estimated Total Volume Pumped: 4,250 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 250 mL/min** **Final Draw Down: 0.36 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 2, 26:4, 17 psi, 250 mL/min

Weather Conditions:
54°F overcast

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/30/2020 8:51 AM	00:00	6.51 pH	9.74 °C	0.16 mS/cm	8.62 mg/L	15.60 NTU	215.7 mV	7.43 ft	260.00 ml/min
4/30/2020 8:58 AM	07:04	6.15 pH	9.35 °C	0.14 mS/cm	3.22 mg/L	6.03 NTU	237.1 mV	7.79 ft	250.00 ml/min
4/30/2020 9:01 AM	10:04	6.12 pH	9.30 °C	0.14 mS/cm	2.84 mg/L	7.47 NTU	239.7 mV	7.79 ft	250.00 ml/min
4/30/2020 9:04 AM	13:04	6.10 pH	9.27 °C	0.14 mS/cm	2.72 mg/L	6.33 NTU	243.4 mV	7.79 ft	250.00 ml/min
4/30/2020 9:07 AM	16:04	6.08 pH	9.25 °C	0.14 mS/cm	2.65 mg/L	5.58 NTU	246.0 mV	7.79 ft	250.00 ml/min
4/30/2020 9:10 AM	19:04	6.09 pH	9.65 °C	0.13 mS/cm	9.07 mg/L	2.73 NTU	246.3 mV	7.79 ft	250.00 ml/min

Samples

Sample ID:	Description:
LL3mw-241-200401-GW	Begin purge @ 8:51 AM (PSI 20/CPM 2/4/26) Stagnant water volume - 1,696 mL Stagnant water volume removed @ 8:58 AM (00:07:04) Lower PSI to 17 @ 8:58 AM (00:07:04) to reduce draw-down Parameters stable @ 9:07 AM (00:16:04) Accidental reading collected @ 9:10 AM (00:19:04) Water is clear, has a brown tint, odorless initially. Water is clear, colorless, odorless after stagnant water removed. Collect sample LL3mw-241-200401-GW for explosives @ 0910 on 04/30/20. Total volume removed - 4,250 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/30/2020

QA Check By: ,5/11/2020

RVAAP-12 LOAD LINE 12

Low-Flow Test Report:

Test Date / Time: 4/20/2020 12:52:33 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL12mw-185 **Well Diameter: 2 in** **Initial Depth to Water: 6.13 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 30 ft** **Pump Intake From TOC: 17.94 ft** **Estimated Total Volume Pumped: 4,131.667 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 100 mL/min** **Final Draw Down: 3.07 ft**	**Instruments Used: Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 59:1, 18 psi, 100 mL/min

Weather Conditions:
41°F, clear, sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 12:52 PM	00:00	6.61 pH	12.37 °C	4.68 mS/cm	2.56 mg/L	0.00 NTU	217.9 mV	6.13 ft	100.00 ml/min
4/20/2020 1:12 PM	19:51	6.45 pH	12.04 °C	4.64 mS/cm	0.30 mg/L	0.00 NTU	213.9 mV	8.90 ft	100.00 ml/min
4/20/2020 1:12 PM	20:19	6.46 pH	12.04 °C	4.60 mS/cm	0.29 mg/L	0.00 NTU	214.3 mV	8.97 ft	100.00 ml/min
4/20/2020 1:15 PM	23:19	6.44 pH	12.47 °C	4.63 mS/cm	0.27 mg/L	0.00 NTU	212.7 mV	9.03 ft	100.00 ml/min
4/20/2020 1:18 PM	26:19	6.44 pH	13.34 °C	4.63 mS/cm	0.28 mg/L	0.22 NTU	211.5 mV	9.05 ft	100.00 ml/min
4/20/2020 1:21 PM	29:19	6.43 pH	13.98 °C	4.62 mS/cm	0.32 mg/L	1.12 NTU	210.8 mV	9.05 ft	100.00 ml/min
4/20/2020 1:24 PM	32:19	6.43 pH	14.26 °C	4.61 mS/cm	0.32 mg/L	4.01 NTU	210.1 mV	9.05 ft	100.00 ml/min
4/20/2020 1:27 PM	35:19	6.44 pH	13.69 °C	4.60 mS/cm	0.31 mg/L	3.23 NTU	209.6 mV	9.05 ft	100.00 ml/min
4/20/2020 1:30 PM	38:19	6.46 pH	13.23 °C	4.59 mS/cm	0.28 mg/L	5.97 NTU	208.7 mV	9.20 ft	100.00 ml/min
4/20/2020 1:33 PM	41:19	6.47 pH	13.55 °C	4.58 mS/cm	0.28 mg/L	5.90 NTU	207.8 mV	9.20 ft	100.00 ml/min

Samples

Sample ID:	Description:
LL12mw-185-200401-GW	Start pre-purge at 12:52 PM. CPM 1 2 >58, PSI = 20. 1:12 PM - End pre-purge. 1:12 PM - Switch to 3 minute intervals. 1:15 PM - Lowered flow to CPM 1 1 > 59, PSI = 18, due to drawdown. 1333 collected sample at LL12mw-185 for ammonia and nitrate. Water is clear, colorless, and odorless. Total purge = 3,000 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/5/2020

Low-Flow Test Report:

Test Date / Time: 4/28/2020 10:04:20 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL12mw-185 **Well Diameter: 2 in** **Initial Depth to Water: 6.35 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 30 ft** **Pump Intake From TOC: 17.94 ft** **Estimated Total Volume Pumped: 3,313.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 25 mL/min** **Final Draw Down: 3.55 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 59:1, 10 psi, 25 mL/min

Weather Conditions:
52°F, cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/28/2020 10:04 AM	00:00	6.69 pH	10.29 °C	4.14 mS/cm	6.08 mg/L	4.49 NTU	253.8 mV	6.35 ft	100.00 ml/min
4/28/2020 10:24 AM	19:51	6.59 pH	10.04 °C	4.68 mS/cm	0.45 mg/L	3.05 NTU	247.9 mV	8.95 ft	100.00 ml/min
4/28/2020 10:24 AM	20:05	6.59 pH	10.10 °C	4.68 mS/cm	0.43 mg/L	3.14 NTU	247.9 mV	8.95 ft	100.00 ml/min
4/28/2020 10:27 AM	23:05	6.59 pH	10.07 °C	4.72 mS/cm	0.40 mg/L	4.32 NTU	245.4 mV	9.45 ft	100.00 ml/min
4/28/2020 10:30 AM	26:05	6.59 pH	10.44 °C	4.74 mS/cm	0.44 mg/L	5.44 NTU	245.4 mV	9.72 ft	40.00 ml/min
4/28/2020 10:33 AM	29:05	6.59 pH	10.80 °C	4.67 mS/cm	0.48 mg/L	9.34 NTU	243.5 mV	9.80 ft	40.00 ml/min
4/28/2020 10:36 AM	32:05	6.59 pH	11.17 °C	4.66 mS/cm	0.46 mg/L	13.68 NTU	243.1 mV	9.84 ft	40.00 ml/min
4/28/2020 10:39 AM	35:05	6.59 pH	11.24 °C	4.70 mS/cm	0.44 mg/L	0.00 NTU	242.7 mV	9.90 ft	40.00 ml/min
4/28/2020 10:42 AM	38:05	6.59 pH	11.52 °C	4.70 mS/cm	0.44 mg/L	0.00 NTU	242.4 mV	9.90 ft	25.00 ml/min
4/28/2020 10:45 AM	41:05	6.58 pH	11.86 °C	4.69 mS/cm	0.49 mg/L	0.00 NTU	241.9 mV	9.90 ft	25.00 ml/min
4/28/2020 10:48 AM	44:05	6.58 pH	12.10 °C	4.66 mS/cm	0.53 mg/L	0.00 NTU	241.7 mV	9.90 ft	25.00 ml/min
4/28/2020 10:51 AM	47:05	6.58 pH	12.30 °C	4.66 mS/cm	0.56 mg/L	0.00 NTU	241.4 mV	9.90 ft	25.00 ml/min

Samples

Sample ID:	Description:
LL12mw-185-200401-GW	10:04 AM - Start pre-purge at LL12mw-185, CPM 1 3>57, PSI = 18. 10:24 AM (00:19:51) - Pre-purge complete, switch to three minute intervals 00:20:05. 10:27 AM (00:23:05) - Lowered purge rate due to draw-down. CPM 1 2>58, PSI = 10. 10:39 AM (00:35:05) - Lowered purge rate due to draw-down. CPM 1 1>59, PSI = 10. 10:51 AM (00:47:05) - LL12mw-185 stable, collect LL12mw-185-200401-GW for ammonia. Water is clear, colorless, and odorless. Total purge volume = 2,790 mL.

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Sampled By: ,4/28/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/20/2020 9:59:54 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL12mw-187 **Well Diameter: 2 in** **Initial Depth to Water: 7.95 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 44 ft** **Pump Intake From TOC: 24.5 ft** **Estimated Total Volume Pumped: 21,099.166 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 175 mL/min** **Final Draw Down: 0.75 ft**	**Instruments Used: Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 1, 56:4, 22 psi, 175 mL/min

Weather Conditions:
37°F, clear, sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/20/2020 9:59 AM	00:00	6.24 pH	18.54 °C	0.00 mS/cm	8.21 mg/L	0.00 NTU	210.5 mV	7.95 ft	175.00 ml/min
4/20/2020 10:12 AM	13:05	6.25 pH	10.11 °C	13.32 mS/cm	0.04 mg/L	25.86 NTU	275.5 mV	7.95 ft	175.00 ml/min
4/20/2020 10:13 AM	13:20	6.25 pH	10.35 °C	13.28 mS/cm	0.04 mg/L	25.70 NTU	275.5 mV	8.80 ft	175.00 ml/min
4/20/2020 10:16 AM	16:20	6.25 pH	10.32 °C	13.35 mS/cm	0.06 mg/L	48.64 NTU	279.2 mV	8.80 ft	175.00 ml/min
4/20/2020 10:19 AM	19:20	6.24 pH	10.25 °C	13.24 mS/cm	0.04 mg/L	68.45 NTU	278.5 mV	8.80 ft	175.00 ml/min
4/20/2020 10:22 AM	22:20	6.25 pH	10.09 °C	13.20 mS/cm	0.04 mg/L	121.50 NTU	281.4 mV	8.80 ft	175.00 ml/min
4/20/2020 10:25 AM	25:20	6.24 pH	10.31 °C	13.21 mS/cm	0.06 mg/L	211.35 NTU	283.5 mV	8.80 ft	175.00 ml/min
4/20/2020 10:28 AM	28:20	6.24 pH	10.72 °C	12.98 mS/cm	0.05 mg/L	270.59 NTU	282.4 mV	8.80 ft	175.00 ml/min
4/20/2020 10:31 AM	31:20	6.24 pH	10.75 °C	12.85 mS/cm	0.05 mg/L	280.41 NTU	283.7 mV	8.70 ft	175.00 ml/min
4/20/2020 10:34 AM	34:20	6.34 pH	10.48 °C	12.75 mS/cm	0.06 mg/L	345.76 NTU	284.9 mV	8.70 ft	175.00 ml/min
4/20/2020 10:37 AM	37:20	6.24 pH	10.51 °C	12.79 mS/cm	0.08 mg/L	440.84 NTU	282.5 mV	8.70 ft	175.00 ml/min
4/20/2020 10:40 AM	40:20	6.24 pH	10.42 °C	12.78 mS/cm	0.06 mg/L	551.75 NTU	282.2 mV	8.70 ft	175.00 ml/min

4/20/2020 10:43 AM	43:20	6.24 pH	10.44 °C	13.51 mS/cm	0.63 mg/L	0.00 NTU	283.2 mV	8.70 ft	175.00 ml/min
4/20/2020 10:46 AM	46:20	6.24 pH	10.37 °C	13.55 mS/cm	0.10 mg/L	2.90 NTU	286.4 mV	8.70 ft	175.00 ml/min
4/20/2020 10:49 AM	49:20	6.24 pH	10.29 °C	13.52 mS/cm	0.08 mg/L	5.00 NTU	289.3 mV	8.70 ft	175.00 ml/min
4/20/2020 10:52 AM	52:20	6.25 pH	10.39 °C	13.44 mS/cm	0.11 mg/L	43.17 NTU	287.9 mV	8.70 ft	175.00 ml/min
4/20/2020 10:55 AM	55:20	6.78 pH	10.81 °C	13.30 mS/cm	0.16 mg/L	80.80 NTU	288.2 mV	8.70 ft	175.00 ml/min
4/20/2020 10:58 AM	58:20	6.25 pH	10.80 °C	13.07 mS/cm	0.11 mg/L	316.90 NTU	290.0 mV	8.70 ft	175.00 ml/min
4/20/2020 11:01 AM	01:01:20	6.25 pH	10.80 °C	12.95 mS/cm	0.09 mg/L	53.48 NTU	293.1 mV	8.70 ft	175.00 ml/min
4/20/2020 11:04 AM	01:04:20	6.25 pH	10.71 °C	13.79 mS/cm	0.13 mg/L	307.24 NTU	292.6 mV	8.70 ft	175.00 ml/min
4/20/2020 11:07 AM	01:07:20	6.26 pH	10.55 °C	13.97 mS/cm	0.13 mg/L	20.78 NTU	295.5 mV	8.70 ft	175.00 ml/min
4/20/2020 11:10 AM	01:10:20	6.26 pH	10.43 °C	14.00 mS/cm	0.11 mg/L	30.53 NTU	297.6 mV	8.70 ft	175.00 ml/min
4/20/2020 11:13 AM	01:13:20	6.26 pH	10.34 °C	13.93 mS/cm	0.10 mg/L	98.14 NTU	299.2 mV	8.70 ft	175.00 ml/min
4/20/2020 11:16 AM	01:16:20	6.27 pH	10.22 °C	13.83 mS/cm	0.10 mg/L	117.43 NTU	300.6 mV	8.70 ft	175.00 ml/min
4/20/2020 11:19 AM	01:19:20	6.26 pH	10.20 °C	13.74 mS/cm	0.09 mg/L	151.35 NTU	302.4 mV	8.70 ft	175.00 ml/min
4/20/2020 11:22 AM	01:22:20	6.27 pH	10.66 °C	13.60 mS/cm	0.09 mg/L	61.21 NTU	302.5 mV	8.70 ft	175.00 ml/min
4/20/2020 11:25 AM	01:25:20	6.26 pH	10.65 °C	13.73 mS/cm	0.11 mg/L	16.56 NTU	304.3 mV	8.70 ft	175.00 ml/min
4/20/2020 11:28 AM	01:28:20	6.27 pH	10.49 °C	13.95 mS/cm	0.11 mg/L	23.35 NTU	306.6 mV	8.70 ft	175.00 ml/min
4/20/2020 11:31 AM	01:31:20	6.26 pH	10.59 °C	13.88 mS/cm	0.10 mg/L	0.00 NTU	307.9 mV	8.70 ft	175.00 ml/min
4/20/2020 11:34 AM	01:34:20	6.26 pH	10.55 °C	13.81 mS/cm	0.10 mg/L	0.35 NTU	309.6 mV	8.70 ft	175.00 ml/min
4/20/2020 11:37 AM	01:37:20	6.26 pH	10.47 °C	13.88 mS/cm	0.10 mg/L	7.08 NTU	311.5 mV	8.70 ft	175.00 ml/min
4/20/2020 11:40 AM	01:40:20	6.27 pH	10.39 °C	13.84 mS/cm	0.12 mg/L	488.91 NTU	312.3 mV	8.70 ft	175.00 ml/min
4/20/2020 11:42 AM	01:42:34	6.27 pH	10.54 °C	13.89 mS/cm	0.22 mg/L	0.00 NTU	312.4 mV	8.70 ft	175.00 ml/min
4/20/2020 11:45 AM	01:45:34	6.27 pH	10.57 °C	13.84 mS/cm	0.10 mg/L	8.27 NTU	302.0 mV	8.70 ft	175.00 ml/min
4/20/2020 11:48 AM	01:48:34	6.27 pH	10.50 °C	13.93 mS/cm	0.10 mg/L	4.32 NTU	298.7 mV	8.70 ft	175.00 ml/min
4/20/2020 11:51 AM	01:51:34	6.27 pH	10.42 °C	13.87 mS/cm	0.09 mg/L	0.00 NTU	303.8 mV	8.70 ft	175.00 ml/min

Samples

Sample ID:	Description:
LL12mw-187-200401-GW	Purge setting CPM1 4 > 56, PSI = 22 00:13:20 - Switch to 3 minute intervals. 00:40:20 - Noticed bubbles in flow cell, tightened in/outflow connections. It appears there are tinny bubbles that are affecting turbidity sensor. Tiny bubbles possibly affected turbidity throughout purge, water did not appear cloudy or turbid. 01:51:34 - well stable, collect sample at LL12mw-187 for ammonia and nitrate. Water is clear colorless, and odorless. Total purged volume = 16,650 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/20/2020

QA Check By: ,5/4/2020

Low-Flow Test Report:

Test Date / Time: 4/28/2020 8:41:50 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL12mw-187 **Well Diameter: 2 in** **Initial Depth to Water: 7.98 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 44 ft** **Pump Intake From TOC: 24.5 ft** **Estimated Total Volume Pumped: 6,658.75 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 175 mL/min** **Final Draw Down: 0.92 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 2, 27:3, 20 psi, 175 mL/min

Weather Conditions:
49°F, cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/28/2020 8:41 AM	00:00	6.31 pH	10.40 °C	13.39 mS/cm	3.59 mg/L	0.79 NTU	274.8 mV	7.98 ft	175.00 ml/min
4/28/2020 8:54 AM	13:05	6.32 pH	9.82 °C	11.66 mS/cm	0.20 mg/L	19.44 NTU	268.8 mV	8.90 ft	175.00 ml/min
4/28/2020 8:55 AM	14:03	6.32 pH	9.81 °C	11.60 mS/cm	0.18 mg/L	41.85 NTU	268.9 mV	8.90 ft	175.00 ml/min
4/28/2020 8:58 AM	17:03	6.31 pH	9.83 °C	11.62 mS/cm	0.17 mg/L	68.29 NTU	268.3 mV	8.90 ft	175.00 ml/min
4/28/2020 9:01 AM	20:03	6.30 pH	9.84 °C	11.55 mS/cm	0.15 mg/L	22.76 NTU	268.0 mV	8.90 ft	175.00 ml/min
4/28/2020 9:04 AM	23:03	6.29 pH	9.84 °C	13.92 mS/cm	0.14 mg/L	64.99 NTU	267.3 mV	8.90 ft	175.00 ml/min
4/28/2020 9:07 AM	26:03	6.29 pH	9.95 °C	13.66 mS/cm	0.12 mg/L	19.43 NTU	267.5 mV	8.90 ft	175.00 ml/min
4/28/2020 9:10 AM	29:03	6.29 pH	9.96 °C	13.95 mS/cm	0.13 mg/L	5.37 NTU	267.0 mV	8.90 ft	175.00 ml/min
4/28/2020 9:13 AM	32:03	6.29 pH	9.99 °C	13.67 mS/cm	0.12 mg/L	9.42 NTU	267.2 mV	8.90 ft	175.00 ml/min
4/28/2020 9:16 AM	35:03	6.28 pH	9.99 °C	13.39 mS/cm	0.12 mg/L	7.41 NTU	267.9 mV	8.90 ft	175.00 ml/min
4/28/2020 9:19 AM	38:03	6.28 pH	10.07 °C	13.30 mS/cm	0.11 mg/L	3.91 NTU	268.2 mV	8.90 ft	175.00 ml/min

Samples

Sample ID:	Description:
LL12mw-187-200401-GW	8:41 AM - Start pre-purge, CPM 2 3>27, PSI = 20. 8:54 AM (00:13:05) - Pre-purge complete. 8:55 AM (00:14:03) - Switch to three minute intervals. 9:19 AM (00:38:03) - LL12mw-187 is stable. 0920 - Collect LL12mw-187-200401-GW for ammonia. Water is clear, colorless, and odorless. Total purge volume = 7,200 mL.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/28/2020

QA Check By: ,5/7/2020

RVAAP-16 FUZE AND BOOSTER QUARRY LANDFILL/PONDS

Low-Flow Test Report:

Test Date / Time: 4/27/2020 2:17:13 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-168 **Well Diameter: 2 in** **Initial Depth to Water: 9.86 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 16.4 ft** **Pump Intake From TOC: 16.4 ft** **Estimated Total Volume Pumped: 10,146.667 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 325 mL/min** **Final Draw Down: 0.05 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 25:5, 40psi, 325 mL/min

Weather Conditions:
57°F sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/27/2020 2:17 PM	00:00	5.00 pH	13.73 °C	0.28 mS/cm	6.82 mg/L	12.95 NTU	174.4 mV	9.86 ft	400.00 ml/min
4/27/2020 2:20 PM	03:43	5.15 pH	10.18 °C	0.31 mS/cm	1.17 mg/L	52.70 NTU	82.1 mV	9.86 ft	400.00 ml/min
4/27/2020 2:24 PM	07:22	5.09 pH	9.66 °C	0.30 mS/cm	0.19 mg/L	33.11 NTU	59.8 mV	9.91 ft	325.00 ml/min
4/27/2020 2:27 PM	10:22	5.00 pH	9.47 °C	0.29 mS/cm	0.13 mg/L	17.36 NTU	-6.9 mV	9.91 ft	325.00 ml/min
4/27/2020 2:30 PM	13:22	4.81 pH	9.29 °C	0.26 mS/cm	0.11 mg/L	11.47 NTU	-40.3 mV	9.91 ft	325.00 ml/min
4/27/2020 2:33 PM	16:22	4.72 pH	9.47 °C	0.26 mS/cm	0.10 mg/L	5.91 NTU	-45.6 mV	9.91 ft	325.00 ml/min
4/27/2020 2:36 PM	19:22	4.72 pH	9.60 °C	0.26 mS/cm	0.10 mg/L	4.68 NTU	-49.4 mV	9.91 ft	325.00 ml/min
4/27/2020 2:39 PM	22:22	4.68 pH	9.56 °C	0.26 mS/cm	0.10 mg/L	3.19 NTU	-49.2 mV	9.91 ft	325.00 ml/min
4/27/2020 2:42 PM	25:22	4.63 pH	9.46 °C	0.26 mS/cm	0.12 mg/L	3.53 NTU	-48.3 mV	9.91 ft	325.00 ml/min

Samples

Sample ID:	Description:
FBQmw-168-200401-GW	Initial purge started: 2:17 PM initial water level: 9.86 ft initial flow rate: 275 mL/min Initial CPM: 2 26:4 40psi Purge volume calculation: 1,322.33 mL Water description: clear, colorless, odorless Initial purge complete: 2:24 PM (00:07:22) The initial purge took longer than expected, due to this the second reading is erroneous Purge started: 2:24 PM (00:07:22) Purge water level: 9.91 ft Purge CPM: 2 25:5 40psi Purge flow rate: 325 mL/min Water description: clear, colorless, with a sulfur odor Samples taken: 1445 Type of samples taken: explosives Total volume purged: 9,130 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/27/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/28/2020 8:48:11 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-170 **Well Diameter: 2 in** **Initial Depth to Water: 16.08 ft**	**Pump Type: QED MP-10 Portable Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 27.6 ft** **Pump Intake From TOC: 27.6 ft** **Estimated Total Volume Pumped: 26,852.5 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 400 mL/min** **Final Draw Down: 0.04 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 4, 10:5, 48 psi, 400 mL/min

Weather Conditions:
48°F cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/28/2020 8:48 AM	00:00	5.34 pH	9.82 °C	0.12 mS/cm	8.85 mg/L	16.13 NTU	241.7 mV	16.08 ft	425.00 ml/min
4/28/2020 8:50 AM	02:38	5.37 pH	9.89 °C	0.12 mS/cm	8.82 mg/L	3.86 NTU	248.5 mV	16.12 ft	400.00 ml/min
4/28/2020 8:50 AM	02:47	5.32 pH	9.89 °C	0.12 mS/cm	8.79 mg/L	5.58 NTU	251.9 mV	16.12 ft	400.00 ml/min
4/28/2020 8:53 AM	05:47	5.41 pH	9.93 °C	0.12 mS/cm	8.65 mg/L	4.71 NTU	250.4 mV	16.12 ft	400.00 ml/min
4/28/2020 8:56 AM	08:47	5.40 pH	9.92 °C	0.12 mS/cm	8.57 mg/L	7.88 NTU	252.6 mV	16.12 ft	400.00 ml/min
4/28/2020 8:59 AM	11:47	5.36 pH	9.95 °C	0.12 mS/cm	8.55 mg/L	7.73 NTU	258.0 mV	16.12 ft	400.00 ml/min
4/28/2020 9:02 AM	14:47	5.47 pH	9.95 °C	0.11 mS/cm	8.78 mg/L	5.22 NTU	255.4 mV	16.12 ft	400.00 ml/min
4/28/2020 9:05 AM	17:47	5.47 pH	9.94 °C	0.11 mS/cm	9.06 mg/L	9.65 NTU	258.8 mV	16.12 ft	400.00 ml/min
4/28/2020 9:08 AM	20:47	5.44 pH	9.98 °C	0.11 mS/cm	9.06 mg/L	10.06 NTU	264.7 mV	16.12 ft	400.00 ml/min
4/28/2020 9:11 AM	23:47	5.58 pH	9.98 °C	0.11 mS/cm	9.16 mg/L	20.98 NTU	259.9 mV	16.12 ft	400.00 ml/min
4/28/2020 9:14 AM	26:47	5.57 pH	9.97 °C	0.11 mS/cm	9.15 mg/L	33.81 NTU	263.3 mV	16.12 ft	400.00 ml/min

4/28/2020 9:19 AM	30:58	5.64 pH	10.00 °C	0.11 mS/cm	9.33 mg/L	30.58 NTU	262.9 mV	16.12 ft	400.00 ml/min
4/28/2020 9:22 AM	33:58	5.60 pH	9.98 °C	0.11 mS/cm	9.22 mg/L	41.02 NTU	268.6 mV	16.12 ft	400.00 ml/min
4/28/2020 9:25 AM	36:58	5.67 pH	9.99 °C	0.11 mS/cm	9.32 mg/L	44.43 NTU	266.7 mV	16.12 ft	400.00 ml/min
4/28/2020 9:28 AM	39:58	5.67 pH	9.98 °C	0.11 mS/cm	9.37 mg/L	65.11 NTU	268.8 mV	16.12 ft	400.00 ml/min
4/28/2020 9:31 AM	42:58	5.61 pH	10.03 °C	0.11 mS/cm	9.53 mg/L	0.00 NTU	273.5 mV	16.12 ft	400.00 ml/min
4/28/2020 9:34 AM	45:58	5.70 pH	10.00 °C	0.11 mS/cm	9.64 mg/L	0.00 NTU	269.9 mV	16.12 ft	400.00 ml/min
4/28/2020 9:37 AM	48:58	5.69 pH	9.99 °C	0.11 mS/cm	9.62 mg/L	0.00 NTU	272.1 mV	16.12 ft	400.00 ml/min
4/28/2020 9:40 AM	51:58	5.61 pH	10.02 °C	0.11 mS/cm	9.55 mg/L	0.18 NTU	277.8 mV	16.12 ft	400.00 ml/min
4/28/2020 9:43 AM	54:58	5.73 pH	10.03 °C	0.11 mS/cm	9.60 mg/L	0.51 NTU	272.6 mV	16.12 ft	400.00 ml/min
4/28/2020 9:46 AM	57:58	5.71 pH	10.00 °C	0.11 mS/cm	9.68 mg/L	2.37 NTU	274.8 mV	16.12 ft	400.00 ml/min
4/28/2020 9:49 AM	01:00:58	5.65 pH	10.04 °C	0.11 mS/cm	9.75 mg/L	0.00 NTU	279.2 mV	16.12 ft	400.00 ml/min
4/28/2020 9:52 AM	01:03:58	5.74 pH	10.02 °C	0.11 mS/cm	9.81 mg/L	0.00 NTU	275.3 mV	16.12 ft	400.00 ml/min
4/28/2020 9:55 AM	01:06:58	5.72 pH	10.00 °C	0.11 mS/cm	9.73 mg/L	0.04 NTU	277.6 mV	16.12 ft	400.00 ml/min

Samples

Sample ID:	Description:
FBQmw-170-200401-GW	Initial purge started: 8:48 AM initial water level: 16.08 ft initial flow rate: 425 mL/min Initial CPM:4 10:5 48psi Purge volume calculation: 1,488.45 mL Water description: clear with a slight gray tint and no odor Initial purge complete: 8:50 AM (00:02:38) Purge started: 8:50 AM (00:02:47) Purge water level: 16.12 ft Purge CPM:4 10:5 40psi Purge flow rate: 400 mL/min Water description: water is clear, colorless, odorless 9:19 AM (00:30:58) the aquatroll disconnected with the tablet, so the reading was slightly off of three minutes 9:31 AM (00:42:58) the water was clear, but turbidity was high, so I shook the aquatroll and there were bubbles inside. There was a dramatic decrease in turbidity, but it is accurate. Samples taken: 0956 Type of samples taken: explosives Total volume purged: 21,730 mL

Sampled By: ,4/28/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/29/2020 12:04:18 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-171 **Well Diameter: 2 in** **Initial Depth to Water: 14.94 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 29 ft** **Pump Intake From TOC: 29 ft** **Estimated Total Volume Pumped: 6,539.583 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.19 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 27:3, 25 psi, 125 mL/min

Weather Conditions:
66°F cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/29/2020 12:04 PM	00:00	6.16 pH	13.72 °C	0.14 mS/cm	8.25 mg/L	75.99 NTU	227.0 mV	14.94 ft	125.00 ml/min
4/29/2020 12:17 PM	13:19	5.82 pH	10.77 °C	0.13 mS/cm	5.55 mg/L	10.83 NTU	255.7 mV	15.13 ft	125.00 ml/min
4/29/2020 12:20 PM	16:19	5.80 pH	11.14 °C	0.13 mS/cm	5.74 mg/L	6.25 NTU	258.9 mV	15.13 ft	125.00 ml/min
4/29/2020 12:23 PM	19:19	5.76 pH	11.22 °C	0.13 mS/cm	5.48 mg/L	6.50 NTU	262.7 mV	15.13 ft	125.00 ml/min
4/29/2020 12:26 PM	22:19	5.83 pH	11.14 °C	0.13 mS/cm	5.49 mg/L	10.69 NTU	261.2 mV	15.13 ft	125.00 ml/min
4/29/2020 12:29 PM	25:19	5.83 pH	11.10 °C	0.13 mS/cm	5.37 mg/L	44.99 NTU	263.1 mV	15.13 ft	125.00 ml/min
4/29/2020 12:32 PM	28:19	5.76 pH	12.30 °C	0.00 mS/cm	7.51 mg/L	0.00 NTU	268.0 mV	15.13 ft	125.00 ml/min
4/29/2020 12:35 PM	31:19	5.80 pH	11.12 °C	0.13 mS/cm	5.45 mg/L	0.40 NTU	266.1 mV	15.13 ft	125.00 ml/min
4/29/2020 12:38 PM	34:19	5.80 pH	10.93 °C	0.13 mS/cm	5.48 mg/L	0.00 NTU	267.0 mV	15.13 ft	125.00 ml/min
4/29/2020 12:41 PM	37:19	5.79 pH	10.86 °C	0.13 mS/cm	5.46 mg/L	0.00 NTU	269.1 mV	15.13 ft	125.00 ml/min
4/29/2020 12:44 PM	40:19	5.77 pH	10.78 °C	0.13 mS/cm	5.44 mg/L	1.74 NTU	271.9 mV	15.13 ft	125.00 ml/min

4/29/2020 12:47 PM	43:19	5.68 pH	10.87 °C	0.13 mS/cm	5.36 mg/L	0.28 NTU	277.6 mV	15.13 ft	125.00 ml/min
4/29/2020 12:50 PM	46:19	5.82 pH	11.02 °C	0.13 mS/cm	5.34 mg/L	2.29 NTU	270.9 mV	15.13 ft	125.00 ml/min
4/29/2020 12:53 PM	49:19	5.81 pH	10.96 °C	0.13 mS/cm	5.30 mg/L	2.60 NTU	271.8 mV	15.13 ft	125.00 ml/min
4/29/2020 12:56 PM	52:19	5.80 pH	10.99 °C	0.13 mS/cm	5.27 mg/L	5.66 NTU	272.9 mV	15.13 ft	125.00 ml/min

Samples

Sample ID:	Description:
FBQmw-171-200401-GW	Initial purge started: 12:05 PM inital water level: 14.94 ft initial flow rate: 125 mL/min Inital CPM: 2 27:3 25psi Purge volume calculation: 1,510.02 mL Water description: clear, colorless, odorless Initial purge complete: 12:17 PM (00:13:19) Purge started: 12:17 PM (00:13:19) Purge water level: 15.13 ft Purge CPM: 2 27:3 25psi Purge flow rate: 125 mL/min Water description: clear, colorless, odorless 12:32 PM (00:28:19) flow cell emptied too help with unexplained, high turbidity. Samples taken: 1258 Type of samples taken: explosives Total volume purged: 6,655 mL

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Sampled By: ,4/29/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/27/2020 12:27:52 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-174 **Well Diameter: 2 in** **Initial Depth to Water: 13.72 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 19.69 ft** **Pump Intake From TOC: 19.69 ft** **Estimated Total Volume Pumped: 3,677.083 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.16 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 28:2, 20psi, 125 mL/min

Weather Conditions:
55°F Sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/27/2020 12:27 PM	00:00	4.81 pH	11.81 °C	0.06 mS/cm	10.21 mg/L	18.01 NTU	211.8 mV	13.72 ft	125.00 ml/min
4/27/2020 12:39 PM	11:25	4.09 pH	10.08 °C	0.05 mS/cm	9.50 mg/L	2.68 NTU	255.0 mV	13.88 ft	125.00 ml/min
4/27/2020 12:42 PM	14:25	4.06 pH	9.80 °C	0.05 mS/cm	9.45 mg/L	2.14 NTU	261.3 mV	13.88 ft	125.00 ml/min
4/27/2020 12:45 PM	17:25	4.03 pH	10.05 °C	0.05 mS/cm	9.21 mg/L	2.30 NTU	267.8 mV	13.88 ft	125.00 ml/min
4/27/2020 12:48 PM	20:25	4.07 pH	10.08 °C	0.05 mS/cm	9.31 mg/L	0.63 NTU	269.3 mV	13.88 ft	125.00 ml/min
4/27/2020 12:51 PM	23:25	4.07 pH	10.09 °C	0.05 mS/cm	9.29 mg/L	0.49 NTU	273.0 mV	13.88 ft	125.00 ml/min
4/27/2020 12:54 PM	26:25	4.06 pH	10.03 °C	0.05 mS/cm	9.27 mg/L	0.35 NTU	276.9 mV	13.88 ft	125.00 ml/min
4/27/2020 12:57 PM	29:25	4.05 pH	9.82 °C	0.05 mS/cm	9.24 mg/L	0.76 NTU	280.3 mV	13.88 ft	125.00 ml/min

Samples

Sample ID:	Description:
FBQmw-174-200401-GW	initial purge started:12:27 PM initial water level: 13.72 ft initial flow rate: 125 mL/min Initial CPM: 2 28:2 20psi Purge volume calculation: 1,501.62 mL Water description: clear, colorless, odorless Initial purge complete: 12:39 PM (00:11:25) Purge started: 12:39 PM (00:11:25) Purge water level: 13.88 ft Purge CPM: 2 28:2 20psi Purge flow rate: 125 mL/min Water description: clear, colorless, odorless Samples taken: 1258 Type of samples taken: explosives Total volume purged: 5,380 mL

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Sampled By: ,4/27/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/27/2020 8:23:10 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-175 **Well Diameter: 2 in** **Initial Depth to Water: 15.48 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 23 ft** **Pump Intake From TOC: 23 ft** **Estimated Total Volume Pumped: 11,255 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 75 mL/min** **Final Draw Down: 0.38 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM: 2, 28:2, 23psi, 75 mL/min

Weather Conditions:
41°F mostly sunny

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/27/2020 8:23 AM	00:00	4.90 pH	8.15 °C	0.12 mS/cm	10.96 mg/L	65.87 NTU	229.7 mV	15.48 ft	140.00 ml/min
4/27/2020 8:33 AM	10:45	4.13 pH	8.35 °C	0.08 mS/cm	9.53 mg/L	141.20 NTU	257.1 mV	15.86 ft	100.00 ml/min
4/27/2020 8:36 AM	13:45	4.09 pH	8.40 °C	0.08 mS/cm	9.52 mg/L	171.33 NTU	261.7 mV	15.86 ft	100.00 ml/min
4/27/2020 8:39 AM	16:45	4.19 pH	8.22 °C	0.08 mS/cm	9.55 mg/L	145.43 NTU	257.0 mV	15.86 ft	100.00 ml/min
4/27/2020 8:42 AM	19:45	4.16 pH	8.17 °C	0.08 mS/cm	9.56 mg/L	125.68 NTU	259.8 mV	15.86 ft	100.00 ml/min
4/27/2020 8:45 AM	22:45	4.13 pH	8.14 °C	0.08 mS/cm	9.57 mg/L	125.06 NTU	261.6 mV	15.86 ft	100.00 ml/min
4/27/2020 8:48 AM	25:45	4.09 pH	8.19 °C	0.08 mS/cm	9.56 mg/L	116.19 NTU	264.0 mV	15.86 ft	100.00 ml/min
4/27/2020 8:51 AM	28:45	4.09 pH	8.24 °C	0.08 mS/cm	9.52 mg/L	108.97 NTU	265.4 mV	15.86 ft	100.00 ml/min
4/27/2020 8:54 AM	31:45	4.08 pH	8.28 °C	0.08 mS/cm	9.47 mg/L	98.65 NTU	266.1 mV	15.86 ft	75.00 ml/min
4/27/2020 8:57 AM	34:45	4.14 pH	8.28 °C	0.08 mS/cm	9.46 mg/L	78.79 NTU	263.1 mV	15.86 ft	75.00 ml/min
4/27/2020 9:00 AM	37:45	4.14 pH	8.26 °C	0.08 mS/cm	9.46 mg/L	78.62 NTU	263.7 mV	15.86 ft	75.00 ml/min
4/27/2020 9:03 AM	40:45	4.12 pH	8.26 °C	0.08 mS/cm	9.46 mg/L	77.41 NTU	265.0 mV	15.86 ft	75.00 ml/min

4/27/2020 9:06 AM	43:45	4.12 pH	8.21 °C	0.08 mS/cm	9.47 mg/L	72.17 NTU	265.5 mV	15.86 ft	75.00 ml/min
4/27/2020 9:09 AM	46:45	4.10 pH	8.20 °C	0.08 mS/cm	9.47 mg/L	79.63 NTU	266.9 mV	15.86 ft	75.00 ml/min
4/27/2020 9:12 AM	49:45	4.07 pH	8.26 °C	0.08 mS/cm	9.44 mg/L	74.99 NTU	268.7 mV	15.86 ft	75.00 ml/min
4/27/2020 9:15 AM	52:45	4.10 pH	8.29 °C	0.08 mS/cm	9.48 mg/L	66.57 NTU	268.0 mV	15.86 ft	75.00 ml/min
4/27/2020 9:18 AM	55:45	4.11 pH	8.30 °C	0.08 mS/cm	9.47 mg/L	65.13 NTU	267.2 mV	15.86 ft	75.00 ml/min
4/27/2020 9:21 AM	58:45	4.12 pH	8.33 °C	0.08 mS/cm	9.49 mg/L	68.36 NTU	267.1 mV	15.86 ft	75.00 ml/min
4/27/2020 9:24 AM	01:01:45	4.12 pH	8.42 °C	0.08 mS/cm	9.49 mg/L	60.41 NTU	266.6 mV	15.86 ft	75.00 ml/min
4/27/2020 9:27 AM	01:04:45	4.12 pH	8.42 °C	0.08 mS/cm	9.51 mg/L	67.98 NTU	267.1 mV	15.86 ft	75.00 ml/min
4/27/2020 9:30 AM	01:07:45	4.11 pH	8.42 °C	0.08 mS/cm	9.50 mg/L	74.37 NTU	268.4 mV	15.86 ft	75.00 ml/min
4/27/2020 9:33 AM	01:10:45	4.13 pH	8.45 °C	0.08 mS/cm	9.53 mg/L	60.17 NTU	266.9 mV	15.86 ft	75.00 ml/min
4/27/2020 9:36 AM	01:13:45	4.12 pH	8.51 °C	0.08 mS/cm	9.55 mg/L	59.31 NTU	268.0 mV	15.86 ft	75.00 ml/min
4/27/2020 9:39 AM	01:16:45	4.11 pH	8.54 °C	0.08 mS/cm	9.56 mg/L	57.59 NTU	268.7 mV	15.86 ft	75.00 ml/min
4/27/2020 9:42 AM	01:19:45	4.11 pH	8.65 °C	0.08 mS/cm	9.58 mg/L	63.65 NTU	268.3 mV	15.86 ft	75.00 ml/min
4/27/2020 9:45 AM	01:22:45	4.14 pH	8.69 °C	0.08 mS/cm	9.55 mg/L	62.88 NTU	266.3 mV	15.86 ft	75.00 ml/min
4/27/2020 9:48 AM	01:25:45	4.13 pH	8.73 °C	0.08 mS/cm	9.54 mg/L	58.05 NTU	267.4 mV	15.86 ft	75.00 ml/min
4/27/2020 9:51 AM	01:28:45	4.18 pH	8.69 °C	0.08 mS/cm	9.55 mg/L	53.20 NTU	264.6 mV	15.86 ft	75.00 ml/min
4/27/2020 9:54 AM	01:31:45	4.17 pH	8.65 °C	0.08 mS/cm	9.55 mg/L	54.70 NTU	265.5 mV	15.86 ft	75.00 ml/min
4/27/2020 9:57 AM	01:34:45	4.16 pH	8.65 °C	0.08 mS/cm	9.56 mg/L	51.77 NTU	266.3 mV	15.86 ft	75.00 ml/min
4/27/2020 10:00 AM	01:37:45	4.15 pH	8.64 °C	0.08 mS/cm	9.57 mg/L	49.75 NTU	266.9 mV	15.86 ft	75.00 ml/min
4/27/2020 10:03 AM	01:40:45	4.16 pH	8.70 °C	0.08 mS/cm	9.55 mg/L	50.06 NTU	266.7 mV	15.86 ft	75.00 ml/min
4/27/2020 10:06 AM	01:43:45	4.18 pH	8.79 °C	0.08 mS/cm	9.52 mg/L	48.23 NTU	265.0 mV	15.86 ft	75.00 ml/min
4/27/2020 10:09 AM	01:46:45	4.23 pH	8.75 °C	0.08 mS/cm	9.54 mg/L	51.32 NTU	262.9 mV	15.86 ft	75.00 ml/min
4/27/2020 10:12 AM	01:49:45	4.22 pH	8.76 °C	0.08 mS/cm	9.56 mg/L	45.21 NTU	263.3 mV	15.86 ft	75.00 ml/min
4/27/2020 10:15 AM	01:52:45	4.21 pH	8.75 °C	0.08 mS/cm	9.58 mg/L	45.93 NTU	263.3 mV	15.86 ft	75.00 ml/min
4/27/2020 10:18 AM	01:55:45	4.20 pH	8.78 °C	0.08 mS/cm	9.57 mg/L	42.62 NTU	264.0 mV	15.86 ft	75.00 ml/min
4/27/2020 10:21 AM	01:58:45	4.20 pH	8.79 °C	0.08 mS/cm	9.57 mg/L	41.69 NTU	264.8 mV	15.86 ft	75.00 ml/min
4/27/2020 10:24 AM	02:01:45	4.19 pH	8.79 °C	0.08 mS/cm	9.56 mg/L	38.23 NTU	265.9 mV	15.86 ft	75.00 ml/min
4/27/2020 10:27 AM	02:04:45	4.24 pH	8.80 °C	0.08 mS/cm	9.58 mg/L	46.87 NTU	262.5 mV	15.86 ft	75.00 ml/min
4/27/2020 10:30 AM	02:07:45	4.25 pH	8.80 °C	0.08 mS/cm	9.59 mg/L	36.82 NTU	262.3 mV	15.86 ft	75.00 ml/min

4/27/2020 10:33 AM	02:10:45	4.27 pH	8.86 °C	0.08 mS/cm	9.58 mg/L	35.70 NTU	261.8 mV	15.86 ft	75.00 ml/min

Samples

Sample ID:	Description:
FBQmw-175-200401-GW	Initial purge started: 8:23 AM inital water level: 15.48 ft initial flow rate: 140 mL/min Inital CPM: 2 27:3 25psi Purge volume calculation: 1,444.17 mL Water description: water is turbid with as grayish tint and an earthy odor Initial purge complete: 8:33 AM (00:10:45) Purge started: 8:33 AM (00:10:45) Purge water level: 15.86 ft Purge CPM: 2 28:2 23psi Purge flow rate: 100 mL/min Water description: water is turbid with a grayish tint and no odor 8:54 AM (00:31:45) The pressure was changed to 20psi in an attempt to bring the turbidity down, resulted in a new flow rate of 75 mL/min Samples taken: 1035 Type of samples taken: duplicate, split, and MSD samples taken for explosives Total volume purged: 16,680 mL

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Sampled By: ,4/27/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/28/2020 11:04:00 AM **Project:** FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-176 **Well Diameter: 2 in** **Initial Depth to Water: 7.25 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 20 ft** **Pump Intake From TOC: 20.19 ft** **Estimated Total Volume Pumped: 24,827.5 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 200 mL/min** **Final Draw Down: 0.11 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:

CPM 2, 25:5, 20 psi, 200 mL/min

Weather Conditions:

54°F cloudy with slight wind

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/28/2020 11:04 AM	00:00	6.21 pH	10.64 °C	0.10 mS/cm	6.09 mg/L	37.65 NTU	154.5 mV	7.25 ft	250.00 ml/min
4/28/2020 11:10 AM	06:37	6.23 pH	8.85 °C	0.12 mS/cm	0.19 mg/L	760.56 NTU	42.4 mV	7.36 ft	250.00 ml/min
4/28/2020 11:13 AM	09:37	6.20 pH	8.75 °C	0.12 mS/cm	0.15 mg/L	482.58 NTU	40.9 mV	7.36 ft	250.00 ml/min
4/28/2020 11:16 AM	12:37	6.13 pH	8.65 °C	0.12 mS/cm	0.13 mg/L	293.97 NTU	41.8 mV	7.36 ft	250.00 ml/min
4/28/2020 11:19 AM	15:37	6.11 pH	8.85 °C	0.12 mS/cm	0.13 mg/L	207.16 NTU	40.8 mV	7.36 ft	250.00 ml/min
4/28/2020 11:22 AM	18:37	6.15 pH	8.78 °C	0.12 mS/cm	0.11 mg/L	157.64 NTU	36.7 mV	7.36 ft	250.00 ml/min
4/28/2020 11:25 AM	21:37	6.13 pH	8.75 °C	0.12 mS/cm	0.11 mg/L	136.84 NTU	36.5 mV	7.36 ft	250.00 ml/min
4/28/2020 11:28 AM	24:37	6.11 pH	8.73 °C	0.12 mS/cm	0.11 mg/L	116.73 NTU	36.8 mV	7.36 ft	200.00 ml/min
4/28/2020 11:31 AM	27:37	6.10 pH	8.73 °C	0.12 mS/cm	0.11 mg/L	92.19 NTU	36.0 mV	7.36 ft	200.00 ml/min
4/28/2020 11:34 AM	30:37	6.09 pH	8.72 °C	0.12 mS/cm	0.11 mg/L	88.83 NTU	35.8 mV	7.36 ft	200.00 ml/min

4/28/2020 11:37 AM	33:37	6.08 pH	8.89 °C	0.12 mS/cm	0.10 mg/L	81.00 NTU	35.4 mV	7.36 ft	200.00 ml/min
4/28/2020 11:40 AM	36:37	6.11 pH	8.90 °C	0.12 mS/cm	0.10 mg/L	74.60 NTU	32.9 mV	7.36 ft	200.00 ml/min
4/28/2020 11:43 AM	39:37	6.11 pH	8.86 °C	0.12 mS/cm	0.10 mg/L	65.19 NTU	32.6 mV	7.36 ft	200.00 ml/min
4/28/2020 11:46 AM	42:37	6.11 pH	8.88 °C	0.12 mS/cm	0.09 mg/L	55.59 NTU	32.0 mV	7.36 ft	200.00 ml/min
4/28/2020 11:49 AM	45:37	6.10 pH	8.90 °C	0.12 mS/cm	0.09 mg/L	61.50 NTU	32.0 mV	7.36 ft	200.00 ml/min
4/28/2020 11:52 AM	48:37	6.12 pH	8.85 °C	0.12 mS/cm	0.09 mg/L	51.94 NTU	30.5 mV	7.36 ft	200.00 ml/min
4/28/2020 11:55 AM	51:37	6.11 pH	9.00 °C	0.12 mS/cm	0.09 mg/L	49.27 NTU	31.0 mV	7.36 ft	200.00 ml/min
4/28/2020 11:58 AM	54:37	6.14 pH	9.00 °C	0.12 mS/cm	0.09 mg/L	42.61 NTU	28.6 mV	7.36 ft	200.00 ml/min
4/28/2020 12:01 PM	57:37	6.14 pH	8.92 °C	0.12 mS/cm	0.09 mg/L	38.12 NTU	28.3 mV	7.36 ft	200.00 ml/min
4/28/2020 12:04 PM	01:00:59	6.12 pH	8.85 °C	0.12 mS/cm	0.09 mg/L	32.92 NTU	28.4 mV	7.36 ft	200.00 ml/min
4/28/2020 12:07 PM	01:03:59	6.12 pH	8.89 °C	0.12 mS/cm	0.09 mg/L	29.64 NTU	29.1 mV	7.36 ft	200.00 ml/min
4/28/2020 12:10 PM	01:06:59	6.14 pH	8.97 °C	0.12 mS/cm	0.09 mg/L	30.45 NTU	27.8 mV	7.36 ft	200.00 ml/min
4/28/2020 12:13 PM	01:09:59	6.18 pH	8.93 °C	0.12 mS/cm	0.08 mg/L	26.61 NTU	25.5 mV	7.36 ft	200.00 ml/min
4/28/2020 12:16 PM	01:12:59	6.17 pH	8.91 °C	0.12 mS/cm	0.08 mg/L	24.49 NTU	25.7 mV	7.36 ft	200.00 ml/min
4/28/2020 12:19 PM	01:15:59	6.19 pH	8.94 °C	0.12 mS/cm	0.08 mg/L	21.87 NTU	24.8 mV	7.36 ft	200.00 ml/min
4/28/2020 12:22 PM	01:18:59	6.18 pH	8.91 °C	0.12 mS/cm	0.08 mg/L	20.30 NTU	24.7 mV	7.36 ft	200.00 ml/min
4/28/2020 12:25 PM	01:21:59	6.18 pH	8.92 °C	0.12 mS/cm	0.08 mg/L	21.14 NTU	24.7 mV	7.36 ft	200.00 ml/min
4/28/2020 12:28 PM	01:24:59	6.18 pH	9.02 °C	0.12 mS/cm	0.08 mg/L	20.46 NTU	25.0 mV	7.36 ft	200.00 ml/min
4/28/2020 12:31 PM	01:27:59	6.22 pH	8.96 °C	0.12 mS/cm	0.08 mg/L	17.76 NTU	22.6 mV	7.36 ft	200.00 ml/min
4/28/2020 12:34 PM	01:30:59	6.23 pH	8.98 °C	0.12 mS/cm	0.08 mg/L	19.30 NTU	21.8 mV	7.36 ft	200.00 ml/min
4/28/2020 12:37 PM	01:33:59	6.22 pH	8.95 °C	0.12 mS/cm	0.08 mg/L	18.11 NTU	22.6 mV	7.36 ft	200.00 ml/min
4/28/2020 12:40 PM	01:36:59	6.22 pH	8.87 °C	0.12 mS/cm	0.08 mg/L	16.79 NTU	22.2 mV	7.36 ft	200.00 ml/min
4/28/2020 12:43 PM	01:39:59	6.21 pH	8.89 °C	0.12 mS/cm	0.07 mg/L	13.62 NTU	22.7 mV	7.36 ft	200.00 ml/min
4/28/2020 12:46 PM	01:42:59	6.21 pH	9.06 °C	0.12 mS/cm	0.08 mg/L	15.32 NTU	22.9 mV	7.36 ft	200.00 ml/min
4/28/2020 12:49 PM	01:45:59	6.25 pH	9.07 °C	0.12 mS/cm	0.07 mg/L	13.14 NTU	20.6 mV	7.36 ft	200.00 ml/min
4/28/2020 12:52 PM	01:48:59	6.24 pH	9.00 °C	0.12 mS/cm	0.07 mg/L	14.33 NTU	21.5 mV	7.36 ft	200.00 ml/min
4/28/2020 12:55 PM	01:51:59	6.25 pH	9.02 °C	0.12 mS/cm	0.07 mg/L	11.89 NTU	20.9 mV	7.36 ft	200.00 ml/min
4/28/2020 12:58 PM	01:54:59	6.23 pH	8.95 °C	0.12 mS/cm	0.07 mg/L	10.53 NTU	21.6 mV	7.36 ft	200.00 ml/min
4/28/2020 1:01 PM	01:57:59	6.23 pH	8.86 °C	0.12 mS/cm	0.07 mg/L	9.95 NTU	21.4 mV	7.36 ft	200.00 ml/min

Samples

Sample ID:	Description:
FBQmw-176-200401-GW	Initial purge started: 11:04 AM initial water level: 7.25 ft initial flow rate: 250 mL/min Initial CPM: 2 24:6 20psi Purge volume calculation: 1,488.28 mL Water description: turbid, orange, and has a sweet odor Initial purge complete: 11:10 AM (00:06:37) Purge started: 11:10 AM (00:06:37) Purge water level: 7.36 ft Purge CPM: 2 24:6 20psi Purge flow rate: 250 mL/min Water description: started turbid and orange with no odor; ended clear with an orange tint and no odor 11:28 AM (00:24:37) changed CPM to above to reduce draw-down 12:04 PM (01:00:59) lost connection with aquatroll, reconnected quickly, but slightly off of the three minute interval Samples taken: 1303 Type of samples taken: explosives Total volume purged: 22,830 mL

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/28/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/29/2020 8:11:11 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FBQmw-177 **Well Diameter: 2 in** **Initial Depth to Water: 10.11 ft**	**Pump Type: QED MP-10 Portable Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 19.8 ft** **Pump Intake From TOC: 19.8 ft** **Estimated Total Volume Pumped: 41,705.668 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 250 mL/min** **Final Draw Down: 0.65 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 4, 11:4, 20psi, 250 mL/min

Weather Conditions:
57°F cloudy and humid

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/29/2020 8:11 AM	00:00	6.90 pH	11.83 °C	0.38 mS/cm	3.87 mg/L	600.51 NTU	226.1 mV	10.11 ft	300.00 ml/min
4/29/2020 8:13 AM	02:27	6.91 pH	10.33 °C	0.35 mS/cm	1.43 mg/L	961.22 NTU	222.0 mV	10.76 ft	320.00 ml/min
4/29/2020 8:16 AM	04:59	6.93 pH	10.20 °C	0.35 mS/cm	2.96 mg/L	948.21 NTU	220.9 mV	10.76 ft	250.00 ml/min
4/29/2020 8:19 AM	07:59	6.97 pH	10.14 °C	0.33 mS/cm	4.12 mg/L	1,082.2 NTU	219.4 mV	10.76 ft	250.00 ml/min
4/29/2020 8:22 AM	10:59	6.96 pH	10.23 °C	0.33 mS/cm	4.41 mg/L	1,188.9 NTU	219.0 mV	10.76 ft	250.00 ml/min
4/29/2020 8:25 AM	13:59	6.98 pH	10.33 °C	0.33 mS/cm	4.65 mg/L	1,147.2 NTU	217.2 mV	10.76 ft	250.00 ml/min
4/29/2020 8:28 AM	16:59	6.98 pH	10.23 °C	0.33 mS/cm	4.81 mg/L	691.33 NTU	217.5 mV	10.76 ft	250.00 ml/min
4/29/2020 8:31 AM	19:59	6.96 pH	10.46 °C	0.33 mS/cm	4.85 mg/L	846.71 NTU	219.1 mV	10.76 ft	250.00 ml/min
4/29/2020 8:34 AM	22:59	6.99 pH	10.47 °C	0.33 mS/cm	4.88 mg/L	478.02 NTU	216.6 mV	10.76 ft	250.00 ml/min
4/29/2020 8:37 AM	25:59	6.98 pH	10.28 °C	0.32 mS/cm	4.91 mg/L	394.09 NTU	216.1 mV	10.76 ft	250.00 ml/min
4/29/2020 8:40 AM	28:59	6.95 pH	10.41 °C	0.33 mS/cm	4.95 mg/L	437.73 NTU	216.9 mV	10.76 ft	250.00 ml/min

4/29/2020 8:43 AM	31:59	6.98 pH	10.38 °C	0.33 mS/cm	4.97 mg/L	377.53 NTU	214.1 mV	10.76 ft	250.00 ml/min
4/29/2020 8:46 AM	34:59	6.97 pH	10.45 °C	0.33 mS/cm	4.97 mg/L	415.53 NTU	213.9 mV	10.76 ft	250.00 ml/min
4/29/2020 8:52 AM	40:59	6.99 pH	10.44 °C	0.34 mS/cm	5.02 mg/L	322.70 NTU	212.2 mV	10.76 ft	250.00 ml/min
4/29/2020 8:58 AM	46:59	6.97 pH	10.46 °C	0.34 mS/cm	5.24 mg/L	299.03 NTU	211.6 mV	10.76 ft	250.00 ml/min
4/29/2020 9:03 AM	52:29	6.98 pH	10.51 °C	0.34 mS/cm	5.36 mg/L	276.62 NTU	210.1 mV	10.76 ft	250.00 ml/min
4/29/2020 9:09 AM	58:29	6.99 pH	10.45 °C	0.35 mS/cm	5.54 mg/L	193.41 NTU	208.5 mV	10.76 ft	250.00 ml/min
4/29/2020 9:15 AM	01:04:29	7.01 pH	10.49 °C	0.35 mS/cm	5.78 mg/L	170.93 NTU	207.2 mV	10.76 ft	250.00 ml/min
4/29/2020 9:21 AM	01:10:29	6.99 pH	10.45 °C	0.35 mS/cm	5.93 mg/L	144.85 NTU	207.5 mV	10.76 ft	250.00 ml/min
4/29/2020 9:27 AM	01:16:29	7.02 pH	10.40 °C	0.35 mS/cm	6.05 mg/L	115.51 NTU	206.0 mV	10.76 ft	250.00 ml/min
4/29/2020 9:33 AM	01:22:29	7.03 pH	10.33 °C	0.35 mS/cm	6.22 mg/L	106.17 NTU	205.3 mV	10.76 ft	250.00 ml/min
4/29/2020 9:39 AM	01:28:29	6.99 pH	10.44 °C	0.35 mS/cm	6.35 mg/L	84.95 NTU	206.7 mV	10.76 ft	250.00 ml/min
4/29/2020 9:45 AM	01:34:29	7.02 pH	10.45 °C	0.35 mS/cm	6.49 mg/L	74.38 NTU	204.1 mV	10.76 ft	250.00 ml/min
4/29/2020 9:51 AM	01:40:29	7.03 pH	10.51 °C	0.35 mS/cm	6.56 mg/L	47.65 NTU	203.1 mV	10.76 ft	250.00 ml/min
4/29/2020 9:57 AM	01:46:29	7.02 pH	10.63 °C	0.35 mS/cm	6.63 mg/L	54.11 NTU	202.6 mV	10.76 ft	250.00 ml/min
4/29/2020 10:03 AM	01:52:29	7.03 pH	10.57 °C	0.35 mS/cm	6.67 mg/L	65.14 NTU	202.0 mV	10.76 ft	250.00 ml/min

4/29/2020 10:09 AM	01:58:29	7.05 pH	10.37 °C	0.35 mS/cm	6.88 mg/L	49.23 NTU	200.6 mV	10.76 ft	250.00 ml/min
4/29/2020 10:12 AM	02:01:29	7.03 pH	10.46 °C	0.35 mS/cm	6.89 mg/L	53.91 NTU	201.5 mV	10.76 ft	250.00 ml/min
4/29/2020 10:15 AM	02:04:29	7.06 pH	10.46 °C	0.35 mS/cm	6.95 mg/L	71.98 NTU	199.5 mV	10.76 ft	250.00 ml/min
4/29/2020 10:18 AM	02:07:29	7.05 pH	10.43 °C	0.35 mS/cm	6.93 mg/L	51.52 NTU	199.7 mV	10.76 ft	250.00 ml/min
4/29/2020 10:21 AM	02:10:29	7.02 pH	10.50 °C	0.35 mS/cm	7.04 mg/L	47.80 NTU	200.4 mV	10.76 ft	250.00 ml/min

Samples

Sample ID:	Description:
FBQmw-177-200401-GW	Initial purge started: 8:11 AM inital water level: 10.11 ft initial flow rate: 300 mL/min Inital CPM: 4 11:4 20psi Purge volume calculation: 1,427.33 mL Water description: brown and turbid with an earthy odor Initial purge complete: 8:16 AM (00:04:59) Initial purge took about double the expected time, the second reading (00:02:27) is not necessary. (00:02:27) adjust CPM 4 10:5, flow rate increased to 320 mL/min Purge started: 8:16 AM (00:04:59) Purge water level: 10.76 ft Purge CPM: 4 11:4 20psi Purge flow rate: 250 mL/min Water description: brown and turbid with an earthy odor Samples taken: 1023 Type of samples taken: explosives Total volume purged: 31,830 mL

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Sampled By: ,4/29/2020

QA Check By: ,5/7/2020

RVAAP-43 LOAD LINE 10

Low-Flow Test Report:

Test Date / Time: 4/28/2020 12:24:00 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: LL10mw-003 **Well Diameter: 2 in** **Initial Depth to Water: 17.65 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 26 ft** **Pump Intake From TOC: 26.9 ft** **Estimated Total Volume Pumped: 2,985 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 150 mL/min** **Final Draw Down: 1 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM 2, 25:5, 20 psi, 150 mL/min

Weather Conditions:
52°F, cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/28/2020 12:24 PM	00:00	6.94 pH	17.32 °C	0.52 mS/cm	7.98 mg/L	0.28 NTU	211.5 mV	16.65 ft	150.00 ml/min
4/28/2020 12:34 PM	10:33	6.68 pH	10.72 °C	0.51 mS/cm	5.36 mg/L	0.00 NTU	223.6 mV	16.65 ft	150.00 ml/min
4/28/2020 12:34 PM	10:54	6.68 pH	11.03 °C	0.51 mS/cm	5.33 mg/L	0.00 NTU	223.1 mV	16.65 ft	150.00 ml/min
4/28/2020 12:37 PM	13:54	6.68 pH	10.87 °C	0.51 mS/cm	5.33 mg/L	0.00 NTU	223.0 mV	16.65 ft	150.00 ml/min
4/28/2020 12:40 PM	16:54	6.69 pH	10.73 °C	0.51 mS/cm	5.30 mg/L	0.00 NTU	221.1 mV	16.65 ft	150.00 ml/min
4/28/2020 12:43 PM	19:54	6.71 pH	10.59 °C	0.51 mS/cm	5.31 mg/L	0.00 NTU	219.4 mV	16.65 ft	150.00 ml/min

Samples

Sample ID:	Description:
LL10mw-003-200401-GW	12:23 PM - Start pre-purge at LL10mw-003, CPM 2 5>25, PSI = 20. 12:32 PM (00:10:33) - Pre-purge complete, 00:10:54 switch to three minute intervals. 12:44 PM (00:19:54) - LL10mw-003 stable, collect LL10mw-003-200401-GW for VOCs (carbon tetrachloride). Water is clear, colorless, and odorless. Total purge volume = 3,100 mL.

