WENCK File #5365-0001
April 2018

Fourth VIRP Progress Report

Former Duluth Dry Cleaner Site
3146 Main Street
Duluth, GA
HSI # 10892

Prepared for:
City of Duluth

3167 Main Street
Duluth, GA 30096

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Responsive partner.
Exceptional outcomes.

Prepared by:

WENCK Associates, Inc.
1080 Holcomb Bridge Road
Building 100, Suite 190
Roswell, GA 30076
Phone: 678-987-5840
Fax: 678-987-5877

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PG Certification

"I certify under penalty of law that this report and all attachments were prepared by me or under my direct supervision in accordance with the Voluntary Remediation Program Act (O.C.G.A. Section 12- 8-101, et seq.). I am a professional engineer/professional geologist who is registered with the Georgia State Board of Registration for Professional Engineers and Land Surveyors/Georgia State Board of Registration for Professional Geologists and I have the necessary experience and am in charge of the investigation and remediation of this release of regulated substances.

The information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Katie T. Ross, P.G.
Project Manager

April 30, 2018

Registration No. 1776
State of Georgia

1.0 Introduction

Wenck Associates, Inc. (Wenck) was authorized by the City of Duluth to implement the Voluntary Investigation and Remediation Plan (VIRP), which was submitted in January 2016 and approved by the Georgia Environmental Protection Division (EPD) in a letter dated March 4, 2016. The site is currently owned by the City of Duluth. The site consists of one parcel located at the intersection of Main Street and Knox Drive in Duluth, Georgia (the Site). The location and topography features of the Site are presented on **Figure 1**. A Site Detail Map is presented as **Figure 2**.

This Fourth VIRP Progress Report provides a summary of the activities conducted at the Site from October 2017 through April 2018.

1.1 SUMMARY OF SITE ACTIVITIES

The following scope of services was performed by Wenck between October 2017 and April 2018:

- Installed one shallow monitoring well (MW-13) south of MW-2 to evaluate groundwater conditions and groundwater flow;
- Surveyed the new monitoring well (MW-13);
- Calculation of Type 2 Risk Reduction Standards (RRS);
- Oversight of public and private utility locate and property boundary survey;
- Performed limited groundwater sampling for volatile organic compounds (VOCs) from eight (8) wells (MW-1 through MW-6, MW-8, and MW-13); as well as geochemical parameters from select wells (MW-1, MW-8, and MW-13) in April 2018; and
- Prepared this report.

In the previous report (Third VIRP Progress Report), the installation and survey of one bedrock well (MW-14), clustered with MW-3 to determine the vertical extent of contamination, was outlined as work to be performed during this reporting period. However, due to parking lot construction and re-paving activities in the upper and lower lot, Wenck was unable to schedule and perform the installation. The installation, as well as the well survey, will be performed during the next reporting period.

2.0 Site Background

2.1 HISTORICAL ACTIVITIES

A dry cleaning business operated at the Site from 1975 to 1993. The dry cleaner closed in 1993 and the existing building was used to operate a woodworking shop from 1993 to 1998. As a result of the historic operation of a dry cleaner at the Site, a release of chlorinated VOCs from dry cleaning solvents, namely tetrachloroethene (PCE) and its daughter products, have impacted soil and groundwater. The VOCs have impacted onsite soil and groundwater and are migrating downgradient of the Site to the west northwest.

In 1998, the building was demolished and converted into a parking lot. In 2000, the City of Duluth purchased the Site. The Site was sold to EJT Downtown, LLC in 2007. The original discovery of the release occurred in 2008 during a Phase II Environmental Site Assessment (ESA) performed by Ahlberg Engineering, Inc., (AEI). Results of the Phase II indicated the presence of PCE and other compounds in soil and groundwater onsite in the vicinity of the former dry cleaning building.

The EPD determined that a release exceeding a reportable quantity had occurred at the Site based upon information provided in the April 4, 2008 release notification. The City of Duluth reacquired the property in 2014 and is now the current owner of the Site. Following the listing on the HSI, limited sub-surface investigations were conducted in 2010 by the US Army Corps of Engineers (USACE) and in 2015 by Wenck. These activities, along with the 2008 Phase II, are summarized in the January 2016 VIRP, which was approved by the EPD in March 2016.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

The uppermost hydrologic unit in the area of the Site is an unconfined surficial aquifer which is comprised of a saprolite-bedrock aquifer. The saprolite-bedrock aquifer is recharged by rainfall and discharges into streams in valley bottoms. The saprolite stores and transmits water in the pore spaces between the soils (clays, silts, and sands) that comprise the saprolite. The saprolite has a much higher storage capacity but lower transmissivity than the underlying bedrock. The bedrock stores and transmits water through secondary porosity features (fractures, joints, and faults). The bedrock can be capable of transmitting very large volumes of water; the transmissivity depends on the density and orientation of the secondary porosity features. Based on groundwater elevations measured intermittently since October 2015, shallow groundwater flows to the northwest.

3.0 Site Activities

During the reporting period, one permanent monitoring well (MW-13) was installed on property owned by the City of Duluth.

Groundwater sampling activities were performed in general accordance with the U.S. Environmental Protection Agency (EPA) Region 4 Science and Ecosystem Support Division (SESD) Quality System and Technical Procedures for groundwater sampling (SESDPROC-301-R3) sampling. Methods and procedures are described below.

3.1 MONITORING WELL INSTALLATION

Monitoring well MW-13 was installed on October 23, 2017 to further evaluate groundwater conditions and groundwater flow evaluation (**Figure 2**). The monitoring well was constructed as a threaded, two-inch diameter PVC well with 10 feet of screen installed from 20 to 30 feet below ground surface (bgs). The well was developed by purging at least five well volumes from the well. The well installation and development logs are presented in **Appendix A.**

3.2 GROUNDWATER SAMPLING

Groundwater sampling was conducted on April 9, 2018 and April 10, 2018. Prior to sampling, depths to groundwater and total well depths were measured using a water level indicator. Previously marked reference points were used to ensure consistency of measurements. Depths were measured to the nearest 0.01 foot. Water level measurement results are presented in **Table 1.**

Groundwater samples were collected from eight (8) monitoring wells (MW-1 through MW-6, MW-8, and MW-13). Previously non-detect wells (MW-7, MW-11, and MW-12) were not sampled during this groundwater sampling event. Off-site wells MW-9 and MW-10 were installed as part of a real estate transaction and were abandoned in 2017 during re-development of the property.

Groundwater was purged via a bladder pump using low-flow techniques. The following field parameters were measured using direct reading instruments: dissolved oxygen (DO), pH, conductivity, water temperature, turbidity, and oxidation-reduction potential (ORP). The tabulated results of these field measurements are presented in **Table 2**. Groundwater parameters during purging were considered stable when at least three (3) sets of readings were within the following ranges:

- pH (± 0.1 SU);
- SC (± 10%);
- DO (± 0.2mg/L or 10%, whichever was greater); and
- ORP (± 10 mV).

Field logs of the sampling activities are provided in **Appendix B**.

The samples were collected in laboratory supplied bottles, placed in a cooler with ice, and submitted under chain-of-custody control to Pace Analytical Services, LLC (Pace) for

laboratory analysis. Laboratory reports and chain-of-custody documentation are included in **Appendix C**.

3.3 SURVEYING MW-13

The newly installed well (MW-13) was surveyed on November 10, 2017 by Precision Planning, Inc., a Georgia licensed surveyor. The survey established the horizontal and vertical coordinates relative to North American horizontal (1983) and vertical (1988) datum.

3.4 DECONTAMINATION AND DISPOSAL ACTIVITIES

Investigation-derived waste (IDW), including soil cuttings, development and purge water, was drummed for off-site disposal. In total, one drum of soil cuttings and one drum of decontamination/development & purge water for the installation of MW-13 were disposed off-site by EQ Industrial Services on November 16, 2017. One drum of decontamination/purge water for the April sampling event will be disposed off-site during the next reporting period IDW waste manifests documenting disposal are presented in **Appendix D**.

3.5 DELINEATION CRITERIA CALCULATIONS

Wenck is proposing Type 2 groundwater RRS to serve as the delineation criteria for VOCs detected at MW-13. MW-13 is located at the property boundary adjacent to the rail-road right-of-way. . Type 1 RRS will be used as the delineation criertia for the entire site, with the exception of MW-13. We propose using updated Type 2 RRS to serve as the delineation criteria for MW-13.

The Type 2 RRS have been calculated to reflect the updated standard Default Exposure Factors as outlined in the United States Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) Directive 9200.1-120 dated February 6, 2014. The Type 2 groundwater RRS values were calculated using EPA's web-based Regional Screening Level (RSL) calculator. **Table 3** presents the delineation criteria as the Type 1 RRS, with the exception of at the location of monitoring well MW-13. The data files generated by the EPA Regional Screening Level ("RSL") calculator are included in **Appendix E** for reference. The Type 2 groundwater RRS provided in this report would be used to demonstrate compliance with the delineation criteria at MW-13 only.

4.0 Findings

4.1 GROUNDWATER FLOW CHARACTERISTICS

Depth to groundwater at wells MW-1 through MW-6, MW-8, and MW-13 was measured using a water level indicator. All measurements were recorded to the nearest 0.01 foot. Groundwater elevations were calculated using top of casing elevations presented in the VIRP and in this report. A summary of the depth to water and groundwater elevations is provided in **Table 1**.

Based on the current data, groundwater appears to be flowing to the southwest with an average hydraulic gradient of 0.023 feet/foot **(Figure 3)**.

4.2 ANALYTICAL RESULTS

Select wells were sampled to evaluate groundwater conditions at the Site. The groundwater sample results are summarized in **Table 3**. Laboratory reports and supporting chain-of-custody documentation are included in **Appendix C**.

4.2.1 Groundwater Results

Groundwater sampling in April 2018 included collection of samples from eight (8) monitoring wells (MW-1 through MW-6, MW-8, and MW-13). Groundwater samples were analyzed to determine concentrations of VOCs (EPA Method 8260B). Additionally, MW-1, MW-8, and MW-13 were analyzed for the following natural attenuation parameters:

- Sulfide
- Chloride;
- Nitrate (as N);
- Sulfate;
- Total Organic Carbon (TOC);
- Alkalinity as $CaCO^3$;
- Methane;
- Ethane; and
- Ethene.

4.2.1.1 Volatile Organic Compounds

Detectable concentrations of VOCs were present in 7 of the 8 wells sampled (MW-1 through MW-6 and MW-13). Concentrations of VOCs were less than laboratory detection limits at MW-8. Monitoring wells MW-7, MW-11, and MW-12 were not sampled during this reporting period. As shown on **Table 3,** three (3) constituents were detected above the delineation criteria, including: PCE, TCE and cis-1,2-dichloroethene (cis-1,2-DCE). Results are as follows:

- PCE exceeded the Type 1 risk reduction standard (RRS) at wells MW-1 through MW-5 and MW-13 with a maximum concentration of 11,200 ug/L at MW-1. PCE is below

the the delneaiton criteria of 5 ug/L at MW-8 and is below the proposed Type 2 RRS at MW-13.
- TCE exceeded the Type 1 RRS at two wells, MW-1 (119 ug/L) and MW-2 (13.8 ug/L).
- Cis-1,2-DCE exceeded the Type 1 RRS at one well, MW-1 (564 ug/L).

From the previous reporting period, the concentration of PCE detected in MW-6 remains below the Type 1 RRS. PCE was detected at the highest concentration at MW-1 at 11,200 ug/L, MW-2 at 911 ug/L, and MW-3 at 1,000 ug/L. Trichloroethene (TCE) was detected in monitoring wells MW-1, MW-2, MW-3, and MW-4. Concentrations of TCE at wells MW-1 and MW-2 were above the Type 1 RRS of 5 ug/L. Concentrations of PCE, TCE, and associated degradation product (cis-1,2-DCE) were highest at MW-1. Concentrations of other breakdown products, such as trans-1,2-dichloroethene and vinyl chloride were less than laboratory detection limits at all the wells sampled with the exception of MW-1, which had a concentration of trans-1,2-dichloroethene at 3.2 ug/L.

Cis-1,2-DCE was detected in well MW-1 at a concentration of 564 ug/L, which is above the Type 1 RRS of 70 ug/L. The detected concentrations of VOCs in the remaining samples were less than applicable RRS. In addition, VOCs were not detected in newly installed delineation well MW-13 with the exception of PCE.

The detected concentrations were generally consistent with previous observations at wells MW-4, MW-5, and MW-6. The detected concentration in MW-13 was generally consistent with the previous observation at the well after its installation, which was also performed during this reporting period. PCE concentrations at wells MW-1 and MW-3 during this event (11,200 ug/L and 1,000 ug/L) were greater than the previous sampling event (6,900 ug/L and 680 ug/L), respectively. Conversely, PCE concentration at well MW-2 during this event (911 ug/L) was less than the previous sampling event (1,000 ug/L). Cis-1,2-DCE concentration at well MW-1 during this event (564 ug/L) was less than the previous sampling event (620 ug/L).

