Mr. Maurice F. Moore
New York State Department of Environmental Conservation
Division of Environmental Remediation
270 Michigan Avenue
Buffalo, NY 14203-2915

Groundwater Monitoring Summary Report

Site #907022 – Al-Tech Specialty Steel Corporation
Willowbrook Avenue
Dunkirk, New York

January 28, 2019

Version 1.0

Groundwater Monitoring Summary Report

Site #907022 – Al-Tech Specialty Steel Corporation
Willowbrook Avenue, Dunkirk, New York

Prepared for:
Mr. Maurice F. Moore
New York State Department of Environmental Conservation
Division of Environmental Remediation
275 Michigan Avenue
Buffalo, New York 14203-2915

Prepared by:
Groundwater & Environmental Services, Inc.
415 Lawrence Bell Drive, Suite 6
Williamsville, New York 14221
Tel: 800-287-7857
www.gesonline.com

GES Project:
0901688

Date:
February 28, 2019

Jennifer Clay
Staff Geologist

Digitally signed by Eric D Popken
Date: 2019.03.01 09:50:33 -05'00'

Eric D. Popken, P.G.
Senior Project Manager

Table of Contents

Figures

Tables

Appendices

Acronyms

DUP	Sample duplicate
DUSR	Quality Assessment Data Usability Summary Report
fmsl	Feet above mean sea level
fbtoc	Feet below top-of-casing
GES	Groundwater & Environmental Services, Inc.
GMSR	Groundwater Monitoring Summary Report
GPS	Global positioning system
HDPE	High density polyethylene
MPS	Multi probe system
MS	Matrix spike
MSD	Matrix spike duplicate
ND	Non-detect
NYSDEC	New York State Department of Environmental Conservation
PCB	Polychlorinated biphenyl
PFAS	Perfluoroalkyl and polyfluoroalkyl substance(s)
PPE	Personal protective equipment
SVOC	Semi-volatile organic compound
TCA	1,1,1-Trichloroethane
TestAmerica	TestAmerica Laboratories, Inc.
TOGS 1.1.1 WQS	*Technical and Operation Guidance Series 1.1.1 Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations*, amended April 2000
USEPA	United States Environmental Protection Agency
VOC	Volatile organic compound
µg/L	micrograms per liter

1 Introduction

Groundwater and Environmental Services, Inc. (GES) has prepared this *Groundwater Monitoring Summary Report* (GMSR) to summarize the groundwater gauging and sampling activities conducted at Site #907022 – Al-Tech Specialty Steel Corporation (the "Site") between May 30, 2018 and June 13, 2018. Sampling activities were completed to analyze groundwater throughout the Site for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4-Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances (PFAS). A special groundwater sampling protocol was implemented and adhered to by field staff at all times during the sampling event in order to collect groundwater samples suitable for subsequent analysis of 1,4-Dioxane and PFAS.

2 Site Location

The Site is a part of New York State Department of Environmental Conservation (NYSDEC) State Superfund Program and referred to as Site #907022. The Site is located at the intersection of Willowbrook Avenue and Brigham Road between Willowbrook Avenue and West Lucas Avenue in Dunkirk, New York as shown in the Site Location Map (**Figure 1**) and Site Map (**Figure 2**). The area surrounding the Site consists of residential and commercial properties as well as a school.

2.1 Emerging Contaminants: PFAS and 1,4-Dioxane

Chemicals used in consumer products are introduced to the environment through various sources such as municipal wastewater treatment plants, runoff from agricultural and urban land surfaces, and septic systems. This type of contamination is referred to as an emerging contaminant since the contamination is not introduced during the production of the product but rather through consumer use.

NYSDEC has identified PFAS and 1,4-Dioxane as emerging contaminants. PFAS are a group of chemicals used to make fluoropolymer coatings and products that resist heat, oil, stains, grease, and water. Fluoropolymer coatings are blends of resins and lubricants used in products such as water-repellent clothing, furniture, adhesives, paint and varnish, food packaging, heat-resistant non-stick cooking surfaces and insulation of electric wires. 1,4-Dioxane is a synthetic industrial chemical that was most commonly used as a stabilizer for chlorinated solvents, particularly 1,1,1-Trichloroethane (TCA). Additionally, 1,4-Dioxane has been identified as a by-product found in consumer products such as deodorants, shampoos, and cosmetics.

3 Groundwater Monitoring Activities

3.1 Groundwater Monitoring Well Inventory and GPS Survey

Prior to conducting groundwater gauging activities, GES personnel completed an inventory of fifty-five (55) existing groundwater monitoring wells documenting at-grade well completion details and riser diameter. Global positioning system (GPS) coordinates were also logged for each well, if possible, using a battery-operated Trimble Geo XT hand-held unit. The results of the groundwater monitoring well inventory and GPS survey are provided in **Table 1**.

3.2 Groundwater Gauging

Prior to sampling, depth to groundwater data was collected from fifty-five (55) monitoring wells using an electronic sonic oil/water interface probe. Adjusted groundwater elevations were determined utilizing the May and June 2018 depth to water measurements and historic top of riser survey elevations provided in Table 1 of the *Groundwater Monitoring Summary Report* (Benchmark Environmental Engineering & Science, PLLC, October 5, 2011). Historic top of riser elevations were reported in feet above mean sea level (fmsl). Adjusted groundwater elevations collected at the Site between May 30, 2018 and June 10, 2018 ranged from 0.25 feet below top of casing (fbtoc) at MW-6 to 15.92 fbtoc at RFI-19. Groundwater at the Site generally flows toward the northwest. Groundwater gauging measurements and groundwater elevations are provided in **Table 1**. A summary of the groundwater elevation data is depicted on the Groundwater Monitoring Map provided as **Figure 3**.

3.3 Groundwater Sampling

GES personnel performed groundwater sampling from May 30, through June 13, 2018, following United States Environmental Protection Agency's (USEPA) *Low-Flow Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells* (Revised January 19, 2010).

Groundwater samples were collected from fifty-five (55) monitoring wells for analysis of a variety of analytes including VOCs, SVOCs (including 1,4-Dioxane), organochlorine pesticides, PCBs, and metals. A subset consisting of thirty-four (34) wells was also analyzed for PFAS. Due to potential sources of cross-contamination by equipment, materials, and consumer products during sampling, a groundwater sampling protocol was implemented and adhered to by field staff at all times during the sampling event in order to collect groundwater samples suitable for subsequent analysis of the above-listed analytes including 1,4-Dioxane and PFAS.

During the groundwater sampling event, low-flow sampling was completed at fifty-five (55) monitoring wells. For each sample set, 1,4-Dioxane (and PFAS at pre-selected locations) samples were collected first to minimize contact with other sample containers and packing materials and reduce the potential for cross-contamination. Each low-flow sampling set-up included a LaMotte™ 2020we turbidity sensor and YSI 556 Multi-Probe System (MPS) with flow cell attachment to monitor groundwater quality stability prior to sampling. To conduct low-flow sampling, a peristaltic

pump was deployed at each monitoring well. High density polyethylene (HDPE) tubing was inserted into the well to recover groundwater and silicon tubing was utilized at the pump and flow cell interface.

The sampling team wore personal protective equipment (PPE), field clothing, and personal hygiene products that would not contaminate the samples. The sampling team wore field clothing that was well laundered and made of cotton. No cosmetics, moisturizers, hand cream, sunscreen, insect repellant, or related products were applied to the sampling team throughout the sampling event.

Powder-free nitrile gloves were worn at all times during the sampling event and changed frequently. Alconox was used to decontaminate equipment before and after sampling at each monitoring well.

Recovered groundwater was stored in laboratory-supplied bottleware with a dedicated cooler for both PFAS and 1,4-Dioxane samples. Upon completion of sampling activities, the coolers were delivered to TestAmerica Laboratories (TestAmerica) Buffalo facility located in Amherst, New York for analysis of VOCs, SVOCs (except for 1,4-Dioxane), organochlorine pesticides, PCBs and metal. Coolers were then shipped to the TestAmerica located South Burlington, Vermont for analysis of PFAS and the TestAmerica located Edison, New Jersey for analysis of 1,4-Dioxane.

3.4 Laboratory Sample Analysis: Quality Assurance/Quality Control

TestAmerica in Amherst, New York, South Burlington, Vermont, and Edison, New Jersey analyzed the groundwater samples collected at the Site. TestAmerica provided full category B deliverables with laboratory analytical data and are included as **Appendix A**. Additionally, a Quality Assessment Data Usability Summary Report (DUSR) was performed by RemVer of Colchester, Connecticut and is included as **Appendix B**. RemVer found all results included in the laboratory analytical reports to be acceptable for use.

Care was taken during all aspects of the sample collection to ensure that high quality data was obtained. Duplicate (DUP) samples, matrix spike, and matrix spike duplicate (MS/MSD) samples were collected for every twenty (20) field samples and submitted for analysis to assure quality of both the sample collection procedure and the laboratory preparation/analytical method. All samples were submitted to TestAmerica under proper chain of custody.

4 Analytical Results

The laboratory analytical data is summarized in **Table 1** through **Table 7**. Detected analytical concentrations were compared to NYSDEC Technical and Operation Guidance Series 1.1.1 *Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations*, amended April 2000 (TOGS 1.1.1 WQS). The groundwater monitoring map plots groundwater elevations and concentrations of select analytes across the Site and is included as **Figure 4**. The following is a summary of the laboratory analytical results:

4.1 Volatile Organic Compounds

Based on the laboratory analytical results, groundwater in nine (9) monitoring wells (LAE-4, MW-4, MW-7, RFI-16, RFI-26, RFI-31, RFI-34, WP-4 and WT-2) was found to contain concentrations of VOCs that exceed the TOGS 1.1.1 WQS. Acetone, benzene, cis-1,2-dichloroethene, methylene chloride, trans-1,2-dichloroethene, trichloroethene and vinyl chloride exceeded TOGS 1.1.1 WQS in one or more of the monitoring well samples listed above. Exceedances are shown on **Figure 4**.

4.2 Semi-Volatile Organic Compounds

Based on the laboratory analytical results, groundwater in three (3) monitoring wells (MW-8, RFI-18 and RFI-34 was found to contain concentrations of SVOCs that exceed the TOGS 1.1.1 WQS. Bis(2-ethylhexyl) phthalate, pentachlorophenol and phenol exceeded TOGS 1.1.1 WQS in one or more of the monitoring well samples listed above. Exceedances are shown on **Figure 5**.

Based on the laboratory analytical results, groundwater in six (6) monitoring wells (BFS-1, MW-5, RFI-11, RFI-29, RFI-31 and WT-2) was found to contain 1,4-Dioxane. Exceedances are shown on **Figure 6**.

4.3 Organochlorine Pesticides

Based on the laboratory analytical results, groundwater in three (3) monitoring wells (BFS-2, MW-7 and RFI-05) was found to contain concentrations of organochlorine pesticides that exceed the TOGS 1.1.1 WQS. Alpha-BHC, delta-BHC and chlordane (technical) exceeded TOGS 1.1.1 WQS in one or more of the monitoring well samples listed above. Exceedances are shown on **Figure 7**.

4.4 Polychlorinated Biphenyls

Based on the laboratory analytical results, groundwater in fifty-three (53) monitoring wells was non-detect (ND) for the analyzed PCBs. Aroclor 1254 was detected in groundwater sampled from two (2) monitoring wells (MW-5 and RFI-09) at concentrations of 0.039 micrograms per liter (µg/L) and 0.036 µg/L, respectively.

4.5 Metals

Based on the laboratory analytical results, groundwater in eighteen (18) monitoring wells was found to contain concentrations of metals that exceed the TOGS 1.1.1 WQS. Exceedances are shown on **Figure 8**.

4.6 Perfluoroalkyl & Polyfluoroalkyl Substances

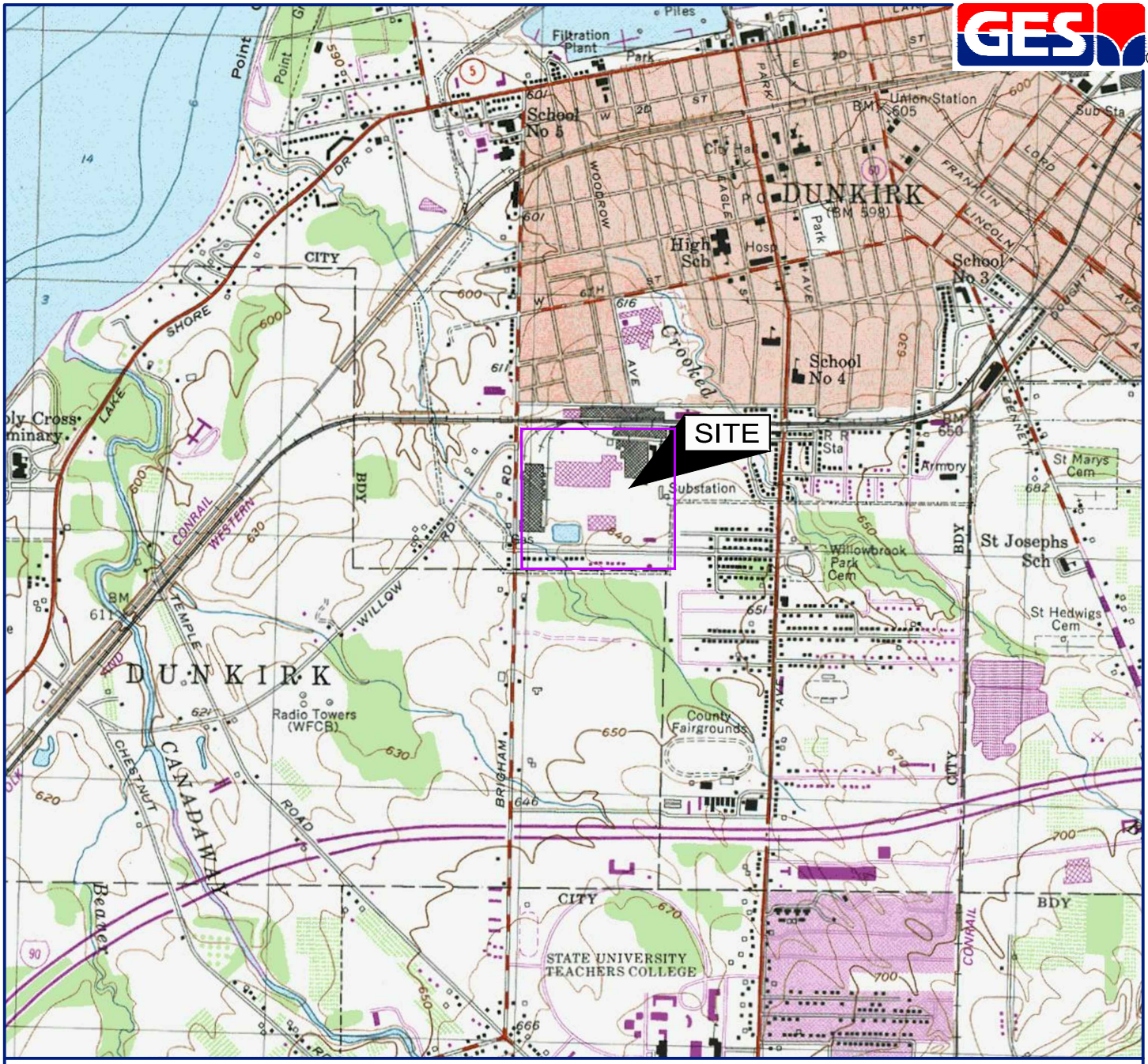
Based on the laboratory analytical results, PFAS were detected in groundwater samples collected from every monitoring well within the subset consisting of thirty-four (34) pre-selected wells.

Arsenic, chromium, manganese, nickel and chromium VI exceeded TOGS 1.1.1 WQS in one or more of the monitoring well samples listed above. Exceedances are shown on **Figure 9**.

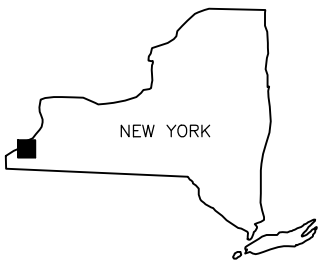
5 Conclusions

GES conducted groundwater monitoring activities at the Site between May 30, 2018 and June 13, 2018. An inventory of the site-wide monitoring well network confirmed the existence of fifty-five (55) monitoring wells, and the locations of the wells were surveyed and logged using GPS coordinates. Sampling activities were completed to analyze groundwater at fifty-five (55) monitoring wells throughout the Site for the presence of VOCs, SVOCs including 1,4-Dioxane, organochlorine pesticides, PCBs, and metals. Additionally, groundwater samples from thirty-four (34) pre-selected locations were also analyzed for PFAS. Based on the findings of the May and June 2018 groundwater monitoring event, groundwater beneath the Site contains VOCs, SVOCs, organochlorine pesticides, and metals at concentrations that exceed the TOGS 1.1.1 WQS. PFAS were detected in groundwater at each well within the subset consisting of thirty-four (34) pre-selected wells. 1,4-Dioxane was detected in groundwater at six (6) out of the fifty-five (55) sampled wells.

Figures



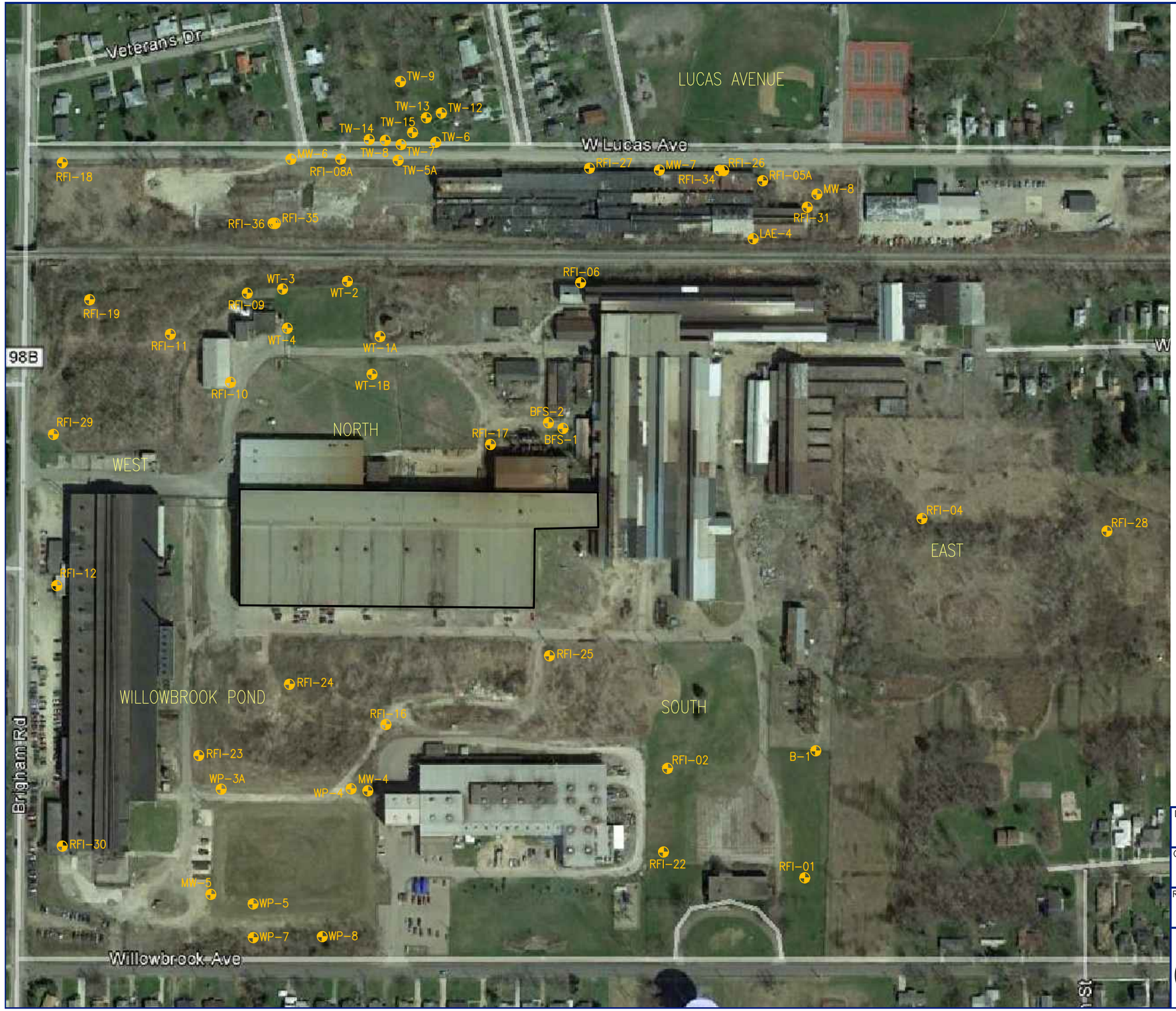
SOURCE: USGS 7.5 MINUTE SERIES
TOPOGRAPHIC QUADRANGLE 1979
DUNKIRK, NEW YORK
CONTOUR INTERVAL = 10'



QUADRANGLE LOCATION

DRAFTED BY: W.G.S.	SITE LOCATION MAP
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 158 SONWIL DRIVE, CHEEKTOWAGA, NEW YORK 14225
NORTH	SCALE IN FEET: 0 — 2000 / DATE: 9-28-18 / FIGURE: 1

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SLM.dwg



LEGEND

MONITORING WELL

DRAFTED BY: W.G.S.	SITE MAP
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 495 AERO DRIVE, SUITE 3, CHEEKTOWAGA, NEW YORK 14225
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-2-18 / FIGURE: 2

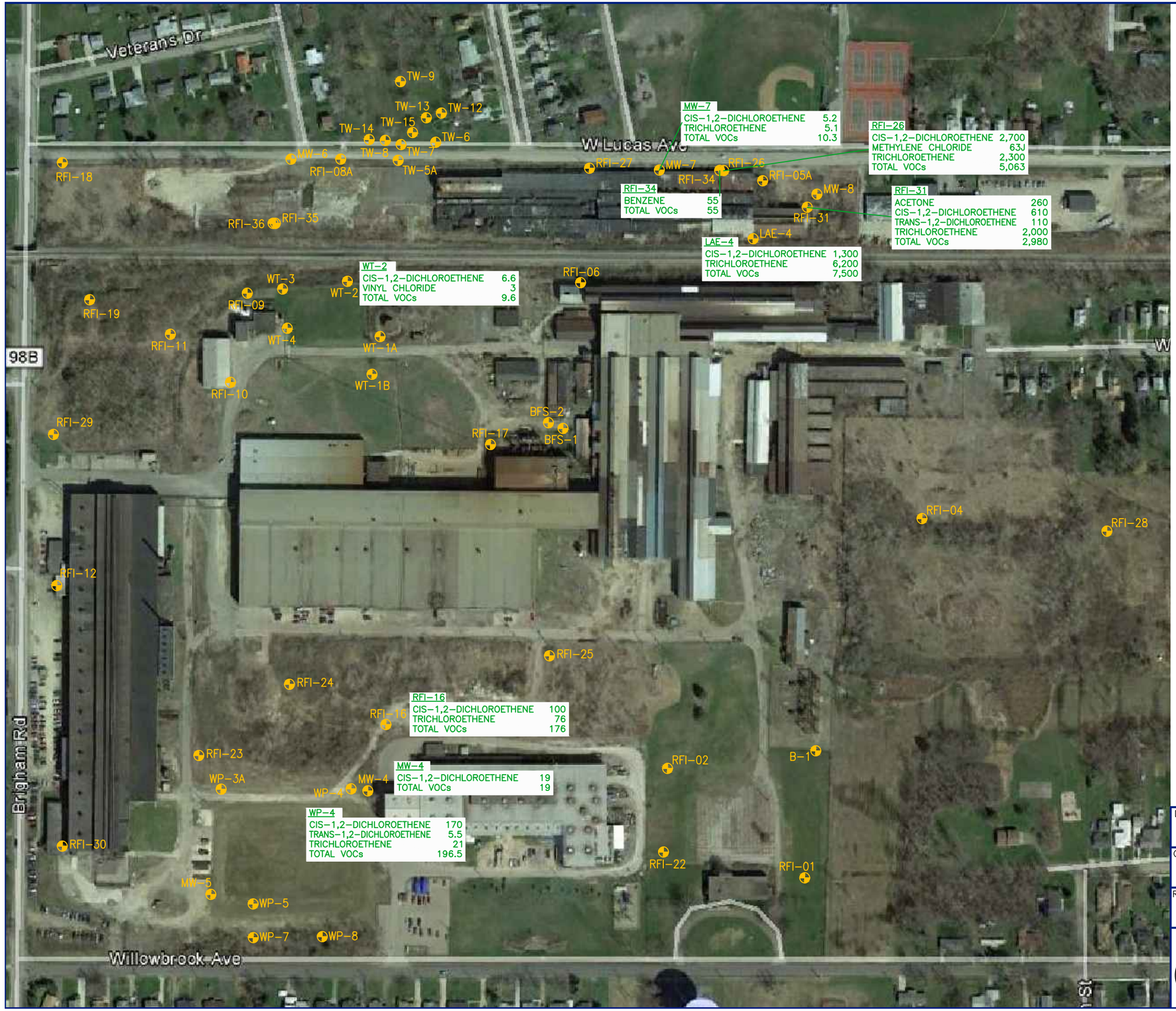
M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg

LEGEND

- MONITORING WELL
- UNDERGROUND GAS LINE
- (632.48) GROUNDWATER ELEVATION (ftmsl)
- GROUNDWATER CONTOUR
- (ftmsl) FEET ABOVE MEAN SEA LEVEL

DRAFTED BY: W.G.S.	GROUNDWATER MONITORING MAP JUNE 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 12-21-18 / FIGURE: 3

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg, B-250, wshea



LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

ACETONE	50
BENZENE	1
CIS-1,2-DICHLOROETHENE	5
METHYLENE CHLORIDE	5
TRANS-1,2-DICHLOROETHENE	5
TRICHLOROETHENE	5
VINYL CHLORIDE	2

NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA VOLATILE ORGANIC COMPOUNDS MAY 31-JUNE 13, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 4