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Sampled By: ,4/28/2020

QA Check By: ,5/7/2020

RVAAP-66 FACILITY-WIDE GROUNDWATER

Low-Flow Test Report:

Test Date / Time: 4/23/2020 11:59:04 AM
Project: FWGWMP-April 2020 Event
Operator Name: Danielle Anderson

Location Name: FWGmw-004 **Well Diameter: 2 in** **Initial Depth to Water: 11.07 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 20.5 ft** **Pump Intake From TOC: 20.5 ft** **Estimated Total Volume Pumped: 2,538.333 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 150 mL/min** **Final Draw Down: 0.32 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2, 28:2, 21psi, 150 mL/min

Weather Conditions:
54° partly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/23/2020 11:59 AM	00:00	6.73 pH	12.46 °C	0.67 mS/cm	7.26 mg/L	10.76 NTU	231.7 mV	11.03 ft	225.00 ml/min
4/23/2020 12:00 PM	00:57	6.98 pH	11.25 °C	0.71 mS/cm	5.32 mg/L	1.36 NTU	224.9 mV	11.07 ft	225.00 ml/min
4/23/2020 12:06 PM	07:23	7.07 pH	10.58 °C	0.72 mS/cm	1.16 mg/L	5.52 NTU	219.6 mV	11.35 ft	150.00 ml/min
4/23/2020 12:09 PM	10:23	7.05 pH	10.46 °C	0.73 mS/cm	0.75 mg/L	3.85 NTU	218.4 mV	11.35 ft	150.00 ml/min
4/23/2020 12:12 PM	13:23	7.03 pH	10.59 °C	0.74 mS/cm	0.56 mg/L	2.75 NTU	218.1 mV	11.35 ft	150.00 ml/min
4/23/2020 12:15 PM	16:23	7.05 pH	10.64 °C	0.75 mS/cm	0.49 mg/L	1.32 NTU	215.4 mV	11.35 ft	150.00 ml/min
4/23/2020 12:18 PM	19:23	7.05 pH	10.57 °C	0.75 mS/cm	0.39 mg/L	0.74 NTU	214.5 mV	11.35 ft	150.00 ml/min
4/23/2020 12:21 PM	22:23	7.04 pH	10.57 °C	0.75 mS/cm	0.35 mg/L	0.39 NTU	213.9 mV	11.35 ft	150.00 ml/min
4/23/2020 12:24 PM	25:23	7.04 pH	10.55 °C	0.75 mS/cm	0.33 mg/L	0.06 NTU	213.0 mV	11.35 ft	150.00 ml/min

Samples

Sample ID:	Description:
FWGmw-004-200401-GW	Initial purge started: 11:59 AM initial water level: 11.03 ft initial flow rate: 225 mL/min Initial CPM: 2 27:3 20psi Purge volume calculation: 1,652.65 mL Water description: clear, colorless, odorless Initial purge complete: 12:06 PM (00:07:23) Purge started: 12:06 PM (00:07:23) Purge water level: 11.35 ft Purge CPM: 2 28:2 21psi Purge flow rate: 150 mL/min Water description: clear, colorless, odorless Samples taken: 1226 Type of samples taken: explosives and TAL metals Total volume purged: 4,930 mL

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Sampled By: ,4/23/2020

QA Check By: ,5/7/2020

Low-Flow Test Report:

Test Date / Time: 4/29/2020 8:33:37 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: FWGmw-007 **Well Diameter: 2 in** **Initial Depth to Water: 23.38 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.25 in** **Tubing Length: 29 ft** **Pump Intake From TOC: 29.9 ft** **Estimated Total Volume Pumped: 18,644 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 110 mL/min** **Final Draw Down: 0.46 ft**	**Instruments Used:** **Aqua TROLL 600 - 611846** **Air Compressor - 25369** **Controller (MP10) - 1143** **Water Level Meter - 25369**

Test Notes:
CPM 3, 17.5:2.5, 21 psi, 110 mL/min

Weather Conditions:
57°F mostly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/29/2020 8:33 AM	00:00	7.05 pH	11.58 °C	0.99 mS/cm	6.54 mg/L	3.11 NTU	258.1 mV	23.38 ft	220.00 ml/min
4/29/2020 8:40 AM	06:40	7.10 pH	11.39 °C	0.99 mS/cm	1.18 mg/L	10.73 NTU	243.2 mV	23.81 ft	135.00 ml/min
4/29/2020 8:43 AM	09:40	7.13 pH	11.45 °C	0.98 mS/cm	1.20 mg/L	10.20 NTU	235.7 mV	23.82 ft	135.00 ml/min
4/29/2020 8:46 AM	12:40	7.13 pH	11.42 °C	0.98 mS/cm	1.28 mg/L	16.80 NTU	228.2 mV	23.82 ft	135.00 ml/min
4/29/2020 8:49 AM	15:40	7.12 pH	11.48 °C	0.98 mS/cm	1.30 mg/L	22.53 NTU	220.2 mV	23.84 ft	135.00 ml/min
4/29/2020 8:52 AM	18:40	7.12 pH	11.49 °C	0.99 mS/cm	1.32 mg/L	45.24 NTU	212.7 mV	23.81 ft	125.00 ml/min
4/29/2020 8:55 AM	21:40	7.12 pH	11.61 °C	0.99 mS/cm	1.33 mg/L	44.78 NTU	206.0 mV	23.81 ft	125.00 ml/min
4/29/2020 8:58 AM	24:40	7.12 pH	11.80 °C	0.00 mS/cm	2.28 mg/L	15.66 NTU	198.0 mV	23.81 ft	125.00 ml/min
4/29/2020 9:01 AM	27:40	6.81 pH	14.77 °C	0.00 mS/cm	9.90 mg/L	84.81 NTU	220.7 mV	23.81 ft	125.00 ml/min
4/29/2020 9:04 AM	30:40	6.80 pH	13.17 °C	0.68 mS/cm	8.43 mg/L	33.28 NTU	255.1 mV	23.81 ft	125.00 ml/min
4/29/2020 9:07 AM	33:40	7.10 pH	11.77 °C	0.96 mS/cm	1.43 mg/L	30.90 NTU	224.9 mV	23.82 ft	125.00 ml/min
4/29/2020 9:10 AM	36:40	7.12 pH	11.75 °C	0.97 mS/cm	1.23 mg/L	39.74 NTU	211.7 mV	23.82 ft	125.00 ml/min

4/29/2020 9:10 AM	36:46	7.11 pH	11.64 °C	0.96 mS/cm	1.23 mg/L	44.98 NTU	211.4 mV	23.84 ft	125.00 ml/min
4/29/2020 9:15 AM	41:46	7.13 pH	11.61 °C	0.96 mS/cm	1.11 mg/L	26.37 NTU	192.3 mV	23.84 ft	125.00 ml/min
4/29/2020 9:20 AM	46:46	7.13 pH	11.54 °C	0.93 mS/cm	0.99 mg/L	26.09 NTU	174.8 mV	23.85 ft	125.00 ml/min
4/29/2020 9:25 AM	51:46	7.11 pH	11.69 °C	0.93 mS/cm	0.91 mg/L	24.28 NTU	160.7 mV	23.85 ft	110.00 ml/min
4/29/2020 9:30 AM	56:46	7.13 pH	11.66 °C	0.92 mS/cm	0.84 mg/L	14.81 NTU	147.4 mV	23.85 ft	110.00 ml/min
4/29/2020 9:35 AM	01:01:46	7.13 pH	11.67 °C	0.91 mS/cm	0.81 mg/L	16.83 NTU	136.4 mV	23.84 ft	110.00 ml/min
4/29/2020 9:40 AM	01:06:46	7.13 pH	11.75 °C	0.94 mS/cm	0.75 mg/L	24.55 NTU	127.6 mV	23.84 ft	110.00 ml/min
4/29/2020 9:45 AM	01:11:46	7.13 pH	11.64 °C	0.92 mS/cm	0.67 mg/L	11.40 NTU	120.8 mV	23.84 ft	110.00 ml/min
4/29/2020 9:50 AM	01:16:46	7.13 pH	11.61 °C	0.92 mS/cm	0.62 mg/L	18.22 NTU	115.2 mV	23.84 ft	110.00 ml/min
4/29/2020 9:53 AM	01:19:52	7.13 pH	11.65 °C	0.92 mS/cm	0.61 mg/L	14.51 NTU	111.0 mV	23.84 ft	110.00 ml/min
4/29/2020 9:56 AM	01:22:52	7.12 pH	11.74 °C	0.91 mS/cm	0.58 mg/L	13.50 NTU	107.7 mV	23.84 ft	110.00 ml/min
4/29/2020 9:59 AM	01:25:52	7.13 pH	11.76 °C	0.91 mS/cm	0.54 mg/L	8.01 NTU	104.1 mV	23.84 ft	110.00 ml/min

Samples

Sample ID:	Description:
FWGmw-007-200401-GW	Begin purge @ 8:33 AM Stagnant water volume - 1,367 mL CPM 3, 17.5:2.5 Stagnant water volume removed @ 8:40 AM (00:06:40) Lower PSI to 23 @ 8:49 AM (00:15:40) to reduce draw-down Empty and clean out flow cell to lower turbidity @ 8:58 AM (00:24:40) Flow cell empty @ 9:01 AM & 9:04 AM (00:27:40 - 00:30:40) Change to 5 minute readings @ 9:10 AM (00:36:40) Lower PSI to 21 @ 9:25 AM (00:51:46) to reduce draw-down Switch to 3 minute readings @ 9:53 AM (01:19:52) Parameters stable @ 9:59 AM (01:25:52) Water is slightly cloudy, colorless, odorless until end of purge. Water sampled is clear, colorless, odorless. Collect sample FWGmw-007-200401-GW for explosives and TAL metals @ 1000 on 04/29/20. Total volume removed - 9,525 mL

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Sampled By: ,4/29/2020

QA Check By: ,5/8/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 8:18:34 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: FWGmw-011 **Well Diameter: 2 in** **Initial Depth to Water: 2.5 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 28 ft** **Pump Intake From TOC: 14 ft** **Estimated Total Volume Pumped: 38,635 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 300 mL/min** **Final Draw Down: 0.2 ft**	**Instruments Used:** **Aqua TROLL 600 - 532289** **Air Compressor - 18421** **Controller (MP10) - 1143** **Water Level Meter - 280318**

Test Notes:
CPM 2 26:4, 20 PSI, 300 mL/min

Weather Conditions:
66°F, party cloudy with sun.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 10:18 AM	00:00	7.13 pH	15.06 °C	0.31 mS/cm	6.68 mg/L	274.89 NTU	89.5 mV	2.50 ft	300.00 ml/min
6/11/2020 10:25 AM	06:28	7.07 pH	11.41 °C	0.33 mS/cm	0.40 mg/L	1,125.5 NTU	-30.4 mV	2.60 ft	300.00 ml/min
6/11/2020 10:25 AM	06:49	7.05 pH	11.53 °C	0.33 mS/cm	0.38 mg/L	1,040.5 NTU	-30.3 mV	2.60 ft	300.00 ml/min
6/11/2020 10:28 AM	09:49	6.87 pH	11.37 °C	0.33 mS/cm	0.26 mg/L	579.82 NTU	-30.5 mV	2.60 ft	300.00 ml/min
6/11/2020 10:31 AM	12:49	6.73 pH	11.35 °C	0.33 mS/cm	0.20 mg/L	402.20 NTU	-27.8 mV	2.60 ft	300.00 ml/min
6/11/2020 10:34 AM	15:49	6.67 pH	11.29 °C	0.33 mS/cm	0.16 mg/L	329.95 NTU	-30.8 mV	2.60 ft	300.00 ml/min
6/11/2020 10:37 AM	18:49	6.64 pH	11.14 °C	0.33 mS/cm	0.14 mg/L	254.96 NTU	-33.4 mV	2.60 ft	300.00 ml/min
6/11/2020 10:40 AM	21:49	6.69 pH	11.26 °C	0.33 mS/cm	0.13 mg/L	213.51 NTU	-39.6 mV	2.60 ft	300.00 ml/min
6/11/2020 10:43 AM	24:49	6.63 pH	11.17 °C	0.33 mS/cm	0.11 mg/L	164.75 NTU	-37.8 mV	2.60 ft	300.00 ml/min
6/11/2020 10:46 AM	27:49	6.65 pH	11.23 °C	0.33 mS/cm	0.10 mg/L	126.87 NTU	-41.6 mV	2.60 ft	300.00 ml/min
6/11/2020 10:49 AM	30:49	6.71 pH	11.23 °C	0.33 mS/cm	0.10 mg/L	123.36 NTU	-46.4 mV	2.60 ft	300.00 ml/min
6/11/2020 10:52 AM	33:49	6.76 pH	11.24 °C	0.33 mS/cm	0.09 mg/L	119.98 NTU	-51.3 mV	2.60 ft	300.00 ml/min

6/11/2020 10:55 AM	36:49	6.80 pH	11.35 °C	0.33 mS/cm	0.09 mg/L	105.53 NTU	-53.3 mV	2.60 ft	300.00 ml/min
6/11/2020 10:58 AM	39:49	6.78 pH	11.36 °C	0.33 mS/cm	0.09 mg/L	100.31 NTU	-55.0 mV	2.60 ft	300.00 ml/min
6/11/2020 11:01 AM	42:49	6.79 pH	11.33 °C	0.33 mS/cm	0.08 mg/L	82.62 NTU	-56.6 mV	2.60 ft	300.00 ml/min
6/11/2020 11:04 AM	45:49	6.80 pH	11.23 °C	0.33 mS/cm	0.08 mg/L	68.50 NTU	-58.1 mV	2.60 ft	300.00 ml/min
6/11/2020 11:07 AM	48:49	6.89 pH	11.26 °C	0.33 mS/cm	0.07 mg/L	60.99 NTU	-64.0 mV	2.60 ft	300.00 ml/min
6/11/2020 11:10 AM	51:49	6.80 pH	11.18 °C	0.33 mS/cm	0.07 mg/L	54.18 NTU	-59.4 mV	2.70 ft	300.00 ml/min
6/11/2020 11:13 AM	54:49	6.81 pH	11.22 °C	0.34 mS/cm	0.07 mg/L	40.48 NTU	-60.2 mV	2.70 ft	300.00 ml/min
6/11/2020 11:16 AM	57:49	6.81 pH	11.14 °C	0.34 mS/cm	0.07 mg/L	50.70 NTU	-61.4 mV	2.70 ft	300.00 ml/min
6/11/2020 11:19 AM	01:00:49	6.82 pH	11.12 °C	0.34 mS/cm	0.07 mg/L	27.15 NTU	-62.8 mV	2.70 ft	300.00 ml/min
6/11/2020 11:22 AM	01:03:49	6.89 pH	11.41 °C	0.34 mS/cm	0.07 mg/L	33.52 NTU	-67.2 mV	2.70 ft	300.00 ml/min
6/11/2020 11:25 AM	01:06:49	6.81 pH	11.40 °C	0.34 mS/cm	0.07 mg/L	25.41 NTU	-62.9 mV	2.70 ft	300.00 ml/min
6/11/2020 11:28 AM	01:09:49	6.79 pH	11.12 °C	0.34 mS/cm	0.07 mg/L	31.26 NTU	-62.1 mV	2.70 ft	300.00 ml/min
6/11/2020 11:31 AM	01:12:49	6.79 pH	11.22 °C	0.34 mS/cm	0.07 mg/L	33.21 NTU	-62.1 mV	2.70 ft	300.00 ml/min
6/11/2020 11:34 AM	01:15:49	6.78 pH	11.52 °C	0.34 mS/cm	0.06 mg/L	29.06 NTU	-62.2 mV	2.70 ft	300.00 ml/min
6/11/2020 11:37 AM	01:18:49	6.77 pH	11.54 °C	0.34 mS/cm	0.07 mg/L	21.41 NTU	-62.5 mV	2.70 ft	300.00 ml/min
6/11/2020 11:40 AM	01:21:49	6.77 pH	11.39 °C	0.34 mS/cm	0.07 mg/L	22.32 NTU	-62.6 mV	2.70 ft	300.00 ml/min
6/11/2020 11:43 AM	01:24:49	6.77 pH	11.23 °C	0.34 mS/cm	0.06 mg/L	12.77 NTU	-62.6 mV	2.70 ft	300.00 ml/min
6/11/2020 11:46 AM	01:27:49	6.77 pH	11.22 °C	0.34 mS/cm	0.06 mg/L	19.38 NTU	-63.1 mV	2.70 ft	300.00 ml/min
6/11/2020 11:49 AM	01:30:49	6.84 pH	11.57 °C	0.34 mS/cm	0.07 mg/L	21.63 NTU	-67.6 mV	2.70 ft	300.00 ml/min
6/11/2020 11:52 AM	01:33:49	6.76 pH	11.53 °C	0.34 mS/cm	0.06 mg/L	35.95 NTU	-63.7 mV	2.70 ft	300.00 ml/min
6/11/2020 11:54 AM	01:35:47	6.75 pH	11.37 °C	0.34 mS/cm	1.45 mg/L	128.17 NTU	-50.8 mV	2.70 ft	300.00 ml/min
6/11/2020 11:57 AM	01:38:47	6.75 pH	11.38 °C	0.34 mS/cm	0.07 mg/L	105.26 NTU	-62.3 mV	2.70 ft	300.00 ml/min
6/11/2020 12:00 PM	01:41:47	6.75 pH	11.09 °C	0.34 mS/cm	0.06 mg/L	147.90 NTU	-63.8 mV	2.70 ft	300.00 ml/min
6/11/2020 12:03 PM	01:44:47	6.75 pH	11.53 °C	0.34 mS/cm	0.06 mg/L	111.72 NTU	-63.6 mV	2.70 ft	300.00 ml/min
6/11/2020 12:06 PM	01:47:47	6.75 pH	11.33 °C	0.34 mS/cm	0.06 mg/L	78.62 NTU	-64.4 mV	2.70 ft	300.00 ml/min
6/11/2020 12:09 PM	01:50:47	6.76 pH	11.21 °C	0.34 mS/cm	0.06 mg/L	72.59 NTU	-65.2 mV	2.70 ft	300.00 ml/min
6/11/2020 12:12 PM	01:53:47	6.76 pH	11.08 °C	0.34 mS/cm	0.06 mg/L	57.13 NTU	-65.8 mV	2.70 ft	300.00 ml/min
6/11/2020 12:15 PM	01:56:47	6.83 pH	11.36 °C	0.34 mS/cm	0.06 mg/L	51.11 NTU	-70.3 mV	2.70 ft	300.00 ml/min
6/11/2020 12:18 PM	01:59:47	6.76 pH	11.37 °C	0.34 mS/cm	0.06 mg/L	38.88 NTU	-65.9 mV	2.70 ft	300.00 ml/min

6/11/2020 12:21 PM	02:02:47	6.76 pH	11.46 °C	0.34 mS/cm	0.06 mg/L	45.75 NTU	-66.4 mV	2.70 ft	300.00 ml/min
6/11/2020 12:24 PM	02:05:47	6.76 pH	11.31 °C	0.34 mS/cm	0.06 mg/L	44.96 NTU	-66.7 mV	2.70 ft	300.00 ml/min
6/11/2020 12:27 PM	02:08:47	6.76 pH	11.09 °C	0.34 mS/cm	0.06 mg/L	35.12 NTU	-66.9 mV	2.70 ft	300.00 ml/min

Samples

Sample ID:	Description:
FWGmw-011-200401-GW	10:18 AM - Start pre-purge at FWGmw-011, CPM 2 4>26, PSI 20. 10:25 AM (00:06:28) - Pre-purge complete, 00:06:49 switch to 3 minute intervals. 11:54 AM (01:35:47) - Tubing popped off flow cell. 12:27 PM (02:08:47) - Purged for 2 hours, all parameters stable except turbidity. Turbidity <50NTU. Collect FWGmw-011-200401-GW for explosives and TAL metals. Filtered sample not required. 1240 - Sample collection complete. Total purge = 41,350 mL

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Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 7:12:56 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: FWGmw-012 **Well Diameter: 2 in** **Initial Depth to Water: 1.05 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 74 ft** **Pump Intake From TOC: 37 ft** **Estimated Total Volume Pumped: 6,626.667 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 400 mL/min** **Final Draw Down: 0.65 ft**	**Instruments Used:** **Aqua TROLL 600 - 532289** **Air Compressor - 18421** **Controller (MP10) - 1143** **Water Level Meter - 280318**

Test Notes:
CPM 2 9>21, PSI = 25

Weather Conditions:
66°F, cloudy, cool.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 9:12 AM	00:00	5.85 pH	12.54 °C	0.20 mS/cm	2.39 mg/L	18.02 NTU	181.7 mV	1.05 ft	400.00 ml/min
6/11/2020 9:20 AM	07:21	5.55 pH	11.49 °C	0.20 mS/cm	0.11 mg/L	79.07 NTU	162.2 mV	1.70 ft	400.00 ml/min
6/11/2020 9:20 AM	07:34	5.57 pH	11.66 °C	0.20 mS/cm	0.10 mg/L	61.00 NTU	161.8 mV	1.70 ft	400.00 ml/min
6/11/2020 9:23 AM	10:34	5.50 pH	11.54 °C	0.20 mS/cm	0.07 mg/L	21.64 NTU	162.6 mV	1.70 ft	400.00 ml/min
6/11/2020 9:26 AM	13:34	5.48 pH	11.46 °C	0.20 mS/cm	0.06 mg/L	8.38 NTU	161.1 mV	1.70 ft	400.00 ml/min
6/11/2020 9:29 AM	16:34	5.48 pH	11.15 °C	0.20 mS/cm	0.06 mg/L	7.03 NTU	159.4 mV	1.70 ft	400.00 ml/min

Samples

Sample ID:	Description:
FWGmw-012-200401-GW	9:12 AM - Start pre-purge at FWGmw-012, CPM 2 9>21, PSI = 25. Water started orange, very cloudy, with no odor. 9:20 AM (00:07:21) - End pre-purge, switch to 3 minute recording intervals at 00:07:34. 9:29 AM (00:16:34) - FWGmw-012 stabilized, collect sample FWGmw-012-200401-GW for explosives and TAL metals. Water cleared up during purge. 0940 - sample collection complete. Total purge volume = 7,000 mL

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Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 4/21/2020 2:17:16 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FWGmw-015 **Well Diameter: 2 in** **Initial Depth to Water: 4.17 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 37 ft** **Pump Intake From TOC: 18.5 ft** **Estimated Total Volume Pumped: 2,601.25 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 75 mL/min** **Final Draw Down: 1.4 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM: 2 27:3, 20 psi, 125 mL/min

Weather Conditions:
39°F cloudy, windy and snowy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/21/2020 2:17 PM	00:00	7.31 pH	9.42 °C	2.28 mS/cm	6.09 mg/L	0.99 NTU	171.3 mV	4.17 ft	125.0 ml/min
4/21/2020 2:39 PM	22:41	6.96 pH	8.53 °C	2.48 mS/cm	1.95 mg/L	0.00 NTU	181.4 mV	5.59 ft	50.00 ml/min
4/21/2020 2:42 PM	25:41	6.96 pH	8.80 °C	2.48 mS/cm	2.01 mg/L	0.00 NTU	181.1 mV	5.59 ft	50.00 ml/min
4/21/2020 2:45 PM	28:41	6.96 pH	8.74 °C	2.48 mS/cm	2.02 mg/L	0.00 NTU	181.1 mV	5.59 ft	50.00 ml/min
4/21/2020 2:48 PM	31:41	6.96 pH	8.62 °C	2.49 mS/cm	1.97 mg/L	0.00 NTU	180.6 mV	5.59 ft	50.00 ml/min
4/21/2020 2:51 PM	34:41	6.96 pH	8.52 °C	2.49 mS/cm	1.92 mg/L	0.00 NTU	180.7 mV	5.59 ft	50.00 ml/min

Samples

Sample ID:	Description:
FWGmw-015-200401-GW	Initial purge started: 2:18 PM initial water level: 4.19 ft initial flow rate: 125 mL/min Initial CPM: 2 27:3 Purge volume calculation: 1,888.69 mL Water description: clear, colorless, odorless Initial purge complete: 2:39 PM (00:22:41) Purge started: 2:39 PM (00:22:41) Purge water level: 5.59 ft Purge CPM: 2 28:2 Purge flow rate: 50 mL/min Water description: clear colorless, odorless Samples taken: 1453 Type of samples taken: explosives and TAL metals Total volume purged: 4,180 mL

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Sampled By: ,4/21/2020

QA Check By: ,5/4/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 12:51:35 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FWGmw-016 **Well Diameter: 2 in** **Initial Depth to Water: 15.7 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 115 ft** **Pump Intake From TOC: 59.5 ft** **Estimated Total Volume Pumped: 4,464.583 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 125 mL/min** **Final Draw Down: 0.04 ft**	**Instruments Used:** **Aqua TROLL 600 - 513586** **Air Compressor - 22487** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 2 27:3 40 psi, 125 mL/min

Weather Conditions:
45°F mostly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 12:51 PM	00:00	7.61 pH	12.80 °C	0.65 mS/cm	9.28 mg/L	0.22 NTU	94.2 mV	15.74 ft	125.00 ml/min
4/22/2020 1:15 PM	23:43	7.14 pH	11.42 °C	0.72 mS/cm	0.49 mg/L	0.00 NTU	-36.5 mV	15.78 ft	150.00 ml/min
4/22/2020 1:18 PM	26:43	7.15 pH	11.43 °C	0.72 mS/cm	0.45 mg/L	0.00 NTU	-37.7 mV	15.78 ft	150.00 ml/min
4/22/2020 1:21 PM	29:43	7.15 pH	11.29 °C	0.72 mS/cm	0.46 mg/L	0.00 NTU	-39.5 mV	15.78 ft	150.00 ml/min
4/22/2020 1:24 PM	32:43	7.14 pH	11.23 °C	0.72 mS/cm	0.41 mg/L	0.00 NTU	-39.9 mV	15.78 ft	150.00 ml/min
4/22/2020 1:27 PM	35:43	7.13 pH	11.31 °C	0.72 mS/cm	0.39 mg/L	0.00 NTU	-39.9 mV	15.78 ft	150.00 ml/min

Samples

Sample ID:	Description:
FWGmw-016-200401-GW	initial purge started: 12:52 PM initial water level: 15.74 ft initial flow rate: 125 mL/min Initial CPM: 2 27:3 40psi Purge volume calculation: 3,134.06 mL Water description: clear, colorless, odorless Initial purge complete: 1:15 PM (00:23:43) Purge started: 1:15 PM (00:23:43) Purge water level: 15.78 ft Purge CPM: 2 27:3 40psi Purge flow rate: 150 mL/min Water description: clear, colorless, odorless Samples taken: 1328 Type of samples taken: explosives and TAL metals Total volume purged: 6,655 mL

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Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 8:14:16 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: FWGmw-018 **Well Diameter: 2 in** **Initial Depth to Water: 20.1 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 141 ft** **Pump Intake From TOC: 141 ft** **Estimated Total Volume Pumped: 25,215.834 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 375 mL/min** **Final Draw Down: 1.1 ft**	**Instruments Used:** **Aqua TROLL 600 - 695538** **Air Compressor - 25369** **Controller (MP10) - Leidos Owned** **Water Level Meter - 41832**

Test Notes:
CPM 4, 3:12, 80 PSI, 375 mL/min

Weather Conditions:
66°F; Partly cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 10:14 AM	00:00	7.54 pH	16.92 °C	0.50 mS/cm	5.26 mg/L	1.78 NTU	213.0 mV	20.10 ft	500.00 ml/min
6/11/2020 10:23 AM	08:52	7.02 pH	11.72 °C	0.61 mS/cm	0.28 mg/L	100.98 NTU	-16.2 mV	21.10 ft	450.00 ml/min
6/11/2020 10:28 AM	14:33	6.96 pH	11.59 °C	0.62 mS/cm	0.16 mg/L	42.83 NTU	-18.1 mV	21.14 ft	450.00 ml/min
6/11/2020 10:31 AM	17:33	6.95 pH	11.72 °C	0.62 mS/cm	0.46 mg/L	56.54 NTU	-8.2 mV	21.16 ft	450.00 ml/min
6/11/2020 10:34 AM	20:33	6.95 pH	11.83 °C	0.62 mS/cm	0.42 mg/L	99.17 NTU	-0.7 mV	21.20 ft	450.00 ml/min
6/11/2020 10:37 AM	23:33	6.95 pH	12.49 °C	0.63 mS/cm	0.70 mg/L	9.62 NTU	4.9 mV	21.20 ft	450.00 ml/min
6/11/2020 10:40 AM	26:33	6.97 pH	11.65 °C	0.63 mS/cm	0.18 mg/L	10.39 NTU	4.4 mV	21.20 ft	425.00 ml/min
6/11/2020 10:43 AM	29:33	7.00 pH	11.66 °C	0.63 mS/cm	0.13 mg/L	9.00 NTU	3.3 mV	21.20 ft	425.00 ml/min
6/11/2020 10:46 AM	32:33	7.04 pH	11.57 °C	0.63 mS/cm	0.11 mg/L	11.16 NTU	1.9 mV	21.20 ft	425.00 ml/min
6/11/2020 10:49 AM	35:33	7.06 pH	11.62 °C	0.63 mS/cm	0.11 mg/L	11.98 NTU	2.4 mV	21.20 ft	375.00 ml/min
6/11/2020 10:52 AM	38:33	7.06 pH	11.63 °C	0.63 mS/cm	0.10 mg/L	14.58 NTU	3.4 mV	21.20 ft	375.00 ml/min
6/11/2020 10:55 AM	41:33	7.06 pH	11.63 °C	0.63 mS/cm	0.18 mg/L	14.53 NTU	5.0 mV	21.20 ft	375.00 ml/min

6/11/2020 10:58 AM	44:33	7.08 pH	11.62 °C	0.63 mS/cm	0.11 mg/L	15.63 NTU	6.2 mV	21.20 ft	375.00 ml/min
6/11/2020 11:01 AM	47:33	7.06 pH	11.63 °C	0.63 mS/cm	0.10 mg/L	15.98 NTU	5.8 mV	21.20 ft	375.00 ml/min
6/11/2020 11:04 AM	50:33	7.06 pH	11.65 °C	0.63 mS/cm	0.78 mg/L	1.06 NTU	19.2 mV	21.20 ft	375.00 ml/min
6/11/2020 11:07 AM	53:33	7.10 pH	11.63 °C	0.63 mS/cm	0.13 mg/L	0.91 NTU	10.6 mV	21.20 ft	375.00 ml/min
6/11/2020 11:10 AM	56:33	7.06 pH	11.61 °C	0.63 mS/cm	0.10 mg/L	1.01 NTU	10.6 mV	21.20 ft	375.00 ml/min
6/11/2020 11:13 AM	59:33	7.08 pH	11.62 °C	0.63 mS/cm	0.10 mg/L	0.93 NTU	10.2 mV	21.20 ft	375.00 ml/min

Samples

Sample ID:	Description:
FWGMW-018-200401-GW	Begin purge @ 10:14 AM PSI 80 CPM 4/4/11 Stagnant water purge volume - 1,335 mL Stagnant water removed @10:23 AM (00:08:52) Water is clear, colorless, odorless throughout purge Empty flow cell @ 11:04 AM (00:50:33) to reduce turbidity Final CPM 4/3/12 Stable @ 11:13 AM (00:59:33) Sample for VOCs and Metals @ 1115 on 06/11/20

Created using VuSitu from In-Situ, Inc.

Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 8:15:39 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Danielle Anderson

Location Name: FWGmw-020 **Well Diameter: 2 in** **Initial Depth to Water: 21.01 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 40 ft** **Pump Intake From TOC: 40 ft** **Estimated Total Volume Pumped: 8,992.083 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 150 mL/min** **Final Draw Down: 0.35 ft**	**Instruments Used:** **Aqua TROLL 600 - 606751** **Air Compressor - 25369** **Controller (MP10) - 1723** **Water Level Meter - 39350**

Test Notes:
CPM 2, 25:5, 21 PSI, 150 mL/min

Weather Conditions:
67°F mostly cloudy

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 10:15 AM	00:00	7.21 pH	15.68 °C	0.70 mS/cm	5.98 mg/L	138.11 NTU	179.3 mV	21.01 ft	175.00 ml/min
6/11/2020 10:25 AM	09:23	7.10 pH	12.77 °C	0.61 mS/cm	9.53 mg/L	238.52 NTU	44.6 mV	21.01 ft	150.00 ml/min
6/11/2020 10:28 AM	12:23	7.06 pH	12.88 °C	0.65 mS/cm	9.78 mg/L	103.12 NTU	39.2 mV	21.01 ft	150.00 ml/min
6/11/2020 10:31 AM	15:23	7.11 pH	12.95 °C	0.74 mS/cm	10.13 mg/L	207.96 NTU	32.9 mV	21.36 ft	150.00 ml/min
6/11/2020 10:34 AM	18:23	7.20 pH	14.57 °C	0.57 mS/cm	9.84 mg/L	183.38 NTU	29.1 mV	21.36 ft	150.00 ml/min
6/11/2020 10:37 AM	21:23	7.18 pH	13.32 °C	0.71 mS/cm	9.50 mg/L	351.24 NTU	26.3 mV	21.36 ft	150.00 ml/min
6/11/2020 10:40 AM	24:23	7.20 pH	12.71 °C	0.56 mS/cm	9.42 mg/L	50.14 NTU	24.0 mV	21.36 ft	150.00 ml/min
6/11/2020 10:43 AM	27:23	7.19 pH	12.54 °C	0.75 mS/cm	9.07 mg/L	52.12 NTU	24.5 mV	21.36 ft	150.00 ml/min
6/11/2020 10:46 AM	30:23	7.18 pH	12.79 °C	0.56 mS/cm	8.94 mg/L	78.89 NTU	21.5 mV	21.36 ft	150.00 ml/min
6/11/2020 10:49 AM	33:23	7.20 pH	12.20 °C	0.75 mS/cm	9.38 mg/L	112.28 NTU	15.4 mV	21.36 ft	150.00 ml/min
6/11/2020 10:52 AM	36:23	7.20 pH	12.30 °C	0.64 mS/cm	8.86 mg/L	84.58 NTU	11.4 mV	21.36 ft	150.00 ml/min
6/11/2020 10:55 AM	39:23	7.20 pH	12.12 °C	0.75 mS/cm	8.75 mg/L	128.29 NTU	9.9 mV	21.36 ft	150.00 ml/min

6/11/2020 10:58 AM	42:23	7.22 pH	12.36 °C	0.55 mS/cm	9.03 mg/L	180.39 NTU	12.6 mV	21.36 ft	150.00 ml/min
6/11/2020 11:01 AM	45:23	7.17 pH	12.55 °C	0.73 mS/cm	8.61 mg/L	227.58 NTU	13.3 mV	21.36 ft	150.00 ml/min
6/11/2020 11:04 AM	48:23	7.16 pH	12.55 °C	0.75 mS/cm	8.54 mg/L	417.32 NTU	16.0 mV	21.36 ft	150.00 ml/min
6/11/2020 11:07 AM	51:23	7.15 pH	12.51 °C	0.68 mS/cm	8.52 mg/L	466.77 NTU	15.4 mV	21.36 ft	150.00 ml/min

Samples

Sample ID:	Description:
FWGmw-020-200401-GW	Initial purge: 10:15 AM Initial water level: 21.01 ft Initial purge rate: 175 mL/min Initial purge calculation: 1,031.3 mL Water was turbid, had an orange tint, and no odor The water appeared to be shooting out of the well, instead of being drawn out, as normal, so there was a lot of air in the line. I talked about it with the PM and she said that as long as 3 parameters were stable, to sample the well. Purge: 10:25 AM (00:09:23) Water level: 21.36 ft Purge rate: 150 mL/min Total volume purged: 7.950 L Water was colorless, turbid, had a rotten organic, and was soapy in appearance 1110 Samples collected for VOCs and TAL metals. With turbidity being high, filtered and unfiltered samples were collected. The sample was taken when not all parameters were stable with permission from the PM

Created using VuSitu from In-Situ, Inc.

Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 10:35:15 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: FWGmw-021 **Well Diameter: 2 in** **Initial Depth to Water: 19.81 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 40 ft** **Pump Intake From TOC: 40 ft** **Estimated Total Volume Pumped: 38,450 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 340 mL/min** **Final Draw Down: 0.85 ft**	**Instruments Used:** **Aqua TROLL 600 - 695538** **Air Compressor - 25369** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 4, 2.5:12.5, 30 PSI, 340 mL/min

Weather Conditions:
72°F; Partly cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 12:35 PM	00:00	7.33 pH	16.61 °C	0.16 mS/cm	7.21 mg/L	13.58 NTU	191.8 mV	19.81 ft	480.00 ml/min
6/11/2020 12:40 PM	05:07	6.25 pH	11.30 °C	0.18 mS/cm	1.18 mg/L	759.07 NTU	138.3 mV	20.52 ft	400.00 ml/min
6/11/2020 12:45 PM	10:07	6.17 pH	11.31 °C	0.18 mS/cm	0.93 mg/L	260.33 NTU	125.9 mV	20.53 ft	400.00 ml/min
6/11/2020 12:50 PM	15:07	5.97 pH	11.07 °C	0.18 mS/cm	0.80 mg/L	77.02 NTU	131.6 mV	20.67 ft	340.00 ml/min
6/11/2020 12:55 PM	20:07	5.81 pH	11.22 °C	0.18 mS/cm	0.76 mg/L	45.67 NTU	137.5 mV	20.67 ft	340.00 ml/min
6/11/2020 1:00 PM	25:07	5.70 pH	11.22 °C	0.18 mS/cm	0.71 mg/L	36.37 NTU	141.8 mV	20.67 ft	340.00 ml/min
6/11/2020 1:05 PM	30:07	5.65 pH	11.13 °C	0.18 mS/cm	0.87 mg/L	31.51 NTU	147.1 mV	20.67 ft	340.00 ml/min
6/11/2020 1:10 PM	35:07	5.64 pH	11.20 °C	0.18 mS/cm	0.65 mg/L	24.35 NTU	143.9 mV	20.66 ft	340.00 ml/min
6/11/2020 1:15 PM	40:07	5.60 pH	11.10 °C	0.18 mS/cm	0.63 mg/L	19.50 NTU	145.1 mV	20.66 ft	340.00 ml/min
6/11/2020 1:20 PM	45:07	5.59 pH	11.12 °C	0.18 mS/cm	0.61 mg/L	22.62 NTU	144.4 mV	20.65 ft	340.00 ml/min
6/11/2020 1:25 PM	50:07	5.56 pH	11.24 °C	0.18 mS/cm	0.60 mg/L	16.62 NTU	148.5 mV	20.65 ft	340.00 ml/min
6/11/2020 1:30 PM	55:07	5.55 pH	11.16 °C	0.18 mS/cm	0.59 mg/L	12.74 NTU	147.7 mV	20.65 ft	340.00 ml/min

6/11/2020 1:35 PM	01:00:07	5.60 pH	11.14 °C	0.18 mS/cm	0.58 mg/L	14.15 NTU	144.4 mV	20.65 ft	340.00 ml/min
6/11/2020 1:40 PM	01:05:07	5.53 pH	11.21 °C	0.18 mS/cm	0.57 mg/L	12.92 NTU	147.8 mV	20.65 ft	340.00 ml/min
6/11/2020 1:45 PM	01:10:07	5.52 pH	11.24 °C	0.18 mS/cm	0.56 mg/L	13.22 NTU	148.1 mV	20.66 ft	340.00 ml/min
6/11/2020 1:48 PM	01:13:13	5.56 pH	11.21 °C	0.18 mS/cm	0.55 mg/L	12.75 NTU	146.4 mV	20.66 ft	340.00 ml/min
6/11/2020 1:51 PM	01:16:13	5.51 pH	11.20 °C	0.18 mS/cm	0.55 mg/L	11.84 NTU	148.2 mV	20.66 ft	340.00 ml/min
6/11/2020 1:54 PM	01:19:13	5.52 pH	11.30 °C	0.18 mS/cm	0.54 mg/L	14.49 NTU	147.9 mV	20.66 ft	340.00 ml/min
6/11/2020 1:57 PM	01:22:13	5.52 pH	11.25 °C	0.18 mS/cm	0.54 mg/L	11.66 NTU	147.7 mV	20.66 ft	340.00 ml/min
6/11/2020 2:00 PM	01:25:13	5.52 pH	11.15 °C	0.18 mS/cm	0.53 mg/L	10.39 NTU	147.6 mV	20.66 ft	340.00 ml/min
6/11/2020 2:03 PM	01:28:13	5.52 pH	11.24 °C	0.18 mS/cm	0.53 mg/L	12.24 NTU	147.8 mV	20.66 ft	340.00 ml/min
6/11/2020 2:06 PM	01:31:13	5.52 pH	11.28 °C	0.18 mS/cm	0.52 mg/L	11.61 NTU	147.4 mV	20.66 ft	340.00 ml/min
6/11/2020 2:09 PM	01:34:13	5.52 pH	11.17 °C	0.18 mS/cm	0.53 mg/L	13.67 NTU	147.5 mV	20.66 ft	340.00 ml/min
6/11/2020 2:12 PM	01:37:13	5.54 pH	11.20 °C	0.18 mS/cm	0.53 mg/L	12.41 NTU	144.8 mV	20.66 ft	340.00 ml/min
6/11/2020 2:15 PM	01:40:13	5.52 pH	11.14 °C	0.18 mS/cm	0.52 mg/L	10.28 NTU	147.5 mV	20.66 ft	340.00 ml/min
6/11/2020 2:18 PM	01:43:13	5.52 pH	11.19 °C	0.18 mS/cm	0.51 mg/L	10.31 NTU	146.9 mV	20.66 ft	340.00 ml/min
6/11/2020 2:21 PM	01:46:13	5.60 pH	11.32 °C	0.18 mS/cm	0.51 mg/L	10.27 NTU	142.9 mV	20.66 ft	340.00 ml/min
6/11/2020 2:24 PM	01:49:13	5.53 pH	11.33 °C	0.18 mS/cm	0.51 mg/L	9.64 NTU	146.6 mV	20.66 ft	340.00 ml/min

Samples

Sample ID:	Description:
FWGMW-021-200401-GW	Begin purge @ 12:35 PM PSI 30, CMP 4/3.5/11.5 Stagnant water volume removed @ 12:40 PM (00:05:07) Stagnant water volume - 2,115 mL Empty flow cell to reduce turbidity @ 1:02 PM (00:27:07) Switch to 3 minute readings @ 1:48 PM (01:13:13) Stable @ 2:24 PM (01:49:13) Water is initially reddish orange with biofoul, extremely turbid, and odorless. Water is clear, colorless, odorless at end of purge. Sample for metals and explosives @ 1425 Collect split sample for metals and explosives (FWGMW-021-200403-GW) Collect duplicate sample for metals and explosives (FWGMW-021-200402-GW) Collect MS/MSD for explosives (FWGMW-021-200401-GWMSD)

Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 6/11/2020 1:13:54 PM
Project: FWGWMP-April 2020 Event
Sampler Name: Gabby Gromofsky

Location Name: FWGmw-024 **Well Diameter: 2 in** **Initial Depth to Water: 13.45 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 31 ft** **Pump Intake From TOC: 31 ft** **Estimated Total Volume Pumped: 24,897.916 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 475 mL/min** **Final Draw Down: 0.05 ft**	**Instruments Used:** **Aqua TROLL 600 - 695538** **Air Compressor - 25369** **Controller (MP10) - 1723** **Water Level Meter - 41832**

Test Notes:
CPM 4, 3.5:11.5, 18 PSI, 475 mL/min

Weather Conditions:
77°F; partly cloudy.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
6/11/2020 3:13 PM	00:00	6.99 pH	18.05 °C	0.42 mS/cm	3.08 mg/L	44.27 NTU	197.0 mV	13.45 ft	475.00 ml/min
6/11/2020 3:18 PM	04:13	7.01 pH	12.29 °C	0.42 mS/cm	0.11 mg/L	695.03 NTU	49.9 mV	13.50 ft	475.00 ml/min
6/11/2020 3:21 PM	07:25	7.04 pH	12.33 °C	0.43 mS/cm	0.07 mg/L	136.11 NTU	33.6 mV	13.50 ft	475.00 ml/min
6/11/2020 3:24 PM	10:25	7.04 pH	12.13 °C	0.44 mS/cm	0.06 mg/L	89.46 NTU	22.8 mV	13.50 ft	475.00 ml/min
6/11/2020 3:27 PM	13:25	7.03 pH	12.30 °C	0.45 mS/cm	0.05 mg/L	63.50 NTU	15.6 mV	13.50 ft	475.00 ml/min
6/11/2020 3:30 PM	16:25	7.01 pH	12.17 °C	0.45 mS/cm	0.05 mg/L	61.07 NTU	10.8 mV	13.50 ft	475.00 ml/min
6/11/2020 3:33 PM	19:25	6.98 pH	12.08 °C	0.46 mS/cm	2.86 mg/L	62.77 NTU	22.5 mV	13.50 ft	475.00 ml/min
6/11/2020 3:36 PM	22:25	6.92 pH	12.16 °C	0.46 mS/cm	0.07 mg/L	53.58 NTU	13.0 mV	13.50 ft	475.00 ml/min
6/11/2020 3:39 PM	25:25	6.88 pH	11.82 °C	0.47 mS/cm	0.05 mg/L	45.48 NTU	9.8 mV	13.50 ft	475.00 ml/min
6/11/2020 3:42 PM	28:25	6.82 pH	11.94 °C	0.47 mS/cm	0.05 mg/L	36.36 NTU	9.5 mV	13.50 ft	475.00 ml/min
6/11/2020 3:45 PM	31:25	6.78 pH	12.13 °C	0.47 mS/cm	0.05 mg/L	29.75 NTU	8.6 mV	13.50 ft	475.00 ml/min
6/11/2020 3:48 PM	34:25	6.79 pH	11.93 °C	0.47 mS/cm	0.10 mg/L	24.90 NTU	15.1 mV	13.50 ft	475.00 ml/min

6/11/2020 3:51 PM	37:25	6.77 pH	11.70 °C	0.47 mS/cm	0.05 mg/L	20.11 NTU	9.7 mV	13.50 ft	475.00 ml/min
6/11/2020 3:54 PM	40:25	6.76 pH	11.88 °C	0.47 mS/cm	0.05 mg/L	17.20 NTU	7.0 mV	13.50 ft	475.00 ml/min
6/11/2020 3:57 PM	43:25	6.72 pH	11.96 °C	0.47 mS/cm	0.05 mg/L	14.96 NTU	7.1 mV	13.50 ft	475.00 ml/min
6/11/2020 4:00 PM	46:25	6.72 pH	11.94 °C	0.47 mS/cm	0.08 mg/L	12.70 NTU	11.1 mV	13.50 ft	475.00 ml/min
6/11/2020 4:03 PM	49:25	6.75 pH	12.03 °C	0.47 mS/cm	0.04 mg/L	11.50 NTU	5.4 mV	13.50 ft	475.00 ml/min
6/11/2020 4:06 PM	52:25	6.71 pH	11.88 °C	0.48 mS/cm	0.04 mg/L	9.37 NTU	4.9 mV	13.50 ft	475.00 ml/min

Samples

Sample ID:	Description:
FWGMW-024-200401-GW	Begin purge @ 3:13 PM PSI 18 CPM 4/3.5/11.5 Stagnant water volume removed @ 3:18 PM (00:04:13) Stagnant water volume - 2,000 mL Empty flow cell to reduce turbidity @ 3:33 PM (00:19:25) Empty flow cell to reduce turbidity @ 3:57 PM (00:43:25) Stable @ 4:06 PM (00:52:25) Water is initially reddish orange with biofoul, extremely turbid, and odorless. Water is clear, colorless, odorless at end of purge. Sample for metals and explosives @ 4:10 PM

Created using VuSitu from In-Situ, Inc.

Sampled By: ,6/11/2020

QA Check By: ,6/15/2020

Low-Flow Test Report:

Test Date / Time: 4/22/2020 10:42:40 AM
Project: FWGWMP-April 2020 Event
Sampler Name: Ryan Laurich

Location Name: SCFmw-004 **Well Diameter: 2 in** **Screen Length: 10 ft** **Top of Screen: 100 ft** **Total Depth: 110 ft** **Initial Depth to Water: 0 ft**	**Pump Type: QED Well Wizard Bladder Pump** **Tubing Type: PTFE** **Tubing Inner Diameter: 0.375 in** **Tubing Length: 215 ft** **Pump Intake From TOC: 105 ft** **Estimated Total Volume Pumped: 0 mL** **Flow Cell Volume: 130 mL** **Final Flow Rate: 500 mL/min** **Final Draw Down: 0 ft**	**Instruments Used:** **Aqua TROLL 600 - 518784** **Air Compressor - 18421** **Controller (MP10) - 3308** **Water Level Meter - 07077**

Test Notes:
CPM: N/A

Weather Conditions:
39°F, clear, sunny.

Low-Flow Readings:

Date Time	Elapsed Time	pH	Temperature	Specific Conductivity	RDO Concentration	Turbidity	ORP	Depth To Water	Flow
		+/- 0.1	+/- 0.5	+/- 3 %	+/- 0.2	+/- 10 %	+/- 20	+/- 5	
4/22/2020 10:42 AM	00:00	7.11 pH	10.70 °C	0.00 mS/cm	11.12 mg/L	879.46 NTU	94.0 mV	0.00 ft	500.00 ml/min
4/22/2020 10:43 AM	01:00	7.10 pH	10.86 °C	0.00 mS/cm	11.07 mg/L	870.54 NTU	95.1 mV	0.00 ft	500.00 ml/min
4/22/2020 10:44 AM	02:00	7.13 pH	9.93 °C	1.22 mS/cm	3.84 mg/L	0.00 NTU	90.9 mV	0.00 ft	500.00 ml/min

Samples

Sample ID:	Description:
SCFmw-004-200401-GW	SCFmw-004 is artesian. Connected Aquatroll to collect water quality parameters. 00:00:00 and 00:01:00 readings were before flow cell was filled. 00:02:00 reading was when flow cell was full. No purge required due to well being artesian. 1040 - Collect grab sample SCFmw-004-200401-GW for explosives and TAL metals. Removed submersible pump and install well packer.

Created using VuSitu from In-Situ, Inc.

Sampled By: ,4/22/2020

QA Check By: ,5/6/2020

D.3 Chains of Custody

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Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-003-TA
Date: 4/20/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
RYAN LAURICH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Nitrate (10)(A)	AMMONIA 15E	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL12mw-187-200401-GW			4/20/20	1151	W	1	1		2	

280-135725 Chain of Custody

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 2
Signature	4/20/2020	Signature	4/20/20	A. Cool, 4C E. H2SO4
Printed Name: Heather Adams	Time 1500	Printed Name: Brent Hill	Time 1500	B. HCl, pH<2, Cool, 4C
Company: Leidos		Company		C. HNO3, pH<2, Cool, 4C
Relinquished by	Date 4-20-20	Received by	Date 4-20-20	D. NaOH, pH>12, Cool 4C
Signature	Time 1545	Signature	Time 1545	1. SW 8260B
Printed Name		Printed Name: ETA		2. SW 8270D
Company		Company		3. SW 8270D SIM
				4. SW 8082A
				5. SW 8081B
				6. SW 8330
				7. SW 6010/6020/7470
				8. SW 9012B
				9. SW 9034
				10. SW 9056/9056A
				11. SW 6860
				12. EPA 353.2
				13. SW 7196
				14. SM2320B
				15. E350.1

Shipping Carrier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

4/21/20 0835

leidos

Chain of Custody Record

1.1°

Page 1 of 1

COC No.: RVAAP-006-TA
Date: 4/20/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) RYAN LAUNCH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Nitrate (10)(A)	AMMONIA 15(E)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL12mw-185-200401-GW	—	—	4/20/20	1334	W	1	1		2	

04/20/2020

Relinquished by	Date	Received by	Date
Signature	4/20/2020	Signature	4-20-20
Printed Name: HEATHER ADAMS	Time: 1500	Printed Name: Brent Hill	Time: 1500
Company: Leidos		Company:	
Relinquished by	Date: 4-20-20	Received by	Date: 4-20-20
Signature		Signature	
Printed Name: Brent Hill	Time: 1545	Printed Name: Ryan Crabtree	Time: 1545
Company		Company: ETA	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. H2SO4

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B
15. E350.1

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

4/21/20
0835

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-004 -TA
Date: 04/20/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	WBGmw-~~001~~-200401-GW -CCW-			04/20/20	1314	W	2		2	

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 2	Shipment Method: Courier
Signature	4/20/2020	Signature	4-20-2020	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C	
Printed Name: HEATHER Adams	Time 1500	Printed Name	Time 1500	1. SW 8260B Notes: 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B	
Company: Leidos		Company			
Relinquished by	Date 4-20-20	Received by	Date 4/21/20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A	Temperature Blank
Signature	Time 1545	Signature Beau Bentley	Time 0835	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B	Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802
Printed Name		Printed Name ETA Den			
Company		Company			

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-002-TA
Date: 04/20/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	WBGmw-009-200401-GW	—	—	04/20/20	1130	W	2		2	

4/20/2020

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 2
Signature: [signature]	04/20/2020	Signature: [signature]	4/20/20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: NEATHER ADAMS	Time: 1500	Printed Name: O'Brent Hall	Time: 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B 6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A 11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Company: Leidos		Company:		Notes:
Relinquished by	Date	Received by	Date	
Signature: [signature]	4/20/20	Signature: [signature]	4/21/20	
Printed Name: O'Brent Hall	Time: 1544	Printed Name: Beau Bentley	Time: 0835	
Company:		Company: ETA Dev		

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-00 -TA
Date: 04/20/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	WBGmw-020-200401-GW	—	—	04/20/20	1048	W	2		2	

4/20/2020

Relinquished by	Date	Received by	Date
Signature	04/20/2020	Signature Brent	4/20/20
Printed Name: HEATHER Adams	Time 1500	Printed Name	Time 1500
Company: Leidos		Company	
Relinquished by	Date 4/20/20	Received by	Date 4/21/20
Signature: Brent Hupp		Signature: Beau Bentley	
Printed Name	Time 1545	Printed Name: STADer	Time 0835
Company		Company	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-005-TA
Date: 04/20/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	WBGmw ~~020~~ -021- 200401-GW	—		04/20/20	1330	W	2		2	

BB 4/20/20

4/20/2020

Relinquished by	Date	Received by	Date
Signature: [signature]	4/20/2020	Signature: [signature] Brent Hupp	4-20-20
Printed Name: Heather Adams	Time: 1500	Printed Name:	Time: 1500
Company: Leidos		Company:	

Relinquished by	Date	Received by	Date
Signature: [signature] Brent Hupp	4-20-20	Signature: [signature]	4/21/20
Printed Name:	Time: 1545	Printed Name: Bear Bentley	Time: 0835
Company:		Company: ETADen	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

-0.1 IR9 +0.3 BB 4/21/20

Chain of Custody Record

leidos

COC No.: RVAAP- 007-TA

Page 1 of 1

Date: 04/21/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B)	Phthalates/Nitroaromatics/ Phenols (2)(A)	LL PAHs (3)(A)	PCBs (4)(A)	Pesticides (5)(A)	Explosives (6)(A)	Cyanide (8)(D)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	DET-004-200401-GW	—	—	04/21/20	0928	W	3	2	2	2		2	1	1		13	
	FWGTB-2004001-TB	—	—	↓	↓	W	2									2	Trip Blank also associated with DET-003 VOC samples.

DA 04/21/20

280-135791 Chain of Custody

Relinquished by	Date	Received by	Date
Signature: [signature]	04/21/2020	Signature: [signature]	4/21/20
Printed Name: HEATHER Adams	Time: HH 4/21 ~~04/21~~ ~~20~~ 1500	Printed Name: Brent Hill	Time: 1500
Company: Leidos		Company:	

Relinquished by	Date	Received by	Date
Signature: [signature]	4-21-20	Signature: [signature]	4/22/20
Printed Name: Brent Hill	Time: 1600	Printed Name: Reed Pottenfer	Time: 0845
Company:		Company: ETA-Ren	

Notes: Total Number of Containers: 15

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes: 2.5, 0.3, 3.0, 2.8, 1.8, 0.1, 0.9

IR#9 to 3 Transfer
RP 4/22/20

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP- 003-TA
Date: 04/21/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B)	Phthalates/Nitroaromatics/ Phenols (2)(A)	LL PAHs (3)(A)	PCBs (4)(A)	Pesticides (5)(A)	Explosives (6)(A)	Cyanide (8)(D)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	DET-003-200401-GW	—	—	04/21/20	0935	W	3	2	2	2		2	1	1		13	
	DET-003-200401-GWMSD	—	—	↓	↓	W	4	4	4	4	4					20	Extra Volume for MS/MSD see note
	DET-003-200402-GW	—	—	↓	↓	W	3	2	2	2						9	NOTE: If Vol an issue min 8 1-L for SVOC/pest/PCB
																	Associated with Trip Blank FWGTB-200401-TB

KD 04/21/20

Relinquished by	Date	Received by	Date
Signature	04/21 2020	Signature Brent Huff	4-21-20
Printed Name Heather Adams	Time 1500	Printed Name	Time 1500
Company Leidos		Company	
Relinquished by Brent Huff	Date 4-21-20	Received by Reed Pottruff	Date 4/22/20
Signature Brent Huff		Signature	
Printed Name	Time 1600	Printed Name ETA-Rem	Time 0845
Company		Company	

Notes: Total Number of Containers: 42

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-009-TA
Date: 4/21/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B)	Phthalates/Phenols/Nitro (2)(A)	LL PAHs (3)(A)	PCBs (4)(A)	Pesticides (5)(A)	Explosives (6)(A)	Cyanide (8)(D)	Phosphorus (7)(C)	TAL Metals+Phosphorus (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	RQLmw-007-200401-GW			4/21/20	0954	W	3	2	2	2		2	1		1		13	
	RQLmw-007-200401-GWMSD					W						4	2		1		7	
	RQLmw-007-200402-GW					W						2	1		1		4	
	~~FWGTB-200402-TB~~				0845	W	2										2	Trip Blank
	~~FWGTB-200403~~ 4/21/20																	
	FWGTB-20040003-TB																	

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 26	Shipment Method: Courier
Signature: [signature]	4/21/2020	Signature: [signature]	4/21/20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C	
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent Huff	Time: 1500	1. SW 8260B Notes: 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B	
Company: Leidos		Company:			
Relinquished by	Date: 4/21/20	Received by	Date: 4/22/20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A	Temperature Blank
Signature: [signature]		Signature: Reed Pottruff			
Printed Name	Time: 1600	Printed Name: ETA-Ren	Time: 0845	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B	Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802
Company		Company			

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-010-TA
Date: 4/21/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
TR Ryan Laurich

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	RQLmw-011-200401-GW	—	—	4/21/20	0245	W	1	1			2	
	RQLmw-011-200401-GWMSD	—	—	↓	↓	W	2	2			4	Extra Volume for Matrix Spike
	RQLmw-011-200402-GW	—	—	↓	↓	W	1	1			2	

Relinquished by	Date	Received by	Date
Signature: [signature]	4/21/2020	Signature: [signature]	4-21-20
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent Hoff	Time: 1500
Company: Leidos		Company:	
Relinquished by	Date: 4-21-20	Received by	Date: 4/22/20
Signature: Brent Hoff		Signature: [signature]	
Printed Name:	Time: 1600	Printed Name: Reed Pottruff	Time: 0845
Company:		Company: ETA-Pen	

Notes: Total Number of Containers: 8

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-013-TA
Date: 4/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) [signature] (Printed Name) Ryan Lawrence

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B) CCl4 ONLY	Phthalates/Phenols/Nitro (2)(A)	LL PAHs (3)(A)	PCBs (4)(A)	Pesticides (5)(A)	Explosives (6)(A)	Cyanide (8)(D)	Nitrogen Nitrate/Sulfate (10)(A)	Alkalinity (14)(A)	Phosphorus (9)(A)	Nitrocellulose (12)(A)	Perchlorate (11)(A)	Phosphorus (7)(C)	TAL Metals (7)(C)	Intravenous Chromium (13)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	RQLmw-008-200401-GW	—	—	4/22/20	0914	W	3	2	2	2		2	1							1			13	
	FWGTB-2004004-TB	—	—	↓	0820	W	2																2	Trip Blank

280-135839 Chain of Custody

Relinquished by	Date	Received by	Date
[signature] Signature	04/22/2020	[signature] Signature	4-22-20
Heather Adams Printed Name	Time 1500	Brent Hutt Printed Name	Time 1500
Leidos Company		Company	
Relinquished by	Date	Received by	Date
[signature] Signature	4-22-20	[signature] Signature	4/23/20
Brent H. Printed Name	Time	Beau Beatley Printed Name	Time 0850
Company		ETA Dea Company	

Notes: Total Number of Containers: 15
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

0.2, -0.3, 0.1 IR 9 +0.3 BB 4/23/20

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-014 -TA
Date: 04/22/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B) CCl4 ONLY	Phthalates/Phenols/Nitro(2)(A)	LL PAHs (3)(A)	PCBs (4)(A)	Pesticides (5)(A)	Explosives (6)(A)	Cyanide (8)(D)	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Hexanitrin (14)(A)	Nitroguanidine (6)(A)	Nitrocellulose (12)(A)	Perchlorate (11)(A)	Phosphorus (7)(C)	TAL Metals (7)(C)	Phosphate Chromium (13)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	RQLmw-009-200401-GW	—	—	04/22/20	0950	W	3	2	2	2		2	1								1			13	
																									Associated with trip blank FWGTB-2004004-TB

04/22/20

Relinquished by	Date	Received by	Date
Signature: [signature]	04/22/2020	Signature: [signature]	4-22-20
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent [signature]	Time: 1500
Company: Leidos		Company:	

Relinquished by	Date	Received by	Date
Signature: [signature]	4-22-20	Signature: [signature]	4/23/20
Printed Name: Brent [signature]	Time: 1600	Printed Name: Ben Bradley	Time: 0850
Company:		Company: ETA Den	

Notes: Total Number of Containers: 13

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-012-TA
Date: 04/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	RQLmw-013-200401-GW	—	—	04/22/20	0904	W	1	1			2	

DA 04/22/20

Relinquished by	Date	Received by	Date
Signature	4/22/20	Signature	4-22-20
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent Hupp	Time: 1500
Company: Leidos		Company	

Relinquished by	Date	Received by	Date
Signature	4-22-20	Signature	4/23/20
Printed Name: Brent H.	Time: 1400	Printed Name: Beau Bentley	Time: 0850
Company		Company: ETA Pen	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-01 -TA
Date: 04/21/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-015-200401-GW	—	—	04/21/20	1453	W	2	1		3	

DA 04/21/20

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 3
Signature: [signature]	4/22/2020	Signature: [signature]	4-22-20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: Heather Adams	Time: 1500	Printed Name:	Time: 1500	1. SW 8260B Notes: 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B
Leidos / Company		Company		
Relinquished by	Date: 4-22-20	Received by	Date: 4/23/20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A
Signature: [signature]		Signature: [signature]		
Printed Name	Time: 1600	Printed Name: Ben Bentley	Time: 0850	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Company		Company: EIA Dev		

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-015-TA

Date: 4/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) RYAN LAUNCH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	SCFmw-004-200401-GW	—	—	4/22/20	1040	W	2	1		3	

Relinquished by
Signature
Printed Name: HEATHER ADAMS
Company: Leidos
Date: 04/22/2020
Time: 1500

Received by
Signature: Brent Huff
Printed Name
Company
Date: 4-22-20
Time: 1500

Relinquished by
Signature: Brent Huff
Printed Name
Company
Date: 4-22-20
Time: 1600

Received by
Signature: Beau Bentley
Printed Name: ETADen
Company
Date: 4/23/20
Time: 0850

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-019-TA
Date: 4/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL3mw-237-200401-GW			4/22/20	1326	W	2		2	

Relinquished by	Date	Received by	Date
Signature	04/22/2020	Signature	4-22-20
Heather Adams	Time 1500	Printed Name	Time 1500
Leidos		Company	

Relinquished by	Date	Received by	Date
Signature	4-22-20	Signature	4/23/20
Brent	Time 1600	Printed Name Bear Beatty	Time 0850
Printed Name		Company STADen	
Company			

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

Leidos

Page 1 of 1

COC No.: RVAAP- 014-TA
Date: 04/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-064-200401-GW	—	—	04/22/20	1148	W	2	1		3	

DA 04/22/20

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 3
Signature	04/22/2020	Signature	4-22-20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: HEATHER ADAMS	Time 1500	Printed Name	Time 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B
Company: Leidos		Company		
Relinquished by	Date 4-22-20	Received by	Date 4/23/20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A
Signature	Time 1600	Signature	Time 0850	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Printed Name		Printed Name		
Company		Company		

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

COC No.: RVAAP-017-TA

Page 1 of 1

Date: 04/22/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-016-200401-GW	—		04/22/20	1328	W	2	1		3	

DA 04/22/20

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 3
Signature: [signature]	04/22/2020	Signature: [signature]	4-22-20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: HEATHER Adams	Time: 1500	Printed Name: [signature]	Time: 1500	1. SW 8260B Notes: 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B
Leidos		Company		
Relinquished by	Date	Received by	Date	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A 11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Signature: [signature]	4-22-20	Signature: Ben Bentley	4/25/20	
Printed Name: [signature]	Time: 1600	Printed Name: ETA Den	Time: 0850	
Company		Company		

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-023-TA
Date: 04/23/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Fall Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-083-200401-GW	—	—	04/23/20	1027	W	2	1	1			4	

DA 04/23/20

280-135888 Chain of Custody

Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4/23/2020	Signature: [signature]	4-23-20	1500
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent H.		
Company: Leidos		Company:		
Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4-23-20	Signature: [signature]	4/24/20	0840
Printed Name: Brent H.	Time: 1600	Printed Name: Reed Pottruff		
Company:		Company: EJA-Ren		

Notes: Total Number of Containers: 4

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes: 0.1, 0.1
IRA 9+0.3 Transfer
RP 4/24/20

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-019-TA
Date: 04/22/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL METALS (7C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL2mw-267-200401-GW	—	—	04/22/20	1400	W	2	1		~~2~~ 3	HA 4/21

HA 04/22/20

Relinquished by	Date	Received by	Date
Signature: [signature]	04/23/2020	Signature: [signature]	4-23-20
Printed Name: HEATHER Adams	Time: 1500	Printed Name: [signature]	Time: 1500
Company: Leidos		Company:	
Relinquished by	Date	Received by	Date
Signature: [signature]	4-23-20	Signature: Reed Pottruff	4/24/20
Printed Name: [signature]	Time: 1600	Printed Name: ETA - Ren	Time: 0840
Company:		Company:	

Notes: Total Number of Containers: ~~2~~ 3
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-024-TA
Date: 04/23/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL2mw-059-200401-GW			04/23/20	1040	W	2		2	

04/23/2020

Relinquished by	Date	Received by	Date
Signature	04/23/2020	Signature Brent	4-23-20
Printed Name	Time 1800	Printed Name	Time 1800
Leidos Company		Company	
Relinquished by	Date 4-23-20	Received by	Date 4/24/20
Signature Brent		Signature Reed Pettrnff	
Printed Name	Time 1600	Printed Name ETA-Pen	Time 0840
Company		Company	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-020-TA
Date: 04/23/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-063-200401-GW	—	—	04/23/20	0855	W	2	1	1	1		4	

DA 04/23/20

Relinquished by	Date	Received by	Date	Time
Signature: [signature]	04/23/2020	Signature: [signature]	4-23-20	1500
Printed Name: Heather Adams	Time	Printed Name: Brent R.		
Company: Leidos		Company:		
Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4-23-20	Signature: Reed Pottruff	4/24/20	0840
Printed Name:	Time	Printed Name: ETA-Ren		
Company:	1600	Company:		

Notes: Total Number of Containers: 4

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

COC No.: RVAAP-021-TA

Page 1 of 1

Date: 04/23/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-080-200401-GW	—	—	04/23/20	0905	W	2		2	

04/23/20

Relinquished by	Date	Received by	Date	Time
Signature	04/23/2020	Signature	4-23-20	1500
Printed Name	Time	Printed Name		
Leidos				
Company		Company		
Relinquished by	Date	Received by	Date	Time
Signature	4-23-20	Signature	4/24/20	0840
Printed Name	Time	Printed Name		
	1400	ETA-Pen		
Company		Company		

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-025-TA
Date: 04/23/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-004-200401-GW	—	—	04/23/20	1226	W	2	1		3	

DA 04/23/20

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 3	Shipment Method: Courier
Signature	4/23/2020	Signature	4-23-20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C	
Printed Name: Heather Adams	Time: 1500	Printed Name	Time: 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B	Notes:
Leidos Company		Company			
Relinquished by	Date: 4-23-20	Received by	Date	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A	Temperature Blank
Signature		Signature			
Printed Name	Time: 1600	Printed Name	Time	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B	Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802
Company		Company			

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-026-TA
Date: 4/23/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Ryan Lausch

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-081-200401-GW	—	—	4/23/20	1229	W	2		2	

Relinquished by: Heather Adams
Signature
Printed Name
Leidos
Company
Date: 04/23 2020
Time: 1300

Received by: Brent
Signature
Printed Name
Company
Date: 4-23-20
Time: 1500

Relinquished by
Signature
Printed Name
Company
Date: 4-23-20
Time: 1600

Received by: Reed Pottruff
Signature
Printed Name: ETA Pen
Company
Date: 4/24/20
Time: 0840

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-022-TA
Date: 4/23/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Ryan Launch

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-084-200401-GW	—	—	4/23/20	0922	W	2		2	

Relinquished by	Date	Received by	Date
Signature: [signature]	04/23/2020	Signature: [signature]	4-23-20
Printed Name: Heather Adams	Time: 1300	Printed Name: Brent H.	Time: 1500
Company: Leidos		Company:	

Relinquished by	Date	Received by	Date
Signature: [signature]	4-23-20	Signature: [signature]	4/24/20
Printed Name: Brent H.	Time: 1600	Printed Name: Reed Pottruff	Time: 0840
Company:		Company: ETA-Pen	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-027-TA
Date: 04/27/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-175-200401-GW	—	—	04/27/20	1035	W	2		2	
	FBQmw-175-200401-GWMSD	—	—	↓	↓	W	4		4	extra volume for MS/MSD
	FBQmw-175-200402-GW	—	—	↓	↓	W	2		2	

DA 04/27/20

280-135968 Chain of Custody

Relinquished by	Date	Received by	Date
Signature	4/27/2020	Signature	4-27-20
Printed Name: Heather Adams	Time: 1500	Printed Name	Time: 1500
Company: Leidos		Company	

Relinquished by	Date	Received by	Date
Signature	4-27-20	Signature: Julius Lubin ~~Julius Lubin~~ 4-28-20	4-28-20
Printed Name	Time: 1600	Printed Name: Julius Lubin ETA Rm	Time: 0915
Company		Company	

Notes: Total Number of Containers: 8
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

1.6, 1.9°C IR 8+0.6 TL 4-28-20

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-030-TA
Date: 04/27/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-174-200401-GW	—		04/27/20	1258	W	2		2	

DA 04/27/20

Relinquished by	Date	Received by	Date	Time
Signature	4/27/2020	Signature	4-27-20	
Heather Adams	Time 1500	Printed Name	Time 1500	
Leidos		Company		
Relinquished by	Date 4-27-20	Received by Julius Lubin	Date 4-28-20	
Signature	Time 1600	Signature	Time 0945	
Printed Name		Printed Name ETA Inc		
Company		Company		

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-010-TA
Date: 4/27/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (8)(A)	Perchlorate (11)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-087-200401-GW			4/27/20	1054	W	2	1	1		4	
	LL1mw-087-200401-GWMSD					W		2			2	extra volume for MS/MSD
	LL1mw-087-200402-GW					W		1			1	

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 7
Signature	4/27/2020	Signature	4/27/20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: Neanec Adams	Time 1500	Printed Name	Time 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B
Leidos Company		Company		
Relinquished by	Date 4/27/20	Received by	Date 4-28-20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A
Signature	Time 1600	Signature Julius Lubin	Time 0945	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Printed Name		Printed Name EPA Lab		
Company		Company		

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-029-TA

Date: 4/27/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lawler

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-089-200401-GW	—	—	4/27/20	1246	W	2	1	1		1		5	
	LL1mw-089-200402-GW	—	—	↓	↓	W	2				1		3	

Notes: Total Number of Containers: 8

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Relinquished by	Date	Received by	Date
Signature	4/27/2020	Signature	4-27-20
Printed Name: Nathan Adams	Time: 1500	Printed Name	Time: 1500
Company: Leidos		Company	
Relinquished by	Date: 4-27-20	Received by: Julius Lubin	Date: 4-28-20
Signature		Signature: Julius Lubin	
Printed Name	Time: 1600	Printed Name: ETA Rm	Time: 0915
Company		Company	

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page | of 1

COC No.: RVAAP-03 -TA
Date: 04/27/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (8)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-168-200401-GW	—	—	04/27/20	1445	W	2		2	

DA 04/27/20

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 2
Signature: [signature]	4/28/2020	Signature: [signature]	4/28/20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent H	Time: 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B 6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A 11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Company: Leidos		Company:		
Relinquished by	Date	Received by	Date	
Signature: [signature]	4-28-20	Signature: [signature]	4-29-20	
Printed Name: Brent H.	Time: 1600	Printed Name: Julia Lubin	Time: 0845	
Company:		Company: EPA Rm		

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-036-TA
Date: 04/28/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-176-200401-GW	—	—	04/28/20	1303	W	2		2	

DA 04/28/20

Relinquished by	Date	Received by	Date
Signature	4/28/2020	Signature	4-28-20
Printed Name: Heather Adams	Time: 1500	Printed Name: Brent H	Time: 1500
Company: Leidos		Company	
Relinquished by	Date	Received by	Date
Signature	4-28-20	Signature: Julius Lubin	4-29-20
Printed Name: Brent H	Time: 1600	Printed Name: ETA Rm	Time: 0845
Company		Company	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-032 -TA

Date: 4/28/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Nitrate (10)(A)	AMMONIA 15E	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL12mw-187-200401-GW			4/28/20	0920	W		1		1	

Total Number of Containers: 1

Relinquished by
Signature
Printed Name: Heather Adams
Company: Leidos
Date: 4/28/2020
Time: 1500

Received by
Signature: Brent H.
Printed Name
Company
Date: 4-28-20
Time: 1500

Relinquished by
Signature: Brent H.
Printed Name
Company
Date: 4-28-20
Time: 1600

Received by
Signature: Julius Lubin
Printed Name: EPA Rep
Company
Date: 4-29-20
Time: 0845

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. H2SO4

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B
15. E350.1

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

COC No.: RVAAP-034 -TA

Page 1 of 1

Date: 4/28/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Nitrate (10)(A)	AMMONIA 15(E)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL12mw-185-200401-GW	—	—	4/29/20	1051	W		1		1	

04/28/2020

280-136017 Chain of Custody

Relinquished by	Date	Received by	Date
Signature	4/28/2020	Signature	4-28-20
Heather Adams	Time 1500	Printed Name Brent H.	Time 1500
Printed Name			
Leidos			
Company		Company	

Relinquished by	Date	Received by	Date
Signature	4-28-20	Signature	4-29-20
Brent H	Time 1600	Julius Lubin	Time 0845
Printed Name		Printed Name ETA Rm	
Company		Company	

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. H2SO4

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B
15. E350.1

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

0.6°C IR 8 +0.6 JL 4-29-20

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-035 -TA

Date: 4/28/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Laurich

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B) CCl4 ONLY	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL10mw-003-200401-GW	—	—	4/28/20	1244	W	3		3	Carbon Tetrachloride only
	FWGTB-200406-TB	—	—	↓	1215	W	2		2	trip blank

04/28/2020

Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4/28/2020	Signature: [signature]	4-28-20	1500
Printed Name: Nathan Adams	Time: 1500	Printed Name: Brad H.		
Company: Leidos		Company:		
Relinquished by	Date: 4-28-20	Received by	Date: 4-29-20	
Signature: [signature]		Signature: Julius Lukin		
Printed Name:	Time: 1600	Printed Name: Julius Lukin	Time: 0845	
Company:		Company: EPA Rm		

Notes: Total Number of Containers: 5

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-033-TA
Date: 04/28/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-170-200401-GW	—	—	04/28/20	0956	W	2		2	

DA 04/28/20

Relinquished by	Date	Received by	Date
Signature	4/28/2020	Signature Brent H.	4-28-20
Printed Name: Heather Adams	Time: 1500	Printed Name	Time: 1500
Company: Leidos		Company	

Relinquished by	Date	Received by	Date
Signature Brent H.	4-28-20	Signature Julius Lubin	4-29-20
Printed Name	Time: 1600	Printed Name ETA Rev	Time: 0845
Company		Company	

Notes: Total Number of Containers: 2
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-040TA
Date: 04/29/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Sulfide (9)(E)	Nitrate/Nitrite/Sulfate (10)(A)	Alkalinity (14)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL1mw-086-200401-GW	—	—	04/29/20	1534	W	1	1		2		~~3~~ 4	HA 4/30/2020
													ONE METALS BOTTLE WAS FIELD FILTERED AS MARKED ON THE BOTTLE.