4.2.1.2 Natural Attenuation Parameters

Natural attenuation parameters were measured in upgradient, source area, and downgradient portions of the groundwater plume (MW-1, MW-8 and MW-13). These included sulfide, chloride, nitrate as N, sulfate, TOC, alkalinity, and dissolved gases (methane, ethane and ethene).

In general, the natural attenuation parameters monitored during the current reporting period do indicate that limited reductive dichlorination of PCE is occurring. This is supported by the presence of PCE breakdown products including TCE, and cis-1,2-DCE. The nitrate concentration was highest at MW-1. Chloride concentration was highest at MW-8 (5.2 mg/L) and was greater than the upgradient concentration at MW-13 (3.1 mg/L), which demonstrates that dechlorination is occurring in the source area.

4.3 EXTENT OF IMPACTS

A summary of constituents detected in groundwater at the Site since 2015 is provided in **Table 3**. April 2018 groundwater conditions for the constituents above the EPD-approved Type 1 RRS are provided on **Figure 4**.

Based on the analytical results, PCE and associated breakdown products are delineated in shallow groundwater to the north by wells MW-6, MW-7, MW-8 and MW-12 and to the west by MW-11 and the east by MW-6. Well MW-13 was installed at the southern property boundary to complete delineation to the south. MW-13 meets the Type 2 RRS delineation critiera. The vertical extent of the groundwater plume will be determined during the next reporting period with the installation of the bedrock well MW-14.

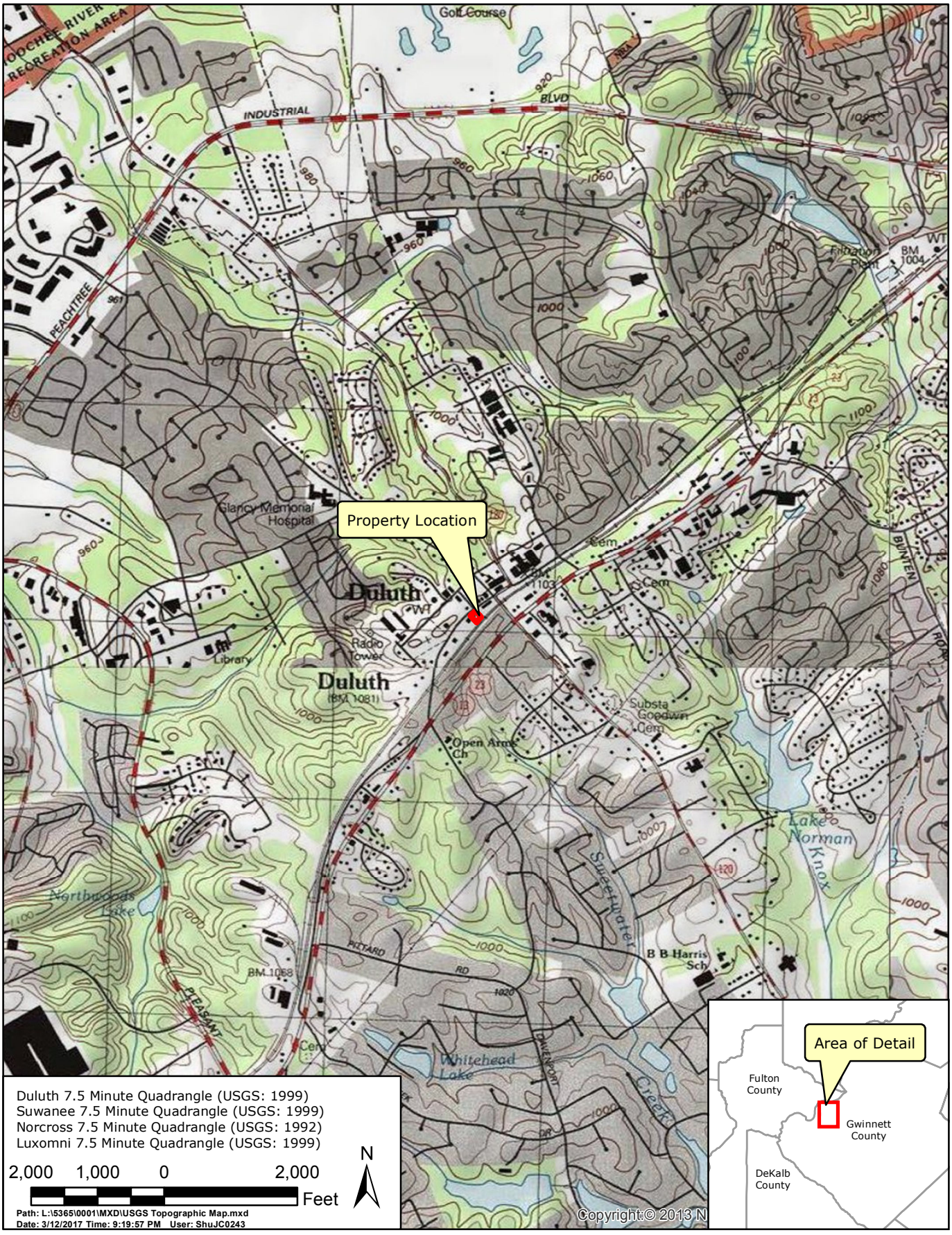
5.0 Recommendations and Schedule

Based on the most recent groundwater results, horizontal delineation to the Type 1 and 2 RRS (MW-13) is complete at the Site. Due to asphalt re-paving activities in the parking lot, installation of one bedrock well clustered with MW-3 will be performed during the next reporting period. Activities planned for the next six-month reporting period (May 2018 through October 2018) include the following:

- Install one bedrock well (MW-14) clustered with MW-3 to determine the vertical extent of contamination;
- Perform site-wide groundwater sampling for VOCs and geochemical parameters (MW-1, MW-5 and MW-6) in September 2018;
- Survey the new monitoring well (MW-14);
- Update the Conceptual Site Model; and
- Prepare the Fifth VIRP Progress Report.

The Fifth VIRP Progress Report will be submitted by October 31, 2018.

Figures



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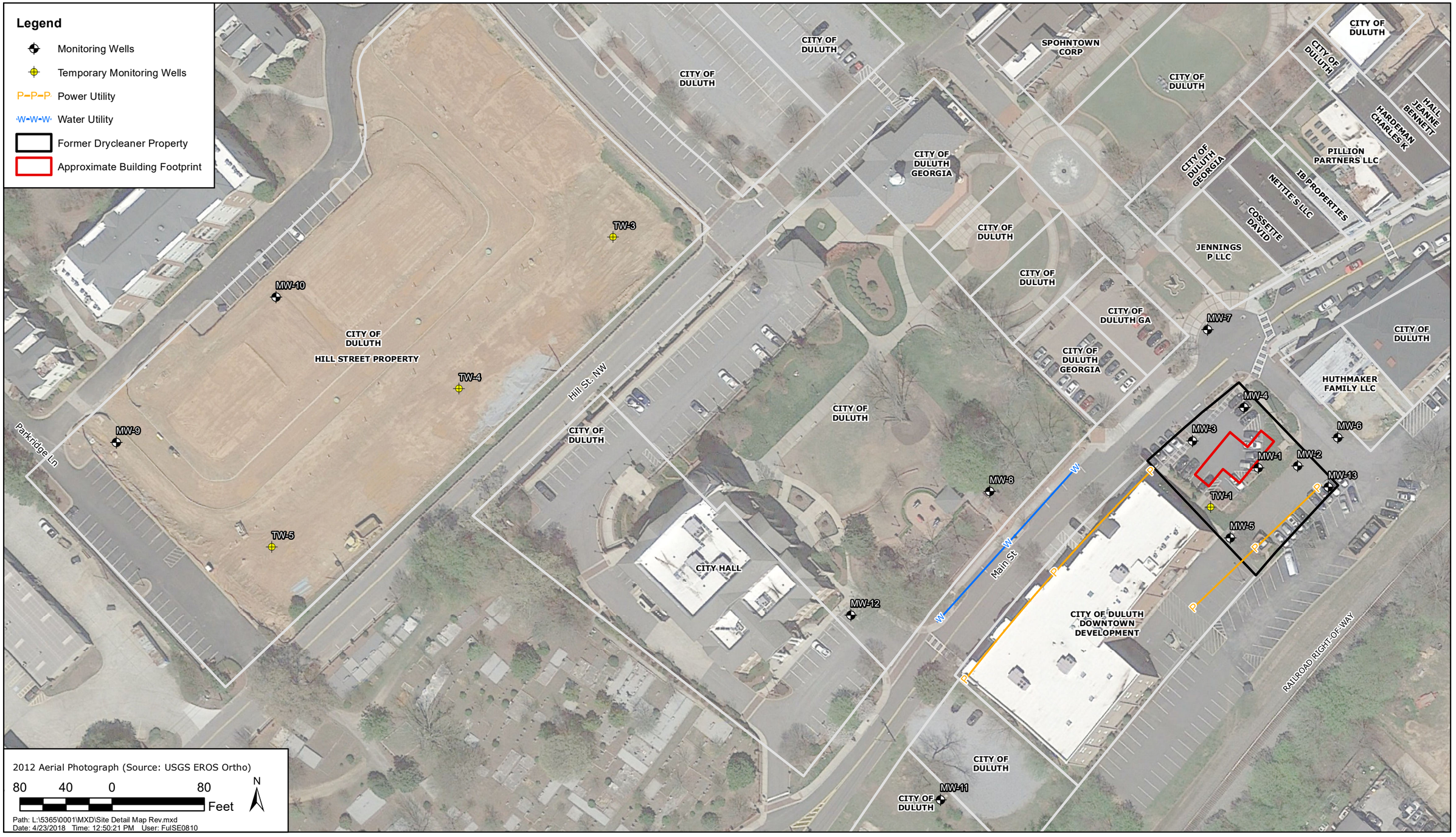
USGS Topographic Map		Figure 1



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Site Detail Map

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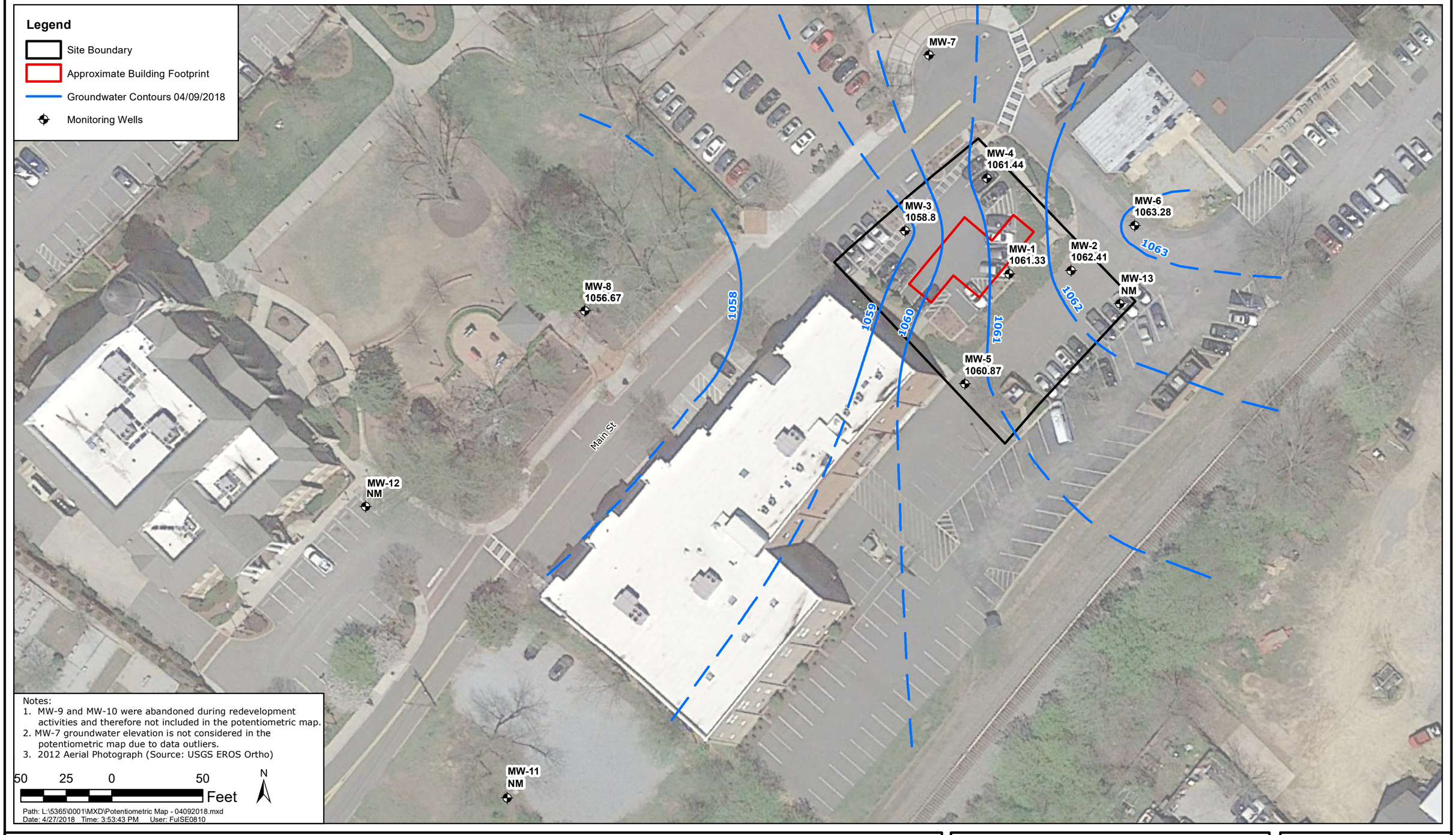
Figure 2