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg

LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

BIS(2-ETHYLHEXYL)PHTHALATE	5
PENTACHLOROPHENOL	2
PHENOL	2

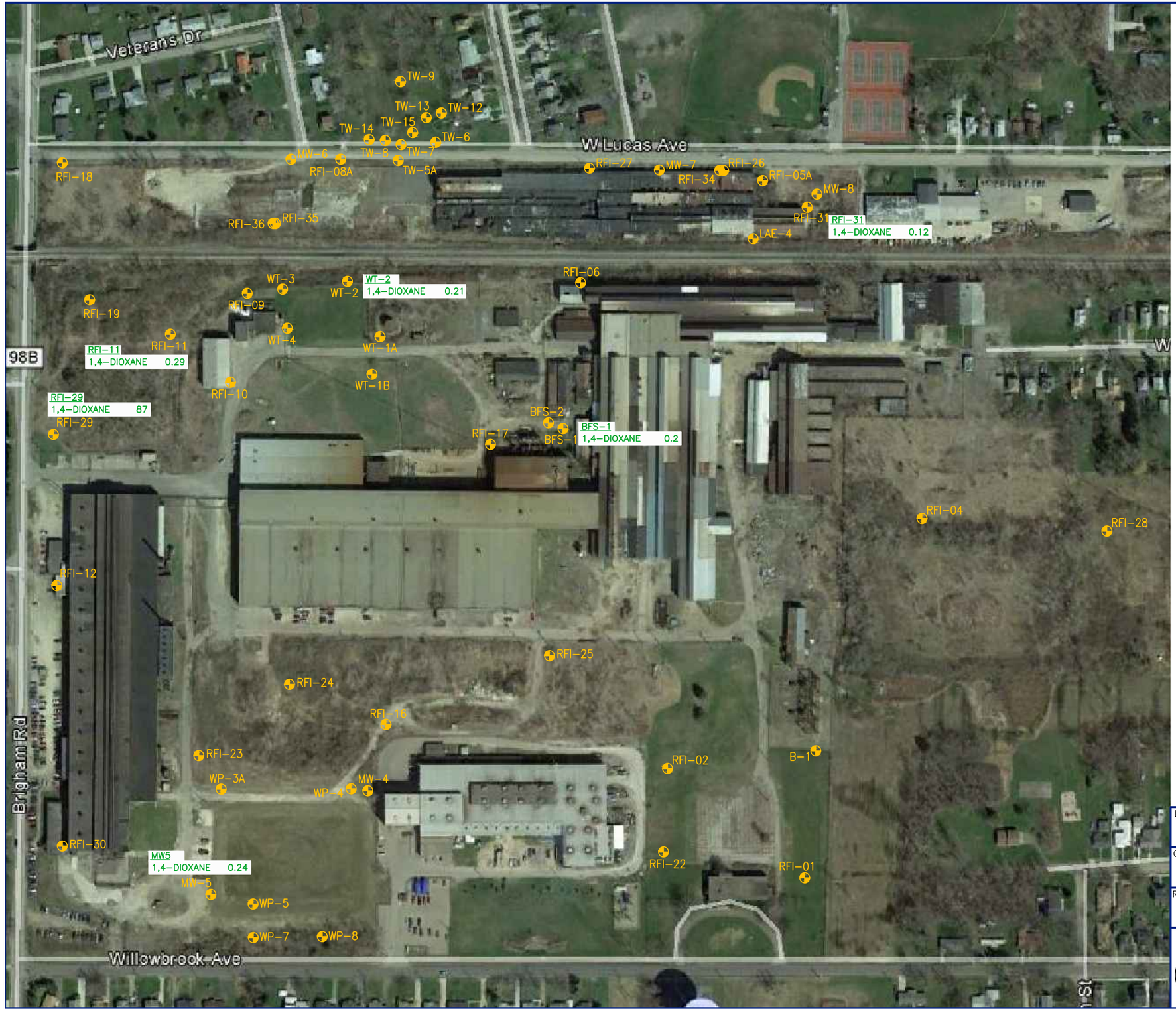
NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA SEMI-VOLATILE ORGANIC COMPOUNDS MAY 31-JUNE 4, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 5

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg



LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

1,4-DIOXANE	.35

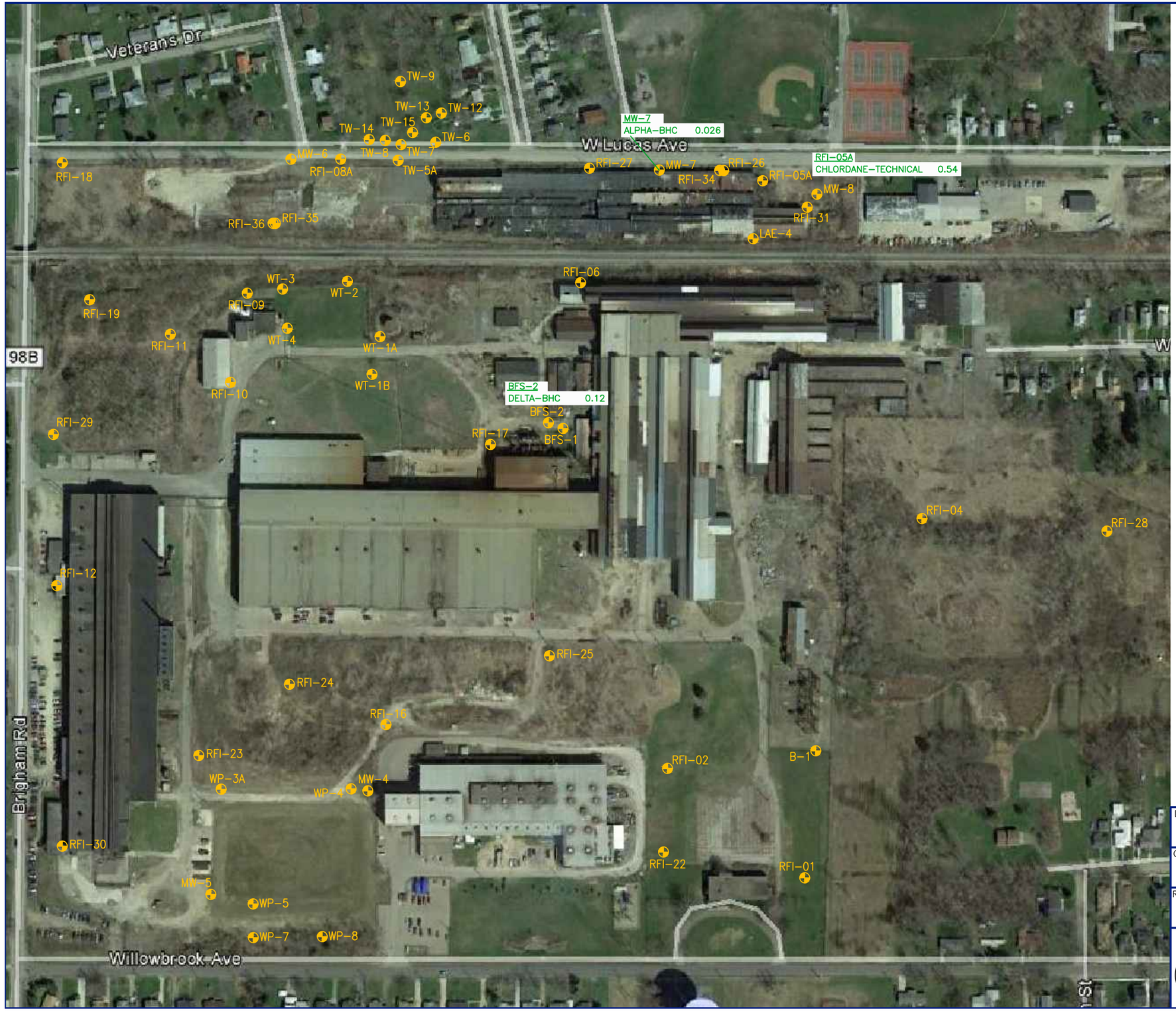
NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA 1,4-DIOXANE MAY 31-JUNE 13, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 6

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg



LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

ALPHA-BHC	0.01
CHLORDANE-TECHNICAL	0.05
DELTA-BHC	0.04

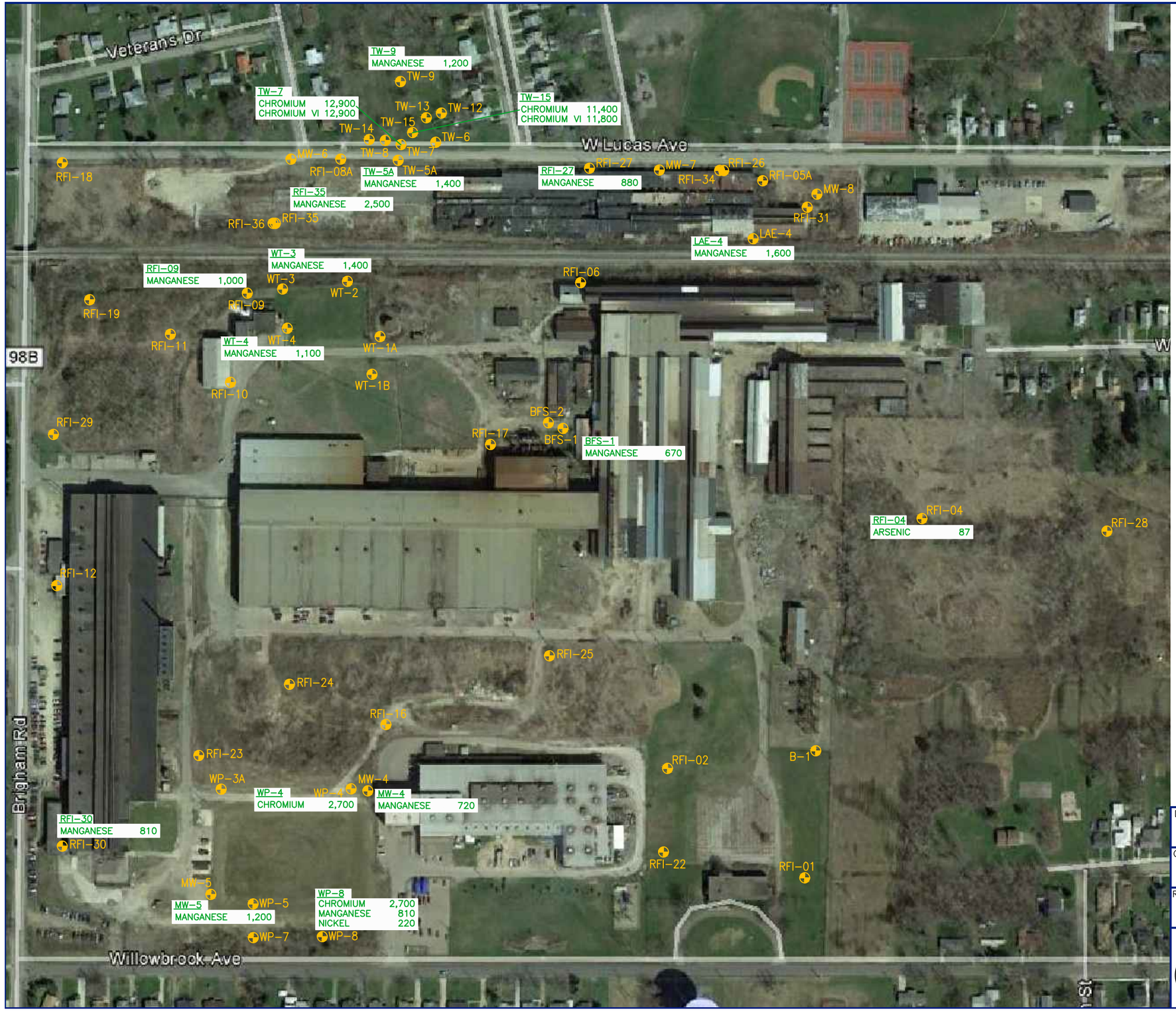
NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA ORGANCHLORINE PESTICIDES MAY 31-JUNE 1, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 7

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg



LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

ARSENIC	50
CHROMIUM	50
CHROMIUM VI	100
MANGANESE	600
NICKEL	200

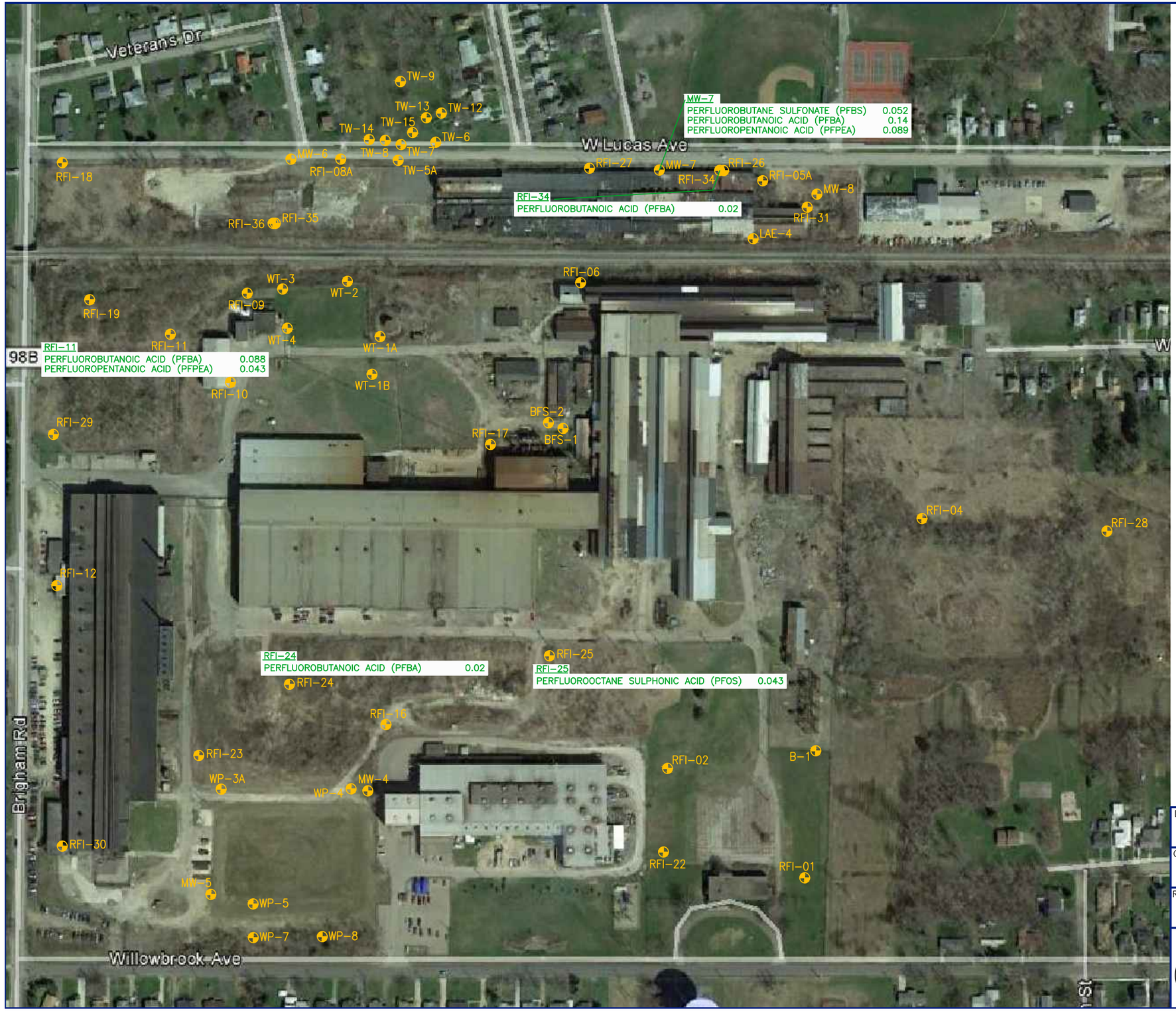
NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA METALS MAY 30-JUNE 13, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 8

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg



LEGEND

MONITORING WELL

TOGS 1.1.1 WATER QUALITY STANDARDS

PFOA & PFOS IN DRINKING WATER	0.020
PFOA & PFOS IN GROUNDWATER	0.070

NOTES:

ALL ANALYTICAL RESULTS ARE IN MICROGRAMS PER LITER (ug/L).

DATA SHOWN IS FOR EXCEEDANCES ONLY.

DRAFTED BY: W.G.S.	GROUNDWATER ANALYTICAL DATA PFAs JUNE 1-JUNE 5, 2018
CHECKED BY: J.K.C.	NYSDEC FORMER AL TECH SPECIALTY STEEL CORP WILLOWBROOK POND OPERABLE UNIT DUNKIRK, NEW YORK
REVIEWED BY: E.P.	Groundwater & Environmental Services, Inc. 415 LAWRENCE BELL DRIVE, SUITE 6, WILLIAMSVILLE, NEW YORK
NORTH	SCALE IN FEET: 0 APPROXIMATE 250 / DATE: 10-3-18 / FIGURE: 9

M:\Graphics\0900-Buffalo\NYSDEC\Dunkirk-altec\Dunkirk-altec SM.dwg

Tables

Table 1

Groundwater Monitoring Well Inventory and GPS Survey

Lucas Ave (22 active wells)	Status	Riser Diameter (inches)	Surface Completion Detail	TOC Elevation (fmsl)	Depth to Water (fbtoc)	Depth to Product (fbtoc)	Adjusted Groundwater Elevation (fmsl)	Depth to Bottom (fbtoc)	Longitude	Latitude
RFI-05A	Active	2	Stick-up	NSD	7.32	NP	-	16.70	-79.339339072	42.474331855
RFI-08A	Active	2	Flush	NSD	1.86	NP	-	14.25	-79.343230961	42.474453545
RFI-18	Active	2	Stick-up	621.52	15.92	NP	605.60	20.70	-79.345798840	42.474411491
RFI-26	Active	2	Stick-up	631.07	8.42	NP	622.65	17.45	-79.339699950	42.474398310
RFI-27	Active	2	Stick-up	633.68	9.48	NP	624.20	20.40	-79.340936675	42.474406397
RFI-31	Active	2	NR	631.72	7.54	NP	624.18	26.65	Not logged due to GPS interference	Not logged due to GPS interference
RFI-34	Active	2	Stick-up	NSD	9.59	NP	-	38.00	-79.339736090	42.474399532
RFI-35	Active	2	Stick-up	NSD	9.58	NP	-	16.40	-79.343827852	42.474011186
RFI-36	Active	2	Stick-up	NSD	9.11	NP	-	27.80	-79.343850008	42.474010881
MW-6	Active	2	Flush	NSD	0.25	NP	-	12.10	-79.343690541	42.474450261
MW-7	Active	2	Stick-up	NSD	7.95	NP	-	14.60	-79.340292779	42.474398019
MW-8	Active	2	Flush	NSD	5.21	NP	-	22.10	-79.338836717	42.474243242
LAE-4	Active	2	Flush	632.28	4.00	NP	628.28	19.60	-79.339422691	42.473934933
TW-5A	Active	2	Flush	NSD	1.65	NP	-	11.35	-79.342700714	42.474449160
TW-6	Active	2	Flush	NSD	2.22	NP	-	17.20	-79.342357359	42.474573845
TW-7	Active	2	Flush	NSD	2.75	NP	-	18.95	Not logged due to GPS interference	Not logged due to GPS interference
TW-8	Active	2	Flush	NSD	2.94	NP	-	19.80	-79.342822424	42.474583470
TW-9	Active	1	Flush	NSD	3.33	NP	-	19.65	-79.342685584	42.474986496
TW-12	Active	2	Flush	NSD	3.40	NP	-	19.70	-79.342306736	42.474773914
TW-13	Active	2	Flush	NSD	3.85	NP	-	19.50	-79.342445259	42.474741125
TW-14	Active	2	Flush	NSD	3.17	NP	-	19.40	-79.342969828	42.474588953
TW-15	Active	2	Flush	630.54	2.79	NP	627.75	18.20	-79.342571158	42.474638916
North (11 active wells)	**Status**	**Riser Diameter (inches)**	**Surface Completion Detail**	**TOC Elevation (fmsl)**	**Depth to Water (fbtoc)**	**Depth to Product (fbtoc)**	**Adjusted Groundwater Elevation (fmsl)**	**Depth to Bottom (fbtoc)**	**Longitude**	**Latitude**
RFI-06	Active	2	Stick-up	633.87	6.60	NP	627.27	13.45	-79.341008928	42.473625284
RFI-09	Active	2	Stick-up	632.22	5.03	NP	627.19	13.20	-79.344082698	42.473532707
RFI-10	Active	2	Stick-up	632.16	3.34	NP	628.82	15.70	-79.344229344	42.472923595
RFI-17	Active	2	Stick-up	637.39	6.13	NP	631.26	13.75	-79.341826370	42.472515484
BFS-1	Active	4	Flush	NSD	3.97	NP	-	11.20	-79.341159890	42.472629277
BFS-2	Active	4	Flush	NSD	3.70	NP	-	6.98	-79.341293957	42.472667222
WT-1A	Active	2	Stick-up	635.62	5.59	NP	630.03	16.74	-79.342853685	42.473245109
WT-1B	Active	2	Stick-up	634.6	4.32	NP	630.28	15.25	Not logged due to GPS interference	Not logged due to GPS interference
WT-2	Active	4	Stick-up	632.35	3.45	NP	628.90	11.90	-79.343159072	42.473619778
WT-3	Active	4	Stick-up	631.35	3.61	NP	627.74	17.50	-79.343756375	42.473563738
WT-4	Active	4	Stick-up	630.18	2.23	NP	627.95	16.60	-79.343710476	42.473296043
West (4 active wells)	**Status**	**Riser Diameter (inches)**	**Surface Completion Detail**	**TOC Elevation (fmsl)**	**Depth to Water (fbtoc)**	**Depth to Product (fbtoc)**	**Adjusted Groundwater Elevation (fmsl)**	**Depth to Bottom (fbtoc)**	**Longitude**	**Latitude**
RFI-11	Active	2	Stick-up	632.65	5.93	NP	626.72	18.25	-79.344787864	42.473248050
RFI-12	Active	2	Stick-up	630.30	9.35	NP	620.95	14.20	-79.345813828	42.471527089
RFI-19	Active	2	Stick-up	629.79	8.93	NP	620.86	30.90	-79.345535216	42.473478875
RFI-29	Active	2	Stick-up	630.20	9.24	NP	620.96	26.45	-79.345857375	42.472557572
Willowbrook Pond (11 active wells)	**Status**	**Riser Diameter (inches)**	**Surface Completion Detail**	**TOC Elevation (fmsl)**	**Depth to Water (fbtoc)**	**Depth to Product (fbtoc)**	**Adjusted Groundwater Elevation (fmsl)**	**Depth to Bottom (fbtoc)**	**Longitude**	**Latitude**
RFI-16	Active	2	Stick-up	641.13	6.77	NP	634.36	17.15	-79.342767223	42.470598702
RFI-23	Active	2	Stick-up	634.09	8.31	NP	625.78	21.00	-79.344489803	42.470375992
RFI-24	Active	2	Stick-up	638.15	8.25	NP	629.90	11.20	-79.343660178	42.470867391
RFI-30	Active	2	Flush	626.52	8.69	NP	617.83	19.10	-79.345742175	42.469750021
MW-4	Active	2	Stick-up	NSD	8.99	NP	-	22.65	-79.342929518	42.470145450
MW-5	Active	2	Flush	NSD	9.26	NP	-	21.60	-79.344367674	42.469429554
WP-3A	Active	2	Stick-up	NSD	7.02	NP	-	23.05	-79.344281290	42.470147471
WP-4	Active	2	Stick-up	641.90	8.32	NP	633.58	20.30	-79.343083435	42.470157849
WP-5	Active	2	Stick-up	635.69	10.86	NP	624.83	12.95	-79.343977934	42.469367235
WP-7	Active	2	Stick-up	635.11	10.52	NP	624.59	12.60	-79.343972652	42.469137513
WP-8	Active	2	Stick-up	638.75	12.5	NP	626.25	19.50	-79.343337567	42.469148029
South (5 active wells)	**Status**	**Riser Diameter (inches)**	**Surface Completion Detail**	**TOC Elevation (fmsl)**	**Depth to Water (fbtoc)**	**Depth to Product (fbtoc)**	**Adjusted Groundwater Elevation (fmsl)**	**Depth to Bottom (fbtoc)**	**Longitude**	**Latitude**
B-1	Active	4	Stick-up	638.54	3.20	NP	635.34	20.45	-79.338802127	42.470446213
RFI-01	Active	2	Flush	640.72	9.67	NP	631.05	13.40	-79.338893521	42.469578523
RFI-02	Active	2	Flush	638.54	7.15	NP	631.39	12.12	-79.340167888	42.470317152
RFI-22	Active	2	Flush	641.04	12.28	NP	628.76	15.20	-79.340198635	42.469746029
RFI-25	Active	2	Stick-up	641.06	5.47	NP	635.59	17.35	-79.341266174	42.471077712
East (2 active wells)	**Status**	**Riser Diameter (inches)**	**Surface Completion Detail**	**TOC Elevation (fmsl)**	**Depth to Water (fbtoc)**	**Depth to Product (fbtoc)**	**Adjusted Groundwater Elevation (fmsl)**	**Depth to Bottom (fbtoc)**	**Longitude**	**Latitude**
RFI-04	Active	2	Stick-up	638.48	6.34	NP	632.14	27.20	-79.337842099	42.472036648
RFI-28	Active	2	Stick-up	637.96	5.48	NP	632.48	32.45	-79.336136511	42.471962157

Notes:
GPS = global positioning system
NR = no record
fbtoc = feet below top of casing
fmsl = feet above mean sea level
NSD = no survey data available
NP = no measurable product detected when gauged
- = no data

Table 2

Groundwater Analytical Data Summary: Volatile Organic Compounds

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 8260C)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1,1-Trichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2,2-Tetrachloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloroethane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2,4-Trichlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromo-3-chloropropane	0.04	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloroethane	0.6	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloropropane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,3-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,4-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
2-Butanone	50	ND < 10 U	ND < 10 U	ND < 10 U	ND < 2000 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 20 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Hexanone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 1000 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Methyl-2-pentanone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 1000 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acetone	50	5.4 J+	ND < 10 U	ND < 10 U	ND < 2000 U	ND < 10 U	ND < 10 U	11	6.7 J+	4.0 J	3.0 J	ND < 10 U
Benzene	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	0.60 J	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromodichloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromoform	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromomethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Carbon Disulfide	60	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Carbon tetrachloride	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Dibromochloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloroform	7	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
cis-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**1,300 J**	**19**	ND < 1.0 U	ND < 1.0 U	**5.2 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
cis-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Cyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	1.4	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Dichlorodifluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Ethylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromoethane	0.0006	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Isopropylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methyl acetate	-	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 500 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 5.0 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U
Methyl tert-butyl ether	10	ND < 1.0 U	ND < 1.0 U	0.95 J	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methylcyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	3.7	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methylene chloride	5	0.70 JB	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	1.7 JB	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Styrene	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Tetrachloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Toluene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	0.76 J	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
trans-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
trans-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Trichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**6,200 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**5.1 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Trichlorofluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Vinyl Chloride	2	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 200 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Xylenes, Total	5	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 400 U	ND < 2.0 U	ND < 2.0 U	0.66 J	ND < 4.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

J+/- = Sample likely to have a high/low bias, respectively

Table 2

Groundwater Analytical Data Summary: Volatile Organic Compounds

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 8260C)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1,1-Trichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2,2-Tetrachloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloroethane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2,4-Trichlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromo-3-chloropropane	0.04	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloroethane	0.6	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloropropane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,3-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,4-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
2-Butanone	50	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 20 U	ND < 10 U	ND < 10 U
2-Hexanone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U	ND < 5.0 U
4-Methyl-2-pentanone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U	ND < 5.0 U
Acetone	50	ND < 10 U	ND < 10 U	3.4 J	3.1 J	3.0 J	ND < 10 U	3.5 J	ND < 10 U	ND < 20 U	ND < 10 U	ND < 10 U
Benzene	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	0.59 J	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Bromodichloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Bromoform	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Bromomethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Carbon Disulfide	60	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Carbon tetrachloride	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Chlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Dibromochloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Chloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Chloroform	7	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Chloromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
cis-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**100 J**	ND < 1.0 U	ND < 1.0 U
cis-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Cyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	3.6	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Dichlorodifluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Ethylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	0.85 J	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromoethane	0.0006	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Isopropylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Methyl acetate	-	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 5.0 U	ND < 2.5 U	ND < 2.5 U
Methyl tert-butyl ether	10	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Methylcyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	3.8	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Methylene chloride	5	ND < 1.0 U	0.81 JB	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	0.54 JB	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Styrene	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Tetrachloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Toluene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	1.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
trans-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	5.0 J	ND < 1.0 U	ND < 1.0 U
trans-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Trichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**76 J**	ND < 1.0 U	ND < 1.0 U
Trichlorofluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Vinyl Chloride	2	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U	ND < 1.0 U
Xylenes, Total	5	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	4.7	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 4.0 U	ND < 2.0 U	ND < 2.0 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