04/30/2020

Relinquished by	Date	Received by	Date
Signature	4/30 2020	Signature	4-30-20
Printed Name: Heather Adams	Time 1500	Printed Name: Brent H.	Time 1500
Company: Leidos		Company	
Relinquished by	Date 4-30-20	Received by	Date 5/1/20
Signature: Brent H.		Signature	
Printed Name	Time 1600	Printed Name: Beau Beatley / ETA Area	Time 0835
Company		Company	

Notes: Total Number of Containers: ~~3~~ 4
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier
HA 4/30/2020

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

COC No.: RVAAP-039-TA

Page 1 of 1

Date: 04/29/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson — Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-171-200401-GW	—	—	04/29/20	1258	W	2		2	

DA 04/29/20

Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4/29/2020	Signature: [signature]	4-29-20	1500
Printed Name: Heather Adams	Time: 1500	Printed Name:		
Company: Leidos		Company:		
Relinquished by	Date	Received by	Date	Time
Signature: [signature]	4-29-20	Signature: Julius Lubin	4-30-20	0835
Printed Name:	Time: 1600	Printed Name: EFA Rm		
Company:		Company:		

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-020-TA
Date: 04/29/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Danielle Anderson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FBQmw-177-200401-GW	—	—	04/29/20	1023	W	2		2	

PA 04/29/20

Relinquished by	Date	Received by	Date	Time
Signature	4/29/2020	Signature	4-29-20	1500
Heather Adams	Time 1500	Brent H.		
Printed Name / Leidos / Company		Printed Name / Company		
Relinquished by	Date 4-29-20	Received by	Date 4-30-20	Time 0835
Signature		Signature: Julie Lubin		
Printed Name	Time 1600	Printed Name: EPA Rep		
Company		Company		

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-037-TA
Date: 04/29/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-007-200401GW -GW	4/29/20		04/29/20	1000	W	2	1		3	

4/29/20

280-136071 Chain of Custody

Relinquished by	Date	Received by	Date
Signature: [signature]	4/29/2020	Signature: [signature] Brent H.	4-29-20
Printed Name: Heather Adams	Time: 1500	Printed Name:	Time: 1500
Company: Leidos		Company:	
Relinquished by: Signature: [signature] Brent H.	Date: 4-29-20	Received by: Signature: [signature] Julius Lubin	Date: 4-30-20
Printed Name:	Time: 1600	Printed Name: ETA Rm	Time: 0835
Company:		Company:	

Notes: Total Number of Containers: 3
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

1.8°C IR 8 +0.6 JL 4-30-20

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-043-TA
Date: 04/30/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (8)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL3mw-241-200401-GW	—	—	04/30/20	0910	W	2		2	

280-136118 Chain of Custody

Relinquished by	Date	Received by	Date	Notes: Total Number of Containers: 2
Signature	4/30/2020	Signature	4-30-20	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C
Printed Name: Heather Adams	Time 1500	Printed Name	Time 1500	1. SW 8260B 2. SW 8270D 3. SW 8270D SIM 4. SW 8082A 5. SW 8081B
Company: Leidos		Company		
Relinquished by	Date 4-30-20	Received by	Date 5/1/20	6. SW 8330 7. SW 6010/6020/7470 8. SW 9012B 9. SW 9034 10. SW 9056/9056A
Signature		Signature		
Printed Name	Time 1000	Printed Name: Beau Beatty	Time 0835	11. SW 6860 12. EPA 353.2 13. SW 7196 14. SM2320B
Company		Company: ETADen		

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

2.3, 1.4 1.8 +0.6 BB 5/1/20

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-042-TA
Date: 4/30/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
RYAN LAURICH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL3mw-238-200401-GW	—	—	4/30/20	0931	W	2		2	

04/30/2020

Relinquished by	Date	Received by	Date
Signature	4/30/2020	Signature	4-30-20
Printed Name: Heather Adams	Time: 1500	Printed Name	Time: 1500
Company: Leidos		Company	
Relinquished by	Date: 4-30-20	Received by	Date: 5/1/20
Signature		Signature	
Printed Name: Brent	Time: 1600	Printed Name: Beau Bentley	Time: 0835
Company		Company: STADen	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-044-TA
Date: 04/30/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	LL3mw-239-200401-GW			04/30/20	1115	W	2		2	

04/30/20

Relinquished by	Date	Received by	Date
Signature	4/30/2020	Signature	4-30-20
Heather Adams	Time	Printed Name	Time
Printed Name	1500	Printed Name	1500
Leidos			
Company		Company	

Relinquished by	Date	Received by	Date
Signature	4-30-20	Signature	5/1/20
Printed Name	Time	Printed Name	Time
	1600	Bear Bentley	0835
Company		STA Den	

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

COC No.: RVAAP-041-TA

Page 1 of 1

Date: 04/30/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event
Job/P.O. No.: P010216426

Sampler (Signature) (Printed Name) Heather Adams

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Date	Time	Matrix	TCLP VOCs (1)(A)	TCLP SVOCs (2)(A), TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A)	Total PCBs (12)(A) / (4)(A)	Ignitability (11)(A)	pH (13)(A) / (6)(A)	Nitrate and Nitrite (10)(A)	Total Cyanide (8)(D)	Total Sulfide (9)('E')							NO. OF CONTAINERS	OBSERVATIONS, COMMENTS
	FWGIDW-200401-WW	4/30/2020	1400	W	3	2	2	1	1	1	1	1							12	

04/30/2020

Total Number of Containers: 12

Relinquished by		Date	Notes:
Signature		4/30/2020	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C E. NaOH/Zn Acetate, pH>9, Cool 4C
Heather Adams	Brent H	Time	1. SW 1311, 8260 2. SW 1311, 8270 3. SW 1311, 8081 4. SW 3510C/8082A (W) 5. SW 1311, 8151 6. SW 9040 (W) 7. SW 1311, 6010, 7470 8. SW 9012A 9. SW 9034 10. SW 9056 11. SW 1010 12. SW 3540C/8082A (S) 13. SW 9045 (S) 14. SW 8260B S=Soil / W=Water
Printed Name		1500	Notes:
Leidos			
Company			

Relinquished by		Date	
Signature		~~4-30-20~~ 5/1/20	
Brent H.	Beau Beatley	Time	
Printed Name	ETADen	~~1600~~ 0835	
Company			

Shipment Method: Courier

Temperature Blank
Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

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Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-047-TA
Date: 06/11/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) Danielle Anderson (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B) CCl4 ONLY	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-020-200401-GW	—	—	6/11/2020	11:10	W	3	2		5	associated with Trip Blank FWGTB-200405-TB

ONE FIELD FILTERED (MORCE) THE OTHER NOT.

DA 06/11/20

280-137630 Chain of Custody

Relinquished by	Date	Received by	Date	Time
Signature: [signature]	6/11/2020	Signature: [signature]	6/11/20	1530
Printed Name: Heather Adams	Time: 1000	Printed Name:		
Company: Leidos		Company:		
Relinquished by: [signature]	Date: 6/11/20	Received by: [signature]	Date: 6/12/20	Time: 0900
Signature: [signature]	Time: 1700	Printed Name: Gavin Seffens		
Company:		Company: ETA Den		

Notes: Total Number of Containers: 5

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-046-TA
Date: 6/11/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lanich

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-012-200401-GW	N/A	N/A	6/11/2020	0929	W	2	1		3	

6/11/2020

Relinquished by	Date	Received by	Date
Signature	6/11/2020	Signature	6/11/20
Printed Name: Heather Adams	Time: 1000	Printed Name	Time: 1530
Company: Leidos		Company	
Relinquished by	Date: 6/11/20	Received by	Date: 6/12/20
Signature		Signature	
Printed Name	Time: 1700	Printed Name: Gavin Seffens	Time: 0900
Company		Company: ETA Den	

Notes: Total Number of Containers: 3
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

0.2, -0.5, 0.4 IR9+0.3 GS 6/12/20

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Chain of Custody Record

leidos

Page1 of 1

COC No.: RVAAP-048-TA
Date: 06/11/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	VOCs (1)(B) CCl4 ONLY	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-018-200401-GW	—	—	06/11/2020	1115	W	3	1		4	
	FWGTB-200405-TB	—	—	↓	1110	W	2			2	trip blank

JJ 6/11/20

Relinquished by	Date	Received by	Date	Time
Signature	06/11/2020	Signature	6/11/20	1530
Printed Name: HEATHER Adams	Time 1000	Printed Name		
Company: Leidos		Company		
Relinquished by	Date 6/11/20	Received by	Date 6/12/20	Time 0900
Signature	Time 1700	Signature		
Printed Name		Printed Name: Gavin Seffens		
Company		Company: ETA Dev		

Notes: Total Number of Containers: 6

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

COC No.: RVAAP-047TA

Page 1 of 1

Date: 06/11/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) GABBY GRZCMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-021-200401-GW			06/11/20	1425	W	2	1		3	
	FWGmw-021-200401-GWMSD			↓	↓	W		1		1	extra volume for MS/MSD
	FWGmw-021-200402-GW					W	2	1		3	

JSD 6/11/20

Relinquished by	Date	Received by	Date	Time
Signature	6/11/2020	Signature	6/11/20	1530
Printed Name: Heather Adams	Time 1600	Printed Name		
Company: Leidos		Company		
Relinquished by	Date 6/11/20	Received by	Date 6/12/20	Time 0900
Signature		Signature		
Printed Name	Time 1700	Printed Name: Gavin Seffens		
Company		Company: ETA Den		

Notes: Total Number of Containers: 7

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-045-TA
Date: 6/11/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lanka

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-011-200401-GW	NA	NA	6/11/2020	1229	W	2	1		3	

6/11/2020

Relinquished by	Date	Received by	Date
Signature	6/11/2020	Signature	6/11/20
Printed Name: Heather Adams	Time: 1600	Printed Name: B. Hupp	Time: 1530
Company: Leidos		Company	
Relinquished by	Date: 6/11/20	Received by	Date: 6/12/20
Signature		Signature	
Printed Name: B. Hupp	Time: 1700	Printed Name: Garin Seffens	Time: 0900
Company		Company: ETA Pen	

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

leidos

Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 051-TA
Date: 06/11/20

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2020
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
GABBY GROMOFSKY

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Site Type	Depth	Date	Time	Matrix	Explosives (6)(A)	TAL Metals (7)(C)	Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGmw-024-200401-GW	—	—	06/11/20	1610	W	2	1		3	

Relinquished by	Date	Received by	Date
Signature: [signature]	6/11/20	Signature: [signature]	6-11-20
Printed Name: GABBY GROMOFSKY	Time: 1740	Printed Name: Nick Sutek	Time: 1740
Company: Leidos		Company: TA	
Relinquished by	Date	Received by	Date
Signature: [signature]	6/11/20	Signature: [signature] ETADen	6/12/20
Printed Name: B. [signature]	Time	Printed Name: Beau Beatley	Time: 0900
Company:		Company: ETADen	

Notes: Total Number of Containers: 3
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:
Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

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D.4 Calibration Logs

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Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/20/2020

Sensor

Serial Number	694207
Last Calibrated	4/20/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.927
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,462.6 µS/cm
Specific Conductivity	7,637.4 µS/cm

Post Measurement

Actual Conductivity	6,769.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	576371
Last Calibrated	4/20/2020

Calibration Details

Slope	1.072673
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.68 mg/L
Pre Measurement	97.75 %Sat
Post Measurement	100.00 %Sat
Temperature	16.76 °C
Barometric Pressure	972.62 mbar

Sensor

Serial Number	668471
Last Calibrated	4/20/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-10.7 mV
Temperature	16.95 °C

Pre Measurement

pH	7.27 pH
pH mV	-10.8 mV

Post Measurement

pH	7.02 pH
pH mV	-10.4 mV

Slope and Offset 1

Slope	-57.56 mV/pH
Offset	-9.6 mV

ORP

ORP Solution	Quick-Cal
Offset	16.9 mV
Temperature	16.95 °C
Pre Measurement	230.7 mV
Post Measurement	235.7 mV

[redacted]

Serial Number	685798
Last Calibrated	Factory Defaults

[redacted]

Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/20/2020

Sensor	**Conductivity**
Serial Number	694426
Last Calibrated	4/20/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.985
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,429.4 µS/cm
Specific Conductivity	7,572.9 µS/cm

Post Measurement

Actual Conductivity	6,792.0 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	2/28/2020

Calibration Details

Slope	0.9739164
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.66 mg/L
Temperature	21.16 °C
Barometric Pressure	855.02 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/20/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-6.9 mV
Temperature	17.09 °C

Pre Measurement

pH	7.32 pH
pH mV	-7.0 mV

Post Measurement

pH	7.02 pH
pH mV	-6.7 mV

Slope and Offset 1

Slope	-57.59 mV/pH
Offset	-5.8 mV

ORP

ORP Solution	Quick-Cal
Offset	13.3 mV
Temperature	17.09 °C
Pre Measurement	225.6 mV
Post Measurement	235.4 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/20/2020

[redacted]

Serial Number	636697
Last Calibrated	4/20/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.015
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,603.1 µS/cm
Specific Conductivity	7,873.6 µS/cm

Post Measurement

Actual Conductivity	6,709.1 µS/cm
Specific Conductivity	8,000.0 µS/cm

[redacted]

Serial Number	692497
Last Calibrated	2/3/2020

Calibration Details

Slope	1.052311
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.02 mg/L
Temperature	20.83 °C
Barometric Pressure	841.03 mbar

[redacted]

Serial Number	668361
Last Calibrated	4/20/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-12.9 mV
Temperature	16.55 °C

Pre Measurement

pH	7.07 pH
pH mV	-12.8 mV

Post Measurement

pH	7.02 pH
pH mV	-12.5 mV

Slope and Offset 1

Slope	-57.48 mV/pH
Offset	-11.7 mV

ORP

ORP Solution	Quick-Cal
Offset	19.1 mV
Temperature	16.55 °C
Pre Measurement	234.8 mV
Post Measurement	236.3 mV

Sensor

Serial Number	687457
Last Calibrated	Factory Defaults

Sensor

Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/21/2020

Sensor

Serial Number	694207
Last Calibrated	4/21/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.927
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,368.0 µS/cm
Specific Conductivity	8,000.1 µS/cm

Post Measurement

Actual Conductivity	6,367.9 µS/cm
Specific Conductivity	8,000.0 µS/cm

Serial Number	576371
Last Calibrated	4/21/2020

Calibration Details

Slope	1.132194
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.70 mg/L
Pre Measurement	94.76 %Sat
Post Measurement	100.00 %Sat
Temperature	16.35 °C
Barometric Pressure	1,018.2 mbar

Sensor

Serial Number	668471
Last Calibrated	4/21/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-15.1 mV
Temperature	14.32 °C

Pre Measurement

pH	7.10 pH
pH mV	-15.1 mV

Post Measurement

pH	7.03 pH
pH mV	-14.6 mV

Slope and Offset 1

Slope	-57.04 mV/pH
Offset	-13.4 mV

ORP

ORP Solution	Quick-Cal
Offset	20.2 mV
Temperature	14.32 °C
Pre Measurement	236.2 mV
Post Measurement	239.6 mV

Sensor	**Turbidity**
Serial Number	685798
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/21/2020

Sensor

Serial Number	694426
Last Calibrated	4/21/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.015
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,162.5 µS/cm
Specific Conductivity	7,857.3 µS/cm

Post Measurement

Actual Conductivity	6,274.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	510766
Last Calibrated	4/20/2020

Calibration Details

Slope	0.8635741
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.46 mg/L
Pre Measurement	112.80 %Sat
Post Measurement	100.00 %Sat
Temperature	16.56 °C
Barometric Pressure	851.77 mbar

Sensor

Serial Number	686970
Last Calibrated	4/21/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-9.6 mV
Temperature	13.71 °C

Pre Measurement

pH	7.07 pH
pH mV	-9.7 mV

Post Measurement

pH	7.03 pH
pH mV	-9.2 mV

Slope and Offset 1

Slope	-56.92 mV/pH
Offset	-7.9 mV

ORP

ORP Solution	Quick-Cal
Offset	12.7 mV
Temperature	13.71 °C
Pre Measurement	240.9 mV
Post Measurement	240.6 mV

Sensor	
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/21/2020

Sensor

Serial Number	694426
Last Calibrated	4/21/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.015
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,162.5 µS/cm
Specific Conductivity	7,857.3 µS/cm

Post Measurement

Actual Conductivity	6,274.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	510766
Last Calibrated	4/21/2020

Calibration Details

Slope	1.030382
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.64 mg/L
Pre Measurement	83.82 %Sat
Post Measurement	100.00 %Sat
Temperature	14.99 °C
Barometric Pressure	998.54 mbar

Sensor

Serial Number	686970
Last Calibrated	4/21/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-9.6 mV
Temperature	13.71 °C

Pre Measurement

pH	7.07 pH
pH mV	-9.7 mV

Post Measurement

pH	7.03 pH
pH mV	-9.2 mV

Slope and Offset 1

Slope	-56.92 mV/pH
Offset	-7.9 mV

ORP

ORP Solution	Quick-Cal
Offset	12.7 mV
Temperature	13.71 °C
Pre Measurement	240.9 mV
Post Measurement	240.6 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/21/2020

Sensor	**Conductivity**
Serial Number	636697
Last Calibrated	4/21/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.026
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,365.0 µS/cm
Specific Conductivity	7,934.2 µS/cm

Post Measurement

Actual Conductivity	6,417.9 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	692497
Last Calibrated	4/21/2020

Calibration Details

Slope	1.039501
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.31 mg/L
Pre Measurement	101.02 %Sat
Post Measurement	100.00 %Sat
Temperature	14.55 °C
Barometric Pressure	964.32 mbar

Sensor	**pH/ORP**
Serial Number	668361
Last Calibrated	4/21/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-16.6 mV
Temperature	14.65 °C

Pre Measurement

pH	7.09 pH
pH mV	-16.6 mV

Post Measurement

pH	7.03 pH
pH mV	-16.0 mV

Slope and Offset 1

Slope	-57.11 mV/pH
Offset	-14.9 mV

ORP

ORP Solution	Quick-Cal
Offset	22.5 mV
Temperature	14.65 °C
Pre Measurement	235.6 mV
Post Measurement	239.1 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/22/2020

Sensor	**Conductivity**
Serial Number	694207
Last Calibrated	4/22/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.931
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,110.3 µS/cm
Specific Conductivity	7,965.8 µS/cm

Post Measurement

Actual Conductivity	6,136.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	576371
Last Calibrated	4/22/2020

Calibration Details

Slope	1.15145
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.01 mg/L
Pre Measurement	98.34 %Sat
Post Measurement	100.00 %Sat
Temperature	15.43 °C
Barometric Pressure	1,051.6 mbar

Sensor	**pH/ORP**
Serial Number	668471
Last Calibrated	4/22/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-16.8 mV
Temperature	12.80 °C

Pre Measurement

pH	7.06 pH
pH mV	-16.5 mV

Post Measurement

pH	7.03 pH
pH mV	-16.1 mV

Slope and Offset 1

Slope	-56.74 mV/pH
Offset	-15.1 mV

ORP

ORP Solution	Quick-Cal
Offset	20.2 mV
Temperature	12.80 °C
Pre Measurement	241.5 mV
Post Measurement	241.9 mV

Sensor	**Turbidity**
Serial Number	685798
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/22/2020

Sensor	**Conductivity**
Serial Number	694426
Last Calibrated	4/22/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.976
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,336.2 µS/cm
Specific Conductivity	8,315.8 µS/cm

Post Measurement

Actual Conductivity	6,095.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	4/21/2020

Calibration Details

Slope	1.030382
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.64 mg/L
Pre Measurement	83.82 %Sat
Post Measurement	100.00 %Sat
Temperature	14.99 °C
Barometric Pressure	998.54 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/22/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-9.5 mV
Temperature	12.54 °C

Pre Measurement

pH	7.03 pH
pH mV	-9.5 mV

Post Measurement

pH	7.03 pH
pH mV	-9.1 mV

Slope and Offset 1

Slope	-56.69 mV/pH
Offset	-7.8 mV

ORP

ORP Solution	Quick-Cal
Offset	11.5 mV
Temperature	12.54 °C
Pre Measurement	243.4 mV
Post Measurement	242.3 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/22/2020

Sensor	**Conductivity**
Serial Number	694426
Last Calibrated	4/22/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.976
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,336.2 µS/cm
Specific Conductivity	8,315.8 µS/cm

Post Measurement

Actual Conductivity	6,095.5 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	4/22/2020

Calibration Details

Slope	1.02704
Offset	0.00 mg/L

Calibration point 100%

Concentration	10.11 mg/L
Pre Measurement	100.33 %Sat
Post Measurement	100.00 %Sat
Temperature	13.70 °C
Barometric Pressure	1,013.8 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/22/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-9.5 mV
Temperature	12.54 °C

Pre Measurement

pH	7.03 pH
pH mV	-9.5 mV

Post Measurement

pH	7.03 pH
pH mV	-9.1 mV

Slope and Offset 1

Slope	-56.69 mV/pH
Offset	-7.8 mV

ORP

ORP Solution	Quick-Cal
Offset	11.5 mV
Temperature	12.54 °C
Pre Measurement	243.4 mV
Post Measurement	242.3 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/22/2020

Sensor

Serial Number	636697
Last Calibrated	4/22/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.027
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,035.4 µS/cm
Specific Conductivity	7,986.2 µS/cm

Post Measurement

Actual Conductivity	6,045.8 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	692497
Last Calibrated	4/22/2020

Calibration Details

Slope	1.04686
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.05 mg/L
Pre Measurement	99.31 %Sat
Post Measurement	100.00 %Sat
Temperature	16.34 °C
Barometric Pressure	980.59 mbar

Sensor

Serial Number	668361
Last Calibrated	4/22/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-18.0 mV
Temperature	12.21 °C

Pre Measurement

pH	7.06 pH
pH mV	-17.9 mV

Post Measurement

pH	7.03 pH
pH mV	-17.2 mV

Slope and Offset 1

Slope	-56.62 mV/pH
Offset	-16.3 mV

ORP

ORP Solution	Quick-Cal
Offset	23.3 mV
Temperature	12.21 °C
Pre Measurement	242.0 mV
Post Measurement	242.8 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/23/2020

Sensor	**Conductivity**
Serial Number	694207
Last Calibrated	4/23/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.924
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,118.0 µS/cm
Specific Conductivity	8,061.0 µS/cm

Post Measurement

Actual Conductivity	6,071.7 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	576371
Last Calibrated	4/23/2020

Calibration Details

Slope	1.083887
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.10 mg/L
Pre Measurement	106.32 %Sat
Post Measurement	100.00 %Sat
Temperature	14.77 °C
Barometric Pressure	986.21 mbar

Sensor	**pH/ORP**
Serial Number	668471
Last Calibrated	4/23/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-16.8 mV
Temperature	12.38 °C

Pre Measurement

pH	7.03 pH
pH mV	-16.9 mV

Post Measurement

pH	7.03 pH
pH mV	-16.1 mV

Slope and Offset 1

Slope	-56.66 mV/pH
Offset	-15.1 mV

ORP

ORP Solution	Quick-Cal
Offset	21.7 mV
Temperature	12.38 °C
Pre Measurement	241.0 mV
Post Measurement	242.6 mV

Sensor	**Turbidity**
Serial Number	685798
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/23/2020

Sensor

Serial Number	694426
Last Calibrated	4/23/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.993
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,072.8 µS/cm
Specific Conductivity	7,859.4 µS/cm

Post Measurement

Actual Conductivity	6,181.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	510766
Last Calibrated	4/23/2020

Calibration Details

Slope	1.097928
Offset	0.00 mg/L

Calibration point 100%

Concentration	10.01 mg/L
Pre Measurement	93.62 %Sat
Post Measurement	100.00 %Sat
Temperature	13.83 °C
Barometric Pressure	1,075.6 mbar

Sensor

Serial Number	686970
Last Calibrated	4/23/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-9.0 mV
Temperature	13.10 °C

Pre Measurement

pH	7.02 pH
pH mV	-9.1 mV

Post Measurement

pH	7.03 pH
pH mV	-8.7 mV

Slope and Offset 1

Slope	-56.8 mV/pH
Offset	-7.3 mV

ORP

ORP Solution	Quick-Cal
Offset	10.7 mV
Temperature	13.10 °C
Pre Measurement	242.1 mV
Post Measurement	241.5 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/23/2020

Sensor

Serial Number	636697
Last Calibrated	4/23/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.002
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,255.6 µS/cm
Specific Conductivity	8,197.3 µS/cm

Post Measurement

Actual Conductivity	6,105.1 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	692497
Last Calibrated	4/23/2020

Calibration Details

Slope	1.042763
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.75 mg/L
Pre Measurement	100.40 %Sat
Post Measurement	100.00 %Sat
Temperature	12.90 °C
Barometric Pressure	976.41 mbar

Sensor

Serial Number	668361
Last Calibrated	4/23/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-18.6 mV
Temperature	12.60 °C

Pre Measurement

pH	7.04 pH
pH mV	-18.6 mV

Post Measurement

pH	7.03 pH
pH mV	-17.9 mV

Slope and Offset 1

Slope	-56.7 mV/pH
Offset	-16.9 mV

ORP

ORP Solution	Quick-Cal
Offset	24.7 mV
Temperature	12.60 °C
Pre Measurement	241.0 mV
Post Measurement	242.2 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/27/2020

Sensor

Serial Number	694207
Last Calibrated	4/27/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.93
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	5,952.2 µS/cm
Specific Conductivity	7,946.4 µS/cm

Post Measurement

Actual Conductivity	5,992.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	576371
Last Calibrated	4/27/2020

Calibration Details

Slope	1.077556
Offset	0.00 mg/L

Calibration point 100%

Concentration	10.00 mg/L
Pre Measurement	100.71 %Sat
Post Measurement	100.00 %Sat
Temperature	10.75 °C
Barometric Pressure	984.53 mbar

Sensor

Serial Number	668471
Last Calibrated	4/27/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-82.5 mV
Temperature	11.86 °C

Pre Measurement

pH	7.00 pH
pH mV	-15.2 mV

Post Measurement

pH	7.03 pH
pH mV	-78.8 mV

Slope and Offset 1

Slope	-56.55 mV/pH
Offset	-80.8 mV

ORP

ORP Solution	Quick-Cal
Offset	17.9 mV
Temperature	11.86 °C
Pre Measurement	245.5 mV
Post Measurement	243.3 mV

Sensor	**Turbidity**
Serial Number	685798
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/27/2020

Serial Number	694426
Last Calibrated	4/27/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.023
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,018.4 µS/cm
Specific Conductivity	7,802.3 µS/cm

Post Measurement

Actual Conductivity	6,170.9 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	4/27/2020

Calibration Details

Slope	1.094283
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.82 mg/L
Pre Measurement	100.29 %Sat
Post Measurement	100.00 %Sat
Temperature	14.84 °C
Barometric Pressure	1,075.6 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/27/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-10.0 mV
Temperature	13.03 °C

Pre Measurement

pH	7.05 pH
pH mV	-10.3 mV

Post Measurement

pH	7.03 pH
pH mV	-9.6 mV

Slope and Offset 1

Slope	-56.78 mV/pH
Offset	-8.3 mV

ORP

ORP Solution	Quick-Cal
Offset	9.7 mV
Temperature	13.03 °C
Pre Measurement	242.2 mV
Post Measurement	241.6 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/27/2020

Sensor	**Conductivity**
Serial Number	636697
Last Calibrated	4/27/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.074
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	5,768.8 µS/cm
Specific Conductivity	7,463.9 µS/cm

Post Measurement

Actual Conductivity	6,183.1 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	692497
Last Calibrated	4/23/2020

Calibration Details

Slope	1.042763
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.75 mg/L
Pre Measurement	100.40 %Sat
Post Measurement	100.00 %Sat
Temperature	12.90 °C
Barometric Pressure	976.41 mbar

Sensor	**pH/ORP**
Serial Number	668361
Last Calibrated	4/27/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-17.0 mV
Temperature	13.11 °C

Pre Measurement

pH	7.00 pH
pH mV	-17.0 mV

Post Measurement

pH	7.03 pH
pH mV	-16.3 mV

Slope and Offset 1

Slope	-56.8 mV/pH
Offset	-15.3 mV

ORP

ORP Solution	Quick-Cal
Offset	22.5 mV
Temperature	13.11 °C
Pre Measurement	243.6 mV
Post Measurement	241.5 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/28/2020

Sensor

Serial Number	694207
Last Calibrated	4/28/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.925
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,202.8 µS/cm
Specific Conductivity	8,039.5 µS/cm

Post Measurement

Actual Conductivity	6,172.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor

Serial Number	576371
Last Calibrated	4/28/2020

Calibration Details

Slope	1.062584
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.79 mg/L
Pre Measurement	101.25 %Sat
Post Measurement	100.00 %Sat
Temperature	12.12 °C
Barometric Pressure	981.54 mbar

Sensor

Serial Number	668471
Last Calibrated	4/28/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-12.0 mV
Temperature	13.04 °C

Pre Measurement

pH	7.21 pH
pH mV	-11.9 mV

Post Measurement

pH	7.03 pH
pH mV	-11.5 mV

Slope and Offset 1

Slope	-56.79 mV/pH
Offset	-10.3 mV

ORP

ORP Solution	Quick-Cal
Offset	17.2 mV
Temperature	13.04 °C
Pre Measurement	224.4 mV
Post Measurement	241.6 mV

Sensor	**Turbidity**
Serial Number	685798
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/28/2020

Sensor	**Conductivity**
Serial Number	694426
Last Calibrated	4/28/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,652.4 µS/cm
Specific Conductivity	8,232.9 µS/cm

Post Measurement

Actual Conductivity	6,464.2 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	4/28/2020

Calibration Details

Slope	1.089015
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.68 mg/L
Pre Measurement	100.47 %Sat
Post Measurement	100.00 %Sat
Temperature	15.60 °C
Barometric Pressure	1,072.2 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/28/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.03 pH
pH mV	-10.6 mV
Temperature	14.95 °C

Pre Measurement

pH	7.04 pH
pH mV	-10.7 mV

Post Measurement

pH	7.03 pH
pH mV	-10.3 mV

Slope and Offset 1

Slope	-57.17 mV/pH
Offset	-8.9 mV

ORP

ORP Solution	Quick-Cal
Offset	10.0 mV
Temperature	14.95 °C
Pre Measurement	238.0 mV
Post Measurement	238.7 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/28/2020

Sensor	**Conductivity**
Serial Number	636697
Last Calibrated	4/28/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.006
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,961.5 µS/cm
Specific Conductivity	8,544.8 µS/cm

Post Measurement

Actual Conductivity	6,517.7 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	692497
Last Calibrated	4/28/2020

Calibration Details

Slope	1.079634
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.38 mg/L
Pre Measurement	96.64 %Sat
Post Measurement	100.00 %Sat
Temperature	14.34 °C
Barometric Pressure	1,003.5 mbar

Sensor	**pH/ORP**
Serial Number	668361
Last Calibrated	4/28/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-15.4 mV
Temperature	15.30 °C

Pre Measurement

pH	7.00 pH
pH mV	-15.6 mV

Post Measurement

pH	7.02 pH
pH mV	-14.9 mV

Slope and Offset 1

Slope	-57.24 mV/pH
Offset	-14.2 mV

ORP

ORP Solution	Quick-Cal
Offset	22.1 mV
Temperature	15.30 °C
Pre Measurement	238.1 mV
Post Measurement	238.2 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	513586
Created	4/29/2020

Sensor	**Conductivity**
Serial Number	694207
Last Calibrated	4/29/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.924
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,650.2 µS/cm
Specific Conductivity	8,016.9 µS/cm

Post Measurement

Actual Conductivity	6,636.2 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	576371
Last Calibrated	4/29/2020

Calibration Details

Slope	1.065656
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.85 mg/L
Pre Measurement	99.72 %Sat
Post Measurement	100.00 %Sat
Temperature	16.23 °C
Barometric Pressure	973.13 mbar

Sensor	**pH/ORP**
Serial Number	668471
Last Calibrated	4/29/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-14.7 mV
Temperature	16.07 °C

Pre Measurement

pH	7.07 pH
pH mV	-14.6 mV

Post Measurement

pH	7.02 pH
pH mV	-14.2 mV

Slope and Offset 1

Slope	-57.39 mV/pH
Offset	-13.5 mV

ORP

ORP Solution	Quick-Cal
Offset	22.0 mV
Temperature	16.07 °C
Pre Measurement	233.3 mV
Post Measurement	237.0 mV

[redacted]

Serial Number	685798
Last Calibrated	Factory Defaults

[redacted]

Serial Number	513586
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/29/2020

[redacted]

Serial Number	636697
Last Calibrated	4/29/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.991
Reference Temperature	25.00 °C

[redacted]

Serial Number	692497
Last Calibrated	4/28/2020

Calibration Details

Slope	1.079634
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.38 mg/L
Pre Measurement	96.64 %Sat
Post Measurement	100.00 %Sat
Temperature	14.34 °C
Barometric Pressure	1,003.5 mbar

[redacted]

Serial Number	668361
Last Calibrated	4/29/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-18.5 mV
Temperature	16.96 °C

Slope and Offset 1

Slope	-57.57 mV/pH
Offset	-17.4 mV

ORP

ORP Solution	Quick-Cal
Offset	22.1 mV

Temperature	15.30 °C

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	518784
Created	4/30/2020

Sensor	**Conductivity**
Serial Number	694426
Last Calibrated	4/30/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.999
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,668.0 µS/cm
Specific Conductivity	8,008.6 µS/cm

Post Measurement

Actual Conductivity	6,660.8 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	510766
Last Calibrated	4/30/2020

Calibration Details

Slope	1.090105
Offset	0.00 mg/L

Calibration point 100%

Concentration	9.32 mg/L
Pre Measurement	99.93 %Sat
Post Measurement	100.00 %Sat
Temperature	17.38 °C
Barometric Pressure	1,072.2 mbar

Sensor	**pH/ORP**
Serial Number	686970
Last Calibrated	4/30/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-9.7 mV
Temperature	16.24 °C

Pre Measurement

pH	7.01 pH
pH mV	-9.7 mV

Post Measurement

pH	7.02 pH
pH mV	-9.4 mV

Slope and Offset 1

Slope	-57.42 mV/pH
Offset	-8.6 mV

ORP

ORP Solution	Quick-Cal
Offset	6.6 mV
Temperature	16.24 °C
Pre Measurement	240.1 mV
Post Measurement	236.7 mV

Sensor	**Turbidity**
Serial Number	694944
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	518784
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	611846
Created	4/30/2020

Sensor	**Conductivity**
Serial Number	636697
Last Calibrated	4/30/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.989
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,689.0 µS/cm
Specific Conductivity	8,021.4 µS/cm

Post Measurement

Actual Conductivity	6,671.2 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	692497
Last Calibrated	4/30/2020

Calibration Details

Slope	1.0597
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.88 mg/L
Pre Measurement	101.84 %Sat
Post Measurement	100.00 %Sat
Temperature	16.02 °C
Barometric Pressure	967.56 mbar

Sensor	**pH/ORP**
Serial Number	668361
Last Calibrated	4/30/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.02 pH
pH mV	-18.5 mV
Temperature	16.30 °C

Pre Measurement

pH	7.02 pH
pH mV	-18.4 mV

Post Measurement

pH	7.02 pH
pH mV	-17.9 mV

Slope and Offset 1

Slope	-57.43 mV/pH
Offset	-17.3 mV

ORP

ORP Solution	Quick-Cal
Offset	26.5 mV
Temperature	16.30 °C
Pre Measurement	232.2 mV
Post Measurement	236.6 mV

Sensor	**Turbidity**
Serial Number	687457
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	611846
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	532229
Created	6/11/2020

Sensor	**Conductivity**
Serial Number	673671
Last Calibrated	6/11/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.909
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,119.7 µS/cm
Specific Conductivity	7,667.7 µS/cm

Post Measurement

Actual Conductivity	7,428.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	505697
Last Calibrated	6/11/2020

Calibration Details

Slope	1.135173
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.94 mg/L
Pre Measurement	91.22 %Sat
Post Measurement	100.00 %Sat
Temperature	22.57 °C
Barometric Pressure	1,055.2 mbar

Sensor	**pH/ORP**
Serial Number	723185
Last Calibrated	6/11/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-2.1 mV
Temperature	21.26 °C

Pre Measurement

pH	7.00 pH
pH mV	-2.3 mV

Post Measurement

pH	7.00 pH
pH mV	-2.1 mV

Slope and Offset 1

Slope	-58.42 mV/pH
Offset	-2.1 mV

ORP

ORP Solution	Quick-Cal
Offset	8.9 mV
Temperature	21.26 °C
Pre Measurement	208.6 mV
Post Measurement	229.2 mV

Sensor	**Turbidity**
Serial Number	694713
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	532229
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	606751
Created	6/11/2020

Sensor	**Conductivity**
Serial Number	673662
Last Calibrated	6/11/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.996
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	6,949.2 µS/cm
Specific Conductivity	7,455.9 µS/cm

Post Measurement

Actual Conductivity	7,456.3 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	601548
Last Calibrated	6/11/2020

Calibration Details

Slope	1.053599
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.14 mg/L
Pre Measurement	99.20 %Sat
Post Measurement	100.00 %Sat
Temperature	20.62 °C
Barometric Pressure	968.59 mbar

Sensor	**pH/ORP**
Serial Number	723217
Last Calibrated	6/11/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-1.4 mV
Temperature	21.44 °C

Pre Measurement

pH	7.11 pH
pH mV	-1.7 mV

Post Measurement

pH	7.00 pH
pH mV	-1.4 mV

Slope and Offset 1

Slope	-58.45 mV/pH
Offset	-1.4 mV

ORP

ORP Solution	Quick-Cal
Offset	7.3 mV
Temperature	21.44 °C
Pre Measurement	224.7 mV
Post Measurement	228.9 mV

Sensor	**Turbidity**
Serial Number	694714
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	606751
Last Calibrated	Factory Defaults

Calibration Report

Instrument	Aqua TROLL 600
Serial Number	695538
Created	6/11/2020

Sensor	**Conductivity**
Serial Number	597011
Last Calibrated	6/11/2020

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	0.983
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	7,379.8 µS/cm
Specific Conductivity	7,957.3 µS/cm

Post Measurement

Actual Conductivity	7,419.4 µS/cm
Specific Conductivity	8,000.0 µS/cm

Sensor	**RDO**
Serial Number	592232
Last Calibrated	6/11/2020

Calibration Details

Slope	0.8820723
Offset	0.00 mg/L

Calibration point 100%

Concentration	8.33 mg/L
Pre Measurement	116.78 %Sat
Post Measurement	100.00 %Sat
Temperature	21.34 °C
Barometric Pressure	845.08 mbar

Sensor	**pH/ORP**
Serial Number	723182
Last Calibrated	6/11/2020

Calibration Details

Calibration Point 1

pH of Buffer	7.00 pH
pH mV	-0.8 mV
Temperature	21.20 °C

Pre Measurement

pH	6.94 pH
pH mV	-0.8 mV

Post Measurement

pH	7.00 pH
pH mV	-0.8 mV

Slope and Offset 1

Slope	-58.41 mV/pH
Offset	-0.8 mV

ORP

ORP Solution	Quick-Cal
Offset	5.4 mV
Temperature	21.20 °C
Pre Measurement	230.3 mV
Post Measurement	229.3 mV

Sensor	**Turbidity**
Serial Number	622098
Last Calibrated	Factory Defaults

Sensor	**Barometric Pressure**
Serial Number	695538
Last Calibrated	Factory Defaults

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APPENDIX E

Investigation-Derived Waste Documentation

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E.1 Characterization and Disposal Plan, Dated June 25, 2020

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June 25, 2020

Ms. Katie Tait, OHARNG
Camp James A. Garfield - Environmental Office
1438 State Route 534 SW
Newton Falls, OH 44444

Subject: **April 2020 Facility-wide Groundwater Monitoring Program Sampling - Investigation-Derived Waste (IDW) Characterization and Disposal Plan**
Reference: **Contract No. W912QR-16-D-0003, Delivery Order No. W912QR-18-F-0337, Groundwater Investigation and Reporting Services, RVAAP Restoration Program**

Dear Ms. Tait:

Investigative activities in accordance with the *Facility-wide Groundwater Monitoring Addendum for 2020* were performed from April 13, 2020 through April 30, 2020 and on June 11, 2020. These activities have resulted in the generation of liquid IDW (consisting of purge water and equipment decontamination fluids). The purpose of this letter is to characterize and classify IDW for disposal and to propose methods for disposing of the IDW.

This letter report includes a summary of IDW generated, the origin of the IDW and proposed classification and recommendations for disposal of the IDW (Table 1), a summary of the analytical results (Attachment A), and the laboratory data package (Attachment B). In addition to the specified plans, this letter report follows guidance established by the *Facility-Wide Sampling and Analysis Plan* (USACE 2011) (herein referred to at the Facility-wide SAP).

One IDW stream was generated as part of the field activities. The waste stream was composited and sampled per requirements outlined in Section 8.0 of the Facility-wide SAP.

IDW stream generated is:

- Fifteen (15), 55 gallon drums containing approximately 661 gallons of groundwater well purge water and equipment decontamination fluids (liquinox wash water, 10% nitric acid, isopropanol, and deionized water)

<u>Liquid IDW Discussion</u>

Per Section 8.4 of the Facility-wide SAP, one composite waste sample was collected for laboratory analysis of 1) metals, herbicides, pesticides, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) using the Toxicity Characteristic Leaching Procedure (TCLP) and 2) total PCBs, total sulfide, total cyanide, nitrate/nitrite, corrosivity (pH), and flashpoint to characterize the waste for disposal. Sample FWGIDW-200401-WW was collected to characterize the liquid drums containing groundwater well purge water and equipment decontamination fluids [liquinox wash water,

10% nitric acid, isopropanol, and deionized (DI) water]. Upon receipt from the laboratory, the analytical results were reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 8-1: Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24) and Table 8-2: Maximum Concentration of Hazardous Waste Characterization Analytes (40 *CFR* 261.21-23) presented in the Facility-wide SAP (USACE 2011), as well as other applicable Resource Conservation Recovery Act (RCRA) Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment A, Table A.1 presents the analytical laboratory data for the liquid IDW sample. The results are summarized below:

1) All analytical results were below the Maximum Concentration for Toxicity Characteristic per 40 *CFR* 261.24;
2) The sample had nondetectable concentrations for all PCBs analyzed;
3) The pH for the IDW is considered neutral (2 S.U. < pH < 12.5 S.U.);
4) The flash point is >60ûC (140ûF).

Given the observed analytical results, it is recommended that the liquid IDW be classified as non-hazardous, non-contaminated.

Recommended Disposal Pathways for IDW

Table 1 presents the disposal pathway identified as a result of IDW characterization data. This IDW has been characterized under provisions of the Facility-Wide SAP and in accordance with RCRA using TCLP analyses and generator knowledge. Leidos recommends that all IDW be disposed of as non-hazardous, non-contaminated waste to be transported offsite to a permitted municipal wastewater facility.

Since the former RVAAP, under RCRA, is the generator of this material, Leidos requests concurrence or direction on the waste classification. Following your concurrence, we will proceed with generating a waste profile, waste manifest (or bill-of-lading), and coordinating waste disposal.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 405-5802.

Leidos

Jed Thomas, P.E.
Deputy Project Manager

cc: Kevin Sedlak, ARNG, Camp James A. Garfield
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Heather Adams, Leidos
Gabby Gromofsky, Leidos

Table 1. Summary of Sampled Investigation-Derived Wastes and Disposal Recommendation

Container Number	Container Type and Size	Contents	Generation Date	Sample ID	Date(s) Sampled	Disposal Recommendation
Leidos-FWGW-026-L	55 Gallon, Steel, Open Top Drum	Purge Water, Equipment Decon Fluids – 44 gal	4/21/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-027-L	55 Gallon, Steel, Open Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-028-L	55 Gallon, Steel, Open Top Drum	Purge Water, Equipment Decon Fluids – 44 gal	4/22/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-029-L	55 Gallon, Steel, Open Top Drum	Purge Water, Equipment Decon Fluids – 44 gal	4/22/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-030-L	55 Gallon, Steel, Open Top Drum	Purge Water, Equipment Decon Fluids – 44 gal	4/23/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-031-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-032-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-033-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-034-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-035-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 45 gal	4/27/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-036-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 44 gal	4/30/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-037-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 46 gal	4/28/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-038-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 48 gal	4/29/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-039-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 47 gal	4/29/20	FWGIDW-200401-WW	4/30/20	Permitted Municipal Wastewater Facility
Leidos-FWGW-040-L	55 Gallon, Steel, Closed Top Drum	Purge Water, Equipment Decon Fluids – 30 gal	6/11/20	See Note 2		Permitted Municipal Wastewater Facility

Note 1: Drum Leidos-FWGW-040-L was generated after the waste stream was sampled on 4/29/20. Using generator knowledge that the waste stream in Leidos-FWGW-040-L is characteristically similar to the IDW sample, Leidos-FWGW-040-L is characterized as Nonhazardous, Noncontaminated waste.

ATTACHMENT A
ANALYTICAL RESULTS

Table A.1. Liquid IDW Sample Results (FWGIDW-200401-WW)

Analyte	CAS Number	Units	Specific Method	Basis	Regulatory Level Citation	Regulatory Level	Sample Result
Arsenic	7440-38-2	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.075 U
Barium	7440-39-3	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	100	0.016 J
Cadmium	7440-43-9	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	1	<0.009 U
Chromium	7440-47-3	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	0.0032 J
Lead	7439-92-1	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.045 U
Mercury	7439-97-6	mg/L	Mercury (CVAA)	TCLP	40 CFR 261.24	0.2	<0.00008 U
Selenium	7782-49-2	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	1	<0.095 U
Silver	7440-22-4	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.025 U
2,4-D	94-75-7	mg/L	Herbicides (GC)	TCLP	40 CFR 261.24	10	<0.018 U
Silvex (2,4,5-TP)	93-72-1	mg/L	Herbicides (GC)	TCLP	40 CFR 261.24	1	<0.0058 U
Chlordane (technical)	57-74-9	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.03	<0.0039 U
Endrin	72-20-8	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.02	<0.0002 U
Heptachlor	76-44-8	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.008	<0.0002 U
Heptachlor epoxide	1024-57-3	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.008	<0.0002 U
Methoxychlor	72-43-5	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	10	<0.00049 UQ
Toxaphene	8001-35-2	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.5	<0.0074 U
gamma-BHC (Lindane)	58-89-9	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.4	<0.0002 U
1,4-Dichlorobenzene	106-46-7	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	7.5	<0.005 U
2,4,5-Trichlorophenol	95-95-4	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	400	<0.01 U
2,4,6-Trichlorophenol	88-06-2	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	2	<0.01 U
2,4-Dinitrotoluene	121-14-2	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.13	<0.01 U
2-Methylphenol (o-cresol)	95-48-7	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.01 U
3 & 4 Methylphenol (m,p-cresol)	15831-10-4	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.02 UM
Hexachlorobenzene	118-74-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.13	<0.01 U
Hexachlorobutadiene	87-68-3	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.15 U
Hexachloroethane	67-72-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	3	<0.15 U
Nitrobenzene	98-95-3	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	2	<0.005 U
Pentachlorophenol	87-86-5	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	100	<0.08 U
Pyridine	110-86-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	5	<0.1 UM
1,1-Dichloroethene	75-35-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.7	<0.004 U
1,2-Dichloroethane	107-06-2	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.004 U
2-Butanone (MEK)	78-93-3	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.032 U
Benzene	71-43-2	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.002 U
Carbon tetrachloride	56-23-5	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.004 U
Chlorobenzene	108-90-7	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	100	<0.002 U
Chloroform	67-66-3	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	6	0.0025 J
Tetrachloroethene	127-18-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.7	<0.004 U
Trichloroethene	79-01-6	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.002 U

Table A.1. Liquid IDW Sample Results (FWGIDW-200401-WW)

Analyte	CAS Number	Units	Specific Method	Basis	Regulatory Level Citation	Regulatory Level	Sample Result
Vinyl chloride	75-01-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.2	<0.008 U
PCB-1016	12674-11-2	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.0004 UQ
PCB-1221	11104-28-2	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.00025 UQ
PCB-1232	11141-16-5	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.0006 UQ
PCB-1242	53469-21-9	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.001 UQ
PCB-1248	12672-29-6	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.0003 UQ
PCB-1254	11097-69-1	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.00025 UQ
PCB-1260	11096-82-5	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.0004 UQ
PCB-1262	37324-23-5	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.0005 UQ
PCB-1268	11100-14-4	ug/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50,000	<0.001 UQ
Flashpoint	N/A	Deg C	Ignitability, Pensky-Martens Closed-Cup Method	Total	40 CFR 261.21	>60ûC (140ûF)	>72ûC (160ûF)
Cyanide, Total	57-12-5	mg/L	Cyanide, Total	Total	40 CFR 261.23	See Note 1	<0.01 U
Sulfide, Total	18496-25-8	mg/L	Sulfide, Acid Soluble and Insoluble (Titrimetric)	Total	40 CFR 261.23	See Note 1	<1.9 U
pH adj. to 25 deg C	N/A	SU	pH	Total	40 CFR 261.22	2 ≤ pH ≤ 12.5	7.6 HF
Nitrate as N	14797-55-8	mg/L	Anions, Ion Chromatography	Total	NA	---	15 DH
Nitrite as N	14797-65-0	mg/L	Anions, Ion Chromatography	Total	NA	---	0.48 J
Temperature	N/A	Deg C	Temperature	Total	NA	---	22 HF

All analyses were from sample collected on 4/30/20 under sample ID FWGIDW-200401-WW.
Waste with PCB concentrations greater than 50 ppm (mg/L) [or 50,000 ppb (ug/L)] are regulated and to be disposed in accordance with the Toxic Substances Control Act (TSCA).
Note 1: The US Environmental Protection Agency requires generators to use their knowledge to make a D003 determination per CFR 261.23(a)(5) for cyanide or sulfide-bearing wastes.
--- = No regulatory standards for determination of hazardous waste exist.
D = The reported value is from a dilution.
H-Sample was prepped or analyzed beyond the specified holding time.
HF = Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
M-Manual integrated compound.
Q = One or more laboratory quality control criteria failed.
U = Non-detect, concentration reported is reporting limit - Lab Qualifier

ATTACHMENT B
LABORATORY ANALYTICAL REPORTS

Job Number: P010216426: Containing Samples FWGIDW-200401-WW

eurofins | Environment Testing America

ANALYTICAL REPORT

Job Number: 280-136118-2

Job Description: Leidos RFP# 001088 - Ravenna AAP-66

For:
Leidos, Inc.
Picatinny Arsenal
356 Ninth Avenue
Suite 106
Dover, NJ 07801

Attention: Rita Schmon-Stasik

Approved for release.
Donna R Rydberg
Senior Project Manager
5/28/2020 7:02 PM

Donna R Rydberg, Senior Project Manager
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0192
donna.rydberg@testamericainc.com
05/28/2020

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Eurofins TestAmerica, Denver
4955 Yarrow Street, Arvada, CO 80002
Tel (303) 736-0100 Fax (303) 431-7171 www.testamericainc.com

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
D	The reported value is from a dilution.
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

CASE NARRATIVE

Client: Leidos, Inc.

Project: Leidos RFP# 001088 - Ravenna AAP-66

Report Number: 280-136118-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT
The samples were received on 5/1/2020 at 8:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.0º C and 2.9º C.

This report contains the data for the IDW sample. All other samples listed on the COCs were reported under job 280-136118-1.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for TCLP volatile organic compounds (GC-MS) in accordance with 1311. The samples were leached on 05/04/2020 and analyzed on 05/14/2020.

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

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with 8270D. The samples were leached on 05/04/2020, prepared on 05/05/2020 and analyzed on 05/11/2020.

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

ORGANOCHLORINE PESTICIDES (GC)
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for Organochlorine Pesticides (GC) in accordance with EPA SW-846 Method 1311/8081B. The samples were leached on 05/04/2020, prepared on 05/11/2020 and analyzed on 05/14/2020.

The continuing calibration verification (CCV) associated with batch 280-494815 recovered outside control limits for DCB Decachlorobiphenyl on the back column low. DCB was in control on the front column and was reported from the front column. Methoxychlor recovered high on both columns. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

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

POLYCHLORINATED BIPHENYLS (PCBS)
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for polychlorinated biphenyls (PCBs) in accordance with SW-846 8082A. The samples were prepared on 05/04/2020 and analyzed on 05/19/2020.

DCB Decachlorobiphenyl failed the surrogate recovery criteria low in sample FWGIDW-200401-WW (280-136118-5). The recovery for surrogate Tetrachloro-m-xylene was in control. Refer to the QC report for details.

The following samples required a sulfuric acid clean-up, via EPA Method 3665A, to reduce matrix interferences: FWGIDW-200401-WW (280-136118-5), (LCS 280-493627/4-A), (LCSD 280-493627/5-A) and (MB 280-493627/1-A).

The following sample required a mercury clean-up, via EPA Method 3660A, to reduce matrix interferences caused by sulfur: FWGIDW-200401-WW (280-136118-5). The reagent lot number used was: SLBZ1323. QC was also mercury cleaned for batch precision.

The continuing calibration verification (CCV) associated with batch 280-495259 recovered outside acceptance criteria, low biased, for PCB-1016, PCB-1260, Tetrachloro-m-xylene and DCB Decachlorobiphenyl on the front (primary) column, but was in control on the back

(confirmation column). Since the associated samples were non-detect for this analyte, the data have been reported from the in control column.

Sequence goes:
CCVIS in control on both columns
CCV/34 front column low biased all compounds; back column in control all compounds.
MB,LCS,LCSD
280-136118-5
CCV/47 front column low biased all compounds; back column in control all compounds

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

TCLP CHLORINATED HERBICIDES
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for TCLP chlorinated herbicides in accordance with EPA SW-846 Methods 1311/8151A. The samples were leached on 05/04/2020, prepared on 05/05/2020 and analyzed on 05/12/2020.

The initial calibration verification (ICV) result for batch 280-494359 was above the upper control limit. Sample results were non-detects, and have been reported as qualified data. FWGIDW-200401-WW (280-136118-5), (280-136118-A-5-G MS) and (280-136118-A-5-H MSD)

Dinoseb: Front column 38.6% limit 15%, back column 55.9% limit 15%
2,4,5-TP (Silvex): Front column 17.2% limit 15%, back column in control

The continuing calibration verification (CCV) associated with batch 280-494359 recovered above the upper control limit for list below. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

23 CCV:
2,4,5-TP (Silvex): Front column 17.9% limit 15%, back column in control

30 CCV:
2,4,5-T: Front column in control, back column 15.5% limit 15%

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

TCLP METALS
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for TCLP metals in accordance with EPA SW846 Methods 1311/6010C. The samples were leached on 05/04/2020, prepared on 05/15/2020 and analyzed on 05/19/2020.

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

TCLP MERCURY
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for TCLP mercury in accordance with SW-846 1311/7470. The samples were leached on 05/04/2020, and prepared and analyzed on 05/21/2020.

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

IGNITABILITY
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for ignitability in accordance with EPA SW-846 Method 1010. The samples were analyzed on 05/07/2020.

The following sample is not associated with a duplicate as none of the samples in the batch had a detectable flash point: FWGIDW-200401-WW (280-136118-5).

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

CYANIDE, TOTAL
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for Cyanide, Total in accordance with 9012B. The samples were prepared on 05/12/2020 and analyzed on 05/13/2020.

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

SULFIDE
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 05/04/2020.

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

CORROSIVITY (PH)
Sample FWGIDW-200401-WW (280-136118-5) was analyzed for Corrosivity (pH) in accordance with EPA SW-846 9040C. The samples

were analyzed on 05/01/2020.

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

ANIONS (48 HOURS)

Sample FWGIDW-200401-WW (280-136118-5) was analyzed for anions (48 hours) in accordance with 9056A. The samples were analyzed on 05/01/2020 and 05/06/2020.

Sample FWGIDW-200401-WW (280-136118-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly. This dilution was performed outside hold times. The client was notified on 5/7/2020 and directed the laboratory to report both sets of data.