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Potentiometric Map - April 2018

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Figure 3

Legend

- Site Boundary
- Approximate Building Footprint
- Parcel Boundary
- Monitoring Wells

MW-10	4/9/2018
PCE	NS
TCE	NS
cis-1,2-DCE	NS
Trans 1,2-DCE	NS
VC	NS

MW-9	4/9/2018
PCE	NS
TCE	NS
cis-1,2-DCE	NS
Trans 1,2-DCE	NS
VC	NS

MW-8	4/9/2018
PCE	<1.0
TCE	<1.0
cis-1,2-DCE	<1.0
Trans 1,2-DCE	<1.0
VC	<1.0

MW-12	4/9/2018
PCE	NS
TCE	NS
cis-1,2-DCE	NS
Trans 1,2-DCE	NS
VC	NS

MW-7	4/9/2018
PCE	NS
TCE	NS
cis-1,2-DCE	NS
Trans 1,2-DCE	NS
VC	NS

MW-4	4/9/2018
PCE	**320**
TCE	**2.3**
cis-1,2-DCE	<1.0
Trans 1,2-DCE	<1.0
VC	<1.0

MW-3	4/10/2018
PCE	**1,000**
TCE	**3**
cis-1,2-DCE	**2**
Trans 1,2-DCE	<1.0
VC	<1.0

MW-6	4/9/2018
PCE	**4.3**
TCE	<1.0
cis-1,2-DCE	<1.0
Trans 1,2-DCE	<1.0
VC	<1.0

MW-13	4/9/2018
PCE	**29.0***
TCE	<1.0
cis-1,2-DCE	<1.0
Trans 1,2-DCE	<1.0
VC	<1.0

MW-5	4/9/2018
PCE	**8.8**
TCE	<1.0
cis-1,2-DCE	<1.0
Trans 1,2-DCE	<1.0
VC	<1.0

MW-2	4/10/2018
PCE	**911**
TCE	**13.8**
cis-1,2-DCE	**6.2**
Trans 1,2-DCE	<1.0
VC	<1.0

MW-1	4/10/2018
PCE	**11,200**
TCE	**119**
cis-1,2-DCE	**564**
Trans 1,2-DCE	**3.2**
VC	<1.0

MW-11	4/9/2018
PCE	NS
TCE	NS
cis-1,2-DCE	NS
Trans 1,2-DCE	NS
VC	NS

Hill St. NW

Parkridge Ln

Main St

*	= Groundwater results from MW-13 are compared to the Type 2 RRS for delineation.
<2.0	= Not detected above laboratory method detection limits.
3.1	= Detected above laboratory method detection limits.
7.5	= Detected above Type 1/3 Risk Reduction Standards

Databox Key:

Sample ID	**Date**
Analyte	Result

Analyte	Units	Type 1/3 RRS	Type 2 RRS
PCE	ug/L	5	40.6
TCE	ug/L	5	2.83
cis-1,2-DCE	ug/L	70	36.1
Vinyl Chloride	ug/L	2	0.188

2012 Aerial Photograph (Source: ESRI)

100 50 0 100 Feet

N

Path: L:\5365\0001\MXD\VOC Detections in GW04092018.mxd
Date: 4/27/2018 Time: 3:44:10 PM User: FulSE0810

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VOC Detections in Groundwater - April 2018

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Figure 4

Tables

TABLE 1
Summary of Groundwater Elevations

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GEPD HSI # 10892

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Well Number	Date Measured	Top of Casing Elevation (feet)	Depth of Screened Interval (feet BLS)	Screened Interval Elevation (feet)	Water Depth (feet)	Corrected Groundwater Elevation (feet)
MW-1	10/6/2015	1092.80	30.18-40.18	1053.23-1063.23	31.75	1061.05
	10/5/2015				31.74	1061.06
	12/6/2015				30.19	1062.61
	8/1/2016				29.55	1063.25
	2/13/2017				32.86	1059.94
	9/18/2017				32.06	1060.74
	4/9/2018				31.47	1061.33
MW-2	10/6/2015	1086.01	19.55-29.55	1056.86-1066.86	24.38	1061.63
	10/5/2015				24.16	1061.85
	12/6/2015				22.2	1063.81
	7/31/2016				22.2	1063.81
	2/13/2017				25.23	1060.78
	9/18/2017				24.42	1061.59
	4/9/2018				23.60	1062.41
MW-3	10/6/2015	1093.63	30.52-45.52	1048.61-1063.61	33.57	1060.06
	10/5/2015				33.53	1060.10
	12/6/2015				32.55	1061.08
	8/1/2016				30.9	1062.73
	2/13/2017				34.84	1058.79
	9/18/2017				34.16	1059.47
	4/9/2018				34.83	1058.80
MW-4	10/6/2015	1092.91	29.64-39.64	1053.85-1043.85	33.78	1059.13
	10/5/2015				31.66	1061.25
	12/6/2015				30.2	1062.71
	8/1/2016				30.7	1062.21
	2/13/2017				32.87	1060.04
	9/18/2017				31.96	1060.95
	4/9/2018				31.47	1061.44
MW-5	7/29/2016	1085.33	20.15-30.15	1055.18-1045.18	22.81	1062.52
	2/6/2017				25.88	1059.45
	9/18/2017				25.28	1060.05
	4/9/2018				24.46	1060.87
MW-6	7/28/2016	1085.50	20.35-30.35	1055.15-1045.15	21.07	1064.43
	2/6/2017				23.85	1061.65
	9/18/2017				22.93	1062.57
	4/9/2018				22.22	1063.28
MW-7	7/29/2016	1092.78	25.45-35.45	1057.33-1047.33	25.90	1066.88
	2/13/2017				28.75	1064.03
	9/18/2017				27.72	1065.06
	4/9/2018				NM	---
MW-8	8/1/2016	1101.97	49.5-64.5	947.47-932.47	41.53	1060.44
	2/6/2017				45.82	1056.15
	9/18/2017				45.78	1056.19
	4/9/2018				45.30	1056.67
MW-9	1/11/2016	1072.07	15-25	1047.07-1037.07	13.10	1058.97
	2/13/2017				NM	---
	9/18/2017				NM	---
	4/9/2018				NM	---
MW-10	1/11/2016	1070.70	6-16	1054.7-1044.7	7.70	1082.18
	2/13/2017				NM	---
	9/18/2017				NM	---
	4/9/2018				NM	---

TABLE 1
Summary of Groundwater Elevations

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GEPD HSI # 10892

Well Number	Date Measured	Top of Casing Elevation (feet)	Depth of Screened Interval (feet BLS)	Screened Interval Elevation (feet)	Water Depth (feet)	Corrected Groundwater Elevation (feet)
MW-11	2/13/2017	1089.88	25-40	1064.88-1049.88	32.40	1057.48
	9/18/2017				31.97	1057.91
	4/9/2018				NM	---
MW-12	9/18/2017	1096.60	35-45	1061.6 - 1051.6	40.33	1056.27
	4/9/2018				NM	---
MW-13	10/31/2017	1085.34	20-30	1065.34 - 1055.34	24.73	1060.61
	4/9/2018				22.77	1062.57

NOTES:

MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA.
MW-9 & MW-10 depths to groundwater & water level elevations were measured from ground surface on 1/11/16 by PCG.
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.
NM = Not Measured

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GAEPD HSI # 10892

Well ID	Date Sampled	Temperature °C	pH	Dissolved Oxygen mg/L	ORP mV	Conductivity µs/cm	Turbidity NTU	Sulfide (mg/L)	Chloride (mg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	Alkalinity as CaCO3 (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane /Ethene (ug/L)
MW-1	10/6/2015	22.33	4.61	9.68	391	81	8.22	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	22.77	4.08	1.33	422	92	18.70	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	16.35	4.18	0	415	51	3.70	<1.0	**3.3**	**4.5**	<5.0	**1.2**	<10.0	0	<10.0
	9/19/2017	25.18	3.09	5.85	273	0.071	NA	<1.0	**3.8**	**7.0**	<5.0	**1.3**	<1.0	NA	<10.0
	4/10/2018	20.35	3.87	3.27	72	0.097	39.40	<1.0	**3.9**	**7.0**	<5.0	<1.0	<1.0	NA	<10.0
MW-2	10/6/2015	22.71	5.21	21.05	267	89	379.00	NA	NA	NA	NA	NA	NA	NA	NA
	7/31/2016	21.83	4.49	1.31	380	230	9.60	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	16.77	5.52	3	321	103	7.90	NA	NA	NA	NA	NA	NA	NA	NA
	9/19/2017	19.56	4.77	1.87	296	0.093	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/10/2018	19.60	4.66	2.41	223	0.111	37.20	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10/6/2015	23.31	4.87	7.39	386	126	0.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	35.12	4.26	2.23	435	62	9.60	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	20.53	4.38	3	382	104	9.70	NA	NA	NA	NA	NA	NA	NA	NA
	9/19/2017	18.56	3.91	4.65	386	0.110	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/10/2018	19.34	4.33	4.36	78	0.128	16.90	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	10/6/2015	23.69	5.23	7.35	257	41	822.00	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	26.54	4.6	2.88	425	24	1.87	NA	NA	NA	NA	NA	NA	NA	NA
	8/1/2016	740.00	2.80	2.88	425	24	1.87	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	19.57	4.56	2.28	379	5.4	5.40	NA	NA	NA	NA	NA	NA	NA	NA
	9/19/2017	30.25	3.87	3.27	240	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	17.24	4.58	4.29	27	0.031	106.00	NA	NA	NA	NA	NA	NA	NA	NA
MW-5	7/29/2016	22.2	5.15	4.3	335	89	0.36	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	20.01	5.75	5.11	163	0.106	0	<1.0	**21**	**0.24**	<5.0	<1.0	**11**	NA	<10.0
	9/19/2017	26.6	4.86	1.94	200	0.084	NA	<1.0	**18**	**0.29**	**6**	<1.0	**12**	NA	<10.0
	4/9/2018	17.21	5.07	2.25	9	0.096	47.60	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GAEPD HSI # 10892

Well ID	Date Sampled	Temperature °C	pH	Dissolved Oxygen mg/L	ORP mV	Conductivity µs/cm	Turbidity NTU	Sulfide (mg/L)	Chloride (mg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	Alkalinity as CaCO3 (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane /Ethene (ug/L)
MW-6	7/28/2016	24.82	4.78	446	395	146	12.20	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	20.3	4.48	6.98	352	180	10.6	<1.0	**4.5**	**1.2**	**210**	<1.0	<10.0	NA	<10.0
	9/19/2017	24.76	4.07	6.62	278	0.147	NA	<1.0	**7.9**	**0.8**	NA	<1.0	<1.0	NA	<10.0
	4/9/2018	20.01	4.25	4.65	317	0.165	21.00	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	7/29/2016	25.65	5.18	4.73	370	79	0.00	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	20.28	4.82	5.86	351	0.041	0	NA	NA	NA	NA	NA	NA	NA	NA
	9/18/2017	23.70	3.70	4.62	273	0.047	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-8	8/1/2016	19.3	5.03	3.06	330	38	27	NA	NA	NA	NA	NA	NA	NA	NA
	2/6/2017	18.97	5.37	7.7	259	0.047	9.53	NA	NA	NA	NA	NA	NA	NA	NA
	9/18/2017	24.24	4.98	3.16	332	0.040	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	16.64	4.87	5.92	264	0.040	90.40	<1.0	**5.20**	**2.30**	<5.0	<1.0	<1.0	NA	<10.0
MW-9	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/18/2017	NA	NA	NA	NA	NA	NA	NS	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-10	1/13/2016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/18/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-11	11/20/2016	17.36	4.58	0.96	349	131	53.4	NA	NA	NA	NA	NA	NA	NA	NA
	2/13/2017	18.9	4.57	4.55	358	226	6.2	NA	NA	NA	NA	NA	NA	NA	NA
	9/18/2017	15.25	4.41	3.76	325	0.283	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 2
Summary of Groundwater Field and Natural Attenuation Parameters

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GAEPD HSI # 10892

Well ID	Date Sampled	Temperature °C	pH	Dissolved Oxygen mg/L	ORP mV	Conductivity µs/cm	Turbidity NTU	Sulfide (mg/L)	Chloride (mg/L)	Nitrate as N (mg/L)	Sulfate (mg/L)	Total Organic Carbon (mg/L)	Alkalinity as CaCO3 (mg/L)	Ferrous Iron (mg/L)	Methane/Ethane /Ethene (ug/L)
MW-12	9/18/2017	24.12	3.88	4.94	252	0.087	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-13	10/31/2017	17.96	5.49	6.10	227	0.196	4.5	NA	NA	NA	NA	NA	NA	NA	NA
	4/9/2018	19.18	5.14	1.59	209	0.162	22.4	<1.0	**3.1**	**1.2**	**55.7**	<1.0	**8.5**	NA	<10.0

Notes:

MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.
mg/L - milligrams per liter
mV - millivolts
µs/cm - microsiemens per centimeter
NTU - nephelometric turbidity units
NA = Not Analyzed for this parameter

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds - Detections

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GAEPD HSI # 10892

WENCK
Responsive partner.
Exceptional outcomes.