J+/- = Sample likely to have a high/low bias, respectively

Table 2

Groundwater Analytical Data Summary: Volatile Organic Compounds

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 8260C)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1,1-Trichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,1,2,2-Tetrachloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,1,2-Trichloroethane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,1-Dichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,1-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2,4-Trichlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2-Dibromo-3-chloropropane	0.04	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2-Dichloroethane	0.6	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2-Dichloropropane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,3-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,4-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
2-Butanone	50	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 800 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 400 U
2-Hexanone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 400 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 200 U
4-Methyl-2-pentanone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 400 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 200 U
Acetone	50	5.3 J	ND < 10 U	ND < 10 U	ND < 10 U	4.8 J	ND < 800 U	4.0 J	ND < 10 U	ND < 10 U	ND < 10 U	**260 J**
Benzene	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Bromodichloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Bromoform	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Bromomethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Carbon Disulfide	60	0.36 J	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Carbon tetrachloride	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Chlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Dibromochloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Chloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Chloroform	7	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Chloromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
cis-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**2,700 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**610 J**
cis-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Cyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Dichlorodifluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Ethylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
1,2-Dibromoethane	0.0006	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Isopropylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Methyl acetate	-	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 200 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 100 U
Methyl tert-butyl ether	10	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Methylcyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Methylene chloride	5	ND < 1.0 U	0.62 JB	ND < 1.0 U	ND < 1.0 U	0.71 J	**63 JB**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Styrene	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Tetrachloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Toluene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
trans-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**110 J**
trans-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Trichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**2,300 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**2,000 J**
Trichlorofluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Vinyl Chloride	2	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 80 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 40 U
Xylenes, Total	5	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 160 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 80 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

J+/- = Sample likely to have a high/low bias, respectively

Table 2

Groundwater Analytical Data Summary: Volatile Organic Compounds

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 8260C)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1,1-Trichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,1,2,2-Tetrachloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,1,2-Trichloroethane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,1-Dichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,1-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2,4-Trichlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2-Dibromo-3-chloropropane	0.04	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2-Dichloroethane	0.6	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2-Dichloropropane	1	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,3-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,4-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
2-Butanone	50	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 40 U	ND < 10 U	ND < 20 U	ND < 10 U
2-Hexanone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 20 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U
4-Methyl-2-pentanone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 20 U	ND < 5.0 U	ND < 10 U	ND < 5.0 U
Acetone	50	ND < 10 U	3.5 J	ND < 10 U	ND < 10 U	ND < 10 U	7.2 J	6.0 J	ND < 40 U	ND < 10 U	7.3 J	5.3 J
Benzene	1	**55**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Bromodichloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Bromoform	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Bromomethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Carbon Disulfide	60	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Carbon tetrachloride	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Chlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Dibromochloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Chloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Chloroform	7	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Chloromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
cis-1,2-Dichloroethene	5	1.8	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
cis-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Cyclohexane	-	8.0	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Dichlorodifluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Ethylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
1,2-Dibromoethane	0.0006	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Isopropylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Methyl acetate	-	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 10 U	ND < 2.5 U	ND < 5.0 U	ND < 2.5 U
Methyl tert-butyl ether	10	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Methylcyclohexane	-	1.3 J	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Methylene chloride	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Styrene	50	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Tetrachloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Toluene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
trans-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
trans-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Trichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Trichlorofluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Vinyl Chloride	2	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 2.0 U	ND < 1.0 U
Xylenes, Total	5	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 8.0 U	ND < 2.0 U	ND < 4.0 U	ND < 2.0 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

J+/- = Sample likely to have a high/low bias, respectively

Table 2

Groundwater Analytical Data Summary: Volatile Organic Compounds

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 8260C)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1,1-Trichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2,2-Tetrachloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloroethane	1	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,1-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2,4-Trichlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromo-3-chloropropane	0.04	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloroethane	0.6	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dichloropropane	1	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,3-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,4-Dichlorobenzene	3	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
2-Butanone	50	ND < 10 U	ND < 10 U	ND < 40 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Hexanone	50	ND < 5.0 U	ND < 5.0 U	ND < 20 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Methyl-2-pentanone	-	ND < 5.0 U	ND < 5.0 U	ND < 20 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acetone	50	3.3 J	ND < 10 U	ND < 40 U	3.1 J+	ND < 10 U	ND < 10 U	ND < 10 U	11	13 J	ND < 10 U	ND < 10 U
Benzene	1	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromodichloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromoform	50	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Bromomethane	50	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Carbon Disulfide	60	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	0.27 J	ND < 1.0 U	ND < 1.0 U
Carbon tetrachloride	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chlorobenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Dibromochloromethane	50	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloroethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloroform	7	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Chloromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
cis-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	**170 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**6.6 J**	ND < 1.0 U	ND < 1.0 U
cis-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Cyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Dichlorodifluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Ethylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
1,2-Dibromoethane	0.0006	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Isopropylbenzene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methyl acetate	-	ND < 2.5 U	ND < 2.5 U	ND < 10 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U	ND < 2.5 U
Methyl tert-butyl ether	10	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methylcyclohexane	-	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Methylene chloride	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Styrene	50	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Tetrachloroethene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Toluene	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
trans-1,2-Dichloroethene	5	ND < 1.0 U	ND < 1.0 U	**5.5 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
trans-1,3-Dichloropropene	0.4	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Trichloroethene	5	ND < 1.0 U	ND < 1.0 U	**21 J**	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	0.83 J	ND < 1.0 U	ND < 1.0 U
Trichlorofluoromethane	5	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U
Vinyl Chloride	2	ND < 1.0 U	ND < 1.0 U	ND < 4.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	ND < 1.0 U	**3.0 J**	ND < 1.0 U	ND < 1.0 U
Xylenes, Total	5	ND < 2.0 U	ND < 2.0 U	ND < 8.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

J+/- = Sample likely to have a high/low bias, respectively

Table 3

Groundwater Analytical Data Summary: Semi-Volatile Organic Compounds

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 8270D)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1'-Biphenyl	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,2'-oxybis(1-Chloropropane)	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,5-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,6-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dichlorophenol	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dimethylphenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dinitrophenol	10	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2,4-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,6-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chloronaphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylnaphthalene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Nitrophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3,3'-Dichlorobenzidine	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4,6-Dinitro-2-methylphenol	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Bromophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloro-3-methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloroaniline	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chlorophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Methylphenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitrophenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Acenaphthene	20	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acenaphthylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acetophenone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	0.63 J	ND < 5.0 U
Anthracene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Atrazine	7.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzaldehyde	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo(b)fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]anthracene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]pyrene	0	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[g,h,i]perylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[k]fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethoxy)methane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethyl) ether	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Ethylhexyl) phthalate	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Butyl benzyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Caprolactam	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Carbazole	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Chrysene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenz[a,h]anthracene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenzofuran	-	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Diethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dimethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-butyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-octyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluoranthene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluorene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobenzene	0.04	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobutadiene	0.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorocyclopentadiene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachloroethane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Indeno[1,2,3-cd]pyrene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Isophorone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Naphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Nitrobenzene	0.4	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodi-n-propylamine	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodiphenylamine	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pentachlorophenol	2	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	**100 J**	ND < 10 U	ND < 10 U
Phenanthrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Phenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pyrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Analyte (Method 8270 SIM ID)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,4-Dioxane	-	ND < 0.20 U	0.20 J	ND < 0.21 U	ND < 0.20 U	ND < 2.0 U	0.24	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 3

Groundwater Analytical Data Summary: Semi-Volatile Organic Compounds

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 8270D)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1'-Biphenyl	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,2'-oxybis(1-Chloropropane)	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,5-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,6-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dichlorophenol	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dimethylphenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dinitrophenol	10	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2,4-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,6-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chloronaphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylnaphthalene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Nitrophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3,3'-Dichlorobenzidine	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4,6-Dinitro-2-methylphenol	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Bromophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloro-3-methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloroaniline	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chlorophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Methylphenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitrophenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Acenaphthene	20	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acenaphthylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acetophenone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Anthracene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Atrazine	7.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzaldehyde	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo(b)fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]anthracene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]pyrene	0	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[g,h,i]perylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[k]fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethoxy)methane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethyl) ether	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Ethylhexyl) phthalate	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	**8.5**
Butyl benzyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Caprolactam	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	2.3 J	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Carbazole	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Chrysene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenz[a,h]anthracene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenzofuran	-	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Diethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dimethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-butyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-octyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluoranthene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluorene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobenzene	0.04	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobutadiene	0.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorocyclopentadiene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachloroethane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Indeno[1,2,3-cd]pyrene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Isophorone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Naphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Nitrobenzene	0.4	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodi-n-propylamine	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodiphenylamine	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pentachlorophenol	2	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Phenanthrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Phenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pyrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Analyte (Method 8270 SIM ID)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,4-Dioxane	-	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	0.29	ND < 0.20 U	ND < 0.20 U	ND < 0.21 U	ND < 0.20 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 3

Groundwater Analytical Data Summary: Semi-Volatile Organic Compounds

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 8270D)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1'-Biphenyl	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,2'-oxybis(1-Chloropropane)	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,5-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4,6-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dichlorophenol	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dimethylphenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,4-Dinitrophenol	10	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2,4-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2,6-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chloronaphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Chlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylnaphthalene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
2-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Nitrophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3,3'-Dichlorobenzidine	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
3-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4,6-Dinitro-2-methylphenol	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Bromophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloro-3-methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chloroaniline	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Chlorophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
4-Methylphenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitrophenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Acenaphthene	20	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acenaphthylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Acetophenone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Anthracene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Atrazine	7.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzaldehyde	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo(b)fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]anthracene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[a]pyrene	0	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[g,h,i]perylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Benzo[k]fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethoxy)methane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Chloroethyl) ether	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
bis(2-Ethylhexyl) phthalate	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Butyl benzyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Caprolactam	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Carbazole	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Chrysene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenz[a,h]anthracene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dibenzofuran	-	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Diethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Dimethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-butyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Di-n-octyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluoranthene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Fluorene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobenzene	0.04	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorobutadiene	0.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachlorocyclopentadiene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Hexachloroethane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Indeno[1,2,3-cd]pyrene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Isophorone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Naphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Nitrobenzene	0.4	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodi-n-propylamine	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
N-Nitrosodiphenylamine	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pentachlorophenol	2	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Phenanthrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Phenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Pyrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Analyte (Method 8270 SIM ID)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,4-Dioxane	-	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	87 J	ND < 0.21 U	0.12 J

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 3

Groundwater Analytical Data Summary: Semi-Volatile Organic Compounds

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 8270D)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1'-Biphenyl	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,2'-oxybis(1-Chloropropane)	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,4,5-Trichlorophenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,4,6-Trichlorophenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,4-Dichlorophenol	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,4-Dimethylphenol	2	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,4-Dinitrophenol	10	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
2,4-Dinitrotoluene	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2,6-Dinitrotoluene	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2-Chloronaphthalene	10	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2-Chlorophenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2-Methylnaphthalene	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2-Methylphenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
2-Nitroaniline	5	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
2-Nitrophenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
3,3'-Dichlorobenzidine	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
3-Nitroaniline	5	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
4,6-Dinitro-2-methylphenol	5	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
4-Bromophenyl phenyl ether	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
4-Chloro-3-methylphenol	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
4-Chloroaniline	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
4-Chlorophenyl phenyl ether	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
4-Methylphenol	1	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
4-Nitroaniline	5	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
4-Nitrophenol	1	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
Acenaphthene	20	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Acenaphthylene	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Acetophenone	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Anthracene	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Atrazine	7.5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzaldehyde	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzo(b)fluoranthene	0.002	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzo[a]anthracene	0.002	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzo[a]pyrene	0	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzo[g,h,i]perylene	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Benzo[k]fluoranthene	0.002	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
bis(2-Chloroethoxy)methane	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
bis(2-Chloroethyl) ether	1	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
bis(2-Ethylhexyl) phthalate	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Butyl benzyl phthalate	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Caprolactam	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Carbazole	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Chrysene	0.002	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Dibenz[a,h]anthracene	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Dibenzofuran	-	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
Diethyl phthalate	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Dimethyl phthalate	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Di-n-butyl phthalate	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Di-n-octyl phthalate	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Fluoranthene	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Fluorene	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Hexachlorobenzene	0.04	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Hexachlorobutadiene	0.5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Hexachlorocyclopentadiene	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Hexachloroethane	5	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Indeno[1,2,3-cd]pyrene	0.002	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Isophorone	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Naphthalene	10	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Nitrobenzene	0.4	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
N-Nitrosodi-n-propylamine	-	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
N-Nitrosodiphenylamine	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Pentachlorophenol	2	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 100 U	ND < 10 U
Phenanthrene	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Phenol	2	**3.2 J**	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Pyrene	50	ND < 25 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 50 U	ND < 5.0 U
Analyte (Method 8270 SIM ID)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
1,4-Dioxane	-	ND < 1.0 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 3

Groundwater Analytical Data Summary: Semi-Volatile Organic Compounds

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 8270D)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,1'-Biphenyl	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,2'-oxybis(1-Chloropropane)	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,4,5-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,4,6-Trichlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,4-Dichlorophenol	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,4-Dimethylphenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,4-Dinitrophenol	10	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2,4-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2,6-Dinitrotoluene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2-Chloronaphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2-Chlorophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2-Methylnaphthalene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2-Methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
2-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
2-Nitrophenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
3,3'-Dichlorobenzidine	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
3-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4,6-Dinitro-2-methylphenol	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Bromophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
4-Chloro-3-methylphenol	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
4-Chloroaniline	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
4-Chlorophenyl phenyl ether	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
4-Methylphenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitroaniline	5	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
4-Nitrophenol	1	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Acenaphthene	20	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Acenaphthylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Acetophenone	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	0.97 J	ND < 5.2 U	ND < 5.0 U
Anthracene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Atrazine	7.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzaldehyde	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzo(b)fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzo[a]anthracene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzo[a]pyrene	0	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzo[g,h,i]perylene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Benzo[k]fluoranthene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
bis(2-Chloroethoxy)methane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
bis(2-Chloroethyl) ether	1	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
bis(2-Ethylhexyl) phthalate	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Butyl benzyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Caprolactam	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Carbazole	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Chrysene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Dibenz[a,h]anthracene	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Dibenzofuran	-	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Diethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Dimethyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Di-n-butyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Di-n-octyl phthalate	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Fluoranthene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Fluorene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Hexachlorobenzene	0.04	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Hexachlorobutadiene	0.5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Hexachlorocyclopentadiene	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Hexachloroethane	5	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Indeno[1,2,3-cd]pyrene	0.002	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Isophorone	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Naphthalene	10	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Nitrobenzene	0.4	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
N-Nitrosodi-n-propylamine	-	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
N-Nitrosodiphenylamine	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Pentachlorophenol	2	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Phenanthrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Phenol	2	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Pyrene	50	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U	ND < 5.0 U	ND < 5.2 U	ND < 5.0 U
Analyte (Method 8270 SIM ID)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
1,4-Dioxane	-	ND < 0.20 U	ND < 2.0 U	ND < 0.20 U	ND < 0.21 U	ND < 0.20 U	ND < 0.21 U	ND < 0.20 U	ND < 0.20 U	0.21	ND < 0.20 U	ND < 0.20 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 4

Groundwater Analytical Data Summary: Organochlorine Pesticides

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aldrin	0	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Alpha-BHC	0.01	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	**0.026 J**	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Beta-BHC	0.04	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Delta-BHC	0.04	ND < 0.051 U	ND < 0.050 U	**0.12 J**	0.012 J	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	0.013 J	0.013 J	ND < 0.049 U	0.012 JB
Gamma-BHC	0.05	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Chlordane, technical	0.05	ND < 0.51 U	ND < 0.50 U	ND < 5.0 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.49 U	ND < 0.50 U
4,4'-DDD	0.3	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
4,4'-DDE	0.2	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
4,4'-DDT	0.2	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	0.014 J	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Dieldrin	0.004	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Endosulfan I	-	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	0.017 J	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Endosulfan II	-	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Endosulfan Sulfate	-	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Endrin	0	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Endrin Aldehyde	5	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Heptachlor	0.04	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Heptachlor Epoxide	0.03	ND < 0.051 U	ND < 0.050 U	ND < 0.50 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.049 U	ND < 0.050 U
Toxaphene	0.06	ND < 0.51 U	ND < 0.50 U	ND < 5.0 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.49 U	ND < 0.50 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 4

Groundwater Analytical Data Summary: Organochlorine Pesticides

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aldrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Alpha-BHC	0.01	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Beta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Delta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	0.011 JB	0.011 J	ND < 0.050 U
Gamma-BHC	0.05	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Chlordane, technical	0.05	ND < 0.50 U	**0.54**	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U
4,4'-DDD	0.3	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
4,4'-DDE	0.2	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
4,4'-DDT	0.2	0.014 J	ND < 0.050 U	ND < 0.050 U	0.017 J	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Dieldrin	0.004	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan I	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan II	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan Sulfate	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endrin Aldehyde	5	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Heptachlor	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Heptachlor Epoxide	0.03	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Toxaphene	0.06	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 4

Groundwater Analytical Data Summary: Organochlorine Pesticides

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aldrin	0	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Alpha-BHC	0.01	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Beta-BHC	0.04	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Delta-BHC	0.04	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Gamma-BHC	0.05	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Chlordane, technical	0.05	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U
4,4'-DDD	0.3	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
4,4'-DDE	0.2	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
4,4'-DDT	0.2	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	0.015 J
Dieldrin	0.004	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Endosulfan I	-	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Endosulfan II	-	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Endosulfan Sulfate	-	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Endrin	0	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Endrin Aldehyde	5	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Heptachlor	0.04	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Heptachlor Epoxide	0.03	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U
Toxaphene	0.06	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 4

Groundwater Analytical Data Summary: Organochlorine Pesticides

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aldrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Alpha-BHC	0.01	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Beta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Delta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	0.012 JB	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	0.011 J
Gamma-BHC	0.05	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Chlordane, technical	0.05	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U
4,4'-DDD	0.3	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
4,4'-DDE	0.2	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
4,4'-DDT	0.2	0.039 J	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Dieldrin	0.004	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan I	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan II	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endosulfan Sulfate	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Endrin Aldehyde	5	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Heptachlor	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Heptachlor Epoxide	0.03	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U
Toxaphene	0.06	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 4

Groundwater Analytical Data Summary: Organochlorine Pesticides

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 608)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aldrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Alpha-BHC	0.01	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Beta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Delta-BHC	0.04	ND < 0.050 U	ND < 0.050 U	0.012 JB	0.013 J	ND < 0.052 U	0.011 J	ND < 0.050 U	ND < 0.051 U	0.011 J	ND < 0.051 U	ND < 0.052 U
Gamma-BHC	0.05	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Chlordane, technical	0.05	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.52 U	ND < 0.52 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.51 U	ND < 0.52 U
4,4'-DDD	0.3	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
4,4'-DDE	0.2	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
4,4'-DDT	0.2	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	0.015 J	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Dieldrin	0.004	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Endosulfan I	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Endosulfan II	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Endosulfan Sulfate	-	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Endrin	0	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Endrin Aldehyde	5	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Heptachlor	0.04	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Heptachlor Epoxide	0.03	ND < 0.050 U	ND < 0.050 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U	ND < 0.052 U	ND < 0.050 U	ND < 0.051 U	ND < 0.050 U	ND < 0.051 U	ND < 0.052 U
Toxaphene	0.06	ND < 0.50 U	ND < 0.50 U	ND < 0.50 U	ND < 0.51 U	ND < 0.52 U	ND < 0.52 U	ND < 0.50 U	ND < 0.51 U	ND < 0.50 U	ND < 0.51 U	ND < 0.52 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 5

Groundwater Analytical Data Summary: Polychlorinated Biphenyls

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aroclor 1016	0.09	ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1221		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1232		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1242		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1248		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1254		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	0.039 J	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U
Aroclor 1260		ND < 0.060 U	ND < 0.060 U	ND < 0.062 U	ND < 0.057 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.58 U	ND < 0.060 U	ND < 0.060 U

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 5

Groundwater Analytical Data Summary: Polychlorinated Biphenyls

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aroclor 1016	0.09	ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1221		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1232		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1242		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1248		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1254		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	0.036 J	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U
Aroclor 1260		ND < 0.067 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.059 U	ND < 0.060 U

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 5

Groundwater Analytical Data Summary: Polychlorinated Biphenyls

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aroclor 1016	0.09	ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1221		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1232		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1242		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1248		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1254		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U
Aroclor 1260		ND < 0.066 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U	ND < 0.060 U	ND < 0.060 U	ND < 0.063 U

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 5

Groundwater Analytical Data Summary: Polychlorinated Biphenyls

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aroclor 1016	0.09	ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1221		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1232		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1242		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1248		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1254		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U
Aroclor 1260		ND < 0.12 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U	ND < 0.057 U	ND < 0.057 U	ND < 0.057 U

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 5

Groundwater Analytical Data Summary: Polychlorinated Biphenyls

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 608)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Aroclor 1016	0.09	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1221		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1232		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1242		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1248		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1254		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U
Aroclor 1260		ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.060 U	ND < 0.061 U	ND < 0.061 U	ND < 0.057 U	ND < 0.057 U	ND < 0.060 U

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 6

Groundwater Analytical Data Summary: Metals

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 6010C)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aluminum	-	81 J	240	2100	71 J	23300	ND < 200 U	ND < 200 U	7300	260	1100	64 J
Antimony	6	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Arsenic	**50**	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	10 J	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U
Barium	2000	200	54	61	80	290	1300 J	1300	130	37	81	20
Beryllium	3	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	1.2 J	ND < 2.0 U	ND < 2.0 U	0.49 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Cadmium	10	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	1.3 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Calcium	-	91000	96900	105000	126000	235000	110000	107000	221000	27800	86600	131000
Chromium	**100**	ND < 4.0 U	26	35	ND < 4.0 U	32	ND < 4.0 U	ND < 4.0 U	17	3 J	1.2 J	ND < 4.0 U
Cobalt	-	ND < 4.0 U	ND < 4.0 U	2.9 J	6.8	17	ND < 4.0 U	ND < 4.0 U	4.7	ND < 4.0 U	ND < 4.0 U	0.78 J
Copper	1000	ND < 10 U	3.2 J	13	ND < 10 U	26	ND < 10 U	ND < 10 U	29	6.6 J	2.8 J	ND < 10 U
Iron	**600**	**870**	570	**3300**	420	**37300**	380	99	**9400**	190	**1200**	530
Lead	50	ND < 10 U	ND < 10 U	5.8 J	ND < 10 U	12	ND < 10 U	ND < 10 U	100 J	ND < 10 U	ND < 10 U	ND < 10 U
Magnesium	**35000**	**40300**	30800	25100	30000	84100	**43300**	**41100**	30800	4600	22500	**45400**
Manganese	**600**	69 B	**670 J**	100 J	**1600 J**	**720 JB**	73	41 JB	170 B	26 J	49 B	190 JB
Nickel	**200**	ND < 10 U	13	46	6.7 J	36	ND < 10 U	ND < 10 U	65	2.2 J	1.4 J	3.5 J
Potassium	-	3300	1600	2200	930	14900	3000	4300	8800	6700	990	2000
Selenium	20	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U
Silver	100	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U
Sodium	-	33500	49300	41300	21300	332000	54500	117000	41000	139000	8100	9700
Thallium	0.5	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Vanadium	-	ND < 5.0 U	16	8.6	ND < 5.0 U	34	ND < 5.0 U	ND < 5.0 U	15	4.4 J	2.5 J	ND < 5.0 U
Zinc	5000	ND < 10 U	7.4 J	590 J	ND < 10 U	67 JB	ND < 10 U	ND < 10 U	140 B	ND < 10 U	5.5 JB	1.7 JB
Analyte (Method 7470A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Mercury	1.4	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U
Analyte (Method 7196A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Chromium VI	**100**	ND < 10 U	15	5.9 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 6

Groundwater Analytical Data Summary: Metals

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 6010C)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aluminum	-	730 J	1100	78 J	69 J	1100	ND < 200 U	NA	60 J	240	ND < 200 U	68 J
Antimony	6	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	NA	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Arsenic	**50**	**87 J**	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U
Barium	2000	150 B	62	45	1900	84	75	200	91 B	55	53	83
Beryllium	3	0.54 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	NA	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Cadmium	10	0.55 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Calcium	-	126000 B	113000	97900	102000	137000 B	153000	NA	86100 B	137000	166000	205000
Chromium	**100**	3.5 J	1.1 J	ND < 4.0 U	ND < 4.0 U	5.2	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	1.1 J	ND < 4.0 U	ND < 4.0 U
Cobalt	-	1.8 J	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	2.6 J	ND < 4.0 U	NA	ND < 4.0 U	2.4 J	ND < 4.0 U	ND < 4.0 U
Copper	1000	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	NA	ND < 10 U	8.7 J	ND < 10 U	ND < 10 U
Iron	**600**	**96600 B**	**1500**	180	**1500**	**1900 B**	220	NA	120 B	**4800**	67	**680**
Lead	50	7.4 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Magnesium	**35000**	**53900 B**	28700 J	29900	**38600**	**37500**	**44600**	NA	34800 B	**39900**	**46700 J**	**86000**
Manganese	**600**	310	160 J B	120 J	81 JB	**1000 B**	250 B	NA	12	440 JB	98 J	400 JB
Nickel	**200**	2.7 J	1.6 J	ND < 10 U	ND < 10 U	9.3 J	ND < 10 U	NA	2.8 J	2.3 J	4.1 J	ND < 10 U
Potassium	-	1900	1600	3400	6000	1900	3700	NA	2700	2700	3300	5300
Selenium	20	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U
Silver	100	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U
Sodium	-	13600 B	10100	61200	216000	23600	178000	NA	24000 B	111000	120000	249000
Thallium	0.5	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	NA	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Vanadium	-	29	2.5 J	ND < 5.0 U	ND < 5.0 U	1.8 J	ND < 5.0 U	NA	ND < 5.0 U	3 J	ND < 5.0 U	ND < 5.0 U
Zinc	5000	18 B	4.6 JB	ND < 10 U	ND < 10 U	4.4 JB	ND < 10 U	NA	ND < 10 U	1.7 JB	ND < 10 U	1.5 JB
Analyte (Method 7470A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Mercury	1.4	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U
Analyte (Method 7196A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Chromium VI	**100**	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	6.8 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 6

Groundwater Analytical Data Summary: Metals

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 6010C)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aluminum	-	1800 J	1700	61 J	640	610	ND < 200 U	ND < 200 U	ND < 200 U	NA	ND < 200 U	750 J
Antimony	6	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	NA	ND < 20 U	ND < 20 U
Arsenic	**50**	9 J	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	7.2 J	ND < 15 U	ND < 15 U	ND < 15 U
Barium	2000	330 B	100	49	170	47	34	29	1200 B	49	270 J	66 B
Beryllium	3	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	NA	ND < 2.0 U	ND < 2.0 U
Cadmium	10	0.57 J	0.57 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	0.51 J	ND < 2.0 U	ND < 2.0 U	0.53 J	ND < 2.0 U	0.8 J
Calcium	-	75600 B	109000	131000	129000	159000	158000	153000	64900 B	NA	122000	197000 B
Chromium	**100**	3.4 J	18	ND < 4.0 U	1.2 J	6.0	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	1.7 J
Cobalt	-	ND < 4.0 U	2.7 J	ND < 4.0 U	0.64 J	0.8 J	ND < 4.0 U	2.9 J	ND < 4.0 U	NA	ND < 4.0 U	1.2 J
Copper	1000	ND < 10 U	2.0 J	ND < 10 U	1.9 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	NA	ND < 10 U	ND < 10 U
Iron	**600**	**2500 B**	**2700**	**14400**	**4200**	**2700**	**1600**	120	**2600 B**	NA	**4700**	**3200 B**
Lead	50	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 50 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Magnesium	**35000**	**45600 B**	31200	**55100**	28200	**69300**	**87000**	42600	24800 B	NA	**38600**	**55800 B**
Manganese	**600**	29	74 B	55 JB	97 JB	500 B	170 B	**880 JB**	550	NA	**810**	160
Nickel	**200**	2.8 J	21	ND < 10 U	7.8 J	3.8 J	ND < 10 U	5.0 J	ND < 10 U	NA	ND < 10 U	5.3 J
Potassium	-	8400	1400	2500	2400	1700	4200	2000	2400	NA	3300	2400
Selenium	20	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U
Silver	100	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U
Sodium	-	57200 B	9000	22600	16200	32300	55500	37800	42600 B	NA	118000	405000 B
Thallium	0.5	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	NA	ND < 20 U	ND < 20 U
Vanadium	-	4.5 J	6.8	ND < 5.0 U	2.1 J	6.4	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	NA	ND < 5.0 U	1.8 J
Zinc	5000	23 B	54 B	ND < 10 U	6.1 JB	4.2 JB	8.5 JB	4.4 JB	ND < 10 U	NA	ND < 10 U	24 B
Analyte (Method 7470A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Mercury	1.4	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U
Analyte (Method 7196A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Chromium VI	**100**	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	5.6 J	ND < 10 U	ND < 10 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 6