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

Detection Summary

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Client Sample ID: FWGIDW-200401-WW
Lab Sample ID: 280-136118-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Chloroform	0.0025	J	0.010	0.0020	0.0016	mg/L	1		8260B	TCLP
Barium	0.016	J	1.0	0.010	0.0040	mg/L	1		6010C	TCLP
Chromium	0.0032	J	0.50	0.013	0.0030	mg/L	1		6010C	TCLP
Flashpoint	>160		1.00	1.00	1.00	Degrees F	1		1010A	Total/NA
pH adj. to 25 deg C	7.6	HF	0.1	0.1	0.1	SU	1		9040C	Total/NA
Temperature	22.0	HF	1.0	1.0	1.0	Degrees C	1		9040C	Total/NA
Nitrate as N	17	J1	0.50	0.20	0.090	mg/L	1		9056A	Total/NA
Nitrate as N	15	D H	2.5	1.0	0.45	mg/L	5		9056A	Total/NA
Nitrite as N	0.48	J	0.50	0.10	0.049	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1-Dichloroethene	0.0040	U	0.010	0.0040	0.0023	mg/L		05/14/20 02:04	1
1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013	mg/L		05/14/20 02:04	1
2-Butanone (MEK)	0.032	U	0.10	0.032	0.020	mg/L		05/14/20 02:04	1
Benzene	0.0020	U	0.010	0.0020	0.0016	mg/L		05/14/20 02:04	1
Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019	mg/L		05/14/20 02:04	1
Chlorobenzene	0.0020	U	0.010	0.0020	0.0017	mg/L		05/14/20 02:04	1
Chloroform	**0.0025**	**J**	0.010	0.0020	0.0016	mg/L		05/14/20 02:04	1
Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020	mg/L		05/14/20 02:04	1
Trichloroethene	0.0020	U	0.010	0.0020	0.0016	mg/L		05/14/20 02:04	1
Vinyl chloride	0.0080	U	0.010	0.0080	0.0010	mg/L		05/14/20 02:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*64 - 129*		*05/14/20 02:04*	*1*
4-Bromofluorobenzene (Surr)	*105*		*78 - 121*		*05/14/20 02:04*	*1*
Dibromofluoromethane (Surr)	*100*		*79 - 119*		*05/14/20 02:04*	*1*
Toluene-d8 (Surr)	*102*		*78 - 120*		*05/14/20 02:04*	*1*

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

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.050	0.0050	0.0015	mg/L		05/11/20 21:00	1
2,4,5-Trichlorophenol	0.010	U	0.10	0.010	0.0026	mg/L		05/11/20 21:00	1
2,4,6-Trichlorophenol	0.010	U	0.10	0.010	0.0037	mg/L		05/11/20 21:00	1
2,4-Dinitrotoluene	0.010	U	0.10	0.010	0.0047	mg/L		05/11/20 21:00	1
2-Methylphenol	0.010	U	0.050	0.010	0.0028	mg/L		05/11/20 21:00	1
3 & 4 Methylphenol	0.020	U M	0.10	0.020	0.0051	mg/L		05/11/20 21:00	1
Hexachlorobenzene	0.010	U	0.050	0.010	0.0048	mg/L		05/11/20 21:00	1
Hexachlorobutadiene	0.15	U	0.15	0.15	0.038	mg/L		05/11/20 21:00	1
Hexachloroethane	0.15	U	0.15	0.15	0.038	mg/L		05/11/20 21:00	1
Nitrobenzene	0.0050	U	0.10	0.0050	0.0022	mg/L		05/11/20 21:00	1
Pentachlorophenol	0.080	U	0.40	0.080	0.028	mg/L		05/11/20 21:00	1
Pyridine	0.10	U M	0.10	0.10	0.025	mg/L		05/11/20 21:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*75*		*51 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*
2-Fluorobiphenyl	*82*		*49 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*
2-Fluorophenol (Surr)	*83*		*50 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*
Nitrobenzene-d5 (Surr)	*82*		*51 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*
Phenol-d5 (Surr)	*78*		*47 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*
Terphenyl-d14 (Surr)	*111*		*56 - 120*	*05/05/20 12:33*	*05/11/20 21:00*	*1*

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

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Endrin	0.00020	U	0.00049	0.00020	0.000077	mg/L		05/14/20 13:37	1

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

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Heptachlor	0.00020	U	0.00049	0.00020	0.000075	mg/L		05/14/20 13:37	1
Heptachlor epoxide	0.00020	U	0.00049	0.00020	0.000074	mg/L		05/14/20 13:37	1
gamma-BHC (Lindane)	0.00020	U	0.00049	0.00020	0.000068	mg/L		05/14/20 13:37	1
Methoxychlor	0.00049	U Q	0.00098	0.00049	0.00013	mg/L		05/14/20 13:37	1
Toxaphene	0.0074	U	0.020	0.0074	0.0036	mg/L		05/14/20 13:37	1
Chlordane (technical)	0.0039	U	0.0049	0.0039	0.0014	mg/L		05/14/20 13:37	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*56*		*28 - 115*	*05/11/20 19:22*	*05/14/20 13:37*	*1*
DCB Decachlorobiphenyl	*71*		*34 - 122*	*05/11/20 19:22*	*05/14/20 13:37*	*1*

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

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016	0.40	U Q M	1.0	0.40	0.12	ug/L		05/19/20 03:26	1
PCB-1221	0.25	U Q	1.0	0.25	0.22	ug/L		05/19/20 03:26	1
PCB-1232	0.60	U Q M	1.0	0.60	0.17	ug/L		05/19/20 03:26	1
PCB-1242	1.0	U Q	1.0	1.0	0.42	ug/L		05/19/20 03:26	1
PCB-1248	0.30	U Q	1.0	0.30	0.092	ug/L		05/19/20 03:26	1
PCB-1254	0.25	U Q	1.0	0.25	0.11	ug/L		05/19/20 03:26	1
PCB-1260	0.40	U Q	1.0	0.40	0.16	ug/L		05/19/20 03:26	1
PCB-1262	0.50	U Q	1.0	0.50	0.22	ug/L		05/19/20 03:26	1
PCB-1268	1.0	U Q	1.0	1.0	0.37	ug/L		05/19/20 03:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*55*		*25 - 120*	*05/04/20 15:26*	*05/19/20 03:26*	*1*
DCB Decachlorobiphenyl	*19*	*Q*	*30 - 136*	*05/04/20 15:26*	*05/19/20 03:26*	*1*

Method: 8151A DOD - Herbicides (GC) - TCLP

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
2,4-D	0.018	U	0.039	0.018	0.0051	mg/L		05/12/20 10:11	1
Silvex (2,4,5-TP)	0.0058	U	0.0097	0.0058	0.0017	mg/L		05/12/20 10:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*73*		*10 - 131*	*05/05/20 11:11*	*05/12/20 10:11*	*1*

Method: 6010C - Metals (ICP) - TCLP

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.075	U	0.50	0.075	0.022	mg/L		05/19/20 01:43	1
Barium	**0.016**	**J**	1.0	0.010	0.0040	mg/L		05/19/20 01:43	1
Cadmium	0.0090	U	0.10	0.0090	0.0020	mg/L		05/19/20 01:43	1

Method: 6010C - Metals (ICP) - TCLP (Continued)

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chromium	**0.0032**	**J**	0.50	0.013	0.0030	mg/L		05/19/20 01:43	1
Lead	0.045	U	0.50	0.045	0.014	mg/L		05/19/20 01:43	1
Selenium	0.095	U	0.10	0.095	0.032	mg/L		05/19/20 01:43	1
Silver	0.025	U	0.50	0.025	0.0098	mg/L		05/19/20 01:43	1

Method: 7470A - Mercury (CVAA) - TCLP

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.000080	U	0.0020	0.000080	0.000030	mg/L		05/21/20 16:34	1

General Chemistry

Client Sample ID: FWGIDW-200401-WW **Lab Sample ID: 280-136118-5**
Date Collected: 04/30/20 14:00 **Matrix: Water**
Date Received: 05/01/20 08:35

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint	**>160**		1.00	1.00	1.00	Degrees F		05/07/20 09:55	1
Cyanide, Total	0.010	U	0.010	0.010	0.0050	mg/L		05/13/20 12:24	1
Sulfide	1.9	U	4.0	1.9	0.79	mg/L		05/04/20 11:30	1
pH adj. to 25 deg C	**7.6**	**HF**	0.1	0.1	0.1	SU		05/01/20 21:09	1
Temperature	**22.0**	**HF**	1.0	1.0	1.0	Degrees C		05/01/20 21:09	1
Nitrate as N	**17**	**J1**	0.50	0.20	0.090	mg/L		05/01/20 14:22	1
Nitrate as N	**15**	**D H**	2.5	1.0	0.45	mg/L		05/06/20 01:01	5
Nitrite as N	**0.48**	**J**	0.50	0.10	0.049	mg/L		05/01/20 14:22	1

Default Detection Limits

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Method: 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Leach: 1311

Analyte	LOQ	DL	Units
1,1-Dichloroethene	0.010	0.0023	mg/L
1,2-Dichloroethane	0.010	0.0013	mg/L
2-Butanone (MEK)	0.10	0.020	mg/L
Benzene	0.010	0.0016	mg/L
Carbon tetrachloride	0.010	0.0019	mg/L
Chlorobenzene	0.010	0.0017	mg/L
Chloroform	0.010	0.0016	mg/L
Tetrachloroethene	0.010	0.0020	mg/L
Trichloroethene	0.010	0.0016	mg/L
Vinyl chloride	0.010	0.0010	mg/L

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

Prep: 3510C
Leach: 1311

Analyte	LOQ	DL	Units
1,4-Dichlorobenzene	0.050	0.0015	mg/L
2,4,5-Trichlorophenol	0.10	0.0026	mg/L
2,4,6-Trichlorophenol	0.10	0.0037	mg/L
2,4-Dinitrotoluene	0.10	0.0047	mg/L
2-Methylphenol	0.050	0.0028	mg/L
3 & 4 Methylphenol	0.10	0.0051	mg/L
Hexachlorobenzene	0.050	0.0048	mg/L
Hexachlorobutadiene	0.15	0.038	mg/L
Hexachloroethane	0.15	0.038	mg/L
Nitrobenzene	0.10	0.0022	mg/L
Pentachlorophenol	0.40	0.028	mg/L
Pyridine	0.10	0.025	mg/L

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

Prep: 3510C
Leach: 1311

Analyte	LOQ	DL	Units
Chlordane (technical)	0.0050	0.0014	mg/L
Endrin	0.00050	0.000079	mg/L
gamma-BHC (Lindane)	0.00050	0.000069	mg/L
Heptachlor	0.00050	0.000077	mg/L
Heptachlor epoxide	0.00050	0.000075	mg/L
Methoxychlor	0.0010	0.00013	mg/L
Toxaphene	0.020	0.0037	mg/L

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

Prep: 3510C

Analyte	LOQ	DL	Units
PCB-1016	1.0	0.12	ug/L
PCB-1221	1.0	0.21	ug/L
PCB-1232	1.0	0.17	ug/L
PCB-1242	1.0	0.42	ug/L
PCB-1248	1.0	0.092	ug/L
PCB-1254	1.0	0.11	ug/L
PCB-1260	1.0	0.16	ug/L
PCB-1262	1.0	0.22	ug/L

Default Detection Limits

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

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

Prep: 3510C

Analyte	LOQ	DL	Units
PCB-1268	1.0	0.36	ug/L

Method: 8151A DOD - Herbicides (GC) - TCLP

Prep: 8151A
Leach: 1311

Analyte	LOQ	DL	Units
2,4-D	0.040	0.0053	mg/L
Silvex (2,4,5-TP)	0.010	0.0017	mg/L

Method: 6010C - Metals (ICP) - TCLP

Prep: 3010A
Leach: 1311

Analyte	LOQ	DL	Units
Arsenic	0.50	0.022	mg/L
Barium	1.0	0.0040	mg/L
Cadmium	0.10	0.0020	mg/L
Chromium	0.50	0.0030	mg/L
Lead	0.50	0.014	mg/L
Selenium	0.10	0.032	mg/L
Silver	0.50	0.0098	mg/L

Method: 7470A - Mercury (CVAA) - TCLP

Prep: 7470A
Leach: 1311

Analyte	LOQ	DL	Units
Mercury	0.0020	0.000030	mg/L

General Chemistry

Analyte	LOQ	DL	Units
Flashpoint	1.00	1.00	Degrees F
pH adj. to 25 deg C	0.1	0.1	SU
Temperature	1.0	1.0	Degrees C
Nitrate as N	0.50	0.090	mg/L
Nitrite as N	0.50	0.049	mg/L

General Chemistry

Prep: 9012B

Analyte	LOQ	DL	Units
Cyanide, Total	0.010	0.0050	mg/L

General Chemistry

Prep: 9030B

Analyte	LOQ	DL	Units
Sulfide	4.0	0.79	mg/L

Surrogate Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Job ID: 280-136118-2

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(64-129)	(78-121)	(79-119)	(78-120)
280-136118-5	FWGIDW-200401-WW	107	105	100	102
LB3 280-493604/1-A	Method Blank	108	105	100	102
LCS 280-493604/2-A	Lab Control Sample	107	104	99	102
LCSD 280-493604/3-A	Lab Control Sample Dup	108	103	101	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

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

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	PHL	TPHL
Lab Sample ID	Client Sample ID	(51-120)	(49-120)	(50-120)	(51-120)	(47-120)	(56-120)
280-136118-5	FWGIDW-200401-WW	75	82	83	82	78	111
280-136118-5 MS	FWGIDW-200401-WW	86	79	81	81	77	116
280-136118-5 MSD	FWGIDW-200401-WW	87	78	75	75	72	115
LB3 280-493603/1-B	Method Blank	83	77	88	86	82	109
LCS 280-493603/2-B	Lab Control Sample	85	81	88	87	81	114

Surrogate Legend

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

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(28-115)	(34-122)
280-136118-5	FWGIDW-200401-WW	56	71
280-136118-5 MS	FWGIDW-200401-WW	58	72
280-136118-5 MS	FWGIDW-200401-WW	59	70
280-136118-5 MSD	FWGIDW-200401-WW	59	69
280-136118-5 MSD	FWGIDW-200401-WW	58	71
LB3 280-493603/1-H	Method Blank	53	78
LCS 280-493603/2-I	Lab Control Sample	61	77
LCS 280-493603/7-B	Lab Control Sample	49	66

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

Surrogate Summary

Client: Leidos, Inc. Job ID: 280-136118-2

Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX2	DCBP2
Lab Sample ID	Client Sample ID	(25-120)	(30-136)
280-136118-5	FWGIDW-200401-WW	55	19 Q

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(25-120)	(30-136)
LCS 280-493627/4-A	Lab Control Sample	61	66
LCSD 280-493627/5-A	Lab Control Sample Dup	60	66
MB 280-493627/1-A	Method Blank	51	58

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8151A DOD - Herbicides (GC)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA1
Lab Sample ID	Client Sample ID	(10-131)
280-136118-5	FWGIDW-200401-WW	73
280-136118-5 MS	FWGIDW-200401-WW	71
280-136118-5 MSD	FWGIDW-200401-WW	77
LB3 280-493603/1-E	Method Blank	73
LCS 280-493603/2-F	Lab Control Sample	79

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid

QC Sample Results

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Job ID: 280-136118-2

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: LB3 280-493604/1-A
Matrix: Water
Analysis Batch: 494783

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,1-Dichloroethene	0.0040	U	0.010	0.0040	0.0023	mg/L		05/14/20 00:17	1
1,2-Dichloroethane	0.0040	U	0.010	0.0040	0.0013	mg/L		05/14/20 00:17	1
2-Butanone (MEK)	0.032	U	0.10	0.032	0.020	mg/L		05/14/20 00:17	1
Benzene	0.0020	U	0.010	0.0020	0.0016	mg/L		05/14/20 00:17	1
Carbon tetrachloride	0.0040	U	0.010	0.0040	0.0019	mg/L		05/14/20 00:17	1
Chlorobenzene	0.0020	U	0.010	0.0020	0.0017	mg/L		05/14/20 00:17	1
Chloroform	0.0020	U	0.010	0.0020	0.0016	mg/L		05/14/20 00:17	1
Tetrachloroethene	0.0040	U	0.010	0.0040	0.0020	mg/L		05/14/20 00:17	1
Trichloroethene	0.0020	U	0.010	0.0020	0.0016	mg/L		05/14/20 00:17	1
Vinyl chloride	0.0080	U	0.010	0.0080	0.0010	mg/L		05/14/20 00:17	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*108*		*64 - 129*		*05/14/20 00:17*	*1*
4-Bromofluorobenzene (Surr)	*105*		*78 - 121*		*05/14/20 00:17*	*1*
Dibromofluoromethane (Surr)	*100*		*79 - 119*		*05/14/20 00:17*	*1*
Toluene-d8 (Surr)	*102*		*78 - 120*		*05/14/20 00:17*	*1*

Lab Sample ID: LCS 280-493604/2-A
Matrix: Water
Analysis Batch: 494783

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	0.250	0.203		mg/L		81	71 - 136
1,2-Dichloroethane	0.250	0.271		mg/L		108	70 - 135
2-Butanone (MEK)	1.00	1.09		mg/L		109	44 - 150
Benzene	0.250	0.238		mg/L		95	74 - 135
Carbon tetrachloride	0.250	0.234		mg/L		94	67 - 135
Chlorobenzene	0.250	0.255		mg/L		102	76 - 135
Chloroform	0.250	0.242		mg/L		97	76 - 120
Tetrachloroethene	0.250	0.231		mg/L		92	70 - 135
Trichloroethene	0.250	0.230		mg/L		92	73 - 135
Vinyl chloride	0.250	0.194		mg/L		78	40 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*107*		*64 - 129*
4-Bromofluorobenzene (Surr)	*104*		*78 - 121*
Dibromofluoromethane (Surr)	*99*		*79 - 119*
Toluene-d8 (Surr)	*102*		*78 - 120*

Lab Sample ID: LCSD 280-493604/3-A
Matrix: Water
Analysis Batch: 494783

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	0.250	0.183		mg/L		73	71 - 136	10	20
1,2-Dichloroethane	0.250	0.248		mg/L		99	70 - 135	9	20
2-Butanone (MEK)	1.00	0.995		mg/L		100	44 - 150	9	32
Benzene	0.250	0.212		mg/L		85	74 - 135	11	20

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

Lab Sample ID: LCSD 280-493604/3-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494783

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Carbon tetrachloride	0.250	0.213		mg/L		85	67 - 135	10	21
Chlorobenzene	0.250	0.233		mg/L		93	76 - 135	9	20
Chloroform	0.250	0.220		mg/L		88	76 - 120	10	20
Tetrachloroethene	0.250	0.207		mg/L		83	70 - 135	11	20
Trichloroethene	0.250	0.211		mg/L		84	73 - 135	9	20
Vinyl chloride	0.250	0.177		mg/L		71	40 - 144	9	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*64 - 129*
4-Bromofluorobenzene (Surr)	*103*		*78 - 121*
Dibromofluoromethane (Surr)	*101*		*79 - 119*
Toluene-d8 (Surr)	*101*		*78 - 120*

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

Lab Sample ID: LB3 280-493603/1-B **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494380 **Prep Batch: 493681**

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.050	0.0050	0.0015	mg/L		05/11/20 20:05	1
2,4,5-Trichlorophenol	0.010	U	0.10	0.010	0.0026	mg/L		05/11/20 20:05	1
2,4,6-Trichlorophenol	0.010	U	0.10	0.010	0.0037	mg/L		05/11/20 20:05	1
2,4-Dinitrotoluene	0.010	U	0.10	0.010	0.0047	mg/L		05/11/20 20:05	1
2-Methylphenol	0.010	U	0.050	0.010	0.0028	mg/L		05/11/20 20:05	1
3 & 4 Methylphenol	0.020	U	0.10	0.020	0.0051	mg/L		05/11/20 20:05	1
Hexachlorobenzene	0.010	U	0.050	0.010	0.0048	mg/L		05/11/20 20:05	1
Hexachlorobutadiene	0.15	U	0.15	0.15	0.038	mg/L		05/11/20 20:05	1
Hexachloroethane	0.15	U	0.15	0.15	0.038	mg/L		05/11/20 20:05	1
Nitrobenzene	0.0050	U	0.10	0.0050	0.0022	mg/L		05/11/20 20:05	1
Pentachlorophenol	0.080	U	0.40	0.080	0.028	mg/L		05/11/20 20:05	1
Pyridine	0.10	U M	0.10	0.10	0.025	mg/L		05/11/20 20:05	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*83*		*51 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*
2-Fluorobiphenyl	*77*		*49 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*
2-Fluorophenol (Surr)	*88*		*50 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*
Nitrobenzene-d5 (Surr)	*86*		*51 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*
Phenol-d5 (Surr)	*82*		*47 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*
Terphenyl-d14 (Surr)	*109*		*56 - 120*	*05/05/20 12:33*	*05/11/20 20:05*	*1*

Lab Sample ID: LCS 280-493603/2-B **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494380 **Prep Batch: 493681**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	0.250	0.182		mg/L		73	36 - 120
2,4,5-Trichlorophenol	0.250	0.225		mg/L		90	46 - 120

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

Lab Sample ID: LCS 280-493603/2-B **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494380 **Prep Batch: 493681**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4,6-Trichlorophenol	0.250	0.231		mg/L		92	43 - 120
2,4-Dinitrotoluene	0.100	0.0841	J	mg/L		84	36 - 120
2-Methylphenol	0.250	0.231		mg/L		92	45 - 120
3 & 4 Methylphenol	0.500	0.444		mg/L		89	44 - 120
Hexachlorobenzene	0.100	0.0887		mg/L		89	52 - 120
Hexachlorobutadiene	0.250	0.162		mg/L		65	35 - 120
Hexachloroethane	0.250	0.130	J	mg/L		52	35 - 120
Nitrobenzene	0.250	0.213		mg/L		85	50 - 120
Pentachlorophenol	0.500	0.371	J	mg/L		74	39 - 120
Pyridine	0.250	0.111		mg/L		45	10 - 121

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*85*		*51 - 120*
2-Fluorobiphenyl	*81*		*49 - 120*
2-Fluorophenol (Surr)	*88*		*50 - 120*
Nitrobenzene-d5 (Surr)	*87*		*51 - 120*
Phenol-d5 (Surr)	*81*		*47 - 120*
Terphenyl-d14 (Surr)	*114*		*56 - 120*

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494380 **Prep Batch: 493681**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	0.0050	U	0.250	0.178		mg/L		71	36 - 120
2,4,5-Trichlorophenol	0.010	U	0.250	0.239		mg/L		96	46 - 120
2,4,6-Trichlorophenol	0.010	U	0.250	0.226		mg/L		90	43 - 120
2,4-Dinitrotoluene	0.010	U	0.100	0.0853	J	mg/L		85	36 - 120
2-Methylphenol	0.010	U	0.250	0.210		mg/L		84	45 - 120
3 & 4 Methylphenol	0.020	U M	0.500	0.409		mg/L		82	44 - 120
Hexachlorobenzene	0.010	U	0.100	0.0861		mg/L		86	52 - 120
Hexachlorobutadiene	0.15	U	0.250	0.160		mg/L		64	35 - 120
Hexachloroethane	0.15	U	0.250	0.141	J	mg/L		57	35 - 120
Nitrobenzene	0.0050	U	0.250	0.191		mg/L		77	50 - 120
Pentachlorophenol	0.080	U	0.500	0.364	J	mg/L		73	39 - 120
Pyridine	0.10	U M	0.250	0.217		mg/L		87	10 - 121

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*86*		*51 - 120*
2-Fluorobiphenyl	*79*		*49 - 120*
2-Fluorophenol (Surr)	*81*		*50 - 120*
Nitrobenzene-d5 (Surr)	*81*		*51 - 120*
Phenol-d5 (Surr)	*77*		*47 - 120*
Terphenyl-d14 (Surr)	*116*		*56 - 120*

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

Lab Sample ID: 280-136118-5 MSD **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494380 **Prep Batch: 493681**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0050	U	0.250	0.160		mg/L		64	36 - 120	11	30
2,4,5-Trichlorophenol	0.010	U	0.250	0.236		mg/L		95	46 - 120	1	30
2,4,6-Trichlorophenol	0.010	U	0.250	0.216		mg/L		86	43 - 120	5	30
2,4-Dinitrotoluene	0.010	U	0.100	0.0814	J	mg/L		81	36 - 120	5	30
2-Methylphenol	0.010	U	0.250	0.188		mg/L		75	45 - 120	11	30
3 & 4 Methylphenol	0.020	U M	0.500	0.384		mg/L		77	44 - 120	6	30
Hexachlorobenzene	0.010	U	0.100	0.0826		mg/L		83	52 - 120	4	30
Hexachlorobutadiene	0.15	U	0.250	0.143	J	mg/L		57	35 - 120	12	30
Hexachloroethane	0.15	U	0.250	0.119	J	mg/L		48	35 - 120	17	30
Nitrobenzene	0.0050	U	0.250	0.181		mg/L		72	50 - 120	6	30
Pentachlorophenol	0.080	U	0.500	0.354	J	mg/L		71	39 - 120	3	30
Pyridine	0.10	U M	0.250	0.192		mg/L		77	10 - 121	12	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*87*		*51 - 120*
2-Fluorobiphenyl	*78*		*49 - 120*
2-Fluorophenol (Surr)	*75*		*50 - 120*
Nitrobenzene-d5 (Surr)	*75*		*51 - 120*
Phenol-d5 (Surr)	*72*		*47 - 120*
Terphenyl-d14 (Surr)	*115*		*56 - 120*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LB3 280-493603/1-H **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Endrin	0.00019	U	0.00048	0.00019	0.000076	mg/L		05/14/20 15:22	1
Heptachlor	0.00019	U	0.00048	0.00019	0.000074	mg/L		05/14/20 15:22	1
Heptachlor epoxide	0.00019	U	0.00048	0.00019	0.000072	mg/L		05/14/20 15:22	1
gamma-BHC (Lindane)	0.00019	U	0.00048	0.00019	0.000066	mg/L		05/14/20 15:22	1
Methoxychlor	0.00048	U	0.00096	0.00048	0.00013	mg/L		05/14/20 15:22	1
Toxaphene	0.0072	U	0.019	0.0072	0.0035	mg/L		05/14/20 15:22	1
Chlordane (technical)	0.0038	U	0.0048	0.0038	0.0013	mg/L		05/14/20 15:22	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*53*		*28 - 115*	*05/11/20 19:22*	*05/14/20 15:22*	*1*
DCB Decachlorobiphenyl	*78*		*34 - 122*	*05/11/20 19:22*	*05/14/20 15:22*	*1*

Lab Sample ID: LCS 280-493603/2-I **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Endrin	0.00500	0.00484		mg/L		97	66 - 143
Heptachlor	0.00500	0.00432		mg/L		86	59 - 143
Heptachlor epoxide	0.00500	0.00445		mg/L		89	37 - 142

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

Lab Sample ID: LCS 280-493603/2-I **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
gamma-BHC (Lindane)	0.00500	0.00435		mg/L		87	68 - 142
Methoxychlor	0.00500	0.00570		mg/L		114	30 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*61*		*28 - 115*
DCB Decachlorobiphenyl	*77*		*34 - 122*

Lab Sample ID: LCS 280-493603/7-B **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Toxaphene	0.200	0.151	M	mg/L		75	63 - 142

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*49*		*28 - 115*
DCB Decachlorobiphenyl	*66*		*34 - 122*

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Endrin	0.00020	U	0.00500	0.00421		mg/L		84	66 - 143
Heptachlor	0.00020	U	0.00500	0.00391		mg/L		78	59 - 143
Heptachlor epoxide	0.00020	U	0.00500	0.00381		mg/L		76	37 - 142
gamma-BHC (Lindane)	0.00020	U	0.00500	0.00382		mg/L		76	68 - 142
Methoxychlor	0.00049	U Q	0.00500	0.00516		mg/L		103	30 - 150

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*58*		*28 - 115*
DCB Decachlorobiphenyl	*72*		*34 - 122*

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Toxaphene	0.0074	U	0.196	0.177	M	mg/L		90	63 - 142

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene	*59*		*28 - 115*
DCB Decachlorobiphenyl	*70*		*34 - 122*

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

Lab Sample ID: 280-136118-5 MSD **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Endrin	0.00020	U	0.00500	0.00445		mg/L		89	66 - 143	6	30
Heptachlor	0.00020	U	0.00500	0.00426		mg/L		85	59 - 143	9	30
Heptachlor epoxide	0.00020	U	0.00500	0.00408		mg/L		82	37 - 142	7	30
gamma-BHC (Lindane)	0.00020	U	0.00500	0.00409		mg/L		82	68 - 142	7	30
Methoxychlor	0.00049	U Q	0.00500	0.00504		mg/L		101	30 - 150	2	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*59*		*28 - 115*
DCB Decachlorobiphenyl	*69*		*34 - 122*

Lab Sample ID: 280-136118-5 MSD **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494815 **Prep Batch: 494442**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toxaphene	0.0074	U	0.198	0.164	M	mg/L		83	63 - 142	8	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*58*		*28 - 115*
DCB Decachlorobiphenyl	*71*		*34 - 122*

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

Lab Sample ID: MB 280-493627/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 495259 **Prep Batch: 493627**

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016	0.40	U	1.0	0.40	0.12	ug/L		05/19/20 02:21	1
PCB-1221	0.25	U	1.0	0.25	0.21	ug/L		05/19/20 02:21	1
PCB-1232	0.60	U	1.0	0.60	0.17	ug/L		05/19/20 02:21	1
PCB-1242	1.0	U	1.0	1.0	0.42	ug/L		05/19/20 02:21	1
PCB-1248	0.30	U	1.0	0.30	0.092	ug/L		05/19/20 02:21	1
PCB-1254	0.25	U	1.0	0.25	0.11	ug/L		05/19/20 02:21	1
PCB-1260	0.40	U	1.0	0.40	0.16	ug/L		05/19/20 02:21	1
PCB-1262	0.50	U	1.0	0.50	0.22	ug/L		05/19/20 02:21	1
PCB-1268	1.0	U	1.0	1.0	0.36	ug/L		05/19/20 02:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*51*		*25 - 120*	*05/04/20 15:26*	*05/19/20 02:21*	*1*
DCB Decachlorobiphenyl	*58*		*30 - 136*	*05/04/20 15:26*	*05/19/20 02:21*	*1*

Lab Sample ID: LCS 280-493627/4-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 495259 **Prep Batch: 493627**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PCB-1016			2.00	1.52		ug/L		76	46 - 129		

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

Lab Sample ID: LCS 280-493627/4-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 495259 **Prep Batch: 493627**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
PCB-1260			2.00	1.29		ug/L		65	45 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*61*		*25 - 120*
DCB Decachlorobiphenyl	*66*		*30 - 136*

Lab Sample ID: LCSD 280-493627/5-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 495259 **Prep Batch: 493627**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
PCB-1016			2.00	1.45		ug/L		73	46 - 129	4	30
PCB-1260			2.00	1.32	M	ug/L		66	45 - 134	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*60*		*25 - 120*
DCB Decachlorobiphenyl	*66*		*30 - 136*

Method: 8151A DOD - Herbicides (GC)

Lab Sample ID: LB3 280-493603/1-E **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494359 **Prep Batch: 493714**

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
2,4-D	0.018	U M	0.040	0.018	0.0052	mg/L		05/12/20 08:50	1
Silvex (2,4,5-TP)	0.0059	U	0.0099	0.0059	0.0017	mg/L		05/12/20 08:50	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid	*73*		*10 - 131*	*05/05/20 11:11*	*05/12/20 08:50*	*1*

Lab Sample ID: LCS 280-493603/2-F **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494359 **Prep Batch: 493714**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4-D			0.0485	0.0399		mg/L		82	13 - 115		
Silvex (2,4,5-TP)			0.0485	0.0448		mg/L		92	10 - 158		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*79*		*10 - 131*

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494359 **Prep Batch: 493714**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
2,4-D	0.018	U	0.0495	0.0386	J	mg/L		78	13 - 115		

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

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494359 **Prep Batch: 493714**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silvex (2,4,5-TP)	0.0058	U	0.0495	0.0385		mg/L		78	10 - 158

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*71*		*10 - 131*

Lab Sample ID: 280-136118-5 MSD **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 494359 **Prep Batch: 493714**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
2,4-D	0.018	U	0.0500	0.0412		mg/L		82	13 - 115	7	30
Silvex (2,4,5-TP)	0.0058	U	0.0500	0.0420		mg/L		84	10 - 158	9	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid	*77*		*10 - 131*

Method: 6010C - Metals (ICP)

Lab Sample ID: LB3 280-493603/1-J **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495413 **Prep Batch: 494829**

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.075	U	0.50	0.075	0.022	mg/L		05/19/20 01:36	1
Barium	0.010	U	1.0	0.010	0.0040	mg/L		05/19/20 01:36	1
Cadmium	0.0090	U	0.10	0.0090	0.0020	mg/L		05/19/20 01:36	1
Chromium	0.013	U	0.50	0.013	0.0030	mg/L		05/19/20 01:36	1
Lead	0.045	U	0.50	0.045	0.014	mg/L		05/19/20 01:36	1
Selenium	0.095	U	0.10	0.095	0.032	mg/L		05/19/20 01:36	1
Silver	0.025	U	0.50	0.025	0.0098	mg/L		05/19/20 01:36	1

Lab Sample ID: LCS 280-493603/2-K **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495413 **Prep Batch: 494829**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	5.00	4.54		mg/L		91	80 - 120
Barium	12.0	11.2		mg/L		93	80 - 120
Cadmium	2.00	1.86		mg/L		93	80 - 120
Chromium	6.00	5.65		mg/L		94	80 - 120
Lead	6.00	5.58		mg/L		93	80 - 120
Selenium	3.00	2.65		mg/L		88	80 - 120
Silver	1.05	0.901		mg/L		86	80 - 120

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 280-136118-5 MS **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495413 **Prep Batch: 494829**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Arsenic	0.075	U	5.00	4.72		mg/L		94	80 - 120		
Barium	0.016	J	12.0	11.5		mg/L		96	80 - 120		
Cadmium	0.0090	U	2.00	1.92		mg/L		96	80 - 120		
Chromium	0.0032	J	6.00	5.82		mg/L		97	80 - 120		
Lead	0.045	U	6.00	5.70		mg/L		95	80 - 120		
Selenium	0.095	U	3.00	2.78		mg/L		93	80 - 120		
Silver	0.025	U	1.05	0.952		mg/L		91	80 - 120		

Lab Sample ID: 280-136118-5 MSD **Client Sample ID: FWGIDW-200401-WW**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495413 **Prep Batch: 494829**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.075	U	5.00	4.75		mg/L		95	80 - 120	1	20
Barium	0.016	J	12.0	11.6		mg/L		97	80 - 120	1	20
Cadmium	0.0090	U	2.00	1.93		mg/L		97	80 - 120	1	20
Chromium	0.0032	J	6.00	5.86		mg/L		98	80 - 120	1	20
Lead	0.045	U	6.00	5.75		mg/L		96	80 - 120	1	20
Selenium	0.095	U	3.00	2.78		mg/L		93	80 - 120	0	20
Silver	0.025	U	1.05	0.946		mg/L		90	80 - 120	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB3 280-493603/1-K **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495840 **Prep Batch: 495627**

Analyte	LB3 Result	LB3 Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.000080	U	0.0020	0.000080	0.000030	mg/L		05/21/20 16:28	1

Lab Sample ID: LCS 280-493603/2-L **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495840 **Prep Batch: 495627**

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury			0.00500	0.00506		mg/L		101	90 - 116		

Lab Sample ID: LCSD 280-493603/3-E **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: TCLP**
Analysis Batch: 495840 **Prep Batch: 495627**

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury			0.00500	0.00507		mg/L		101	90 - 116	0	10

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: MB 280-494021/2 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494021

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint	>160		1.00	1.00	1.00	Degrees F		05/07/20 09:55	1

Lab Sample ID: MB 280-494021/8 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494021

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint	>160		1.00	1.00	1.00	Degrees F		05/07/20 09:55	1

Lab Sample ID: LCS 280-494021/1 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494021

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Flashpoint	145	145.0		Degrees F		100	96 - 104

Lab Sample ID: LCSD 280-494021/7 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494021

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Flashpoint	145	147.0		Degrees F		101	96 - 104	1	10

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

Lab Sample ID: MB 280-494545/4-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494714 **Prep Batch: 494545**

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Total	0.010	U	0.010	0.010	0.0050	mg/L		05/13/20 11:44	1

Lab Sample ID: HLCS 280-494545/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494714 **Prep Batch: 494545**

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.350	0.346		mg/L		99	90 - 110

Lab Sample ID: LCS 280-494545/3-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494714 **Prep Batch: 494545**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.100	0.0946		mg/L		95	83 - 116

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

Lab Sample ID: LLCS 280-494545/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 494714 **Prep Batch: 494545**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cyanide, Total	0.100	0.0947		mg/L		95	44 - 167

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 280-493600/2-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493611 **Prep Batch: 493600**

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide	1.9	U	4.0	1.9	0.79	mg/L		05/04/20 11:30	1

Lab Sample ID: LCS 280-493600/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493611 **Prep Batch: 493600**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfide	21.1	18.4		mg/L		87	44 - 110

Method: 9040C - pH

Lab Sample ID: LCS 280-493544/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493544

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-493691/6 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493691

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Nitrate as N	0.20	U	0.50	0.20	0.090	mg/L		05/05/20 11:22	1

Lab Sample ID: LCS 280-493691/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493691

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	4.68		mg/L		94	88 - 111

Lab Sample ID: LCSD 280-493691/5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 493691

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	5.00	4.70		mg/L		94	88 - 111	0	10

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MRL 280-493691/3
Matrix: Water
Analysis Batch: 493691

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

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate as N			0.500	0.440	J	mg/L		88	50 - 150		

QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Job ID: 280-136118-2

GC/MS VOA

Leach Batch: 493604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	1311	
LB3 280-493604/1-A	Method Blank	TCLP	Water	1311	
LCS 280-493604/2-A	Lab Control Sample	TCLP	Water	1311	
LCSD 280-493604/3-A	Lab Control Sample Dup	TCLP	Water	1311	

Analysis Batch: 494783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	8260B	493604
LB3 280-493604/1-A	Method Blank	TCLP	Water	8260B	493604
LCS 280-493604/2-A	Lab Control Sample	TCLP	Water	8260B	493604
LCSD 280-493604/3-A	Lab Control Sample Dup	TCLP	Water	8260B	493604

GC/MS Semi VOA

Leach Batch: 493603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	1311	
LB3 280-493603/1-B	Method Blank	TCLP	Water	1311	
LCS 280-493603/2-B	Lab Control Sample	TCLP	Water	1311	
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	1311	
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	1311	

Prep Batch: 493681

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	3510C	493603
LB3 280-493603/1-B	Method Blank	TCLP	Water	3510C	493603
LCS 280-493603/2-B	Lab Control Sample	TCLP	Water	3510C	493603
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	3510C	493603
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	3510C	493603

Analysis Batch: 494380

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	8270D	493681
LB3 280-493603/1-B	Method Blank	TCLP	Water	8270D	493681
LCS 280-493603/2-B	Lab Control Sample	TCLP	Water	8270D	493681
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	8270D	493681
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	8270D	493681

GC Semi VOA

Leach Batch: 493603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	1311	
LB3 280-493603/1-E	Method Blank	TCLP	Water	1311	
LB3 280-493603/1-H	Method Blank	TCLP	Water	1311	
LCS 280-493603/2-F	Lab Control Sample	TCLP	Water	1311	
LCS 280-493603/2-I	Lab Control Sample	TCLP	Water	1311	
LCS 280-493603/7-B	Lab Control Sample	TCLP	Water	1311	
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	1311	
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	1311	

QC Association Summary

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

GC Semi VOA

Prep Batch: 493627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	3510C	
MB 280-493627/1-A	Method Blank	Total/NA	Water	3510C	
LCS 280-493627/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 280-493627/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Prep Batch: 493714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	8151A	493603
LB3 280-493603/1-E	Method Blank	TCLP	Water	8151A	493603
LCS 280-493603/2-F	Lab Control Sample	TCLP	Water	8151A	493603
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	8151A	493603
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	8151A	493603

Analysis Batch: 494359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	8151A DOD	493714
LB3 280-493603/1-E	Method Blank	TCLP	Water	8151A DOD	493714
LCS 280-493603/2-F	Lab Control Sample	TCLP	Water	8151A DOD	493714
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	8151A DOD	493714
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	8151A DOD	493714

Prep Batch: 494442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	3510C	493603
LB3 280-493603/1-H	Method Blank	TCLP	Water	3510C	493603
LCS 280-493603/2-I	Lab Control Sample	TCLP	Water	3510C	493603
LCS 280-493603/7-B	Lab Control Sample	TCLP	Water	3510C	493603
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	3510C	493603
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	3510C	493603
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	3510C	493603
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	3510C	493603

Analysis Batch: 494815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	8081B	494442
LB3 280-493603/1-H	Method Blank	TCLP	Water	8081B	494442
LCS 280-493603/2-I	Lab Control Sample	TCLP	Water	8081B	494442
LCS 280-493603/7-B	Lab Control Sample	TCLP	Water	8081B	494442
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	8081B	494442
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	8081B	494442
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	8081B	494442
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	8081B	494442

Analysis Batch: 495259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	8082A	493627
MB 280-493627/1-A	Method Blank	Total/NA	Water	8082A	493627
LCS 280-493627/4-A	Lab Control Sample	Total/NA	Water	8082A	493627
LCSD 280-493627/5-A	Lab Control Sample Dup	Total/NA	Water	8082A	493627

QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Job ID: 280-136118-2

Metals

Leach Batch: 493603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	1311	
LB3 280-493603/1-J	Method Blank	TCLP	Water	1311	
LB3 280-493603/1-K	Method Blank	TCLP	Water	1311	
LCS 280-493603/2-K	Lab Control Sample	TCLP	Water	1311	
LCS 280-493603/2-L	Lab Control Sample	TCLP	Water	1311	
LCSD 280-493603/3-E	Lab Control Sample Dup	TCLP	Water	1311	
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	1311	
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	1311	

Prep Batch: 494829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	3010A	493603
LB3 280-493603/1-J	Method Blank	TCLP	Water	3010A	493603
LCS 280-493603/2-K	Lab Control Sample	TCLP	Water	3010A	493603
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	3010A	493603
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	3010A	493603

Analysis Batch: 495413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	6010C	494829
LB3 280-493603/1-J	Method Blank	TCLP	Water	6010C	494829
LCS 280-493603/2-K	Lab Control Sample	TCLP	Water	6010C	494829
280-136118-5 MS	FWGIDW-200401-WW	TCLP	Water	6010C	494829
280-136118-5 MSD	FWGIDW-200401-WW	TCLP	Water	6010C	494829

Prep Batch: 495627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	7470A	493603
LB3 280-493603/1-K	Method Blank	TCLP	Water	7470A	493603
LCS 280-493603/2-L	Lab Control Sample	TCLP	Water	7470A	493603
LCSD 280-493603/3-E	Lab Control Sample Dup	TCLP	Water	7470A	493603

Analysis Batch: 495840

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	TCLP	Water	7470A	495627
LB3 280-493603/1-K	Method Blank	TCLP	Water	7470A	495627
LCS 280-493603/2-L	Lab Control Sample	TCLP	Water	7470A	495627
LCSD 280-493603/3-E	Lab Control Sample Dup	TCLP	Water	7470A	495627

General Chemistry

Analysis Batch: 493461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9056A	

Analysis Batch: 493544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9040C	
LCS 280-493544/4	Lab Control Sample	Total/NA	Water	9040C	

QC Association Summary

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

General Chemistry

Prep Batch: 493600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9030B	
MB 280-493600/2-A	Method Blank	Total/NA	Water	9030B	
LCS 280-493600/1-A	Lab Control Sample	Total/NA	Water	9030B	

Analysis Batch: 493611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9034	493600
MB 280-493600/2-A	Method Blank	Total/NA	Water	9034	493600
LCS 280-493600/1-A	Lab Control Sample	Total/NA	Water	9034	493600

Analysis Batch: 493691

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9056A	
MB 280-493691/6	Method Blank	Total/NA	Water	9056A	
LCS 280-493691/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-493691/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-493691/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 494021

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	1010A	
MB 280-494021/2	Method Blank	Total/NA	Water	1010A	
MB 280-494021/8	Method Blank	Total/NA	Water	1010A	
LCS 280-494021/1	Lab Control Sample	Total/NA	Water	1010A	
LCSD 280-494021/7	Lab Control Sample Dup	Total/NA	Water	1010A	

Prep Batch: 494545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9012B	
MB 280-494545/4-A	Method Blank	Total/NA	Water	9012B	
HLCS 280-494545/1-A	Lab Control Sample	Total/NA	Water	9012B	
LCS 280-494545/3-A	Lab Control Sample	Total/NA	Water	9012B	
LLCS 280-494545/2-A	Lab Control Sample	Total/NA	Water	9012B	

Analysis Batch: 494714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-136118-5	FWGIDW-200401-WW	Total/NA	Water	9012B	494545
MB 280-494545/4-A	Method Blank	Total/NA	Water	9012B	494545
HLCS 280-494545/1-A	Lab Control Sample	Total/NA	Water	9012B	494545
LCS 280-494545/3-A	Lab Control Sample	Total/NA	Water	9012B	494545
LLCS 280-494545/2-A	Lab Control Sample	Total/NA	Water	9012B	494545

Lab Chronicle

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Client Sample ID: FWGIDW-200401-WW
Lab Sample ID: 280-136118-5

Date Collected: 04/30/20 14:00
Matrix: Water
Date Received: 05/01/20 08:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			1.0 g	1.0 mL	493604	05/04/20 09:20	DEN	TAL DEN
TCLP	Analysis	8260B		1	0.5 mL	5 mL	494783	05/14/20 02:04	PP	TAL DEN
TCLP	Leach	1311			1.0 g	1.0 mL	493603	05/04/20 08:17	DEN	TAL DEN
TCLP	Prep	3510C			200 mL	1 mL	493681	05/05/20 12:33	AC	TAL DEN
TCLP	Analysis	8270D		1			494380	05/11/20 21:00	RDP	TAL DEN
TCLP	Leach	1311			1.0 g	1.0 mL	493603	05/04/20 08:17	DEN	TAL DEN
TCLP	Prep	3510C			102 mL	10 mL	494442	05/11/20 19:22	DFB1	TAL DEN
TCLP	Analysis	8081B		1			494815	05/14/20 13:37	MD	TAL DEN
Total/NA	Prep	3510C			994.2 mL	10 mL	493627	05/04/20 15:26	NK	TAL DEN
Total/NA	Analysis	8082A		1			495259	05/19/20 03:26	MAM	TAL DEN
TCLP	Leach	1311			1.0 g	1.0 mL	493603	05/04/20 08:17	DEN	TAL DEN
TCLP	Prep	8151A			103 mL	10 mL	493714	05/05/20 11:11	DFB1	TAL DEN
TCLP	Analysis	8151A DOD		1			494359	05/12/20 10:11	TMC	TAL DEN
TCLP	Leach	1311			1.0 g	1.0 mL	493603	05/04/20 08:17	DEN	TAL DEN
TCLP	Prep	3010A			10 mL	50 mL	494829	05/15/20 15:20	EC	TAL DEN
TCLP	Analysis	6010C		1			495413	05/19/20 01:43	LMT	TAL DEN
TCLP	Leach	1311			1.0 g	1.0 mL	493603	05/04/20 08:17	DEN	TAL DEN
TCLP	Prep	7470A			30 mL	50 mL	495627	05/21/20 10:00	AL	TAL DEN
TCLP	Analysis	7470A		1			495840	05/21/20 16:34	AL	TAL DEN
Total/NA	Analysis	1010A		1			494021	05/07/20 09:55	SPG	TAL DEN
Total/NA	Prep	9012B			50 mL	50 mL	494545	05/12/20 12:04	JMB	TAL DEN
Total/NA	Analysis	9012B		1	50 mL	50 mL	494714	05/13/20 12:24	JMB	TAL DEN
Total/NA	Prep	9030B			50 mL	50 mL	493600	05/04/20 10:35	BB	TAL DEN
Total/NA	Analysis	9034		1			493611	05/04/20 11:30	BB	TAL DEN
Total/NA	Analysis	9040C		1			493544	05/01/20 21:09	CJ	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	493691	05/06/20 01:01	JAP	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	493461	05/01/20 14:22	JAP	TAL DEN

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Leidos, Inc. Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-21

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

Analysis Method	Prep Method	Matrix	Analyte
8270D	3510C	Water	2,4,6-Trichlorophenol
9040C		Water	Temperature

Method Summary

Client: Leidos, Inc. Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL DEN
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	TAL DEN
8081B	Organochlorine Pesticides (GC)	SW846	TAL DEN
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	TAL DEN
8151A DOD	Herbicides (GC)	SW846	TAL DEN
6010C	Metals (ICP)	SW846	TAL DEN
7470A	Mercury (CVAA)	SW846	TAL DEN
1010A	Ignitability, Pensky-Martens Closed-Cup Method	SW846	TAL DEN
9012B	Cyanide, Total and/or Amenable	EPA	TAL DEN
9034	Sulfide, Acid Soluble and Insoluble (Titrimetric)	SW846	TAL DEN
9040C	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
1311	TCLP Extraction	SW846	TAL DEN
3010A	Preparation, Total Metals	SW846	TAL DEN
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL DEN
5030B	Purge and Trap	SW846	TAL DEN
7470A	Preparation, Mercury	SW846	TAL DEN
8151A	Extraction (Herbicides)	SW846	TAL DEN
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	TAL DEN
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	SW846	TAL DEN

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: Leidos, Inc.
Job ID: 280-136118-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-136118-5	FWGIDW-200401-WW	Water	04/30/20 14:00	05/01/20 08:35	

leidos

Chain of Custody Record

COC No.: RVAAP-041-TA

Page 1 of 1

Date: 04/30/2020

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event
Job/P.O. No.: P010216426

Sampler (Signature) (Printed Name) Heather Adams

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

Laboratory No.	Sample ID	Date	Time	Matrix	TCLP VOCs (1)(A)	TCLP SVOCs (2)(A), TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A)	Total PCBs (12)(A) / (4)(A)	Ignitability (11)(A)	pH (13)(A) / (6)(A)	Nitrate and Nitrite (10)(A)	Total Cyanide (8)(D)	Total Sulfide (9)('E')							NO. OF CONTAINERS	OBSERVATIONS, COMMENTS
	FWGIDW-200401-WW	4/30/2020	1400	W	3	2	2	1	1	1	1	1							12	

04/30/2020

Total Number of Containers: 12

Relinquished by		Date	Notes:
Signature		4/30/2020	A. Cool, 4C B. HCl, pH<2, Cool, 4C C. HNO3, pH<2, Cool, 4C D. NaOH, pH>12, Cool 4C E. NaOH/Zn Acetate, pH>9, Cool 4C
Heather Adams	Brent H	Time	1. SW 1311, 8260 2. SW 1311, 8270 3. SW 1311, 8081 4. SW 3510C/8082A (W) 5. SW 1311, 8151 6. SW 9040 (W) 7. SW 1311, 6010, 7470 8. SW 9012A 9. SW 9034 10. SW 9056 11. SW 1010 12. SW 3540C/8082A (S) 13. SW 9045 (S) 14. SW 8260B S=Soil / W=Water
Printed Name		1500	Notes:
Leidos			
Company			

Relinquished by		Date	
Signature		~~4-30-20~~ 5/1/20	
Brent H.	Beau Beatley	Time	
Printed Name	ETADen	~~1600~~ 0835	
Company			

Shipment Method: Courier

Temperature Blank
Lab:

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

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ATTACHMENT 2.
Waste Material Profile Sheet
Clean Harbors Profile No. CH2041062

WASTE MATERIAL PROFILE SHEET

Clean Harbors Profile No. CH2041062

A. GENERAL INFORMATION

GENERATOR EPA ID #/REGISTRATION # ***OH5210020736*** GENERATOR NAME: ***Former Ravenna Army Ammunition Plant***

GENERATOR CODE (Assigned by Clean Harbors) ***FO23255*** CITY ***Ravenna*** STATE/PROVINCE ***OH*** ZIP/POSTAL CODE ***44266***

ADDRESS ***8451 State Route 5*** PHONE: **(614) 336-6136**

CUSTOMER CODE (Assigned by Clean Harbors) ***LE18366*** CUSTOMER NAME: ***Leidos***

ADDRESS ***8866 Commons Boulevard*** CITY ***Twinsburg*** STATE/PROVINCE ***OH*** ZIP/POSTAL CODE ***44087***

B. WASTE DESCRIPTION

WASTE DESCRIPTION: ***Groundwater Sampling - Liquid IDW***

PROCESS GENERATING WASTE: **Environmental Sampling**

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ? **No**

C. PHYSICAL PROPERTIES (at 25C or 77F)

PHYSICAL STATE
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- [x] LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

NUMBER OF PHASES/LAYERS
- [x] 1 2 3

% BY VOLUME (Approx.)

TOP	***0.00***
MIDDLE	***0.00***
BOTTOM	***0.00***

VISCOSITY (If liquid present)
- [x] 1 - 100 (e.g. Water)
- 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

COLOR
Cloudy/Brown

ODOR
- [x] NONE
- MILD
- STRONG

Describe:

BOILING POINT ºF (ºC)
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- [x] >= 130 (>54)

MELTING POINT ºF (ºC)
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

TOTAL ORGANIC CARBON
- [x] <= 1%
- 1-9%
- >= 10%

FLASH POINT ºF (ºC)
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- [x] > 200 (>93)

pH
- <= 2
- 2.1 - 6.9
- 7 (Neutral)
- [x] 7.1 - 12.4
- >= 12.5

SPECIFIC GRAVITY
- < 0.8 (e.g. Gasoline)
- 0.8-1.0 (e.g. Ethanol)
- [x] 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

ASH
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- [x] Unknown

BTU/LB (MJ/kg)
- [x] < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- > 10,000 (>23.2)

Actual:

D. COMPOSITION (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

CHEMICAL	MIN	--	MAX	UOM
DEIONIZED WATER	0.2500000	--	0.5000000	%
GROUNDWATER	99.0000000	--	100.0000000	%
ISOPROPYL ALCOHOL	0.2500000	--	0.5000000	%
NITRIC ACID	0.2500000	--	0.5000000	%
SOAP (LIQUID)	0.2500000	--	0.5000000	%

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes, describe, including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES [x] NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES [x] NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE. ***G09*** SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE. ***W113***

E. CONSTITUENTS

Are these values based on testing or knowledge? Knowledge ☑ Testing

If constituent concentrations are based on analytical testing, analysis must be provided. Please attach document(s) using the link on the Submit tab.

Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.

RCRA	REGULATED METALS	REGULATORY LEVEL (mg/l)	TCLP mg/l	TOTAL	UOM	NOT APPLICABLE
D004	ARSENIC	5.0	0.0000	0.0000000	PPM	
D005	BARIUM	100.0	0.0160	0.0160000	PPM	
D006	CADMIUM	1.0	0.0000	0.0000000	PPM	
D007	CHROMIUM	5.0	0.0032	0.0030000	PPM	
D008	LEAD	5.0	0.0000	0.0000000	PPM	
D009	MERCURY	0.2	0.0000	0.0000000	PPM	
D010	SELENIUM	1.0	0.0000	0.0000000	PPM	
D011	SILVER	5.0	0.0000	0.0000000	PPB	

	VOLATILE COMPOUNDS		
D018	BENZENE	0.5	0
D019	CARBON TETRACHLORIDE	0.5	0
D021	CHLOROBENZENE	100.0	0
D022	CHLOROFORM	6.0	0.0025
D028	1,2-DICHLOROETHANE	0.5	0
D029	1,1-DICHLOROETHYLENE	0.7	0
D035	METHYL ETHYL KETONE	200.0	0
D039	TETRACHLOROETHYLENE	0.7	0
D040	TRICHLOROETHYLENE	0.5	0
D043	VINYL CHLORIDE	0.2	0

	SEMI-VOLATILE COMPOUNDS		
D023	o-CRESOL	200.0	0
D024	m-CRESOL	200.0	0
D025	p-CRESOL	200.0	0
D026	CRESOL (TOTAL)	200.0	0
D027	1,4-DICHLOROBENZENE	7.5	0
D030	2,4-DINITROTOLUENE	0.13	0
D032	HEXACHLOROBENZENE	0.13	0
D033	HEXACHLOROBUTADIENE	0.5	0
D034	HEXACHLOROETHANE	3.0	0
D036	NITROBENZENE	2.0	0
D037	PENTACHLOROPHENOL	100.0	0
D038	PYRIDINE	5.0	0
D041	2,4,5-TRICHLOROPHENOL	400.0	0
D042	2,4,6-TRICHLOROPHENOL	2.0	0

	PESTICIDES AND HERBICIDES		
D012	ENDRIN	0.02	0
D013	LINDANE	0.4	0
D014	METHOXYCHLOR	10.0	0
D015	TOXAPHENE	0.5	0
D016	2,4-D	10.0	0
D017	2,4,5-TP (SILVEX)	1.0	0
D020	CHLORDANE	0.03	0
D031	HEPTACHLOR (AND ITS EPOXIDE)	0.008	0

OTHER CONSTITUENTS	MAX	UOM	NOT APPLICABLE
BROMINE			☑
CHLORINE			☑
FLUORINE			☑
IODINE			☑
SULFUR			☑
POTASSIUM			☑
SODIUM			☑
AMMONIA			☑
CYANIDE AMENABLE			☑
CYANIDE REACTIVE			☑
CYANIDE TOTAL	0	PPM	
SULFIDE REACTIVE			☑

HOCs

☑ NONE

< 1000 PPM

>= 1000 PPM

PCBs

☑ NONE

< 50 PPM

>=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES ☑ NO

ADDITIONAL HAZARDS

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES ☑ NO (If yes, explain)

CHOOSE ALL THAT APPLY

DEA REGULATED SUBSTANCES | EXPLOSIVE | FUMING | OSHA REGULATED CARCINOGENS

POLYMERIZABLE | RADIOACTIVE | REACTIVE MATERIAL | ☑ NONE OF THE ABOVE

F. REGULATORY STATUS

YES ☑ NO USEPA HAZARDOUS WASTE?

YES ☑ NO DO ANY STATE WASTE CODES APPLY?

Texas Waste Code

YES ☑ NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

YES ☑ NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?

LDR CATEGORY: ***Not subject to LDR***
VARIANCE INFO:

YES ☑ NO IS THIS A UNIVERSAL WASTE?

☑ YES NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS A VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?

YES NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?

YES ☑ NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

YES ☑ NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

YES ☑ NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 76.6 KPA (11.1 PSIA)?

☑ YES NO IS THIS CERCLA REGULATED (SUPERFUND) WASTE ?

YES ☑ NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?

Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

YES NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?

YES NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?

YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

What is the TAB quantity for your facility? Megagram/year (1 Mg = 2,200 lbs)

The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

Describe the knowledge :

G. DOT/TDG INFORMATION

DOT/TDG PROPER SHIPPING NAME:

NON DOT REGULATED MATERIAL, LIQUID IDW

H. TRANSPORTATION REQUIREMENTS

ESTIMATED SHIPMENT FREQUENCY ☑ ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY OTHER

☑ **CONTAINERIZED**

15-15 CONTAINERS/SHIPMENT

STORAGE CAPACITY:
CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE

CUBIC YARD BOX ☑ DRUM

OTHER:

DRUM SIZE: ***55***

BULK LIQUID

GALLONS/SHIPMENT: ***0 Min -0 Max*** GAL.

BULK SOLID

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: ***0 Min - 0 Max***

I. SPECIAL REQUEST

COMMENTS OR REQUESTS:

GENERATOR'S CERTIFICATION

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

AUTHORIZED SIGNATURE	NAME (PRINT)	TITLE	DATE
kathryn.s.tait.nfg@mail.mil			

This waste profile has been submitted using Clean Harbors' electronic signature system.

*40 CFR Sec. 264.12 required notice:

As required by Federal Resource Conservation and Recovery Act regulations found in 40 CFR Part 264.12(b) and all equivalent State hazardous waste regulations, notice is hereby provided that all Clean Harbors facilities that may be used to treat, store, and /or dispose of the hazardous waste described on this waste profile have the appropriate permits and the capacity to manage these wastes.

Please note this profile must be submitted for re-evaluation if there has been a change in the waste generating process or when there have been changes in the chemical composition or physical characteristics of the material.

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E.2 Waste Manifest

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NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

DS 2003902076

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. OH5210020736

Manifest Document No. NH02076

2. Page 1 of 1

3. Generator's Name and Mailing Address
Former Ravenna Army Ammunition Plant
1438 State Route 534 SW
Newton Falls OH 44444

4. Generator's Phone ((614) 336-6136 ATTN:Katie Tait

Site Address :
9451 State Route 5
Ravenna,OH 44266

5. Transporter 1 Company Name: Clean Harbors Environmental Services, Inc.

6. US EPA ID Number: MAD039322250

A. State Transporter's ID

B. Transporter 1 Phone (781) 792-5000

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
Spring Grove Resource Recovery Inc.
4879 Spring Grove Avenue
Cincinnati, OH 45232

10. US EPA ID Number: OHD000816629

E. State Facility's ID

F. Facility's Phone (513) 681-5735

11. WASTE DESCRIPTION	Containers No.	Containers Type	13. Total Quantity	14. Unit Wt./Vol.
a. NON DOT REGULATED MATERIAL, LIQUID IDW	15	DM	6000	P
b.				
c.				
d.				

G. Additional Descriptions for Materials Listed Above
11a.CH2041062 15255

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

EMERGENCY PHONE #: (800) 483-3718

GENERATOR: Former Ravenna Army Ammunition Plant

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name: Kathryn S Tait
Signature: Kathryn S Tait
Date: Month 08 Day 13 Year 20

17. Transporter 1 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature: STEPHEN GARLICK
Date: Month 08 Day 13 Year 20

18. Transporter 2 Acknowledgement of Receipt of Materials
Printed/Typed Name:
Signature:
Date: Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.
Printed/Typed Name: LaKesha Mason
Signature:
Date: Month 8 Day 20 Year 20

GENERATOR

TRANSPORTER

FACILITY

NON-HAZARDOUS WASTE

CF14 © 2002 LABELMASTER® (800) 621-5808 www.labelmaster.com

Generator acknowledges that no material change has occurred either in the characteristics or in the process generating the material.