Well ID	Date Sampled	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	Benzene (ug/L)	Chloroform (ug/L)	Toluene (ug/L)	Vinyl Chloride (ug/L)
Delneation Criteria: Type 1/3 RRS		**5**	**5**	**70**	**100**	**700**	**5**	**80**	**1,000**	**2**
MW-13 Delineation Criteria: Type 2 RRS*		**40.6**	**2.83**	**36.1**	**361**	**5.74**	**NC**	**2.21**	**NC**	**0.188**
MW-1	10/6/2015	**15,000**	**120**	**540**	<5.0	NC	**10**	**13**	**16**	**2.4**
	8/1/2016	**14,000**	**99**	**440**	**2.2**	**5.9**	**10**	**10**	**16**	<2.0
	2/13/2017	**13,000**	**120**	**670**	**2.3**	<2.0	<2.0	**13**	<2.0	**2.8**
	9/19/2017	**6,900**	**110**	**620**	<2.0	**5.2**	<2.0	**12**	<2.0	<2.0
	4/10/2018	**11,200**	**119**	**564**	**3.2**	**3.3**	<1.0	**13.5**	<1.0	<1.0
MW-2	10/6/2015	**1,100**	**7.6**	**8**	<5.0	NC	**7.8**	<5.0	**15**	<2.0
	7/31/2016	**2,200**	**12**	**5.7**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	**660**	**7.3**	**7.2**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/19/2017	**1,000**	**15**	**10**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/10/2018	**911**	**13.8**	**6.2**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-3	10/6/2015	**1,500**	<5.0	<5.0	<5.0	NC	<5.0	<5.0	<5.0	<2.0
	8/1/2016	**850**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	**2,400**	**2.6**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/19/2017	**680**	**2.3**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/10/2018	**1,000**	**3**	**2**	<1.0	<1.0	<1.0	**1.1**	<1.0	<1.0
IW-MW3-50	11/14/2016	**260**	**12**	**6.6**	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
IW-MW3-55	11/14/2016	**890**	**48**	**25**	<5.0	<5.0	<5.0	<5.0	<5.0	**3.1**
IW-MW3-63	11/14/2016	**290**	**33**	**23**	<5.0	<5.0	<5.0	<5.0	<5.0	**2.7**
MW-4	10/6/2015	**600**	<5.0	<5.0	<5.0	NC	**12**	<5.0	**23**	<2.0
	8/1/2016	**850**	**3.1**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	8/1/2016	**740**	**2.8**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	**490**	**2.1**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/19/2017	**210**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**320**	**2.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-5	7/29/2016	**32**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	**30**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/19/2017	**12**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**8.8**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-6	7/28/2016	**7.5**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	**8.2**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/19/2017	**3.3**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**4.3**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

TABLE 3
Summary of Groundwater Analytical Results
Volatile Organic Compounds - Detections

Former Duluth Dry Cleaner
3146 Main Street
Duluth, Fulton County, Georgia
GAEPD HSI # 10892

WENCK
Responsive partner.
Exceptional outcomes.

Well ID	Date Sampled	Tetrachloroethene (ug/L)	Trichloroethene (ug/L)	cis-1,2-Dichloroethene (ug/L)	trans-1,2-Dichloroethene (ug/L)	1,1,1,2-Tetrachloroethane (ug/L)	Benzene (ug/L)	Chloroform (ug/L)	Toluene (ug/L)	Vinyl Chloride (ug/L)
Delneation Criteria: Type 1/3 RRS		**5**	**5**	**70**	**100**	**700**	**5**	**80**	**1,000**	**2**
MW-13 Delineation Criteria: Type 2 RRS*		**40.6**	**2.83**	**36.1**	**361**	**5.74**	**NC**	**2.21**	**NC**	**0.188**
MW-7	7/29/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-8	8/1/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/6/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
MW-9	1/13/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/18/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-10	1/13/2016	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	2/13/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/18/2017	NS	NS	NS	NS	NS	NS	NS	NS	NS
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-11	11/20/2016	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
	2/13/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
TW-1	11/14/2016	**51.0**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0
MW-12	9/18/2017	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	NS	NS	NS	NS	NS	NS	NS	NS	NS
MW-13*	10/31/2018	**14**	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
	4/9/2018	**29**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Notes:

* Groundwater results from MW-13 are compared to the Type 2 RRS for delineation.
MW-9 & MW-10 were previously identified as MW-1 & MW-2 in PGC Phase II ESA
MW-9 & MW-10 were abandoned due to redevelopment activities in 2017.

<1.0	= Analyte not detected above the laboratory detection limit
5.7	= Analyte detected above the laboratory detection limit
190	= Exceeds the Delineation Criteria, which is the Type 1/3 RRS (except for MW-13)
NC	= Not Calculated
NS	= Not Sampled

Appendix A

Monitoring Well Installation and Development Log

WENCK

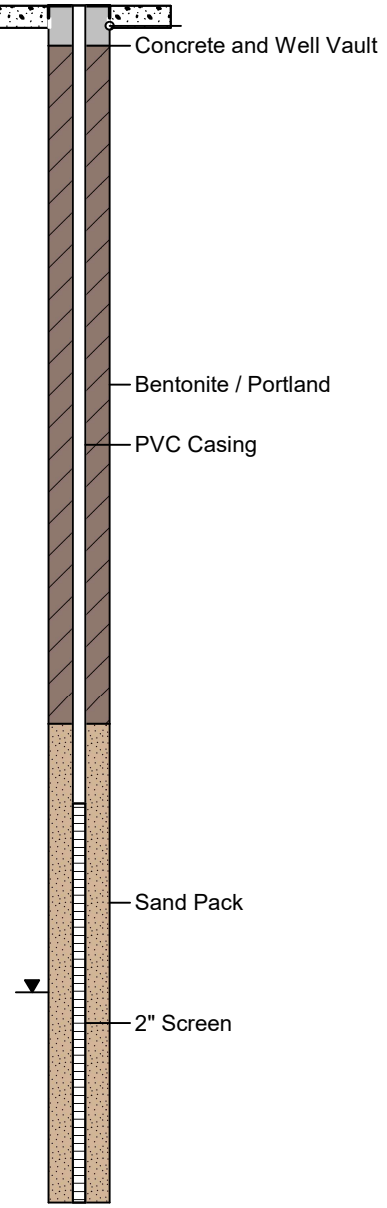
Responsive partner. Exceptional outcomes.

LOG OF BORING MW-13

City of Duluth
Subsurface Investigation
Main St.
Project # 5365

Date Started	: 10/23/17	Drilling Contractor	: Atlas Geo
Date Completed	: 10/23/17	Driller	: Alan and Mikey
Hole Diameter	: 6 inch	Logged By	: WB
Drilling Method	: Geoprobe/ HSA		
Sampling Method	: Dual Tube (4')		

Depth in Feet	Approx Surf Elev1085	USCS	DESCRIPTION	PID (PPM)
0	1085		Asphalt (FILL)	
			Residual (FILL)	
5	1080	ML	Orange-brown, dry, SANDY SILT (SAPROLITE)	0.1
10	1075	ML	Orange-brown, dry, CLAYEY SILT (SAPROLITE)	0.0
15	1070	ML	Orange-brown, dry to moist, CLAYEY SILT (SAPROLITE)	0.0
20	1065	ML	Pink with orange and black striations, moist, CLAYEY SILT (SAPROLITE)	0.0
25	1060		Wet @ 28 ft	0.0
30			EOB @ 30 ft	0.1



Notes:
Water level (24.73') measured from TOC on 10/30/17.

WENCK

Responsive partner.
Exceptional outcomes.

Well Development Log

Project Name: City of Duluth **Date:** 10/30/2017

Address: Main Street

Weather Conditions: Overcast, 30's

Field Technician(s): W Barnett

Well ID:			
Unique Well ID	MW-13	Average Purging Rate (g/m)	0.1 g/m
Casing Diameter (inches)	2	Volume Purged (gals.)	6
Top of Casing Elev. (feet)	1085.34	Purged Dry (Y/N)	Y
Depth to Water from TOC (feet)	24.73	Sampling Device	Horiba U53
Groundwater Elev. (feet)		Time Sample Collected	—
Depth to Bottom of Well from TOC (feet)	30	Color	Turbid
Volume of Water in Well (gals.)		Odor	None
3 Well Volumes (gals.)	2.58	Well Capped & Locked (Y/N)	Y, N
Purging Device	Whale Pump	Lock Key #	—
Purging Start Time	9:30; 11:45	Damage to Well? (Y/N)	N
Purging Stop Time	11:00; 12:00	Free Product Present? (Y/N)	N

Volume Purged (gallons)	2	3	4	4.5	5.0	5.5	6
Stabilization Readings							
Time	9:42	9:55	10:00	10:55	11:45	11:50	11:55
Temperature (°C)	20.60	20.47	21.44	20.29	22.22	22.44	22.66
Specific Conductance (mS/cm)	.262	.255	.231	.237	.218	.218	.221
pH	5.45	5.25	5.15	4.67	5.10	5.13	5.15
ORP (mV)	153	188	192	216	213	213	212
Dissolved Oxygen (mg/L)	5.92	6.38	6.29	5.26	5.80	5.67	5.15
Turbidity (NTU)	out of range	993	137	347	964	501	446

Comments:
One well volume = Water column in feet x 0.163 gallons/foot
Well development = purge 10 well volumes and turbidity is less then 50 NTU
Well purging before sampling = 3 to 5 well volumes

well purged dry allow for re-charge 11:00 - 11:45

Appendix B

Monitoring Well Sampling Logs

WENCK ASSOCIATES

Responsive partner. Exceptional outcomes.

Page 1 of 1

GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: 5365-0001	
Location: Duluth, GA		Well ID: MW-13	
Date: 10/3/17	Start Time at Well: 755		End Time at Well: 937
Sampler: WB	Weather: Cold, 40's		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2"	Well Screen Depth Interval: 20 (ft) to 30 (ft)		Initial Depth to Water (ft): 24.73
Total Well Depth (ft): 30'	Well Capacity (gallons per foot): .163	1 Well Volume (gallons): .85	3 Well Vol. (gal): 2.6
			Total Vol. Purged (gal): 4.0L ~ 1.1 gal

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 28'	Final Depth of Tubing (ft): 28'	Total Purge Time: 40 min	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): .1 L/min	Final Purge Rate (gpm): .1 L/min	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
810									
815	.5 L	25.09	14.52	5.47	.206	6.95	67	Pink/Red	191
820	1.0 L	25.24	15.32	5.50	.207	6.95	31.1	Musty	197
825	1.5 L	25.38	16.33	5.53	.204	6.88	13.7		204
830	2.0 L	25.54	16.97	5.52	.202	6.78	8.83	Clear/	209
835	2.5 L	25.62	17.49	5.52	.200	6.55	8.32	No Odor	214
840	3.0 L	25.74	17.73	5.53	.198	6.29	6.57		218
845	3.5 L	25.78	17.86	5.52	.197	6.10	5.66		223
850	4.0 L	25.83	17.96	5.49	.196	6.10	4.45		227

: **Temperature** - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NT

SAMPLING

Sampled by (print): William Barnett		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 857	Time Sampling Completed: 919
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-13	857	3	40 mL	HCl	8260 (VOCs)	

Notes:

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GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 53665	
Location: Duluth, GA	Well ID: MW-8	
Date: 4/9/18	Start Time at Well: 1100	End Time at Well: 13:35
Sampler: SEF/MAR	Weather: Overcast 40s	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval:	Initial Depth to Water (ft):
2	49.5 (ft) to 64.5 (ft)	45.30

Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):	Total Vol. Purged (gal):
64.5	0.163	3.12	9.36	5.0L

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer / Bladder Pump / Electric Submersible Pump / Peristaltic Pump / Other (specify)
57	57	110 min	

Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): Low-Flow-Low Stress / Micro-purge	Meter(s) used (circle one): YSI 556 / Lamotte 2020 / Horiba U53
0.1L/m	0.1L/m		