Groundwater Analytical Data Summary: Metals

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 6010C)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aluminum	-	300	400	120 J	ND < 200 U	ND < 200 U	67 J	ND < 200 U	170 J	89 J	270	ND < 200 U
Antimony	6	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 40 U	ND < 20 U	ND < 20 U	ND < 40 U	ND < 20 U
Arsenic	**50**	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	17 J	ND < 15 U	ND < 15 U	14 J	ND < 15 U
Barium	2000	250	370	420	35	31	460	41	150	110	46	68
Beryllium	3	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Cadmium	10	0.62 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	2.9	ND < 2.0 U	1.8 J
Calcium	-	129000	112000	51400	222000 B	428000 B	228000	255000	54900	204000	215000	147000
Chromium	**100**	6.8	ND < 4.0 U	ND < 4.0 U	12	ND < 4.0 U	ND < 4.0 U	**11400**	5.5	4.6	**12900**	ND < 4.0 U
Cobalt	-	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	ND < 4.0 U	2.7 J	0.65 J	1.4 J	ND < 4.0 U
Copper	1000	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Iron	**600**	470	**950**	**960**	490 B	380 B	140	38 J	**1000**	**1100**	300	490
Lead	50	ND < 20 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Magnesium	**35000**	23500	25300	18100	**74500**	**154000**	**57300**	**90500**	16700	**49000**	**78500**	**61600**
Manganese	**600**	71 B	**2500 JB**	61 JB	32 B	120 B	110 J	18 J	**1400 JB**	170 J	59 J	110 J
Nickel	**200**	12	3.0 J	1.3 J	4.1 J	ND < 10 U	2.8 J	4.7 J	4.6 J	4.2 J	6 J	2.7 J
Potassium	-	7100	3000	5400	3800	7200	3600	6500	2100	6500	7300	3900
Selenium	20	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U
Silver	100	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U
Sodium	-	249000	38000	305000	95800	327000	598000	881000	355000	528000	950000	115000
Thallium	0.5	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Vanadium	-	3.7 J	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Zinc	5000	42 B	23 JB	20 JB	610 B	5.8 JB	170	ND < 20 U	3.1 JB	19 J	ND < 20 U	5.0 J
Analyte (Method 7470A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Mercury	1.4	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U
Analyte (Method 7196A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Chromium VI	**100**	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	**11800**	ND < 10 U	ND < 10 U	**12900**	ND < 10 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 6

Groundwater Analytical Data Summary: Metals

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 6010C)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Aluminum	-	ND < 200 U	13700	460	93 J	ND < 200 U	450	ND < 200 U	140 J	710 J	120 J	ND < 200 U
Antimony	6	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Arsenic	**50**	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U	ND < 15 U
Barium	2000	30	240	60	130 J	110 J	63 J	84	120	59 J	13	30
Beryllium	3	ND < 2.0 U	0.67 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Cadmium	10	0.69 J	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U	ND < 2.0 U
Calcium	-	230000 B	122000	163000	173000	175000	167000	143000 B	144000 B	85900 J	330000 B	206000 B
Chromium	**100**	ND < 4.0 U	18	**2700**	ND < 4.0 U	ND < 4.0 U	**2100**	1.6 J	ND < 4.0 U	1.1 J	1.4 J	ND < 4.0 U
Cobalt	-	ND < 4.0 U	12	3.8 J	2.6 J	ND < 4.0 U	7.8	2.3 J	ND < 4.0 U	ND < 4.0 U	1.1 J	ND < 4.0 U
Copper	1000	ND < 10 U	16	18	ND < 10 U	ND < 10 U	29	1.7 J	ND < 10 U	2.5 J	ND < 10 U	ND < 10 U
Iron	**600**	**5200 B**	**19100**	**14000**	**1000**	**1400**	**8500**	420 B	290 B	43 J	**1500 B**	**1600 B**
Lead	50	ND < 10 U	5.9 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Magnesium	**35000**	**60200**	**58900**	**51200**	**47500**	**48000**	**48000**	**35100**	33500	ND < 200 U	**103000**	**64900**
Manganese	**600**	**1200 B**	420 JB	160 JB	**1200**	450	**810**	**1500 B**	320 B	ND < 3.0 U	**1400 B**	**1100 B**
Nickel	**200**	2.4 J	21	130	4.1 J	ND < 10 U	**220**	25	2.7 J	35 J	19	ND < 10 U
Potassium	-	2000	9700	3200	3300	1300	1300	1600	2000	12000 J	9400	7300
Selenium	20	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U	ND < 25 U
Silver	100	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U	ND < 6.0 U
Sodium	-	34500	49100	129000	151000	74300	17900	89200	85600	37200 J	121000	168000
Thallium	0.5	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U	ND < 20 U
Vanadium	-	ND < 5.0 U	21	11	ND < 5.0 U	ND < 5.0 U	11	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U	ND < 5.0 U
Zinc	5000	ND < 10 U	32 JB	4.8 JB	ND < 10 U	ND < 10 U	2.7 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U
Analyte (Method 7470A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Mercury	1.4	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U	ND < 0.20 U
Analyte (Method 7196A)	**TOGS 1.1.1 WQS (ug/L)**	**Concentrations reported in micrograms per liter (ug/L)**										
Chromium VI	**100**	ND < 10 U	ND < 10 U	ND < 10 U	9.5 J	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U	ND < 10 U

NOTES:

Bold values indicate analytical result exceedes TOGS 1.1.1 WQS

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

U = Analyte analyzed for, but not detected above the sample's reported quantitation limit

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 7

Groundwater Analytical Data Summary: Perfluoroalkyl and Polyfluoroalkyl Substances

Sample Location		B-1	BFS-1	BFS-2	LAE-4	MW-4	MW-5	MW-6	MW-7	MW-8	RFI-01	RFI-02
Sample Date		6/1/2018	5/31/2018	5/31/2018	5/31/2018	6/4/2018	6/12/2018	6/4/2018	6/1/2018	5/31/2018	6/1/2018	6/4/2018
Analytes (Method 537 [Modified] PFC IDA)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Perfluorobutanoic acid (PFBA)	-	0.0034 B	NA	0.0044 B	NA	0.008 B	0.014 JB	0.002 B	0.14 B	0.012 B	0.0025 B	0.00088 JB
Perfluoropentanoic acid (PFPeA)	-	0.0025 B	NA	0.0039 B	NA	0.00075 JB	ND < 0.0017 U	0.00071 JB	0.089 B	ND < 0.0018 U	0.001 JB	0.00094 JB
Perfluorohexanoic acid (PFHxA)	-	0.00064 JB	NA	0.0012 JB	NA	0.0006 JB	0.00022 J	0.00072 JB	0.0032 B	0.0023 B	0.00085 JB	0.001 JB
Perfluoroheptanoic acid (PFHpA)	-	0.00036 JB	NA	0.0015 JB	NA	0.00033 JB	ND < 0.0017 U	0.00036 JB	0.0015 JB	0.001 JB	0.00079 JB	0.00035 JB
Perfluorooctanoic acid (PFOA)	-	ND < 0.0018 U	NA	0.0014 J	NA	0.00059 JB	ND < 0.0017 U	0.00058 JB	0.0025 B	0.0016 J	0.0016 J	0.0008 JB
Perfluorononanoic acid (PFNA)	-	0.00046 J	NA	0.00092 J	NA	0.00034 JB	ND < 0.0017 U	0.00038 JB	0.00061 JB	0.00085 J	0.00045 J	0.00043 JB
Perfluorodecanoic acid (PFDA)	-	ND < 0.0018 U	NA	0.00056 J	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	0.00046 J	0.00062 J	0.00043 J	ND < 0.0017 U
Perfluoroundecanoic acid (PFUnA)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U
Perfluorododecanoic acid (PFDoA)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U
Perfluorotridecanoic acid (PFTriA)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U
Perfluorotetradecanoic acid (PFTeA)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U
Perfluorobutane Sulfonate (PFBS)	-	ND < 0.0018 U	NA	0.0039	NA	0.0011 J	ND < 0.0017 U	ND < 0.0018 U	0.052	0.0019	0.0013 J	ND < 0.0017 U
Perfluorohexane sulfonate (PFHxS)	-	0.00093 JB	NA	0.0012 JB	NA	0.00096 JB	ND < 0.0017 U	0.00092 JB	0.0013 JB	0.0014 JB	0.0033 B	0.0073 B
Perfluoroheptane sulfonic acid (PFHpS)	-	0.00045 J	NA	0.00046 J	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	0.00051 J	ND < 0.0018 U	0.00044 J	ND < 0.0017 U
Perfluorooctane sulphonic acid (PFOS)	-	0.00029 JB	NA	0.0017 JB	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	0.0026	0.00075 JB	0.0094 B	0.0014 J
Perfluorodecane sulfonic acid (PFDS)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U
Perfluorooctane Sulfonamide (PFOSA)	-	0.0006 JB	NA	ND < 0.0018 U	NA	0.00059 J	ND < 0.0017 U	0.00058 J	0.00063 J	0.00062 JB	ND < 0.0018 U	ND < 0.0017 U
N-METHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	0.00065 J	NA	0.0007 J	NA	0.00066 JB	ND < 0.017 U	ND < 0.0018 U	ND < 0.0018 U	0.0008 J	0.00068 J	ND < 0.0017 U
N-ETHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	ND < 0.017 U	ND < 0.0018 U	ND < 0.0018 U	0.00065 JB	0.00066 JB	ND < 0.0017 U
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	-	ND < 0.0018 U	NA	ND < 0.0018 U	NA	ND < 0.0017 U	0.0014 J	ND < 0.0018 U	0.00078 J	0.0021 B	ND < 0.0018 U	0.0028
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	-	0.0011 JB	NA	0.00077 JB	NA	0.00064 JB	ND < 0.017 U	ND < 0.0018 U	0.00065 JB	0.00065 JB	ND < 0.0018 U	0.00071 JB

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 7

Groundwater Analytical Data Summary: Perfluoroalkyl and Polyfluoroalkyl Substances

Sample Location		RFI-04	RFI-05A	RFI-06	RFI-08A	RFI-09	RFI-10	RFI-11	RFI-12	RFI-16	RFI-17	RFI-18
Sample Date		6/13/2018	6/1/2018	5/31/2018	6/4/2018	5/30/2018	6/1/2018	6/5/2018	6/13/2018	6/4/2018	5/31/2018	6/4/2018
Analytes (Method 537 [Modified] PFC IDA)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Perfluorobutanoic acid (PFBA)	-	ND < 0.0017 U	0.0061 B	0.0018 B	0.0021 B	0.0044 B	NA	0.088 B	0.0029 JB	0.0083 B	NA	0.0051 B
Perfluoropentanoic acid (PFPeA)	-	0.00072 J	0.0022 B	0.0011 JB	0.0011 JB	0.0069 B	NA	0.043 B	ND < 0.0017 U	0.002 B	NA	0.0013 JB
Perfluorohexanoic acid (PFHxA)	-	0.00049 J	0.00071 JB	0.00083 JB	0.00068 JB	ND < 0.0017 U	NA	0.0036 B	ND < 0.0017 U	0.0008 JB	NA	0.00091 JB
Perfluoroheptanoic acid (PFHpA)	-	ND < 0.0017 U	0.00042 JB	0.00056 JB	0.00038 JB	0.00041 JB	NA	0.00075 JB	ND < 0.0017 U	0.00046 JB	NA	0.00042 JB
Perfluorooctanoic acid (PFOA)	-	0.00028 J	0.001 JB	0.00086 J	0.00058 JB	0.0014 J	NA	0.0013 JB	0.00031 J	0.0022 B	NA	0.00081 JB
Perfluorononanoic acid (PFNA)	-	ND < 0.0017 U	0.0004 JB	0.00036 J	0.00037 JB	0.00057 J	NA	ND < 0.0017 U	ND < 0.0017 U	0.00052 JB	NA	0.00049 JB
Perfluorodecanoic acid (PFDA)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	0.00042 J	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluoroundecanoic acid (PFUnA)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluorododecanoic acid (PFDoA)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluorotridecanoic acid (PFTriA)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluorotetradecanoic acid (PFTeA)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluorobutane Sulfonate (PFBS)	-	ND < 0.0017 U	0.0016 J	ND < 0.0017 U	ND < 0.0018 U	0.0025	NA	0.0027	ND < 0.0017 U	0.002	NA	0.0012 J
Perfluorohexane sulfonate (PFHxS)	-	ND < 0.0017 U	0.0011 JB	0.00099 JB	0.001 JB	0.0012 JB	NA	ND < 0.0017 U	ND < 0.0017 U	0.0014 JB	NA	0.001 JB
Perfluoroheptane sulfonic acid (PFHpS)	-	ND < 0.0017 U	ND < 0.0018 U	0.00044 J	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	0.00043 J	NA	ND < 0.0018 U
Perfluorooctane sulphonic acid (PFOS)	-	ND < 0.0017 U	0.00028 J	ND < 0.0017 U	ND < 0.0018 U	0.00072 JB	NA	0.00028 J	ND < 0.0017 U	0.0047	NA	ND < 0.0018 U
Perfluorodecane sulfonic acid (PFDS)	-	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0017 U	NA	ND < 0.0018 U
Perfluorooctane Sulfonamide (PFOSA)	-	ND < 0.0017 U	0.00063 J	0.00065 JB	0.00062 J	0.00059 JB	NA	0.00058 J	ND < 0.0017 U	0.00056 J	NA	0.00059 J
N-METHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	ND < 0.017 U	0.00066 JB	0.00064 J	ND < 0.0018 U	0.00068 J	NA	ND < 0.0017 U	ND < 0.017 U	ND < 0.0017 U	NA	0.00067 JB
N-ETHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	ND < 0.017 U	0.00058 JB	ND < 0.0017 U	0.00054 JB	0.00067 JB	NA	0.00055 JB	ND < 0.017 U	ND < 0.0017 U	NA	0.00056 JB
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	-	0.0044 J	0.0015 J	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	NA	ND < 0.0017 U	ND < 0.017 U	ND < 0.0017 U	NA	ND < 0.0018 U
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	-	ND < 0.017 U	0.00095 JB	ND < 0.0017 U	0.00063 JB	0.00072 JB	NA	0.00063 JB	ND < 0.017 U	0.00061 JB	NA	0.00068 JB

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 7

Groundwater Analytical Data Summary: Perfluoroalkyl and Polyfluoroalkyl Substances

Sample Location		RFI-19	RFI-22	RFI-23	RFI-24	RFI-25	RFI-26	RFI-27	RFI-28	RFI-29	RFI-30	RFI-31
Sample Date		6/13/2018	6/1/2018	6/4/2018	6/4/2018	6/1/2018	6/1/2018	6/4/2018	6/13/2018	6/5/2018	6/12/2018	6/13/2018
Analytes (Method 537 [Modified] PFC IDA)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Perfluorobutanoic acid (PFBA)	-	0.0029 JB	0.0036 B	0.0035 B	0.02 B	0.01 B	0.0041 B	0.0047 B	0.00044 JB	0.0022 B	0.011 JB	NA
Perfluoropentanoic acid (PFPeA)	-	ND < 0.0019 U	0.001 JB	0.0057 B	0.0051 B	0.018 B	0.0005 JB	0.0018 B	ND < 0.0018 U	0.00092 JB	0.0031 J	NA
Perfluorohexanoic acid (PFHxA)	-	ND < 0.0019 U	0.00084 JB	0.00082 JB	0.0032 B	0.0018 B	0.00075 JB	0.00078 JB	ND < 0.0018 U	0.00087 JB	0.00038 J	NA
Perfluoroheptanoic acid (PFHpA)	-	ND < 0.0019 U	0.00059 JB	0.00038 JB	0.0021 B	0.0011 JB	0.0004 JB	0.00051 JB	ND < 0.0018 U	0.00044 JB	0.00054 J	NA
Perfluorooctanoic acid (PFOA)	-	0.00040 J	0.0018	0.0005 JB	0.003 B	0.004	0.00071 JB	0.00065 JB	0.00031 J	0.00053 JB	0.0016 J	NA
Perfluorononanoic acid (PFNA)	-	ND < 0.0019 U	0.00042 J	0.0004 JB	0.00061 JB	0.001 J	0.00035 JB	0.00037 JB	ND < 0.0018 U	0.00035 JB	ND < 0.0017 U	NA
Perfluorodecanoic acid (PFDA)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	0.0004 J	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluoroundecanoic acid (PFUnA)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorododecanoic acid (PFDoA)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorotridecanoic acid (PFTriA)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorotetradecanoic acid (PFTeA)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorobutane Sulfonate (PFBS)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	0.0018	0.0089	0.0015 J	0.0021	ND < 0.0018 U	ND < 0.0018 U	0.0015 J	NA
Perfluorohexane sulfonate (PFHxS)	-	ND < 0.0019 U	0.0018 B	0.00093 JB	0.0019 B	0.014 B	0.0012 JB	0.0011 JB	0.00041 J	0.001 JB	0.00035 J	NA
Perfluoroheptane sulfonic acid (PFHpS)	-	ND < 0.0019 U	0.00061 J	ND < 0.0017 U	ND < 0.0018 U	0.00058 J	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorooctane sulphonic acid (PFOS)	-	ND < 0.0019 U	0.0049 B	ND < 0.0017 U	0.0018	0.043 B	ND < 0.0017 U	0.00035 J	ND < 0.0018 U	ND < 0.0018 U	0.00081 J	NA
Perfluorodecane sulfonic acid (PFDS)	-	ND < 0.0019 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0018 U	ND < 0.0017 U	NA
Perfluorooctane Sulfonamide (PFOSA)	-	ND < 0.0019 U	0.00059 JB	0.00058 J	0.00061 J	0.00072 JB	ND < 0.0017 U	0.0006 J	ND < 0.0018 U	0.00058 J	ND < 0.0017 U	NA
N-METHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	ND < 0.019 U	0.00066 J	0.00067 JB	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	0.00079 JB	ND < 0.018 U	ND < 0.0018 U	ND < 0.017 U	NA
N-ETHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	ND < 0.019 U	0.00073 JB	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	0.00073 JB	ND < 0.018 U	ND < 0.0018 U	ND < 0.017 U	NA
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	-	0.00099 J	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	ND < 0.0017 U	ND < 0.0017 U	ND < 0.0018 U	0.0044 J	ND < 0.0018 U	ND < 0.017 U	NA
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	-	ND < 0.019 U	ND < 0.0017 U	0.00075 JB	ND < 0.0018 U	0.00064 JB	ND < 0.0017 U	0.00064 JB	ND < 0.018 U	0.00062 JB	ND < 0.017 U	NA

NOTES:

TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000

µg/L = micrograms per liter

- = no published regulatory standard

J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample

B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.

NA = not analyzed

Table 7

Groundwater Analytical Data Summary: Perfluoroalkyl and Polyfluoroalkyl Substances

Sample Location		RFI-34	RFI-35	RFI-36	TW-12	TW-13	TW-14	TW-15	TW-5A	TW-6	TW-7	TW-8
Sample Date		6/1/2018	6/4/2018	6/4/2018	5/30/2018	5/30/2018	5/31/2018	5/31/2018	6/4/2018	5/31/2018	5/31/2018	5/31/2018
Analytes (Method 537 [Modified] PFC IDA)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Perfluorobutanoic acid (PFBA)	-	0.023 B	NA	0.0036 B	NA	NA	NA	NA	0.013 B	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	-	0.0098 B	NA	0.00064 JB	NA	NA	NA	NA	0.0004 JB	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	-	0.0029 B	NA	0.00076 JB	NA	NA	NA	NA	0.0016 JB	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	-	0.002 B	NA	0.00035 JB	NA	NA	NA	NA	0.0013 JB	NA	NA	NA
Perfluorooctanoic acid (PFOA)	-	0.0049 B	NA	0.00067 JB	NA	NA	NA	NA	0.0024 B	NA	NA	NA
Perfluorononanoic acid (PFNA)	-	0.00099 JB	NA	0.00037 JB	NA	NA	NA	NA	0.00082 JB	NA	NA	NA
Perfluorodecanoic acid (PFDA)	-	0.00081 J	NA	ND < 0.0017 U	NA	NA	NA	NA	0.00049 J	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	-	0.00039 JB	NA	0.00037 JB	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	-	ND < 0.0018 U	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorotridecanoic acid (PFTriA)	-	ND < 0.0018 U	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	-	ND < 0.0018 U	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorobutane Sulfonate (PFBS)	-	0.0025	NA	ND < 0.0017 U	NA	NA	NA	NA	0.007	NA	NA	NA
Perfluorohexane sulfonate (PFHxS)	-	0.0015 JB	NA	0.00097 JB	NA	NA	NA	NA	0.0012 JB	NA	NA	NA
Perfluoroheptane sulfonic acid (PFHpS)	-	ND < 0.0018 U	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorooctane sulphonic acid (PFOS)	-	0.0036	NA	ND < 0.0017 U	NA	NA	NA	NA	0.0003 J	NA	NA	NA
Perfluorodecane sulfonic acid (PFDS)	-	ND < 0.0018 U	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	-	0.00064 J	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
N-METHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	0.00067 JB	NA	ND < 0.0017 U	NA	NA	NA	NA	0.00071 JB	NA	NA	NA
N-ETHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	0.00078 JB	NA	ND < 0.0017 U	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	-	0.012	NA	0.0025	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	-	0.0013 JB	NA	0.00059 JB	NA	NA	NA	NA	ND < 0.0018 U	NA	NA	NA

NOTES:
TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000
µg/L = micrograms per liter
- = no published regulatory standard
J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample
B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.
NA = not analyzed

Table 7

Groundwater Analytical Data Summary: Perfluoroalkyl and Polyfluoroalkyl Substances

Sample Location		TW-9	WP-3A	WP-4	WP-5	WP-7	WP-8	WT-1A	WT-1B	WT-2	WT-3	WT-4
Sample Date		5/30/2018	6/4/2018	6/4/2018	6/12/2018	6/12/2018	6/12/2018	5/30/2018	5/30/2018	5/31/2018	5/30/2018	5/30/2018
Analytes (Method 537 [Modified] PFC IDA)	TOGS 1.1.1 WQS (ug/L)	Concentrations reported in micrograms per liter (ug/L)										
Perfluorobutanoic acid (PFBA)	-	NA	NA	NA	NA	NA	0.00071 BJ	0.012 B	NA	NA	NA	0.0043 B
Perfluoropentanoic acid (PFPeA)	-	NA	NA	NA	NA	NA	0.00074 J	0.029 B	NA	NA	NA	0.0071 B
Perfluorohexanoic acid (PFHxA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.0014 JB	NA	NA	NA	0.0011 JB
Perfluoroheptanoic acid (PFHpA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.0010 JB	NA	NA	NA	0.00045 JB
Perfluorooctanoic acid (PFOA)	-	NA	NA	NA	NA	NA	0.00046 J	0.0018	NA	NA	NA	0.00099 J
Perfluorononanoic acid (PFNA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.00052 J	NA	NA	NA	0.00038 J
Perfluorodecanoic acid (PFDA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluoroundecanoic acid (PFUnA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluorododecanoic acid (PFDoA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluorotridecanoic acid (PFTriA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluorotetradecanoic acid (PFTeA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluorobutane Sulfonate (PFBS)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.013	NA	NA	NA	0.0038
Perfluorohexane sulfonate (PFHxS)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.0019 B	NA	NA	NA	0.0011 JB
Perfluoroheptane sulfonic acid (PFHpS)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	0.00046 J
Perfluorooctane sulphonic acid (PFOS)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.0012 JB	NA	NA	NA	0.00071 JB
Perfluorodecane sulfonic acid (PFDS)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
Perfluorooctane Sulfonamide (PFOSA)	-	NA	NA	NA	NA	NA	ND < 0.0017 U	0.0006 JB	NA	NA	NA	ND < 0.0017 U
N-METHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	NA	NA	NA	NA	NA	ND < 0.017 U	ND < 0.0018 U	NA	NA	NA	ND < 0.0017 U
N-ETHYL PERFLUOROOCTANE SULFONAMIDOACETIC ACID	-	NA	NA	NA	NA	NA	ND < 0.017 U	0.00065 JB	NA	NA	NA	ND < 0.0017 U
SODIUM 1H,1H,2H,2H-PERFLUOROOCTANE SULFONATE (6:2)	-	NA	NA	NA	NA	NA	0.00095 J	ND < 0.0018 U	NA	NA	NA	0.011 B
SODIUM 1H,1H,2H,2H-PERFLUORODECANE SULFONATE (8:2)	-	NA	NA	NA	NA	NA	ND < 0.017 U	0.00064 JB	NA	NA	NA	0.00091 JB

NOTES:
TOGS 1.1.1 WQS = Ambient Water Quality Standards Guidance Values and Groundwater Effluent Limitations, amended April 2000
µg/L = micrograms per liter
- = no published regulatory standard
J = Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample or Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample
B = An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.
NA = not analyzed

Appendix A – Category B Laboratory Analytical Reports

Appendix B – DUSR

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	See Table 1		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

Groundwater & Environmental Services (GES) contracted RemVer to perform a data quality assessment (DQA) on the analytical data for groundwater samples. reported in multiple Sample Delivery Groups (SDGs) from Test America. Table 1 (attached) lists nine (9) SDGs. Table 2 provides a cross-list of the samples associated with each SDG; some samples occur in two different SDGs.

RemVer prepared a separate DQA sub-report for each SDG, evaluating the performance of the analytical procedures and the quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. Each sub-report includes a narrative discussion of sample results qualified during the DQA/DUSR.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS or SIM
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☒ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. The monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs).

Significant Data Usability Issues

The laboratory (Test America) reported the data in nine separate laboratory reports, under distinct Sample Delivery Group (SDG) numbers. RemVer prepared nine sub-reports, one DUSR per SDG. RemVer rejected no results; therefore, all results are acceptable for use, although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section in each DUSR sub-report for further detail.