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APPENDIX F

Laboratory Analytical Results and Screening

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F.1 Spring 2020 Analytical Results

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	Station	DETmw-003	DETmw-003	DETmw-004	FBQmw-168	FBQmw-170	FBQmw-171	FBQmw-174	FBQmw-175	FBQmw-175	FBQmw-176	FBQmw-177	FWGmw-004	FWGmw-007	FWGmw-011
	Sample Id	DET-003-200402-GW	DET-003-200401-GW	DET-004-200401-GW	FBQmw-168-200401-GW	FBQmw-170-200401-GW	FBQmw-171-200401-GW	FBQmw-174-200401-GW	FBQmw-175-200402-GW	FBQmw-175-200401-GW	FBQmw-176-200401-GW	FBQmw-177-200401-GW	FWGmw-004-200401-GW	FWGmw-007-200401-GW	FWGmw-011-200401-GW
	Date	04/21/20	04/21/20	04/21/20	04/27/20	04/28/20	04/29/20	04/27/20	04/27/20	04/27/20	04/28/20	04/29/20	04/23/20	04/29/20	06/11/20
	Sample Type	FD	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Homewood	Homewood	Homewood	Homewood	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Metals															
Aluminum	7429-90-5	NA	<0.07 U	<0.07 U	NA	NA	NA	NA	NA	NA	NA	NA	0.035 J	0.093 J	0.36 J
Antimony	7440-36-0	NA	<0.001 U	<0.001 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U
Arsenic	7440-38-2	NA	0.0091	<0.001 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	0.0067
Barium	7440-39-3	NA	0.046 J	0.055 J	NA	NA	NA	NA	NA	NA	NA	NA	0.021	0.021	0.031
Beryllium	7440-41-7	NA	<0.0003 U	<0.0003 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.0003 U	<0.0003 U	<0.0003 U
Cadmium	7440-43-9	NA	<0.001 U	<0.001 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U
Calcium	7440-70-2	NA	75	100	NA	NA	NA	NA	NA	NA	NA	NA	92	120	48
Chromium	7440-47-3	NA	<0.0018 U	<0.0018 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.0018 U	0.00071 J	0.00054 J
Cobalt	7440-48-4	NA	0.00032 J	<0.00035 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.00035 U	0.00075 J	0.0014
Copper	7440-50-8	NA	<0.0018 UJ	0.0055 J	NA	NA	NA	NA	NA	NA	NA	NA	0.00072 J	<0.0018 U	<0.0018 U
Iron	7439-89-6	NA	1.9	<0.085 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.085 U	0.65	8.6
Lead	7439-92-1	NA	<0.0007 U	0.00019 J	NA	NA	NA	NA	NA	NA	NA	NA	<0.0007 U	<0.0007 U	0.00056 J
Magnesium	7439-95-4	NA	29	21	NA	NA	NA	NA	NA	NA	NA	NA	48	58	11
Manganese	7439-96-5	NA	0.26 J	0.016 J	NA	NA	NA	NA	NA	NA	NA	NA	0.0058 J	0.21	0.29 J
Mercury	7439-97-6	NA	<0.00008 U	<0.00008 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.00008 U	<0.00008 U	<0.00008 U
Nickel	7440-02-0	NA	<0.001 U	0.00057 J	NA	NA	NA	NA	NA	NA	NA	NA	0.00038 J	0.0015 J	0.0015 J
Potassium	7440-09-7	NA	<1.9 UJ	<1.5 UJ	NA	NA	NA	NA	NA	NA	NA	NA	0.7 J	2.3 J	1 J
Selenium	7782-49-2	NA	<0.001 U	0.0012 J	NA	NA	NA	NA	NA	NA	NA	NA	0.00055 J	<0.001 U	<0.001 U
Silver	7440-22-4	NA	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U
Sodium	7440-23-5	NA	13	1.8 J	NA	NA	NA	NA	NA	NA	NA	NA	3.9 J	8.8	5.4
Thallium	7440-28-0	NA	<0.0002 U	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.0002 U	<0.0002 U	<0.0002 U
Vanadium	7440-62-2	NA	<0.003 U	<0.003 U	NA	NA	NA	NA	NA	NA	NA	NA	<0.003 U	<0.003 U	<0.003 U
Zinc	7440-66-6	NA	<0.008 U	0.012 J	NA	NA	NA	NA	NA	NA	NA	NA	<0.008 U	0.0033 J	<0.0044 U
Anions															
Nitrate	14797-55-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrite	14797-65-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	14808-79-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	18496-25-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Alkalinity	N33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia	7664-41-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	57-12-5	NA	0.0054 J	0.0054 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Phosphorus as P	7723-14-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	DETmw-003	DETmw-003	DETmw-004	FBQmw-168	FBQmw-170	FBQmw-171	FBQmw-174	FBQmw-175	FBQmw-175	FBQmw-176	FBQmw-177	FWGmw-004	FWGmw-007	FWGmw-011
	Sample Id	DET-003-200402-GW	DET-003-200401-GW	DET-004-200401-GW	FBQmw-168-200401-GW	FBQmw-170-200401-GW	FBQmw-171-200401-GW	FBQmw-174-200401-GW	FBQmw-175-200402-GW	FBQmw-175-200401-GW	FBQmw-176-200401-GW	FBQmw-177-200401-GW	FWGmw-004-200401-GW	FWGmw-007-200401-GW	FWGmw-011-200401-GW
	Date	04/21/20	04/21/20	04/21/20	04/27/20	04/28/20	04/29/20	04/27/20	04/27/20	04/27/20	04/28/20	04/29/20	04/23/20	04/29/20	06/11/20
	Sample Type	FD	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Homewood	Homewood	Homewood	Homewood	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Explosives/Propellants															
1,3,5-Trinitrobenzene	99-35-4	NA	<0.00042 U	<0.0004 U	<0.00021 U	<0.00021 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.00039 U	<0.00022 U	<0.00021 U
1,3-Dinitrobenzene	99-65-0	NA	<0.00021 U	<0.0002 U	<0.00011 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.00011 U	<0.0001 U	<0.0002 U	<0.00011 U	<0.0001 U
2,4,6-Trinitrotoluene	118-96-7	NA	<0.00042 U	<0.0004 U	<0.00011 U	<0.0001 U	<0.0001 U	0.016	<0.0001 U	<0.0001 U	<0.00011 U	<0.0001 U	<0.00039 U	<0.00011 U	<0.0001 U
2,4-Dinitrotoluene	121-14-2	NA	<0.00021 U	<0.0002 U	<0.00009 U	<0.00008 U	<0.00008 U	0.00047	<0.00008 U	<0.00008 U	<0.00009 U	<0.00008 U	<0.0002 U	<0.00009 U	<0.00008 U
2,6-Dinitrotoluene	606-20-2	NA	<0.00021 U	<0.0002 U	<0.00009 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00009 U	<0.00008 U	<0.0002 U	<0.00009 U	<0.00008 U
2-Amino-4,6-Dinitrotoluene	35572-78-2	NA	<0.00013 U	<0.00012 U	<0.00011 U	<0.0001 U	<0.0001 U	0.018	<0.0001 U	<0.0001 U	<0.00011 U	<0.0001 U	<0.00012 U	<0.00011 U	<0.0001 U
2-Nitrotoluene	88-72-2	NA	<0.00021 U	<0.0002 U	<0.00021 U	<0.00021 U	<0.00021 UJ	<0.0002 U	<0.00021 U	<0.0002 UJ	<0.00021 U	<0.0002 UJ	<0.0002 U	<0.00022 UJ	<0.00021 U
3-Nitrotoluene	99-08-1	NA	<0.00042 U	<0.0004 U	<0.00043 U	<0.00042 U	<0.00041 UJ	<0.0004 U	<0.00041 U	<0.0004 U	<0.00043 U	<0.00039 UJ	<0.00039 U	<0.00043 UJ	<0.00042 U
4-Amino-2,6-Dinitrotoluene	19406-51-0	NA	<0.00013 U	<0.00012 U	<0.00013 U	<0.00012 U	<0.00012 U	0.018	<0.00012 U	<0.00012 U	<0.00013 UJ	<0.00012 U	<0.00012 U	<0.00013 U	<0.00013 U
4-Nitrotoluene	99-99-0	NA	<0.00042 U	<0.0004 U	<0.00043 U	<0.00042 U	<0.00041 UJ	<0.0004 U	<0.00041 U	<0.0004 U	<0.00043 U	<0.00039 UJ	<0.00039 U	<0.00043 UJ	0.017
HMX	2691-41-0	NA	<0.00021 U	0.0015	<0.00021 U	<0.00021 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00022 U	<0.00021 U
Nitrobenzene	98-95-3	NA	<0.00021 U	<0.0002 U	<0.00021 U	<0.00021 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00022 U	<0.00021 U
Nitroglycerin	55-63-0	NA	<0.0021 U	<0.002 U	<0.0021 U	<0.0021 U	<0.0021 U	<0.002 U	<0.0021 U	<0.002 U	<0.0021 U	<0.002 U	<0.002 U	<0.0022 U	<0.0021 U
PETN	78-11-5	NA	<0.0042 U	<0.004 U	<0.0011 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.0011 U	<0.00098 U	<0.0039 U	<0.0011 U	<0.001 U
RDX	121-82-4	NA	<0.00042 U	0.0015	<0.00021 U	<0.00021 U	<0.00021 U	0.001 J	<0.00021 U	<0.0002 U	<0.00021 U	<0.0002 U	<0.00039 U	<0.00022 U	0.00016 J
Tetryl	479-45-8	NA	<0.00021 U	<0.0002 U	<0.00011 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.00011 U	<0.0001 U	<0.0002 U	<0.00011 U	<0.0001 U
SVOCs															
1-Methylnaphthalene	90-12-0	<0.00004 U	<0.00005 U	<0.00004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	<0.0044 U	<0.0045 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	88-06-2	<0.001 U	<0.001 U	<0.00097 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	51-28-5	<0.03 U	<0.03 U	<0.029 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	<0.0044 U	<0.0045 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	<0.0044 U	<0.0045 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	95-57-8	<0.0044 U	<0.0045 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	534-52-1	<0.0089 U	<0.0089 U	<0.0085 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	<0.00005 U	<0.00006 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	95-48-7	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	88-75-5	<0.001 U	<0.001 U	<0.00097 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	<0.005 U	<0.0051 U	<0.0049 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100-02-7	<0.004 U	<0.0041 U	<0.0039 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	<0.00001 U	<0.00001 U	<0.00001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	208-96-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	56-55-3	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	<0.00005 U	<0.00006 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	DETmw-003	DETmw-003	DETmw-004	FBQmw-168	FBQmw-170	FBQmw-171	FBQmw-174	FBQmw-175	FBQmw-175	FBQmw-176	FBQmw-177	FWGmw-004	FWGmw-007	FWGmw-011
	Sample Id	DET-003-200402-GW	DET-003-200401-GW	DET-004-200401-GW	FBQmw-168-200401-GW	FBQmw-170-200401-GW	FBQmw-171-200401-GW	FBQmw-174-200401-GW	FBQmw-175-200402-GW	FBQmw-175-200401-GW	FBQmw-176-200401-GW	FBQmw-177-200401-GW	FWGmw-004-200401-GW	FWGmw-007-200401-GW	FWGmw-011-200401-GW
	Date	04/21/20	04/21/20	04/21/20	04/27/20	04/28/20	04/29/20	04/27/20	04/27/20	04/27/20	04/28/20	04/29/20	04/23/20	04/29/20	06/11/20
	Sample Type	FD	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Homewood	Homewood	Homewood	Homewood	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Benzo(b)fluoranthene	205-99-2	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	191-24-2	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	<0.00005 U	<0.00006 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	85-68-7	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	<0.0044 U	<0.0045 U	<0.0043 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	<0.001 U	<0.001 U	<0.00097 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	<0.001 U	<0.001 U	<0.00097 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	131-11-3	<0.0005 U	<0.00051 U	<0.00049 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	206-44-0	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	86-73-7	<0.00004 U	<0.00005 U	<0.00004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	<0.00005 U	<0.00006 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	<0.002 U	<0.002 U	<0.0019 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	87-86-5	<0.06 U	<0.061 U	<0.058 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	108-95-2	0.002 J	0.0049 J	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	129-00-0	<0.0001 U	<0.00011 U	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Cresols	1319-77-3	<0.0005 U	<0.00051 U	<0.00049 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
PCB-1016	12674-11-2	<0.0004 U	<0.0004 U	<0.00039 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1221	11104-28-2	<0.00025 U	<0.00025 U	<0.00024 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1232	11141-16-5	<0.0006 U	<0.0006 U	<0.00058 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1242	53469-21-9	<0.001 U	<0.001 U	<0.00096 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1248	12672-29-6	<0.0003 U	<0.0003 U	<0.00029 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1254	11097-69-1	<0.00025 U	<0.00025 U	<0.00024 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1260	11096-82-5	<0.0004 U	<0.0004 U	<0.00039 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides															
4,4'-DDD	72-54-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	72-55-9	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	50-29-3	<0.00005 U	<0.00005 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	309-00-2	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	DETmw-003	DETmw-003	DETmw-004	FBQmw-168	FBQmw-170	FBQmw-171	FBQmw-174	FBQmw-175	FBQmw-175	FBQmw-176	FBQmw-177	FWGmw-004	FWGmw-007	FWGmw-011
	Sample Id	DET-003-200402-GW	DET-003-200401-GW	DET-004-200401-GW	FBQmw-168-200401-GW	FBQmw-170-200401-GW	FBQmw-171-200401-GW	FBQmw-174-200401-GW	FBQmw-175-200402-GW	FBQmw-175-200401-GW	FBQmw-176-200401-GW	FBQmw-177-200401-GW	FWGmw-004-200401-GW	FWGmw-007-200401-GW	FWGmw-011-200401-GW
	Date	04/21/20	04/21/20	04/21/20	04/27/20	04/28/20	04/29/20	04/27/20	04/27/20	04/27/20	04/28/20	04/29/20	04/23/20	04/29/20	06/11/20
	Sample Type	FD	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Homewood	Homewood	Homewood	Homewood	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Endrin	72-20-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1024-57-3	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lindane	58-89-9	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	<0.00005 U	<0.00005 U	<0.00005 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	<0.0008 U	<0.0008 U	<0.00077 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	319-84-6	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5103-71-9	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	319-85-7	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	319-86-8	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	5103-74-2	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	DETmw-003	DETmw-003	DETmw-004	FBQmw-168	FBQmw-170	FBQmw-171	FBQmw-174	FBQmw-175	FBQmw-175	FBQmw-176	FBQmw-177	FWGmw-004	FWGmw-007	FWGmw-011
	Sample Id	DET-003-200402-GW	DET-003-200401-GW	DET-004-200401-GW	FBQmw-168-200401-GW	FBQmw-170-200401-GW	FBQmw-171-200401-GW	FBQmw-174-200401-GW	FBQmw-175-200402-GW	FBQmw-175-200401-GW	FBQmw-176-200401-GW	FBQmw-177-200401-GW	FWGmw-004-200401-GW	FWGmw-007-200401-GW	FWGmw-011-200401-GW
	Date	04/21/20	04/21/20	04/21/20	04/27/20	04/28/20	04/29/20	04/27/20	04/27/20	04/27/20	04/28/20	04/29/20	04/23/20	04/29/20	06/11/20
	Sample Type	FD	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Homewood	Homewood	Homewood	Homewood	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
VOCs															
1,1,1-Trichloroethane	71-55-6	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	79-00-5	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	75-35-4	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	106-93-4	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	107-06-2	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene	540-59-0	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	78-93-3	<0.004 U	<0.004 U	<0.004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	<0.004 U	<0.004 U	<0.004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	108-10-1	<0.0032 U	<0.0032 U	<0.0032 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	<0.0067 U	<0.0064 U	<0.0064 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	71-43-2	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	108-86-1	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	<0.0002 U	<0.0002 UJ	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	75-25-2	<0.001 UJ	<0.001 UJ	<0.001 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	74-83-9	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	108-90-7	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	75-00-3	<0.0016 U	<0.0016 UJ	<0.0016 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	75-09-2	<0.002 U	<0.002 UJ	<0.002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	<0.0002 U	<0.0002 UJ	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, total	1330-20-7	<0.0008 U	<0.0008 UJ	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	<0.0004 U	<0.0004 UJ	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	FWGmw-012	FWGmw-015	FWGmw-016	FWGmw-018	FWGmw-020	FWGmw-020	FWGmw-021	FWGmw-021	FWGmw-024	LL10mw-003	LL12mw-185	LL12mw-185	LL12mw-187	LL12mw-187
	Sample Id	FWGmw-012-200401-GW	FWGmw-015-200401-GW	FWGmw-016-200401-GW	FWGmw-018-200401-GW	FWGmw-020-200401-GW	FWGmw-020-200401-GW	FWGmw-021-200402-GW	FWGmw-021-200401-GW	FWGmw-024-200401-GW	LL10mw-003-200401-GW	LL12mw-185-200401-GW	LL12mw-185-200401b-GW	LL12mw-187-200401-GW	LL12mw-187-200401b-GW
	Date	06/11/20	04/21/20	04/22/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	04/28/20	04/20/20	04/28/20	04/20/20	04/28/20
	Sample Type	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Unconsolidated	Upper Sharon	Basal Sharon Congl	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Metals															
Aluminum	7429-90-5	0.19 J	<0.07 U	<0.07 U	<0.07 U	<0.07 U	<0.07 U	0.043 J	0.052 J	<0.07 U	NA	NA	NA	NA	NA
Antimony	7440-36-0	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 UJ	<0.001 UJ	<0.001 UJ	<0.001 UJ	<0.001 U	NA	NA	NA	NA	NA
Arsenic	7440-38-2	0.0018 J	0.00034 J	0.004 J	0.02	0.045	0.044	0.00082 J	0.00087 J	0.0024 J	NA	NA	NA	NA	NA
Barium	7440-39-3	0.022 J	0.0077 J	0.052 J	0.073	0.078 J	0.079	0.017	0.017	0.01	NA	NA	NA	NA	NA
Beryllium	7440-41-7	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	<0.0003 U	NA	NA	NA	NA	NA
Cadmium	7440-43-9	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	NA	NA	NA	NA
Calcium	7440-70-2	23	260	100	90	100	100 J	19	19	73	NA	NA	NA	NA	NA
Chromium	7440-47-3	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	NA	NA	NA	NA	NA
Cobalt	7440-48-4	0.0018	<0.00035 U	<0.00035 U	0.0024	0.0029	0.0031	0.004	0.004	0.00077 J	NA	NA	NA	NA	NA
Copper	7440-50-8	0.0033 J	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0018 U	<0.0013 U	NA	NA	NA	NA	NA
Iron	7439-89-6	3.2	<0.18 U	<0.65 U	0.45	0.6	1.4	3.5	3.5 J	2	NA	NA	NA	NA	NA
Lead	7439-92-1	0.0019 J	<0.0007 U	<0.0007 U	<0.0007 U	<0.0007 U	<0.0007 U	0.00022 J	0.00021 J	<0.0007 U	NA	NA	NA	NA	NA
Magnesium	7439-95-4	5.1	250	28	27	32	34	6.9	7.1	21	NA	NA	NA	NA	NA
Manganese	7439-96-5	0.092 J	0.06	0.22	0.13 J	0.062 J	0.06 J	0.62 J	0.61 J	0.33 J	NA	NA	NA	NA	NA
Mercury	7439-97-6	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	<0.00008 U	NA	NA	NA	NA	NA
Nickel	7440-02-0	0.0012 J	0.00058 J	<0.001 U	0.0031	0.002 J	0.002 J	0.0093	0.0089	0.0027 J	NA	NA	NA	NA	NA
Potassium	7440-09-7	1.3 J	3.2	2.2 J	2.1 J	4.5	4.3	1.5 J	1.4 J	1 J	NA	NA	NA	NA	NA
Selenium	7782-49-2	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	NA	NA	NA	NA
Silver	7440-22-4	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA
Sodium	7440-23-5	6	43	12	16	15	15	3.5 J	3.6 J	5.2	NA	NA	NA	NA	NA
Thallium	7440-28-0	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	<0.0002 U	NA	NA	NA	NA	NA
Vanadium	7440-62-2	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	NA	NA	NA	NA	NA
Zinc	7440-66-6	0.034	<0.008 U	<0.008 U	<0.008 U	<0.008 U	<0.008 U	<0.014 U	<0.013 U	<0.0032 U	NA	NA	NA	NA	NA
Anions															
Nitrate	14797-55-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	69	NA	1600 J	NA
Nitrite	14797-65-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	14808-79-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfide	18496-25-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Miscellaneous															
Alkalinity	N33	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ammonia	7664-41-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05 U	NA	720
Cyanide	57-12-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Phosphorus as P	7723-14-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	FWGmw-012	FWGmw-015	FWGmw-016	FWGmw-018	FWGmw-020	FWGmw-020	FWGmw-021	FWGmw-021	FWGmw-024	LL10mw-003	LL12mw-185	LL12mw-185	LL12mw-187	LL12mw-187
	Sample Id	FWGmw-012-200401-GW	FWGmw-015-200401-GW	FWGmw-016-200401-GW	FWGmw-018-200401-GW	FWGmw-020-200401-GW	FWGmw-020-200401-GW	FWGmw-021-200402-GW	FWGmw-021-200401-GW	FWGmw-024-200401-GW	LL10mw-003-200401-GW	LL12mw-185-200401-GW	LL12mw-185-200401b-GW	LL12mw-187-200401-GW	LL12mw-187-200401b-GW
	Date	06/11/20	04/21/20	04/22/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	04/28/20	04/20/20	04/28/20	04/20/20	04/28/20
	Sample Type	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Unconsolidated	Upper Sharon	Basal Sharon Congl	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Explosives/Propellants															
1,3,5-Trinitrobenzene	99-35-4	<0.00021 U	<0.00041 UJ	<0.00039 UJ	NA	NA	NA	<0.00019 U	<0.0002 U	<0.00021 U	NA	NA	NA	NA	NA
1,3-Dinitrobenzene	99-65-0	<0.0001 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA
2,4,6-Trinitrotoluene	118-96-7	<0.0001 U	<0.00041 UJ	<0.00039 UJ	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	<0.00008 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.00008 U	<0.00008 U	<0.00008 U	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	<0.00008 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.00008 U	<0.00008 U	<0.00008 U	NA	NA	NA	NA	NA
2-Amino-4,6-Dinitrotoluene	35572-78-2	<0.0001 U	<0.00012 UJ	<0.00012 UJ	NA	NA	NA	0.00016	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA
2-Nitrotoluene	88-72-2	<0.00021 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.00019 U	<0.0002 U	<0.00021 U	NA	NA	NA	NA	NA
3-Nitrotoluene	99-08-1	<0.00042 U	<0.00041 UJ	<0.00039 UJ	NA	NA	NA	<0.00038 U	<0.00039 U	<0.00041 U	NA	NA	NA	NA	NA
4-Amino-2,6-Dinitrotoluene	19406-51-0	<0.00013 U	<0.00012 UJ	<0.00012 UJ	NA	NA	NA	<0.00012 U	<0.00012 U	<0.00012 U	NA	NA	NA	NA	NA
4-Nitrotoluene	99-99-0	0.011	<0.00041 UJ	<0.00039 UJ	NA	NA	NA	<0.00038 U	<0.00039 U	<0.00041 U	NA	NA	NA	NA	NA
HMX	2691-41-0	<0.00021 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.00019 U	<0.0002 U	<0.00021 U	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	<0.00021 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.00019 U	<0.0002 U	<0.00021 U	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	<0.0021 U	<0.002 UJ	<0.002 UJ	NA	NA	NA	<0.0019 U	<0.002 U	<0.0021 U	NA	NA	NA	NA	NA
PETN	78-11-5	<0.001 U	<0.0041 UJ	<0.0039 UJ	NA	NA	NA	<0.00096 U	<0.00098 U	<0.001 U	NA	NA	NA	NA	NA
RDX	121-82-4	<0.00021 U	<0.00041 UJ	<0.00039 UJ	NA	NA	NA	0.00046 J	0.00054 J	<0.00021 U	NA	NA	NA	NA	NA
Tetryl	479-45-8	<0.0001 U	<0.0002 UJ	<0.0002 UJ	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA	NA	NA	NA
SVOCs															
1-Methylnaphthalene	90-12-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	88-06-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	51-28-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	95-57-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	534-52-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	95-48-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	88-75-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100-02-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	208-96-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	FWGmw-012	FWGmw-015	FWGmw-016	FWGmw-018	FWGmw-020	FWGmw-020	FWGmw-021	FWGmw-021	FWGmw-024	LL10mw-003	LL12mw-185	LL12mw-185	LL12mw-187	LL12mw-187
	Sample Id	FWGmw-012-200401-GW	FWGmw-015-200401-GW	FWGmw-016-200401-GW	FWGmw-018-200401-GW	FWGmw-020-200401-GW	FWGmw-020-200401-GW	FWGmw-021-200402-GW	FWGmw-021-200401-GW	FWGmw-024-200401-GW	LL10mw-003-200401-GW	LL12mw-185-200401-GW	LL12mw-185-200401b-GW	LL12mw-187-200401-GW	LL12mw-187-200401b-GW
	Date	06/11/20	04/21/20	04/22/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	04/28/20	04/20/20	04/28/20	04/20/20	04/28/20
	Sample Type	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Unconsolidated	Upper Sharon	Basal Sharon Congl	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	191-24-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	85-68-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	131-11-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	206-44-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	86-73-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	87-86-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	108-95-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	129-00-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Cresols	1319-77-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
PCB-1016	12674-11-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1221	11104-28-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1232	11141-16-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1242	53469-21-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1248	12672-29-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides															
4,4'-DDD	72-54-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	72-55-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	50-29-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	309-00-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	FWGmw-012	FWGmw-015	FWGmw-016	FWGmw-018	FWGmw-020	FWGmw-020	FWGmw-021	FWGmw-021	FWGmw-024	LL10mw-003	LL12mw-185	LL12mw-185	LL12mw-187	LL12mw-187
	Sample Id	FWGmw-012-200401-GW	FWGmw-015-200401-GW	FWGmw-016-200401-GW	FWGmw-018-200401-GW	FWGmw-020-200401-GW	FWGmw-020-200401-GW	FWGmw-021-200402-GW	FWGmw-021-200401-GW	FWGmw-024-200401-GW	LL10mw-003-200401-GW	LL12mw-185-200401-GW	LL12mw-185-200401b-GW	LL12mw-187-200401-GW	LL12mw-187-200401b-GW
	Date	06/11/20	04/21/20	04/22/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	04/28/20	04/20/20	04/28/20	04/20/20	04/28/20
	Sample Type	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Unconsolidated	Upper Sharon	Basal Sharon Congl	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Endrin	72-20-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1024-57-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lindane	58-89-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	319-84-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5103-71-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	319-85-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	5103-74-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	FWGmw-012	FWGmw-015	FWGmw-016	FWGmw-018	FWGmw-020	FWGmw-020	FWGmw-021	FWGmw-021	FWGmw-024	LL10mw-003	LL12mw-185	LL12mw-185	LL12mw-187	LL12mw-187
	Sample Id	FWGmw-012-200401-GW	FWGmw-015-200401-GW	FWGmw-016-200401-GW	FWGmw-018-200401-GW	FWGmw-020-200401-GW	FWGmw-020-200401-GW	FWGmw-021-200402-GW	FWGmw-021-200401-GW	FWGmw-024-200401-GW	LL10mw-003-200401-GW	LL12mw-185-200401-GW	LL12mw-185-200401b-GW	LL12mw-187-200401-GW	LL12mw-187-200401b-GW
	Date	06/11/20	04/21/20	04/22/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	06/11/20	04/28/20	04/20/20	04/28/20	04/20/20	04/28/20
	Sample Type	GR	GR	GR	GR	GR	GR	FD	GR	GR	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Unconsolidated	Upper Sharon	Basal Sharon Congl	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Homewood	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
VOCs															
1,1,1-Trichloroethane	71-55-6	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	79-00-5	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	75-35-4	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	106-93-4	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	107-06-2	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene	540-59-0	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	78-93-3	NA	NA	NA	<0.004 U	NA	<0.004 U	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	NA	NA	NA	<0.004 U	NA	<0.004 U	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	108-10-1	NA	NA	NA	<0.0032 U	NA	<0.0032 U	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	NA	NA	NA	<0.0064 U	NA	<0.0064 U	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	71-43-2	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	108-86-1	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	NA	NA	NA	<0.0002 U	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	75-25-2	NA	NA	NA	<0.001 U	NA	<0.001 U	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	74-83-9	NA	NA	NA	<0.0008 UJ	NA	<0.0008 UJ	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	0.0013 J	NA	NA	NA	NA
Chlorobenzene	108-90-7	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	75-00-3	NA	NA	NA	<0.0016 U	NA	<0.0016 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	75-09-2	NA	NA	NA	<0.002 U	NA	<0.002 U	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	NA	NA	NA	<0.0002 U	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, total	1330-20-7	NA	NA	NA	<0.0008 U	NA	<0.0008 U	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	NA	NA	NA	<0.0004 U	NA	<0.0004 U	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL1mw-063	LL1mw-064	LL1mw-080	LL1mw-081	LL1mw-083	LL1mw-084	LL1mw-086	LL1mw-086	LL1mw-087	LL1mw-087	LL1mw-089	LL1mw-089	LL2mw-059	LL2mw-267
	Sample Id	LL1mw-063-200401-GW	LL1mw-064-200401-GW	LL1mw-080-200401-GW	LL1mw-081-200401-GW	LL1mw-083-200401-GW	LL1mw-084-200401-GW	LL1mw-086-200401-GW	LL1mw-086-200401-GW	LL1mw-087-200402-GW	LL1mw-087-200401-GW	LL1mw-089-200402-GW	LL1mw-089-200401-GW	LL2mw-059-200401-GW	LL2mw-267-200401-GW
	Date	04/23/20	04/22/20	04/23/20	04/23/20	04/23/20	04/23/20	04/29/20	04/29/20	04/27/20	04/27/20	04/27/20	04/27/20	04/23/20	04/22/20
	Sample Type	GR	GR	GR	GR	GR	GR	GR	GR	FD	GR	FD	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**														
Metals															
Aluminum	7429-90-5	NA	0.048 J	NA	NA	NA	NA	NA	NA	NA	0.29 J	0.045 J	0.061 J	NA	NA
Antimony	7440-36-0	NA	<0.001 U	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	NA	NA
Arsenic	7440-38-2	NA	0.0087	NA	NA	NA	NA	NA	NA	NA	0.00066 J	0.001 J	0.00095 J	NA	NA
Barium	7440-39-3	NA	0.051 J	NA	NA	NA	NA	NA	NA	NA	0.021	0.001 J	0.00051 J	NA	NA
Beryllium	7440-41-7	NA	<0.0003 U	NA	NA	NA	NA	NA	NA	NA	<0.0003 U	<0.0003 U	<0.0003 U	NA	NA
Cadmium	7440-43-9	NA	<0.001 U	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	NA	NA
Calcium	7440-70-2	NA	59	NA	NA	NA	NA	NA	NA	NA	79	3.8	3.9	NA	NA
Chromium	7440-47-3	NA	<0.0018 U	NA	NA	NA	NA	NA	NA	NA	<0.0018 U	<0.0018 U	<0.0018 U	NA	NA
Cobalt	7440-48-4	NA	0.00009 J	NA	NA	NA	NA	NA	NA	NA	0.00045 J	0.00075 J	0.00075 J	NA	NA
Copper	7440-50-8	NA	0.00079 J	NA	NA	NA	NA	NA	NA	NA	<0.0018 U	<0.0018 U	<0.0018 U	NA	NA
Iron	7439-89-6	NA	2.4	NA	NA	NA	NA	NA	NA	NA	0.89	<0.085 U	<0.085 U	NA	NA
Lead	7439-92-1	NA	0.00043 J	NA	NA	NA	NA	NA	NA	NA	0.00041 J	<0.0007 U	<0.0007 U	NA	NA
Magnesium	7439-95-4	NA	9.9	NA	NA	NA	NA	NA	NA	NA	19	5	5.2	NA	NA
Manganese	7439-96-5	NA	0.12	NA	NA	NA	NA	0.45	0.57	NA	0.072 J	0.046 J	0.046 J	NA	0.56 J
Mercury	7439-97-6	NA	<0.00008 U	NA	NA	NA	NA	NA	NA	NA	<0.00008 U	<0.00008 U	<0.00008 U	NA	NA
Nickel	7440-02-0	NA	<0.001 U	NA	NA	NA	NA	NA	NA	NA	0.0021 J	0.0068	0.0065	NA	NA
Potassium	7440-09-7	NA	0.73 J	NA	NA	NA	NA	NA	NA	NA	1.2 J	0.85 J	0.82 J	NA	NA
Selenium	7782-49-2	NA	<0.001 U	NA	NA	NA	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	NA	NA
Silver	7440-22-4	NA	<0.0001 U	NA	NA	NA	NA	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA
Sodium	7440-23-5	NA	5.2	NA	NA	NA	NA	NA	NA	NA	8.2	2.6 J	2.6 J	NA	NA
Thallium	7440-28-0	NA	<0.0002 U	NA	NA	NA	NA	NA	NA	NA	<0.0002 U	0.00017 J	0.00015 J	NA	NA
Vanadium	7440-62-2	NA	<0.003 U	NA	NA	NA	NA	NA	NA	NA	<0.003 U	<0.003 U	<0.003 U	NA	NA
Zinc	7440-66-6	NA	0.0021 J	NA	NA	NA	NA	NA	NA	NA	<0.008 U	0.015 J	0.012 J	NA	NA
Anions															
Nitrate	14797-55-8	0.7	NA	NA	NA	0.43 J	NA	NA	<0.2 U	NA	NA	NA	0.12 J	NA	NA
Nitrite	14797-65-0	<0.1 U	NA	NA	NA	<0.1 U	NA	NA	<0.1 U	NA	NA	NA	<0.1 U	NA	NA
Sulfate	14808-79-8	100	NA	NA	NA	100	NA	NA	89	NA	NA	NA	25	NA	NA
Sulfide	18496-25-8	<1.9 U	NA	NA	NA	<1.9 U	NA	NA	<1.9 U	NA	NA	NA	<1.9 U	NA	NA
Miscellaneous															
Alkalinity	N33	6.1 J	NA	NA	NA	<10 U	NA	NA	190	NA	NA	NA	8.8 J	NA	NA
Ammonia	7664-41-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	57-12-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA	NA	0.00001 J	0.00002 J	NA	NA	NA	NA
Total Phosphorus as P	7723-14-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL1mw-063	LL1mw-064	LL1mw-080	LL1mw-081	LL1mw-083	LL1mw-084	LL1mw-086	LL1mw-086	LL1mw-087	LL1mw-087	LL1mw-089	LL1mw-089	LL2mw-059	LL2mw-267
	Sample Id	LL1mw-063-200401-GW	LL1mw-064-200401-GW	LL1mw-080-200401-GW	LL1mw-081-200401-GW	LL1mw-083-200401-GW	LL1mw-084-200401-GW	LL1mw-086-200401-GW	LL1mw-086-200401-GW	LL1mw-087-200402-GW	LL1mw-087-200401-GW	LL1mw-089-200402-GW	LL1mw-089-200401-GW	LL2mw-059-200401-GW	LL2mw-267-200401-GW
	Date	04/23/20	04/22/20	04/23/20	04/23/20	04/23/20	04/23/20	04/29/20	04/29/20	04/27/20	04/27/20	04/27/20	04/27/20	04/23/20	04/22/20
	Sample Type	GR	GR	GR	GR	GR	GR	GR	GR	FD	GR	FD	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**														
Explosives/Propellants															
1,3,5-Trinitrobenzene	99-35-4	<0.0004 U	<0.00042 U	<0.00039 U	<0.00041 U	0.0036 J	0.0012	NA	NA	NA	<0.00021 U	<0.00022 U	<0.0002 U	0.0024	<0.0004 U
1,3-Dinitrobenzene	99-65-0	<0.0002 U	<0.00021 U	0.0001 J	<0.0002 U	0.00078 J	0.00065 J	NA	NA	NA	<0.0001 U	<0.00011 U	<0.0001 U	<0.00021 U	<0.0002 U
2,4,6-Trinitrotoluene	118-96-7	<0.0004 U	<0.00042 U	<0.00039 U	<0.00041 U	0.0014 J	0.0023	NA	NA	NA	<0.0001 U	<0.00011 U	<0.0001 U	<0.00042 U	<0.0004 U
2,4-Dinitrotoluene	121-14-2	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	0.002 J	0.00064 J	NA	NA	NA	<0.00008 U	<0.00009 U	<0.00008 U	0.00047	<0.0002 U
2,6-Dinitrotoluene	606-20-2	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00019 UJ	<0.0002 U	NA	NA	NA	<0.00008 U	<0.00009 U	<0.00008 U	<0.00021 U	<0.0002 U
2-Amino-4,6-Dinitrotoluene	35572-78-2	<0.00012 U	<0.00013 U	0.0011	0.00056 J	0.007 J	0.0073	NA	NA	NA	<0.0001 U	<0.00011 U	<0.0001 U	0.00056	0.00012 J
2-Nitrotoluene	88-72-2	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00019 UJ	<0.0002 U	NA	NA	NA	<0.00021 U	<0.00022 U	<0.0002 U	<0.00021 U	<0.0002 U
3-Nitrotoluene	99-08-1	<0.0004 U	<0.00042 U	<0.00039 U	<0.00041 U	<0.00039 UJ	<0.00039 U	NA	NA	NA	<0.00042 U	<0.00044 U	<0.0004 U	<0.00042 U	<0.0004 U
4-Amino-2,6-Dinitrotoluene	19406-51-0	<0.00012 U	<0.00013 U	0.0022	0.00053 J	0.011 J	0.017	NA	NA	NA	<0.00012 U	<0.00013 U	<0.00012 U	0.00051	0.00017 J
4-Nitrotoluene	99-99-0	<0.0004 U	<0.00042 U	<0.00039 U	<0.00041 U	<0.00039 UJ	<0.00039 U	NA	NA	NA	<0.00042 U	<0.00044 U	<0.0004 U	<0.00042 U	<0.0004 U
HMX	2691-41-0	0.0032	<0.00021 U	0.002	<0.0002 U	<0.00019 U	<0.0002 U	NA	NA	NA	<0.00021 U	<0.00022 U	<0.0002 U	<0.00021 U	<0.0002 U
Nitrobenzene	98-95-3	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00019 UJ	<0.0002 U	NA	NA	NA	<0.00021 U	<0.00022 U	<0.0002 U	<0.00021 U	<0.0002 U
Nitroglycerin	55-63-0	<0.002 U	<0.0021 U	<0.002 U	<0.002 U	<0.0019 UJ	<0.002 U	NA	NA	NA	<0.0021 U	<0.0022 U	<0.002 U	<0.0021 U	<0.002 U
PETN	78-11-5	<0.004 U	<0.0042 U	<0.0039 U	<0.0041 U	<0.0039 UJ	<0.0039 U	NA	NA	NA	<0.001 U	<0.0011 U	<0.001 U	<0.0042 U	<0.004 U
RDX	121-82-4	<0.0004 U	<0.00042 U	0.011	0.00029 J	<0.00039 UJ	0.0023 J	NA	NA	NA	<0.00021 U	<0.00022 U	<0.0002 U	<0.00042 U	<0.0004 U
Tetryl	479-45-8	<0.0002 U	<0.00021 U	<0.0002 U	<0.0002 U	<0.00019 UJ	<0.0002 U	NA	NA	NA	<0.0001 U	<0.00011 U	<0.0001 U	<0.00021 U	<0.0002 U
SVOCs															
1-Methylnaphthalene	90-12-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	88-06-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	51-28-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	95-57-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	534-52-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylphenol	95-48-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Nitrophenol	88-75-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100-02-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	208-96-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL1mw-063	LL1mw-064	LL1mw-080	LL1mw-081	LL1mw-083	LL1mw-084	LL1mw-086	LL1mw-086	LL1mw-087	LL1mw-087	LL1mw-089	LL1mw-089	LL2mw-059	LL2mw-267
	Sample Id	LL1mw-063-200401-GW	LL1mw-064-200401-GW	LL1mw-080-200401-GW	LL1mw-081-200401-GW	LL1mw-083-200401-GW	LL1mw-084-200401-GW	LL1mw-086-200401-GW	LL1mw-086-200401-GW	LL1mw-087-200402-GW	LL1mw-087-200401-GW	LL1mw-089-200402-GW	LL1mw-089-200401-GW	LL2mw-059-200401-GW	LL2mw-267-200401-GW
	Date	04/23/20	04/22/20	04/23/20	04/23/20	04/23/20	04/23/20	04/29/20	04/29/20	04/27/20	04/27/20	04/27/20	04/27/20	04/23/20	04/22/20
	Sample Type	GR	GR	GR	GR	GR	GR	GR	GR	FD	GR	FD	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**														
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	191-24-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	85-68-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	131-11-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	206-44-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	86-73-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	87-86-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	108-95-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	129-00-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Cresols	1319-77-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCBs															
PCB-1016	12674-11-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1221	11104-28-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1232	11141-16-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1242	53469-21-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1248	12672-29-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1254	11097-69-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB-1260	11096-82-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pesticides															
4,4'-DDD	72-54-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	72-55-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	50-29-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	309-00-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL1mw-063	LL1mw-064	LL1mw-080	LL1mw-081	LL1mw-083	LL1mw-084	LL1mw-086	LL1mw-086	LL1mw-087	LL1mw-087	LL1mw-089	LL1mw-089	LL2mw-059	LL2mw-267
	Sample Id	LL1mw-063-200401-GW	LL1mw-064-200401-GW	LL1mw-080-200401-GW	LL1mw-081-200401-GW	LL1mw-083-200401-GW	LL1mw-084-200401-GW	LL1mw-086-200401-GW	LL1mw-086-200401-GW	LL1mw-087-200402-GW	LL1mw-087-200401-GW	LL1mw-089-200402-GW	LL1mw-089-200401-GW	LL2mw-059-200401-GW	LL2mw-267-200401-GW
	Date	04/23/20	04/22/20	04/23/20	04/23/20	04/23/20	04/23/20	04/29/20	04/29/20	04/27/20	04/27/20	04/27/20	04/27/20	04/23/20	04/22/20
	Sample Type	GR	GR	GR	GR	GR	GR	GR	GR	FD	GR	FD	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**														
Endrin	72-20-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1024-57-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lindane	58-89-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	319-84-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5103-71-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
beta-BHC	319-85-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	319-86-8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane	5103-74-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL1mw-063	LL1mw-064	LL1mw-080	LL1mw-081	LL1mw-083	LL1mw-084	LL1mw-086	LL1mw-086	LL1mw-087	LL1mw-087	LL1mw-089	LL1mw-089	LL2mw-059	LL2mw-267
	Sample Id	LL1mw-063-200401-GW	LL1mw-064-200401-GW	LL1mw-080-200401-GW	LL1mw-081-200401-GW	LL1mw-083-200401-GW	LL1mw-084-200401-GW	LL1mw-086-200401-GW	LL1mw-086-200401-GW	LL1mw-087-200402-GW	LL1mw-087-200401-GW	LL1mw-089-200402-GW	LL1mw-089-200401-GW	LL2mw-059-200401-GW	LL2mw-267-200401-GW
	Date	04/23/20	04/22/20	04/23/20	04/23/20	04/23/20	04/23/20	04/29/20	04/29/20	04/27/20	04/27/20	04/27/20	04/27/20	04/23/20	04/22/20
	Sample Type	GR	GR	GR	GR	GR	GR	GR	GR	FD	GR	FD	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Dissolved	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Unconsolidated	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**														
VOCs															
1,1,1-Trichloroethane	71-55-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	79-00-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	75-35-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	106-93-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	107-06-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene	540-59-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	78-93-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	108-10-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	71-43-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromobenzene	108-86-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	75-25-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	74-83-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	108-90-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	75-00-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene chloride	75-09-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, total	1330-20-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL3mw-237	LL3mw-238	LL3mw-239	LL3mw-241	RQLmw-007	RQLmw-007	RQLmw-008	RQLmw-009	RQLmw-011	RQLmw-011	RQLmw-013	SCFmw-004	WBGmw-006	WBGmw-009
	Sample Id	LL3mw-237-200401-GW	LL3mw-238-200401-GW	LL3mw-239-200401-GW	LL3mw-241-200401-GW	RQLmw-007-200402-GW	RQLmw-007-200401-GW	RQLmw-008-2004201-GW	RQLmw-009-200401-GW	RQLmw-011-200402-GW	RQLmw-011-200401-GW	RQLmw-013-200401-GW	SCFmw-004-200401-GW	WBGmw-006-200401-GW	WBGmw-009-200401-GW
	Date	04/22/20	04/30/20	04/30/20	04/30/20	04/21/20	04/21/20	04/22/20	04/22/20	04/21/20	04/21/20	04/22/20	04/22/20	04/20/20	04/20/20
	Sample Type	GR	GR	GR	GR	FD	GR	GR	GR	FD	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Basal Sharon Congl	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Metals															
Aluminum	7429-90-5	NA	NA	NA	NA	0.04 J	0.051 J	<0.07 U	0.074 J	NA	NA	NA	0.024 J	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	NA	NA	<0.001 U	NA	NA
Arsenic	7440-38-2	NA	NA	NA	NA	0.0079	0.0083	0.016	0.001 J	NA	NA	NA	<0.001 U	NA	NA
Barium	7440-39-3	NA	NA	NA	NA	0.033 J	0.031 J	0.098 J	0.0014 J	NA	NA	NA	0.051 J	NA	NA
Beryllium	7440-41-7	NA	NA	NA	NA	<0.0003 U	<0.0003 U	<0.0003 U	0.00012 J	NA	NA	NA	<0.0003 U	NA	NA
Cadmium	7440-43-9	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	NA	NA	<0.001 U	NA	NA
Calcium	7440-70-2	NA	NA	NA	NA	83	94 J	63	19	NA	NA	NA	170	NA	NA
Chromium	7440-47-3	NA	NA	NA	NA	<0.0018 U	<0.0018 U	<0.0018 U	0.0048 J	NA	NA	NA	<0.0018 U	NA	NA
Cobalt	7440-48-4	NA	NA	NA	NA	0.011	0.011	0.0042	0.00019 J	NA	NA	NA	<0.00035 U	NA	NA
Copper	7440-50-8	NA	NA	NA	NA	0.00074 J	0.0009 J	<0.0018 U	0.003	NA	NA	NA	0.0032	NA	NA
Iron	7439-89-6	NA	NA	NA	NA	4.7	4	63	2.6	NA	NA	NA	<0.085 U	NA	NA
Lead	7439-92-1	NA	NA	NA	NA	0.00029 J	0.00031 J	0.00019 J	0.00053 J	NA	NA	NA	0.00025 J	NA	NA
Magnesium	7439-95-4	NA	NA	NA	NA	42	48 J	72	11	NA	NA	NA	66	NA	NA
Manganese	7439-96-5	NA	NA	NA	NA	1.8 J	2 J	0.84	0.023	NA	NA	NA	0.82	NA	NA
Mercury	7439-97-6	NA	NA	NA	NA	0.00014 J	<0.00008 U	<0.00008 U	<0.00008 U	NA	NA	NA	<0.00008 U	NA	NA
Nickel	7440-02-0	NA	NA	NA	NA	0.033 J	0.039 J	0.0064	0.0004 J	NA	NA	NA	0.00045 J	NA	NA
Potassium	7440-09-7	NA	NA	NA	NA	<3.9 UJ	<4.3 UJ	2.9 J	2.8 J	NA	NA	NA	2.9 J	NA	NA
Selenium	7782-49-2	NA	NA	NA	NA	<0.001 U	<0.001 U	<0.001 U	<0.001 U	NA	NA	NA	<0.001 U	NA	NA
Silver	7440-22-4	NA	NA	NA	NA	<0.0001 U	<0.0001 U	<0.0001 U	<0.0001 U	NA	NA	NA	<0.0001 U	NA	NA
Sodium	7440-23-5	NA	NA	NA	NA	3.7 J	3.4 J	3.9 J	1.2 J	NA	NA	NA	13	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	<0.0002 U	<0.0002 U	<0.0002 U	0.0004 J	NA	NA	NA	<0.0002 U	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	<0.003 U	<0.003 U	<0.003 U	0.0014 J	NA	NA	NA	<0.003 U	NA	NA
Zinc	7440-66-6	NA	NA	NA	NA	0.0039 J	0.0077 J	0.03	0.014 J	NA	NA	NA	0.01 J	NA	NA
Anions															
Nitrate	14797-55-8	NA	NA	NA	NA	NA	NA	NA	NA	<0.2 U	<0.2 U	<0.2 U	NA	NA	NA
Nitrite	14797-65-0	NA	NA	NA	NA	NA	NA	NA	NA	<0.1 U	<0.1 U	<0.1 U	NA	NA	NA
Sulfate	14808-79-8	NA	NA	NA	NA	NA	NA	NA	NA	87 J	87 J	140	NA	NA	NA
Sulfide	18496-25-8	NA	NA	NA	NA	NA	NA	NA	NA	<1.9 U	<1.9 U	<1.9 U	NA	NA	NA
Miscellaneous															
Alkalinity	N33	NA	NA	NA	NA	NA	NA	NA	NA	<10 U	<10 U	<10 U	NA	NA	NA
Ammonia	7664-41-7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	57-12-5	NA	NA	NA	NA	<0.01 U	<0.01 U	<0.01 UJ	<0.01 UJ	NA	NA	NA	NA	NA	NA
Perchlorate	14797-73-0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Phosphorus as P	7723-14-0	NA	NA	NA	NA	0.033 J	0.031 J	NA	NA	NA	NA	NA	NA	NA	NA

	Station	LL3mw-237	LL3mw-238	LL3mw-239	LL3mw-241	RQLmw-007	RQLmw-007	RQLmw-008	RQLmw-009	RQLmw-011	RQLmw-011	RQLmw-013	SCFmw-004	WBGmw-006	WBGmw-009
	Sample Id	LL3mw-237-200401-GW	LL3mw-238-200401-GW	LL3mw-239-200401-GW	LL3mw-241-200401-GW	RQLmw-007-200402-GW	RQLmw-007-200401-GW	RQLmw-008-2004201-GW	RQLmw-009-200401-GW	RQLmw-011-200402-GW	RQLmw-011-200401-GW	RQLmw-013-200401-GW	SCFmw-004-200401-GW	WBGmw-006-200401-GW	WBGmw-009-200401-GW
	Date	04/22/20	04/30/20	04/30/20	04/30/20	04/21/20	04/21/20	04/22/20	04/22/20	04/21/20	04/21/20	04/22/20	04/22/20	04/20/20	04/20/20
	Sample Type	GR	GR	GR	GR	FD	GR	GR	GR	FD	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Basal Sharon Congl	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Explosives/Propellants															
1,3,5-Trinitrobenzene	99-35-4	<0.00041 UJ	0.01	<0.00021 U	0.011	<0.00041 UJ	<0.00041 UJ	<0.00041 UJ	<0.00042 UJ	NA	NA	NA	<0.00043 U	<0.00038 U	<0.00043 U
1,3-Dinitrobenzene	99-65-0	<0.00021 UJ	<0.0001 U	<0.00011 U	<0.00011 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
2,4,6-Trinitrotoluene	118-96-7	<0.00041 U	0.024	0.00025	0.0054	<0.00041 UJ	<0.00041 UJ	<0.00041 UJ	<0.00042 UJ	NA	NA	NA	<0.00043 U	<0.00038 U	<0.00043 U
2,4-Dinitrotoluene	121-14-2	<0.00021 UJ	<0.00008 U	<0.00009 U	<0.00009 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
2,6-Dinitrotoluene	606-20-2	<0.00021 UJ	<0.00008 U	<0.00009 U	<0.00009 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
2-Amino-4,6-Dinitrotoluene	35572-78-2	0.0018 J	0.0066	0.00057	0.0027	<0.00012 UJ	<0.00012 UJ	<0.00012 UJ	<0.00012 UJ	NA	NA	NA	<0.00013 U	<0.00011 U	<0.00013 U
2-Nitrotoluene	88-72-2	<0.00021 UJ	<0.00021 UJ	<0.00021 UJ	<0.00022 UJ	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
3-Nitrotoluene	99-08-1	<0.00041 UJ	<0.00042 UJ	<0.00043 UJ	<0.00043 UJ	<0.00041 UJ	<0.00041 R	<0.00041 UJ	<0.00042 UJ	NA	NA	NA	<0.00043 U	<0.00038 U	<0.00043 U
4-Amino-2,6-Dinitrotoluene	19406-51-0	0.0032 J	0.015	0.00083	0.0025	<0.00012 UJ	<0.00012 UJ	<0.00012 UJ	<0.00012 UJ	NA	NA	NA	<0.00013 U	<0.00011 U	<0.00013 U
4-Nitrotoluene	99-99-0	<0.00041 UJ	<0.00042 UJ	<0.00043 UJ	<0.00043 UJ	<0.00041 UJ	<0.00041 UJ	<0.00041 UJ	<0.00042 UJ	NA	NA	NA	<0.00043 U	<0.00038 U	<0.00043 U
HMX	2691-41-0	<0.00021 UJ	0.0015 J	<0.00021 U	<0.00022 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	0.0042	0.00078
Nitrobenzene	98-95-3	<0.00021 UJ	<0.00021 U	<0.00021 U	<0.00022 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
Nitroglycerin	55-63-0	<0.0021 UJ	<0.0021 U	<0.0021 U	<0.0022 U	<0.002 UJ	<0.0021 UJ	<0.002 UJ	<0.0021 UJ	NA	NA	NA	<0.0021 U	<0.0019 U	<0.0022 U
PETN	78-11-5	<0.0041 UJ	<0.001 U	<0.0011 U	<0.0011 U	<0.0041 UJ	<0.0041 UJ	<0.0041 UJ	<0.0042 UJ	NA	NA	NA	<0.0043 U	<0.0038 U	<0.0043 U
RDX	121-82-4	<0.00041 UJ	0.003	0.0011	0.001	<0.00041 U	<0.00041 U	<0.00041 UJ	<0.00042 UJ	NA	NA	NA	<0.00043 U	0.013	0.0019
Tetryl	479-45-8	<0.00021 UJ	<0.0001 U	<0.00011 U	<0.00011 U	<0.0002 UJ	<0.00021 UJ	<0.0002 UJ	<0.00021 UJ	NA	NA	NA	<0.00021 U	<0.00019 U	<0.00022 U
SVOCs															
1-Methylnaphthalene	90-12-0	NA	NA	NA	NA	NA	<0.00004 U	<0.00004 U	<0.00004 UJ	NA	NA	NA	NA	NA	NA
2,4,5-Trichlorophenol	95-95-4	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 U	<0.0047 U	NA	NA	NA	NA	NA	NA
2,4,6-Trichlorophenol	88-06-2	NA	NA	NA	NA	NA	<0.001 U	<0.00099 U	<0.0011 U	NA	NA	NA	NA	NA	NA
2,4-Dichlorophenol	120-83-2	NA	NA	NA	NA	NA	<0.002 U	<0.002 UJ	<0.0021 UJ	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	105-67-9	NA	NA	NA	NA	NA	<0.002 U	<0.002 U	<0.0021 U	NA	NA	NA	NA	NA	NA
2,4-Dinitrophenol	51-28-5	NA	NA	NA	NA	NA	<0.03 U	<0.03 U	<0.032 U	NA	NA	NA	NA	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 U	<0.0047 U	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 U	<0.0047 U	NA	NA	NA	NA	NA	NA
2-Chlorophenol	95-57-8	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 UJ	<0.0047 UJ	NA	NA	NA	NA	NA	NA
2-Methyl-4,6-dinitrophenol	534-52-1	NA	NA	NA	NA	NA	<0.0089 U	<0.0087 U	<0.0094 U	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	91-57-6	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 UJ	NA	NA	NA	NA	NA	NA
2-Methylphenol	95-48-7	NA	NA	NA	NA	NA	<0.002 U	<0.002 UJ	<0.0021 UJ	NA	NA	NA	NA	NA	NA
2-Nitrophenol	88-75-5	NA	NA	NA	NA	NA	<0.001 U	<0.00099 UJ	<0.0011 UJ	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	59-50-7	NA	NA	NA	NA	NA	<0.0051 U	<0.005 U	<0.0053 U	NA	NA	NA	NA	NA	NA
4-Nitrophenol	100-02-7	NA	NA	NA	NA	NA	<0.004 U	<0.004 U	<0.0043 U	NA	NA	NA	NA	NA	NA
Acenaphthene	83-32-9	NA	NA	NA	NA	NA	<0.00001 U	0.00009 J	<0.00001 UJ	NA	NA	NA	NA	NA	NA
Acenaphthylene	208-96-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 UJ	NA	NA	NA	NA	NA	NA
Anthracene	120-12-7	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Benz(a)anthracene	56-55-3	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 UJ	NA	NA	NA	NA	NA	NA

	Station	LL3mw-237	LL3mw-238	LL3mw-239	LL3mw-241	RQLmw-007	RQLmw-007	RQLmw-008	RQLmw-009	RQLmw-011	RQLmw-011	RQLmw-013	SCFmw-004	WBGmw-006	WBGmw-009
	Sample Id	LL3mw-237-200401-GW	LL3mw-238-200401-GW	LL3mw-239-200401-GW	LL3mw-241-200401-GW	RQLmw-007-200402-GW	RQLmw-007-200401-GW	RQLmw-008-2004201-GW	RQLmw-009-200401-GW	RQLmw-011-200402-GW	RQLmw-011-200401-GW	RQLmw-013-200401-GW	SCFmw-004-200401-GW	WBGmw-006-200401-GW	WBGmw-009-200401-GW
	Date	04/22/20	04/30/20	04/30/20	04/30/20	04/21/20	04/21/20	04/22/20	04/22/20	04/21/20	04/21/20	04/22/20	04/22/20	04/20/20	04/20/20
	Sample Type	GR	GR	GR	GR	FD	GR	GR	GR	FD	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Basal Sharon Congl	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Benzo(ghi)perylene	191-24-2	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	207-08-9	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 UJ	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	NA	NA	NA	NA	NA	<0.002 U	<0.002 U	<0.0021 U	NA	NA	NA	NA	NA	NA
Butyl benzyl phthalate	85-68-7	NA	NA	NA	NA	NA	<0.002 U	<0.002 U	<0.0021 U	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	84-74-2	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 U	<0.0047 U	NA	NA	NA	NA	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA	NA	NA	NA	<0.001 U	<0.00099 U	<0.0011 U	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Diethyl phthalate	84-66-2	NA	NA	NA	NA	NA	<0.001 U	<0.00099 U	<0.0011 U	NA	NA	NA	NA	NA	NA
Dimethyl phthalate	131-11-3	NA	NA	NA	NA	NA	<0.00051 U	<0.0005 U	<0.00053 U	NA	NA	NA	NA	NA	NA
Fluoranthene	206-44-0	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Fluorene	86-73-7	NA	NA	NA	NA	NA	<0.00004 U	0.00009 J	<0.00004 UJ	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Naphthalene	91-20-3	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 UJ	NA	NA	NA	NA	NA	NA
Nitrobenzene	98-95-3	NA	NA	NA	NA	NA	<0.002 U	<0.002 UJ	<0.0021 UJ	NA	NA	NA	NA	NA	NA
Pentachlorophenol	87-86-5	NA	NA	NA	NA	NA	<0.061 U	<0.06 U	<0.064 U	NA	NA	NA	NA	NA	NA
Phenanthrene	85-01-8	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Phenol	108-95-2	NA	NA	NA	NA	NA	<0.0044 U	<0.0044 UJ	<0.0047 UJ	NA	NA	NA	NA	NA	NA
Pyrene	129-00-0	NA	NA	NA	NA	NA	<0.00011 U	<0.0001 U	<0.00011 UJ	NA	NA	NA	NA	NA	NA
Total Cresols	1319-77-3	NA	NA	NA	NA	NA	<0.00051 U	<0.0005 U	<0.00053 U	NA	NA	NA	NA	NA	NA
PCBs															
PCB-1016	12674-11-2	NA	NA	NA	NA	NA	<0.00043 U	<0.00041 UJ	<0.00038 UJ	NA	NA	NA	NA	NA	NA
PCB-1221	11104-28-2	NA	NA	NA	NA	NA	<0.00027 U	<0.00026 U	<0.00024 U	NA	NA	NA	NA	NA	NA
PCB-1232	11141-16-5	NA	NA	NA	NA	NA	<0.00064 U	<0.00062 U	<0.00057 U	NA	NA	NA	NA	NA	NA
PCB-1242	53469-21-9	NA	NA	NA	NA	NA	<0.0011 U	<0.001 U	<0.00096 U	NA	NA	NA	NA	NA	NA
PCB-1248	12672-29-6	NA	NA	NA	NA	NA	<0.00032 U	<0.00031 U	<0.00029 U	NA	NA	NA	NA	NA	NA
PCB-1254	11097-69-1	NA	NA	NA	NA	NA	<0.00027 U	<0.00026 U	<0.00024 U	NA	NA	NA	NA	NA	NA
PCB-1260	11096-82-5	NA	NA	NA	NA	NA	<0.00043 U	<0.00041 U	<0.00038 U	NA	NA	NA	NA	NA	NA
Pesticides															
4,4'-DDD	72-54-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
4,4'-DDE	72-55-9	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
4,4'-DDT	50-29-3	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 U	NA	NA	NA	NA	NA	NA
Aldrin	309-00-2	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Dieldrin	60-57-1	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Endosulfan I	959-98-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Endosulfan II	33213-65-9	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	1031-07-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA

	Station	LL3mw-237	LL3mw-238	LL3mw-239	LL3mw-241	RQLmw-007	RQLmw-007	RQLmw-008	RQLmw-009	RQLmw-011	RQLmw-011	RQLmw-013	SCFmw-004	WBGmw-006	WBGmw-009
	Sample Id	LL3mw-237-200401-GW	LL3mw-238-200401-GW	LL3mw-239-200401-GW	LL3mw-241-200401-GW	RQLmw-007-200402-GW	RQLmw-007-200401-GW	RQLmw-008-2004201-GW	RQLmw-009-200401-GW	RQLmw-011-200402-GW	RQLmw-011-200401-GW	RQLmw-013-200401-GW	SCFmw-004-200401-GW	WBGmw-006-200401-GW	WBGmw-009-200401-GW
	Date	04/22/20	04/30/20	04/30/20	04/30/20	04/21/20	04/21/20	04/22/20	04/22/20	04/21/20	04/21/20	04/22/20	04/22/20	04/20/20	04/20/20
	Sample Type	GR	GR	GR	GR	FD	GR	GR	GR	FD	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Basal Sharon Congl	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
Endrin	72-20-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA
Endrin aldehyde	7421-93-4	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA
Endrin ketone	53494-70-5	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1024-57-3	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Lindane	58-89-9	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	NA	NA	NA	NA	NA	<0.00005 U	<0.00005 U	<0.00005 U	NA	NA	NA	NA	NA	NA
Toxaphene	8001-35-2	NA	NA	NA	NA	NA	<0.00086 U	<0.00083 U	<0.00077 U	NA	NA	NA	NA	NA	NA
alpha-BHC	319-84-6	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
alpha-Chlordane	5103-71-9	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
beta-BHC	319-85-7	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
delta-BHC	319-86-8	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 U	<0.00002 U	NA	NA	NA	NA	NA	NA
gamma-Chlordane	5103-74-2	NA	NA	NA	NA	NA	<0.00002 U	<0.00002 UJ	<0.00002 UJ	NA	NA	NA	NA	NA	NA

	Station	LL3mw-237	LL3mw-238	LL3mw-239	LL3mw-241	RQLmw-007	RQLmw-007	RQLmw-008	RQLmw-009	RQLmw-011	RQLmw-011	RQLmw-013	SCFmw-004	WBGmw-006	WBGmw-009
	Sample Id	LL3mw-237-200401-GW	LL3mw-238-200401-GW	LL3mw-239-200401-GW	LL3mw-241-200401-GW	RQLmw-007-200402-GW	RQLmw-007-200401-GW	RQLmw-008-2004201-GW	RQLmw-009-200401-GW	RQLmw-011-200402-GW	RQLmw-011-200401-GW	RQLmw-013-200401-GW	SCFmw-004-200401-GW	WBGmw-006-200401-GW	WBGmw-009-200401-GW
	Date	04/22/20	04/30/20	04/30/20	04/30/20	04/21/20	04/21/20	04/22/20	04/22/20	04/21/20	04/21/20	04/22/20	04/22/20	04/20/20	04/20/20
	Sample Type	GR	GR	GR	GR	FD	GR	GR	GR	FD	GR	GR	GR	GR	GR
	Filter Status	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
	Aquifer	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Upper Sharon	Basal Sharon Congl	Unconsolidated	Unconsolidated
Analyte (mg/L)	**CAS Number**														
VOCs															
1,1,1-Trichloroethane	71-55-6	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
1,1,2-Trichloroethane	79-00-5	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
1,1-Dichloroethane	75-34-3	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	75-35-4	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
1,2-Dibromoethane	106-93-4	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	107-06-2	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene	540-59-0	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
1,2-Dichloropropane	78-87-5	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
2-Butanone	78-93-3	NA	NA	NA	NA	NA	<0.004 U	<0.004 U	<0.004 U	NA	NA	NA	NA	NA	NA
2-Hexanone	591-78-6	NA	NA	NA	NA	NA	<0.004 U	<0.004 U	<0.004 U	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	108-10-1	NA	NA	NA	NA	NA	<0.0032 U	<0.0032 U	<0.0032 U	NA	NA	NA	NA	NA	NA
Acetone	67-64-1	NA	NA	NA	NA	NA	0.08	<0.0064 U	<0.0064 U	NA	NA	NA	NA	NA	NA
Benzene	71-43-2	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Bromobenzene	108-86-1	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Bromochloromethane	74-97-5	NA	NA	NA	NA	NA	<0.0002 U	<0.0002 U	<0.0002 U	NA	NA	NA	NA	NA	NA
Bromodichloromethane	75-27-4	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Bromoform	75-25-2	NA	NA	NA	NA	NA	<0.001 UJ	<0.001 UJ	<0.001 UJ	NA	NA	NA	NA	NA	NA
Bromomethane	74-83-9	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
Carbon disulfide	75-15-0	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	56-23-5	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Chlorobenzene	108-90-7	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Chloroethane	75-00-3	NA	NA	NA	NA	NA	<0.0016 U	<0.0016 U	<0.0016 U	NA	NA	NA	NA	NA	NA
Chloroform	67-66-3	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Chloromethane	74-87-3	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
Dibromochloromethane	124-48-1	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Methylene chloride	75-09-2	NA	NA	NA	NA	NA	<0.002 U	<0.002 U	<0.002 U	NA	NA	NA	NA	NA	NA
Styrene	100-42-5	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Toluene	108-88-3	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Trichloroethene	79-01-6	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	75-01-4	NA	NA	NA	NA	NA	<0.0002 U	<0.0002 U	<0.0002 U	NA	NA	NA	NA	NA	NA
Xylenes, total	1330-20-7	NA	NA	NA	NA	NA	<0.0008 U	<0.0008 U	<0.0008 U	NA	NA	NA	NA	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA
trans-1,3-Dichloropropene	10061-02-6	NA	NA	NA	NA	NA	<0.0004 U	<0.0004 U	<0.0004 U	NA	NA	NA	NA	NA	NA

	Station	WBGmw-020	WBGmw-021
	Sample Id	WBGmw-020-200401-GW	WBGmw-021-200401-GW
	Date	04/20/20	04/20/20
	Sample Type	GR	GR
	Filter Status	Total	Total
	Aquifer	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**		
Metals			
Aluminum	7429-90-5	NA	NA
Antimony	7440-36-0	NA	NA
Arsenic	7440-38-2	NA	NA
Barium	7440-39-3	NA	NA
Beryllium	7440-41-7	NA	NA
Cadmium	7440-43-9	NA	NA
Calcium	7440-70-2	NA	NA
Chromium	7440-47-3	NA	NA
Cobalt	7440-48-4	NA	NA
Copper	7440-50-8	NA	NA
Iron	7439-89-6	NA	NA
Lead	7439-92-1	NA	NA
Magnesium	7439-95-4	NA	NA
Manganese	7439-96-5	NA	NA
Mercury	7439-97-6	NA	NA
Nickel	7440-02-0	NA	NA
Potassium	7440-09-7	NA	NA
Selenium	7782-49-2	NA	NA
Silver	7440-22-4	NA	NA
Sodium	7440-23-5	NA	NA
Thallium	7440-28-0	NA	NA
Vanadium	7440-62-2	NA	NA
Zinc	7440-66-6	NA	NA
Anions			
Nitrate	14797-55-8	NA	NA
Nitrite	14797-65-0	NA	NA
Sulfate	14808-79-8	NA	NA
Sulfide	18496-25-8	NA	NA
Miscellaneous			
Alkalinity	N33	NA	NA
Ammonia	7664-41-7	NA	NA
Cyanide	57-12-5	NA	NA
Perchlorate	14797-73-0	NA	NA
Total Phosphorus as P	7723-14-0	NA	NA

	Station	WBGmw-020	WBGmw-021
	Sample Id	WBGmw-020-200401-GW	WBGmw-021-200401-GW
	Date	04/20/20	04/20/20
	Sample Type	GR	GR
	Filter Status	Total	Total
	Aquifer	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**		
Explosives/Propellants			
1,3,5-Trinitrobenzene	99-35-4	<0.00038 U	<0.0004 U
1,3-Dinitrobenzene	99-65-0	<0.00019 U	<0.0002 U
2,4,6-Trinitrotoluene	118-96-7	<0.00038 U	<0.0004 U
2,4-Dinitrotoluene	121-14-2	<0.00019 U	<0.0002 U
2,6-Dinitrotoluene	606-20-2	<0.00019 U	<0.0002 U
2-Amino-4,6-Dinitrotoluene	35572-78-2	<0.00011 U	<0.00012 U
2-Nitrotoluene	88-72-2	<0.00019 U	<0.0002 U
3-Nitrotoluene	99-08-1	<0.00038 U	<0.0004 U
4-Amino-2,6-Dinitrotoluene	19406-51-0	<0.00011 U	<0.00012 U
4-Nitrotoluene	99-99-0	<0.00038 U	<0.0004 U
HMX	2691-41-0	<0.00019 U	<0.0002 U
Nitrobenzene	98-95-3	<0.00019 U	<0.0002 U
Nitroglycerin	55-63-0	<0.0019 U	<0.002 U
PETN	78-11-5	<0.0038 U	<0.004 U
RDX	121-82-4	<0.00038 U	<0.0004 U
Tetryl	479-45-8	<0.00019 U	<0.0002 U
SVOCs			
1-Methylnaphthalene	90-12-0	NA	NA
2,4,5-Trichlorophenol	95-95-4	NA	NA
2,4,6-Trichlorophenol	88-06-2	NA	NA
2,4-Dichlorophenol	120-83-2	NA	NA
2,4-Dimethylphenol	105-67-9	NA	NA
2,4-Dinitrophenol	51-28-5	NA	NA
2,4-Dinitrotoluene	121-14-2	NA	NA
2,6-Dinitrotoluene	606-20-2	NA	NA
2-Chlorophenol	95-57-8	NA	NA
2-Methyl-4,6-dinitrophenol	534-52-1	NA	NA
2-Methylnaphthalene	91-57-6	NA	NA
2-Methylphenol	95-48-7	NA	NA
2-Nitrophenol	88-75-5	NA	NA
4-Chloro-3-methylphenol	59-50-7	NA	NA
4-Nitrophenol	100-02-7	NA	NA
Acenaphthene	83-32-9	NA	NA
Acenaphthylene	208-96-8	NA	NA
Anthracene	120-12-7	NA	NA
Benz(a)anthracene	56-55-3	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA

	Station	WBGmw-020	WBGmw-021
	Sample Id	WBGmw-020-200401-GW	WBGmw-021-200401-GW
	Date	04/20/20	04/20/20
	Sample Type	GR	GR
	Filter Status	Total	Total
	Aquifer	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**		
Benzo(b)fluoranthene	205-99-2	NA	NA
Benzo(ghi)perylene	191-24-2	NA	NA
Benzo(k)fluoranthene	207-08-9	NA	NA
Bis(2-ethylhexyl)phthalate	117-81-7	NA	NA
Butyl benzyl phthalate	85-68-7	NA	NA
Chrysene	218-01-9	NA	NA
Di-n-butyl phthalate	84-74-2	NA	NA
Di-n-octylphthalate	117-84-0	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA
Diethyl phthalate	84-66-2	NA	NA
Dimethyl phthalate	131-11-3	NA	NA
Fluoranthene	206-44-0	NA	NA
Fluorene	86-73-7	NA	NA
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA
Naphthalene	91-20-3	NA	NA
Nitrobenzene	98-95-3	NA	NA
Pentachlorophenol	87-86-5	NA	NA
Phenanthrene	85-01-8	NA	NA
Phenol	108-95-2	NA	NA
Pyrene	129-00-0	NA	NA
Total Cresols	1319-77-3	NA	NA
PCBs			
PCB-1016	12674-11-2	NA	NA
PCB-1221	11104-28-2	NA	NA
PCB-1232	11141-16-5	NA	NA
PCB-1242	53469-21-9	NA	NA
PCB-1248	12672-29-6	NA	NA
PCB-1254	11097-69-1	NA	NA
PCB-1260	11096-82-5	NA	NA
Pesticides			
4,4'-DDD	72-54-8	NA	NA
4,4'-DDE	72-55-9	NA	NA
4,4'-DDT	50-29-3	NA	NA
Aldrin	309-00-2	NA	NA
Dieldrin	60-57-1	NA	NA
Endosulfan I	959-98-8	NA	NA
Endosulfan II	33213-65-9	NA	NA
Endosulfan sulfate	1031-07-8	NA	NA

	Station	WBGmw-020	WBGmw-021
	Sample Id	WBGmw-020-200401-GW	WBGmw-021-200401-GW
	Date	04/20/20	04/20/20
	Sample Type	GR	GR
	Filter Status	Total	Total
	Aquifer	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**		
Endrin	72-20-8	NA	NA
Endrin aldehyde	7421-93-4	NA	NA
Endrin ketone	53494-70-5	NA	NA
Heptachlor	76-44-8	NA	NA
Heptachlor epoxide	1024-57-3	NA	NA
Lindane	58-89-9	NA	NA
Methoxychlor	72-43-5	NA	NA
Toxaphene	8001-35-2	NA	NA
alpha-BHC	319-84-6	NA	NA
alpha-Chlordane	5103-71-9	NA	NA
beta-BHC	319-85-7	NA	NA
delta-BHC	319-86-8	NA	NA
gamma-Chlordane	5103-74-2	NA	NA

	Station	WBGmw-020	WBGmw-021
	Sample Id	WBGmw-020-200401-GW	WBGmw-021-200401-GW
	Date	04/20/20	04/20/20
	Sample Type	GR	GR
	Filter Status	Total	Total
	Aquifer	Upper Sharon	Upper Sharon
Analyte (mg/L)	**CAS Number**		
VOCs			
1,1,1-Trichloroethane	71-55-6	NA	NA
1,1,2,2-Tetrachloroethane	79-34-5	NA	NA
1,1,2-Trichloroethane	79-00-5	NA	NA
1,1-Dichloroethane	75-34-3	NA	NA
1,1-Dichloroethene	75-35-4	NA	NA
1,2-Dibromoethane	106-93-4	NA	NA
1,2-Dichloroethane	107-06-2	NA	NA
1,2-Dichloroethene	540-59-0	NA	NA
1,2-Dichloropropane	78-87-5	NA	NA
2-Butanone	78-93-3	NA	NA
2-Hexanone	591-78-6	NA	NA
4-Methyl-2-pentanone	108-10-1	NA	NA
Acetone	67-64-1	NA	NA
Benzene	71-43-2	NA	NA
Bromobenzene	108-86-1	NA	NA
Bromochloromethane	74-97-5	NA	NA
Bromodichloromethane	75-27-4	NA	NA
Bromoform	75-25-2	NA	NA
Bromomethane	74-83-9	NA	NA
Carbon disulfide	75-15-0	NA	NA
Carbon tetrachloride	56-23-5	NA	NA
Chlorobenzene	108-90-7	NA	NA
Chloroethane	75-00-3	NA	NA
Chloroform	67-66-3	NA	NA
Chloromethane	74-87-3	NA	NA
Dibromochloromethane	124-48-1	NA	NA
Ethylbenzene	100-41-4	NA	NA
Methylene chloride	75-09-2	NA	NA
Styrene	100-42-5	NA	NA
Tetrachloroethene	127-18-4	NA	NA
Toluene	108-88-3	NA	NA
Trichloroethene	79-01-6	NA	NA
Vinyl chloride	75-01-4	NA	NA
Xylenes, total	1330-20-7	NA	NA
cis-1,3-Dichloropropene	10061-01-5	NA	NA
trans-1,3-Dichloropropene	10061-02-6	NA	NA