11:25

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
1140	0.5L	45.70	16.34	4.89	0.044	6.66	OOR.	brn/no	217.7
1145	1.0L	45.70	16.47	4.89	0.043	6.45	265	" "	229.0
1150	1.5L	45.70	16.56	4.89	0.042	6.29	236	" "	236.8
1155	2.0L	45.70	16.57	4.86	0.041	6.26	184	" "	242.2
1200	2.5L	45.70	16.63	4.87	0.041	6.19	153	" "	246.4
1205	3.0L	45.70	16.63	4.86	0.041	6.19	120	" "	250.5
1210	3.5L	45.70	16.63	4.88	0.041	6.15	104	slt turb/no	254.4
1215	4.0L	45.70	16.63	4.88	0.040	6.05	96.2	" "	258.0
1220	4.5L	45.70	16.59	4.86	0.040	5.97	113	" "	260.6
1225	5.0L	45.70	16.64	4.87	0.040	5.92	90.4	" "	263.7

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): SEF/MAR	Collection Method (circle one): Bailer / Straw method / Vacuum Jug / Other	Time Sampling Initiated: 12:45	Time Sampling Completed: 13:15

Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-8	1245	2	40mL	HCL	TOC	G
MW-8		3	40mL	HCL	VOC	
MW-8		3	40mL	—	MEE	
MW-8		1	500mL	NaOH	Sulfide	
Notes: MW-8		1	250mL	—	Alkalinity	
MW-8		1	120mL	—	Nitrate, Chloride, Sulfate	

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GROUNDWATER SAMPLING LOG

Project: 5365		Project Number: 5365	
Location: Duluth, GA		Well ID: MW-5	
Date: 4/9/18	Start Time at Well: 3:10		End Time at Well: 17:30
Sampler: MAR	Weather: Overcast 80s		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 20 (ft) to 30 (ft)		Initial Depth to Water (ft): ~~24.55~~ 24.46
Total Well Depth (ft): 30	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 0.90	3 Well Vol. (gal): 2.7
			Total Vol. Purged (gal): 7.0L

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 27	Final Depth of Tubing (ft): 27	Total Purge Time: 85 min.	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): ~~0.1~~ 0.1L/m	Final Purge Rate (gpm): ~~0.1~~ 0.1L/m	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
3:30 15:35	0.5L	24.55	18.36	5.48	0.144	5.89	386	BRN/NO	40.2
15:40	1.0L	24.55	18.15	5.33	0.135	6.11	398	BRN/NO	39.3
15:45	1.5L	24.55	17.82	5.23	0.111	4.68	292	BRN/NO	33.7
15:50	2.0L	24.71	17.83	5.18	0.108	3.85	252	BRN/NO	30.6
15:55	2.5L	24.75	17.91	5.13	0.105	3.53	213	BRN/NO	26.8
16:00	3.0L	24.75	17.89	5.11	0.103	3.47	167	BRN/NO	23.8
16:05	3.5L	24.80	17.90	5.10	0.100	3.35	133	BRN/NO	20.5
16:10	4.0L	24.83	17.99	5.09	0.099	3.28	128	BRN/NO	19.0
16:15	4.5L	24.85	18.00	5.09	0.099	2.98	86.5	BRN/NO	17.4
16:20	5.0L	24.86	17.91	5.09	0.098	2.75	77.9	CLR/NO	15.4
16:25	5.5L	24.87	17.76	5.08	0.098	2.79	57.2	CLR/NO	12.9

Stabilization: Temperature - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): MAR		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 16:55	Time Sampling Completed: 17:00
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-5	16:55	3	40mL	HCL	VOC	G

Notes:

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GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-5	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
16:30	6.0L	24.80	17.66	5.08	0.098	2.51	53.1	CLR/NO	9.2
16:35	6.5L	24.80	17.50	5.07	0.097	2.48	46.9	CLR/NO	9.4
16:40	7.0L	24.82	17.21	5.07	0.096	2.25	47.6	CLR/NO	8.7

Stabilization: Temperature - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

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GROUNDWATER SAMPLING LOG

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Project: City of Duluth		Project Number: 53665	
Location: Duluth, GA		Well ID: MW-6	
Date: 4/9/18	Start Time at Well: 1610		End Time at Well: 17:55
Sampler: SEF	Weather: clear 60s		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 20 (ft) to 30 (ft)		Initial Depth to Water (ft): 22.22
Total Well Depth (ft): 30.20	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.30	3 Well Vol. (gal): 3.9
			Total Vol. Purged (gal): 4.0L

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 26.5	Final Depth of Tubing (ft): 26.5	Total Purge Time: 49 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump ~~Other (specify)~~
Initial Purge Rate (gpm): 0.14/m	Final Purge Rate (gpm): 0.14/m	Purge ~~Method~~ (circle one): Low Flow-Low Stress ~~Micro-purge~~	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

16:36

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
16:41	0.5L	22.60	20.53	4.33	0.164	5.32	140	brn/no	262.1
16:46	1.0L	22.60	20.78	4.30	0.159	4.83	101	" "	277.7
16:51	1.5L	22.70	20.79	4.28	0.160	4.91	50.6	clr/no	290.1
16:56	2.0L	22.75	20.41	4.27	0.161	4.62	33.7	" "	297.9
17:01	2.5L	22.75	20.07	4.26	0.162	4.71	27.2	" "	302.4
17:06	3.0L	22.80	20.05	4.25	0.164	4.76	20.3	" "	309.3
17:11	3.5L	22.80	20.04	4.25	0.165	4.71	21.0	" "	313.0
17:16	4.0L	22.80	20.01	4.25	0.165	4.65	21.0	" "	316.7
17:19	S	a	M	P	T	E			

Stabilization: Temperature - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 17:19	Time Sampling Completed: 17:25
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-6	17:19	3	40mL	HCL	VOC	G

Notes:

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GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 5365		
Location: Duluth, GA	Well ID: MW-13		
Date: 4/4/18	Start Time at Well: 1830	End Time at Well: 2025	
Sampler: SEF	Weather: Clear 50s	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 20 (ft) to 30 (ft)	Initial Depth to Water (ft): 22.77	
Total Well Depth (ft): 30	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.17	3 Well Vol. (gal): 3.51
			Total Vol. Purged (gal): 3.0L

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 26.5	Final Depth of Tubing (ft): 26.5	Total Purge Time: 63 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1L/m	Final Purge Rate (gpm): 0.1L/m	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
19:02									
1907	0.5L	23.00	19.53	5.19	0.162	2.52	23.1	clr/no	194.1
1912	1.0L	23.09	19.67	5.18	0.161	1.96	19.4	" "	186.3
1917	1.5L	23.11	19.42	5.17	0.160	1.74	17.7	" "	189.4
1922	2.0L	23.18	19.31	5.16	0.160	1.75	20.1	" "	197.1
1927	2.5L	23.23	19.23	5.15	0.162	1.71	22.5	" "	203.4
1932	3.0L	23.30	19.18	5.14	0.162	1.59	22.4	" "	209.1
1937	S	a	M	P	T	E			

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1937	Time Sampling Completed: 2005
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-13	1937	2	40ml	HCL	TOC	G
MW-13	1937	3	40ml	HCL	VOC	↓
MW-13	1937	3	40ml	~~HA~~	MEE	↓
MW-13	1937	1	500ml	NaOH	Sulfide	↓
Notes: MW-13	1937	1	250ml	—	Alkalinity	G
MW-13	1937	1	120ml	—	Nitrate, Chloride, Sulfate	G

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GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 5365		
Location: Duluth, GA	Well ID: MW-4		
Date: 4/9/10	Start Time at Well: 6:35 (18:35)	End Time at Well: 20:25	
Sampler: MAR	Weather: Overcast 50s	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 29.64 (ft) to 39.64 (ft)		Initial Depth to Water (ft): 31.47
Total Well Depth (ft): 39.20	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.25	3 Well Vol. (gal): 3.75
			Total Vol. Purged (gal): 2.5L

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 35.5	Final Depth of Tubing (ft): 35.5	Total Purge Time: 1 hr	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)
Initial Purge Rate (gpm): 0.14/m	Final Purge Rate (gpm): 0.05L/m	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

18:55

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
19:05	0.5L	32.15	19.11	4.84	0.034	4.61	215	SLT TRB/NO	58.5
19:10	0.75L	32.21	18.36	4.79	0.033	4.80	202	SLT TRB/NO	53.1
19:15	1.0L	32.24	18.03	4.74	0.032	4.68	182	SLT TRB/NO	43.3
19:20	1.25L	32.28	17.93	4.70	0.031	4.65	152	SLT TRB/NO	38.4
19:25	1.5L	32.28	17.82	4.67	0.031	4.72	136	SLT TRB/NO	33.6
19:30	1.75L	32.30	17.44	4.65	0.031	4.62	128	SLT TRB/NO	31.2
19:35	2.0L	32.35	17.25	4.63	0.031	4.50	113	SLT TRB/NO	28.4
19:40	2.25L	32.37	17.28	4.60	0.031	4.40	113	SLT TRB/NO	27.8
19:45	2.5L	32.42	17.24	4.58	0.031	4.29	106	SLT TRB/NO	26.5
~~19:50~~									

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): MAR		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 19:50	Time Sampling Completed: 19:55
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-4	19:50	3	40mL	HCL	VOC	G

Notes: ~~Sl~~ Decreased throttle to accomodate draw down. at 19:05

35.5

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GROUNDWATER SAMPLING LOG

Project: City of Duluth	Project Number: 53265		
Location: Duluth, GA	Well ID: MW-3		
Date: 4/10/18	Start Time at Well: 9:10	End Time at Well: 1125	
Sampler: SEF	Weather: Overcast 50s	Comments:	

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 30.52 (ft) to 45.52 (ft)		Initial Depth to Water (ft): 34.83
Total Well Depth (ft): 44.87	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.63	3 Well Vol. (gal): 4.89
			Total Vol. Purged (gal): 6.5L

Well capacity (gallons per foot): 0.75" = 0.02; 1" = 0.04; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 39.8	Final Depth of Tubing (ft): 39.8	Total Purge Time: 75 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

940

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
945	0.5L	34.30	18.86	4.88	0.130	5.29	OR	Tan brown/NO	78.0
950	1.0L	34.30	19.48	4.41	0.131	4.80	200	" "	69.7
955	1.5L	34.32	19.56	4.37	0.130	4.72	176	" "	69.7
1000	2.0L	34.35	19.45	4.37	0.130	4.78	159	" "	69.6
1005	2.5L	34.41	19.59	4.37	0.126	4.73	138.3	Clr/NO	74.0
1010	3.0L	34.48	19.58	4.37	0.126	4.73	93.4	" "	74.6
1015	3.5L	34.48	19.47	4.37	0.126	4.60	67.2	" "	71.8
1020	4.0L	34.49	19.29	4.36	0.126	4.46	54.1	" "	73.4
1025	4.5L	34.50	19.28	4.35	0.126	4.35	40.0	" "	73.5
1030	5.0L	34.50	19.20	4.35	0.126	4.46	25.5	" "	74.0
1035	5.5L	34.51	19.30	4.35	0.126	4.43	19.3	" "	75.2

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1050	Time Sampling Completed: 1055
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-3	1050	3	40mL	HCl	VOC	G

Notes:
OR = Over range

O

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GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-3	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal): Total Vol. Purged (gal):

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
1040	6.0L	34.51	19.29	4.34	0.127	4.38	17.2	clr/no	76.1
1045	6.5L	34.51	19.34	4.33	0.128	4.36	16.9	" "	77.5
1050	5	a	m	p	1	e			

Stabilization: Temperature - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print):	Collection Method (circle one): Bailer Straw method Vacuum Jug Other	Time Sampling Initiated:	Time Sampling Completed:

Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: 5365	
Location: Duluth, GA		Well ID: MW-2	
Date: 4/10/18	Start Time at Well: 9:30		End Time at Well: 11:50
Sampler: MAR	Weather: CLEAR 60s		Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval:		Initial Depth to Water (ft):
2	19.55 (ft) to 29.55 (ft)		23.60
Total Well Depth (ft):	**Well Capacity (gallons per foot):**	**1 Well Volume (gallons):**	**3 Well Vol. (gal):**
29.55	0.163	0.970	2.91
			Total Vol. Purged (gal): 5.02

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)
26.5	26.5	1hr	
Initial Purge Rate (gpm):	**Final Purge Rate (gpm):**	**Purge Method (circle one):**	**Meter(s) used (circle one):** YSI 556 Lamotte 2020 Horiba U53
0.1 L/m	0.1 L/m	Low Flow-Low Stress Micro-purge	

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
~~9:50~~ 10:15									
10:20	0.5L	24.0	19.74	4.70	0.136	2.91	376	BRN/NO	157.8
10:25	1.0L	24.25	19.96	4.66	0.137	3.06	308	BRN/NO	165.7
10:30	1.5L	24.75	20.15	4.61	0.144	2.86	136	SLT TRB/NO	182.6
10:35	2.0L	24.93	19.97	4.60	0.129	2.68	104	SLT TRB/NO	193.0
10:40	2.5L	24.85	19.66	4.60	0.126	2.55	90.3	SLT TRB/NO	201.3
10:45	3.0L	24.85	19.30	4.63	0.115	2.40	75.8	SLT TRB/NO	206.9
10:50	3.5L	24.85	19.42	4.64	0.116	2.50	65.5	SLT TRB/NO	211.2
10:55	4.0L	24.85	19.44	4.65	0.114	2.43	53.7	SLT TRB/NO	216.3
11:00	4.5L	24.85	19.50	4.65	0.114	2.50	45.9	SLT TRB/NO	218.7
11:05	5.0L	24.82	19.60	4.66	0.111	2.41	37.2	CLR/NO	223.0