- DQA/DUSR Sub-report for SDG #200-43768 reviewed the analytical results of twenty-nine (29) samples (including MS/MSD, duplicates, and one blank).
- DQA/DUSR Sub-report for SDG #480-136667 reviewed the analytical results of eight (8) samples.
- DQA/DUSR Sub-report for SDG #480-136738 reviewed the analytical results of thirteen (13) samples (including MS/MSD and duplicate).
- DQA/DUSR Sub-report for SDG #480-136802 reviewed the analytical results of ten (10) samples (including MS/MSD, duplicate, and one blank).
- DQA/DUSR Sub-report for SDG #480-136863 reviewed the analytical results of fifteen (15) samples (including MS/MSD and duplicate).
- DQA/DUSR Sub-report for SDG #480-136912 reviewed the analytical results of two (2) samples.
- DQA/DUSR Sub-report for SDG #480-137324 reviewed the analytical results of five (5) samples.
- DQA/DUSR Sub-report for SDG #480-137419 reviewed the analytical results of five (5) samples.
- DQA/DUSR Sub-report for SDG #480-138505 reviewed the analytical results of seven (7) samples.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

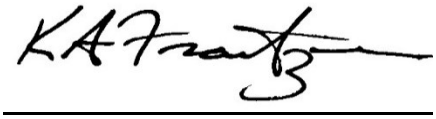
USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

Biography
Qualifier Flags

Tables

1. Sample Data Group List
2. Sample and SDG Cross-List



Prepared by: Kurt A. Frantzen, PhD
November 18, 2018

GES PO#746056-1109

Attachment

Biography
Data Usability Reviewer: Kurt A. Frantzen, PhD

Experience

2014-Present	AECC	Senior EHS Consultant
2013-Present	d/b/a RemVer	Owner
2011-2012	RemVer, Inc.	President
2006-2011	Kleinfelder	Senior Principal Scientist
2005	Kleinfelder	Principal Scientist, Part-Time/On Call
2004-2006	d/b/a Environmental Risk Group	Owner
2004-2006	RemVer, Inc., Larchmont, NY	Founder, President
1999-2004	VHB, Inc.	ERM Director & Associate
1997-1998	GEI Consultants, Inc.	Senior Project Manager
1992-1997	Ecology and Environment, Inc.	Technical Chief
1991-1992	EA Engineering, Science, & Technology, Inc.	Project Manager III
1990-1991	Ecology and Environment, Inc.	Technical Group Manager
1986-1990	Ecology and Environment, Inc.	Senior Environmental Scientist

Education

Am Cancer Soc. Post-Doctoral Fellow, U Washington 1985-1986

PhD—Life Sci. / Biochem, NU—Lincoln	1985
MS—Plant Pathology, Kansas State Univ.	1980
BS—Biology, NU—Omaha	1978

Registrations

Certified Hazardous Materials Manager, since 2007-2018, #14143

Professional Affiliations

Society Risk Analysis ('09 & '11 Chair, Eco-Risk Assessment)
Am. Chemistry Society
Am. Assoc. Advance Science
NY Academy of Science
Am. Institute of Biological Sciences
LSP Association

Other

- CERCLA & RCRA experience, as well as DOD (Air Force & Army) & DOE (INEL)
- NE Regional Experience—NY BCP; Mass MCP; & various sites in CT, RI & NH
- National Experience: NE, SE, Gulf & West Coast, Mid-west, Inter-mountain, California, Alaska
- International: Germany, Israel, Kuwait, Australia
- Selected Publications
    - *Using Risk Appraisals to Manage Environmentally Impaired Properties*, 2000, VHB Site Works, Report 108
    - *Risk-Based Analysis for Environmental Managers*, 2001, CRC/Lewis
    - Chapter 7 Risk Assessment, *Managing Hazardous Materials*, 2002 & 2009, IHMM
    - Chapter 22 Cleanup Goals, *Brownfields Law & Practice*, 2004-Present, Lexis/Nexis
    - *Use of Risk Assessment in Risk Management of Contaminated Sites*, 2008, ITRC
- 61 Conference Papers & Invited Professional Presentations
    - 1999-2018, Visiting Lecturer, Brownfields Program, Harvard Graduate School of Design
    - 2010-2013, Invited Lecturer, Pace University Law School

Attachment
Qualifier Flags

Qualifier	Quality Implication
U	Analyte analyzed for, but not detected above the sample's reported quantitation limit
J	Analyte positively identified at a numerical value that is the approximate concentration of the analyte in the sample
J +	Sample likely to have a high bias
J –	Sample likely to have a low bias
UJ	Analyte not detected above the sample quantitation limit; the associated quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample
N	The analysis indicates the present of an analyte for which there is presumptive evidence to make a "tentative identification."
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.
R	Sample result rejected due to serious deficiency in ability to analyze sample and meet quality control criteria; the presence or absence of the analyte cannot be confirmed. This qualifier also may apply when more than one sample result is generated for a target analyte (*i.e.*, dilutions or re-analyses), the most technically acceptable result is considered acceptable.
B | EB TB | BB	An analyte identified in method blank (B), aqueous equipment (EB), trip (TB), or bottle blanks (BB) used to assess field contamination associated with soil or sediment samples mandates these qualifiers for only soil and sediment sample results.
P	Use professional judgment based on data use. It usually has an "M" with it, which indicates that a manual check should be made if the data that are qualified with the "P" are important to the data user. In addition, "PM" also means a decision is necessary from the Project Manager (or a delegate) concerning the need for further review of the data (*see below*).
PM	A manual review of the raw data is recommended to determine if the defect affects data use, as in "R" above. This review should include consideration of potential affects that could result from using the "P" qualified data. For example, in the case of holding-time exceedance, the Project Manager or delegate can decide to use the data with no qualification when analytes of interest are known not to be adversely affected by holding-time exceedances. Another example is the case where soil sample duplicate analyses for metals exceed the precision criteria; because this is likely due to sample non-homogeneity rather than contract laboratory error, then the manager or delegate must decide how to use the data.

Table 1
Sample Data Group List
Al-Tech NYSDEC Site #907022
Dunkirk, New York

RemVer

Count	SDG	Report Date	# of Samples	Receipt by Lab	# of Coolers	Temps (°C)														
1	200-43768	06/22/18	29	06/08/18 10:30	2	1.5	2.6													
2	480-136667	06/13/18	8	05/30/18 19:00	8	20.6	20.9	21.5	21.8	22.0	22.3	22.6	23.0							
3	480-136738	06/14/18	13	05/31/18 20:20	15	2.3	2.8	2.9	3.1	3.2	3.3	3.5	3.8	3.9	4.0	4.1	4.5	4.6	5.2	5.6
4	480-136802	06/15/18	10	06/01/18 19:10	12	1.6	1.7	1.8	2.2	2.3	2.6	2.9	3.0	3.5	4.0	4.5	5.0			
5	480-136863	06/20/18	15	06/04/18 21:30	15	1.0	1.1	1.5	1.6	1.7	2.0	2.0	2.2	2.9	3.3	3.5	3.8	4.0	4.5	5.0
6	480-136912	06/21/18	2	06/05/18 17:25	2	2.9	3.1													
7	480-137324	06/26/18	5	06/12/18 19:35	7	0.9	1.0	1.5	2.3	2.8	3.0	3.6								
8	480-137419	06/28/18	5	06/13/18 23:10	7	0.1	0.9	1.5	1.8	2.0	2.6	3.1								
9	480-138505	08/09/18	7	06/29/18 17:15	1	4.0														

Table 2
Sample List and Sample Data Group Cross-List
Al-Tech NYSDEC Site #907022
Dunkirk, New York

RemVer

Count	Sample ID	QA/QC	Sample Date	Lab-SDG-#	Receipt by Lab	Lab-SDG-#	Receipt by Lab
1	B-1	Yes	06/01/18	200-43768-10	06/08/18 10:30	480-136802-5	06/01/18 19:10
2	BFS-1	Yes	05/31/18	480-136738-2	05/31/18 20:20	None	None
3	BFS-2	Yes	05/31/18	200-43768-5	06/08/18 10:30	480-136738-3	05/31/18 20:20
4	DUP-053118	Yes	05/31/18	480-136738-10	05/31/18 20:20	None	None
5	DUP-060118	Yes	06/01/18	200-43768-8	06/08/18 10:30	480-136802-3	06/01/18 19:10
6	DUP-060418	Yes	06/04/18	200-43768-21	06/08/18 10:30	480-136863-11	06/04/18 21:30
7	LAE-4	Target	05/31/18	480-136738-12	05/31/18 20:20	None	None
8	MW-4	Target	06/04/18	200-43768-23	06/08/18 10:30	480-136863-4	06/04/18 21:30
9	MW-5	Target	06/12/18	480-137324-4	06/12/18 19:35	480-138505-2	06/29/18 17:15
10	MW-6	Target	06/04/18	200-43768-25	06/08/18 10:30	480-136863-14	06/04/18 21:30
11	MW-7	Target	06/01/18	200-43768-15	06/08/18 10:30	480-136802-10	06/01/18 19:10
12	MW-8	Target	05/31/18	200-43768-4	06/08/18 10:30	480-136738-13	05/31/18 20:20
13	RFI-01	Target	06/01/18	200-43768-9	06/08/18 10:30	480-136802-4	06/01/18 19:10
14	RFI-02	Target	06/04/18	200-43768-17	06/08/18 10:30	480-136863-1	06/04/18 21:30
15	RFI-04	Target	06/13/18	480-137419-3	06/13/18 23:10	480-138505-6	06/29/18 17:15
16	RFI-05A	Target	06/01/18	200-43768-12	06/08/18 10:30	480-136802-7	06/01/18 19:10
17	RFI-06	Target	05/31/18	200-43768-6	06/08/18 10:30	480-136738-5	05/31/18 20:20
18	RFI-08A	Target	06/04/18	200-43768-20	06/08/18 10:30	480-136863-10	05/30/18 19:00
19	RFI-09	Target	05/30/18	200-43768-3	06/08/18 10:30	480-136667-4	05/30/18 19:00
20	RFI-10	Target	06/01/18	480-136802-1	06/01/18 19:10	None	None
21	RFI-11	Target	06/05/18	200-43768-29	06/08/18 10:30	480-136912-2	06/05/18 17:25
22	RFI-12	Target	06/13/18	480-137419-1	06/13/18 23:10	480-138505-4	06/29/18 17:15
23	RFI-16	Target	06/04/18	200-43768-22	06/08/18 10:30	480-136863-3	06/04/18 21:30
24	RFI-17	Target	05/31/18	480-136738-4	05/31/18 20:20	None	None
25	RFI-18	Target	06/04/18	200-43768-26	06/08/18 10:30	480-136863-15	06/04/18 21:30
26	RFI-19	Target	06/13/18	480-137419-2	06/13/18 23:10	480-138505-5	06/29/18 17:15
27	RFI-22	Target	06/01/18	200-43768-11	06/08/18 10:30	480-136802-6	06/01/18 19:10
28	RFI-23	Target	06/04/18	200-43768-27	06/08/18 10:30	480-136863-7	06/04/18 21:30
29	RFI-24	Target	06/04/18	200-43768-19	06/08/18 10:30	480-136863-2	06/04/18 21:30
30	RFI-25	Target	06/01/18	200-43768-7	06/08/18 10:30	480-136802-2	06/01/18 19:10
31	RFI-26	Target	06/01/18	200-43768-13	06/08/18 10:30	480-136802-8	06/01/18 19:10
32	RFI-27	Target	06/04/18	200-43768-16	06/08/18 10:30	480-136863-8	06/04/18 21:30
33	RFI-28	Target	06/13/18	480-137419-4	06/13/18 23:10	480-138505-7	06/29/18 17:15
34	RFI-29	Target	06/05/18	200-43768-28	06/08/18 10:30	480-136912-1	06/05/18 17:25
35	RFI-30	Target	06/12/18	480-137324-5	06/12/18 19:35	480-138505-3	06/29/18 17:15
36	RFI-31	Target	06/13/18	480-137419-5	06/13/18 23:10	None	None
37	RFI-34	Target	06/01/18	200-43768-14	06/08/18 10:30	480-136802-9	06/01/18 19:10
38	RFI-35	Target	06/04/18	480-136863-12	06/04/18 21:30	None	None
39	RFI-36	Target	06/04/18	200-43768-24	06/08/18 10:30	480-136863-13	06/04/18 21:30
40	TW-12	Target	05/30/18	480-136667-7	05/30/18 19:00	None	None
41	TW-13	Target	05/30/18	480-136667-8	05/30/18 19:00	None	None
42	TW-14	Target	05/31/18	480-136738-11	05/31/18 20:20	None	None
43	TW-15	Target	05/31/18	480-136738-6	05/31/18 20:20	None	None
44	TW-5A	Target	06/04/18	200-43768-18	06/08/18 10:30	480-136863-9	06/04/18 21:30
45	TW-6	Target	05/31/18	480-136738-8	05/31/18 20:20	None	None
46	TW-7	Target	05/31/18	480-136738-7	05/31/18 20:20	None	None
47	TW-8	Target	05/31/18	480-136738-9	05/31/18 20:20	None	None

Table 2
Sample List and Sample Data Group Cross-List
Al-Tech NYSDEC Site #907022
Dunkirk, New York

RemVer

Count	Sample ID	QA/QC	Sample Date	Lab-SDG-#	Receipt by Lab	Lab-SDG-#	Receipt by Lab
48	TW-9	Target	05/30/18	480-136667-6	05/30/18 19:00	None	None
49	WP-3A	Target	06/04/18	480-136863-6	06/04/18 21:30	None	None
50	WP-4	Target	06/04/18	480-136863-5	06/04/18 21:30	None	None
51	WP-5	Target	06/12/18	480-137324-2	06/12/18 19:35	None	None
52	WP-7	Target	06/12/18	480-137324-3	06/12/18 19:35	None	None
53	WP-8	Target	06/12/18	480-137324-1	06/12/18 19:35	480-138505-1	06/29/18 17:15
54	WT-1A	Target	05/30/18	200-43768-2	06/08/18 10:30	480-136667-2	05/30/18 19:00
55	WT-1B	Target	05/30/18	480-136667-3	05/30/18 19:00	None	None
56	WT-2	Target	05/31/18	480-136738-1	05/31/18 20:20	None	None
57	WT-3	Target	05/30/18	480-136667-5	05/30/18 19:00	None	None
58	WT-4	Target	05/30/18	200-43768-1	06/08/18 10:30	480-136667-1	05/30/18 19:00

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	200-43768		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data reported in Sample Delivery Groups (SDGs) #200-43768 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☐ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☐ Method 7196 Hexavalent Chromium (other:_____)
☐ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B Pesticides
☐ Method 8082 PCBs
☐ Method 8151 Chlorinated Herbicides
☐ Method 8260C VOCs GC/MS
☐ Method 8270D Semi-VOCs (sVOCs) GC/MS or SIM
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☒ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
☑ Method 3535 Solid-Phase Extraction (SPE)

Quality Control Requirements Summary

☒ Duplicate
☒ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☐ Trip Blank(s)
☒ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #200-43768, the samples of which came from a five-day collection event on May 30 & 31, 2018 and June 01, 04, & 05, 2018. Groundwater monitoring evaluation of PFAS from the listed wells was the purpose of this sampling event.

Significant Data Usability Issues In SDG: #200-43768

Of the twenty-nine (29) samples discussed herein, RemVer rejected no PFAS results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #200-43768)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #200-43768 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
WT-4	#-1	Water	05/30/18	06/08/18	480-136667-1
WT-1A	#-2	Water	05/30/18	06/08/18	480-136667-2
RFI-09	#-3	Water	05/30/18	06/08/18	480-136667-4
MW-8	#-4	Water	05/31/18	06/08/18	480-136738-13
BFS-2	#-5 (MS/MSD Batch 130595)	Water	05/31/18	06/08/18	480-136738-3
RFI-06	#-6	Water	05/31/18	06/08/18	480-136738-5
RFI-25	#-7	Water	06/01/18	06/08/18	480-136802-2
DUP-060118	#-8	Water	06/01/18	06/08/18	480-136802-3
RFI-01	#-9	Water	06/01/18	06/08/18	480-136802-4
B-1	#-10	Water	06/01/18	06/08/18	480-136802-5
RFI-22	#-11	Water	06/01/18	06/08/18	480-136802-6
RFI-05A	#-12 (MS/MSD Batch 130831)	Water	06/01/18	06/08/18	480-136802-7
RFI-26	#-13	Water	06/01/18	06/08/18	480-136802-8
RFI-34	#-14	Water	06/01/18	06/08/18	480-136802-9
MW-7	#-15	Water	06/01/18	06/08/18	480-136802-10
RFI-27	#-16	Water	06/04/18	06/08/18	480-136863-8
RFI-02	#-17	Water	06/04/18	06/08/18	480-136863-1
TW-5A	#-18	Water	06/04/18	06/08/18	480-136863-9
RFI-24	#-19	Water	06/04/18	06/08/18	480-136863-2

Sample ID	SDG #200-43768 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
RFI-08A	#-20	Water	06/04/18	06/08/18	480-136863-10
DUP-060418	#-21	Water	06/04/18	06/08/18	480-136863-11
RFI-16	#-22	Water	06/04/18	06/08/18	480-136863-3
MW-4	#-23	Water	06/04/18	06/08/18	480-136863-4
RFI-36	#-24	Water	06/04/18	06/08/18	480-136863-13
MW-6	#-25	Water	06/04/18	06/08/18	480-136863-14
RFI-18	#-26	Water	06/04/18	06/08/18	480-136863-15
RFI-23	#-27	Water	06/04/18	06/08/18	480-136863-7
RFI-29	#-28	Water	06/05/18	06/08/18	480-136912-1
RFI-11	#-29	Water	06/05/18	06/08/18	480-136912-2

The SDG included the following samples with their analyses:

138505	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs	PFAS
#–1	WT-4	—	—	—	—	—	—	—	X
#–2	WT-1A	—	—	—	—	—	—	—	X
#–3	RFI-09	—	—	—	—	—	—	—	X
#–4	MW-8	—	—	—	—	—	—	—	X
#–5	BFS-2	—	—	—	—	—	—	—	X
#–6	RFI-06	—	—	—	—	—	—	—	X
#–7	RFI-25	—	—	—	—	—	—	—	X
#-8	DUP-060118	—	—	—	—	—	—	—	X
#-9	RFI-01	—	—	—	—	—	—	—	X
#-10	B-1	—	—	—	—	—	—	—	X
#-11	RFI-22	—	—	—	—	—	—	—	X
#-12	RFI-05A	—	—	—	—	—	—	—	X
#-13	RFI-26	—	—	—	—	—	—	—	X
#-14	RFI-34	—	—	—	—	—	—	—	X
#-15	MW-7	—	—	—	—	—	—	—	X
#-16	RFI-27	—	—	—	—	—	—	—	X
#-17	RFI-02	—	—	—	—	—	—	—	X
#-18	TW-5A	—	—	—	—	—	—	—	X
#-19	RFI-24	—	—	—	—	—	—	—	X
#-20	RFI-08A	—	—	—	—	—	—	—	X
#-21	DUP-060418	—	—	—	—	—	—	—	X
#-22	RFI-16	—	—	—	—	—	—	—	X
#-23	MW-4	—	—	—	—	—	—	—	X
#-24	RFI-36	—	—	—	—	—	—	—	X
#-25	MW-6	—	—	—	—	—	—	—	X
#-26	RFI-18	—	—	—	—	—	—	—	X
#-27	RFI-23	—	—	—	—	—	—	—	X
#-28	RFI-29	—	—	—	—	—	—	—	X
#-29	RFI-11	—	—	—	—	—	—	—	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | PFAS: Perfluoroalkyl & Polyfluoroalkyl Substances (537) | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
200-138505	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
200-138505	Y	Y	None

Do all QC data fall within the protocol required limits and specifications?

(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
200-138505	☒	☐	☐	☐	☒	☐	☐	☐	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 2 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
200-138505	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
200-138505	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
200-138505	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
200-138505	Y	Several data qualifications were applied as described below

The following PFAS compound abbreviations are used throughout this DUSR:

Perfluorobutanoic acid (PFBA)
Perfluoropentanoic acid (PFPeA)
Perfluorohexanoic acid (PFHxA)
Perfluoroheptanoic acid (PFHpA)
Perfluorooctanoic acid (PFOA)
Perfluorononanoic acid (PFNA)
Perfluorodecanoic acid (PFDA)
Perfluoroundecanoic acid (PFUnA)
Perfluorododecanoic acid (PFDoA)
Perfluorotridecanoic Acid (PFTriA)
Perfluorotetradecanoic acid (PFTeA)

Perfluorobutanesulfonic acid (PFBS)
Perfluorohexanesulfonic acid (PFHxS)
Perfluoroheptanesulfonic Acid (PFHpS)
Perfluorooctanesulfonic acid (PFOS)
Perfluorodecanesulfonic acid (PFDS)
Perfluorooctane Sulfonamide (PFOSA)
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 13, 2018; and this group of twenty-nine samples were collected between May 30th and June 5, 2013. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced one SDG report #200-43768 (dated 22-Jun-18), which contained the required data and information.

The samples and supporting laboratory quality checks were run in two separate batches:

SDG #200-43768	**Group A**	**Group B**
Preparation Batch	130506	130574
Analytical Batch	130595	130831
Samples	#–1 – #–11	#–12 – #–29

Chain of Custody (COC) Evaluation

NYSDEC/GES produced one COC for the referenced fieldwork (single, multi-page COC). The laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received one cooler with samples on 6/8/2018 @ 10:30 AM (designated as SDG-#200-43768) in proper condition and, where required, on ice. The temperature of the two coolers at receipt was measured as 1.5 and 2.6ºC, respectively. Holding times and preservation requirements were met with no exceptions.

Blank Evaluation

The Method Blanks (MBs) for Method 537 (SDG-#200-43768) had detections of different PFAS compounds greater than the respective Method Detection Limit (MDL), but less than the Reporting Detection Limit (RDL), as indicated in the following table.

PFAS	**Batch #130595**	**Batch #130831**
	Samples: #–1 – #–11	Samples: #–12 – #–29
PFBA	MDL>X<RDL	MDL>X<RDL
PFPeA	MDL>X<RDL	MDL>X<RDL
PFHxA	MDL>X<RDL	MDL>X<RDL
PFHpA	MDL>X<RDL	MDL>X<RDL
PFOA	—	MDL>X<RDL
PFNA	—	MDL>X<RDL
PFUnA	—	MDL>X<RDL
PFHxS	MDL>X<RDL	MDL>X<RDL
PFOS	MDL>X<RDL	—
PFOSA	MDL>X<RDL	—
NMeFOSAA	—	MDL>X<RDL
NEtFOSAA	MDL>X<RDL	MDL>X<RDL
6:2	MDL>X<RDL	—
8:2	MDL>X<RDL	MDL>X<RDL

Therefore, detected concentrations of these compounds should be considered as estimates and flagged UB/B, but only if the associated sample reported a result greater than the respective MDL or RL.

Field Blanks (#-5 [BFS-2] and #-12 [B-1]) had certain detectable analytes (above their respective reporting limits [RLs]) as indicated below:

PFAS	#-5 [BFS-2]	#-10 [B-1]
PFBA	F–B B/UB	F–B B/UB
PFPeA	F–B B/UB	F–B B/UB
PFHxA	F–UB B/UB	F–UB B/UB
PFHpA	F–UB B/UB	F–UB B/UB
PFOA	F–UB	—
PFNA	F–UB	F–UB
PFDA	F–UB	—
PFUnA	—	—
PFDoA	—	—
PFTriA	—	—
PFTeA	—	—
PFBS	F–B	—
PFHxS	F–UB B/UB	F–UB B/UB
PFHpS	F–UB	F–UB
PFOS	F–UB B/UB	F–UB B/UB
PFDS	—	—
PFOSA	B/UB	F–UB B/UB
NMeFOSAA	F–UB	F–UB
NEtFOSAA	B/UB	B/UB
6:2	B/UB	B/UB
8:2	F–UB B/UB	F–UB B/UB

Note: B or UB—in MB F–B: Field Blank Sample X>RDL F–UB: Field Blank Sample MDL>X<RDL

Laboratory Control Samples (LCS)

The various LCS' were within the acceptable range for their particular analyses in SDG #200-43768, except for the isotope dilution (see discussion below).

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In this SDGs, there were no quality exceptions as the method uses isotope dilution (see discussion below).

Site-Specific Matrix Spikes and Matrix Spike Duplicates

The matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses used the following samples:

- Group A (Samples #-1 – #-11)—#-5 [BFS-2]
- Group B (Samples #-12 – #-29)—#-12 [RFI-05A]

Both sets of MS/MSD met the QA criteria, except for the isotope dilution (see discussion below).

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Duplicates

The samples associated with this SDG had two accompanying field replicates:

- #-8 [DUP-060118]
- #-21 [DUP-060418]

GES did not inform RemVer of the well samples associated with each of these replicates; therefore, we were unable to evaluate performance in this instance. Therefore, this is not a significant quality issue as it can be handled by GES directly (*note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision are within acceptable limits*). Regardless, the analytical Method Duplicates met their RPD performance criteria according to TA.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues; however, if an analyte was above the MDL but below the RL, then it was flagged as "UJ".

Isotope Dilution Analyte (IDA)

Isotope Dilution Analyte (IDA) recovery for certain compounds were either less than or greater than the method recommended limits.

Isotope–PFAS	QC Issue	Effected Sample(s)
13C4-PFBA	<LCL	#-1, -2, -3, -5 [& MS/MSD], -7, -8, -9 #-14, -15, -18, -22, -27, -29
M2-6:2FTS	>UCL	#-1, -2, -3, -4, -5 [& MS/MSD], -7, -8 #-12 [& MS/MSD], -14, -15, -16, -17, -18, -19, -20, -22, -26, -29
M2-8:2FTS	>UCL	#-1, -2, -3, -4, -5 [& MS/MSD], -7, -8 14, -15, -18, -29
13C4-PFOS, 13C5-PFNA, 13C2-PFUnA	>UCL	#-4

Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries; nevertheless, RemVer flagged these analytes as UJ/J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

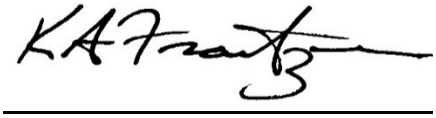
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-138505 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD, CHMM
November 19, 2018

GES PO #746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method Blank: Batch #130595 Samples: #–1 – #–11	Yes	PFBA, PFPeA, PFHxA, PFHpA, PFHxS, PFOS, PFOSA, NEtFOSAA, 6:2, & 8:2	Flag UB/B, if present
Method Blank: Batch #130831 Samples: #–12 – #–29	Yes	PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Flag UB/B, if present
Method Blanks: All Samples	No	All Other PFAS	No Comment
Field Blanks: #-5 [BFS-2] & #-10 [B-1]	Yes	PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, & 8:2	Flag UB/B, if present

IDA	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Samples					
#-1, -2, -3, -5 [& MS/MSD], -7, -8, -9, #-14, -15, -18, -22, -27, -29	—	X	—	13C4-PFBA	Flag UJ / J
#-1, -2, -3, -4, -5 [& MS/MSD], -7, -8, #-12 [& MS/MSD], -14, -15, -16, -17, -18, -19, -20, -22, -26, -29	—	—	X	M2-6:2FTS	Flag UJ / J
#-1, -2, -3, -4, -5 [& MS/MSD], -7, -8, 14, -15, -18, -29	—	—	X	M2-8:2FTS	Flag UJ / J
#-4	—	—	X	13C4-PFOS, 13C5-PFNA, 13C2-PFUnA	Flag UJ / J
All Others	—	—	—	All Others	No Comment

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
PFAS	#-8	N/A	—	—	Did Not Evaluate
	#-21	N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved ☐ Y ☐ N—Not Applicable
Significant QC Variances Noted ☒ Y ☐ N
Requested Reporting Limits Achieved ☒ Y ☐ N
Preservation Requirements Met ☒ Y ☐ N
Holding Time Requirements Met ☒ Y ☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
#-1 WT-4	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-2 WT-1A	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-3 RFI-09	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-4 MW-8	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-5 BFS-2	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-6 RFI-06	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
#-7 RFI-25	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-8 DUP-060118	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-9 RFI-01	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
#-10 B-1	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-11 RFI-22	PFBA, PFPeA, PFHxA, PFHpA, PFDA, PFBS, PFHxS, PFHpS, PFOS, PFOSA, NMeFOSAA, NEtFOSAA, 6:2, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-12 RFI-05A	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J
#-13 RFI-26	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-14 RFI-34	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-15 MW-7	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-16 RFI-27	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J
#-17 RFI-02	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J
#-18 TW-5A	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-19 RFI-24	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J
#-20 RFI-08A	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
#-21 DUP-060418	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-22 RFI-16	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J
#-23 MW-4	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-24 RFI-36	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-25 MW-6	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
#-26 RFI-18	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	>UCL	—	—	Flag UJ / J
#-27 RFI-23	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
#-28 RFI-29	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
#-29 RFI-11	PFBA, PFPeA, PFHxA, PFHpA, PFHpS, PFOA, PFNA, PFDA, PFBS, PFOS, PFOSA, PFUnA, PFHxS, NMeFOSAA, NEtFOSAA, & 8:2	Method &/or Field Blank	If >RL	—	High	Flag UB / B
	ALL	IDA	<LCL	—	—	Flag UJ / J
		IDA	>UCL	—	Low/High	Flag UJ / J
		IDA	>UCL	—	—	Flag UJ / J

Notes: † RPD—Relative Percent Difference
‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-136667		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-136667 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-136667, the samples of which came from a groundwater collection event on May 30, 2018.