F.2 Chemical-Specific Screening Criteria

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Appendix F.2 Chemical-Specific Screening Criteria

Analysis Type	Chemical	CAS No	Screening Criteria (mg/L)				Selected Screening Criteria		Background Concentration (mg/L)			
			NGT CUG	Resident CUG	MCL	Tapwater RSL	Criteria (mg/L)	Source	Unconsolidated	Homewood	Upper Sharon	Basal Sharon Conglomerate
Anions	Nitrate	14797-55-8	52.283	1.666	10	3.2	10	MCL	---	---	---	---
Anions	Nitrite	14797-65-0	---	---	1	0.2	1	MCL	---	---	---	---
Anions	Sulfate	14808-79-8	---	---	---	---	---	---	---	---	---	---
Anions	Sulfide	18496-25-8	---	---	---	---	---	---	---	---	---	---
Explosives/Propellants	1,3,5-Trinitrobenzene	99-35-4	---	---	---	0.059	0.059	RSL	---	---	---	---
Explosives/Propellants	1,3-Dinitrobenzene	99-65-0	0.00328	0.000104	---	0.0002	0.0002	RSL	---	---	---	---
Explosives/Propellants	2,4,6-Trinitrotoluene	118-96-7	0.0164	0.000521	---	0.00098	0.00098	RSL	---	---	---	---
Explosives/Propellants	2,4-Dinitrotoluene	121-14-2	0.00129	0.00012	---	0.00024	0.00024	RSL	---	---	---	---
Explosives/Propellants	2,6-Dinitrotoluene	606-20-2	0.00131	0.000122	---	0.000049	0.000122	RA	---	---	---	---
Explosives/Propellants	2-Amino-4,6-Dinitrotoluene	35572-78-2	0.00655	0.000209	---	0.0039	0.0039	RSL	---	---	---	---
Explosives/Propellants	2-Nitrotoluene	88-72-2	0.00399	0.00037	---	0.00031	0.00037	RA	---	---	---	---
Explosives/Propellants	3-Nitrotoluene	99-08-1	---	---	---	0.00017	0.00017	RSL	---	---	---	---
Explosives/Propellants	4-Amino-2,6-Dinitrotoluene	19406-51-0	0.00655	0.000209	---	0.0039	0.0039	RSL	---	---	---	---
Explosives/Propellants	4-Nitrotoluene	99-99-0	0.054	0.00501	---	0.0043	0.00501	RA	---	---	---	---
Explosives/Propellants	HMX	2691-41-0	---	---	---	0.1	0.1	RSL	---	---	---	---
Explosives/Propellants	Nitrobenzene	98-95-3	0.0164	0.000521	---	0.00014	0.000521	RC	---	---	---	---
Explosives/Propellants	Nitrocellulose	9004-70-0	---	---	---	6000	6000	RSL	---	---	---	---
Explosives/Propellants	Nitroglycerin	55-63-0	0.054	0.00501	---	0.0002	0.00501	RA	---	---	---	---
Explosives/Propellants	Nitroguanidine	556-88-7	---	---	---	0.2	0.2	RSL	---	---	---	---
Explosives/Propellants	PETN	78-11-5	---	---	---	0.0039	0.0039	RSL	---	---	---	---
Explosives/Propellants	RDX	121-82-4	0.00834	0.000774	---	0.00097	0.00097	RSL	---	---	---	---
Explosives/Propellants	Tetryl	479-45-8	---	---	---	0.0039	0.0039	RSL	---	---	---	---
Metals, Filtered	Aluminum	7429-90-5	31.981	1.028	---	2	2	RSL	0.386	0.43	0.038	0.049
Metals, Filtered	Antimony	7440-36-0	0.0117	0.000389	0.006	0.00078	0.006	MCL	0	0	0	0.0006
Metals, Filtered	Arsenic	7440-38-2	0.000608	0.000056	0.01	0.000052	0.01	MCL	0.003	0.008	0.003	0.048
Metals, Filtered	Barium	7440-39-3	6.332	0.204	2	0.38	2	MCL	0.034	0.177	0.035	0.145
Metals, Filtered	Beryllium	7440-41-7	---	---	0.004	0.0025	0.004	MCL	0	0	0	0.00023
Metals, Filtered	Cadmium	7440-43-9	0.0132	0.000456	0.005	0.00092	0.005	MCL	0	0	0	0
Metals, Filtered	Calcium	7440-70-2	---	---	---	---	---	---	107	143	118	93
Metals, Filtered	Chromium	7440-47-3	33.087	1.214	0.1	2.2	0.1	MCL	0.002	0.007	0	0.00074
Metals, Filtered	Cobalt	7440-48-4	0.654	0.0208	---	0.0006	0.0208	RC	0.00083	0.003	0.001	0.005
Metals, Filtered	Copper	7440-50-8	---	---	1.3	0.08	1.3	MCL	0.005	0.002	0.001	0.00069
Metals, Filtered	Iron	7439-89-6	9.671	0.31	---	1.4	1.4	RSL	1.91	22.3	2.08	2.56
Metals, Filtered	Lead	7439-92-1	---	---	0.015	0.015	0.015	MCL	0.00099	0.00032	0.002	0.00022
Metals, Filtered	Magnesium	7439-95-4	---	---	---	---	---	---	55.3	37.5	38.9	30
Metals, Filtered	Manganese	7439-96-5	1.421	0.0463	---	0.043	0.0463	RC	0.075	0.56	0.198	1.03
Metals, Filtered	Mercury	7439-97-6	---	---	0.002	0.000063	0.002	MCL	0	0	0	0
Metals, Filtered	Nickel	7440-02-0	0.654	0.0208	---	0.039	0.039	RSL	0.002	0.005	0.002	0.014
Metals, Filtered	Potassium	7440-09-7	---	---	---	---	---	---	4.84	2.01	3.38	2.9
Metals, Filtered	Selenium	7782-49-2	---	---	0.05	0.01	0.05	MCL	0.00099	0	0.001	0
Metals, Filtered	Silver	7440-22-4	---	---	---	0.0094	0.0094	RSL	0	0	0	0
Metals, Filtered	Sodium	7440-23-5	---	---	---	---	---	---	18.2	21	129	15.3
Metals, Filtered	Thallium	7440-28-0	0.00261	0.000083	0.002	0.00002	0.002	MCL	0	0	0	0.000097
Metals, Filtered	Vanadium	7440-62-2	0.185	0.00638	---	0.0086	0.0086	RSL	0.0005	0.0007	0.00085	0
Metals, Filtered	Zinc	7440-66-6	9.756	0.312	---	0.6	0.6	RSL	0.005	0.011	0.009	0.003
Metals, Total	Aluminum	7429-90-5	31.981	1.028	---	2	2	RSL	0.386	0.43	0.038	0.049
Metals, Total	Antimony	7440-36-0	0.0117	0.000389	0.006	0.00078	0.006	MCL	0	0	0	0.0006
Metals, Total	Arsenic	7440-38-2	0.000608	0.000056	0.01	0.000052	0.01	MCL	0.003	0.008	0.003	0.048
Metals, Total	Barium	7440-39-3	6.332	0.204	2	0.38	2	MCL	0.034	0.177	0.035	0.145
Metals, Total	Beryllium	7440-41-7	---	---	0.004	0.0025	0.004	MCL	0	0	0	0.00023
Metals, Total	Cadmium	7440-43-9	0.0132	0.000456	0.005	0.00092	0.005	MCL	0	0	0	0
Metals, Total	Calcium	7440-70-2	---	---	---	---	---	---	107	143	118	93
Metals, Total	Chromium	7440-47-3	33.087	1.214	0.1	2.2	0.1	MCL	0.002	0.007	0	0.00074

			Screening Criteria (mg/L)				Selected Screening Criteria		Background Concentration (mg/L)			
Analysis Type	Chemical	CAS No	NGT CUG	Resident CUG	MCL	Tapwater RSL	Criteria (mg/L)	Source	Unconsolidated	Homewood	Upper Sharon	Basal Sharon Conglomerate
Metals, Total	Cobalt	7440-48-4	0.654	0.0208	---	0.0006	0.0208	RC	0.00083	0.003	0.001	0.005
Metals, Total	Copper	7440-50-8	---	---	1.3	0.08	1.3	MCL	0.005	0.002	0.001	0.00069
Metals, Total	Iron	7439-89-6	9.671	0.31	---	1.4	1.4	RSL	1.91	22.3	2.08	2.56
Metals, Total	Lead	7439-92-1	---	---	0.015	0.015	0.015	MCL	0.00099	0.00032	0.002	0.00022
Metals, Total	Magnesium	7439-95-4	---	---	---	---	---	---	55.3	37.5	38.9	30
Metals, Total	Manganese	7439-96-5	1.421	0.0463	---	0.043	0.0463	RC	0.075	0.56	0.198	1.03
Metals, Total	Mercury	7439-97-6	---	---	0.002	0.000063	0.002	MCL	0	0	0	0
Metals, Total	Nickel	7440-02-0	0.654	0.0208	---	0.039	0.039	RSL	0.002	0.005	0.002	0.014
Metals, Total	Potassium	7440-09-7	---	---	---	---	---	---	4.84	2.01	3.38	2.9
Metals, Total	Selenium	7782-49-2	---	---	0.05	0.01	0.05	MCL	0.00099	0	0.001	0
Metals, Total	Silver	7440-22-4	---	---	---	0.0094	0.0094	RSL	0	0	0	0
Metals, Total	Sodium	7440-23-5	---	---	---	---	---	---	18.2	21	129	15.3
Metals, Total	Thallium	7440-28-0	0.00261	0.000083	0.002	0.00002	0.002	MCL	0	0	0	0.000097
Metals, Total	Vanadium	7440-62-2	0.185	0.00638	---	0.0086	0.0086	RSL	0.0005	0.0007	0.00085	0
Metals, Total	Zinc	7440-66-6	9.756	0.312	---	0.6	0.6	RSL	0.005	0.011	0.009	0.003
Miscellaneous	Alkalinity	N33	---	---	---	---	---	---	---	---	---	---
Miscellaneous	Chromium, hexavalent	18540-29-9	---	---	---	0.000035	0.000035	RSL	0	0	0	0
Miscellaneous	Cyanide	57-12-5	---	---	0.2	0.00015	0.2	MCL	---	---	---	---
Miscellaneous	Perchlorate	14797-73-0	---	---	---	0.0014	0.0014	RSL	---	---	---	---
Miscellaneous	Total Phosphorus as P	7723-14-0	---	---	---	0.00004	0.00004	RSL	---	---	---	---
PCBs	PCB-1016	12674-11-2	---	---	---	0.00014	0.00014	RSL	---	---	---	---
PCBs	PCB-1221	11104-28-2	---	---	---	0.0000047	0.0000047	RSL	---	---	---	---
PCBs	PCB-1232	11141-16-5	---	---	---	0.0000047	0.0000047	RSL	---	---	---	---
PCBs	PCB-1242	53469-21-9	0.00229	0.000213	---	0.0000078	0.000213	RA	---	---	---	---
PCBs	PCB-1248	12672-29-6	---	---	---	0.0000078	0.0000078	RSL	---	---	---	---
PCBs	PCB-1254	11097-69-1	0.000655	0.000021	---	0.0000078	0.000021	RC	---	---	---	---
PCBs	PCB-1260	11096-82-5	0.00229	0.000213	---	0.0000078	0.000213	RA	---	---	---	---
Pesticides	4,4'-DDD	72-54-8	0.000639	0.000059	---	0.0000063	0.000059	RA	---	---	---	---
Pesticides	4,4'-DDE	72-55-9	0.000503	0.000047	---	0.000046	0.000047	RA	---	---	---	---
Pesticides	4,4'-DDT	50-29-3	0.000294	0.000027	---	0.00023	0.00023	RSL	---	---	---	---
Pesticides	Aldrin	309-00-2	0.000051	0.000005	---	9.2E-07	0.000005	RA	---	---	---	---
Pesticides	Dieldrin	60-57-1	0.000038	0.000004	---	0.0000018	0.000004	RA	---	---	---	---
Pesticides	Endosulfan I	959-98-8	---	---	---	0.01	0.01	RSL	---	---	---	---
Pesticides	Endosulfan II	33213-65-9	---	---	---	0.01	0.01	RSL	---	---	---	---
Pesticides	Endosulfan sulfate	1031-07-8	---	---	---	0.01	0.01	RSL	---	---	---	---
Pesticides	Endrin	72-20-8	---	---	0.002	0.00023	0.002	MCL	---	---	---	---
Pesticides	Endrin aldehyde	7421-93-4	---	---	---	0.00023	0.00023	RSL	---	---	---	---
Pesticides	Endrin ketone	53494-70-5	---	---	---	0.00023	0.00023	RSL	---	---	---	---
Pesticides	Heptachlor	76-44-8	0.000153	0.000014	0.0004	0.0000014	0.0004	MCL	---	---	---	---
Pesticides	Heptachlor epoxide	1024-57-3	0.000101	0.000009	0.0002	0.0000014	0.0002	MCL	---	---	---	---
Pesticides	Lindane	58-89-9	0.00055	0.000051	0.0002	0.000042	0.0002	MCL	---	---	---	---
Pesticides	Methoxychlor	72-43-5	---	---	0.04	0.0037	0.04	MCL	---	---	---	---
Pesticides	Toxaphene	8001-35-2	0.000518	0.000048	0.003	0.000071	0.003	MCL	---	---	---	---
Pesticides	alpha-BHC	319-84-6	0.000146	0.000014	---	0.0000072	0.000014	RA	---	---	---	---
Pesticides	alpha-Chlordane	5103-71-9	---	---	---	0.00002	0.00002	RSL	---	---	---	---
Pesticides	beta-BHC	319-85-7	0.00051	0.000047	---	0.000025	0.000047	RA	---	---	---	---
Pesticides	delta-BHC	319-86-8	---	---	---	---	---	---	---	---	---	---
Pesticides	gamma-Chlordane	5103-74-2	---	---	---	0.00002	0.00002	RSL	---	---	---	---
SVOCs	1,2,4-Trichlorobenzene	120-82-1	---	---	0.07	0.0004	0.07	MCL	---	---	---	---
SVOCs	1,2-Dichlorobenzene	95-50-1	---	---	0.6	0.03	0.6	MCL	---	---	---	---
SVOCs	1,3-Dichlorobenzene	541-73-1	---	---	---	---	---	---	---	---	---	---
SVOCs	1,4-Dichlorobenzene	106-46-7	---	---	0.075	0.00048	0.075	MCL	---	---	---	---
SVOCs	1,4-Dioxane	123-91-1	---	---	---	0.00046	0.00046	RSL	---	---	---	---

			Screening Criteria (mg/L)				Selected Screening Criteria		Background Concentration (mg/L)			
Analysis Type	Chemical	CAS No	NGT CUG	Resident CUG	MCL	Tapwater RSL	Criteria (mg/L)	Source	Unconsolidated	Homewood	Upper Sharon	Basal Sharon Conglomerate
SVOCs	1-Methylnaphthalene	90-12-0	---	---	---	0.0011	0.0011	RSL	---	---	---	---
SVOCs	2,4,5-Trichlorophenol	95-95-4	---	---	---	0.12	0.12	RSL	---	---	---	---
SVOCs	2,4,6-Trichlorophenol	88-06-2	---	---	---	0.0012	0.0012	RSL	---	---	---	---
SVOCs	2,4-Dichlorophenol	120-83-2	---	---	---	0.0046	0.0046	RSL	---	---	---	---
SVOCs	2,4-Dimethylphenol	105-67-9	---	---	---	0.036	0.036	RSL	---	---	---	---
SVOCs	2,4-Dinitrophenol	51-28-5	---	---	---	0.0039	0.0039	RSL	---	---	---	---
SVOCs	2,4-Dinitrotoluene	121-14-2	0.00129	0.00012	---	0.00024	0.00024	RSL	---	---	---	---
SVOCs	2,6-Dinitrotoluene	606-20-2	0.00131	0.000122	---	0.000049	0.000122	RA	---	---	---	---
SVOCs	2-Chloronaphthalene	91-58-7	---	---	---	0.075	0.075	RSL	---	---	---	---
SVOCs	2-Chlorophenol	95-57-8	---	---	---	0.0091	0.0091	RSL	---	---	---	---
SVOCs	2-Methyl-4,6-dinitrophenol	534-52-1	---	---	---	0.00015	0.00015	RSL	---	---	---	---
SVOCs	2-Methylnaphthalene	91-57-6	---	---	---	0.0036	0.0036	RSL	---	---	---	---
SVOCs	2-Methylphenol	95-48-7	---	---	---	0.093	0.093	RSL	---	---	---	---
SVOCs	2-Nitrobenzenamine	88-74-4	---	---	---	0.019	0.019	RSL	---	---	---	---
SVOCs	2-Nitrophenol	88-75-5	---	---	---	---	---	---	---	---	---	---
SVOCs	3,3'-Dichlorobenzidine	91-94-1	---	---	---	0.00013	0.00013	RSL	---	---	---	---
SVOCs	3-Nitrobenzenamine	99-09-2	---	---	---	---	---	---	---	---	---	---
SVOCs	4-Bromophenyl phenyl ether	101-55-3	---	---	---	---	---	---	---	---	---	---
SVOCs	4-Chloro-3-methylphenol	59-50-7	---	---	---	0.14	0.14	RSL	---	---	---	---
SVOCs	4-Chlorobenzenamine	106-47-8	---	---	---	0.00037	0.00037	RSL	---	---	---	---
SVOCs	4-Chlorophenyl phenyl ether	7005-72-3	---	---	---	---	---	---	---	---	---	---
SVOCs	4-Nitrobenzenamine	100-01-6	0.0437	0.00313	---	0.0038	0.0038	RSL	---	---	---	---
SVOCs	4-Nitrophenol	100-02-7	---	---	---	---	---	---	---	---	---	---
SVOCs	Acenaphthene	83-32-9	---	---	---	0.053	0.053	RSL	---	---	---	---
SVOCs	Acenaphthylene	208-96-8	---	---	---	0.012	0.012	RSL	---	---	---	---
SVOCs	Anthracene	120-12-7	---	---	---	0.18	0.18	RSL	---	---	---	---
SVOCs	Benz(a)anthracene	56-55-3	0.000042	0.000004	---	0.00003	0.00003	RSL	---	---	---	---
SVOCs	Benzenemethanol	100-51-6	---	---	---	0.2	0.2	RSL	---	---	---	---
SVOCs	Benzo(a)pyrene	50-32-8	0.000002	0.00000023	0.0002	0.000025	0.0002	MCL	---	---	---	---
SVOCs	Benzo(b)fluoranthene	205-99-2	0.000024	0.000002	---	0.00025	0.00025	RSL	---	---	---	---
SVOCs	Benzo(ghi)perylene	191-24-2	---	---	---	0.012	0.012	RSL	---	---	---	---
SVOCs	Benzo(k)fluoranthene	207-08-9	---	---	---	0.0025	0.0025	RSL	---	---	---	---
SVOCs	Benzoic acid	65-85-0	---	---	---	7.5	7.5	RSL	---	---	---	---
SVOCs	Bis(2-chloroethoxy)methane	111-91-1	---	---	---	0.0059	0.0059	RSL	---	---	---	---
SVOCs	Bis(2-chloroethyl) ether	111-44-4	---	---	---	0.000014	0.000014	RSL	---	---	---	---
SVOCs	Bis(2-chloroisopropyl) ether	108-60-1	---	---	---	0.071	0.071	RSL	---	---	---	---
SVOCs	Bis(2-ethylhexyl)phthalate	117-81-7	0.0097	0.0009	0.006	0.0056	0.006	MCL	---	---	---	---
SVOCs	Butyl benzyl phthalate	85-68-7	---	---	---	0.016	0.016	RSL	---	---	---	---
SVOCs	Carbazole	86-74-8	---	---	---	---	---	---	---	---	---	---
SVOCs	Chrysene	218-01-9	---	---	---	0.025	0.025	RSL	---	---	---	---
SVOCs	Di-n-butyl phthalate	84-74-2	---	---	---	0.09	0.09	RSL	---	---	---	---
SVOCs	Di-n-octylphthalate	117-84-0	---	---	---	0.02	0.02	RSL	---	---	---	---
SVOCs	Dibenz(a,h)anthracene	53-70-3	0.000002	0.00000015	---	0.000025	0.000025	RSL	---	---	---	---
SVOCs	Dibenzofuran	132-64-9	---	---	---	0.00079	0.00079	RSL	---	---	---	---
SVOCs	Diethyl phthalate	84-66-2	---	---	---	1.5	1.5	RSL	---	---	---	---
SVOCs	Dimethyl phthalate	131-11-3	---	---	---	---	---	---	---	---	---	---
SVOCs	Fluoranthene	206-44-0	---	---	---	0.08	0.08	RSL	---	---	---	---
SVOCs	Fluorene	86-73-7	---	---	---	0.029	0.029	RSL	---	---	---	---
SVOCs	Hexachlorobenzene	118-74-1	---	---	0.001	0.0000098	0.001	MCL	---	---	---	---
SVOCs	Hexachlorobutadiene	87-68-3	---	---	---	0.00014	0.00014	RSL	---	---	---	---
SVOCs	Hexachlorocyclopentadiene	77-47-4	---	---	0.05	0.000041	0.05	MCL	---	---	---	---
SVOCs	Hexachloroethane	67-72-1	---	---	---	0.00033	0.00033	RSL	---	---	---	---
SVOCs	Indeno(1,2,3-cd)pyrene	193-39-5	0.000024	0.000002	---	0.00025	0.00025	RSL	---	---	---	---

			Screening Criteria (mg/L)				Selected Screening Criteria		Background Concentration (mg/L)			
Analysis Type	Chemical	CAS No	NGT CUG	Resident CUG	MCL	Tapwater RSL	Criteria (mg/L)	Source	Unconsolidated	Homewood	Upper Sharon	Basal Sharon Conglomerate
SVOCs	Isophorone	78-59-1	---	---	---	0.078	0.078	RSL	---	---	---	---
SVOCs	N-Nitroso-di-n-propylamine	621-64-7	---	---	---	0.000011	0.000011	RSL	---	---	---	---
SVOCs	N-Nitrosodiphenylamine	86-30-6	---	---	---	0.012	0.012	RSL	---	---	---	---
SVOCs	Naphthalene	91-20-3	---	---	---	0.00017	0.00017	RSL	---	---	---	---
SVOCs	Nitrobenzene	98-95-3	0.0164	0.000521	---	0.00014	0.000521	RC	---	---	---	---
SVOCs	Pentachlorophenol	87-86-5	0.000797	0.000074	0.001	0.000041	0.001	MCL	---	---	---	---
SVOCs	Phenanthrene	85-01-8	---	---	---	0.012	0.012	RSL	---	---	---	---
SVOCs	Phenol	108-95-2	---	---	---	0.58	0.58	RSL	---	---	---	---
SVOCs	Pyrene	129-00-0	---	---	---	0.012	0.012	RSL	---	---	---	---
SVOCs	Total Cresols	1319-77-3	---	---	---	0.15	0.15	RSL	---	---	---	---
VOCs	1,1,1-Trichloroethane	71-55-6	---	---	0.2	0.8	0.2	MCL	---	---	---	---
VOCs	1,1,2,2-Tetrachloroethane	79-34-5	0.000744	0.000069	---	0.000076	0.000076	RSL	---	---	---	---
VOCs	1,1,2-Trichloroethane	79-00-5	---	---	0.005	0.000041	0.005	MCL	---	---	---	---
VOCs	1,1-Dichloroethane	75-34-3	---	---	---	0.0028	0.0028	RSL	---	---	---	---
VOCs	1,1-Dichloroethene	75-35-4	---	---	0.007	0.028	0.007	MCL	---	---	---	---
VOCs	1,2-Dibromoethane	106-93-4	---	---	0.00005	0.0000075	0.00005	MCL	---	---	---	---
VOCs	1,2-Dichloroethane	107-06-2	0.00167	0.000155	0.005	0.00017	0.005	MCL	---	---	---	---
VOCs	1,2-Dichloroethene	540-59-0	---	---	0.07	0.0036	0.07	MCL	---	---	---	---
VOCs	1,2-Dichloropropane	78-87-5	---	---	0.005	0.00082	0.005	MCL	---	---	---	---
VOCs	2-Butanone	78-93-3	---	---	---	0.56	0.56	RSL	---	---	---	---
VOCs	2-Hexanone	591-78-6	---	---	---	0.0038	0.0038	RSL	---	---	---	---
VOCs	4-Methyl-2-pentanone	108-10-1	---	---	---	0.63	0.63	RSL	---	---	---	---
VOCs	Acetone	67-64-1	---	---	---	1.4	1.4	RSL	---	---	---	---
VOCs	Benzene	71-43-2	0.00464	0.000431	0.005	0.00046	0.005	MCL	---	---	---	---
VOCs	Bromobenzene	108-86-1	---	---	---	0.0062	0.0062	RSL	---	---	---	---
VOCs	Bromochloromethane	74-97-5	---	---	---	0.0083	0.0083	RSL	---	---	---	---
VOCs	Bromodichloromethane	75-27-4	---	---	---	0.00013	0.00013	RSL	---	---	---	---
VOCs	Bromoform	75-25-2	---	---	---	0.0033	0.0033	RSL	---	---	---	---
VOCs	Bromomethane	74-83-9	---	---	---	0.00075	0.00075	RSL	---	---	---	---
VOCs	Carbon disulfide	75-15-0	---	---	---	0.081	0.081	RSL	---	---	---	---
VOCs	Carbon tetrachloride	56-23-5	0.0022	0.000204	0.005	0.00046	0.005	MCL	---	---	---	---
VOCs	Chlorobenzene	108-90-7	---	---	0.1	0.0078	0.1	MCL	---	---	---	---
VOCs	Chloroethane	75-00-3	---	---	---	2.1	2.1	RSL	---	---	---	---
VOCs	Chloroform	67-66-3	0.00223	0.000207	0.08	0.00022	0.08	MCL	---	---	---	---
VOCs	Chloromethane	74-87-3	---	---	---	0.019	0.019	RSL	---	---	---	---
VOCs	Dibromochloromethane	124-48-1	---	---	---	0.00087	0.00087	RSL	---	---	---	---
VOCs	Ethylbenzene	100-41-4	---	---	0.7	0.0015	0.7	MCL	---	---	---	---
VOCs	Methylene chloride	75-09-2	0.0575	0.00534	0.005	0.011	0.005	MCL	---	---	---	---
VOCs	Styrene	100-42-5	---	---	0.1	0.12	0.1	MCL	---	---	---	---
VOCs	Tetrachloroethene	127-18-4	0.00105	0.000098	0.005	0.0041	0.005	MCL	---	---	---	---
VOCs	Toluene	108-88-3	---	---	1	0.11	1	MCL	---	---	---	---
VOCs	Trichloroethene	79-01-6	0.000336	0.000031	0.005	0.00028	0.005	MCL	---	---	---	---
VOCs	Vinyl chloride	75-01-4	---	---	0.002	0.000019	0.002	MCL	---	---	---	---
VOCs	Xylenes, total	1330-20-7	---	---	10	0.019	10	MCL	---	---	---	---
VOCs	cis-1,3-Dichloropropene	10061-01-5	---	---	---	0.00047	0.00047	RSL	---	---	---	---
VOCs	trans-1,3-Dichloropropene	10061-02-6	---	---	---	0.00047	0.00047	RSL	---	---	---	---

F.3 Spring 2020 Results that Exceed Screening Criteria

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Zone	Well	Date Collected	Sample ID	Sample Type	Analysis Type	Chemical	Result (mg/L)	Validation Qualifier	GW Screening Level (mg/L)	GW Screening Level Source	Background Criteria (mg/L)
Basal Sharon Congl	FWGmw-018	6/11/2020	FWGmw-018-200401-GW	Grab	Metals, Total	Sodium	16				15.3
Basal Sharon Congl	SCFmw-004	4/22/2020	SCFmw-004-200401-GW	Grab	Metals, Total	Calcium	170				93
Basal Sharon Congl	SCFmw-004	4/22/2020	SCFmw-004-200401-GW	Grab	Metals, Total	Magnesium	66				30
Homewood	FBQmw-174	4/27/2020	FBQmw-174-200401-GW	Grab	Explosives/Propellants	2,4,6-Trinitrotoluene	0.016		0.00098	RSL	
Homewood	FBQmw-174	4/27/2020	FBQmw-174-200401-GW	Grab	Explosives/Propellants	2,4-Dinitrotoluene	0.00047		0.00024	RSL	
Homewood	FBQmw-174	4/27/2020	FBQmw-174-200401-GW	Grab	Explosives/Propellants	2-Amino-4,6-Dinitrotoluene	0.018		0.0039	RSL	
Homewood	FBQmw-174	4/27/2020	FBQmw-174-200401-GW	Grab	Explosives/Propellants	4-Amino-2,6-Dinitrotoluene	0.018		0.0039	RSL	
Homewood	FBQmw-174	4/27/2020	FBQmw-174-200401-GW	Grab	Explosives/Propellants	RDX	0.001	J	0.00097	RSL	
Unconsolidated	DETmw-003	4/21/2020	DET-003-200401-GW	Grab	Metals, Total	Manganese	0.26	J	0.075	BKG	0.075
Unconsolidated	DETmw-004	4/21/2020	DET-004-200401-GW	Grab	Explosives/Propellants	RDX	0.0015		0.00097	RSL	
Unconsolidated	WBGmw-006	4/20/2020	WBGmw-006-200401-GW	Grab	Explosives/Propellants	RDX	0.013		0.00097	RSL	
Unconsolidated	WBGmw-009	4/20/2020	WBGmw-009-200401-GW	Grab	Explosives/Propellants	RDX	0.0019		0.00097	RSL	
Unconsolidated	LL1mw-063	4/23/2020	LL1mw-063-200401-GW	Grab	Anions	Sulfate	100				
Unconsolidated	LL1mw-063	4/23/2020	LL1mw-063-200401-GW	Grab	Miscellaneous	Alkalinity	6.1	J			
Unconsolidated	LL1mw-064	4/22/2020	LL1mw-064-200401-GW	Grab	Metals, Total	Iron	2.4		1.91	BKG	1.91
Unconsolidated	LL1mw-064	4/22/2020	LL1mw-064-200401-GW	Grab	Metals, Total	Manganese	0.12		0.075	BKG	0.075
Unconsolidated	LL1mw-086	4/29/2020	LL1mw-086-200401-GW	Grab	Anions	Sulfate	89				
Unconsolidated	LL1mw-086	4/29/2020	LL1mw-086-200401-GW	Grab	Metals, Filtered	Manganese	0.45		0.075	BKG	0.075
Unconsolidated	LL1mw-086	4/29/2020	LL1mw-086-200401-GW	Grab	Metals, Total	Manganese	0.57		0.075	BKG	0.075
Unconsolidated	LL1mw-086	4/29/2020	LL1mw-086-200401-GW	Grab	Miscellaneous	Alkalinity	190				
Unconsolidated	LL1mw-089	4/27/2020	LL1mw-089-200401-GW	Grab	Anions	Sulfate	25				
Unconsolidated	LL1mw-089	4/27/2020	LL1mw-089-200401-GW	Grab	Miscellaneous	Alkalinity	8.8	J			
Unconsolidated	LL12mw-185	4/20/2020	LL12mw-185-200401-GW	Grab	Anions	Nitrate	69		10	MCL	
Unconsolidated	LL12mw-187	4/20/2020	LL12mw-187-200401-GW	Grab	Anions	Nitrate	1600	J	10	MCL	
Unconsolidated	LL12mw-187	4/28/2020	LL12mw-187-200401b-GW	Grab	Miscellaneous	Ammonia	720				
Unconsolidated	FWGmw-007	4/29/2020	FWGmw-007-200401-GW	Grab	Metals, Total	Calcium	120				107
Unconsolidated	FWGmw-007	4/29/2020	FWGmw-007-200401-GW	Grab	Metals, Total	Magnesium	58				55.3
Unconsolidated	FWGmw-007	4/29/2020	FWGmw-007-200401-GW	Grab	Metals, Total	Manganese	0.21		0.075	BKG	0.075
Unconsolidated	FWGmw-011	6/11/2020	FWGmw-011-200401-GW	Grab	Explosives/Propellants	4-Nitrotoluene	0.017		0.00501	RA	
Unconsolidated	FWGmw-011	6/11/2020	FWGmw-011-200401-GW	Grab	Metals, Total	Iron	8.6		1.91	BKG	1.91
Unconsolidated	FWGmw-011	6/11/2020	FWGmw-011-200401-GW	Grab	Metals, Total	Manganese	0.29	J	0.075	BKG	0.075
Unconsolidated	FWGmw-015	4/21/2020	FWGmw-015-200401-GW	Grab	Metals, Total	Calcium	260				107
Unconsolidated	FWGmw-015	4/21/2020	FWGmw-015-200401-GW	Grab	Metals, Total	Magnesium	250				55.3
Unconsolidated	FWGmw-015	4/21/2020	FWGmw-015-200401-GW	Grab	Metals, Total	Sodium	43				18.2
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200401-GW	Grab	Metals, Total	Iron	4		2.08	BKG	2.08
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200402-GW	Field Duplicate	Metals, Total	Iron	4.7		2.08	BKG	2.08
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200402-GW	Field Duplicate	Metals, Total	Magnesium	42				38.9
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200401-GW	Grab	Metals, Total	Magnesium	48	J			38.9
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200402-GW	Field Duplicate	Metals, Total	Manganese	1.8	J	0.198	BKG	0.198
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200401-GW	Grab	Metals, Total	Manganese	2	J	0.198	BKG	0.198
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200401-GW	Grab	Metals, Total	Nickel	0.039	J	0.039	RSL	0.002
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200401-GW	Grab	Miscellaneous	Total Phosphorus as P	0.031	J			
Upper Sharon	RQLmw-007	4/21/2020	RQLmw-007-200402-GW	Field Duplicate	Miscellaneous	Total Phosphorus as P	0.033	J			
Upper Sharon	RQLmw-008	4/22/2020	RQLmw-008-2004201-GW	Grab	Metals, Total	Arsenic	0.016		0.01	MCL	0.003
Upper Sharon	RQLmw-008	4/22/2020	RQLmw-008-2004201-GW	Grab	Metals, Total	Iron	63		2.08	BKG	2.08

Zone	Well	Date Collected	Sample ID	Sample Type	Analysis Type	Chemical	Result (mg/L)	Validation Qualifier	GW Screening Level (mg/L)	GW Screening Level Source	Background Criteria (mg/L)
Upper Sharon	RQLmw-008	4/22/2020	RQLmw-008-2004201-GW	Grab	Metals, Total	Magnesium	72				38.9
Upper Sharon	RQLmw-008	4/22/2020	RQLmw-008-2004201-GW	Grab	Metals, Total	Manganese	0.84		0.198	BKG	0.198
Upper Sharon	RQLmw-009	4/22/2020	RQLmw-009-200401-GW	Grab	Metals, Total	Iron	2.6		2.08	BKG	2.08
Upper Sharon	RQLmw-011	4/21/2020	RQLmw-011-200402-GW	Field Duplicate	Anions	Sulfate	87	J			
Upper Sharon	RQLmw-011	4/21/2020	RQLmw-011-200401-GW	Grab	Anions	Sulfate	87	J			
Upper Sharon	RQLmw-013	4/22/2020	RQLmw-013-200401-GW	Grab	Anions	Sulfate	140				
Upper Sharon	LL1mw-080	4/23/2020	LL1mw-080-200401-GW	Grab	Explosives/Propellants	RDX	0.011		0.00097	RSL	
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Anions	Sulfate	100				
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Explosives/Propellants	1,3-Dinitrobenzene	0.00078	J	0.0002	RSL	
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Explosives/Propellants	2,4,6-Trinitrotoluene	0.0014	J	0.00098	RSL	
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Explosives/Propellants	2,4-Dinitrotoluene	0.002	J	0.00024	RSL	
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Explosives/Propellants	2-Amino-4,6-Dinitrotoluene	0.007	J	0.0039	RSL	
Upper Sharon	LL1mw-083	4/23/2020	LL1mw-083-200401-GW	Grab	Explosives/Propellants	4-Amino-2,6-Dinitrotoluene	0.011	J	0.0039	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	1,3-Dinitrobenzene	0.00065	J	0.0002	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	2,4,6-Trinitrotoluene	0.0023		0.00098	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	2,4-Dinitrotoluene	0.00064	J	0.00024	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	2-Amino-4,6-Dinitrotoluene	0.0073		0.0039	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	4-Amino-2,6-Dinitrotoluene	0.017		0.0039	RSL	
Upper Sharon	LL1mw-084	4/23/2020	LL1mw-084-200401-GW	Grab	Explosives/Propellants	RDX	0.0023	J	0.00097	RSL	
Upper Sharon	LL2mw-059	4/23/2020	LL2mw-059-200401-GW	Grab	Explosives/Propellants	2,4-Dinitrotoluene	0.00047		0.00024	RSL	
Upper Sharon	LL2mw-267	4/22/2020	LL2mw-267-200401-GW	Grab	Metals, Total	Manganese	0.56	J	0.198	BKG	0.198
Upper Sharon	LL3mw-238	4/30/2020	LL3mw-238-200401-GW	Grab	Explosives/Propellants	2,4,6-Trinitrotoluene	0.024		0.00098	RSL	
Upper Sharon	LL3mw-238	4/30/2020	LL3mw-238-200401-GW	Grab	Explosives/Propellants	2-Amino-4,6-Dinitrotoluene	0.0066		0.0039	RSL	
Upper Sharon	LL3mw-238	4/30/2020	LL3mw-238-200401-GW	Grab	Explosives/Propellants	4-Amino-2,6-Dinitrotoluene	0.015		0.0039	RSL	
Upper Sharon	LL3mw-238	4/30/2020	LL3mw-238-200401-GW	Grab	Explosives/Propellants	RDX	0.003		0.00097	RSL	
Upper Sharon	LL3mw-239	4/30/2020	LL3mw-239-200401-GW	Grab	Explosives/Propellants	RDX	0.0011		0.00097	RSL	
Upper Sharon	LL3mw-241	4/30/2020	LL3mw-241-200401-GW	Grab	Explosives/Propellants	2,4,6-Trinitrotoluene	0.0054		0.00098	RSL	
Upper Sharon	LL3mw-241	4/30/2020	LL3mw-241-200401-GW	Grab	Explosives/Propellants	RDX	0.001		0.00097	RSL	
Upper Sharon	FWGmw-012	6/11/2020	FWGmw-012-200401-GW	Grab	Explosives/Propellants	4-Nitrotoluene	0.011		0.00501	RA	
Upper Sharon	FWGmw-012	6/11/2020	FWGmw-012-200401-GW	Grab	Metals, Total	Iron	3.2		2.08	BKG	2.08
Upper Sharon	FWGmw-016	4/22/2020	FWGmw-016-200401-GW	Grab	Metals, Total	Manganese	0.22		0.198	BKG	0.198
Upper Sharon	FWGmw-020	6/11/2020	FWGmw-020-200401-GW	Grab	Metals, Filtered	Arsenic	0.045		0.01	MCL	0.003
Upper Sharon	FWGmw-020	6/11/2020	FWGmw-020-200401-GW	Grab	Metals, Filtered	Potassium	4.5				3.38
Upper Sharon	FWGmw-020	6/11/2020	FWGmw-020-200401-GW	Grab	Metals, Total	Arsenic	0.044		0.01	MCL	0.003
Upper Sharon	FWGmw-020	6/11/2020	FWGmw-020-200401-GW	Grab	Metals, Total	Potassium	4.3				3.38
Upper Sharon	FWGmw-021	6/11/2020	FWGmw-021-200402-GW	Field Duplicate	Metals, Total	Iron	3.5		2.08	BKG	2.08
Upper Sharon	FWGmw-021	6/11/2020	FWGmw-021-200401-GW	Grab	Metals, Total	Iron	3.5	J	2.08	BKG	2.08
Upper Sharon	FWGmw-021	6/11/2020	FWGmw-021-200402-GW	Field Duplicate	Metals, Total	Manganese	0.62	J	0.198	BKG	0.198
Upper Sharon	FWGmw-021	6/11/2020	FWGmw-021-200401-GW	Grab	Metals, Total	Manganese	0.61	J	0.198	BKG	0.198
Upper Sharon	FWGmw-024	6/11/2020	FWGmw-024-200401-GW	Grab	Metals, Total	Manganese	0.33	J	0.198	BKG	0.198

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APPENDIX G

Laboratory Data Packages
(Provided as separate files on compact disc)

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APPENDIX H

Data Quality Assessment Report

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ACRONYMS AND ABBREVIATIONS

ADR	Automated Data Review
CCV	Continuing Calibration Verification
DoD	U.S. Department of Defense
DQA	Data Quality Assessment
DQO	Data Quality Objective
EDD	Electronic Data Deliverable
FCR	Field Change Request
FWGWMP	Facility-wide Groundwater Monitoring Program
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LOD	Limit of Detection
LOQ	Limit of Quantitation
MDL	Method Detection Level
MPC	Measurement Performance Criteria
MPR	Monthly Progress Report
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PAH	Polycyclic Aromatic Hydrocarbon
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyl
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
QSM	Quality Systems Manual
REIMS	RVAAP Environmental Information Management System
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
RPD	Relative Percent Difference
RVAAP	Ravenna Army Ammunition Plant
SVOC	Semi-volatile Organic Compound
TestAmerica	Laboratories, Inc.
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile Organic Compound

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H. PROJECT QUALITY ASSURANCE SUMMARY

H.1 PURPOSE OF THIS REPORT

Environmental data must be evaluated relative to their known limitations and intended use. As can be expected in environmental media, some analytical results and data points require the user to be cautioned relative to the quality of the project information presented. The data verification/validation process and this data quality assessment (DQA) are performed to assist current and future data users in interpreting these data.

The purpose of this DQA report is to document the following:

- The quality control (QC) procedures that were followed to ensure data generated by Leidos during the implementation of the Spring 2020 sampling event to support the Facility-wide Groundwater Monitoring Program (FWGWMP) at the former Ravenna Army Ammunition Plant (RVAAP) meet project requirements,
- The quality of the data collected, and
- Any problems encountered during the course of the study and their solutions.

This DQA report provides an assessment of the analytical information generated during the implementation of the *Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2020* (Leidos 2020; herein referred to as the 2020 Addendum). Implementation of the 2020 Addendum was conducted in accordance with the *Remedial Investigation Work Plan for Groundwater and Environmental Services for RVAAP-66 Facility-wide Groundwater* (TEC-Weston 2016; herein referred to as the Remedial Investigation Work Plan [RIWP]), Appendix A.2 Quality Assurance Project Plan (QAPP).

This DQA documents the quality of the data collected during the Spring 2020 sampling event and assesses if quality assurance (QA)/QC objectives were met. The primary intent of this assessment is to document that, except as noted, data generated for this investigation can withstand scientific scrutiny; are appropriate for their intended purpose; are technically defensible; and are of known and adequate quality (i.e., precision, accuracy, representativeness, comparability, completeness and sensitivity [PARCCS]).

Multiple activities were performed to achieve the required data quality for this project. Data quality objectives (DQOs), along with a QA program, were established to guide the implementation of the field sampling and laboratory analysis per the 2020 Addendum (Leidos 2020). The QA program was established to standardize procedures and document activities per the FWGWMP Plan (Portage Environmental 2004) and RIWP. This program provided a means to detect and correct any deficiencies in the process. Upon receipt by the project team, results provided in the electronic data deliverable (EDD) were subjected to electronic review by an automated data review (ADR) process to identify and qualify problems related to the analysis. This was followed by manual verification/validation of QC results not included in the EDD/ADR review. These combined verification/validation results are

summarized in this DQA to document that data used in the Remedial Investigation (RI) are identified as having met the criteria and are being used appropriately.

H.2 QUALITY ASSURANCE PROGRAM

The QAPP within the RIWP (TEC-Weston 2016) was developed to enumerate the quantity and type of environmental samples needed and to define the quantity and type of QA/QC samples to be used to evaluate data quality. These documents established requirements for field and laboratory QC procedures. In general, field QC duplicate samples were required at a frequency of 10 percent; volatile organic compound (VOC) trip blanks were to accompany each cooler containing water samples for VOC determinations; field blanks and equipment blanks were collected as needed to demonstrate equipment decontamination and clean ambient field conditions; and analytical laboratory QC samples, including duplicates, matrix spikes (MSs), laboratory control samples (LCSs), and method blanks, were required for each preparation batch of 20 samples or less for each parameter. Note that during the Spring 2020 event, only dedicated sampling equipment was used; therefore, field blanks and equipment blanks were not required.

A primary goal of the QA program is to ensure that the quality of results for all environmental measurements is appropriate for their intended use and that standardized field procedures guide the investigation. Through the process of readiness review, training, equipment calibration, QC implementation, and detailed documentation, the project has successfully accomplished the goals set for the QA program.

H.2.1 Monthly Progress Reports

Monthly Progress Reports (MPRs) were completed by the Leidos Project Manager for the duration of the project. The MPRs contained information on work completed, a summary of anticipated upcoming work, discussion of any health and safety issues, and a summary of investigation-derived waste staged at the facility. These reports were issued to the U.S. Army Corps of Engineers (USACE), Louisville District Contracting Officer's Representative and Project Manager by email.

H.2.2 Daily Activity Logs

The Field Manager completed Daily Activity Logs. These include information such as, but not limited to, on-site sub-tier contractors, on-site equipment, work performed summaries, QC activities, health and safety activities, problems encountered, and corrective actions.

H.2.3 Laboratory "Definitive" Level Data Reporting

The QAPP for this project identified requirements for laboratory data reporting. White Water Associates of Amasa, Michigan, and their subcontracted partner TestAmerica Laboratories, Inc. (TestAmerica) of Denver, Colorado, performed all analyses. TestAmerica Denver is accredited by the U.S. Department of Defense (DoD) for the analyses they performed. All analytical procedures were completed in accordance with U.S. Environmental Protection Agency (USEPA) requirements; the DoD

Quality Systems Manual (QSM), Version 5.0 (DoD 2017); and the QAPP. USEPA "definitive" data have been reported, including laboratory-level IV data packages meeting QSM Appendix A guidance.

This information from the laboratory, along with field information, provides the basis for subsequent data evaluation relative to and the data quality indicators of PARCCS.

H.2.4 Field Change Requests

The FCRs applicable to the Spring 2020 sampling event are summarized below and presented in Appendix C:

- LEIDOS_FWGW_001 – Specifies that, due to the permanent bladder pumps, total depths of wells will not be collected during the facility-wide comprehensive water level measurements.
- LEIDOS_FWGW_004 – Specifies the field QC sampling frequency.
- LEIDOS_FWGW_006 – Documents the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.
- LEIDOS_FWGW_010 – Specifies that post-sample water quality parameters may not be an accurate characterization of groundwater, and water quality parameters recorded at the time of stabilization (before sampling) are the parameters used for evaluation.

H.3 DATA VERIFICATION/VALIDATION

The objective when evaluating the project data quality is to determine its usability. The evaluation is based on the interpretation of laboratory QC measures, field QC measures, and project DQOs. This project implemented ADR software to facilitate laboratory data review. The ADR output was reviewed by the project-designated verification staff, as discussed below.

H.3.1 Field Data Verification

Field-generated documents, such as sampling logs, boring logs, daily health and safety summaries, daily safety inspections, equipment calibration and maintenance logs, and sample management logs, were peer-reviewed on site.

H.3.2 Laboratory Data Verification/Validation

Analytical data generated for this project have been subjected to a process of automated and manual data verification, validation, and review. Criteria and protocols were established in the following documents:

- 2020 Addendum (Leidos 2020);
- RIWP, including Appendix A.2 QAPP (TEC-Weston 2016);
- DoD QSM, Version 5.0 (DoD 2017);
- USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-99/008 (USEPA 1999);

- USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540/R-04/004 (USEPA 2004); and
- Leidos Technical Support Contractor QA Standard Operating Procedure (ESE-DM-05), *Data Verification and Validation* (Leidos 2015).

Upon receipt of analytical data, QA staff performed a systematic examination of 100 percent of the reports, including ADR outputs. Discrepancies identified during this process were recorded and documented. Any discrepancies were resolved prior to database flag entry. The QA Program Nonconformance Report and Corrective Action systems were implemented as required.

During the verification phase of the review and evaluation process, data were subjected to a systematic technical review by examining all field sample and analytical QC results against the measurement performance criteria (MPC) specified in the QAPP, following USEPA functional guidelines, DoD QSM criteria, and Leidos internal procedures for laboratory data review. These guidelines describe methods for evaluating the review criteria and actions to be performed resulting from the review of these criteria. The primary objectives of this phase were to assess and summarize the quality and reliability of the data for the intended use and to document factors that may affect the usability of the data. This data verification/validation and analytical review process included, but was not necessarily limited to, the following parameters:

- Data completeness;
- Analytical holding times and sample preservation;
- Calibration (initial and continuing);
- Method blanks and calibration blanks;
- Sample results verification;
- Surrogate recovery (organics);
- LCS analysis;
- Internal standard performance;
- MS/matrix spike duplicate (MSD) recovery;
- Serial dilution/post digestion spike, interference check standards (inorganics);
- Field duplicate analysis comparison;
- Reported detection limits; and
- Secondary dilutions.

As a result of this review, data were qualified based on the technical evaluations of QC sample results compared to the MPC specified in the QAPP. Qualifiers were applied as needed to field and analytical results to indicate the usability of the data for its intended purpose.

H.3.3 Definitions of Data Qualifiers (Flags)

During the data verification/validation process, laboratory data were assigned appropriate data qualification flags with reason codes. Qualification flags are defined as follows:

- "U" Indicates the analyte was analyzed for, but not detected above, the level of the associated value.
- "J" Indicates the analyte was positively identified; however, the associated numerical value is an approximate concentration of the analyte in the sample.
- "UJ" Indicates the analyte was analyzed for, but not detected above, the associated value; however, the reported value is an estimate and demonstrates a decreased knowledge of its accuracy or precision.
- "R" Indicates the analyte value reported is unusable due to significant noncompliant QC results. One 3-nitrotoluene result was qualified as unusable due to 0 percent MS duplicate recovery.

H.3.4 Data Compliance

Forty-nine environmental groundwater samples were collected with approximately 1972 discrete data points (i.e., analytes) obtained, reviewed, and integrated into the assessment (these totals do not include field measurements, field QC blanks, and field descriptions). During the project, samples were successfully collected and produced usable results for more than 99.9 percent of the sample analyses performed during the Spring 2020 sampling event.

Table HH-1 summarizes the number of environmental and QA split samples collected during the Spring 2020 sampling event. Cross-references for field duplicates and field QC samples and the associated primary samples are presented in Table HH-2 along with the requested parameters for each sample. Table HH-3 summarizes the qualified analyses grouped by parameter, and Table H-4 details the individual results qualified during review. The majority of the estimated values were based on concentrations between the laboratory method detection levels (MDLs) and the sample limit of quantitation (LOQ) (i.e., values determined in this region have an inherently higher variability and are considered to be estimated concentrations); qualifiers also were assigned based on noncompliant MS recoveries, blank contamination, surrogate recoveries, and LCS recoveries, as well as professional judgment.

During the Spring 2020 sampling event, seven field duplicates were collected and analyzed with primary samples. Five trip blanks were collected and analyzed for VOCs. Equipment rinsate blanks were not required because samples were collected via the use of dedicated sampling equipment. The project goal for blanks is to achieve concentrations less than the reporting levels. Table H-5 summarizes analytes that were detected in the trip blanks. In general, trip blank results indicate that the potential for sample contamination due to cross contamination is very low.

H.4 DATA QUALITY EVALUATION

H.4.1 Volatile Organic Groundwater Analysis

Analytical holding times were met for VOC samples. Initial calibrations and continuing calibration criteria were achieved with the exception of bromoform and bromomethane in standards associated with seven data points qualified as estimated (UJ) based on professional judgment. Surrogate recoveries and internal area counts were within control limits for all analyses. No results were qualified based on laboratory method blanks. Two trip blanks contained acetone detections and resulted in four results qualified as non-detect (U) based on professional judgment. All LCS recoveries were within criteria. MS/MSD recoveries resulted in 28 data points being qualified as estimated (UJ); relative percent difference (RPD) values met control criteria. No samples required dilutions. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in the RVAAP Environmental Information Management System (REIMS).

H.4.2 Semi-volatile Organic Groundwater Analysis

Extraction and analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Surrogate recoveries met criteria. Internal standard area counts and compound retention times met criteria throughout the data analyses. Method blanks were free of contamination. LCS recoveries resulted in 12 data points being qualified as estimated (UJ). MS/MSD recoveries were within control limits with the exception of one compound, which was outside criteria, resulting in one data point being qualified as estimated (J); RPD values met control criteria. No semi-volatile organic compound (SVOC) samples required dilutions. No data were rejected for any reason, and the results are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.3 Polycyclic Aromatic Hydrocarbon Groundwater Analysis

Extraction and analytical holding times were met for all samples. Initial and continuing calibration criteria were met. Internal standard area counts and compound retention times met criteria throughout the data analyses. Surrogate recoveries were met with the exception of one sample for which 18 data points were qualified as estimated (UJ). Method blanks were free from contamination. LCS and MS/MSD recoveries and RPD values met criteria. No polycyclic aromatic hydrocarbon (PAH) samples required dilutions. No data were rejected for any reason. All values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.4 Pesticide Analysis Groundwater Analysis

Analytical holding times were met for all samples; as needed, cleanup protocols (SW3660A and SW3665A) were used to reduce matrix interferences in the sample extracts. Surrogate recoveries met control criteria for all samples. Initial and continuing calibrations met criteria for all pesticide compounds, with the exception of six compounds in standards associated with two samples, resulting in 12 data points qualified as estimated (UJ) due to professional judgment. Pesticide method blanks were free of contamination. LCS recoveries and MS/MSD recoveries and RPD values were within criteria. No pesticide samples required dilutions. Column comparison criteria were met. No pesticide data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.5 Polychlorinated Biphenyl Analysis Groundwater Analysis

Analytical holding times were met for all samples; as needed, cleanup protocols (SW3660A and SW3665A) were used to reduce matrix interferences in the sample extracts. Surrogate recoveries met control limits. Initial and continuing calibration criteria were met for all polychlorinated biphenyl (PCB) compounds with the exception of one compound in standards associated with two samples, resulting in two data points qualified as estimated (UJ) due to professional judgment. PCB method blanks were free from contamination. LCS recoveries were within acceptance criteria. MS/MSD recoveries and RPD values met criteria. No PCB data were estimated or rejected for any reason. No PCB samples required a dilution. All PCB values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.6 Explosives Groundwater Analysis

Analytical holding times were met for all samples. Surrogate recoveries for 8 samples were outside control limits and resulted in 123 data points qualified as estimated (J/UJ). Initial and continuing calibration criteria were met with the exception of one compound in standards associated with one data point qualified as estimated (UJ) due to professional judgment. All method blanks were free of contamination. Column comparison criteria were exceeded for 10 results, which caused these data points to be qualified as "J" based on professional judgment. LCS recovery for 3 compounds exceeded criteria, resulting in 18 results being qualified as estimated (UJ). MS/MSD recoveries were below criteria for two compounds which caused three data points to be qualified as estimated (UJ). MS/MSD recovery for one compound was 0 percent, which resulted in one data point to be qualified as unusable (R); this sample also had a surrogate recovery that did not meet criteria. No explosives samples required dilutions. With the exception of the rejected result, for those analyses that were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.7 Metals and Phosphorus Groundwater Analysis

Analytical holding times were met for all samples. LCS recoveries met criteria. MS/MSD recoveries exceeded criteria for 9 compounds, which resulted in 18 sample results qualified as estimated (J/UJ). MS/MSD RPD values were within control limits. Method blank contamination resulted in 15 results being qualified as non-detect (U/UJ) when sample results were less than 10 times the blank results. Initial and continuing calibration criteria were evaluated and sample results associated with calibration standard exceedances were qualified as follows: if initial calibration verification (ICV) or continuing calibration verification (CCV) results were above criteria, detects were qualified as estimated (J); if ICV/CCV results were below criteria, detects were qualified as estimated (J) and non-detects were qualified at an estimated concentration (UJ). Calibration blank contamination was evaluated similar to method blanks. Professional judgment was used to qualify 51 results, based on ICV/CCV results and initial and continuing calibration blank contamination per above, as well as for non-conformances related to serial dilutions and post digestion spike results. No data were rejected for any reason. No dilutions were required. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the reported values were considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.8 Anions

One nitrate result was qualified as estimated (J) due to missed holding times. Initial and continuing calibration criteria were met for all compounds. Method and calibration blank were free from contamination that impacted sample results. MS/MSD recoveries were outside criteria for sulfate, which resulted in two results qualified as estimated (J); RPD values met criteria. Laboratory duplicate results met criteria. No groundwater samples required a dilution. Analyses that were qualified as estimated should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.9 Cyanide

Preparation holding time was missed for two samples, and two data points were qualified as estimated (J). Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS recovery was outside criteria for one cyanide compound, which resulted in two data points qualified as estimated (J) due to professional judgment. MS/MSD recoveries and RPD values met criteria. No dilutions were required. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.10 Perchlorate

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries were outside control limits and resulted in two data points qualified as estimated (J); RPD values met criteria. No dilutions were required. No data were rejected for any reason. Reported values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix D and can be found in REIMS.

H.4.11 Alkalinity

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for alkalinity. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries and RPD values met criteria for alkalinity. No dilutions were required. No data were rejected or qualified for any reason.

H.4.12 Ammonia

Analytical holding times were met for all samples. Samples LL23mw-287-200401-GW and LL12mw-185-200401-GW were originally collected in an improper container with sodium hydroxide preservative. The samples were recollected in the appropriate container with sulfuric acid. Sample LL12mw-187-200401-GW was analyzed at a 200× dilution. Initial and continuing calibration criteria were met for ammonia. Method and calibration blanks were free from contamination. LCS recoveries were within criteria. No data were rejected or qualified for any reason.

H.4.13 Precision

Field duplicate samples were collected to assess the combined variability (i.e., precision) due to environmental media, sampling reproducibility, and analytical precision. Field duplicate samples were collected from the same spatial and temporal conditions as the primary environmental sample.

Field duplicate comparison information is presented in Table H-6. If a given analyte was not detected in both the regular and field duplicate sample, precision was considered within limits, and results were not included in the table. The RPD was calculated only when both samples had reported concentrations greater than five times the LOQ. When one or both sample values were between the LOQ and five times the LOQ, the absolute difference was evaluated. Tables 12-1 through 12-17 of the QAPP set the RPD criteria, while the absolute difference is set at one times the reporting limit. All field duplicate comparisons met criteria.

H.4.14 Sensitivity

Determining minimum detectable values allows the investigation to assess the confidence that can be placed in a value relative to the magnitude of analyte concentration observed. The closer a measured value comes to the minimum detectable concentration, the less confidence and more variation the

measurement may have. Project sensitivity goals were expressed relative to the project action limits in the QAPP, as presented in Tables 15-1 through 15-19; these tables identified compounds for which the expected limit of detection (LOD) was greater than the project action limit. These limits were further evaluated relative to the applicable screening criteria, and LODs were at or below screening criteria, with the exceptions previously noted in the QAPP tables. In addition, several compounds not listed in the QAPP (benz[a]anthracene; Aldrin; dieldrin; 2,4-dinitrophenol; 2-methyl-4,6-dinitrophenol; and Aroclor 1016) were reported with LODs greater than the screening criteria; Aroclor 1016 and benz(a)anthracene had MDLs below the screening criteria. With these exceptions, LODs are considered adequate for their intended use and have been considered during data interpretation and statistical applications.

Method blank determinations were performed with each analytical sample batch for each analyte under investigation. These blanks were evaluated to determine their potential impact on individual data points. Action levels are set at 5 times the blank concentration for all analytes, except those designated as common laboratory contaminants (i.e., methylene chloride, acetone, toluene, 2-butanone, and phthalate compounds), for which the action level is 10 times the blank concentration. Action limits for inorganics were set as 10 times the blank concentration. Reported sample concentrations are evaluated against blank action levels, and the following qualifications are made when reportable quantities of analytes were observed in the associated method blank:

- When the sample analyte concentration is above the action level (5 to 10 times the blank concentration), the data are not qualified and it is considered a positive value.
- If the sample concentration is below the action level, the data are considered impacted by the method blank. If the sample result is greater than the LOQ, the result is qualified as a non-detectable concentration at the analyte value reported and these data are qualified as "U." If the sample result is greater than the LOD but less than the LOQ, the result is qualified as a non-detectable concentration at the analyte value reported and these data are qualified as "UJ." If the sample result is less than the LOD (an estimated value), the result is qualified as non-detectable at the concentration of the LOD and qualified as "U."

No data were rejected as a result of method blank contamination; however, various analytes were qualified as a non-detectable concentration (U, UJ), as summarized in Table H-4.

Table H-5 summarizes analytes that were detected in the five trip blanks associated with this sampling event. Trace concentration of acetone were detected, as listed in Table H-5, at concentrations less than the reporting level. The transportation and sample storage process, and the procedures and precautions employed, were effective in preserving the integrity of the sample analysis.

H.4.15 Representativeness and Comparability

Representativeness expresses the degree to which data accurately reflect the analyte or parameter of interest for the environmental media being studied and is the qualitative term most concerned with the proper design of the sampling program. Factors that affect the representativeness of analytical data include proper preservation, holding times, and use of standard sampling and analytical methods.

Samples were picked up on site by the TestAmerica courier and then delivered or shipped to the appropriate laboratory location; samples were received within temperature specifications and in good condition. Holding times were met for all samples with the exception of one nitrate analysis and the extraction holding time for cyanide in two samples; these results were qualified as estimated.

Comparability, like representativeness, is a qualitative term relative to an individual project data set. The RI employed appropriate sampling methodologies, sample containers and preservation, and site surveillance; used standard sampling devices and uniform training; and documented sampling procedures, standard analytical protocols/procedures, QC checks with standard control limits, and universally accepted data reporting units to ensure comparability to other data sets. Through the proper implementation and documentation of these standard practices, the project has established the confidence that the data will be comparable to other project and programmatic information. Table H-7 presents the standardized parameter groups, sample containers, preservation techniques, and associated holding times for environmental media.

H.4.16 Completeness

Usable data are defined as those data that pass individual scrutiny during the verification and validation process. These data, including estimated data, have been determined to be usable for RVAAP restoration program objectives.

The completeness goal for analytical data is 95 percent, as defined in Tables 12-1 through 12-17 of the FWGWMP Plan (Portage Environmental 2004). All samples specified in the 2020 Addendum (Leidos 2020) were collected as planned, and usable results were generated for 99.9 percent of sample analyses performed.

H.5 DATA QUALITY ASSESSMENT SUMMARY

The overall quality of the Spring 2020 sampling event meets established project objectives. Through implementation of the project data verification, validation, and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable; some data have been qualified estimated, “J” or “UJ.” One data point (3-nitrotoluene in RQLmw-007-200401-GW) was rejected. Data that have been qualified as estimated indicate accuracy, precision, or sensitivity did not meet all requirements, but results are considered adequate for interpretation. All undetected analytes were reported at detection levels that were adequate for use during data interpretation and statistical applications except as discussed previously.

Data produced for this project demonstrate they can withstand scientific scrutiny; are appropriate for its intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of QA and QC measures. The environmental information presented has an established confidence that allows utilization for the project objectives and provides data for future needs.

H.6 REFERENCES

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Table H-1. Number of Samples Collected – Spring 2020 Sampling Event

Media	Environmental Samples	Field Duplicates	USACE Split Samples	Trip Blanks	Equipment Rinsate Blanks[a]	Source Water Blanks[b]
Groundwater	49	7	0	5	0	0

[a] Equipment rinsate blanks were collected at a frequency of one per field cycle for the entire annual sampling event for the RVAAP-66 Facility-wide Groundwater area of concern. Only dedicated sampling equipment was needed; therefore, no rinsate blanks were collected.

[b] Source water blanks for deionized and potable water used during equipment decontamination were evaluated for the entire RVAAP-66 Facility-Wide Groundwater area of concern; none were collected during this event.