Stabilization: Temperature - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): MAR	Collection Method (circle one): Bailer Straw method Vacuum Jug Other	Time Sampling Initiated: 11:10	Time Sampling Completed: 11:15

Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-2	11:10	3	40mL	HCL	VOC	G

Notes:

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project: City of Duluth		Project Number: 53605	
Location: Duluth, GA		Well ID: MW-1	
Date: 4/10/18	Start Time at Well: 1130		End Time at Well: 1405
Sampler: SEF	Weather: Clear 60s		Comments:

WELL CHARACTERISTICS

Well Diameter (in): 2	Well Screen Depth Interval: 30.18 (ft) to 40.18 (ft)		Initial Depth to Water (ft): 31.47
Total Well Depth (ft): 39.8	Well Capacity (gallons per foot): 0.163	1 Well Volume (gallons): 1.35	3 Well Vol. (gal): 4.05
			Total Vol. Purged (gal):

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft): 35.75	Final Depth of Tubing (ft): 35.75	Total Purge Time: 44 min	Purge Equipment (circle one): Bailer (Bladder Pump) Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm): 0.1L/m	Final Purge Rate (gpm): 0.1L/m	Purge Method (circle one): (Low Flow-Low Stress) Micro-purge	Meter(s) used (circle one): (YSI 556) Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
1156									
1201	0.5L	31.50	20.20	4.01	0.097	3.65	OR	red brn/ no	96.6
1206	1.0L	31.65	20.15	3.75	0.096	3.55	547	" "	85.2
1211	1.5L	31.83	20.04	3.58	0.096	4.32	290	" "	70.4
1216	2.0L	31.83	20.36	3.64	0.096	4.45	260	" "	70.5
1221	2.5L	31.85	19.93	3.66	0.096	3.62	226	clr/ no	69.0
1226	3.0L	31.87	20.25	3.71	0.096	3.30	166	" "	68.3
1231	3.5L	31.91	20.19	3.76	0.096	3.56	131.6	" "	81.2
1236	4.0L	31.92	20.14	3.80	0.097	3.63	104.2	" "	95.7
1241	4.5L	31.95	20.10	3.84	0.098	3.72	63.5	" "	103.0
1246	5.0L	32.02	20.36	3.80	0.100	3.46	52.5	" "	85.2
1251	5.5L	32.12	20.40	3.83	0.099	3.24	43.0	" "	76.2

Stabilization: **Temperature** - ± 0.1°; **pH** - ± 0.1; **Conductivity** - ± 5%; **Dissolved Oxygen** - ± 0.2 mg/L (or 10% saturation); **Turbidity** - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print): SEF		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated: 1305	Time Sampling Completed: 1335
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))
MW-1	1305	2	40ml	HCl	TOC	G
MW-1	1305	3	40ml	HCl	VOC	
MW-1	1305	3	40ml	—	MEE	
MW-1	1305	1		NaOH	Sulfide	
MW-1	1305	1		—	Alkalinity	
MW-1	1305	1		—	Nitrate, Chloride, Sulfate	

Notes:
*DUP-1 collected for VOC @ 13:05

OR = over range

WENCK

Responsive partner. Exceptional outcomes.

GROUNDWATER SAMPLING LOG

Project:	Project Number:	
Location:	Well ID: MW-1	
Date:	Start Time at Well:	End Time at Well:
Sampler:	Weather:	Comments:

WELL CHARACTERISTICS

Well Diameter (in):	Well Screen Depth Interval: _____ (ft) to _____ (ft)		Initial Depth to Water (ft):
Total Well Depth (ft):	Well Capacity (gallons per foot):	1 Well Volume (gallons):	3 Well Vol. (gal):
			Total Vol. Purged (gal):

Well capacity (gallons per foot): **0.75"** = 0.02; **1"** = 0.04; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88

PURGING DATA

Initial Depth of Tubing (ft):	Final Depth of Tubing (ft):	Total Purge Time:	Purge Equipment (circle one): Bailer Bladder Pump Electric Submersible Pump Peristaltic Pump Other (specify)_____
Initial Purge Rate (gpm):	Final Purge Rate (gpm):	Purge Method (circle one): Low Flow-Low Stress Micro-purge	Meter(s) used (circle one): YSI 556 Lamotte 2020 Horiba U53

Reading Time	Total Volume Purged (gal)	Depth to Water (ft)	Temperature (°C)	Ph SU	Conductivity (µS/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTUs)	Color/ Odor	ORP (mV)
1256	6.0L	32.20	20.34	3.86	0.098	3.09	40.8	dk/no	72.6
1301	6.5L	32.24	20.35	3.87	0.097	3.27	39.4	" "	71.8
1305	S	a	m	p	l	e			

Stabilization: Temperature - ± 0.1°; pH - ± 0.1; Conductivity - ± 5%; Dissolved Oxygen - ± 0.2 mg/L (or 10% saturation); Turbidity - ≤ 10 NTUs (or stable)

SAMPLING

Sampled by (print):		Collection Method (circle one): Bailer Straw method Vacuum Jug Other			Time Sampling Initiated:	Time Sampling Completed:
Sample ID	Sample Time	Number of Containers	Volume	Preservative	Analysis/ EPA Method	Sample Type (G - Grab, C - Composite, Other (specify))

Notes:

Appendix C

Laboratory Reports and Chain-of-Custody Documentation

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

Laboratory Report

Prepared For:

WENCK Associates

1080 Holcomb Bridge Road, Building 100, Suite 190

Roswell, GA 30076

Attention: Ms. Katie T. Ross

Report Number: AAJ0995

November 02, 2017

Project: Duluth, City of

Project #:[none]

We appreciate the opportunity to provide the analytical support for your project. The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Approved:

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-13	AAJ0995-01	Ground Water	10/31/17 08:57	10/31/17 11:30
Trip Blank	AAJ0995-02	Water	10/31/17 00:00	10/31/17 11:30

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: MW-13
Date/Time Sampled: 10/31/2017 8:57:00AM
Matrix: Ground Water

Project: Duluth, City of
Lab Number ID: AAJ0995-01
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Acrolein	ND	50	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Bromoform	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG

PACE ANALYTICAL SERVICES, LLC.

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(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: MW-13
Date/Time Sampled: 10/31/2017 8:57:00AM
Matrix: Ground Water

Project: Duluth, City of
Lab Number ID: AAJ0995-01
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Tetrachloroethene	14	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG

PACE ANALYTICAL SERVICES, LLC.

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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: MW-13
Date/Time Sampled: 10/31/2017 8:57:00AM
Matrix: Ground Water

Project: Duluth, City of
Lab Number ID: AAJ0995-01
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 21:55	7110065	JG
Surrogate: Dibromofluoromethane	*88 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 21:55*	*7110065*	
Surrogate: 1,2-Dichloroethane-d4	*94 %*	*78-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 21:55*	*7110065*	
Surrogate: Toluene-d8	*98 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 21:55*	*7110065*	
Surrogate: 4-Bromofluorobenzene	*102 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 21:55*	*7110065*	

PACE ANALYTICAL SERVICES, LLC.

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WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: Trip Blank
Date/Time Sampled: 10/31/2017 12:00:00AM
Matrix: Water

Project: Duluth, City of
Lab Number ID: AAJ0995-02
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Acetone	ND	100	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Acrolein	ND	50	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Acrylonitrile	ND	50	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Benzene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Bromobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Bromochloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Bromodichloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Bromoform	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Bromomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
n-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
sec-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
tert-Butylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Carbon Disulfide	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Carbon Tetrachloride	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Chlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1-Chlorobutane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Chloroethane	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Chloroform	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Chloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
2-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
4-Chlorotoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Dibromochloromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2-Dibromo-3-chloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2-Dibromoethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Dibromomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,3-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,4-Dichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Dichlorodifluoromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2-Dichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
cis-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
trans-1,2-Dichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG

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Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: Trip Blank
Date/Time Sampled: 10/31/2017 12:00:00AM
Matrix: Water

Project: Duluth, City of
Lab Number ID: AAJ0995-02
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
1,2-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,3-Dichloropropane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
2,2-Dichloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1-Dichloropropene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
cis-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
trans-1,3-Dichloropropene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Ethylbenzene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Ethyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Hexachlorobutadiene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
p-Isopropyltoluene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Hexachloroethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Iodomethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Isopropylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methacrylonitrile	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methyl Acrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methylene Chloride	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methyl Methacrylate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Methyl-tert-Butyl Ether	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Naphthalene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
2-Nitropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Propionitrile (Ethyl Cyanide)	ND	20	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
n-Propylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Styrene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Tetrachloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Tetrahydrofuran	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Toluene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2,3-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2,4-Trichlorobenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1,1-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,1,2-Trichloroethane	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Trichloroethene	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG

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WENCK Associates
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Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995
Client ID: Trip Blank
Date/Time Sampled: 10/31/2017 12:00:00AM
Matrix: Water

Project: Duluth, City of
Lab Number ID: AAJ0995-02
Date/Time Received: 10/31/2017 11:30:00AM

Analyte	Result	RL	Units	Method	Qual.	DF	Preparation Date	Analytical Date	Batch	Init.
Volatile Organic Compounds by EPA 8260										
Trichlorofluoromethane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2,3-Trichloropropane	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,2,4-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
1,3,5-Trimethylbenzene	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Vinyl Acetate	ND	10	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Vinyl Chloride	ND	2.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
m+p-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
o-Xylene	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Xylenes, total	ND	5.0	ug/L	EPA 8260B		1	11/01/17 11:00	11/01/17 22:25	7110065	JG
Surrogate: Dibromofluoromethane	*97 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 22:25*	*7110065*	
Surrogate: 1,2-Dichloroethane-d4	*107 %*	*78-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 22:25*	*7110065*	
Surrogate: Toluene-d8	*99 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 22:25*	*7110065*	
Surrogate: 4-Bromofluorobenzene	*103 %*	*80-120*		*EPA 8260B*			*11/01/17 11:00*	*11/1/17 22:25*	*7110065*	

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Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110065 - EPA 5030B										
Blank (7110065-BLK1)					Prepared & Analyzed: 11/01/17					
Acetone	ND	100	ug/L							
Acrolein	ND	50	ug/L							
Acrylonitrile	ND	50	ug/L							
Allyl Chloride (3-Chloropropylene)	ND	10	ug/L							
Benzene	ND	2.0	ug/L							
Bromobenzene	ND	10	ug/L							
Bromochloromethane	ND	10	ug/L							
Bromodichloromethane	ND	10	ug/L							
Bromoform	ND	10	ug/L							
Bromomethane	ND	10	ug/L							
n-Butylbenzene	ND	10	ug/L							
sec-Butylbenzene	ND	10	ug/L							
tert-Butylbenzene	ND	10	ug/L							
Carbon Disulfide	ND	10	ug/L							
Carbon Tetrachloride	ND	2.0	ug/L							
Chlorobenzene	ND	10	ug/L							
1-Chlorobutane	ND	10	ug/L							
Chloroethane	ND	5.0	ug/L							
Chloroform	ND	2.0	ug/L							
Chloromethane	ND	10	ug/L							
2-Chlorotoluene	ND	10	ug/L							
4-Chlorotoluene	ND	10	ug/L							
Dibromochloromethane	ND	10	ug/L							
1,2-Dibromo-3-chloropropane	ND	10	ug/L							
1,2-Dibromoethane	ND	10	ug/L							
Dibromomethane	ND	10	ug/L							
1,2-Dichlorobenzene	ND	10	ug/L							
1,3-Dichlorobenzene	ND	10	ug/L							
1,4-Dichlorobenzene	ND	10	ug/L							
trans-1,4-Dichloro-2-butene	ND	5.0	ug/L							
Dichlorodifluoromethane	ND	10	ug/L							
1,1-Dichloroethane	ND	2.0	ug/L							
1,2-Dichloroethane	ND	2.0	ug/L							
1,1-Dichloroethene	ND	2.0	ug/L							
cis-1,2-Dichloroethene	ND	2.0	ug/L							
trans-1,2-Dichloroethene	ND	2.0	ug/L							
1,2-Dichloropropane	ND	2.0	ug/L							
1,3-Dichloropropane	ND	2.0	ug/L							
2,2-Dichloropropane	ND	10	ug/L							
1,1-Dichloropropene	ND	10	ug/L							
cis-1,3-Dichloropropene	ND	2.0	ug/L							