Significant Data Usability Issues In SDG: #480-136667

Of the eight (8) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (*note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits*).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-136667)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-136667 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
WT-4	#-1	Water	05/30/18	05/30/18	200-43768-1
WT-1A	#-2	Water	05/30/18	05/30/18	200-43768-2
WT-1B	#-3	Water	05/30/18	05/30/18	NONE
RFI-09	#-4	Water	05/30/18	05/30/18	200-43768-3
WT-3	#-5	Water	05/30/18	05/30/18	NONE
TW-9	#-6	Water	05/30/18	05/30/18	NONE
TW-12	#-7	Water	05/30/18	05/30/18	NONE
TW-13	#-8	Water	05/30/18	05/30/18	NONE

The SDG included the following samples with their analyses:

136667	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	WT-4	X	X	X	X	X	X	X
#–2	WT-1A	X	X	X	X	X	X	X
#–3	WT-1B	X	X	X	X	X	X	X
#–4	RFI-09	X	X	X	X	X	X	X
#–5	WT-3	X	X	X	X	X	X	X
#–6	TW-9	X	X	X	X	X	X	X
#–7	TW-12	X	X	X	X	X	X	X
#–8	TW-13	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-136667	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-136667	Y	Y	None

Do the QC data fall within the protocol required limits and specifications? *(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data*									
SDG	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
480-136667	☒	☐	☐	☒	☒	☐	☐	☒	☒
The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.									

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-136667	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-136667	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-136667	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-136667	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of eight samples were collected on May 30, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-136667 (dated 13-Jun-18). The SDG report had one issue associated with it but otherwise contained the required data and information. The issue is discussed in the following sections.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683137).

- SDG: #480-136667—single, one-page COC, laboratory noted no issues at the time of acceptance

RemVer noted that notes on the COC indicate that the cooler holding the samples was supplied with no ice, resulting in elevated sample temperatures.

Sample Preservation & Holding Time Evaluation

Laboratory received eight coolers with samples on 5/30/2018 @ 19:00 PM (designated as SDG-#480-136667) directly from the field. The temperatures of the coolers at receipt were 20.6, 20.9, 21.5, 21.8, 22.0, 22.3, 22.6, and 23.0ºC. The samples arrived in good condition and properly preserved. The samples were submitted with no ice; however, the TA report narrative and sample receipt contradicts the clear COC notation indicating this fact. Holding times and preservation requirements were met with no exceptions.

Blank Evaluation

The SDG #480-136667 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes), with the following exceptions associated with Method 6010: Calcium, Iron, Manganese, and Zinc. Therefore, RemVer flagged these four metals with a 'B' qualification to indicate their occurrence (detection) in the associated blank.

The samples included in this SDG included no Blanks (either Equipment, Field, or Trip). This poses a limitation on the samples in this SDG in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-136667, with the following exceptions:

- Method 8270C Analytical Batch #417741 had LCS/LCSD recoveries beyond control limits (RPD acceptable) for Atrazine causing the results to be biased high, but the analyte was not detected in the associated samples. Additionally, Benzo[b]fluoranthene had acceptable control limits but the RPD was greater than the required limit, indicating poor precision. Therefore, RemVer flagged the results for these two analytes as UJ+ or J+ in all samples.
- Method 608 (PCBs) Analytical Batch #417514 recoveries of the surrogate Decachlorobiphenyl were just beyond the lower control limit (LCL). In contrast, the secondary surrogate Tetrachloro-m-xylene and all analyte recoveries were within limits; moreover, no PCBs were detected in the analytical samples. Therefore, RemVer did not flagged the PCB results.

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-136667 there were no exceptions, other than the following:

- Method 8270D—Samples #-1, -4, -5, and -6 had one or two surrogates (2-Fluorobiphenyl and/or 2,4,6-Tribromophenol) outside of their respective control limits. Therefore, RemVer flagged all semi-VOC results as UJ or J.

Site-Specific Matrix Spikes and Matrix Spike Duplicates

There were no matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-136667. This was due to insufficient volume associated with these samples or others associated with the various preparatory/analytical batches. Therefore, analytical performance was judged via associated LCS'. RemVer did not flag this as a significant quality issue and the data are usable despite this issue.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, this was a multi-day sampling event covered by multiple SDGs, therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable in the SDG for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as "UJ".

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable SDGs for all analytes with no exceptions.

CCVs were acceptable for all methods and analytes, with the following exceptions:

- Method 8260C—Batch #417473 had recoveries below the lower control limit (LCL, low bias) for Chloromethane and Vinyl Chloride in all samples. RemVer flagged the results as UJ- or J-.
- Method 8270D—Batch #417741 had recoveries greater than the upper control limit (UCL) for Atrazine in all samples. RemVer flagged the results as UJ or J.
- Method 608—Batch #417514 had recoveries greater than the upper control limit (UCL) for PCB-1221 in all samples. RemVer flagged the results as UJ or J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

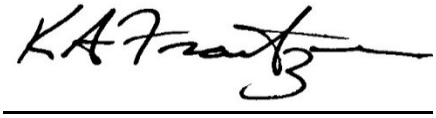
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-136667 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOA	No Comment
Method: 8270	No	1,4 Dioxane	No Comment
Method: 8270 SIM-ID	No	PFCs	No Comment
Method: 608	Batch 417729—No	Organochlorine Pesticides	No Comment
	Batch 417514—No	PCBs	
Method: 6010	No	All TAL Metals	No Comment
	Yes	Calcium	Flag B
		Iron	
		Manganese	
		Zinc	
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
Method: 8270	—	—	—	All Other	No Comment
Method: 8270	—	—	X >RPD	Atrazine Benzo[b]fluoranthene	Flag UJ+ or J+ Flag UJ or J
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	All	No Comment (Samples 2, 3, 7, & 8)
	—	—	2-Fluorobiphenyl &/or 2,4,6-Tribromophenol	All	Flag UJ or J (Samples 1, 4, 5, & 6)
8270 SIM-ID	—	—	—		No Comment
Method: 608	—	—	—	Pesticides	No Comment
Method: 608	—	Decachloro-biphenyl	—	All PCBs	Secondary Surrogate Okay, No Flag
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs	—	—	—	None	—	See Narrative
SVOCs	—	—	—		—	
SVOCs SIM-ID	—	—	—		—	
Pesticides	—	—	—		—	
PCBs	—	—	—		—	
TAL-Metals	—	—	—		—	
Mercury	—	—	—		—	
Chromium-Hex.	—	—	—		—	

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-136667						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 WT-4	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	All SVOCs	Surrogates	>UCL	—	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-2 WT-1A	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-3 WT-1B	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-4 RFI-09	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	All SVOCs	Surrogates	>UCL	—	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B

SDG #480-136667						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-5 WT-3	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	All SVOCs	Surrogates	>UCL	—	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-6 TW-9	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	All SVOCs	Surrogates	>UCL	—	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-7 TW-12	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B
#-8 TW-13	All	MDL>result<RDL	—	—	—	Flag UJ
	Chloromethane Vinyl Chloride	CCV	<LCL	—	Low	Flag UJ- or J-
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	Benzo (b) fluoranthene	LCS/D	—	X	—	Flag UJ or J
	PCB-1221	CCV	>UCL	—	—	Flag UJ or J
	Calcium, Iron, Manganese, & Zinc	Blank	—	—	—	Flag B

Notes: † RPD—Relative Percent Difference

‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-136738		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-136738 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-136738, the samples of which came from a collection event on May 31, 2018.

Significant Data Usability Issues In SDG: #480-136738

Of the thirteen (13) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (*note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits*).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-136738)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-136738 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
WT-2	#-1	Water	05/31/18	05/31/18	None
BFS-1	#-2	Water	05/31/18	05/31/18	None
BFS-2	#-3	Water	05/31/18	05/31/18	200-43768-5
RFI-17	#-4	Water	05/31/18	05/31/18	None
RFI-06	#-5	Water	05/31/18	05/31/18	200-43768-6
TW-15	#-6	Water	05/31/18	05/31/18	None
TW-7	#-7	Water	05/31/18	05/31/18	None
TW-6	#-8	Water	05/31/18	05/31/18	None
TW-8	#-9	Water	05/31/18	05/31/18	None
DUP-053118	#-10	Water	05/31/18	05/31/18	None
TW-14	#-11	Water	05/31/18	05/31/18	None
LAE-4	#-12	Water	05/31/18	05/31/18	None
MW-8	#-13	Water	05/31/18	05/31/18	200-43768-4

The SDG included the following samples with their analyses:

136738	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	WT-2	X	X	X	X	X	X	X
#–2	BFS-1	X	X	X	X	X	X	X
#–3	BFS-2	X	X	X	X	X	X	X
#–4	RFI-17	X	X	X	X	X	X	X
#–5	RFI-06	X	X	X	X	X	X	X
#–6	TW-15	X	X	X	X	X	X	X
#–7	TW-7	X	X	X	X	X	X	X
#–8	TW-6	X	X	X	X	X	X	X
#-9	TW-8	X	X	X	X	X	X	X
#-10	DUP-053118	X	X	X	X	X	X	X
#-11	TW-14	X	X	X	X	X	X	X
#-12	LAE-4	X	X	X	X	X	X	X
#-13	MW-8	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-136738	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-136738	Y	N	None #-1 (WT-2) not properly preserved

Do the QC data fall within the protocol required limits and specifications?
(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-136738	☐	☐	☐	☒	☒	☐	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-136738	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-136738	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-136738	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-136738	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of thirteen samples were collected on May 31, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-136738 (dated 14-Jun-18). The SDG report contained the required data and information.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683137): SDG: #480-136738—single, two-page COC. While the laboratory noted no issues at the time of acceptance, one of the samplers annotated the COC indicating that Sample #-1 (WT-1) had a very high pH; proper preservation requires low pH. Subsequently, the laboratory noted in its report narrative that excess acid was added to adjust pH. RemVer flagged all results for this sample as UJ or J.

Sample Preservation & Holding Time Evaluation

Laboratory received fifteen coolers with samples on 5/31/2018 @ 20:20 PM (designated as SDG-#480-136738) directly from the field. The temperatures of the coolers at receipt were 2.3, 2.8, 2.9, 3.1, 3.2, 3.3, 3.5, 3.8, 3.9, 4.0, 4.1, 4.5, 4.6, 5.2, and 5.6ºC. The samples arrived in good condition, properly preserved and, where required, on ice.

Blank Evaluation

The SDG #480-136738 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes), with no exceptions:

The samples included in this SDG included no field generated Blanks (either Equipment, Field, or Trip). This poses a limitation on the samples in this SDG in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-136738, with the following exceptions:

- Method 8260D—Analytical Batch 417852 had recoveries greater than the Upper Control Limit (UCL) 2-Butanone (MEK). This quality issue impacted Sample #-1 (WT-2). Therefore, RemVer flagged the results as UJ or J.

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-136738 there were no exceptions, other than the following:

- Method 8270D SIM-ID (1,4-Dioxane)—the raw analytical results were flagged by the laboratory as E due to the results beyond the calibration range. This was the result of an instrument bias calculation based on the recovery of 1,4-Dioxane-d8 isotope. RemVer flagged all results as UJ or J this impacted the MS/MSD sample.
- Method 608 (PCBs)—surrogate (Decachlorobiphenyl) recoveries in the method blank (MB 480-417611/1-A) and laboratory control sample (LCS 480-417611/2-A) were beyond their control limits, while the second surrogate (Tetrachloro-m-xylene) was within limits. As this impacted multiple analytical controls, RemVer flagged the PCB results for all samples as UJ or J.

Site-Specific Matrix Spikes and Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-136738 used Sample #-5 (WP-4). Analytical performance in these runs was within the acceptable control with the following exceptions:

- Method 8260D—Batch 417945 had multiple analyte exceptions (see below). RemVer flagged the results for these analytes as UJ or J.
    - Several analytes had either MS or MSD spike recoveries beyond limits: 1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, and trans-1,2-Dichloroethene
    - Several analytes had RPDs greater than control limits: 1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, and Toluene
- Method 8270D—Batch 417742 had two analytes with RPDs above control limits: 3,3'-Dichlorobenzidine and N-Nitrosodiphenylamine. RemVer flagged the results for these analytes as UJ or J.
- Method 6010C—Batch 418617 had two exceptions. Manganese had MS/MSD recoveries beyond limits, and Zinc had both MS/MSD recoveries and its RPD beyond limits. RemVer flagged the results for these analytes as UJ or J.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance, however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as “UJ”.

The following samples had elevated reporting limits (RLs) for certain analyses. RemVer flagged the analytical results as UJ or J.

- Sample #-6 (TW-15)—Method 6010C Arsenic, Antimony, & Zinc; due to the presence of Chromium.
- Sample #-7 (TW-7)—
  - Method 8260C analytes; due to foaming at the time of purge.
  - Method 8270D analytes; due to nature of the sample matrix.
  - Method 6010C Arsenic, Antimony, & Zinc; due to the presence of Chromium.
- Sample #-12 (LAE-4)—Method 8260C analytes; necessary to bring target analytes within the calibration range.
- Sample #-13 (MW-8)—
  - Method 8270C analytes; necessary to bring target analytes within the calibration range.
  - Method 608 analytes (Pesticides & PCBs); due to nature of the sample matrix.

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable for all analytes with no exceptions.

CCVs were acceptable in the SDG for all methods and analytes, with the following exceptions:

- Method 8260C—Batch #418059 had recoveries below the lower control limit (LCL, with low bias) for 1,1-Dichloroethene, Carbon disulfide, and Carbon tetrachloride. This impacted the following samples: #-2 through #-13, inclusive. RemVer flagged the results as UJ- or J-.
- Method 8270D—Batch #417742 had recoveries outside the control limits and/or beyond the minimum response factor (RF) criteria for 2,4-Dinitrophenol and Pentachlorophenol in all samples. RemVer flagged the results as UJ or J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

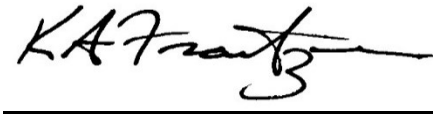
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-136738 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOA	No Comment
Method: 8270	No	SVOCs	No Comment
Method: 8270 SIM-ID	No	1,4 Dioxane	No Comment
Method: 608	No	Organochlorine Pesticides	No Comment
	No	PCBs	No Comment
Method: 6010	No	All TAL Metals	No Comment
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
	—	—	X	2-Butanone (MEK)	Flag UJ or J
Method: 8270	—	—	—	All	No Comment
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	—	No Comment
8270 SIM-ID	—	—	X	1,4-Dioxane	Flag UJ or J
Method: 608	—	—	—	Pesticides	No Comment
Method: 608	—	—	X	All PCBs	Flag UJ or J
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs: Others	—	—	—	Batch	—	No Comment
1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	—	—	X	417945	—	Flag UJ or J
1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	—	—	—	417945	>limit	Flag UJ or J
SVOCs: All	—	—	—	Batch	—	No Comment
3,3'-Dichlorobenzidine & N-Nitrosodiphenylamine	—	—	—	417742	>limit	Flag UJ or J
SVOCs SIM-ID	—	—	—	Batch	—	No Comment
Pesticides	—	—	—	Batch	—	No Comment
PCBs	—	—	—	Batch	—	No Comment
TAL-Metals	—	—	—	Batch	—	No Comment
Manganese			X	418617		Flag UJ or J
Zinc			X	418617	>limit	Flag UJ or J
Mercury	—	—	—	—	—	No Comment
Chromium-Hex.	—	—	—	—	—	No Comment

Attachment 1 continued

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☐ Y	☒ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 WT-2	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-2 BFS-1	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene,	MS/MSD	>UCL	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	trans-1,2-Dichloroethene					
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-3 BFS-2	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene,	MS/MSD	—	X	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene					
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-4 RFI-17	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-5 RFI-06	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-6 TW-15	All	MDL>result<RDL	—	—	—	Flag UJ
	Arsenic, Antimony, & Zinc	DLs	—	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-7 TW-7	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	All SVOCs	DLs	—	—	—	Flag UJ or J
	Arsenic, Antimony, & Zinc	DLs	—	—	—	Flag UJ or J
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene,	MS/MSD	>UCL	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene					
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-8 TW-6	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride,	MS/MSD	—	X	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene					
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-9 TW-8	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-10 DUP-053118	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-11 TW-14	All	MDL>result<RDL	—	—	—	Flag UJ
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-12 LAE-4	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene,	MS/MSD	>UCL	—	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	trans-1,2-Dichloroethene					
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride, Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene	MS/MSD	—	X	—	Flag UJ or J
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-13 MW-8	All	MDL>result<RDL	—	—	—	Flag UJ
	All SVOCs	DLs	—	—	—	Flag UJ or J
	All Pesticides & PCBs	DLs	—	—	—	Flag UJ or J
	2-Butanone (MEK)	LCS	>UCL	—	—	Flag UJ or J
	1,2-Dichlorobenzene, 1,2-Dichloropropane, 1,4-Dichlorobenzene, Chlorobenzene, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Styrene, Toluene, trans-1,2-Dichloroethene	MS/MSD	>UCL	—	—	Flag UJ or J
	1,1,1-Trichloroethane, 1,1-Dichloroethene, 1,2,4-Trichlorobenzene, Benzene, Carbon Disulfide, Carbon Tetrachloride,	MS/MSD	—	X	—	Flag UJ or J

SDG #480-136738						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Cyclohexane, Ethylbenzene, Isopropylbenzene, Methylcyclohexane, Methylene Chloride, Tetrachloroethene, Toluene					
	3,3'-Dichloro-benzidine & N-Nitrosodiphenylamine	MS/MSD	—	X	—	Flag UJ or J
	Manganese	MS/MSD	>UCL	—	—	Flag UJ or J
	Zinc	MS/MSD	>UCL	X	—	Flag UJ or J
	1,1-Dichloroethene, Carbon disulfide, & Carbon tetrachloride	CCV	<LCL	—	Low	Flag UJ- or J-
	2,4-Dinitrophenol & Pentachlorophenol	CCV	>UCL	—	—	Flag UJ or J
	1,4-Dioxane	Surrogate	>UCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J

Notes: † RPD—Relative Percent Difference

‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-136802		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-136802 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-136802, the samples of which came from a collection event on June 1, 2018.

Significant Data Usability Issues In SDG: #480-136802

Of the ten (10) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-136802)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-136802 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
RFI-10	#-1	Water	06/01/18	06/01/18	None
RFI-25	#-2	Water	06/01/18	06/01/18	200-43768-7
DUP-060118	#-3	Water	06/01/18	06/01/18	200-43768-8
RFI-01	#-4	Water	06/01/18	06/01/18	200-43768-9
B-1	#-5	Water	06/01/18	06/01/18	200-43768-10
RFI-22	#-6	Water	06/01/18	06/01/18	200-43768-11
RFI-05A	#-7	Water	06/01/18	06/01/18	200-43768-12
RFI-26	#-8	Water	06/01/18	06/01/18	200-43768-13
RFI-34	#-9	Water	06/01/18	06/01/18	200-43768-14
MW-7	#-10	Water	06/01/18	06/01/18	200-43768-15

The SDG included the following samples with their analyses:

136802	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	RFI-10	X	X	X	X	X	X	X
#–2	RFI-25	X	X	X	X	X	X	X
#–3	DUP-060118	X	X	X	X	X	X	X
#–4	RFI-01	X	X	X	X	X	X	X
#–5	B-1	X	X	X	X	X	X	X
#–6	RFI-22	X	X	X	X	X	X	X
#–7	RFI-05A	X	X	X	X	X	X	X
#–8	RFI-26	X	X	X	X	X	X	X
#-9	RFI-34	X	X	X	X	X	X	X
#-10	MW-7	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-136802	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-136802	Y	Y	None

Do the QC data fall within the protocol required limits and specifications?
(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-136802	☒	☐	☐	☒	☒	☒	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-136802	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-136802	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-136802	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-136802	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of ten samples were collected on June 1, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-136802 (dated 15-Jun-18). The SDG report contained the required data and information.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683137): SDG: #480-136802—single, two-page COC, laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received twelve coolers with samples on 6/4/2018 @ 21:30 PM (designated as SDG-#480-136802) directly from the field. The temperatures of the coolers at receipt were 1.6, 1.7, 1.8, 2.2, 2.3, 2.6, 2.9, 3.0, 3.5, 4.0, 4.5, and 5.0ºC. The samples arrived in good condition, properly preserved and, where required, on ice.

Blank Evaluation

The SDG #480-136802 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes), with the following exceptions:

- Method 8260D MB—RemVer flagged Methylene Chloride with a 'B' qualification to indicate their occurrence (detection) in the associated blank of Batch #418061. This impacted samples: #-1 (RFI-10), #-5 (B-1), #-6 (RFI-22), #-7 (RFI-05A), #-8 (RFI-26), #-9 (RFI-34), and #-10 (MW-7).
- Method 6010 MB—RemVer flagged Manganese with a 'B' qualification to indicate their occurrence (detection) in the associated blank of Batch #418127. This impacted all samples.

The samples included in this SDG included no field generated Blanks (either Equipment, Field, or Trip). This poses a limitation on these samples in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs. Nevertheless, Sample B-1 may be a field blank, this was not clarified for the DUSR. Regardless, it had detections of the following analytes: Acetone, Methylene Chloride, Aluminum, Barium, Calcium, Iron, Magnesium, Manganese, Potassium, and Sodium.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-136802, with the following exceptions:

- Method 8260C—Analytical Batch #418061 LSC/D recoveries were greater than the UCL with high bias for Acetone. This impacted the following samples: #-1 (RFI-10), #-5 (B-1), #-6 (RFI-22), #-7 (RFI-05A), #-8 (RFI-26), #-9 (RFI-34), and #-10 (MW-7). Therefore, RemVer flagged the Acetone results as UJ+ or J+ in these samples.
- Method 608 (PCBs)—LCS had poor surrogate recoveries (see below).

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-136802 there were no exceptions, other than the following:

- Method 608 (Pesticides)—surrogate recoveries were beyond the control limits for Samples #-6 and #-9. Therefore, RemVer flagged the results as UJ or J in these two samples.
- Method 608 (PCBs)—the surrogate Decachlorobiphenyl had recoveries less than the LCL in the LCS (LCS 480-418243/2-A) for all ten samples; however, the secondary surrogate Tetrachloro-m-xylene was acceptable. Therefore, RemVer did not flag these results.

Site-Specific Matrix Spikes and Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-136802 used Sample #-5 (WP-4). Analytical performance in these runs was within the acceptable control with the following exceptionsL

- Method 8260C—Analytical Batch #418312 MS recoveries had an RPD above the control limit for Methylcyclohexane. Therefore, RemVer flagged these results as UJ or J in all samples.
- Method 608—Analytical batch #418153 MS/MSD recoveries were greater than the UCL for DDT. Therefore, RemVer flagged these results as UJ or J in all samples.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as “UJ”.

Sample #-10 (MW-7) had elevated reporting limits (RLs) due to dilution, the result of foaming at the time of purging for analysis. Similarly, Sample #-8 (RFI-26) required elevated RLs due to dilution to bring target analytes within the calibration range. RemVer flagged the Method 8260C analytes as “UJ” or “J”.

Sample #-9 (RFI-34) required elevated Method 8270D and 608 RLs, the result of dilution due to the nature of the sample matrix. This sample also was colored, requiring dilution, which impacted the RLs of 8270D SIM-ID. RemVer flagged the associated analytes as "UJ" or "J".

Samples #-8 (RFI-26), #-9 (RFI-34), and #-10 (MW-7) had enough Sulfur to interfere with the Method 6010C analysis for Lead; this required dilution of these samples resulting in elevated RLs. RemVer flagged the Lead results in these samples as "UJ" or "J".

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable for all analytes with no exceptions.

CCVs were acceptable in the SDG for all methods and analytes, with the following exceptions:

- Method 8260C—Batch #418061 had recoveries above the upper control limit (UCL) for 2-Butanone (MEK) and Methylene Chloride. This impacted the following samples: #-1 (RFI-10), #-5 (B-1), #-6 (RFI-22), #-7 (RFI-05A), #-8 (RFI-26), #-9 (RFI-34), and #-10 (MW-7). RemVer flagged the results as UJ or J.
- Method 8270D—Batches #418164 & #418380 had recoveries below the lower control limit (LCL, low bias) for Pentachlorophenol in all samples. RemVer flagged the results as UJ- or J-.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

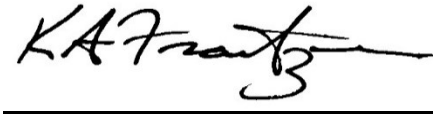
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-136802 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOA	No Comment
Method: 8270	No	Other SVOCs	No Comment
	Yes	Methylene Chloride	Flag UB or B
Method: 8270 SIM-ID	No	1,4 Dioxane	No Comment
Method: 608	No	Organochlorine Pesticides	No Comment
	No	PCBs	No Comment
Method: 6010	No	Other TAL Metals	No Comment
	Yes	Manganese	Flag UB or B
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
	—	—	X	Acetone	Flag UJ+ or J+
Method: 8270	—	—	—	All	No Comment
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	—	No Comment
8270 SIM-ID	—	—	—	1,4-Dioxane	No Comment
Method: 608	—	—	— X	Other Pesticides DDT	No Comment #-6 & #-9: Flag UJ or J
Method: 608	—	—	—	All PCBs	No Comment
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs	—	—	—	Batch	—	No Comment
Methylcyclohexane	—	—	—	Batch	>limit	Flag UJ/J
SVOCs	—	—	—	Batch	—	No Comment
SVOCs SIM-ID	—	—	—	Batch	—	No Comment
Pesticides	—	—	—	Batch	—	No Comment
DDT	—	—	X	Batch	—	Flag UJ/J
PCBs	—	—	—	Batch	—	No Comment
TAL-Metals	—	—	—	Batch	—	No Comment
Mercury	—	—	—	Batch	—	No Comment
Chromium-Hex.	—	—	—	Batch	—	No Comment

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-136802						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 RFI-10	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-2 RFI-25	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-3 DUP-060118	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-4 RFI-01	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-5 B-1	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-6 RFI-22	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pesticides	Surrogate	>UCL	—	—	Flag UJ or J
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-

SDG #480-136802						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-7 RFI-05A	All	MDL>result<RDL	—	—	—	Flag UJ
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-8 RFI-26	All	MDL>result<RDL	—	—	—	Flag UJ
	VOCs	DL	—	—	—	Flag UJ or J
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Lead	DL	—	—	—	Flag UJ or J
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-9 RFI-34	All	MDL>result<RDL	—	—	—	Flag UJ
	VOCs	DLs	—	—	—	Flag UJ or J
	SVOCs	DLs	—	—	—	Flag UJ or J
	1,4-Dioxane	DL	—	—	—	Flag UJ or J
	Pesticides & PCBs	DLs	—	—	—	Flag UJ or J
	Lead	DL	—	—	—	Flag UJ or J
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pesticides	Surrogate	>UCL	—	—	Flag UJ or J
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J
#-10 MW-7	All	MDL>result<RDL	—	—	—	Flag UJ
	VOCs	DL	—	—	—	Flag UJ or J
	Lead	DL	—	—	—	Flag UJ or J
	Methylene Chloride & Manganese	Blanks	—	—	—	Flag B or UB
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-

SDG #480-136802						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Methylene Chloride & MEK	CCV	>UCL	—	—	Flag UJ or J
	Methylcyclohexane	MS/MSD	—	X	—	Flag UJ or J
	DDT	MS/MSD	>UCL	—	—	Flag UJ or J

Notes: † RPD—Relative Percent Difference
‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-136863		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-136863 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-136863, the samples of which came from a collection event on June 4, 2018.