RVAAP = Ravenna Army Ammunition Plant

USACE = U.S. Army Corps of Engineers

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Table H-2. Identification of Regular and QC Samples Collected – Spring 2020 Sampling Event

Environmental Samples	Laboratory SDG	Field Duplicates	Trip Blanks*	Metals	Explosives	SVOCs	PAHs	VOCs	Pesticides	PCBs	Cyanide	Perchlorate	Anions	Alkalinity
DET-003-200401-GW	280-135791-1	DET-003-200402-GW	FWGTB-2004001-TB	X	X	X	X	X	X	X	X			
DET-004-200401-GW	280-135791-1		FWGTB-2004001-TB	X	X	X	X	X	X	X	X			
FBQmw-168-200401-GW	280-136017-1				X									
FBQmw-170-200401-GW	280-136017-1				X									
FBQmw-171-200401-GW	280-136071-1				X									
FBQmw-174-200401-GW	280-135968-1				X									
FBQmw-175-200401-GW	280-135968-1	FBQmw-175-200402-GW			X									
FBQmw-176-200401-GW	280-136017-1				X									
FBQmw-177-200401-GW	280-136071-1				X									
FWGmw-004-200401-GW	280-135888-1			X	X									
FWGmw-007-200401-GW	280-136071-1			X	X									
FWGmw-011-200401-GW	280-137630-1			X	X									
FWGmw-012-200401-GW	280-137630-1			X	X									
FWGmw-015-200401-GW	280-135839-1			X	X									
FWGmw-016-200401-GW	280-135839-1			X	X									
FWGmw-018-200401-GW	280-137630-1		FWGTB-200405-TB	X				X						
FWGmw-020-200401-GW	280-137630-1		FWGTB-200405-TB	X				X						
FWGmw-021-200401-GW	280-137630-1	FWGmw-021-200402-GW		X	X									
FWGmw-024-200401-GW	280-137630-1			X	X									
LL10mw-003-200401-GW	280-136017-1		FWGTB-200406-TB					X						
LL12mw-185-200401-GW	280-136017-1													
LL12mw-185-200401b-GW	280-135725-1												X	
LL12mw-187-200401-GW	280-136017-1													
LL12mw-187-200401b-GW	280-135725-1												X	
LL1mw-063-200401-GW	280-135888-1				X								X	X
LL1mw-064-200401-GW	280-135839-1			X	X									
LL1mw-080-200401-GW	280-135888-1				X									
LL1mw-081-200401-GW	280-135888-1				X									
LL1mw-083-200401-GW	280-135888-1				X								X	X

Table H-3. Identification of Regular and QC Samples Collected – Spring 2020 Sampling Event (Continued)

Environmental Samples	Laboratory SDG	Field Duplicates	Trip Blanks*	Metals	Explosives	SVOCs	PAHs	VOCs	Pesticides	PCBs	Cyanide	Perchlorate	Anions	Alkalinity
LL1mw-084-200401-GW	280-135888-1				X									
LL1mw-086-200401-GW	280-136118-1			X									X	X
LL1mw-087-200401-GW	280-135968-1	LL1mw-087-200402-GW		X	X							X		
LL1mw-089-200401-GW	280-135968-1	LL1mw-089-200402-GW		X	X								X	X
LL2mw-059-200401-GW	280-135888-1				X									
LL2mw-267-200401-GW	280-135888-1			X	X									
LL3mw-237-200401-GW	280-135839-1				X									
LL3mw-238-200401-GW	280-136118-1				X									
LL3mw-239-200401-GW	280-136118-1				X									
LL3mw-241-200401-GW	280-136118-1				X									
RQLmw-007-200401-GW	280-135791-1	RQLmw-007-200402-GW	FWGTB-2004003-TB	X	X	X	X	X	X	X	X			
RQLmw-008-2004201-GW	280-135839-1		FWGTB-2004004-TB	X	X	X	X	X	X	X	X			
RQLmw-009-200401-GW	280-135839-1		FWGTB-2004004-TB	X	X	X	X	X	X	X	X			
RQLmw-011-200401-GW	280-135791-1	RQLmw-011-200402-GW											X	X
RQLmw-013-200401-GW	280-135839-1												X	X
SCFmw-004-200401-GW	280-135839-1			X	X									
WBGmw-006-200401-GW	280-135725-1				X									
WBGmw-009-200401-GW	280-135725-1				X									
WBGmw-020-200401-GW	280-135725-1				X									
WBGmw-021-200401-GW	280-135725-1				X									

*Trip blanks only accompany samples for VOCs in water.
PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
QC = Quality Control
SDG = Sample Delivery Group
SVOC = Semi-volatile Organic Compound
TB = Trip Blank
VOC = Volatile Organic Compound

Table H-3. Summary of Qualified Results for Samples – Spring 2020 Sampling Event

Analysis Group	Validation Qualifier[a]	Validation Code[b]	Number Qualified	Total Number of Analyses	Percent Qualified
All Analyses	R		1	1972	0.1
All Analyses	J		186	1972	9.4
All Analyses	UJ		225	1972	11.0
All Analyses	U		29	1972	1.5
All Analyses	None		1531	1972	78.0
Metals	J	MS-J	11	534	2.1
Metals	J	MS-J, ProJudge-J	4	534	0.8
Metals	J	MS-J, RepLimit-J	2	534	0.4
Metals	J	ProJudge-J	22	534	4.1
Metals	J	RepLimit-J	101	534	19.0
Metals	J	RepLimit-J, ProJudge-J	7	534	1.3
Metals	UJ	MB-U, RepLimit-J, ProJudge-UJ	2	534	0.4
Metals	UJ	MS-J, ProJudge-UJ	1	534	0.2
Metals	UJ	ProJudge-UJ	2	534	0.4
Metals	UJ	RepLimit-J, ProJudge-UJ	4	534	0.8
Metals	U	MB-U	1	534	0.2
Metals	U	MB-U, RepLimit-J	9	534	1.7
Metals	U	MB-U, RepLimit-J, ProJudge-U	3	534	0.6
Metals	U	ProJudge-U	1	534	0.2
Metals	U	RepLimit-J, ProJudge-U	5	534	0.9
Metals	None	None	359	534	67.0
Explosives	R	Surr-UJ, MS-UJ, ProJudge-R	1	688	0.2
Explosives	J	ProJudge-J	10	688	1.5
Explosives	J	RepLimit-J	4	688	0.6
Explosives	J	RepLimit-J, ProJudge-J	1	688	0.2
Explosives	J	Surr-J	8	688	1.2
Explosives	UJ	LCS-UJ	18	688	2.6
Explosives	UJ	MS-UJ	1	688	0.2
Explosives	UJ	ProJudge-UJ	1	688	0.2
Explosives	UJ	Surr-UJ	113	688	16.0
Explosives	UJ	Surr-UJ, MS-UJ	2	688	0.3
Explosives	U	ProJudge-U	6	688	0.9
Explosives	None	None	523	688	76.0
SVOCs	J	MS-J, RepLimit-J	1	138	0.7
SVOCs	J	RepLimit-J	1	138	0.7
SVOCs	UJ	LCS-UJ	12	138	8.7
SVOCs	None	None	124	138	90.0
PAHs	J	RepLimit-J	2	108	1.9
PAHs	UJ	Surr-UJ	18	108	17.0
PAHs	None	None	88	108	81.0
VOCs	J	RepLimit-J	1	289	0.4
VOCs	UJ	MS-UJ	28	289	9.7
VOCs	UJ	ProJudge-UJ	7	289	2.4
VOCs	U	RepLimit-J, ProJudge-U	4	289	1.4
VOCs	None	None	249	289	86.0
Pesticides	UJ	ProJudge-UJ	12	126	9.5
Pesticides	None	None	114	126	90.0
PCBs	UJ	ProJudge-UJ	2	42	4.8
PCBs	None	None	40	42	95.0

Table H-3. Summary of Qualified Results for Samples – Spring 2020 Sampling Event (Continued)

Analysis Group	Validation Qualifier[a]	Validation Code[b]	Number Qualified	Total Number of Analyses	Percent Qualified
Cyanide	J	RepLimit-J	2	6	33.0
Cyanide	UJ	ProJudge-UJ	2	6	33.0
Cyanide	None	None	2	6	33.0
Perchlorate	J	MS-J, RepLimit-J	2	2	100.0
Anions	J	MS-J	2	30	6.7
Anions	J	ProJudge-J	1	30	3.3
Anions	J	RepLimit-J	2	30	6.7
Anions	None	None	25	30	83.0
Alkalinity	J	RepLimit-J	2	7	29.0
Alkalinity	None	None	5	7	71.0
Ammonia	None	None	2	2	100.0

[a] Validation Qualifiers:
J = Estimated
U = Not Detected
UJ = Not Detected and Reporting Limit Estimated
R = Unusable

[b] Validation Reason Codes:
HT = Holding Time
LCS = laboratory Control Sample
MB = Method Blank
MS = Matrix Spike
ProJudge = Professional Judgment
RptLimit = Reporting Limit
Surr = Surrogate Recovery

PAH = Polycyclic Aromatic Hydrocarbon
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
VOC = Volatile Organic Compound

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code[c]
Metals	ALUMINUM	280-135888-1	FWGmw-004-200401-GW	35	300	J	J	RepLimit-J
Metals	ALUMINUM	280-136071-1	FWGmw-007-200401-GW	93	300	J	J	RepLimit-J
Metals	ALUMINUM	280-137630-1	FWGmw-011-200401-GW	360	300		J	ProJudge-J
Metals	ALUMINUM	280-137630-1	FWGmw-012-200401-GW	190	300	J	J	RepLimit-J, ProJudge-J
Metals	ALUMINUM	280-137630-1	FWGmw-021-200401-GW	52	300	J Q	J	RepLimit-J, ProJudge-J
Metals	ALUMINUM	280-137630-1	FWGmw-021-200402-GW	43	300	J Q	J	RepLimit-J, ProJudge-J
Metals	ALUMINUM	280-135839-1	LL1mw-064-200401-GW	48	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135968-1	LL1mw-087-200401-GW	290	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135968-1	LL1mw-089-200401-GW	61	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135968-1	LL1mw-089-200402-GW	45	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135791-1	RQLmw-007-200401-GW	51	300	J J1	J	MS-J, RepLimit-J
Metals	ALUMINUM	280-135791-1	RQLmw-007-200402-GW	40	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135839-1	RQLmw-009-200401-GW	74	300	J	J	RepLimit-J
Metals	ALUMINUM	280-135839-1	SCFmw-004-200401-GW	24	300	J	J	RepLimit-J
Metals	ANTIMONY	280-137630-1	FWGmw-020-200401-GW	1.0	6.0	J Q	UJ	RepLimit-J, ProJudge-UJ
Metals	ANTIMONY	280-137630-1	FWGmw-020-200401-GW	1.0	6.0	J Q	UJ	RepLimit-J, ProJudge-UJ
Metals	ANTIMONY	280-137630-1	FWGmw-021-200401-GW	1.0	6.0	J Q	UJ	RepLimit-J, ProJudge-UJ
Metals	ANTIMONY	280-137630-1	FWGmw-021-200402-GW	1.0	6.0	J Q	UJ	RepLimit-J, ProJudge-UJ
Metals	ARSENIC	280-137630-1	FWGmw-012-200401-GW	1.8	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135839-1	FWGmw-015-200401-GW	0.34	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135839-1	FWGmw-016-200401-GW	4.0	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-137630-1	FWGmw-021-200401-GW	0.87	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-137630-1	FWGmw-021-200402-GW	0.82	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-137630-1	FWGmw-024-200401-GW	2.4	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135968-1	LL1mw-087-200401-GW	0.66	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135968-1	LL1mw-089-200401-GW	0.95	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135968-1	LL1mw-089-200402-GW	1.0	5.0	J	J	RepLimit-J
Metals	ARSENIC	280-135839-1	RQLmw-009-200401-GW	1.0	5.0	J	J	RepLimit-J
Metals	BARIUM	280-135791-1	DET-003-200401-GW	46	3.0		J	ProJudge-J
Metals	BARIUM	280-135791-1	DET-004-200401-GW	55	3.0		J	ProJudge-J
Metals	BARIUM	280-137630-1	FWGmw-012-200401-GW	22	3.0		J	ProJudge-J
Metals	BARIUM	280-135839-1	FWGmw-015-200401-GW	7.7	3.0		J	ProJudge-J
Metals	BARIUM	280-135839-1	FWGmw-016-200401-GW	52	3.0		J	ProJudge-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Metals	BARIUM	280-137630-1	FWGmw-020-200401-GW	78	3.0	J1	J	MS-J
Metals	BARIUM	280-135839-1	LL1mw-064-200401-GW	51	3.0		J	ProJudge-J
Metals	BARIUM	280-135968-1	LL1mw-089-200401-GW	0.51	3.0	J	J	RepLimit-J
Metals	BARIUM	280-135968-1	LL1mw-089-200402-GW	1.0	3.0	J	J	RepLimit-J
Metals	BARIUM	280-135791-1	RQLmw-007-200401-GW	31	3.0		J	ProJudge-J
Metals	BARIUM	280-135791-1	RQLmw-007-200402-GW	33	3.0		J	ProJudge-J
Metals	BARIUM	280-135839-1	RQLmw-008-2004201-GW	98	3.0		J	ProJudge-J
Metals	BARIUM	280-135839-1	RQLmw-009-200401-GW	1.4	3.0	J	J	RepLimit-J
Metals	BARIUM	280-135839-1	SCFmw-004-200401-GW	51	3.0		J	ProJudge-J
Metals	BERYLLIUM	280-135839-1	RQLmw-009-200401-GW	0.12	1.0	J	J	RepLimit-J
Metals	CALCIUM	280-137630-1	FWGmw-020-200401-GW	100000	1000		J	ProJudge-J
Metals	CALCIUM	280-135791-1	RQLmw-007-200401-GW	94000	1000	J1	J	MS-J, ProJudge-J
Metals	CHROMIUM	280-136071-1	FWGmw-007-200401-GW	0.71	10	J	J	RepLimit-J
Metals	CHROMIUM	280-137630-1	FWGmw-011-200401-GW	0.54	10	J	J	RepLimit-J
Metals	CHROMIUM	280-135968-1	LL1mw-087-200401-GW	1.8	10	J	U	MB-U, RepLimit-J
Metals	CHROMIUM	280-135839-1	RQLmw-009-200401-GW	4.8	10	J	J	RepLimit-J
Metals	COBALT	280-135791-1	DET-003-200401-GW	0.32	1.0	J	J	RepLimit-J
Metals	COBALT	280-136071-1	FWGmw-007-200401-GW	0.75	1.0	J	J	RepLimit-J
Metals	COBALT	280-137630-1	FWGmw-024-200401-GW	0.77	1.0	J	J	RepLimit-J
Metals	COBALT	280-135839-1	LL1mw-064-200401-GW	0.093	1.0	J	J	RepLimit-J
Metals	COBALT	280-135968-1	LL1mw-087-200401-GW	0.45	1.0	J	J	RepLimit-J
Metals	COBALT	280-135968-1	LL1mw-089-200401-GW	0.75	1.0	J	J	RepLimit-J
Metals	COBALT	280-135968-1	LL1mw-089-200402-GW	0.75	1.0	J	J	RepLimit-J
Metals	COBALT	280-135839-1	RQLmw-009-200401-GW	0.19	1.0	J	J	RepLimit-J
Metals	COPPER	280-135791-1	DET-003-200401-GW	1.8	2.0	U	UJ	ProJudge-UJ
Metals	COPPER	280-135791-1	DET-004-200401-GW	5.5	2.0		J	ProJudge-J
Metals	COPPER	280-135888-1	FWGmw-004-200401-GW	0.72	2.0	J	J	RepLimit-J
Metals	COPPER	280-137630-1	FWGmw-012-200401-GW	3.3	2.0		J	ProJudge-J
Metals	COPPER	280-137630-1	FWGmw-024-200401-GW	1.3	2.0	J	U	MB-U, RepLimit-J
Metals	COPPER	280-135839-1	LL1mw-064-200401-GW	0.79	2.0	J	J	RepLimit-J
Metals	COPPER	280-135968-1	LL1mw-087-200401-GW	1.8	2.0	J	U	MB-U, RepLimit-J
Metals	COPPER	280-135791-1	RQLmw-007-200401-GW	0.90	2.0	J	J	RepLimit-J, ProJudge-J
Metals	COPPER	280-135791-1	RQLmw-007-200402-GW	0.74	2.0	J	J	RepLimit-J, ProJudge-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Metals	IRON	280-135888-1	FWGmw-004-200401-GW	85	100	J B	U	MB-U, RepLimit-J, ProJudge-U
Metals	IRON	280-135839-1	FWGmw-015-200401-GW	180	100	B	U	MB-U
Metals	IRON	280-135839-1	FWGmw-016-200401-GW	650	100	B	U	ProJudge-U
Metals	IRON	280-137630-1	FWGmw-021-200401-GW	3500	100		J	MS-J
Metals	IRON	280-135968-1	LL1mw-089-200401-GW	85	100	J B	U	MB-U, RepLimit-J
Metals	IRON	280-135968-1	LL1mw-089-200402-GW	85	100	J B	U	MB-U, RepLimit-J
Metals	IRON	280-135839-1	SCFmw-004-200401-GW	85	100	J B	U	MB-U, RepLimit-J, ProJudge-U
Metals	LEAD	280-135791-1	DET-004-200401-GW	0.19	3.0	J	J	RepLimit-J
Metals	LEAD	280-137630-1	FWGmw-011-200401-GW	0.56	3.0	J	J	RepLimit-J
Metals	LEAD	280-137630-1	FWGmw-012-200401-GW	1.9	3.0	J	J	RepLimit-J, ProJudge-J
Metals	LEAD	280-137630-1	FWGmw-021-200401-GW	0.21	3.0	J	J	RepLimit-J
Metals	LEAD	280-137630-1	FWGmw-021-200402-GW	0.22	3.0	J	J	RepLimit-J
Metals	LEAD	280-135839-1	LL1mw-064-200401-GW	0.43	3.0	J	J	RepLimit-J
Metals	LEAD	280-135968-1	LL1mw-087-200401-GW	0.41	3.0	J	J	RepLimit-J
Metals	LEAD	280-135791-1	RQLmw-007-200401-GW	0.31	3.0	J	J	RepLimit-J
Metals	LEAD	280-135791-1	RQLmw-007-200402-GW	0.29	3.0	J	J	RepLimit-J
Metals	LEAD	280-135839-1	RQLmw-008-2004201-GW	0.19	3.0	J	J	RepLimit-J
Metals	LEAD	280-135839-1	RQLmw-009-200401-GW	0.53	3.0	J	J	RepLimit-J
Metals	LEAD	280-135839-1	SCFmw-004-200401-GW	0.25	3.0	J	J	RepLimit-J
Metals	MAGNESIUM	280-135791-1	RQLmw-007-200401-GW	48000	500	J1	J	MS-J, ProJudge-J
Metals	MANGANESE	280-135791-1	DET-003-200401-GW	260	3.5	Q	J	ProJudge-J
Metals	MANGANESE	280-135791-1	DET-004-200401-GW	16	3.5	Q	J	ProJudge-J
Metals	MANGANESE	280-135888-1	FWGmw-004-200401-GW	5.8	3.5		J	ProJudge-J
Metals	MANGANESE	280-137630-1	FWGmw-011-200401-GW	290	3.5		J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-012-200401-GW	92	3.5		J	MS-J, ProJudge-J
Metals	MANGANESE	280-137630-1	FWGmw-018-200401-GW	130	3.5		J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-020-200401-GW	60	3.5		J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-020-200401-GW	62	3.5	J1	J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-021-200401-GW	610	3.5	J1	J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-021-200402-GW	620	3.5		J	MS-J
Metals	MANGANESE	280-137630-1	FWGmw-024-200401-GW	330	3.5		J	MS-J
Metals	MANGANESE	280-135968-1	LL1mw-087-200401-GW	72	3.5		J	ProJudge-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Metals	MANGANESE	280-135968-1	LL1mw-089-200401-GW	46	3.5		J	ProJudge-J
Metals	MANGANESE	280-135968-1	LL1mw-089-200402-GW	46	3.5		J	ProJudge-J
Metals	MANGANESE	280-135888-1	LL2mw-267-200401-GW	560	3.5		J	ProJudge-J
Metals	MANGANESE	280-135791-1	RQLmw-007-200401-GW	2000	3.5	Q J1	J	ProJudge-J
Metals	MANGANESE	280-135791-1	RQLmw-007-200402-GW	1800	3.5	Q	J	MS-J, ProJudge-J
Metals	MERCURY	280-137630-1	FWGmw-012-200401-GW	0.08	0.20	J	U	MB-U, RepLimit-J, ProJudge-U
Metals	MERCURY	280-135791-1	RQLmw-007-200402-GW	0.14	0.20	J	J	RepLimit-J
Metals	NICKEL	280-135791-1	DET-004-200401-GW	0.57	3.0	J	J	RepLimit-J
Metals	NICKEL	280-135888-1	FWGmw-004-200401-GW	0.38	3.0	J	J	RepLimit-J
Metals	NICKEL	280-136071-1	FWGmw-007-200401-GW	1.5	3.0	J	J	RepLimit-J
Metals	NICKEL	280-137630-1	FWGmw-011-200401-GW	1.5	3.0	J	J	RepLimit-J
Metals	NICKEL	280-137630-1	FWGmw-012-200401-GW	1.2	3.0	J	J	RepLimit-J
Metals	NICKEL	280-135839-1	FWGmw-015-200401-GW	0.58	3.0	J	J	RepLimit-J
Metals	NICKEL	280-137630-1	FWGmw-020-200401-GW	2.0	3.0	J	J	RepLimit-J
Metals	NICKEL	280-137630-1	FWGmw-020-200401-GW	2.0	3.0	J	J	RepLimit-J
Metals	NICKEL	280-137630-1	FWGmw-024-200401-GW	2.7	3.0	J	J	RepLimit-J
Metals	NICKEL	280-135968-1	LL1mw-087-200401-GW	2.1	3.0	J	J	RepLimit-J
Metals	NICKEL	280-135791-1	RQLmw-007-200401-GW	39	3.0	J1	J	MS-J
Metals	NICKEL	280-135791-1	RQLmw-007-200402-GW	33	3.0		J	MS-J
Metals	NICKEL	280-135839-1	RQLmw-009-200401-GW	0.40	3.0	J	J	RepLimit-J
Metals	NICKEL	280-135839-1	SCFmw-004-200401-GW	0.45	3.0	J	J	RepLimit-J
Metals	POTASSIUM	280-135791-1	DET-003-200401-GW	1900	3000	J	UJ	MB-U, RepLimit-J, ProJudge-UJ
Metals	POTASSIUM	280-135791-1	DET-004-200401-GW	1500	3000	J	UJ	MB-U, RepLimit-J, ProJudge-UJ
Metals	POTASSIUM	280-135888-1	FWGmw-004-200401-GW	700	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-136071-1	FWGmw-007-200401-GW	2300	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-137630-1	FWGmw-011-200401-GW	1000	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-137630-1	FWGmw-012-200401-GW	1300	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135839-1	FWGmw-016-200401-GW	2200	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-137630-1	FWGmw-018-200401-GW	2100	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-137630-1	FWGmw-021-200401-GW	1400	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-137630-1	FWGmw-021-200402-GW	1500	3000	J	J	RepLimit-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Metals	POTASSIUM	280-137630-1	FWGmw-024-200401-GW	1000	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135839-1	LL1mw-064-200401-GW	730	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135968-1	LL1mw-087-200401-GW	1200	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135968-1	LL1mw-089-200401-GW	820	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135968-1	LL1mw-089-200402-GW	850	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135791-1	RQLmw-007-200401-GW	4300	3000	J1	UJ	MS-J, ProJudge-UJ
Metals	POTASSIUM	280-135791-1	RQLmw-007-200402-GW	3900	3000		UJ	ProJudge-UJ
Metals	POTASSIUM	280-135839-1	RQLmw-008-2004201-GW	2900	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135839-1	RQLmw-009-200401-GW	2800	3000	J	J	RepLimit-J
Metals	POTASSIUM	280-135839-1	SCFmw-004-200401-GW	2900	3000	J	J	RepLimit-J
Metals	Phosphorus	280-135791-1	RQLmw-007-200401-GW	31	3000	J	J	MS-J, RepLimit-J
Metals	Phosphorus	280-135791-1	RQLmw-007-200402-GW	33	3000	J	J	RepLimit-J
Metals	SELENIUM	280-135791-1	DET-004-200401-GW	1.2	5.0	J	J	RepLimit-J
Metals	SELENIUM	280-135888-1	FWGmw-004-200401-GW	0.55	5.0	J	J	RepLimit-J
Metals	SILVER	280-135839-1	RQLmw-008-2004201-GW	0.10	5.0	J	U	RepLimit-J, ProJudge-U
Metals	SILVER	280-135839-1	RQLmw-009-200401-GW	0.10	5.0	J	U	RepLimit-J, ProJudge-U
Metals	SODIUM	280-135791-1	DET-004-200401-GW	1800	5000	J	J	RepLimit-J
Metals	SODIUM	280-135888-1	FWGmw-004-200401-GW	3900	5000	J	J	RepLimit-J
Metals	SODIUM	280-137630-1	FWGmw-021-200401-GW	3600	5000	J	J	RepLimit-J
Metals	SODIUM	280-137630-1	FWGmw-021-200402-GW	3500	5000	J	J	RepLimit-J
Metals	SODIUM	280-135968-1	LL1mw-089-200401-GW	2600	5000	J	J	RepLimit-J
Metals	SODIUM	280-135968-1	LL1mw-089-200402-GW	2600	5000	J	J	RepLimit-J
Metals	SODIUM	280-135791-1	RQLmw-007-200401-GW	3400	5000	J	J	RepLimit-J
Metals	SODIUM	280-135791-1	RQLmw-007-200402-GW	3700	5000	J	J	RepLimit-J
Metals	SODIUM	280-135839-1	RQLmw-008-2004201-GW	3900	5000	J	J	RepLimit-J
Metals	SODIUM	280-135839-1	RQLmw-009-200401-GW	1200	5000	J	J	RepLimit-J
Metals	THALLIUM	280-136071-1	FWGmw-007-200401-GW	0.20	1.0	J	U	RepLimit-J, ProJudge-U
Metals	THALLIUM	280-135968-1	LL1mw-089-200401-GW	0.15	1.0	J	J	RepLimit-J
Metals	THALLIUM	280-135968-1	LL1mw-089-200402-GW	0.17	1.0	J	J	RepLimit-J
Metals	THALLIUM	280-135839-1	RQLmw-009-200401-GW	0.40	1.0	J	J	RepLimit-J
Metals	VANADIUM	280-135839-1	RQLmw-009-200401-GW	1.4	6.0	J	J	RepLimit-J
Metals	ZINC	280-135791-1	DET-004-200401-GW	12	20	J	J	RepLimit-J
Metals	ZINC	280-135888-1	FWGmw-004-200401-GW	8	20	J	U	MB-U, RepLimit-J
Metals	ZINC	280-136071-1	FWGmw-007-200401-GW	3.3	20	J	J	RepLimit-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Metals	ZINC	280-137630-1	FWGmw-011-200401-GW	4.4	20	J	U	MB-U, RepLimit-J
Metals	ZINC	280-137630-1	FWGmw-021-200401-GW	13	20	J	U	RepLimit-J, ProJudge-U
Metals	ZINC	280-137630-1	FWGmw-021-200402-GW	14	20	J	U	RepLimit-J, ProJudge-U
Metals	ZINC	280-137630-1	FWGmw-024-200401-GW	3.2	20	J	U	MB-U, RepLimit-J
Metals	ZINC	280-135839-1	LL1mw-064-200401-GW	2.1	20	J	J	RepLimit-J
Metals	ZINC	280-135968-1	LL1mw-087-200401-GW	8	20	J	U	MB-U, RepLimit-J
Metals	ZINC	280-135968-1	LL1mw-089-200401-GW	12	20	J	J	RepLimit-J
Metals	ZINC	280-135968-1	LL1mw-089-200402-GW	15	20	J	J	RepLimit-J
Metals	ZINC	280-135791-1	RQLmw-007-200401-GW	7.7	20	J J1	J	RepLimit-J, ProJudge-J
Metals	ZINC	280-135791-1	RQLmw-007-200402-GW	3.9	20	J	J	RepLimit-J
Metals	ZINC	280-135839-1	RQLmw-009-200401-GW	14	20	J	J	RepLimit-J
Metals	ZINC	280-135839-1	SCFmw-004-200401-GW	10	20	J	J	RepLimit-J
Explosives	1,3,5-TRINITROBENZENE	280-135839-1	FWGmw-015-200401-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135839-1	FWGmw-016-200401-GW	0.39	0.98	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135888-1	LL1mw-083-200401-GW	3.6	0.97	Q M	J	Surr-J
Explosives	1,3,5-TRINITROBENZENE	280-135839-1	LL3mw-237-200401-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135791-1	RQLmw-007-200401-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135791-1	RQLmw-007-200402-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135839-1	RQLmw-008-2004201-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	1,3,5-TRINITROBENZENE	280-135839-1	RQLmw-009-200401-GW	0.42	1.0	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135839-1	FWGmw-015-200401-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135839-1	FWGmw-016-200401-GW	0.20	0.39	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135888-1	LL1mw-080-200401-GW	0.10	0.39	J M J1	J	RepLimit-J
Explosives	1,3-DINITROBENZENE	280-135888-1	LL1mw-083-200401-GW	0.78	0.39	Q J1	J	Surr-J
Explosives	1,3-DINITROBENZENE	280-135888-1	LL1mw-084-200401-GW	0.65	0.39	M J1	J	ProJudge-J
Explosives	1,3-DINITROBENZENE	280-135839-1	LL3mw-237-200401-GW	0.21	0.41	U M Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135791-1	RQLmw-007-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135791-1	RQLmw-007-200402-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135839-1	RQLmw-008-2004201-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	1,3-DINITROBENZENE	280-135839-1	RQLmw-009-200401-GW	0.21	0.42	U Q	UJ	Surr-UJ
Explosives	2,4,6-TRINITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	2,4,6-TRINITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.39	0.39	U Q	UJ	Surr-UJ
Explosives	2,4,6-TRINITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	1.4	0.39	Q	J	Surr-J
Explosives	2,4,6-TRINITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.41	0.41	U Q	UJ	Surr-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	2,4,6-TRINITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	2,4,6-TRINITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	2,4,6-TRINITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.42	0.42	U Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.20	0.39	U Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	2.0	0.39	Q	J	Surr-J
Explosives	2,4-DINITROTOLUENE	280-135888-1	LL1mw-084-200401-GW	0.64	0.39	J1	J	ProJudge-J
Explosives	2,4-DINITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.21	0.41	U M Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.20	0.41	U M Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	2,4-DINITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.21	0.42	U M Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.20	0.20	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.20	0.20	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	0.19	0.19	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	0.21	0.21	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.21	0.21	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.20	0.20	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.20	0.20	U Q	UJ	Surr-UJ
Explosives	2,6-DINITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.21	0.21	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-137630-1	FWGmw-021-200402-GW	0.16	0.11	J1	J	ProJudge-J
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135888-1	LL1mw-081-200401-GW	0.56	0.20	J1	J	ProJudge-J
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	7.0	0.19	Q	J	Surr-J
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135888-1	LL2mw-267-200401-GW	0.12	0.20	J J1	J	RepLimit-J
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	1.8	0.21	M Q	J	Surr-J

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.12	0.21	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	2-AMINO-4,6-DINITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.12	0.21	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-136017-1	FBQmw-168-200401-GW	0.21	0.22	U Q	U	ProJudge-U
Explosives	2-NITROTOLUENE	280-136017-1	FBQmw-170-200401-GW	0.21	0.22	U Q	U	ProJudge-U
Explosives	2-NITROTOLUENE	280-136071-1	FBQmw-171-200401-GW	0.21	0.22	U Q	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-135968-1	FBQmw-175-200401-GW	0.20	0.21	U J1	UJ	MS-UJ
Explosives	2-NITROTOLUENE	280-136017-1	FBQmw-176-200401-GW	0.21	0.22	U Q	U	ProJudge-U
Explosives	2-NITROTOLUENE	280-136071-1	FBQmw-177-200401-GW	0.20	0.21	U Q	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-136071-1	FWGmw-007-200401-GW	0.22	0.23	U Q	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.20	0.39	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	0.19	0.39	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-136118-1	LL3mw-238-200401-GW	0.21	0.22	U Q M	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-136118-1	LL3mw-239-200401-GW	0.21	0.22	U Q	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-136118-1	LL3mw-241-200401-GW	0.22	0.23	U Q M	UJ	LCS-UJ
Explosives	2-NITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.21	0.41	U Q J1	UJ	Surr-UJ, MS-UJ
Explosives	2-NITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	2-NITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.21	0.42	U Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-136071-1	FBQmw-171-200401-GW	0.41	0.41	U Q	UJ	LCS-UJ
Explosives	3-NITROTOLUENE	280-136071-1	FBQmw-177-200401-GW	0.39	0.39	U Q	UJ	LCS-UJ
Explosives	3-NITROTOLUENE	280-136071-1	FWGmw-007-200401-GW	0.43	0.43	U Q	UJ	LCS-UJ
Explosives	3-NITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.41	0.41	U M Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.39	0.39	U M Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	0.39	0.39	U Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-136118-1	LL3mw-238-200401-GW	0.42	0.42	U Q	UJ	LCS-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	3-NITROTOLUENE	280-136118-1	LL3mw-239-200401-GW	0.43	0.43	U Q	UJ	LCS-UJ
Explosives	3-NITROTOLUENE	280-136118-1	LL3mw-241-200401-GW	0.43	0.43	U Q M	UJ	LCS-UJ
Explosives	3-NITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.41	0.41	U Q J1	R	Surr-UJ, MS-UJ, ProJudge-R
Explosives	3-NITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.41	0.41	U M Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.41	0.41	U M Q	UJ	Surr-UJ
Explosives	3-NITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.42	0.42	U M Q	UJ	Surr-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-136017-1	FBQmw-176-200401-GW	0.13	0.16	U	UJ	ProJudge-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135888-1	LL1mw-081-200401-GW	0.53	0.20	J1	J	ProJudge-J
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	11	0.19	Q	J	Surr-J
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135888-1	LL2mw-267-200401-GW	0.17	0.20	J M J1	J	RepLimit-J
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	3.2	0.21	M Q	J	Surr-J
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.12	0.21	U Q J1	UJ	Surr-UJ, MS-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.12	0.20	U Q	UJ	Surr-UJ
Explosives	4-AMINO-2,6-DINITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.12	0.21	U M Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-136017-1	FBQmw-168-200401-GW	0.43	0.44	U Q	U	ProJudge-U
Explosives	4-NITROTOLUENE	280-136017-1	FBQmw-170-200401-GW	0.42	0.43	U M Q	U	ProJudge-U
Explosives	4-NITROTOLUENE	280-136071-1	FBQmw-171-200401-GW	0.41	0.42	U Q	UJ	LCS-UJ
Explosives	4-NITROTOLUENE	280-136017-1	FBQmw-176-200401-GW	0.43	0.44	U Q	U	ProJudge-U
Explosives	4-NITROTOLUENE	280-136071-1	FBQmw-177-200401-GW	0.39	0.40	U Q	UJ	LCS-UJ
Explosives	4-NITROTOLUENE	280-136071-1	FWGmw-007-200401-GW	0.43	0.44	U Q	UJ	LCS-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	4-NITROTOLUENE	280-135839-1	FWGmw-015-200401-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135839-1	FWGmw-016-200401-GW	0.39	0.98	U Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135888-1	LL1mw-083-200401-GW	0.39	0.97	U Q M	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135839-1	LL3mw-237-200401-GW	0.41	1.0	U Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-136118-1	LL3mw-238-200401-GW	0.42	0.43	U Q M	UJ	LCS-UJ
Explosives	4-NITROTOLUENE	280-136118-1	LL3mw-239-200401-GW	0.43	0.44	U Q	UJ	LCS-UJ
Explosives	4-NITROTOLUENE	280-136118-1	LL3mw-241-200401-GW	0.43	0.44	U Q M	UJ	LCS-UJ
Explosives	4-NITROTOLUENE	280-135791-1	RQLmw-007-200401-GW	0.41	1.0	U M Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135791-1	RQLmw-007-200402-GW	0.41	1.0	U M Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135839-1	RQLmw-008-2004201-GW	0.41	1.0	U M Q	UJ	Surr-UJ
Explosives	4-NITROTOLUENE	280-135839-1	RQLmw-009-200401-GW	0.42	1.0	U M Q	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135968-1	FBQmw-174-200401-GW	1.0	0.21	M J1	J	ProJudge-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-137630-1	FWGmw-011-200401-GW	0.16	0.22	J J1	J	RepLimit-J, ProJudge-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135839-1	FWGmw-015-200401-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135839-1	FWGmw-016-200401-GW	0.39	0.39	U Q	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-137630-1	FWGmw-021-200401-GW	0.54	0.21	J1 M	J	ProJudge-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-137630-1	FWGmw-021-200402-GW	0.46	0.20	J1	J	ProJudge-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135888-1	LL1mw-081-200401-GW	0.29	0.41	J M	J	RepLimit-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135888-1	LL1mw-083-200401-GW	0.39	0.39	U Q M	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135888-1	LL1mw-084-200401-GW	2.3	0.39	M J1	J	ProJudge-J
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135839-1	LL3mw-237-200401-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135839-1	RQLmw-008-2004201-GW	0.41	0.41	U Q	UJ	Surr-UJ
Explosives	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	280-135839-1	RQLmw-009-200401-GW	0.42	0.42	U Q	UJ	Surr-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	NITROBENZENE	280-135839-1	FWGmw-015-200401-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135839-1	FWGmw-016-200401-GW	0.20	0.39	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135888-1	LL1mw-083-200401-GW	0.19	0.39	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135839-1	LL3mw-237-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135791-1	RQLmw-007-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135791-1	RQLmw-007-200402-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135839-1	RQLmw-008-2004201-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	NITROBENZENE	280-135839-1	RQLmw-009-200401-GW	0.21	0.42	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135839-1	FWGmw-015-200401-GW	2.0	3.1	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135839-1	FWGmw-016-200401-GW	2.0	2.9	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135888-1	LL1mw-083-200401-GW	1.9	2.9	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135839-1	LL3mw-237-200401-GW	2.1	3.1	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135791-1	RQLmw-007-200401-GW	2.1	3.1	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135791-1	RQLmw-007-200402-GW	2.0	3.1	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135839-1	RQLmw-008-2004201-GW	2.0	3.1	U Q	UJ	Surr-UJ
Explosives	NITROGLYCERINE	280-135839-1	RQLmw-009-200401-GW	2.1	3.1	U Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135839-1	FWGmw-015-200401-GW	0.20	0.41	U M Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135839-1	FWGmw-016-200401-GW	0.20	0.39	U Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135839-1	LL3mw-237-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-136118-1	LL3mw-238-200401-GW	1.5	0.22	J1	J	ProJudge-J
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135791-1	RQLmw-007-200401-GW	0.21	0.41	U Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135791-1	RQLmw-007-200402-GW	0.20	0.41	U Q	UJ	Surr-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135839-1	RQLmw-008-2004201-GW	0.20	0.41	U Q	UJ	Surr-UJ
Explosives	OCTAHYDRO-1,3,5,7-TETRANITRO-1,3,5,7-TETRAZOCINE (HMX)	280-135839-1	RQLmw-009-200401-GW	0.21	0.42	U Q	UJ	Surr-UJ
Explosives	PETN	280-135839-1	FWGmw-015-200401-GW	4.1	4.1	U Q	UJ	Surr-UJ
Explosives	PETN	280-135839-1	FWGmw-016-200401-GW	3.9	3.9	U Q	UJ	Surr-UJ
Explosives	PETN	280-135888-1	LL1mw-083-200401-GW	3.9	3.9	U Q	UJ	Surr-UJ
Explosives	PETN	280-135839-1	LL3mw-237-200401-GW	4.1	4.1	U Q	UJ	Surr-UJ
Explosives	PETN	280-135791-1	RQLmw-007-200401-GW	4.1	4.1	U Q	UJ	Surr-UJ
Explosives	PETN	280-135791-1	RQLmw-007-200402-GW	4.1	4.1	U Q	UJ	Surr-UJ
Explosives	PETN	280-135839-1	RQLmw-008-2004201-GW	4.1	4.1	U Q	UJ	Surr-UJ
Explosives	PETN	280-135839-1	RQLmw-009-200401-GW	4.2	4.2	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135839-1	FWGmw-015-200401-GW	0.20	0.24	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135839-1	FWGmw-016-200401-GW	0.20	0.24	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135888-1	LL1mw-083-200401-GW	0.19	0.23	U Q M	UJ	Surr-UJ
Explosives	TETRYL	280-135839-1	LL3mw-237-200401-GW	0.21	0.25	U M Q	UJ	Surr-UJ
Explosives	TETRYL	280-135791-1	RQLmw-007-200401-GW	0.21	0.25	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135791-1	RQLmw-007-200402-GW	0.20	0.24	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135839-1	RQLmw-008-2004201-GW	0.20	0.25	U Q	UJ	Surr-UJ
Explosives	TETRYL	280-135839-1	RQLmw-009-200401-GW	0.21	0.25	U Q	UJ	Surr-UJ
SVOCs	2,4-DICHLOROPHENOL	280-135839-1	RQLmw-008-2004201-GW	2.0	9.9	U Q	UJ	LCS-UJ
SVOCs	2,4-DICHLOROPHENOL	280-135839-1	RQLmw-009-200401-GW	2.1	11	U Q	UJ	LCS-UJ
SVOCs	2-CHLOROPHENOL	280-135839-1	RQLmw-008-2004201-GW	4.4	9.9	U Q	UJ	LCS-UJ
SVOCs	2-CHLOROPHENOL	280-135839-1	RQLmw-009-200401-GW	4.7	11	U Q	UJ	LCS-UJ
SVOCs	2-METHYLPHENOL (O-CRESOL)	280-135839-1	RQLmw-008-2004201-GW	2.0	9.9	U M Q	UJ	LCS-UJ
SVOCs	2-METHYLPHENOL (O-CRESOL)	280-135839-1	RQLmw-009-200401-GW	2.1	11	U Q	UJ	LCS-UJ
SVOCs	2-NITROPHENOL	280-135839-1	RQLmw-008-2004201-GW	0.99	20	U Q	UJ	LCS-UJ
SVOCs	2-NITROPHENOL	280-135839-1	RQLmw-009-200401-GW	1.1	21	U Q	UJ	LCS-UJ
SVOCs	NITROBENZENE	280-135839-1	RQLmw-008-2004201-GW	2.0	20	U Q	UJ	LCS-UJ
SVOCs	NITROBENZENE	280-135839-1	RQLmw-009-200401-GW	2.1	21	U Q	UJ	LCS-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
SVOCs	PHENOL	280-135791-1	DET-003-200401-GW	4.9	10	J J1	J	MS-J, RepLimit-J
SVOCs	PHENOL	280-135791-1	DET-003-200402-GW	2.0	10	J	J	RepLimit-J
SVOCs	PHENOL	280-135839-1	RQLmw-008-2004201-GW	4.4	9.9	U Q	UJ	LCS-UJ
SVOCs	PHENOL	280-135839-1	RQLmw-009-200401-GW	4.7	11	U Q	UJ	LCS-UJ
PAHs	1-METHYLNAPHTHALENE	280-135839-1	RQLmw-009-200401-GW	0.043	0.11	U Q	UJ	Surr-UJ
PAHs	2-METHYLNAPHTHALENE	280-135839-1	RQLmw-009-200401-GW	0.054	0.11	U Q	UJ	Surr-UJ
PAHs	ACENAPHTHENE	280-135839-1	RQLmw-008-2004201-GW	0.086	0.10	J	J	RepLimit-J
PAHs	ACENAPHTHENE	280-135839-1	RQLmw-009-200401-GW	0.013	0.11	U Q	UJ	Surr-UJ
PAHs	ACENAPHTHYLENE	280-135839-1	RQLmw-009-200401-GW	0.022	0.11	U Q	UJ	Surr-UJ
PAHs	ANTHRACENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U Q	UJ	Surr-UJ
PAHs	BENZ(A)ANTHRACENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U	UJ	Surr-UJ
PAHs	BENZO(A)PYRENE	280-135839-1	RQLmw-009-200401-GW	0.054	0.11	U M	UJ	Surr-UJ
PAHs	BENZO(B)FLUORANTHENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U M	UJ	Surr-UJ
PAHs	BENZO(G,H,I)PERYLENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U	UJ	Surr-UJ
PAHs	BENZO(K)FLUORANTHENE	280-135839-1	RQLmw-009-200401-GW	0.054	0.11	U M	UJ	Surr-UJ
PAHs	CHRYSENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U	UJ	Surr-UJ
PAHs	DIBENZO(A,H)ANTHRACENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U M	UJ	Surr-UJ
PAHs	FLUORANTHENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U Q	UJ	Surr-UJ
PAHs	FLUORENE	280-135839-1	RQLmw-008-2004201-GW	0.094	0.10	J	J	RepLimit-J
PAHs	FLUORENE	280-135839-1	RQLmw-009-200401-GW	0.043	0.11	U Q	UJ	Surr-UJ
PAHs	INDENO(1,2,3-CD)PYRENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U	UJ	Surr-UJ
PAHs	NAPHTHALENE	280-135839-1	RQLmw-009-200401-GW	0.054	0.11	U Q	UJ	Surr-UJ
PAHs	PHENANTHRENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U Q	UJ	Surr-UJ
PAHs	PYRENE	280-135839-1	RQLmw-009-200401-GW	0.11	0.11	U Q	UJ	Surr-UJ
VOCs	1,1,1-TRICHLOROETHANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	1,1,2,2-TETRACHLOROETHANE	280-135791-1	DET-003-200401-GW	0.80	1.0	U J1	UJ	MS-UJ
VOCs	1,1,2-TRICHLOROETHANE	280-135791-1	DET-003-200401-GW	0.80	1.0	U J1	UJ	MS-UJ
VOCs	1,1-DICHLOROETHANE	280-135791-1	DET-003-200401-GW	0.80	1.0	U J1	UJ	MS-UJ
VOCs	1,2-DIBROMOETHANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	1,2-DICHLOROETHANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	1,2-DICHLOROPROPANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	ACETONE	280-135791-1	DET-003-200401-GW	6.4	10	J	U	RepLimit-J, ProJudge-U
VOCs	ACETONE	280-135791-1	DET-003-200402-GW	6.7	10	J	U	RepLimit-J, ProJudge-U
VOCs	ACETONE	280-135791-1	DET-004-200401-GW	6.4	10	J	U	RepLimit-J, ProJudge-U

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
VOCs	ACETONE	280-135839-1	RQLmw-009-200401-GW	6.4	10	J	U	RepLimit-J, ProJudge-U
VOCs	BENZENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	BROMOCHLOROMETHANE	280-135791-1	DET-003-200401-GW	0.20	1.0	U J1	UJ	MS-UJ
VOCs	BROMODICHLOROMETHANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	BROMOFORM	280-135791-1	DET-003-200401-GW	1.0	1.0	U Q J1	UJ	MS-UJ
VOCs	BROMOFORM	280-135791-1	DET-003-200402-GW	1.0	1.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOFORM	280-135791-1	DET-004-200401-GW	1.0	1.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOFORM	280-135791-1	RQLmw-007-200401-GW	1.0	1.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOFORM	280-135839-1	RQLmw-008-2004201-GW	1.0	1.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOFORM	280-135839-1	RQLmw-009-200401-GW	1.0	1.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOMETHANE	280-135791-1	DET-003-200401-GW	0.80	2.0	U J1	UJ	MS-UJ
VOCs	BROMOMETHANE	280-137630-1	FWGmw-018-200401-GW	0.80	2.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOMETHANE	280-137630-1	FWGmw-020-200401-GW	0.80	2.0	U Q	UJ	ProJudge-UJ
VOCs	BROMOBENZENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	CARBON TETRACHLORIDE	280-135791-1	DET-003-200401-GW	0.40	2.0	U J1	UJ	MS-UJ
VOCs	CARBON TETRACHLORIDE	280-136017-1	LL10mw-003-200401-GW	1.3	2.0	J	J	RepLimit-J
VOCs	CHLOROBENZENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	CHLOROETHANE	280-135791-1	DET-003-200401-GW	1.6	2.0	U J1	UJ	MS-UJ
VOCs	CHLOROFORM	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	CIS-1,3-DICHLOROPROPENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	DIBROMOCHLOROMETHANE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	ETHYLBENZENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	METHYLENE CHLORIDE	280-135791-1	DET-003-200401-GW	2.0	5.0	U J1	UJ	MS-UJ
VOCs	STYRENE	280-135791-1	DET-003-200401-GW	0.80	1.0	U J1	UJ	MS-UJ
VOCs	TETRACHLOROETHENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	TOLUENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	TRANS-1,3-DICHLOROPROPENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	TRICHLOROETHENE	280-135791-1	DET-003-200401-GW	0.40	1.0	U J1	UJ	MS-UJ
VOCs	VINYL CHLORIDE	280-135791-1	DET-003-200401-GW	0.20	1.5	U J1	UJ	MS-UJ
VOCs	XYLENES (TOTAL)	280-135791-1	DET-003-200401-GW	0.80	1.0	U J1	UJ	MS-UJ
Pesticides	ENDOSULFAN II	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ
Pesticides	ENDOSULFAN II	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
Pesticides	ENDOSULFAN SULFATE	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

Analysis Type	Chemical	Sample Delivery Group	Sample ID	Results	Det. Limit (LOQ)	Lab Qual[a]	Val. Qual[b]	Validation Code
Pesticides	ENDOSULFAN SULFATE	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
Pesticides	ENDRIN	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ
Pesticides	ENDRIN	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
Pesticides	ENDRIN ALDEHYDE	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ
Pesticides	ENDRIN ALDEHYDE	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
Pesticides	ENDRIN KETONE	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ
Pesticides	ENDRIN KETONE	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
Pesticides	GAMMA-CHLORDANE	280-135839-1	RQLmw-008-2004201-GW	0.021	0.052	U	UJ	ProJudge-UJ
Pesticides	GAMMA-CHLORDANE	280-135839-1	RQLmw-009-200401-GW	0.019	0.048	U	UJ	ProJudge-UJ
PCBs	AROCLOR 1016	280-135839-1	RQLmw-008-2004201-GW	0.41	1.0	U Q	UJ	ProJudge-UJ
PCBs	AROCLOR 1016	280-135839-1	RQLmw-009-200401-GW	0.38	0.96	U Q	UJ	ProJudge-UJ
Cyanide	CYANIDE, TOTAL	280-135791-1	DET-003-200401-GW	0.0054	0.010	J Q	J	RepLimit-J
Cyanide	CYANIDE, TOTAL	280-135791-1	DET-004-200401-GW	0.0054	0.010	J Q	J	RepLimit-J
Cyanide	CYANIDE, TOTAL	280-135839-1	RQLmw-008-2004201-GW	0.010	0.010	U H	UJ	ProJudge-UJ
Cyanide	CYANIDE, TOTAL	280-135839-1	RQLmw-009-200401-GW	0.010	0.010	U H	UJ	ProJudge-UJ
Perchlorate	PERCHLORATE	280-135968-1	LL1mw-087-200401-GW	0.015	0.050	J M J1	J	MS-J, RepLimit-J
Perchlorate	PERCHLORATE	280-135968-1	LL1mw-087-200402-GW	0.014	0.050	J	J	MS-J, RepLimit-J
Anions	NITRATE AS N	280-135725-1	LL12mw-187-200401-GW	1600	250	D H	J	ProJudge-J
Anions	NITRATE AS N	280-135888-1	LL1mw-083-200401-GW	0.43	0.50	J	J	RepLimit-J
Anions	NITRATE AS N	280-135968-1	LL1mw-089-200401-GW	0.12	0.50	J	J	RepLimit-J
Anions	SULFATE	280-135791-1	RQLmw-011-200401-GW	87	5.0	J1	J	MS-J
Anions	SULFATE	280-135791-1	RQLmw-011-200402-GW	87	5.0		J	MS-J
Alkalinity	ALKALINITY	280-135888-1	LL1mw-063-200401-GW	6.1	10	J	J	RepLimit-J
Alkalinity	ALKALINITY	280-135968-1	LL1mw-089-200401-GW	8.8	10	J	J	RepLimit-J

[a] Laboratory Qualifiers:
J = Estimated because result is between the method detection limit and the reporting limit
J1= Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
U = Not Detected
H = Holding Time
M = Manually integrated compound
Q = One or More Quality Control Failed

[b] Validation Qualifiers:
J = Estimated
R = Rejected
U = Not Detected
UJ = Not Detected and Reporting Limit Estimated

Table H-4. Detailed Listing of Qualified Results – Spring 2020 Sampling Event (Continued)

[c] Validation Reason Codes:

HT = Holding Time
LCS = Laboratory Control Sample
MB = Method Blank
MS = Matrix Spike
ProJudge = Professional Judgment
RptLimit = Reporting Limit
Surr = Surrogate Recovery

ID = Identifier
LOQ = Limit of Quantitation
PAH = Polycyclic Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
SVOC = Semi-volatile Organic Compound
VOC = Volatile Organic Compound

Table H-5. Results for Analytes Detected in Field Blanks or Trip Blanks – Spring 2020 Sampling Event

Sample ID	Analysis Type	Analyte Name	Result
FWGTB-2004001-TB	VOCs	ACETONE	4.4 J
FWGTB-2004003-TB	VOCs	ACETONE	3.8 J
FWGTB-2004004-TB	VOCs	ACETONE	3.5 J
FWGTB-200405-TB	VOCs	ACETONE	2.6 J

Sample Type: TB = Trip Blank
Data Qualifier: J = Estimated
ID = Identifier
VOC = Volatile Organic Compound

Table H-6. Field Duplicate Pair Comparisons for Analytes Detected in Samples – Spring 2020 Sampling Event

Sample ID	Chemical	Regular Result	Duplicate Result	RPD % or (Absolute Difference)[a]	Test[b]
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	ALUMINUM	0.052 J	0.043 J	(0.03)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	ARSENIC	0.00087 J	0.00082 J	(0.01)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	BARIUM	0.017	0.017	0%	RPD
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	CALCIUM	19	19	0%	RPD
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	COBALT	0.004	0.004	(0.00)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	IRON	3.5 J	3.5	0%	RPD
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	LEAD	0.00021 J	0.00022 J	(0.00)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	MAGNESIUM	7.1	6.9	3%	RPD
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	MANGANESE	0.61 J	0.62 J	2%	RPD
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	NICKEL	0.0089	0.0093	(0.13)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	POTASSIUM	1.4 J	1.5 J	(0.03)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	SODIUM	3.6 J	3.5 J	(0.02)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	2-AMINO-4,6-DINITROTOLUENE	0.000098 U	0.00016	(0.56)	D
FWGmw-021-200401-GW/ FWGmw-021-200402-GW	HEXAHYDRO-1,3,5-TRINITRO-1,3,5-TRIAZINE (RDX)	0.00054 J	0.00046 J	(0.39)	D
LL1mw-087-200401-GW/ LL1mw-087-200402-GW	PERCHLORATE	0.000015 J	0.000014 J	(0.02)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	ALUMINUM	0.061 J	0.045 J	(0.05)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	ARSENIC	0.00095 J	0.001 J	(0.01)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	BARIUM	0.00051 J	0.001 J	(0.16)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	CALCIUM	3.9	3.8	(0.10)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	COBALT	0.00075 J	0.00075 J	(0.00)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	MAGNESIUM	5.2	5	4%	RPD
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	MANGANESE	0.046 J	0.046 J	0%	RPD
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	NICKEL	0.0065	0.0068	(0.10)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	POTASSIUM	0.82 J	0.85 J	(0.01)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	SODIUM	2.6 J	2.6 J	(0.00)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	THALLIUM	0.00015 J	0.00017 J	(0.02)	D
LL1mw-089-200401-GW/ LL1mw-089-200402-GW	ZINC	0.012 J	0.015 J	(0.15)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	ALUMINUM	0.051 J	0.04 J	(0.04)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	ARSENIC	0.0083	0.0079	(0.08)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	BARIUM	0.031 J	0.033 J	6%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	CALCIUM	94 J	83	12%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	COBALT	0.011	0.011	0%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	COPPER	0.0009 J	0.00074 J	(0.08)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	IRON	4	4.7	16%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	LEAD	0.00031 J	0.00029 J	(0.01)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	MAGNESIUM	48 J	42	13%	RPD

Table H-6. Field Duplicate Pair Comparisons for Analytes Detected in Samples – Spring 2020 Sampling Event (Continued)

Sample ID	Chemical	Regular Result	Duplicate Result	RPD % or (Absolute Difference)[a]	Test[b]
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	MANGANESE	2 J	1.8 J	11%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	MERCURY	0.00008 U	0.00014 J	(0.30)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	NICKEL	0.039 J	0.033 J	17%	RPD
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	PHOSPHORUS	0.031 J	0.033 J	(0.00)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	SODIUM	3.4 J	3.7 J	(0.06)	D
RQLmw-007-200401-GW/ RQLmw-007-200402-GW	ZINC	0.0077 J	0.0039 J	(0.19)	D
RQLmw-011-200401-GW/ RQLmw-011-200402-GW	SULFATE	86.9	87 J	0%	RPD
DET-003-200401-GW/ DET-003-200402-GW	PHENOL	0.0049 J	0.002 J	(0.29)	D

[a] RPD is calculated as 100× |R-D|/(R-D)/2, where R is the concentration of the regular sample and D is the concentration of the duplicate. The absolute difference is calculated as |R-D|/L, where L is the average reporting limit of the two samples. Values followed by a "%" are RPD values. Values in parentheses are absolute difference values.

[b] The test used to evaluate the duplicate comparison is the RPD if both sample results were more than five times the reporting limit or D if any result was less than five times the reporting limit.

*RPD or D outside criteria.

Data Qualifiers:

J = Estimated

U = Not Detected

UJ = Not Detected and Reporting Limit Estimated

D = Absolute Difference

ID = Identifier

RPD = Relative Percent Difference

Table H-7. Container Requirements for Groundwater Samples

Analyte Group	Container	Minimum Sample Size	Preservative	Holding Time
Volatile Organic Compounds	Three 40-mL glass vial	40 mL	HCl to pH <2 Cool ≤ 6°C	14 days
Semi-volatile Organic Compounds	Two 1-L amber glass	1 L	Cool ≤6°C	7 days (extraction) 40 days (analysis)
Polycyclic Aromatic Hydrocarbon Compounds	Two 1-L amber glass	1 L	Cool ≤6°C	7 days (extraction) 40 days (analysis)
Pesticide Compounds	Two 1-L amber glass	1 L	Cool ≤6°C	7 days (extraction) 40 days (analysis)
Polychlorinated Biphenyls	Two 1-L amber glass	1 L	Cool ≤6°C	1 year (extraction) 40 days (analysis)
Explosive Compounds	Two 500-mL amber glass	500 mL	Cool ≤6°C	7 days (extraction) 40 days (analysis)
Perchlorate	125-mL HDPE	10 mL	Cool ≤ 6°C	28 days
Metals (TAL)+Phosphorus+Mercury	500-mL HDPE poly	100 mL	HNO_3 to pH <2 Cool ≤ 6°C	180 days; Hg at 28 days
Sulfide	500-mL HDPE	250 mL	NaOH/Zn Acetate, pH >9; Cool ≤ 6°C	7 days
Anions	50-mL HDPE	15 mL	Cool ≤ 6°C	48 hours (nitrate, nitrite) 28 days (sulfate)
Alkalinity	250-mL HDPE	250 mL	Cool ≤ 6°C	14 days
Total Cyanide	250-mL HDPE	100 mL	NaOH, Cool ≤ 6°C	14 days

HCl = Hydrochloric Acid
HDPE = High-Density Polyethylene
Hg = Mercury
HNO_3 = Nitric Acid
hr = Hour
L = Liter
mL = Milliliter
NaOH = Sodium Hydroxide
TAL = Target Analyte List
Zn = Zinc

APPENDIX I

Well Redevelopment Forms

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WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: FBQmw-168

Activity: ✔ Purge ✔ Development Sample ID NA Date/Time NA

Personnel: Rich Sprinzl (Leidos)

Date and Time: Start: 4/22/20 1000 Complete: 4/22/20 1102

Purge Method(s): Bailer Bladder Pump X Other: Whaler Pump

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 35.50

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	4/22/20
Water Level Tape: Solinst 100'	39350	NA
Other:		
Other: RS 4/22/20		
Other:		
Other:		
Other:		

Recorded By: RS 4/22/20 **QA Checked By:**

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** FBQmw-168

Depths (btoc): 11.64 Top of Screen 21.64 Bottom of Screen 8.64 Top of Filter Pack 9.88 Water Level 21.10 TD

Well Construction: PVC Stainless Steel Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 4.94 gallons

Vc: Riser casing volume

Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot) 6" per well log → 1.46 gal/ft

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$V_c = (21.10 - 9.88) \times 0.163 = 1.82$ gal

$V_f = [(21.10 - 9.88) \times 1.46 \times 0.3] - [(21.10 - 9.88) \times 0.163] = 3.12$ gal

$V_T = 1.82 + 3.12 = \boxed{4.94 \text{ gal}}$ (4.94; 1.82)

$5 \times V_T = 24.7$ gal

Site Conditions: Cleared/mowed area within brush/treeline, west of FBQ access road + ponds

Field Observations: very soft bottom (sediment); surged well w/pump prior to pumping → very turbid with orange-brown color. Well stabilized for 3 readings (>5x well volumes)
Reset existing QED Bladder Pump, intake depth ~18.40 ft BTOC (16.40 to top of pump + 2' long pump/fittings) 1/4"x1/4" tubing

Deviations from Approved SAP: None

Recorded By: RG 4/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: FBQmw-168

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/22/20	1000	0	8.60	0.210	4.96	>800	3.15	115	0	0.66	9.80	Surged well w/ Pump. Very turbid/orange-brown.
	1010	6	NM	NM	NM	NM	NM	NM	6	0.66→0	9.87	Slightly turbid; tubing detached (No flow). Reattached/Resurged well.
	1026	7.5	8.56	0.343	6.09	>800	3.75	-12	13.5	0.66	10.64	Turbid → Resurged well → No flow (Reattached tubing)
	1035	3.5	8.50	0.351	6.40	280	3.02	-23	17		10.60	Less turbid
	1040	2.75	8.30	0.356	6.38	101	3.14	-18	19.75		10.62	Less turbid
	1045	2.25	8.18	0.371	6.42	356	2.33	-35	22		10.65	Slightly turbid/light brown
	1050	25	8.49	0.372	6.40	14.1	2.70	-23	24.5		10.66	Very slightly turbid/faint brown color 5x well volumes removed
	1053	2.75	8.52	0.373	6.39	9.1	2.80	-21	27.25		10.64	clear
	1056	2.75	8.35	0.376	6.38	4.0	2.13	-21	30		10.63	clear
	1059	2.75	8.43	0.375	6.35	0.8	2.21	-21	32.75		10.63	clear
	1102	2.75	8.59	0.376	6.32	0.0	2.27	-21	35.50		10.64	Clear, well stabilized for 3 Readings - Development completed.

RS 4/22/20

Recorded By: RS 4/22/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: FEQmw-175

Activity: ✓ Purge ✓ Development Sample ID NA Date/Time NA

Personnel: Rich Spinnel (Leidos)

Date and Time: Start: 04/22/20 1158 Complete: 04/22/20 1232

Purge Method(s): Bailer Bladder Pump X Other: Whaler Pump

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 8.75

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	4/22/20
Water Level Tape: Solinst 100'	39350	NA
Other:		
Other: R.S. 4/23/20		
Other:		
Other:		
Other:		

Recorded By: RSpinnel 04/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** FBQmw-175

Depths (btoc): 15.57 Top of Screen 25.57 Bottom of Screen 12.57 Top of Filter Pack 15.30 Water Level 23.95 :TD

Well Construction: ☑ PVC ☐ Stainless Steel ☐ Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 3.81 gallons

Vc: Riser casing volume

Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot) 6" per well log → 1.469

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$V_c = [(23.95 - 15.30) \times 0.163] = 1.41$ gal

$V_f = [(23.95 - 15.30) \times 1.469 \times 0.3] - [(23.95 - 15.30) \times 0.163] = 2.40$ gal

3.81 1.41

$V_t = 1.41 + 2.40 = 3.81$ gal

$5 \times V_t = 19.05$ gal

Site Conditions: Between hillside (east) and FBQ Pond #2 (west).

Field Observations: Soft Bottom. Surged well with whaler pump prior to purging. Had to switch pumps due to malfunction. Well went dry.
Reinstalled existing bladder pump ~22.6 ft BTOC (20.6 to top + ~2' long pump) (1/4" x 1/4" tubing)

Deviations from Approved SAP: Well went dry prior to 5 well volumes removed or 3 stabilized readings could be observed.

Recorded By: RSpr 04/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: FBQ MW-175

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/22/20	1158	0	8.39	0.118	6.44	>800	10.21	59	0	0.46	16.42	Surged well w/pump. Very turbid and orange-brown color
	1212	3.25	8.32	0.101	6.05	>800	9.73	147	3.25	0.46	19.80	1210 tubing detached (No Flow) Fixed very turbid orange-brown
	1218	1	NM	NM	NM	NM	NM	NM	4.25	0.46	NM	Pump stopped working switched pumps Restart at 1225
	1230	4.5	8.73	0.092	5.15	>800	9.63	221	8.75	0.95	22.60	Drawdown observed, adjust pump depth.
	1232	<0.25	NM	NM	NM	NM	NM	NM	8.75	0	ND	well went dry (~2.3X well volume Removed)
												Redevelopment Concluded

RS 4/22/20

Recorded By: RS 04/22/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: FBQmw-170

Activity: ✓ Purge ✓ Development Sample ID NA Date/Time NA

Personnel: Rich Sprinzl (Leidos)

Date and Time: Start: 04/20/20 1400 Complete: 04/21/20 1039

Purge Method(s): Bailer Bladder Pump ✓ Other: Whaler Pump.

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 42

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	4/20/20, 4/21/20
Water Level Tape: Solinst 100'	39352D	NA
Other:		
Other:		
Other:		
Other:		
Other:		

RS 4/21/20

Recorded By: [signature] 4/20/20 4/21/20 **QA Checked By:** [signature]

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** FBQmw-170

Depths (btoc): 22.59 Top of Screen 32.59 Bottom of Screen 19.59 Top of Filter Pack 15.82 Water Level 32.61 TD

Well Construction: ✓ PVC ☐ Stainless Steel ☐ Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 6.35 gallons

Vc: Riser casing volume

Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot) → 6" per well log → 1.469 gal/ft

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$Vc = (32.61 - 15.82) \times 0.163 = 2.73$ gal

*use WL (vs FP) $Vf = [(32.61 - 19.59) \times 1.469 \times 0.3] - [(32.61 - 19.59) \times 0.163] = 3.61$ gal

(5.39) 2.12

$Vt = 2.73 + 3.61 = \boxed{6.35 \text{ gal}}$

$5 \times Vt = 31.7$

Site Conditions: Grassy area adjacent to/west of FBQ Pond #2.

Field Observations: Very soft bottom (sediment fines); surged well w/ pump prior to purging.
Initially used QED rental; due to low flow (600 mL/min), switched to Whaler pump.
Reinstalled ~~existing~~ Bladder Pump — Intake depth = 27.59 ft BTOC (1/4" x 1/4" tubing)
4/24/20 Portable

Deviations from Approved SAP: None

Recorded By: RS 4/21/20 **QA Checked By:**

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: FBQmw-170

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
4/20/20	1400	<0.25	10.67	0.171	5.79	168	8.70	162	<0.25	~900mL	16.05	surged well w/ pump. CPM 4 (14/1) moderate turbidity/light Brown.
	1415	1.0	9.60	0.129	5.62	112	7.96	173	1	(Good) 0.16	15.71	CPM 6 (7/3) Flow ↑ Slight turbidity/light Brown.
	1430	3.5	10.17	0.123	5.64	60.9	9.68	221	4.5		15.62	Less turbidity CPM 6 (5x5)
	1445	2.5	9.61	0.124	5.86	25.5	8.02	158	6		15.47	Much lower turbidity/clearing CPM 4 (5/10)
	1500	2.5	10.52	0.120	5.49	15.6	12.44	219	8.5		15.48	Mostly clear/slight Brown color.
	1510	1.75	9.47	0.122	5.64	9.83	9.77	167	10.25		15.48	Clear
	1520	1.0	10.11	0.120	5.67	3.5	9.21	210	11.25		15.48	clear
	1530	1.0	9.85	0.120	5.62	4.2	8.40	214	12.25		15.49	Clear
	1540	1.0	9.86	0.120	5.59	3.6	14.09	220	13.25		15.48	Clear.
04/21/20	0922	<0.25	9.59	0.130	5.63	161	8.27	225	13.25	0.21	15.61	Turbid (re-surge w/pump), orange-brown - tubing detached at 0932 (Reattached)
	0948	3.25	8.91	0.126	5.62	47.2	8.03	131	16.5	0.72	17.50	- tubing detached at 0936 - slightly turbid restarted at 0940
	1000	6.0	9.62	0.122	5.21	8.6	7.96	194	22.5	0.58	19.60	clear, well stabilizing (turb<10 NTU)
	1020	6.75	9.55	0.125	5.51	1.8	6.84	138	29.25	0.58	19.95	clear (
	1023	2.5	9.91	0.122	5.54	2.1	6.76	138	31.75	0.58	20.00	5x well volume removed.
	1026	2.5	9.56	0.121	5.47	0.8	6.15	174	34.25	0.58	20.05	clear
	1029	2.0	9.48	0.121	5.40	0.7	6.38	189	36.25	0.58	20.09	clear.

Recorded By: RS 4/20/20 04/21/20

QA Checked By:

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: FBQmw170

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
4/21/20	1032	1.75	9.38	0.121	5.38	0.5	7.27	183	38	0.58	20.09	Clear
	1035	2	9.52	0.122	5.34	0.5	7.10	184	40		20.17	Clear
	1038	2	9.39	0.122	5.35	0.4	7.93	185	42		20.19	clear; well stabilized over last 3 readings - Development completed.