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November 02, 2017

Report No.: AAJ0995

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110065 - EPA 5030B										
Blank (7110065-BLK1)					Prepared & Analyzed: 11/01/17					
trans-1,3-Dichloropropene	ND	2.0	ug/L							
Ethylbenzene	ND	2.0	ug/L							
Ethyl Methacrylate	ND	10	ug/L							
Hexachlorobutadiene	ND	10	ug/L							
p-Isopropyltoluene	ND	10	ug/L							
Hexachloroethane	ND	10	ug/L							
Iodomethane	ND	10	ug/L							
Isopropylbenzene	ND	10	ug/L							
Methacrylonitrile	ND	10	ug/L							
Methyl Acrylate	ND	10	ug/L							
Methyl Butyl Ketone (2-Hexanone)	ND	10	ug/L							
Methylene Chloride	ND	5.0	ug/L							
Methyl Ethyl Ketone (2-Butanone)	ND	100	ug/L							
Methyl Methacrylate	ND	10	ug/L							
4-Methyl-2-pentanone (MIBK)	ND	10	ug/L							
Methyl-tert-Butyl Ether	ND	10	ug/L							
Naphthalene	ND	10	ug/L							
2-Nitropropane	ND	10	ug/L							
Propionitrile (Ethyl Cyanide)	ND	20	ug/L							
n-Propylbenzene	ND	10	ug/L							
Styrene	ND	5.0	ug/L							
1,1,1,2-Tetrachloroethane	ND	2.0	ug/L							
1,1,2,2-Tetrachloroethane	ND	2.0	ug/L							
Tetrachloroethene	ND	2.0	ug/L							
Tetrahydrofuran	ND	10	ug/L							
Toluene	ND	2.0	ug/L							
1,2,3-Trichlorobenzene	ND	10	ug/L							
1,2,4-Trichlorobenzene	ND	10	ug/L							
1,1,1-Trichloroethane	ND	2.0	ug/L							
1,1,2-Trichloroethane	ND	2.0	ug/L							
Trichloroethene	ND	2.0	ug/L							
Trichlorofluoromethane	ND	10	ug/L							
1,2,3-Trichloropropane	ND	10	ug/L							
1,2,4-Trimethylbenzene	ND	10	ug/L							
1,3,5-Trimethylbenzene	ND	10	ug/L							
Vinyl Acetate	ND	10	ug/L							
Vinyl Chloride	ND	2.0	ug/L							
m+p-Xylene	ND	5.0	ug/L							
o-Xylene	ND	5.0	ug/L							
Xylenes, total	ND	5.0	ug/L							
Surrogate: Dibromofluoromethane	*47*		*ug/L*	*50.000*		*95*	*80-120*			

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Attention: Ms. Katie T. Ross

November 02, 2017

Report No.: AAJ0995

Volatile Organic Compounds by EPA 8260 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch 7110065 - EPA 5030B										
Blank (7110065-BLK1)					Prepared & Analyzed: 11/01/17					
Surrogate: 1,2-Dichloroethane-d4	*52*		*ug/L*	*50.000*		*104*	*78-120*			
Surrogate: Toluene-d8	*50*		*ug/L*	*50.000*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*51*		*ug/L*	*50.000*		*102*	*80-120*			
LCS (7110065-BS1)					Prepared & Analyzed: 11/01/17					
Benzene	48		ug/L	50.000		97	67-134			
Chlorobenzene	49		ug/L	50.000		99	69-122			
1,1-Dichloroethene	46		ug/L	50.000		91	58-142			
Toluene	48		ug/L	50.000		96	68-127			
Trichloroethene	48		ug/L	50.000		96	72-132			
Surrogate: Dibromofluoromethane	*44*		*ug/L*	*50.000*		*88*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*47*		*ug/L*	*50.000*		*95*	*78-120*			
Surrogate: Toluene-d8	*49*		*ug/L*	*50.000*		*97*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*50*		*ug/L*	*50.000*		*101*	*80-120*			
Matrix Spike (7110065-MS1)	**Source: AAJ0980-01**				Prepared & Analyzed: 11/01/17					
Benzene	48		ug/L	50.000	2.2	92	67-134			
Chlorobenzene	48		ug/L	50.000	0.0	95	69-122			
1,1-Dichloroethene	43		ug/L	50.000	0.0	87	58-142			
Toluene	47		ug/L	50.000	0.0	93	68-127			
Trichloroethene	48		ug/L	50.000	0.0	96	72-132			
Surrogate: Dibromofluoromethane	*47*		*ug/L*	*50.000*		*93*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*52*		*ug/L*	*50.000*		*104*	*78-120*			
Surrogate: Toluene-d8	*49*		*ug/L*	*50.000*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*49*		*ug/L*	*50.000*		*99*	*80-120*			
Matrix Spike Dup (7110065-MSD1)	**Source: AAJ0980-01**				Prepared & Analyzed: 11/01/17					
Benzene	51		ug/L	50.000	2.2	97	67-134	5	9	
Chlorobenzene	50		ug/L	50.000	0.0	100	69-122		13	
1,1-Dichloroethene	45		ug/L	50.000	0.0	91	58-142		9	
Toluene	48		ug/L	50.000	0.0	96	68-127	2	9	
Trichloroethene	49		ug/L	50.000	0.0	99	72-132	3	11	
Surrogate: Dibromofluoromethane	*48*		*ug/L*	*50.000*		*96*	*80-120*			
Surrogate: 1,2-Dichloroethane-d4	*52*		*ug/L*	*50.000*		*104*	*78-120*			
Surrogate: Toluene-d8	*50*		*ug/L*	*50.000*		*99*	*80-120*			
Surrogate: 4-Bromofluorobenzene	*50*		*ug/L*	*50.000*		*99*	*80-120*			

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

WENCK Associates
1080 Holcomb Bridge Road, Building 100, S
Roswell GA, 30076
Attention: Ms. Katie T. Ross

November 02, 2017

Laboratory Certifications

Code	Description	Number	Expires
GADW	Georgia DW Inorganics Eff: 07/01/2016	812	06/30/2018
GADWM	Georgia DW Microbiology Eff: 07/01/2015	812	12/09/2019
NC	North Carolina	381	12/31/2017
NELAC	FL DOH (Non-Pot. Water, Solids) Eff:: 07/01/2016	E87315	06/30/2018
NELDW	FL DOH NELAC (Drinking Water) Eff: 07/01/2016	E87315	06/30/2018
SC	South Carolina	98011001	11/30/2017
TX	Texas	T104704397-08-TX	03/31/2018
VA	Virginia	460204	12/14/2017

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Attention: Ms. Katie T. Ross

November 02, 2017

Legend

Definition of Laboratory Terms

ND - None Detected at the Reporting Limit
TIC - Tentatively Identified Compound
CFU - Colony Forming Units
SOP - Method run per Pace Standard Operating Procedure
RL - Reporting Limit
DF - Dilution Factor
***** - Analyte not included in the NELAC list of certified analytes.

Sample Information

N-Nitrosodiphenylamine breaks down to diphenylamine in the GCMS; both analytes are reported as N-Nitrososdiphenylamine. Pace is not NELAC certified for diphenylamine.

Phthalic acid and phthalic anhydride are reported as dimethyl phthalate

Maleic acid and maleic anhydride are reported as dimethyl malate

1,2-Diphenylhydrazine breaks down to azobenzene in the GCMS; both analytes are reported as azobenzene

Drinking Water Records will be available for at least 5 years and are subject to disposal after the 5 years have elapsed.

Definition of Qualifiers

Note: Unless otherwise noted, all results are reported on an as received basis.

CHAIN OF CUSTODY RECORD

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

CLIENT NAME: WENCK

CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER: 1080 Holcomb Bridge Rd, Bldg 100, Ste 190 Roswell, GA

REPORT TO: Katie Ross

CC: William Barnett

REQUESTED COMPLETION DATE: Standard

PO #:

PROJECT NAME/STATE: City of Duluth

PROJECT #:

ANALYSIS REQUESTED

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	CONTAINER TYPE:	PRESERVATION:	# of CONTAINERS	VOC's (8260)	LAB ID NUMBER
10/31/17	857	GW		X	MW-13			3	X	1
1		W		X	TRIP BLANK				X	2

SAMPLED BY AND TITLE: William Barnett / PM

DATE/TIME: 10/31/17 857

RELINQUISHED BY: William Barnett

DATE/TIME: 10/31/17 1130

RECEIVED BY:

DATE/TIME:

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY LAB: Rodriman

DATE/TIME: 10/31/17 1130

SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER CLIENT OTHER FS

Custody Seal: Intact Broken Not Present N/A

# of Coolers:

Cooler ID:

Temperature: Min: 4.1 Max

Ice: Yes No NA

checked: es No NA

CONTAINER TYPE	PRESERVATION
P - PLASTIC	1 - HCl, ≤6°C
A - AMBER GLASS	2 - H_2SO_4, ≤6°C
G - CLEAR GLASS	3 - HNO_3
V - VOA VIAL	4 - NaOH, ≤6°C
S - STERILE	5 - NaOH/ZnAc, ≤6°C
O - OTHER	6 - $Na_2S_2O_3$, ≤6°C
	7 - ≤6°C not frozen

*MATRIX CODES:

DW -	DRINKING WATER	S -	SOIL
WW -	WASTEWATER	SL -	SLUDGE
GW -	GROUNDWATER	SD -	SOLID
SW -	SURFACE WATER	A -	AIR
ST -	STORM WATER	L -	LIQUID
W -	WATER	P -	PRODUCT

REMARKS/ADDITIONAL INFORMATION

FOR LAB USE ONLY

LAB #: AAJ0995

Entered into LIMS:

Tracking #:

Sample Condition Upon Receipt

Pace Analytical

Client Name: Weck Project # AAJ0995

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other _____

Optional
Proj Due Date:
Proj Name:

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used IR-4 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 4.1 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 10/31/17 MR

Temp should be above freezing to 6°C Comments:

Chain of Custody Present:	☑Yes	☐No	☐N/A	1.	
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.	
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.	
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.	
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.	
Short Hold Time Analysis (<72hr):	☐Yes	☑No	☐N/A	6.	
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.	
Sufficient Volume:	☑Yes	☐No	☐N/A	8.	
Correct Containers Used:	☑Yes	☐No	☐N/A	9.	
-Pace Containers Used:	☑Yes	☐No	☐N/A		
Containers Intact:	☑Yes	☐No	☐N/A	10.	
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.	
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.	
-Includes date/time/ID/Analysis Matrix: GW					
All containers needing preservation have been checked.	☐Yes	☐No	☑N/A	13.	
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes	☐No	☐N/A		
exceptions: (VOA) coliform, TOC, O&G, WI-DRO (water)	☑Yes	☐No		Initial when completed	Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No	☑N/A	14.	
Headspace in VOA Vials (>6mm):	☐Yes	☑No	☐N/A	15.	
Trip Blank Present:	☑Yes	☐No	☐N/A	16.	
Trip Blank Custody Seals Present	☐Yes	☐No	☐N/A		
Pace Trip Blank Lot # (if purchased): _____					

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

PACE ANALYTICAL SERVICES, LLC.

Environmental Monitoring & Laboratory Analysis
110 Technology Parkway, Peachtree Corners, GA 30092
(770) 734-4200 FAX (770) 734-4201

LOG-IN CHECKLIST **Printed: 10/31/2017 3:08:39PM**

Attn: Ms. Katie T. Ross

Client: WENCK Associates
Project: Duluth, City of
Date Received: 10/31/17 11:30

Work Order: AAJ0995
Logged In By: Mohammad M. Rahman

OBSERVATIONS

#Samples: 2 **#Containers:** 6

Minimum Temp(C): 4.1 **Maximum Temp(C):** 4.1 **Custody Seal(s) Used:** Yes

CHECKLIST ITEMS

COC included with Samples	YES
Sample Container(s) Intact	YES
Chain of Custody Complete	YES
Sample Container(s) Match COC	YES
Custody seal Intact	YES
Temperature in Compliance	YES
Sufficient Sample Volume for Analysis	YES
Zero Headspace Maintained for VOA Analyses	YES
Samples labeled preserved (If Applicable)	YES
Samples received within Allowable Hold Times	YES
Samples Received on Ice	YES
Preservation Confirmed	YES

Comments:

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

April 19, 2018

Katie Ross
WENCK Associates
1080 Holcomb Bridge Rd.
Roswell, GA 30076

RE: Project: City of Duluth - 5365
Pace Project No.: 263783

Dear Katie Ross:
Enclosed are the analytical results for sample(s) received by the laboratory on April 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Eben Buchanan

Eben Buchanan
eben.buchanan@pacelabs.com
(770)734-4200
Project Manager

Enclosures

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

CERTIFICATIONS

Project: City of Duluth - 5365
Pace Project No.: 263783

Atlanta Certification IDs

110 Technology Parkway Peachtree Corners, GA 30092
Florida DOH Certification #: E87315
Georgia DW Inorganics Certification #: 812
Georgia DW Microbiology Certification #: 812
North Carolina Certification #: 381
South Carolina Certification #: 98011001
Texas Certification #: T104704397-08-TX
Virginia Certification #: 460204