Significant Data Usability Issues In SDG: #480-136863

Of the fifteen (15) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (*note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits*).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-136863)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-136863 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
RFI-02	#-1	Water	06/04/18	06/04/18	200-43768-17
RFI-24	#-2	Water	06/04/18	06/04/18	200-43768-19
RFI-16	#-3	Water	06/04/18	06/04/18	200-43768-22
MW-4	#-4	Water	06/04/18	06/04/18	200-43768-23
WP-4	#-5	Water	06/04/18	06/04/18	None
WP-3A	#-6	Water	06/04/18	06/04/18	None
RFI-23	#-7	Water	06/04/18	06/04/18	200-43768-27
RFI-27	#-8	Water	06/04/18	06/04/18	200-43768-16
TW-5A	#-9	Water	06/04/18	06/04/18	200-43768-18
RFI-08A	#-10	Water	06/04/18	06/04/18	200-43768-20
DUP-060418	#-11	Water	06/04/18	06/04/18	200-43768-21
RFI-35	#-12	Water	06/04/18	06/04/18	None
RFI-36	#-13	Water	06/04/18	06/04/18	200-43768-24
MW-6	#-14	Water	06/04/18	06/04/18	200-43768-25
RFI-18	#-15	Water	06/04/18	06/04/18	200-43768-26

The SDG included the following samples with their analyses:

136863	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	RFI-02	X	X	X	X	X	X	X
#–2	RFI-24	X	X	X	X	X	X	X
#–3	RFI-16	X	X	X	X	X	X	X
#–4	MW-4	X	X	X	X	X	X	X
#–5	WP-4	X	X	X	X	X	X	X
#–6	WP-3A	X	X	X	X	X	X	X
#–7	RFI-23	X	X	X	X	X	X	X
#–8	RFI-27	X	X	X	X	X	X	X
#-9	TW-5A	X	X	X	X	X	X	X
#-10	RFI-08A	X	X	X	X	X	X	X
#-11	DUP-060418	X	X	X	X	X	X	X
#-12	RFI-35	X	X	X	X	X	X	X
#-13	RFI-36	X	X	X	X	X	X	X
#-14	MW-6	X	X	X	X	X	X	X
#-15	RFI-18	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-136863	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-136863	Y	Y	None

Do the QC data fall within the protocol required limits and specifications?
(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-136863	☒	☐	☐	☒	☒	☐	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-136863	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-136863	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-136863	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-136863	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of fifteen samples were collected on June 4, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-136863 (dated 20-Jun-18). The SDG report contained the required data and information.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683138): SDG: #480-136863—single, two-page COC, laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received fifteen coolers with samples on 6/4/2018 @ 21:30 PM (designated as SDG-#480-136863) directly from the field. The temperatures of the coolers at receipt were 1.0, 1.1, 1.5, 1.6, 1.7, 2.0, 2.0, 2.2, 2.9, 3.3, 3.5, 3.8, 4.0, 4.5 and 5.0ºC. The samples arrived in good condition, properly preserved and, where required, on ice.

Blank Evaluation

The SDG #480-136863 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes), with the following exceptions:

- Method 608 MB—RemVer flagged delta-BHC with a 'B' qualification to indicate their occurrence (detection) in the associated blank.
- Method 6010 MB—RemVer flagged Manganese and Zinc with a 'B' qualification to indicate their occurrence (detection) in the associated blank.

The samples included in this SDG included no field generated Blanks (either Equipment, Field, or Trip). This poses a limitation on these samples in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-136863, with the following exceptions:

- Method(s) 608—the laboratory control sample (LCS) for analytical batch 480-418768 had recoveries outside control limits with high bias for the following analytes: PCB-1016. This quality issue impacted all samples. Therefore, RemVer flagged the PCB results as UJ+ or J+.

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-136863 there were no exceptions, other than the following:

- Method 608 (Pesticides)—surrogate recoveries in Samples #-4 (MW-4) and #-6 (WP-3A) was below their control limits, likely due to matrix interference. Therefore, RemVer flagged the results for these samples as UJ or J.
- Method 608 (PCBs)—surrogate recoveries in Samples #-4 (MW-4), #-5 (WP-4), #-6 (WP-3A), #-7 (RFI-23), and #-8 (RFI-27) was beyond their control limits, likely due to matrix interference. Therefore, RemVer flagged the PCB results for these samples as UJ or J.

Site-Specific Matrix Spikes and Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-136863 used Sample #-5 (WP-4). Analytical performance in these runs was within the acceptable control with no exceptions.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as “UJ”.

Several samples had elevated concentrations of Method 8260C target analytes requiring dilution to bring them within the calibration range and resulting in elevated reporting limits (RDL). This impacted the following samples: #-3 (RFI-16) and #-5 (WP-4) [including MS/MSD]. RemVer flagged the associated analytes as “UJ” or “J”.

Organic preparation (Method 3510C) had several issues impacting all organic analytes of Samples #-4 (MW-4) and #-6 (WP-3A). Due to the matrix, initial volume used deviated from the standard procedure, resulting in altered reporting limits. RemVer flagged the associated analytes as “UJ” or “J”.

Several volatile samples required dilution due to foaming at the time of purging during the original Method 8260C analysis. This resulted in elevated reporting limits (RDL). This impacted sample: #-9 (TW-5A). RemVer flagged the associated analytes as “UJ” or “J”.

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable for all analytes with no exceptions.

CCVs were acceptable in the SDG for all methods and analytes, with the following exceptions:

- Method 8260C—Batch # 418556 had recoveries above the upper control limit (UCL) for 2-Butanone (MEK). This impacted the following samples: #-14 (MW-6) and #-15 (RFI-18). RemVer flagged the results as UJ or J.
- Method 8270D—Batch #418380 had recoveries below the lower control limit (LCL, low bias) for Pentachlorophenol in all samples. RemVer flagged the results as UJ- or J-.
- Method 608-Pesticides—in Batch # 418226/7 the CCV for Chlordane (technical) was decreased and exceeded control criteria in all samples. RemVer flagged the results as UJ or J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-136863 Annotated EDD with Validation (separate EXCEL workbook, attached)

Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOA	No Comment
Method: 8270	No	SVOCs	No Comment
Method: 8270 SIM-ID	No	1,4 Dioxane	No Comment
Method: 608	No	Organochlorine Pesticides	No Comment
	Yes	Delta-BHC	Flag B or UB
	No	PCBs	No Comment
Method: 6010	No	All TAL Metals	No Comment
	Yes	Magnesium	Flag B or UB
		Zinc	
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
Method: 8270	—	—	—	All	No Comment
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	X	PCBs	Flag UJ+ or J+
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	—	No Comment
8270 SIM-ID	—	—	—		No Comment
Method: 608	—	X	—	All Pesticides	Flag UJ or J
Method: 608	—	—	X	All PCBs	Flag UJ or J
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs	—	—	—	Batch	—	No Comment
SVOCs	—	—	—		—	
SVOCs SIM-ID	—	—	—		—	
Pesticides	—	—	—		—	
PCBs	—	—	—		—	
TAL-Metals	—	—	—		—	
Mercury	—	—	—		—	
Chromium-Hex.	—	—	—		—	

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-136863						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 RFI-02	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-2 RFI-24	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-3 RFI-16	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-4 MW-4	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Pesticides	Surrogate	<LCL	—	—	Flag UJ or J
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-5 WP-4	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-6 WP-3A	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-

SDG #480-136863						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	Pesticides	Surrogate	<LCL	—	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-7 RFI-23	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-8 RFI-27	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
	PCBs	Surrogate	>UCL	—	—	Flag UJ or J
#-9 TW-5A	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	DLs	—	—	—	Flag UJ or J
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-10 RFI-08A	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-11 DUP-060418	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-12 RFI-35	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-13 RFI-36	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB

SDG #480-136863						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-14 MW-6	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	2-Butanone (MEK)	CCV	—	—	—	Flag UJ or J
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+
#-15 RFI-18	All	MDL>result<RDL	—	—	—	Flag UJ
	delta-BHC, Magnesium & Zinc	Blanks	—	—	—	Flag B or UB
	2-Butanone (MEK)	CCV	—	—	—	Flag UJ or J
	Pentachlorophenol	CCV	<LCL	—	Low	Flag UJ- or J-
	Chlordane	CCV	>UCL	X	—	Flag UJ or J
	PCBs	LCS	>UCL	—	Hi	Flag UJ+ or J+

Notes: † RPD—Relative Percent Difference
‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-136912		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-136912 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-136912, the samples of which came from a collection event on June 5, 2018.

Significant Data Usability Issues In SDG: #480-136912

Of the two (2) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (*note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits*).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-136912)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-136912 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
RFI-29	#-1	Water	06/05/18	06/05/18	200-43768-28
RFI-11	#-2	Water	06/05/18	06/05/18	200-43768-29

The SDG included the following samples with their analyses:

136912	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	RFI-29	X	X	X	X	X	X	X
#–2	RFI-11	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-136912	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-136912	Y	Y	None

Do the QC data fall within the protocol required limits and specifications? *(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data*									
SDG	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
480-136912	☒	☐	☐	☐	☒	☐	☐	☒	☒
The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.									

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-136912	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-136912	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-136912	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-136912	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of two samples were collected on June 5, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-136912 (dated 21-Jun-18). The SDG report had the required data and information.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683138): SDG: #480-136912—single, one-page COC, laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received two coolers with samples on 6/5/2018 @ 17:25 PM (designated as SDG-#480-136912) directly from the field. The temperatures of the coolers at receipt were 2.9 and 3.1ºC. The samples arrived in good condition, properly preserved, and where necessary under ice. Holding times and preservation requirements were met with no exceptions.

Blank Evaluation

The SDG #480-136912 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes), with no exceptions.

The samples in this SDG included no field associated Blanks (either Equipment, Field, or Trip). This poses a limitation on these samples in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-136912, with the following exceptions:

- Method 8270C Analytical Batch #418683 had LCS/LCSD recoveries beyond control limits (RPD acceptable) for Atrazine causing the results to be biased high, but the analyte was not detected in the associated samples. Therefore, RemVer flagged the results for these two analytes as UJ+ or J+ in all samples.
- Method 8270C SIM-ID Analytical Batch #480-419458 had a raw data result for 1,4-Dioxane beyond the calibrated range; this was due to isotope dilution (surrogate, see below) causing a bias correction due to the recovery 1,4-Dioxane-d8 isotope.

Surrogates and Isotope Dilution

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-136912 there were no exceptions, other than the following:

- Method 8270C SIM-ID—Isotope Dilution Analyte (IDA) recovery was above the recommended method limit for sample #-1 (RFI-29). While quantitation by isotope dilution generally precludes adverse effects on data quality due to elevated IDA recoveries, RemVer flagged the result as estimated (J flag).

Site-Specific Matrix Spikes and Matrix Spike Duplicates

There were no matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-136912. This was due to insufficient volumes associated with these samples or others associated with the various preparatory/analytical batches. Therefore, analytical performance was judged

via associated LCS'. RemVer did not flag this as a significant quality issue and the data are usable despite this issue.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

This SDG had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as "UJ".

Analysis for 1,4-Dioxane (Method 8270D SIM-ID) in Sample #-1 (RFI-29) required dilution to bring the concentration within calibration range; this resulted in elevated reporting limits (RLs). This was a related issue to the isotope dilution (surrogate, see below) causing a bias correction due to the recovery 1,4-Dioxane-d8 isotope. RemVer flagged the result with a J flag.

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standards (external or internal) and CCVs were acceptable for all analytes with no exceptions.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

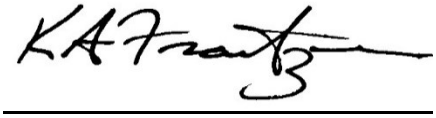
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-136912 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOA	No Comment
Method: 8270	No	1,4 Dioxane	No Comment
Method: 8270 SIM-ID	No	PFCs	No Comment
Method: 608	Batch 417729—No	Organochlorine Pesticides	No Comment
	Batch 417514—No	PCBs	
Method: 6010	No	All TAL Metals	No Comment
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
Method: 8270	—	—	—	All Other	No Comment
Method: 8270	—	—	X	Atrazine	Flag UJ+ or J+
8270 SIM-ID	—	—	X	1,4 Dioxane	Flag J
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	All	No Comment
8270 SIM-ID	—	—	X	1,4-Dioxane-d8	Flag UJ or J
Method: 608	—	—	—	Pesticides	No Comment
Method: 608	—	—	—	All PCBs	No Comment
Method: 6010	—	—	—	—	No Comment
Method: 7470	—	—	—	—	No Comment
Method: 7196	—	—	—	—	No Comment

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs	—	—	—	None	—	See Narrative
SVOCs	—	—	—		—	
SVOCs SIM-ID	—	—	—		—	
Pesticides	—	—	—		—	
PCBs	—	—	—		—	
TAL-Metals	—	—	—		—	
Mercury	—	—	—		—	
Chromium-Hex.	—	—	—		—	

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-136912						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 RFI-29	All	MDL>result<RDL	—	—	—	Flag UJ
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+
	1,4-Dioxane	IDA/LCS	>UCL	—	—	Flag J
#-2 RFI-11	All	MDL>result<RDL	—	—	—	Flag UJ
	Atrazine	LCS/D CCV	>UCL >UCL	— —	Hi —	Flag UJ+ or J+

Notes: † RPD—Relative Percent Difference

‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-137324		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-137324 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-137324, the samples of which came from a collection event on June 12, 2018.

Significant Data Usability Issues In SDG: #480-137324

Of the five (5) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-137324)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-137324 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
WP-8	#-1	Water	06/12/18	06/12/18	480-138505-1
WP-5	#-2	Water	06/12/18	06/12/18	None
WP-7	#-3	Water	06/12/18	06/12/18	None
MW-5	#-4	Water	06/12/18	06/12/18	480-138505-2
RFI-30	#-5	Water	06/12/18	06/12/18	480-138505-3

The SDG included the following samples with their analyses:

137324	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	WP-8	X	X	X	X	X	X	X
#–2	WP-5	X	X	X	X	X	X	X
#–3	WP-7	X	X	X	X	X	X	X
#–4	MW-5	X	X	X	X	X	X	X
#–5	RFI-30	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-137324	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-137324	Y	Y	None

Do the QC data fall within the protocol required limits and specifications?

(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-137324	☒	☐	☐	☒	☐	☒	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-137324	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-137324	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-137324	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-137324	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 12, 2018; and this group of five samples were collected on June 12, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-137324 (dated 26-Jun-18). The SDG report had one issue associated with it but otherwise contained the required data and information. The issue is discussed in the following sections.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#683138): SDG: #480-137324—single, one-page COC, laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received seven coolers with samples on 6/12/2018 @ 19:35 PM (designated as SDG-#480-137324) directly from the field. The temperatures of the coolers at receipt were 0.9, 1.0, 1.5, 2.3, 2.8, 3.0 and 3.6ºC. The samples arrived in good condition, properly preserved and, where required, on ice. Holding times and preservation requirements were met with no exceptions.

Blank Evaluation

The SDG #480-137324 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes) with no exceptions.

The samples in this SDG included no field associated Blanks (either Equipment, Field, or Trip). This poses a limitation on these samples in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-137324, with the following exceptions:

- Method(s) 8260C—Analytical Batch #420159 had LCS/LCSD recoveries greater than the upper control limit (UCL, RPD acceptable) for Acetone causing the results to be biased high, but the analyte was not detected in the associated samples. Therefore, RemVer flagged the results for these two analytes as UJ+ or J+ in all samples.
- Method(s) 8270D—Analytical Batch #419632 had LCS/LCSD recoveries greater than the upper control limit (UCL) for Atrazine causing the results to be biased high, but the analyte was not detected in the associated samples. This impacted the following samples: #-1 (WP-8), #-3 (WP-7), #-4 (MW-5), and #-5 (RFI-30). Therefore, RemVer flagged the results for these two analytes as UJ+ or J+ in all samples.

- Method(s) 8270D—Analytical Batch #419630 had LCS recoveries greater than the UCL (RPD acceptable) for Atrazine, but the analyte was not detected in the associated sample. This impacted one sample: #-2 (WP-5). Therefore, RemVer flagged the results for these two analytes as UJ or J in all samples.

The recovery of the Post Spike for Barium in Preparatory Batch #419433 (Method 6010C) was outside quality control limits, but the serial dilution was compliant. Therefore, RemVer flagged the results for these two analytes as UJ or J in all samples.

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-137324, surrogate performance, in those methods that use them, were within the acceptable control with no exceptions.

Site-Specific Matrix Spikes and Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-137324 used Sample #-2 (WP-5). Analytical performance in these runs was within the acceptable control with the following exceptions:

- Method(s) 8260C—Analytical Batch #420300 had MS/MSD recoveries below the LCL (RPD acceptable) for Styrene and trans-1,3-Dichloropropene, but the analytes were not detected in the associated sample #-2 (WP-5). Therefore, RemVer flagged the results for these two analytes as UJ or J in all samples.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as “UJ”.

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable for all analytes with no exceptions.

CCVs were acceptable in the SDG for all methods and analytes, with the following exceptions:

- Method 8270D—Batch #419630 had recoveries below the lower control limit (LCL, low bias) for Hexachlorocyclopentadiene and Pentachlorophenol. This impacted one sample: #-2 (WP-5). RemVer flagged the results as UJ- or J-.
- Method 8270D—Batch #419632 had recoveries below the lower control limit (LCL, low bias) for Hexachlorocyclopentadiene and Pentachlorophenol. This impacted the following

samples: #-1 (WP-8), #-3 (WP-7), #-4 (MW-5), and #-5 (RFI-30). RemVer flagged the results as UJ- or J-.

- Method 8270D—Batch #419632 had recoveries greater than the upper control limit (UCL) for Atrazine. This impacted the following samples: #-1 (WP-8), #-3 (WP-7), #-4 (MW-5), and #-5 (RFI-30). RemVer flagged the results as UJ or J.
- Method 608—Batch # 419976 had recoveries greater than the UCL for PCB-1254 in all samples. RemVer flagged the results as UJ or J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-137324 Annotated EDD with Validation (separate EXCEL workbook, attached)

Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	VOCs	No Comment
Method: 8270	No	SVOCs	No Comment
Method: 8270 SIM-ID	No	1,4 Dioxane	No Comment
Method: 608	Batch 417729—No	Organochlorine Pesticides	No Comment
	Batch 417514—No	PCBs	
Method: 6010	No	All TAL Metals	No Comment
Method: 7470	No	Mercury	No Comment
Method: 7196	No	Chromium, hexavalent	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
	—	—	X	Acetone	Flag UJ+ or J+
Method: 8270 #-1, #-3, #-4, & #-5	—	—	—	All Other	No Comment
	—	—	X	Atrazine	Flag UJ+ or J+
#-2	—	—	X	Atrazine	Flag UJ or J
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
	—	—	X	Barium	Flag UJ or J
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	—	No Comment
8270 SIM-ID	—	—	—	—	No Comment
Method: 608	—	—	—	Pesticides	No Comment
Method: 608	—	—	—	All PCBs	No Comment
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs: Others	—	—	—	Batch	—	No Comment
Styrene & t-1,3-Dichloropropene	—	X	—	#-2 only		Flag UJ or J
SVOCs	—	—	—	Batch	—	No Comment
SVOCs SIM-ID	—	—	—	Batch	—	No Comment
Pesticides	—	—	—	Batch	—	No Comment
PCBs	—	—	—	Batch	—	No Comment
TAL-Metals	—	—	—	—	—	No Comment
Mercury	—	—	—	—	—	No Comment
Chromium-Hex.	—	—	—	—	—	No Comment

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-137324						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 WP-8	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Atrazine	LCS/D & CCV	>UCL	—	Hi	Flag UJ+ or J+
	Hexachlorocyclopentadiene & Pentachlorophenol	CCV	<LCL	X	—	Flag UJ- or J-
	PCB-1254	CCV	>UCL	—	—	Flag UJ or J
	Barium	LCS	>UCL	—	—	Flag UJ or J
#-2 WP-5	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Styrene & t-1,3-Dichloropropene	MS/MSD	<LCL	—	—	Flag UJ or J
	Atrazine	LCS/D & CCV	>UCL	—	—Hi	Flag UJ or J
	Hexachlorocyclopentadiene & Pentachlorophenol	CCV	<LCL	X	—	Flag UJ- or J-
	PCB-1254	CCV	>UCL	—	—	Flag UJ or J
	Barium	LCS	>UCL	—	—	Flag UJ or J
#-3 WP-7	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Atrazine	LCS/D & CCV	>UCL	—	Hi	Flag UJ+ or J+
	Hexachlorocyclopentadiene & Pentachlorophenol	CCV	<LCL	X	—	Flag UJ- or J-
	PCB-1254	CCV	>UCL	—	—	Flag UJ or J
	Barium	LCS	>UCL	—	—	Flag UJ or J
#-4 MW-5	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Atrazine	LCS/D & CCV	>UCL	—	Hi	Flag UJ+ or J+
	Hexachlorocyclopentadiene & Pentachlorophenol	CCV	<LCL	X	—	Flag UJ- or J-
	PCB-1254	CCV	>UCL	—	—	Flag UJ or J
	Barium	LCS	>UCL	—	—	Flag UJ or J
#-5 RFI-30	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetone	LCS	>UCL	—	Hi	Flag UJ+ or J+
	Atrazine	LCS/D & CCV	>UCL	—	Hi	Flag UJ+ or J+
	Hexachlorocyclopentadiene & Pentachlorophenol	CCV	<LCL	X	—	Flag UJ- or J-
	PCB-1254	CCV	>UCL	—	—	Flag UJ or J
	Barium	LCS	>UCL	—	—	Flag UJ or J

Notes: † RPD—Relative Percent Difference

‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-137419		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-137419 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☒ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☒ Method 7196 Hexavalent Chromium (other:_____)
☒ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B or ☒ 608 Pesticides
☐ Method 8082 or ☒ 608 PCBs
☐ Method 8151 Chlorinated Herbicides
☒ Method 8260C VOCs GC/MS
☒ Method 8270D Semi-VOCs (sVOCs) GC/MS &/or SIM-ID
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☐ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
- ☑ Method 3535 Solid-Phase Extraction (SPE)
- ☑ Method 3510C Liquid-Liquid Extraction
- ☑ Method 5030C Purge & Trap
- ☑ Method 3005A Total Metals Prep.

Quality Control Requirements Summary

☐ Duplicate
☐ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☒ Method Blanks (no Trip Blank)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data Under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-137419, the samples of which came from a collection event on June 12, 2018.

Significant Data Usability Issues In SDG: #480-137419

Of the five (5) samples discussed herein, RemVer rejected no results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-137419)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-137419 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
RFI-12	#-1	Water	06/13/18	06/13/18	480-138505-4
RFI-19	#-2	Water	06/13/18	06/13/18	480-138505-5
RFI-04	#-3	Water	06/13/18	06/13/18	480-138505-6
RFI-28	#-4	Water	06/13/18	06/13/18	480-138505-7
RFI-31	#-5	Water	06/13/18	06/13/18	None

The SDG included the following samples with their analyses:

137419	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs
#–1	RFI-12	X	X	X	X	X	X	X
#–2	RFI-19	X	X	X	X	X	X	X
#–3	RFI-04	X	X	X	X	X	X	X
#–4	RFI-28	X	X	X	X	X	X	X
#–5	RFI-31	X	X	X	X	X	X	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-137419	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-137419	Y	N	Headspace in volatile sample #-5

Do the QC data fall within the protocol required limits and specifications?

(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-137419	☒	☐	☐	☒	☒	☒	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 1 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-137419	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-137419	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-137419	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-137419	Y	Several data qualifications were applied as described below

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 13, 2018; and this group of five samples were collected on June 13, 2018. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced an SDG report #480-137419 (dated 28-Jun-18). The SDG report had one issue associated with it but otherwise contained the required data and information. The issue is discussed in the following sections.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#724941): SDG: #480-137419—single, one-page COC, laboratory noted no issues at the time of acceptance.

Sample Preservation & Holding Time Evaluation

Laboratory received seven coolers with samples on 6/13/2018 @ 23:10 PM (designated as SDG-#480-137419) directly from the field. The temperatures of the coolers at receipt were 0.1, 0.9, 1.5, 1.8, 2.0, 2.6, and 3.1ºC. The samples arrived in good condition, properly preserved and, where required, on ice. Holding times and preservation requirements were met with one exception:

- Volatile Sample #-5 (RFI-31) had significant headspace (>6mm) in the sample container. Therefore, RemVer flagged (UJ or J) all Method 8260 analytes associated with this sample.

Blank Evaluation

The SDG #480-137419 had Method Blanks (MBs) for each method. The MBs were acceptable (no detectable analytes) with the following exceptions:

- Method 8270—Acetophenone was detected in the Blank.
- Method 608—Endrin Aldehyde was detected in the Blank.
- Method 6010—Barium, Calcium, Copper, Iron, Magnesium, Sodium, and Zinc were detected in the Blank.

The samples in this SDG included no field associated Blanks (either Equipment, Field, or Trip). This poses a limitation on these samples in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various method LCS' (LCS & LCS duplicates [LCSD]) were within the acceptable control ranges and relative percent differences (RPDs) for their particular analyses in SDG 480-137419, with the following exceptions:

- Method(s) 8260C—Analytical Batch #420488 had LCS/LCSD recoveries greater than the upper control limit (UCL, RPD acceptable) for Acetone, but the analyte was not detected in the associated samples. Therefore, RemVer flagged the results for this analyte as UJ or J in samples: #-1 (RFI-12), #-2 (RFI-19), #-3 (RFI-04), and #-4 (RFI-28).
- Method(s) 8260C—Analytical Batch #420732 had LCS/LCSD recoveries greater than the upper control limit (UCL, RPD acceptable) for Acetone, but the analyte was not detected in the associated samples. Therefore, RemVer flagged the results for this analyte as UJ or J in samples: #-5 (##).

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In SDG #480-137419, surrogate performance, in those methods that use them, were within the acceptable control with the following exceptions:

- Method 608 Pesticides—had surrogate recoveries outside of control limits due to matrix interference. Therefore, RemVer flagged the results for this analyte as UJ or J in samples: #-4 (RFI-28) and -5 (RFI-31).