RS 4/21/20

Recorded By: RS 4/21/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: FBQmw-177

Activity: ✔ Purge ✔ Development Sample ID NA Date/Time NA

Personnel: Rich Sprinzl (Leidos)

Date and Time: Start: 04/21/20 1155 Complete: 04/21/20 1258

Purge Method(s): Bailer Bladder Pump X Other: Whaler Pump

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 43.25

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	4/21/20
Water Level Tape: Solinst 100'	39350	NA
Other:		
Other: RS 4/21/20		
Other:		
Other:		
Other:		

Recorded By: RS 4/21/20 **QA Checked By:**

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** FBQmw-177

Depths (btoc): 14.84 Top of Screen 24.84 Bottom of Screen 11.84 Top of Filter Pack 9.95 Water Level 24.67 TD

Well Construction: PVC Stainless Steel Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 5.95 gallons

Vc: Riser casing volume

Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot) 6" per well log

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$Vc = (24.67 - 9.95) \times 0.163 = 2.40$ gal

$Vf = [(24.67 - (11.84)) \times 1.469 \times 0.3] - [(24.67 - 11.84) \times 0.163] = 3.55$

5.65 2.04

$Vt = 2.40 + 3.55 = \boxed{5.95 \text{ gal}}$

$5 \times Vt = 29.75$ gal

Site Conditions: Grassy (mowed) area just South of FBQponds and east of access road.

Field Observations: very soft bottom. Tubing existing in well pumped ok. Surged well using whaler pump prior to purging. Well went dry after 5X well volumes removed (but water was still turbid). Setup QED Bladder pump (portable) middle of screen at ~11.84 ft BTOC (on 4/22/20 at 0900) (1/4"x1/4" tubing) 04/22/20

Deviations from Approved SAP: Well went dry after 5 well volumes removed. Water remained turbid and did not stabilize (readings due to drawdown

Recorded By: [signature] 04/21/20 04/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: FBQmw-177

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/21/20	1155	0	8.98	0.354	5.93	335	4.70	141	0	0.66	13.65	Surged w/whaler pump. Very turbid, brown.
	1215	13.5	9.08	0.357	6.72	>800	4.70	118	13.5	0.79	19.30	Flow ↑ (max), initially WL=16.85 very turbid, brown
	1235	14.75	9.39	0.360	6.63	>800	7.20	50	28.25	0.66	19.90	Slightly less turbid, Flow↓
	1250	10.0	9.89	0.344	6.62	>800	6.45	58	38.25	0.79	21.22	Drawdown toward bottom after Flow ↑, >5x well volumes removed
	1258	5.0	NM	NM	NM	NM	NM	NM	43.25	0.79	ND 04/21/20	well went dry, >5x well volumes removed
												Redevelopment Concluded
					04/21/20							

Recorded By: RS 4/21/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: LLmw-087

Activity: ✓ Purge ✓ Development Sample ID NA Date/Time NA

Personnel: Rich Sprunzl (Leidos)

Date and Time: Start: 04/22/20 1438 Complete: 04/22/20 1539

Purge Method(s): Bailer Bladder Pump ✓ Other: WHALER PUMP

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 14.25

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	04/22/20
Water Level Tape: Solinst 100'	39350	NA
Other:		
Other:		
Other:		
Other:		
Other:		

RS 4/22/20

Recorded By: RSm 04/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation Well ID: LL1mw-087

Depths (btoc): 9.52 Top of Screen 19.52 Bottom of Screen 8.02 Top of Filter Pack 4.58 Water Level 17.78 TD

Well Construction: ☑ PVC ☐ Stainless Steel ☐ Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 8.20 gallons
Vc: Riser casing volume
Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot)
Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))
(8" per well log)

$V_c = (17.78 - 4.58) \times 0.163 = 2.15$ gal
13.2

$V_f = [(17.78 - 8.02) \times 2.611 \times 0.3] - [(17.78 - 8.02) \times 0.163] = 6.05$ gal
7.64 1.59

$V_t = 2.15 + 6.05 = 8.20$ gal

$5 \times V_t = 41$ gal

Site Conditions: Grassy area near SE perimeter fence, outside of LL1; adjacent to SCFmw-004.

Field Observations: Soft bottom; surged well w/ whaler pump prior to pumping. Lots of gray silt fines (1/4-1/2" per Bucket)
Well went dry initially in ~6 minutes, let well recharge for 5 minutes, resurged + pumped dry again.
Recharged for 15 min + 20 min and purged until dry again.
Reinstalled existing Bladder pump (intake depth ~15.25 ft BTOC) * (3.5' long pump) (3/8" water x 1/4" air)

Deviations from Approved SAP: Well went dry prior to 'well volume' removed. Let recharge 4x prior to pumping dry again.
However, water did not clear up or have stabilized readings.

Recorded By: [signature] 04/22/20 **QA Checked By:** [signature]

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LLMW-087

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
4/22/20	1438	0	9.05	0.610	6.39	>800	3.96	155	0	3333/0.88	9.80	Very turbid dark brown gray color
	1444	5.25	NM	NM	NM	NM	NM	NM	5.25	3000/0.88	NM	Well went dry (water was still very turbid/dk gray
	1450	1.25	NM	NM	NM	NM	NM	NM	6.5	0.88 (3333)	NM	Let recharge for 5min, went dry after 5 lt 1.25gal removed, lots of fines/turbid/gray
	1455	1.5	NM	NM	NM	NM	NM	NM	8.0	0.88 (3333)	NM	Let recharge for 5min, went dry after 1.5gal removed, lots of fines/turbid/gra
	1515	0.25	8.60	0.652	7.09	>800	5.15	85	8.25 (1x)	0.88 (3333)	7.05	Recharged ~20min, dark gray/very turbid, 1x well volume removed
	1518	3.25	NM	NM	NM	NM	NM	NM	11.5	0.88	NM	went dry, lots of fines/turbid
	1533	<0.1	8.56	0.616	7.10	>800	2.96	-28	11.5	0.88	8.55	Recharged ~15min, lots of fines/turbid
	1539	2.75	NM						14.25	0.88	NM	Went dry after 2.75gal, ~1.75 well volumes removed
												Redevelopment concluded.

4/22/20

Recorded By: 4/22/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: LL1 MW-006

Activity: ☑ Purge ☑ Development Sample ID NA Date/Time NA

Personnel: Rich Sprinzl, Leidos

Date and Time: Start: 4/23/20 1000 Complete: 4/27/20 1305

Purge Method(s): X Bailer X Bladder Pump X Other: Whaler Pump

Monitoring Method(s): PID LEL H2S CO Other: NA

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 209.75

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	34027	4/23/20, 4/27/20
Water Level Tape: Solinst 100'	39350	NA
Other:		
Other:		
Other:		
Other:		
Other:		

Recorded By: RS 4/23/20 **QA Checked By:**

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** LLMW-086

Depths (btoc): 67.13 Top of Screen 77.13 Bottom of Screen 62.63 Top of Filter Pack 6.05 (6.11 on 4/15/20) 6.15 on 4/27/20 Water Level 77.95 TD (77.4)

Well Construction: ☑ PVC ☐ Stainless Steel Other: NA 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume
Vc: Riser casing volume
Vf: Filter pack volume

Vt (Total Well Volume) = 40.8 gallons
5x = 204 gal

Vc = (Height of water column) x (Volume of casing per foot)
Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

13" → 6.87 gal/ft

$V_{BH/ft} = \pi \cdot r^2 \cdot h = \pi \cdot (\frac{6.5}{12})^2 \times 1ft \times 7.48 = 6.87 gal/ft$

Top of Existing Pump: 69.65 ft BTOC
Intake Depth ~ 73.15 ft BTOC

$V_c = (77.95 - 6.05) \times 0.163 = 11.72 gal$

$V_f = [(77.95-62.63) \times 6.87 \times 0.3] - [(77.95-62.63) \times 0.163]$
31.57 2.49

$V_f = 29.08$

$V_t = 11.72 + 29.08 = 40.8 gal$

Site Conditions: Between tree line and ditch/eastern perimeter road + fence. Very saturated in area, ditch has ponded water.

Field Observations: Hard bottom, but pump had some ~~sand~~ white precipitate adhered to it (also seen in purge water bucket) @ 4/27/20
Surged with bailer prior to pumping. Small amount of fines in settled purge water. Due to depth, existing bladder pump was briefly used but flow rate too low. Switched to whaler pump.
(Existing pump 3.5' long w/ 3/8" water + 1/4" air lines)

Deviations from Approved SAP: None

Recorded By: RSm 4/23/20 **QA Checked By:**

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LLlmw-086

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/23/20	1000	0.5			RS 4/23/20				0.5	<0.16	6.05	Surged with Bailer. Some fines + sand and white precipitate flakes in Bucket. Moderately Turbid
	1030	0.25			RS 4/23/20				0.75	0.16	4.70	Bladder Pump too slow of flow to redevelop. Stopped pumping/removed.
	1108	0	10.09	1.38	7.41	61.6	3.08	178	0.75	0.44	6.23	Switched to whaler pump, Resurged. Some turbidity / Light Brown
	1218	22	11.08	1.48	9.38	0.0	3.55	-157	22.75	0.44	7.60	Clear
	1300	18.5	11.24	1.53	8.00	0.0	4.41	-138	41.25	0.44	7.70	Clear, 1 well volume removed.
	1325	11	11.62	1.43	8.57	83.0	7.20	5	52.25	0.44	7.50	Clear
	1330	0			RS 4/23/20				52.25	0.65	6.80	Switched whaler pump
	1410	26			RS 4/23/20				78.25	0.65	9.85	Stopped pumping to relocate Discharge hose to new Drum.
	1417	0			RS 4/23/20				78.25	0.65	9.51	Restarted pump
	1439	14.25 15.5 RS 4/23/20			RS 4/23/20				92.5	0.65	9.80	Stopped development for the day. >2x well volumes removed.
04/27/20	0810	0.25	8.21	0.558	5.65	93.1	3.03	247	92.75	0.44	6.85	Resurged/Restarted pumping with Whaler Pump. Initial WL=6.75'; minor turbidity Light Brown
	0935	30	8.91	0.543	8.20	14.1	4.57	-88	122.75	0.44	9.81	Slight to no turbidity (clearing, some floating solids) ~3x well volumes removed.
	1025	20	9.07	0.536	8.04	0.0	3.65	-127	142.75	0.44	7.43	Clear
	1138	30	11.90	0.515	7.51	4.1	4.97	-125	172.75	0.44	7.50	Clear 4x well volumes removed
	1212	15	12.74	0.507	7.77	0.0	2.97	-123	187.75	0.44	7.05	Clear
	1217	2	11.31	0.517	7.67	0.0	2.86	-113	189.75	0.44	7.08	clear

Recorded By: R Spring 04/23/20 04/27/20

QA Checked By:

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LLmw-086

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
4/27/20	1222	2	11.30	0.518	7.59	0.0	2.76	-113	191.75	0.44	7.05	Clear
	1227	2	11.00	0.521	7.57	0.0	2.73	-113	193.75	0.44	7.05	"
	1232	2	11.01	0.523	7.56	0.0	2.79	-114	195.75	0.44	7.05	"
	1240	3.5	10.53	0.521	7.59	0.0	2.81	-104	199.25	0.44	7.06	"
	1255	6.5	11.33	0.519	7.57	0.0	2.87	-97	205.75	0.44	7.05	", 5x well volumes removed
	1300	2	11.03	0.521	7.56	0.0	2.90	-102	207.75	0.44	7.05	"
	1305	2	10.89	0.523	7.56	0.0	2.84	-109	209.75	0.44	7.06	" Stable for 3 Readings, Redevelopment concluded.

4/27/20

Recorded By: RSm 4/27/20

QA Checked By:

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: LL3mw - 241

Activity: ☑ Purge ☑ Development Sample ID NA Date/Time NA

Personnel: GABBY GROMOFSKY

Date and Time: Start: 04/27/2020 1222 Complete: 04/27/2020 1520

Purge Method(s): ☐ Bailer ☐ Bladder Pump ☒ Other: ~~AJA~~ 4/27/20 MONSOON PUMP

Monitoring Method(s): PID LEL H2S CO Other: N/A

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 113.95 GAL

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: ~~Horiba U 52~~ 4/27/20 AQUATROLL	6118446	04/27/20
Water Level Tape: SOLINIST	25869	N/A
Other:		
Other:		
Other:		
Other: 04/27/20		
Other:		

Recorded By: 04/27/20 **QA Checked By:**

REVIEWED
By Rich Sprinzl at 4:31 pm, Jun 05, 2020

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** UL3mw - 241

Depths (btoc): 14.95 Top of Screen 24.95 Bottom of Screen 11.54 Top of Filter Pack 8.01 Water Level TOTAL DEPTH: 25.36'

Well Construction: ☑ PVC ☐ Stainless Steel ☐ Other: N/A 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf

REVIEWED

Where Vt: Total well volume
Vc: Riser casing volume
Vf: Filter pack volume

Vt (Total Well Volume) = ~~10.82~~ 11.40 gallons 4/27/20

Vc = (Height of water column) x (Volume of casing per foot)
Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$V_c = [(25.36) - (8.01)](0.163) = 2.25$ 4/27/20

$V_f = [(25.36 - 11.54)(0.3)(2.641)] - [(25.36 - 11.54)(0.163)]$

$V_f = 10.82 - 2.25 = 8.57$

$V_f + V_c = 11.40$ GALLONS

Site Conditions: WELL ACCESSIBLE BY VEHICLE | BRUSH CLEARED | DIRECTLY OFF ACCESS PATH

4/27/20

Field Observations: HARD BOTTOM | 3' DEDICATED PUMP WITH 3/8" TUBING | WATER EXTREMELY TURBID INITIALLY AND CLEAR | COLORLESS | ODORLESS @ END OF PURGE. | HARD BOTTOM THROUGHOUT PURGE.

Deviations from Approved SAP: 4/27/20

Recorded By: 04/27/20 **QA Checked By:**

By Rich Sprinzl at 4:31 pm, Jun 05, 2020

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LL3mw-241

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/27/20	1222	0.25	13.74	162.13	6.98	1123.8	4.21	257.7	0.25	0.65	9.55	WATER IS VERY TURBID / REDDISH BROWN / ODORLESS
	1241	12.35	12.11	157.69	6.26	119.82	4.80	273.4	12.60		15.99	04/27/20
	1258	11.05	13.78	152.16	6.25	886.2	4.55	255.6	23.65		17.80	> 1 WELL VOLUME REMOVED
	1316	11.7	13.22	154.84	6.26	800.36	5.06	284.4	34.35		18.75	> 2 WELL VOLUME REMOVED
	1341	16.25	12.84	156.12	6.25	243.58	5.41	286.4	50.60		19.10	> 3 WELL VOLUME REMOVED
	1412	20.15	12.75	157.19	6.24	16.07	5.16	248.9	70.75		18.25	WATER IS CLEAR / COLORLESS / ODORLESS
	1414	1.3	12.89	158.44	6.25	15.32	4.90	235.1	72.05		18.20	5 WELL VOLUMES REMOVED
	1436	04/27/20 ~~14.13~~	12.83	158.71	6.15	2.52	5.33	224.6	85.35		18.40	04/27/20
	1458	14.3	12.40	157.90	6.20	6.15	5.17	217.6	99.65		18.80	
	1520	14.3	12.35	158.19	6.24	3.70	4.88	230.8	113.95		18.91	STABLE / DEVELOPED

04/27/20

Recorded By: 04/27/20

QA Checked By:

REVIEWED
By Rich Sprinzl at 4:31 pm, Jun 05, 2020

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: LL3mw-239

Activity: ✓ Purge ✓ Development Sample ID NA Date/Time NA

Personnel: GABBY GROMOFSKY

Date and Time: Start: 04/27/2020 1020 Complete: 04/28/20

Purge Method(s): Bailer Bladder Pump Other: WHALER PUMP

Monitoring Method(s): PID LEL H2S CO Other: N/A

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 56.6 GALLONS

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: Horiba U-52	N/A	N/A
Water Level Tape: SOLINIST 200'	280319	N/A
Other: AQUATROLL	611846	04/27/20 04/28/20
Other:		
Other:		
Other:		
Other:		

Recorded By: 04/28/20

QA Checked By:

REVIEWED
By Rich Sprinzl at 4:29 pm, Jun 05, 2020

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** LL3mw - 239

Depths (btoc): 26.65 Top of Screen 36.70 Bottom of Screen 22.80 Top of Filter Pack 22.82 Water Level MEASURED TOTAL DEPTH: 36.59 WELL LOG TOTAL DEPTH: 36.80

Well Construction: PVC Stainless Steel Other: N/A 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume **Vt (Total Well Volume) =** 10.91 gallons

Vc: Riser casing volume

Vf: Filter pack volume

Vc = (Height of water column) x (Volume of casing per foot)

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$V_c = (36.59 - 22.82)(0.163) = 2.24$

$V_f = [(36.80 - 22.82)(2.611)(0.3)] - [(36.80 - 22.82)(0.163)]$

$V_f = 10.95 - 2.28 = 8.67$

$V_t = 10.91$ GAL

Site Conditions: WELL ACCESSIBLE BY VEHICLE | BRUSH CLEARED | DIRECTLY OFF ACCESS PATH

JJ/04/28/20

Field Observations: VERY SOFT BOTTOM (INITIALLY) | BIOFOUL ON DEDICATED PUMP | TOTAL DEPTH DIFFERS FROM CONSTRUCTION INFO SIGNIFICANTLY | WATER INITIALLY DARK REDDISH BROWN, VERY TURBID, ODORLESS | DEDICATED PUMP IS 2" BLADDER PUMP WITH 1/4" BONDED TUBING | HARD BOTTOM @ END OF PURGE.

Deviations from Approved SAP:

JJ/ 4/28/20

Recorded By: 04/27/20 **QA Checked By:**

REVIEWED
By Rich Sprinzl at 4:29 pm, Jun 05, 2020

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LL3mw-239

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (µS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/27/20	1020	1	12.35	220.14	6.06	1652.8	2.57	240.2	1	0.5	23.20	WATER IS EXTREMELY TURBID WITH FINE SEDIMENT/REDDISH BROWN/ODORLESS
	1025				04/28/20							TUBING BECAME DISCONNECTED AND PUMP STOPPED
	1031	0.25	9.12	212.11	6.09	1334.6	4.17	289.5	3.75	0.5	28.50	RESUME PURGE
	1052	7.5	12.81	200.51	6.08	1405.8	3.08	240.6	11.25	0.5	31.80	ONE WELL VOLUME REMOVED
	1100	2.5	12.30	195.71	6.12	1096.2	1.84	259.7	13.75	0.3	33.40	04/28/20
	1116	3.2	12.61	192.21	6.13	235.4	3.99	254.4	16.95	0.2	36.00	WATER BECOMING CLEAR BETWEEN SURGING EFFORTS
	1120	0.6		4/27/20						0.2	DRY	WELL DRY
04/28/20	0916	0.25	10.58	185.97	6.36	567.8	6.10	303.4	17.75	0.4	23.63	04/28/20
	0936	7.5	10.48	185.43	5.99	927.6	5.56	303.8	25.25	0.4	32.8	
	0948	3			4/28/20					0.4	DRY	WELL DRY - 2.5 VOLUMES REMOVED
	1050	0.25	11.40	192.55	6.19	787.8	7.68	295.5	28.~~25~~ 5	0.4	26.65	WATER LEVEL @ TOP OF SCREEN - RESUME PURGING
	1124	9	12.51	174.66	6.13	300.6	6.28	280.8	37.5	0.25	35.6	WATER CLOUDY WITH A RED TINT WHEN SURGING/CLEAR OTHERWISE
	1152	4.5		4/28/20					42	0.2	DRY	WELL DRY
	1309	0.5	13.96	184.87	6.24	213.20	7.72	239.4	42.5	0.5	26.50	WATER LEVEL @ TOP OF SCREEN - RESUME PURGE
	1325	0			4/28/20				50.5	0.5	DRY	04/28/20
	1420	0.5	12.74	188.72	6.23	37.18	7.82	271.4	51	0.4	26.81	~~WATER~~ 04/28/20

Recorded By: 04/28/20

QA Checked By:

REVIEWED
By Rich Sprinzl at 4:29 pm, Jun 05, 2020

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LL3mw-239

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/28/20	1431	~~0.2~~ 2	11.60	188.51	6.05	42.84	7.69	273.2	59.0	0.4	30.89	WATER SLIGHTLY CLOUDY
↓	1446	6	11.20	180.76	5.72	18.24	7.91	303.2	59.0	0.4	31.95	>5 WELL VOLUMES REMOVED WATER CLEAR/COLORLESS
↓	1451	~~0.2~~ 2	11.17	180.77	5.70	2.29	7.64	299.3	61.0	0.4	33.02	↓
↓	1456	~~0.2~~ 2	10.99	181.01	5.62	2.72	7.58	288.5	63.0	0.4	34.21	↓ STABLE / DEVELOPMENT COMPLETE

11/28/20

Recorded By: 4/28/20

QA Checked By:

REVIEWED
By Rich Sprinzl at 4:29 pm, Jun 05, 2020

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installati Well ID: LL3mw-238

Activity: ☑ Purge ☑ Development Sample ID NA Date/Time NA

Personnel: GABBY GROMOFSKY | RYAN LAURICH (04/27) | RICH SPRINZL (04/28)

Date and Time: Start: 04/27/20 0852 Complete: 04/28/20 1045

Purge Method(s): ☐ Bailer ☐ Bladder Pump ☒ Other: WHALER PUMP

Monitoring Method(s): ☐ PID ☐ LEL ☐ H2S ☐ CO ☐ Other: N/A

ID: NA ID: NA ID: NA ID: NA ID: NA

Initial Reading NA NA NA NA NA

Total Volume of Water Removed (Gallons): 352

FIELD INSTRUMENT	SERIAL NUMBER	DATE OF LAST CALIBRATION
Water Quality: ~~Horiba U-52~~ AQUATROLL 600 (GG 4/27/20)	611846	04/27/20 + 04/28/20
Water Level Tape: SOLINIST 200'	280319	N/A
Other:		
Other:		
Other:		
Other:		
Other:		

GG 4/27/20

Recorded By: [signature] 04/27/20 **QA Checked By:**

REVIEWED
By Rich Sprinzl at 4:18 pm, Jun 05, 2020

WELL DEVELOPMENT FORM

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation **Well ID:** LL3mw-238

Depths (btoc): 12.66 Top of Screen 22.66 Bottom of Screen 9.56 Top of Filter Pack 15.49 Water Level TOTAL DEPTH: 23.16 *MEASURED 4/27/20

Well Construction: ☑ PVC ☐ Stainless Steel ☐ Other: N/A 2 Casing I.D. (inches)

Well Volume: Vt = Vc + Vf Where Vt: Total well volume, Vc: Riser casing volume, Vf: Filter pack volume **Vt (Total Well Volume) =** 6.01 gallons

Vc = (Height of water column) x (Volume of casing per foot)

Vf = (((Saturated thickness of filter pack) x (Volume of borehole per foot)) x (0.3) - ((Saturated thickness of filter pack) x (Volume of casing per foot))

$V_c = (23.16 - 15.49)(0.163) = 1.25$ GAL

$V_f = [(23.16 - 15.49)(2.011)(0.3)] - [(23.16 - 15.49)(0.163)] = 4.76$ GAL

$V_t = 6.01$ GAL

Site Conditions: WELL ACCESSIBLE BY VEHICLE | BRUSH CLEARED

SSS / 04/27/20

Field Observations: BOTTOM IS INITIALLY SEMI-HARD | WATER IS TURBID, BROWN, ODORLESS | RECHARGE RATE IS 1' | 15 MINUTES | MEASURED TOTAL DEPTH DIFFERS FROM CONSTRUCTION INFO (TD = 22.90) | DEDICATED PUMP IS 2" BLADDER WITH 1/4" TUBING | HARD BOTTOM @ END OF PURGE.

Deviations from Approved SAP:

SSS / 04/27/20

Recorded By: [signature] 04/27/20 **QA Checked By:**

REVIEWED
By Rich Sprinzl at 4:27 pm, Jun 05, 2020

WELL DEVELOPMENT LOG

Project Name: RVAAP Facility Wide Groundwater RI Observation Well Installation

Well ID: LL3mw - 238

Date	Time	Gallons Removed	Temp (oC)	Specific Cond. (mS/cm)	pH (std. unit)	Turbidity (NTU)	Dissolved Oxygen (mg/L)	eH (mV)	Total Gallons Removed	Flow Rate (gal/min)	Water Level (ft btoc)	Comments
04/27/20	0852	1	9.77	368.50	6.80	268.72	3.27	226.9	1	0.5	16.49	WATER IS CLOUDY WITH A BROWN TINT AND NO ODOR
	0903	6	9.87	355.95	6.76	2543.9	5.15	251.3	7	0.5	21.25	TURBID AND BROWN / FINE SAND SETTLING OUT
	0906	1	~~10.95~~ JJS 4/28/20						8	0.5	DRY	WELL DRY
	1142	0	10.95	349.20	6.83	809.9	9.43	226.7	8	0.65	16.35	RESUME
	1153	7.2	~~13.80~~ JJS 4/27/20						15.2	0.65	DRY	2.5 WELL VOLUMES REMOVED
	1450	6	~~10.47~~ 13.80 JJS 4/27/20	355.00	7.34	>10000	8.31	174.0	21.2	0.65	DRY	3.5 WELL VOLUMES REMOVED
04/28/20	0828	0.25	10.42	330.40	6.76	1178.1	8.51	270.0	21.45	0.65	15.44	JJS 4/28/20
	0839	7.25	~~10.42~~ JJS 4/28/20						28.7	0.65	DRY	4.8 VOLUMES REMOVED
	1018	0	9.75	358.00	7.07	>800	9.00	77	28.7	0.35	17.50	WL RECHARGED TO 17.23 - RESUME - SURGE W/ PUMP - TURBID / BROWN
	1023	1.5	9.49	359.00	7.05	432	7.26	83	30.2	0.35	18.60	5 WELL VOLUMES REMOVED - TURBID / BROWN
	1028	1	9.88	362.00	7.00	>800	7.42	90	31.2	0.35	20.00	JJS 4/28/20
	1038	2.5	9.99	360.00	7.22	685	7.02	49	33.7	0.35	>21.50	WL BELOW TOP OF PUMP - WELL GOING DRY
	1043	1	9.74	361.00	7.22	>800	7.28	40	34.7	0.35	>21.50	INCREASED TURBIDITY DUE TO WELL GOING DRY
	1045	0.5		JJS	4/28/20				35.2	0.35	DRY	DRY - >5 WELL VOLUMES (~5.8) REMOVED - RE-DEVELOPMENT CONCLUDED.
JJS 4/28/20			JJS 4/28/20									

Recorded By: 04/28/20

QA Checked By:

REVIEWED
By Rich Sprinzl at 4:18 pm, Jun 05, 2020

APPENDIX J

Ohio EPA Comments

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Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

March 1, 2021

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

Subject: Response to Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" dated January 11, 2021

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on January 11, 2021. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

In order to document the communications between the Army and Ohio EPA, we refer the Army to correspondence that occurred via email on the following dates:

- September 17, 2020: The original document, "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" was submitted to Ohio EPA.

- November 16, 2020: Ohio EPA provided comments to the Army National Guard.

- November 23, 2020: Army National Guard provided a response to Ohio EPA comments.

- December 28, 2020: Ohio EPA provided additional comments to the Army National Guard.

- January 11, 2021: Army National Guard provided a response to Ohio EPA comments.

Based on our review of the Army National Guard's Response to Ohio EPA comments on the "Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" provided in your letter dated January 11, 2021, we find the responses acceptable and the document can be finalized. Please be sure that all agreed-upon changes, additions and clarifications are included in the final document.

If you have questions, you can reach me via email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/sc

ec: Rebecca Shreffler, Chenega Tri-Services
Katie Tait, OHARNG RTLS
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Mark Leeper, ARNG

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 11, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-Wide Groundwater, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event (Work Activity No. 267-000-859-036)

References: Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event, dated September 17, 2020
Ohio EPA Comments on Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020, letter dated November 16, 2020
Army Response to Ohio EPA Comments, letter dated November 23, 2020
Ohio EPA's Reply to the Army Response to Comments, letter dated December 28, 2020

Dear Mr. Palombo:

The Army appreciates your reply to the Army's responses to Ohio EPA comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event. Enclosed for your review are supplemental responses to your comments dated November 16, 2020 and reply dated December 28, 2020. If these supplemental responses do not achieve suitable resolution, please contact us with dates and times that you would be available for a resolution meeting. Upon final resolution of the comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171
Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.01.11 13:03:20 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Mark Leeper, ARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event (Work Activity No. 267-000-859-036)

COMMENTS

Ohio EPA Comment 1 (dated 11/20/20): Figure 3-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2020: Page 3-1 makes several references (line 87 and line 121) to the 47 wells selected for sampling as being "depicted in Figure 3-1". While these wells are depicted on Figure 3-1, it would be clearer to also list the appropriate tables that denote these 47 wells (i.e., Table 3-1 and Table 4-1).

> *Army Response (Original)*: Agree. The text on lines 87 and 121 have been revised as follows: "These wells are depicted in Figure 3-1 and presented in Table 3-1."
>
> **Ohio EPA Reply (dated 12/28/20):** USACE concurred and responded that the text on lines 87 and 121 have been revised to include "and presented in Table 3-1." Ohio EPA considers this comment adequately addressed and resolved.
>
> *Army Response (Revised)*: Comment noted. Thank you for the feedback.

Ohio EPA Comment 2 (dated 11/20/: Well discrepancies between 2020 Addenda and Spring 2020 Sampling Event: According to the Draft 2020 Addendum, a total of 43 wells (including RCRA wells) were slated for resampling in 2020. However, the Final 2020 Addendum specified that 47 wells (including RCRA wells) were to be sampled for 2020. The narrative (Section 3.1) of the Final 2020 Addendum indicated three wells were added to the 2020 sampling scheme to further assess explosives at the Fuze and Booster Quarry Landfill. The Final 2020 Addendum also stated three wells (LL3mw-238, LL3mw-239, LL3mw-241) were added based on recent findings during the development of the RI Report.

Table 4.1 of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that among the previously agreed-upon 43 wells, well LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003 were additionally sampled for the Spring 2020 event. These wells were not on the Draft 2020 Addendum, but they do match those 47 wells specified in the Final 2020 Addendum.

Please clarify the Final 2020 Addendum narrative indicating that six wells were added to the initial 43 wells (which would equal a total of 49), or how the final number of 47 sampled wells was achieved according to the Spring 2020 Semi-Annual Report. Please explain the discrepancies between the 2020 Addenda and the 2020 Sampling schedule and why the four wells were added to the Spring 2020 event.

> *Army Response (Original)*: Clarification. As indicated in the comment, there is no discrepancy between the wells specified in the Final 2020 Addendum and the wells sampled in spring 2020. Please note that the narrative in Section 3.1 of the 2020 Addendum is intended to describe general changes between the 2019 FWGWMP sampling scheme and the 2020 FWGWMP sampling scheme, not to document changes between the draft and final version of the 2020 Addendum.
>
> The decision to revise the Draft 2020 Addendum and include 4 additional wells (LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003) in the 2020 FWGWMP sampling scheme is documented in the Final 2020 Addendum, Appendix A Ohio EPA Comments (response to Ohio EPA comment 1). The agreed upon rationale for sampling these wells is presented in Table 3-3 of the Final 2020 Addendum and Table 4-1 of the Draft Semi-Annual Report.

Ohio EPA Reply (dated 12/28/20): USACE clarified that the Final 2020 Addendum language agreed with the wells sampled for the Spring 2020 event, and further states that decisions to revised the Draft 2020 Addendum and include four additional wells (well LL3mw-238, LL3mw-239, LL3mw-241, and LL10mw-003) is documented in the Final 2020 Addendum, Appendix A Ohio EPA Comments, response to Ohio EPA Comment 1.

Ohio EPA review and approval of the Draft 2020 Addendum included a known quantity of 43 wells and was apparently not informed of the change in number of wells to 47, nor the discrepancy noted of either six additional wells or four additional wells in the Final 2020 Addendum.

Due to the Covid-19 protocols, Ohio EPA staff have not been in the office since March 2020 and do not have access to historical, hardcopy RVAAP documents referenced in the November 23, 2020 response to comments letter. We request that you please address and clarify the questions as presented during our last review in an easy to comprehend format – these questions were formulated upon review of these same historical documents being back-referenced. If these documents do provide the answers to the questions posed, please simply provide the explanation. Ohio EPA requests clarification for this comment and it remains unresolved.

Army Response (Revised): Clarification. The timeline below presents the regulatory review and approval process of the Final 2020 Addendum that included the 47 wells:

- 2/13/20 – The Army submitted the Draft 2020 Addendum that recommended sampling 43 wells to support the FWGWMP in 2020.
- 4/10/20 – Ohio EPA provided comments on the Draft 2020 Addendum.
- 5/1/20 – The Army's responses to Ohio EPA comments were submitted via email to the Ohio EPA project team. The response to Ohio EPA Comment 1 stated that the Army plans to add the following wells, which increased the total number of wells from 43 to 47:

    - LL3mw-238, LL3mw-239, and LL3mw-241 for explosives to assess extent of contamination.
    - LL10mw-003 for carbon tetrachloride to verify recent reduced concentrations in this well.

    In addition, this response stated that ammonia will be added to the list of chemicals to be analyzed for LL12mw-185 and LL12mw-187. Since LL12mw-185 and LL12mw-187 were already part of the sampling scheme presented in the Draft 2020 Addendum, this did not increase the total number of wells to be sampled.
- 5/27/20 – In response to the Army's letter dated 5/1/20, Ohio EPA provided a letter stating "the comments from Ohio EPA's April 10, 2020 comment letter have been adequately addressed" and requested the Army "finalize the document with the changes agreed to according to this correspondence".
- 6/12/20 – The Final 2020 Addendum was submitted to Ohio EPA via the Ohio EPA liquid fileshare site. This addendum contained the final 47 wells to be sampled in 2020, as agreed upon during comment resolution. The changes specified in the 5/1/20 response letter, and as summarized above, were then presented in the "2020 FWGWMP Sampling Recommendations" column in Table 3-3 of the addendum.
- 7/7/20 – Ohio EPA provided a letter approving the Final 2020 Addendum.

The Army is hopeful that the above explanation of the when and why wells were added to the Final Addendum satisfies this comment.

Ohio Comment 3 (dated 11/20/20): Low pH Wells and Sampling Results for Fuze and Booster Quarry Landfill for Spring 2020 Sampling: Five wells had been previously identified by Ohio EPA to have low pH values within the Ohio EPA comment letter on the Draft 2020 Addendum and stated as such in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response). Three previously identified low-pH wells were from the Fuze and Booster Quarry Landfill (FBQmw-171, FBQmw174, and FBQmw-175), but these wells did not have pH results summaries shown on Table 4-1 for the Spring 2020 sampling event.

Additional clarification should be presented regarding which wells were added to further assess explosives at the Fuze and Booster Quarry Landfill as indicated on the Final 2020 Addendum, if any of these wells were added to address pH issues, or if pH was recorded for these wells but not included on the Summary.

Army Response (Original): Clarification and agree. The pH for wells FBQmw-171, FBQmw-174, and FBQmw-175 have been added to Table 4-1. As noted in the response to Draft 2020 Addendum, Ohio EPA Comment 3, further "evaluation of potential Army activities to the pH in groundwater in these areas is included in the RI Report".

Regarding the further assessment of explosives at the Fuze and Booster Quarry Landfill, Table 4-1 of the Semi-Annual Report presents the recommendation to "monitor for explosives" at appropriate FBQ wells, mirroring what was presented in the approved Final 2020 Addendum.

Ohio EPA Reply (dated 12/28/20): USACE concurred and clarified that the pH for wells FBQmw-171, FBQmw-174, and FBQmw-175 have been added to Table 4-1 and that further "evaluation of potential Army activities to the pH in groundwater in these areas is included in the RI Report". The USACE response also indicates that Table 4-1 of the Semi-Annual Report presents the recommendation to "monitor for explosives" at appropriate FBQ wells.

Ohio EPA requests further clarification regarding the additional two wells out of the five wells previously identified by Ohio EPA to have low pH values (as stated above in the initial comment).

See the Ohio EPA comment letter on the Draft 2020 Addendum, in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response).

Army Response (Revised): Clarification and agree. The other two wells referenced in the comment were LL1mw-084 and RQLmw-012. Table 4-1 has been further upgraded to present the pH for well LL1mw-084. However, as noted in the Army Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response), RQLmw-012 was not scheduled to be sampled in 2020; therefore, the pH for this well in 2020 is not available.

Ohio EPA Comment 4 (dated 11/20/20): Ground Water Monitoring Well Repairs: A review of Appendix B (Summary of Groundwater Monitoring Well Conditions and Repair Recommendations) showed the April 2020 status of facility-wide ground water wells and repairs needed (such as cracked well pads, rusted hinges, casing repainting needed, ID repainting needed, etc.).

Please provide information on when completion of these needed repairs is being scheduled.

Army Response (Original): Clarification. As in 2019, a summary of the well conditions and repairs made in 2020 will be provided in the 2020 Annual Report. Please reference Appendix H of the 2019 Annual Report as an example of what will be provided in the 2020 Annual Report.

Ohio EPA Reply (dated 12/28/20): USACE response stated that "As in 2019, a summary of the well conditions and repairs made in 2020 will be provided in the 2020 Annual Report. Please reference Appendix H of the 2019 Annual Report as an example of what will be provided in the 2020 Annual Report"

Since Ohio EPA has not yet received the 2020 Annual Report, as previously discussed in Comment 1, please provide the requested information during the first iteration of the response to comments letter. The initial comment asked for clarification about when necessary well repairs were going to be scheduled, i.e., 'Well repairs consisting of X, Y, and Z will be completed for wells X, Y, and Z during the 2020 field season and repairs will be documented in the 2020 Annual report'.

Ohio EPA requests clarification for this comment and it remains unresolved.

Army Response (Revised): Clarification and agree. The purpose of this report is to provide analytical results from the Spring 2020 sampling event. A comprehensive 2020 field summary (including well repairs) will be documented in the forthcoming 2020 Annual Report (projected submittal in February 2021). However, the last sentence of the first paragraph in Section 3.2 has been revised as follows:

"However, the Army is ~~currently~~ conducting well repair activities throughout 2020, such as painting the wells and bollards and re-stenciling the well identifications. These repairs will be summarized in the 2020 Annual Report. "

Ohio EPA Comment 5 (dated 11/20/20): Table 4-1 Data Summary Completeness: Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 47 wells were analyzed for the proper analytical parameters in accordance with the Final 2020 Addendum (well-specific combinations of VOCs, SVOCs, PAHs, phenols, PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results but did not appear to list the phosphorus results of 0.031(J) mg/L from RQLmw-007.

Please verify that all applicable results are summarized on Table 4-1.

Army Response (Original): Clarification and agree. Since phosphorus is considered an essential nutrient, the phosphorus result was not discussed. However, since phosphorus is called out specifically in the 2020 FWGWMP Sampling Recommendations column, the following bullet has been added to the last column.

• Phosphorus was detected at a concentration of 0.033J mg/L. Phosphorus does not have an RSL, background concentration, or FWCUG.

Ohio EPA Reply (dated 12/28/20): USACE responded that "However, since phosphorus is called out specifically in the 2020 FWGWMP Sampling Recommendations column, the following bullet has been added to the last column: • Phosphorus was detected at a concentration of 0.033J mg/L. Phosphorus does not have an RSL, background concentration, or FWCUG."

Ohio EPA appreciates the addition of the phosphorus results for RQLmw-007 but is not sure of which result now is correct: the referenced 0.031(J) mg/L or the new bulleted version of 0.033J mg/L. Also, as requested, please provide verification that all applicable results, not just the referenced phosphorous result for RQLmw-007, are properly included in Table 4-1.

Ohio EPA requests clarification for this comment and it remains unresolved.

Army Response (Revised): Agree. The initial response to comment mistakenly provided the duplicate sample result of 0.033J mg/L instead of the primary sample result of 0.031J mg/L. The revision has been further revised as below. The data and results provided in Table 4-1 have been reviewed to verify all applicable results.

• Phosphorus was detected at a concentration of 0.031J mg/L in the primary sample and 0.033J mg/L in the duplicate sample. Phosphorus does not have an RSL, background concentration, or FWCUG.

Ohio EPA Comment 6 (dated 11/20/20): Well Redevelopment – Elevated Turbidity Results: Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, LL3mw-241) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016. According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 NTUs, while four of these wells went dry with no final readings. During sampling, of these nine wells (two to seven days later), five wells were found to have <10 NTUs, while four exceeded 10 NTUs, with the highest reading being 1,238.8 NTUs from well LL1mw-086.

Please explain any effects these elevated turbidity readings may have contributed to Spring 2020 sampling results, and any plans to further redevelop/improve well LL1mw-086.

Army Response (Original): Clarification. The four wells after well redevelopment had turbidity above 10 NTU: FBQmw-175 (35.7 NTU), FBQmw-177 (47.8 NTU), LL1mw-086 (1,238.8 NTU), and LL1mw-087 (17.95 NTU). The targeted chemical group for FBQmw-175 and FBQmw-177 is explosives, which are not anticipated to be impacted by high turbidity.

LL1mw-086 and LL1mw-087 were analyzed for metals in spring 2010. With the exception of manganese at LL1mw-086, all metal concentrations in spring 2020 were below the screening level or background concentration. (Please note the metal summary for LL1mw-086 will be revised in Table 4-1). In addition, metals were not identified as a COC requiring further evaluation in an FS, and the COCs requiring further assessment in an FS at Load Line 1 are not near LL1mw-086 or LL1mw-087. Therefore, the high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions. Further plans to redevelop and/or improve well LL1mw-086 are dependent upon future use and targeted chemicals.

Ohio EPA Reply (dated 12/28/20): USACE clarification response indicated that of the four wells after well redevelopment had turbidity above 10 NTU: FBQmw-175 (35.7 NTU), FBQmw-177 (47.8 NTU), LL1mw-086 (1,238.8 NTU), and LL1mw-087 (17.95 NTU), the targeted chemical group for FBQmw-175 and FBQmw-177 is explosives, which are not anticipated to be impacted by high turbidity.

LL1mw-086 and LL1mw-087 were analyzed for metals in Spring 2010. With the exception of manganese at LL1mw-086, all metal concentrations in Spring 2020 were below the screening level or background concentration. (Please note the metal summary for LL1mw-086 will be revised in Table 4-1). In addition, metals were not identified as a chemical of concern (COC) requiring further evaluation in a Feasibility Study (FS), and the COCs requiring further assessment in an FS at Load Line 1 are not near LL1mw-086 or LL1mw-087. Therefore, the high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions. Further plans to redevelop and/or improve well LL1mw-086 are dependent upon future use and targeted chemicals.

Ohio EPA still states that the turbidity of well LL1mw-086 may be of potential concern but acknowledges the USACE response that further plans to redevelop or improve this well may be considered in the future. Ohio EPA considers this comment adequately addressed and resolved.

Army Response (Revised): Comment noted. Thank you for the feedback.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

December 28, 2020

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

Subject: Ohio EPA's Reply to the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" dated November 23, 2020

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on November 23, 2020.The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003.

Comments on the Army's response based on Ohio EPA review are provided below. Please provide a reply to the enclosed comments in accordance with the Director's Findings and Orders.

COMMENTS

1. Figure 3-1 reference in the *Draft FWGWMP Semi-Annual Report for Spring 2020*:

Page 3-1 makes several references (line 87 and line 121) to the 47 wells selected for sampling as being "depicted in Figure 3-1". While these wells are depicted on Figure 3-1, it would be clearer to also list the appropriate tables that denote these 47 wells, i.e., Table 3-1 and Table 4-1.

USACE concurred and responded that the text on lines 87 and 121 have been revised to include "and presented in Table 3-1." Ohio EPA considers this comment adequately addressed and resolved.

2. Well discrepancies between 2020 Addenda and Spring 2020 Sampling Event:

According to the Draft 2020 Addendum, a total of 43 wells (including [Resource Conservation and Recovery Act] RCRA wells) were slated for resampling in 2020. However, the Final 2020 Addendum specified that 47 wells (including RCRA wells) were to be sampled for 2020. The narrative (Section 3.1) of the Final 2020 Addendum indicates three wells were added to the 2020 sampling scheme to further assess explosives at the Fuze and Booster Quarry Landfill. The Final 2020 Addendum also states three wells (LL3mw-238, LL3mw-239, LL3mw-241) were added based on recent findings during the development of the [Remedial Investigation] RI Report.

Table 4.1 of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicates that among the previously agreed-upon 43 wells, well LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003 were additionally sampled for the Spring 2020 event: these wells were not on the Draft 2020 Addendum but they do match those 47 wells specified in the Final 2020 Addendum.

Please clarify the Final 2020 Addendum narrative indicating that six wells were added to the initial 43 wells (which would equal a total of 49), or how the final number of 47 sampled wells was achieved according to the Spring 2020 Semi-Annual Report. Please explain the discrepancies between the 2020 Addendums and the 2020 Sampling schedule and why the four wells were added to the Spring 2020 event.

USACE clarified that the Final 2020 Addendum language agreed with the wells sampled for the Spring 2020 event, and further states that decisions to revised the Draft 2020 Addendum and include four additional wells (well LL3mw-238, LL3mw-239, LL3mw-241, and LL10mw-003) is documented in the Final 2020 Addendum, Appendix A Ohio EPA Comments, response to Ohio EPA Comment 1.

Ohio EPA review and approval of the Draft 2020 Addendum included a known quantity of 43 wells and was apparently not informed of the change in number of wells to 47, nor the discrepancy noted of either six additional wells or four additional wells in the Final 2020 Addendum.

Due to the Covid-19 protocols, Ohio EPA staff have not been in the office since March 2020 and do not have access to historical, hardcopy RVAAP documents referenced in the November 23, 2020 response to comments letter. We request that you please address and clarify the questions as presented during our last review in an easy to comprehend format – these questions were formulated upon review of these same

historical documents being back-referenced. If these documents do provide the answers to the questions posed, please simply provide the explanation.

Ohio EPA requests clarification for this comment and it remains unresolved.

3. Low pH Wells and Sampling Results for Fuze and Booster Quarry Landfill for Spring 2020 Sampling:

Five wells had been previously identified by Ohio EPA to have low pH values within the Ohio EPA comments letter on the Draft 2020 Addendum, and stated as such in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response). Three previously identified low-pH wells were from the Fuze and Booster Quarry Landfill (FBQmw-171, FBQmw174, and FBQmw-175), but these wells did not have pH results summaries shown on Table 4-1 for the Spring 2020 sampling event.

Additional clarification should be presented regarding which wells were added to further assess explosives at the Fuze and Booster Quarry Landfill as indicated on the Final 2020 Addendum, if any of these wells were added to address pH issues, or if pH was recorded for these wells but not included on the Summary.

USACE concurred and clarified that the pH for wells FBQmw-171, FBQmw-174, and FBQmw-175 have been added to Table 4-1 and that further "evaluation of potential Army activities to the pH in groundwater in these areas is included in the RI Report". The USACE response also indicates that Table 4-1 of the Semi-Annual Report presents the recommendation to "monitor for explosives" at appropriate FBQ wells.

Ohio EPA requests further clarification regarding the additional two wells out of the five wells previously identified by Ohio EPA to have low pH values (as stated above in the initial comment).

See the Ohio EPA comment letter on the Draft 2020 Addendum, in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response).

4. Ground Water Monitoring Well Repairs:

A review of Appendix B (Summary of Groundwater Monitoring Well Conditions and Repair Recommendations) showed the April 2020 status of facility-wide ground water wells and repairs needed (such as cracked well pads, rusted hinges, casing repainting needed, ID repainting needed, etc.).

Please provide information on when completion of these needed repairs is being scheduled.

USACE response stated that "As in 2019, a summary of the well conditions and repairs made in 2020 will be provided in the 2020 Annual Report. Please reference Appendix H of the 2019 Annual Report as an example of what will be provided in the 2020 Annual Report"

Since Ohio EPA has not yet received the 2020 Annual Report, as previously discussed in Comment 1, please provide the requested information during the first iteration of the response to comments letter. The initial comment asked for clarification about when necessary well repairs were going to be scheduled, i.e., 'Well repairs consisting of X, Y, and Z will be completed for wells X, Y, and Z during the 2020 field season and repairs will be documented in the 2020 Annual report'.

Ohio EPA requests clarification for this comment and it remains unresolved.

5. Table 4-1 Data Summary Completeness:

Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 47 wells were analyzed for the proper analytical parameters in accordance with the Final 2020 Addendum (well-specific combinations of [volatile organic compounds] VOCs, [semi-volatile organic compounds] SVOCs, [polycyclic aromatic hydrocarbons] PAHs, phenols, [polychlorinated biphenyls] PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results but did not appear to list the phosphorus results of 0.031(J) mg/L from RQLmw-007.

Please verify that all applicable results are summarized on Table 4-1.

USACE responded that "However, since phosphorus is called out specifically in the 2020 FWGWMP Sampling Recommendations column, the following bullet has been added to the last column: • Phosphorus was detected at a concentration of 0.033J mg/L. Phosphorus does not have an RSL, background concentration, or FWCUG."

Ohio EPA appreciates the addition of the phosphorus results for RQLmw-007 but is not sure of which result now is correct: the referenced 0.031(J) mg/L or the new bulleted version of 0.033J mg/L. Also, as requested, please provide verification that all applicable results, not just the referenced phosphorous result for RQLmw-007, are properly included in Table 4-1.

Ohio EPA requests clarification for this comment and it remains unresolved.

6. Well Redevelopment – Elevated Turbidity Results:

Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, and LL3mw-241) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016. According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 [nephelometric turbidity units] NTUs, while four of these wells went dry with no final readings. During sampling, these nine wells (two to seven days later), five wells were found to have <10 NTUs, while four exceeded 10 NTUs, with the highest reading of 1,238.8 NTUs from well LL1mw-086.

Please explain any effects these elevated turbidity readings may have contributed to Spring 2020 sampling results, and any future plans to further redevelop/improve well LL1mw-086.

USACE clarification response indicated that of the four wells after well redevelopment had turbidity above 10 NTU: FBQmw-175 (35.7 NTU), FBQmw-177 (47.8 NTU), LL1mw-086 (1,238.8 NTU), and LL1mw-087 (17.95 NTU), the targeted chemical group for FBQmw-175 and FBQmw-177 is explosives, which are not anticipated to be impacted by high turbidity.

LL1mw-086 and LL1mw-087 were analyzed for metals in Spring 2010. With the exception of manganese at LL1mw-086, all metal concentrations in Spring 2020 were below the screening level or background concentration. (Please note the metal summary for LL1mw-086 will be revised in Table 4-1). In addition, metals were not identified as a chemical of concern (COC) requiring further evaluation in a Feasibility Study (FS), and the COCs requiring further assessment in an FS at Load Line 1 are not near LL1mw-086 or LL1mw-087. Therefore, the high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions. Further plans to redevelop and/or improve well LL1mw-086 are dependent upon future use and targeted chemicals.

Ohio EPA still states that the turbidity of well LL1mw-086 may be of potential concern but acknowledges the USACE response that further plans to redevelop or improve this well may be considered in the future. Ohio EPA considers this comment adequately addressed and resolved.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

The Army's response to Ohio EPA comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss Ohio EPA's reply, you can reach me by email at kevin.palombo@epa.ohio.gov, or at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/sc

ec: Rebecca Shreffler, Chenega Tri-Services
Katie Tait, OHARNG RTLS
Mark Leeper, ARNG
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA NEDO, DERR
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Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

November 23, 2020

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-Wide Groundwater, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your time and comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event. Enclosed for your review are responses to your comments. Upon resolution of these comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@mail.mil if there are issues or concerns with this submission.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2020.11.23 12:58:47 -05'00'

Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Bob Princic, Ohio EPA, NEDO, DERR
Liam Envoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Mark Leeper, ARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event (Work Activity No. 267-000-859-036)

COMMENTS

Comment 1: Figure 3-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2020: Page 3-1 makes several references (line 87 and line 121) to the 47 wells selected for sampling as being "depicted in Figure 3-1". While these wells are depicted on Figure 3-1, it would be clearer to also list the appropriate tables that denote these 47 wells (i.e., Table 3-1 and Table 4-1).

Army Response: Agree. The text on lines 87 and 121 have been revised as follows: "These wells are depicted in Figure 3-1 and presented in Table 3-1."

Comment 2: Well discrepancies between 2020 Addenda and Spring 2020 Sampling Event: According to the Draft 2020 Addendum, a total of 43 wells (including RCRA wells) were slated for resampling in 2020. However, the Final 2020 Addendum specified that 47 wells (including RCRA wells) were to be sampled for 2020. The narrative (Section 3.1) of the Final 2020 Addendum indicated three wells were added to the 2020 sampling scheme to further assess explosives at the Fuze and Booster Quarry Landfill. The Final 2020 Addendum also stated three wells (LL3mw-238, LL3mw-239, LL3mw-241) were added based on recent findings during the development of the RI Report.

Table 4.1 of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that among the previously agreed-upon 43 wells, well LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003 were additionally sampled for the Spring 2020 event. These wells were not on the Draft 2020 Addendum, but they do match those 47 wells specified in the Final 2020 Addendum.

Please clarify the Final 2020 Addendum narrative indicating that six wells were added to the initial 43 wells (which would equal a total of 49), or how the final number of 47 sampled wells was achieved according to the Spring 2020 Semi-Annual Report. Please explain the discrepancies between the 2020 Addenda and the 2020 Sampling schedule and why the four wells were added to the Spring 2020 event.

Army Response: Clarification. As indicated in the comment, there is no discrepancy between the wells specified in the Final 2020 Addendum and the wells sampled in spring 2020. Please note that the narrative in Section 3.1 of the 2020 Addendum is intended to describe general changes between the 2019 FWGWMP sampling scheme and the 2020 FWGWMP sampling scheme, not to document changes between the draft and final version of the 2020 Addendum.

The decision to revise the Draft 2020 Addendum and include 4 additional wells (LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003) in the 2020 FWGWMP sampling scheme is documented in the Final 2020 Addendum, Appendix A Ohio EPA Comments (response to Ohio EPA comment 1). The agreed upon rationale for sampling these wells is presented in Table 3-3 of the Final 2020 Addendum and Table 4-1 of the Draft Semi-Annual Report.

Comment 3: Low pH Wells and Sampling Results for Fuze and Booster Quarry Landfill for Spring 2020 Sampling: Five wells had been previously identified by Ohio EPA to have low pH values within the Ohio EPA comment letter on the Draft 2020 Addendum and stated as such in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response). Three previously identified low-pH wells were from the Fuze and Booster Quarry Landfill (FBQmw-171, FBQmw174, and FBQmw-175), but these wells did not have pH results summaries shown on Table 4-1 for the Spring 2020 sampling event.

Additional clarification should be presented regarding which wells were added to further assess explosives at the Fuze and Booster Quarry Landfill as indicated on the Final 2020 Addendum, if any of these wells were added to address pH issues, or if pH was recorded for these wells but not included on the Summary.

Army Response: Clarification and agree. The pH for wells FBQmw-171, FBQmw-174, and FBQmw-175 have been added to Table 4-1. As noted in the response to Draft 2020 Addendum, Ohio EPA Comment 3, further "evaluation of potential Army activities to the pH in groundwater in these areas is included in the RI Report".

Regarding the further assessment of explosives at the Fuze and Booster Quarry Landfill, Table 4-1 of the Semi-Annual Report presents the recommendation to "monitor for explosives" at appropriate FBQ wells, mirroring what was presented in the approved Final 2020 Addendum.

Comment 4: Ground Water Monitoring Well Repairs: A review of Appendix B (Summary of Groundwater Monitoring Well Conditions and Repair Recommendations) showed the April 2020 status of facility-wide ground water wells and repairs needed (such as cracked well pads, rusted hinges, casing repainting needed, ID repainting needed, etc.).

Please provide information on when completion of these needed repairs is being scheduled.

Army Response: Clarification. As in 2019, a summary of the well conditions and repairs made in 2020 will be provided in the 2020 Annual Report. Please reference Appendix H of the 2019 Annual Report as an example of what will be provided in the 2020 Annual Report.

Comment 5: Table 4-1 Data Summary Completeness: Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 47 wells were analyzed for the proper analytical parameters in accordance with the Final 2020 Addendum (well-specific combinations of VOCs, SVOCs, PAHs, phenols, PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results but did not appear to list the phosphorus results of 0.031(J) mg/L from RQLmw-007.

Please verify that all applicable results are summarized on Table 4-1.

Army Response: Clarification and agree. Since phosphorus is considered an essential nutrient, the phosphorus result was not discussed. However, since phosphorus is called out specifically in the 2020 FWGWMP Sampling Recommendations column, the following bullet has been added to the last column.

- Phosphorus was detected at a concentration of 0.033J mg/L. Phosphorus does not have an RSL, background concentration, or FWCUG.

Comment 6: Well Redevelopment – Elevated Turbidity Results: Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, LL3mw-241) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016. According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 NTUs, while four of these wells went dry with no final readings. During sampling, of these nine wells (two to seven days later), five wells were found to have <10 NTUs, while four exceeded 10 NTUs, with the highest reading being 1,238.8 NTUs from well LL1mw-086.

Please explain any effects these elevated turbidity readings may have contributed to Spring 2020 sampling results, and any plans to further redevelop/improve well LL1mw-086.

Army Response: Clarification. The four wells after well redevelopment had turbidity above 10 NTU: FBQmw-175 (35.7 NTU), FBQmw-177 (47.8 NTU), LL1mw-086 (1,238.8 NTU), and LL1mw-087 (17.95 NTU). The targeted chemical group for FBQmw-175 and FBQmw-177 is explosives, which are not anticipated to be impacted by high turbidity.

LL1mw-086 and LL1mw-087 were analyzed for metals in spring 2010. With the exception of manganese at LL1mw-086, all metal concentrations in spring 2020 were below the screening level or background concentration. (Please note the metal summary for LL1mw-086 will be revised in Table 4-1). In addition, metals were not identified as a COC requiring further evaluation in an FS, and the COCs requiring further assessment in an FS at Load Line 1 are not near LL1mw-086 or LL1mw-087. Therefore, the high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions. Further plans to redevelop and/or improve well LL1mw-086 are dependent upon future use and targeted chemicals.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

November 16, 2020

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A. Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID # 267000859036

Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" dated September 17, 2020

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Facility-wide Groundwater Monitoring Program [FWGWMP] Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA, Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on September 17, 2020.

The report was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003; Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Director's Findings and Orders.

DRAFT FWGWMP SEMI-ANNUAL REPORT FOR SPRING 2020

The Draft FWGWMP Semi-Annual Report for Spring 2020 summarizes ground water monitoring activities conducted during the Spring 2020 sampling event, and provides descriptions of field activities performed, presents field and analytical results, and evaluates chemical data collected per the approved ground water sampling scheme specified in the FWGWMP Ground Water Addendum for 2020.

RECEIVED
NOV 16 2020

According to the Draft 2020 Addendum, a total of 43 wells (including Resource Conservation and Recovery Act (RCRA) wells) were slated for resampling in 2020. However, the Final 2020 Addendum specified that 47 wells (including RCRA wells) were to be sampled for 2020. The narrative (Section 3.1) of the Final 2020 Addendum indicates three wells were added to the 2020 sampling scheme to further assess explosives at the Fuze and Booster Quarry Landfill. The Final 2020 Addendum also states that three wells (LL3mw-238, LL3mw-239, LL3mw-241) were added based on recent findings during the development of the Remedial Investigation (RI) Report. It is unclear if this meant to indicate that six wells were added to the initial 43 wells for a total of 49, or how the final number of 47 wells were sampled according to the Spring 2020 Semi-Annual Report.

Five wells had been previously identified by Ohio EPA to have low pH values within the Ohio EPA comment letter on the Draft 2020 Addendum and stated as such in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response). Three of these wells were from the Fuze and Booster Quarry Landfill (FBQmw-171, FBQmw174, and FBQmw-175), but these wells did not have pH results summaries for the Spring 2020 sampling event. Additional clarification should be presented regarding which wells were added to further assess explosives at the Fuze and Booster Quarry Landfill as indicated on the Final 2020 Addendum. The clarification should include if any wells were added to address pH issues, or if pH was measured for these wells.

Table 4.1 of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that among the previously agreed-upon 43 wells, well LL3mw-238, LL3mw-239, LL3mw-241, and LL10mw-003 were additionally sampled for the Spring 2020 event. These wells were not on the Draft 2020 Addendum but they do match those 47 wells specified in the Final 2020 Addendum. While the rationale for sampling these wells was explained on the above referenced Table 4.1, further clarification regarding the discrepancy between the 2020 Addendum and the 2020 Sampling schedule and why these four wells were added to the Spring 2020 event may be warranted.

- From April 20 through April 30, 2020, and on June 11, 2020 (Spring 2020 sampling event), a total of 47 of the facility's monitoring wells were sampled. This included sampling of the five semi-annual RCRA ground water wells.

- A review of Appendix B (Summary of Groundwater Monitoring Well Conditions and Repair Recommendations) showed the April 2020 status of facility-wide ground water wells and repairs needed (such as cracked well pads, rusted hinges, casing repainting needed, ID repainting needed, etc.).

- Section 3.4 (Page 3-2, line 140) documents the four previously approved field change requests submitted and applicable to the Spring 2020 sampling event, also included as Appendix C. No new Field Change Requests were necessary for the

Spring 2020 event. A total of four Ohio EPA-approved Field Change Request forms were included within Appendix C (LEIDOS_FWGW_001, LEIDOS_FWGW_004, and LEIDOS_FWGW_006 from 2018 and LEIDOS_FWGW_010 from 2019).

- Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 47 wells were analyzed for the proper analytical parameters in accordance with the Final 2020 Addendum (well-specific combinations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Other than in Table 4-1, no other summary or evaluation of the data findings was presented in this report; further evaluation of the Spring 2020 data is expected to be presented along with the Fall 2020 data in the Draft FWGWMP Annual Report for 2020. Table 4-1 generally presented summaries of all the available well-specific data results but did not appear to list the phosphorus results of 0.031(J) mg/L from RQLmw-007.

- A review of Appendix H (Data Quality Assessment Report) showed the data quality review of the analytical reports indicated that 99.9% of the data was qualified as usable, with some data qualified as estimated and one data point was rejected. Overall, the data quality assessment reported that the data produced for the project can withstand scientific scrutiny, are appropriate for its intended purpose, are technically defensible, and are of known and acceptable sensitivity, precision, and accuracy.

- Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, LL3mw-241) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016. According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 Nephelometric Turbidity Units (NTUs), while four of these wells went dry with no final readings. During sampling, of these nine wells (two to seven days later), five wells were found to have <10 NTUs, while four exceeded 10 NTUs, with the highest reading being 1,238.8 NTUs from well LL1mw-086. Further discussion may be warranted to evaluate if these elevated turbidity readings could have contributed to Spring 2020 sampling results in some manner, and if additional potential well redevelopment activities could help lower the elevated turbidity numbers in well LL1mw-086.

COMMENTS

1. **Figure 3-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2020:**

   Page 3-1 makes several references (line 87 and line 121) to the 47 wells selected for sampling as being "depicted in Figure 3-1". While these wells are depicted on Figure 3-1, it would be clearer to also list the appropriate tables that denote these 47 wells (i.e., Table 3-1 and Table 4-1).

2. **Well discrepancies between 2020 Addenda and Spring 2020 Sampling Event:**

   According to the Draft 2020 Addendum, a total of 43 wells (including RCRA wells) were slated for resampling in 2020. However, the Final 2020 Addendum specified that 47 wells (including RCRA wells) were to be sampled for 2020. The narrative (Section 3.1) of the Final 2020 Addendum indicated three wells were added to the 2020 sampling scheme to further assess explosives at the Fuze and Booster Quarry Landfill. The Final 2020 Addendum also stated three wells (LL3mw-238, LL3mw-239, LL3mw-241) were added based on recent findings during the development of the RI Report.

   Table 4.1 of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that among the previously agreed-upon 43 wells, well LL3mw-238, LL3mw-239, LL3mw-241, LL10mw-003 were additionally sampled for the Spring 2020 event. These wells were not on the Draft 2020 Addendum, but they do match those 47 wells specified in the Final 2020 Addendum.

   Please clarify the Final 2020 Addendum narrative indicating that six wells were added to the initial 43 wells (which would equal a total of 49), or how the final number of 47 sampled wells was achieved according to the Spring 2020 Semi-Annual Report. Please explain the discrepancies between the 2020 Addenda and the 2020 Sampling schedule and why the four wells were added to the Spring 2020 event.

3. **Low pH Wells and Sampling Results for Fuze and Booster Quarry Landfill for Spring 2020 Sampling:**

   Five wells had been previously identified by Ohio EPA to have low pH values within the Ohio EPA comment letter on the Draft 2020 Addendum and stated as such in the USACE Response to Comments letter dated May 1, 2020 (Comment #3, Page 4, Army Response). Three previously identified low-pH wells were from the Fuze and Booster Quarry Landfill (FBQmw-171, FBQmw174, and FBQmw-175), but these wells did not have pH results summaries shown on Table 4-1 for the Spring 2020 sampling event.

Additional clarification should be presented regarding which wells were added to further assess explosives at the Fuze and Booster Quarry Landfill as indicated on the Final 2020 Addendum, if any of these wells were added to address pH issues, or if pH was recorded for these wells but not included on the Summary.

4. Ground Water Monitoring Well Repairs:

A review of Appendix B (Summary of Groundwater Monitoring Well Conditions and Repair Recommendations) showed the April 2020 status of facility-wide ground water wells and repairs needed (such as cracked well pads, rusted hinges, casing repainting needed, ID repainting needed, etc.).

Please provide information on when completion of these needed repairs is being scheduled.

5. Table 4-1 Data Summary Completeness:

Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 47 wells were analyzed for the proper analytical parameters in accordance with the Final 2020 Addendum (well-specific combinations of VOCs, SVOCs, PAHs, phenols, PCBs, perchlorate, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals). Table 4-1 generally presented summaries of all the available well-specific data results but did not appear to list the phosphorus results of 0.031(J) mg/L from RQLmw-007.

Please verify that all applicable results are summarized on Table 4-1.

6. Well Redevelopment – Elevated Turbidity Results:

Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2020 indicated that nine permanent monitoring wells (FBQmw-168, FBQmw-170, FBQmw-175, FBQmw-177, LL1mw-087, LL1mw-086, LL3mw-238, LL3mw-239, LL3mw-241) were redeveloped following Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016. According to the Turbidity Value Table 6-1, five of these wells achieved post-redevelopment readings of <10 NTUs, while four of these wells went dry with no final readings. During sampling, of these nine wells (two to seven days later), five wells were found to have <10 NTUs, while four exceeded 10 NTUs, with the highest reading being 1,238.8 NTUs from well LL1mw-086.

Please explain any effects these elevated turbidity readings may have contributed to Spring 2020 sampling results, and any plans to further redevelop/improve well LL1mw-086.

As a precautionary response to COVID-19, Ohio EPA is currently operating with most staff working remotely. During this time, we will not be issuing hard-copy mail. This letter is an official response from Ohio EPA that will be maintained as a public record.

This "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2020 Sampling Event" was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, please call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
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KP/sc

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