Site-Specific Matrix Spikes and Matrix Spike Duplicates

Matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses in SDG #480-137419 used Sample #-2 (WP-5). Analytical performance in these runs was within the acceptable control with the following exceptions:

- Method(s) 8260C—Analytical Batch #420488 had MS/MSD recoveries above the UCL (RPD acceptable) for Acetone. Therefore, RemVer flagged the results for this analyte as UJ or J in samples: #-1 (RFI-12), #-2 (RFI-19), #-3 (RFI-04), and #-4 (RFI-28).
- Method(s) 8260C—Analytical Batch #420732 had MS/MSD recoveries below the LCL (RPD acceptable) for Trichloroethene. Therefore, RemVer flagged the results for this analyte as UJ or J in sample #-5 (RFI-31).
- Method 8270D SIM ID—Analytical Batch #421409 had MS/MSD recoveries beyond control limits. The associated LCS recovery was within acceptance limits, therefore, sample matrix interference or non-homogeneity is suspected. Therefore, RemVer flagged the 1,4-Dioxane results as UJ or J in all samples.
- Method 6010C—Batch #419752 had a serial dilution outside quality control limits for Total Aluminum, while the post-digestion spike was compliant. Additionally, the post spike recoveries of were outside quality control limits for Total Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, and Thallium, while the serial dilution was compliant. Therefore, RemVer flagged the results for these analytes as UJ or J in all samples.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues. If an analyte was above the MDL but below the RL, then it was flagged as "UJ".

Sample #-5 (RFI-31) had target analytes beyond the Method 8260C calibration range; therefore, it was diluted, resulting in elevated reporting limits. This also impacted the associated MS/MSD runs. RemVer flagged all associated method analytes as "UJ" or "J".

Sample #-3 (RFI-04) had issues associated with organic preparation (Method 3510C associated with Method 608-Pesticides) due to insufficient sample, which resulted in elevated reporting limits. RemVer flagged all associated method analytes as "UJ" or "J".

Calibration Standards and Continuing Calibration Verification (CCV)

Calibration standard (external or internal) were acceptable for all analytes with no exceptions.

CCVs were acceptable in the SDG for all methods and analytes, with the following exceptions:

- Method 8260C—Batch #420488 had recoveries greater than the upper control limit (UCL) for Acetone and 2-Butanone (MEK). This impacted the following samples: #-1 (RFI-12), #-2 (RFI-19), #-3 (RFI-04), and #-4 (RFI-28). RemVer flagged the results as UJ or J.
- Method 8260C—Batch #420732 had recovery greater than the upper control limit (UCL) for Acetone. This impacted sample: #-5 (RFI-31). RemVer flagged the results as UJ or J.
- Method 8270D—Batch #420732 had recoveries below the lower control limit (LCL, low bias) for Trichlorofluoromethane and Vinyl Chloride. This impacted sample: #-5 (RFI-31). RemVer flagged the results as UJ- or J-.
- Method 8270D—Batch #420467 had recoveries below the lower control limit (LCL, low bias) for Pentachlorophenol and 2,4-Dinitrophenol. This impacted the following samples: #-1 (RFI-12), #-2 (RFI-19), and #-3 (RFI-04). RemVer flagged the results as UJ- or J-.
- Method 8270D—Batch #420467 had recoveries greater than the upper control limit (UCL) for Atrazine. This impacted the following samples: #-1 (RFI-12), #-2 (RFI-19), and #-3 (RFI-04). RemVer flagged the results as UJ or J.
- Method 8270D—Batch #420085 had recoveries below the lower control limit (LCL, low bias) for Pentachlorophenol and 2,4-Dinitrophenol. This impacted the following samples: #-4 (RFI-28) and #-5 (RFI-31). RemVer flagged the results as UJ or J.
- Method 8270D—Batch #420085 had recoveries greater than the upper control limit (UCL) for Atrazine. This impacted the following samples: #-4 (RFI-28) and #-5 (RFI-31). RemVer flagged the results as UJ or J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

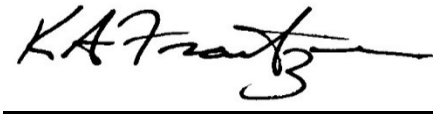
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-137419 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD
November 19, 2018

GES PO#746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method: 8260	No	—	No Comment
Method: 8270	No	Acetophenone	Flag B or UB
Method: 8270 SIM-ID	No	—	No Comment
Method: 608	Batch 417729—No	Endrin Aldehyde	Flag B or UB
	Batch 417514—No	—	No Comment
Method: 6010	No	Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Flag B or UB
Method: 7470	No	—	No Comment
Method: 7196	No	—	No Comment

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
Method: 8260	—	—	—	All	No Comment
	—	—	X	Acetone	Flag UJ or J
Method: 8270	—	—	—	All Other	No Comment
8270 SIM-ID	—	—	—	1,4 Dioxane	No Comment
Method: 608	—	—	—	Organochlorine Pesticides	No Comment
Method: 608	—	—	—	PCBs	No Comment
Method: 6010	—	—	—	TAL-Metals	No Comment
Method: 7470	—	—	—	Mercury	No Comment
Method: 7196	—	—	—	Chromium, hexavalent	No Comment

SURROGATES	SV <10%	> 10% & < LCL	>UCL	Compound(s)	Notes
Method: 8260C	—	—	—	—	No Comment
Method: 8270D	—	—	—	—	No Comment
8270 SIM-ID	—	—	—	—	No Comment
Method: 608 #-4 & #-5	—	—	X	All Pesticides	Flag UJ or J
Method: 608	—	—	—	All PCBs	No Comment
Method: 6010	—	—	—	—	—
Method: 7470	—	—	—	—	—
Method: 7196	—	—	—	—	—

Attachment 1 continued

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
VOCs: Others	—	—	—	Batch	—	No Comment
Acetone	—	—	X	Batch		Flag UJ or J #-1, 2, 3, & 4
Trichloroethene	—	X	—	Batch		Flag UJ or J #-5 only
SVOCs	—	—	—	Batch	—	No Comment
SVOCs SIM-ID	—	—	X	Batch	—	Flag UJ or J
Pesticides	—	—	—	Batch	—	No Comment
PCBs	—	—	—	Batch	—	No Comment
TAL-Metals	—	—	—	Batch	—	No Comment
Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, & Thallium	—	—	X	Batch	—	Flag UJ or J
Mercury	—	—	—	—	—	No Comment
Chromium-Hex.	—	—	—	—	—	No Comment

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
		N/A	—	—	
		N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☐ Y	☒ N
Holding Time Requirements Met	☒ Y	☐ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

SDG #480-137419						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
#-1 RFI-12	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetophenone, Endrin Aldehyde, Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Blank	—	—	—	Flag B or UB
	Acetone	LCS & CCV	>UCL	—	—	Flag UJ or J
	Acetone	MS/MSD	>UCL	—	—	Flag UJ or J
	Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, & Thallium	MS/MSD	>UCL	—	—	Flag UJ or J
	Pentachlorophenol & 2,4-Dinotrophenol	CCV	<LCL	—	—	Flag UJ- or J-
	Atrazine	CCV	>UCL	—	—	Flag UJ or J
	2-Butanone (MEK)	CCV	>UCL	—	—	Flag UJ or J
#-2 RFI-19	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetophenone, Endrin Aldehyde, Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Blank	—	—	—	Flag B or UB
	Acetone	LCS & CCV	>UCL	—	—	Flag UJ or J
	Acetone	MS/MSD	>UCL	—	—	Flag UJ or J
	Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, & Thallium	MS/MSD	>UCL	—	—	Flag UJ or J
	Atrazine	CCV	>UCL	—	—	Flag UJ or J
	Pentachlorophenol & 2,4-Dinotrophenol	CCV	<UCL	—	—	Flag UJ- or J-
#-3 RFI-04	All	MDL>result<RDL	—	—	—	Flag UJ
	All Pesticides	Organic Prep	—	—	—	Flag UJ or J
	Acetophenone, Endrin Aldehyde, Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Blank	—	—	—	Flag B or UB
	Acetone	LCS & CCV	>UCL	—	—	Flag UJ or J
	Acetone	MS/MSD	>UCL	—	—	Flag UJ or J
	Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium,	MS/MSD	>UCL	—	—	Flag UJ or J

SDG #480-137419						
Sample Number(s)	**Compound(s)**	**QC Non-Conformance**	**% Recovery**	**% RPD †**	**High or Low Bias ‡**	**Comments**
	Nickel, Lead, Antimony, Selenium, & Thallium					
	Atrazine	CCV	>UCL	—	—	Flag UJ or J
	Pentachlorophenol & 2,4-Dinotrophenol	CCV	<LCL	—	—	Flag UJ- or J-
#-4 RFI-28	All	MDL>result<RDL	—	—	—	Flag UJ
	Acetophenone, Endrin Aldehyde, Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Blank	—	—	—	Flag B or UB
	Acetone	LCS & CCV	>UCL	—	—	Flag UJ or J
	Acetone	MS/MSD	>UCL	—	—	Flag UJ or J
	Pesticides	Surrogates	>UCL	—	—	Flag UJ or J
	Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, & Thallium	MS/MSD	>UCL	—	—	Flag UJ or J
	Atrazine	CCV	>UCL	—	—	Flag UJ or J
	Pentachlorophenol & 2,4-Dinotrophenol	CCV	<LCL	—	—	Flag UJ- or J-
#-5 RFI-31	All	MDL>result<RDL	—	—	—	Flag UJ
	All VOCs	RLs	—	—	—	Flag UJ or J
	Acetophenone, Endrin Aldehyde, Barium, Calcium, Copper, Iron, Magnesium, Sodium, & Zinc	Blank	—	—	—	Flag B or UB
	Acetone	LCS & CCV	>UCL	—	—	Flag UJ or J
	Trichlorofluoromethane & Vinyl Chloride	CCV	<LCL	—	—	Flag UJ- or J-
	Trichloroethene	MS/MSD	<LCL	—	—	Flag UJ or J
	Pesticides	Surrogates	>UCL	—	—	Flag UJ or J
	Aluminum, Arsenic, Calcium, Cadmium, Cobalt, Magnesium, Sodium, Nickel, Lead, Antimony, Selenium, & Thallium	MS/MSD	>UCL	—	—	Flag UJ or J
	Atrazine	CCV	>UCL	—	—	Flag UJ or J
	Pentachlorophenol & 2,4-Dinotrophenol	CCV	<LCL	—	—	Flag UJ- or J-

Notes: † RPD—Relative Percent Difference
‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.

RemVer

Quality Assessment
Data Usability Summary Report

			RemVer Project #2018GE07 Client Project # 0901688-02-840
Site:	Al-Tech, Dunkirk, NY	**Site #:**	907022
Client:	NYSDEC via GES, Inc.	**Site Owner:**	–N/A–
Sample Delivery Groups (SDGs)	480-138505		
Sample Matrix:	☐ Drinking water ☒ Groundwater ☐ Surface water ☐ Soil ☐ Sediment ☐ Air ☐ Biota (tissue, type: _____) ☐ Other: _____		

Introduction

RemVer performed a data quality assessment (DQA) on the analytical data for groundwater samples. reported in Sample Delivery Groups (SDGs) #480-138505 from Test America (TA). A DQA is an evaluation of the performance of analytical procedures and quality of the resulting data. RemVer followed the requirements of the New York State Department of Environmental Conservation (NYSDEC) Data Usability Summary Report (DUSR) guidelines for an Analytical Services Protocol (ASP) Category B Data Deliverable. This report includes a narrative discussion of sample results qualified during the DQA. Attached to the main report is a list describing the final reported qualification flags applied to the data by RemVer during this DQA process.

Reported Methods

☐ Method 1311 TCLP
☐ Method 1312 SPLP
☐ Method 6010A, B & C / 6020 Trace Metals
☐ Method 7000 Metals
☐ Method 7196 Hexavalent Chromium (other:_____)
☐ Method 7470A or 7471 Mercury
☐ Method 8021 Volatile Organic Compounds (VOCs) GC
☐ Method 8081B Pesticides
☐ Method 8082 PCBs
☐ Method 8151 Chlorinated Herbicides
☐ Method 8260C VOCs GC/MS
☐ Method 8270D Semi-VOCs (sVOCs) GC/MS or SIM
☐ Method 9010/9012/9014 Cyanides (_____)

☐ Method TO-13A PAHs (air)
☐ Method TO-14A / -15 VOCs (air, summa) (_____)
☐ Method TO-17 VOCs (air, sorbent)
☒ Method 537 PFCs via SPE & LC/MS-MS
☐ Volatile Petroleum Hydrocarbons (VPH) Method
☐ Extractable Petroleum Hydrocarbons (EPH)
☒ Other Methods:
☑ Method 3535 Solid-Phase Extraction (SPE)

Quality Control Requirements Summary

☐ Duplicate
☒ Matrix Spike [MS] / Matrix Spike Duplicate [MSD]
☐ Trip Blank(s)
☐ Equipment, Method, &/or Rinsate Blank

☐ Other Field QC: Field notes regarding sampling
☐ Special QAPP Requirements: _____
_____

Intended Use of Data under Review

NYSDEC contracted GES to perform a 2018 site-wide comprehensive groundwater monitoring event at the referenced site. This monitoring event (30 May through 12 June) was to update the existing groundwater dataset with current synoptic conditions. Sampling was to provide analyses of groundwater conditions for the presence of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) including 1,4 Dioxane, organochlorine pesticides, polychlorinated biphenyls (PCBs), and metals/metalloids. Additionally, groundwater samples from pre-selected locations were analyzed for the presence of emerging contaminants including perfluoroalkyl and polyfluoroalkyl substances/compounds (PFAS or PFCs). This multi-day event resulted in multiple analytical Sample Delivery Groups (SDGs). RemVer prepared DUSRs for each laboratory report representing a unique SDG.

This DUSR addresses SDG #480-138505, the samples of which came from a collection event on June 12–13, 2018. Groundwater monitoring evaluation of PFAS from the listed wells was the purpose of this sampling event.

Significant Data Usability Issues In SDG: 480-138505

Of the seven (7) samples discussed herein, RemVer rejected no PFAS results. The results are acceptable for use although the results of some analytes are flagged due to sample handling, or laboratory accuracy or precision issues. Please refer to the Lab Results and Data Usability Narrative section for further detail.

The samples associated with this SDG contained no Field Duplicate samples or Blanks (Trip, Field, or Equipment). RemVer did not evaluate the duplicate or field-associated blanks to judge sampling performance in this instance. Regardless, the analytical Method Duplicates met their RPD performance criteria. This was a multi-day sampling event covered by multiple SDGs; herein the reader will find a cross-listing of the samples and their association with other SDGs. RemVer did not find this is to be a significant quality issue as it can be handled by GES directly (note: if the Relative Percent Difference [RPD] between the original sample and its associated replicate are less than 20%, then sampling performance precision is within acceptable limits).

Detailed Quality Review

Field Notes Review

	Y	N	NA	COMMENTS
Sampling notes	☐	☒	☐	
Field meteorological data	☐	☐	☒	No review required under QAPP
Associated sampling location and plan included	☐	☒	☐	See RAP/QAPP
Associated drilling logs available, reviewed	☐	☐	☒	No review required under QAPP
Identification of QC samples in notes	☒	☐	☐	Sample IDs
Sampling instrument decontamination records	☐	☐	☒	No review required under QAPP
Sampling instrument calibration logs	☐	☐	☒	No review required under QAPP
Chain of custody included	☒	☐	☐	With analytical report
Notes include communication logs	☐	☒	☐	
Any corrective action (CA) reports	☐	☒	☐	If so, CA documentation of results required.
Any deviation from methods noted? If so, explain	☐	☒	☐	None
Any electronic data deliverables	☐	☒	☐	None
Sampling Report (by Field Team Leader)	☐	☒	☐	

Lab Report Contents (Test America SDG Reports: #480-138505)

☒ SDG Narrative
☒ Contract Lab Sample Information Sheets
☒ Data Package Summary Forms
☒ Chain-of-Custody (COC) Forms
☒ Test Results (no tentatively identified compounds [TICs])
☒ Calibration standards
☒ Surrogate recoveries
☒ Blank results
☒ Spike recoveries
☒ Duplicate results
☒ Confirmation (lab check/QC) samples
☒ Internal standard area & retention time summary
☒ Chromatograms
☒ Raw data files
☒ Other specific information

The SDG reported the following samples:

Sample ID	SDG #480-138505 –Sample #	Matrix	Sampled	Received	Reported in Other SDGs
WP-4	#-1	Water	06/12/18	06/29/18	480-137324-1
MW-5	#-2	Water	06/12/18	06/29/18	480-137324-4
RFI-30	#-3	Water	06/12/18	06/29/18	480-137324-5
RFI-12	#-4	Water	06/13/18	06/29/18	480-137419-1
RFI-19	#-5 (MS/MSD))	Water	06/13/18	06/29/18	480-137419-2
RFI-04	#-6	Water	06/13/18	06/29/18	480-137419-3
RFI-28	#-7	Water	06/13/18	06/29/18	480-137419-4

The SDG included the following samples with their analyses:

138505	Well	VOCs	SVOCs	SIM-ID	TAL & Hg	Hex–Cr	Pest	PCBs	PFAS
#–1	WP-4	—	—	—	—	—	—	—	X
#–2	MW-5	—	—	—	—	—	—	—	X
#–3	RFI-30	—	—	—	—	—	—	—	X
#–4	RFI-12	—	—	—	—	—	—	—	X
#–5	RFI-19	—	—	—	—	—	—	—	X
#–6	RFI-04	—	—	—	—	—	—	—	X
#–7	RFI-28	—	—	—	—	—	—	—	X

VOC: Volatile Organic Compounds (8260) | SVOC: Semi-VOCs (8270) | SIM-ID: SVOC Ion Monitor w/ Isotope Dilution (8270)
TAL: Total Analyte List (6010) | Hg: Mercury (7470) | Hex-Cr: Hexavalent Chromium (7196) | Pest: Pesticides (608)
PCBs via 608 | PFAS: Perfluoroalkyl & Polyfluoroalkyl Substances (537) | * Dry, no sample † No sample

Is the data package complete as defined under the requirements for the NYSDEC ASP Category B?		
Laboratory Report	**Complete (Y/N)**	**Comments**
480-138505	Y	No

Sample Preservation Requirements & Holding Times Met?			
Laboratory Report	**Hold Times (Y/N)**	**Preservation (Y/N)**	**Exception Comment**
480-138505	N	Y	Samples received by lab beyond holding time

Do the QC data fall within the protocol required limits and specifications?

(1) blanks, (2) instrument tunings, (3) calibration standards, (4) calibration verifications, (5) surrogate recoveries, (6) spike recoveries, (7) replicate analyses, (8) laboratory controls, (9) and sample data

SDG	1	2	3	4	5	6	7	8	9
480-138505	☒	☐	☐	☐	☒	☒	☐	☒	☒

The narrative section, below, discusses these deficiencies in detail, see Attachment 2 as well.

Have the data been generated using established and agreed upon analytical protocols?		
Laboratory Report	**Protocols (Y/N)**	**Exception Comment**
480-138505	Y	No

Do the raw data confirm the results provided in the data summary sheets and quality control verification forms?		
Laboratory Report	**Confirmation (Y/N)**	**Exception Comment**
480-138505	Y	No

Have the correct data qualifiers been used and are they consistent with the most current guidance?		
Laboratory Report	**Qualifiers (Y/N)**	**Comment**
480-138505	Y	The laboratory generally applied appropriate qualifiers.

Have any quality control (QC) exceedances been specifically noted in this DUSR and the corresponding QC summary sheets from the data packages referenced?		
Laboratory Report	**QC Exceedances Documented (Y/N)**	**Comment**
480-138505	Y	Several data qualifications were applied as described below

The following PFAS compound abbreviations are used in this DUSR:

Perfluorobutanoic acid (PFBA)
Perfluoropentanoic acid (PFPeA)
Perfluorohexanoic acid (PFHxA)
Perfluoroheptanoic acid (PFHpA)
Perfluorooctanoic acid (PFOA)
Perfluorononanoic acid (PFNA)
Perfluorodecanoic acid (PFDA)
Perfluoroundecanoic acid (PFUnA)
Perfluorododecanoic acid (PFDoA)
Perfluorotridecanoic Acid (PFTriA)
Perfluorotetradecanoic acid (PFTeA)

Perfluorobutanesulfonic acid (PFBS)
Perfluorohexanesulfonic acid (PFHxS)
Perfluoroheptanesulfonic Acid (PFHpS)
Perfluorooctanesulfonic acid (PFOS)
Perfluorodecanesulfonic acid (PFDS)
Perfluorooctane Sulfonamide (PFOSA)
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

Data Quality and Usability Narrative

Field Notes Inspection

The groundwater samples came from a multi-day collection event between May 30th through June 13, 2018; and this group of eight samples were collected on June 12 and June 13, 2013. A review of the field notes was not performed for this DUSR.

Laboratory Report Inspection

TA produced one SDG report #480-138505 (dated 9-Aug-18), which contained the required data and information.

Chain of Custody (COC) Evaluation

NYSDEC/GES produced a COC for the referenced fieldwork (GES Project PSID#724941): SDG: #480-138505—single, one-page COC, laboratory noted no issues at the time of acceptance. The laboratory produced a second COC for sub-contract laboratory.

Sample Preservation & Holding Time Evaluation

Laboratory received one cooler with samples on 6/29/2018 @ 17:15 PM (designated as SDG-#480-138505) in proper condition and, where required, on ice. The temperature of the cooler at receipt was measured as 4.0 ºC. The laboratory noted that the samples arrived outside of holding times. Preservation requirements were met.

Blank Evaluation

The Method Blanks (MBs) for Method 537 (batch 200-131669 [preparation] & 200-132020 [analytical]) had a detection of Perfluorobutanoic acid (PFBA) greater than the Method Detection Limit (MDL) but less than the Reporting Limit (RL). Therefore, detected concentrations of PFBA should be considered as estimates and flagged UJB or JB, but only if the associated sample reported a result greater than the respective MDL or RL.

The samples included in this SDG included no field generated Blanks (either Equipment, Field, or Trip). This poses a limitation on the samples in this SDG in that it provides no quality measure of operational performance of the sampling itself. Because this was a multi-day sampling event covered by multiple SDGs, this is not a significant quality issue. Herein the reader will find a cross-listing of the samples and their association with other SDGs.

Laboratory Control Samples (LCS)

The various LCS' were within the acceptable range for their particular analyses in SDG #480-138505, except for the isotope dilution (see discussion below).

Surrogates

Surrogates added to a sample allow testing of preparatory and instrument behavior resulting in recoveries within appropriate method ranges for the analytes. In this SDGs, there were no quality exceptions as the method uses isotope dilution (see discussion below).

Site-Specific Matrix Spikes and Matrix Spike Duplicates

The matrix spike/matrix spike duplicate (MS/MSD) runs for the analyses used Sample #-5 (RFI-19). Both the MS and MSD met the QA criteria, except for the isotope dilution (see discussion below).

Tentatively Identified Compounds (TICs)

The SDGs had no analysis of TICs.

Duplicates

The samples associated with this SDG did not have an accompanying field replicate. RemVer did not evaluate a field duplicate to judge sampling performance in this instance; however, as this was a multi-day sampling event covered by multiple SDGs. Therefore, this is not a significant quality issue. Regardless, the analytical Method Duplicates met their RPD performance criteria.

Detection Limits

Analytical detection limits were acceptable for all analytes causing no QA issues; however, if an analyte was above the MDL but below the RL, then it was flagged as “UJ”.

Isotope Dilution Analyte

Isotope Dilution Analyte (IDA) recovery for M2-6:2FTS were greater than the method recommended limits for the following samples: #-3 (RFI-30) and #-7 (RFI-28). There were similar issues associated with M2-6:2FTS in the following quality analyses: MS/MSD (#-5 [RFI-19]), LCS (Batch 200-131669/2-A), and MB (Batch 200-131669/1-A). Quantitation by isotope dilution generally precludes adverse effects on data quality due to elevated IDA recoveries; nevertheless, RemVer flagged this analyte as UJ/J.

Sample Result and Usability Evaluation

Due to certain sample issues or laboratory performance, some results were qualified; however, the data are usable. No data received an R (rejected) flag.

References

NYSDEC, 2010, *Technical Guidance for Site Investigation and Remediation*, "DER-10," Division of Environmental Remediation: Albany, NY, May, 232p

NYSDEC, 2010, *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, Appendix 2B IN *Technical Guidance for Site Investigation and Remediation*, Division of Environmental Remediation: Albany, NY, May, 232p

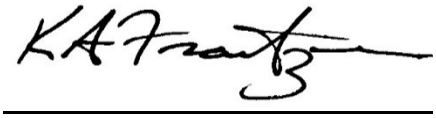
USEPA, 2008, *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, OSWER 9240.1-48, USEPA-540-R-08-01, Office of Superfund Remediation and Technology Innovation: Washington, DC, June, 225p

USEPA, 2010, *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, OSWER 9240.1-51, USEPA-540-R-10-011, Office of Superfund Remediation and Technology Innovation: Washington, DC, January, 110p

USEPA, 2012, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846*, Current Online Revision: http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed April 2012

Attachments

1. DQA Detail Worksheet
2. DQA Non-Conformance Summary Workheet
3. SDG 480-138505 Annotated EDD with Validation (separate EXCEL workbook, attached)



Prepared by: Kurt A. Frantzen, PhD, CHMM
November 19, 2018

GES PO #746056-1109

Attachment 1
DQA Detail Worksheet

BLANKS	>RL?	Compounds	Notes
Method Blank: PFAS	Yes	PFBA	Flag UJB if >MDL Flag JB if >RDL
—	—	—	—
—	—	—	—
—	—	—	—

LCS	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
PFAS	—	—	X	M2-6:2FTS	Flag UJ/J
	—	—	—	All Others	No Comment

SURROGATES	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	Compound(s)	Notes
PFAS	—	—	X	M2-6:2FTS	Flag UJ/J
	—	—	—	All Others	No Comment

MS/MSDs	SV <10%	Low Bias > 10% & < LCL	High Bias >UCL	QC Source	RPDs	Notes
PFAS	—	—	X	M2-6:2FTS	—	Flag UJ/J
	—	—	—	All Others	—	No Comment

FIELD DUPLICATES RPDs	QC Source	Soil RPD > 50%	Water RPD > 20%	Compounds	Notes
None	Unknown	N/A	—	—	Did Not Evaluate
None	Unknown	N/A	—	—	
LAB DUPLICATES					
-------	Batch	N/A	—	As listed	No Comment

Reasonable Confidence Achieved	☐ Y	☐ N—Not Applicable
Significant QC Variances Noted	☒ Y	☐ N
Requested Reporting Limits Achieved	☒ Y	☐ N
Preservation Requirements Met	☒ Y	☐ N
Holding Time Requirements Met	☐ Y	☒ N

Abbreviations:
RL = Reporting Limit LCS = Laboratory Control Sample SV = Significant QC Variance
RPD = Relative Percent Difference LCL= RCP Lower Control Limit UCL= RCP Upper Control Limit
VOCs = Volatile Organic Compounds SVOCs = Semi-volatile Organic Compounds Pest = Pesticides
EPH = Extractable Petroleum Hydrocarbons VPH = Volatile Petroleum Hydrocarbons ETPH = EPH-Total
PCBs = Polychlorinated Biphenyls N/A = Not Applicable N/C = Not Collected -- = nothing to report
Notes: * Typical lab contaminants, not site-related

Attachment 2
DQA Non-Conformance Summary Worksheet

Only Flagged Results Shown Below

Sample Number(s)	Compound(s)	QC Non-Conformance	% Recovery	% RPD †	High or Low Bias ‡	Comments
WP-8 #–1	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
MW-5 #–2	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
RFI-30 #–3	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
RFI-12 #–4	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
RFI-19 #–5	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
RFI-04 #-6	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J
RFI-28 #-7	PFBA	Method Blank	If >Limits	—	High	Flag UB / B
	M2-6:2FTS	Isotope Dilu.	>UCL	—	High	Flag UJ / J
	ALL	Holding Time	—	—	—	Flag UJ / J

Notes: † RPD—Relative Percent Difference
‡ Bias High—Reported result may be lower, Reporting Limit (RL) is acceptable as reported. Bias Low—Reported results may be higher, RL may be higher than reported.