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE SUMMARY

Project: City of Duluth - 5365
Pace Project No.: 263783

Lab ID	Sample ID	Matrix	Date Collected	Date Received
263783001	**MW-8**	Water	04/09/18 12:45	04/10/18 15:55
263783002	**MW-6**	Water	04/09/18 17:19	04/10/18 15:55
263783003	**MW-5**	Water	04/09/18 16:55	04/10/18 15:55
263783004	**MW-13**	Water	04/09/18 19:37	04/10/18 15:55
263783005	**MW-4**	Water	04/09/18 19:50	04/10/18 15:55
263783006	**MW-3**	Water	04/10/18 10:50	04/10/18 15:55
263783007	**MW-2**	Water	04/10/18 11:10	04/10/18 15:55
263783008	**MW-1**	Water	04/10/18 13:05	04/10/18 15:55
263783009	**Dup-1**	Water	04/10/18 00:00	04/10/18 15:55
263783010	**Trip Blank**	Water	04/10/18 00:00	04/10/18 15:55

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

SAMPLE ANALYTE COUNT

Project: City of Duluth - 5365
Pace Project No.: 263783

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
263783001	**MW-8**	RSK 175 Modified	CAH	3	PASI-C
		EPA 8260B	LIH	64	PASI-GA
		SM 2320B	JAD	1	PASI-GA
		EPA 9034	JPT	1	PASI-GA
		EPA 9056A	RLC	1	PASI-GA
		EPA 9056A	RLC	2	PASI-GA
		EPA 9060A	FDS	1	PASI-GA
263783002	**MW-6**	EPA 8260B	LIH	64	PASI-GA
263783003	**MW-5**	EPA 8260B	LIH	64	PASI-GA
263783004	**MW-13**	RSK 175 Modified	CAH	3	PASI-C
		EPA 8260B	LIH	64	PASI-GA
		SM 2320B	JAD	1	PASI-GA
		EPA 9034	JPT	1	PASI-GA
		EPA 9056A	RLC	1	PASI-GA
		EPA 9056A	RLC	2	PASI-GA
		EPA 9060A	FDS	1	PASI-GA
263783005	**MW-4**	EPA 8260B	LIH	64	PASI-GA
263783006	**MW-3**	EPA 8260B	LIH	64	PASI-GA
263783007	**MW-2**	EPA 8260B	LIH	64	PASI-GA
263783008	**MW-1**	RSK 175 Modified	CAH	3	PASI-C
		EPA 8260B	LIH	64	PASI-GA
		SM 2320B	JAD	1	PASI-GA
		EPA 9034	JPT	1	PASI-GA
		EPA 9056A	RLC	1	PASI-GA
		EPA 9056A	RLC	2	PASI-GA
		EPA 9060A	FDS	1	PASI-GA
263783009	**Dup-1**	EPA 8260B	LIH	64	PASI-GA
263783010	**Trip Blank**	EPA 8260B	LIH	64	PASI-GA

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-8 **Lab ID: 263783001** Collected: 04/09/18 12:45 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		04/13/18 15:25	74-84-0	
Ethene	ND	ug/L	10.0	1		04/13/18 15:25	74-85-1	
Methane	ND	ug/L	10.0	1		04/13/18 15:25	74-82-8	
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 20:42	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 20:42	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 20:42	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 20:42	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 20:42	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 20:42	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 20:42	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 20:42	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 20:42	56-23-5	M1
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 20:42	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 20:42	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 20:42	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 20:42	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 20:42	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 20:42	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 20:42	124-48-1	M1
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 20:42	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 20:42	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 20:42	75-71-8	M1
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 20:42	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 20:42	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 20:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 20:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 20:42	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 20:42	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 20:42	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 20:42	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 20:42	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 20:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 20:42	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 20:42	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 20:42	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 20:42	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 20:42	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 20:42	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 20:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 20:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 20:42	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-8 **Lab ID: 263783001** Collected: 04/09/18 12:45 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Naphthalene	ND	ug/L	1.0	1		04/13/18 20:42	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 20:42	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 20:42	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 20:42	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/13/18 20:42	127-18-4	R1
Toluene	ND	ug/L	1.0	1		04/13/18 20:42	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 20:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 20:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 20:42	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/13/18 20:42	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 20:42	75-69-4	M1
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 20:42	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 20:42	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 20:42	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 20:42	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 20:42	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 20:42	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	118	%.	81-119	1		04/13/18 20:42	17060-07-0	
Dibromofluoromethane (S)	101	%.	82-114	1		04/13/18 20:42	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		04/13/18 20:42	460-00-4	
Toluene-d8 (S)	99	%.	82-109	1		04/13/18 20:42	2037-26-5	
2320B Alkalinity Low Level	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	ND	mg/L	1.0	1		04/17/18 11:22		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030A							
Sulfide	ND	mg/L	1.0	1	04/12/18 14:25	04/12/18 16:16	18496-25-8	
9056 IC Anions 48hr	Analytical Method: EPA 9056A							
Nitrate as N	**2.3**	mg/L	0.050	1		04/11/18 10:42	14797-55-8	
9056 IC Anions	Analytical Method: EPA 9056A							
Chloride	**5.2**	mg/L	1.0	1		04/16/18 14:46	16887-00-6	
Sulfate	ND	mg/L	5.0	1		04/16/18 14:46	14808-79-8	
9060A Total Organic Carbon	Analytical Method: EPA 9060A							
Mean Total Organic Carbon	ND	mg/L	1.0	1		04/16/18 21:28	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-6 **Lab ID: 263783002** Collected: 04/09/18 17:19 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 21:07	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 21:07	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 21:07	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 21:07	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 21:07	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 21:07	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 21:07	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 21:07	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 21:07	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 21:07	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 21:07	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 21:07	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:07	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:07	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 21:07	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 21:07	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 21:07	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 21:07	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 21:07	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:07	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:07	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:07	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:07	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:07	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:07	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:07	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:07	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:07	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:07	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:07	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 21:07	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 21:07	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 21:07	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 21:07	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 21:07	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 21:07	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 21:07	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 21:07	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 21:07	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 21:07	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:07	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:07	79-34-5	
Tetrachloroethene	**4.3**	ug/L	1.0	1		04/13/18 21:07	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-6 **Lab ID: 263783002** Collected: 04/09/18 17:19 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 21:07	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:07	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:07	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:07	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/13/18 21:07	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 21:07	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 21:07	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 21:07	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 21:07	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 21:07	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 21:07	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 21:07	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	118	%.	81-119	1		04/13/18 21:07	17060-07-0	
Dibromofluoromethane (S)	99	%.	82-114	1		04/13/18 21:07	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		04/13/18 21:07	460-00-4	
Toluene-d8 (S)	99	%.	82-109	1		04/13/18 21:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-5 **Lab ID: 263783003** Collected: 04/09/18 16:55 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 21:33	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 21:33	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 21:33	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 21:33	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 21:33	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 21:33	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 21:33	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 21:33	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 21:33	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 21:33	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 21:33	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 21:33	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:33	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:33	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 21:33	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 21:33	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 21:33	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 21:33	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 21:33	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:33	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:33	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:33	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:33	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:33	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:33	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:33	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:33	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:33	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:33	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:33	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 21:33	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 21:33	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 21:33	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 21:33	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 21:33	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 21:33	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 21:33	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 21:33	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 21:33	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 21:33	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:33	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:33	79-34-5	
Tetrachloroethene	**8.8**	ug/L	1.0	1		04/13/18 21:33	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-5 **Lab ID: 263783003** Collected: 04/09/18 16:55 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 21:33	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:33	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:33	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:33	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/13/18 21:33	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 21:33	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 21:33	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 21:33	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 21:33	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 21:33	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 21:33	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 21:33	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	117	%.	81-119	1		04/13/18 21:33	17060-07-0	
Dibromofluoromethane (S)	101	%.	82-114	1		04/13/18 21:33	1868-53-7	
4-Bromofluorobenzene (S)	99	%.	82-120	1		04/13/18 21:33	460-00-4	
Toluene-d8 (S)	98	%.	82-109	1		04/13/18 21:33	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-13 **Lab ID: 263783004** Collected: 04/09/18 19:37 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		04/13/18 15:40	74-84-0	
Ethene	ND	ug/L	10.0	1		04/13/18 15:40	74-85-1	
Methane	ND	ug/L	10.0	1		04/13/18 15:40	74-82-8	
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 21:58	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 21:58	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 21:58	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 21:58	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 21:58	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 21:58	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 21:58	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 21:58	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 21:58	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 21:58	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 21:58	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 21:58	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:58	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 21:58	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 21:58	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 21:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 21:58	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 21:58	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 21:58	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:58	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 21:58	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 21:58	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:58	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:58	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 21:58	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:58	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 21:58	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 21:58	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 21:58	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 21:58	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 21:58	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 21:58	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 21:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 21:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 21:58	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-13 **Lab ID: 263783004** Collected: 04/09/18 19:37 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Naphthalene	ND	ug/L	1.0	1		04/13/18 21:58	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 21:58	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:58	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 21:58	79-34-5	
Tetrachloroethene	**29.0**	ug/L	1.0	1		04/13/18 21:58	127-18-4	
Toluene	ND	ug/L	1.0	1		04/13/18 21:58	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 21:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 21:58	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/13/18 21:58	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 21:58	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 21:58	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 21:58	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 21:58	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 21:58	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 21:58	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 21:58	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	120	%.	81-119	1		04/13/18 21:58	17060-07-0	S0
Dibromofluoromethane (S)	100	%.	82-114	1		04/13/18 21:58	1868-53-7	
4-Bromofluorobenzene (S)	102	%.	82-120	1		04/13/18 21:58	460-00-4	
Toluene-d8 (S)	97	%.	82-109	1		04/13/18 21:58	2037-26-5	
2320B Alkalinity Low Level	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	**8.5**	mg/L	1.0	1		04/17/18 11:26		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030A							
Sulfide	ND	mg/L	1.0	1	04/12/18 14:25	04/12/18 16:18	18496-25-8	
9056 IC Anions 48hr	Analytical Method: EPA 9056A							
Nitrate as N	**1.2**	mg/L	0.050	1		04/11/18 11:04	14797-55-8	
9056 IC Anions	Analytical Method: EPA 9056A							
Chloride	**3.1**	mg/L	1.0	1		04/16/18 15:48	16887-00-6	
Sulfate	**55.7**	mg/L	25.0	5		04/18/18 10:28	14808-79-8	
9060A Total Organic Carbon	Analytical Method: EPA 9060A							
Mean Total Organic Carbon	ND	mg/L	1.0	1		04/16/18 22:12	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-4 **Lab ID: 263783005** Collected: 04/09/18 19:50 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 22:24	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 22:24	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 22:24	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 22:24	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 22:24	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 22:24	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 22:24	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 22:24	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 22:24	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 22:24	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 22:24	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 22:24	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 22:24	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 22:24	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 22:24	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 22:24	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 22:24	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 22:24	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 22:24	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 22:24	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 22:24	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 22:24	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 22:24	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 22:24	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:24	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:24	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:24	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:24	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:24	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:24	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 22:24	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 22:24	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 22:24	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 22:24	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 22:24	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 22:24	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 22:24	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 22:24	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 22:24	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 22:24	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 22:24	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 22:24	79-34-5	
Tetrachloroethene	**320**	ug/L	10.0	10		04/16/18 12:34	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-4 **Lab ID: 263783005** Collected: 04/09/18 19:50 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 22:24	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:24	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 22:24	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 22:24	79-00-5	
Trichloroethene	**2.3**	ug/L	1.0	1		04/13/18 22:24	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 22:24	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 22:24	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 22:24	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 22:24	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 22:24	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 22:24	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 22:24	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	119	%.	81-119	1		04/13/18 22:24	17060-07-0	
Dibromofluoromethane (S)	102	%.	82-114	1		04/13/18 22:24	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	82-120	1		04/13/18 22:24	460-00-4	
Toluene-d8 (S)	96	%.	82-109	1		04/13/18 22:24	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-3 **Lab ID: 263783006** Collected: 04/10/18 10:50 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 22:49	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 22:49	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 22:49	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 22:49	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 22:49	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 22:49	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 22:49	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 22:49	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 22:49	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 22:49	75-00-3	
Chloroform	**1.1**	ug/L	1.0	1		04/13/18 22:49	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 22:49	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 22:49	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 22:49	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 22:49	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 22:49	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 22:49	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 22:49	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 22:49	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 22:49	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 22:49	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 22:49	75-35-4	
cis-1,2-Dichloroethene	**2.0**	ug/L	1.0	1		04/13/18 22:49	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 22:49	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:49	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:49	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 22:49	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:49	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:49	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 22:49	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 22:49	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 22:49	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 22:49	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 22:49	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 22:49	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 22:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 22:49	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 22:49	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 22:49	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 22:49	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 22:49	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 22:49	79-34-5	
Tetrachloroethene	**1000**	ug/L	50.0	50		04/16/18 12:59	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-3 **Lab ID: 263783006** Collected: 04/10/18 10:50 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 22:49	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 22:49	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 22:49	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 22:49	79-00-5	
Trichloroethene	**3.0**	ug/L	1.0	1		04/13/18 22:49	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 22:49	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 22:49	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 22:49	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 22:49	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 22:49	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 22:49	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 22:49	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	117	%.	81-119	1		04/13/18 22:49	17060-07-0	
Dibromofluoromethane (S)	100	%.	82-114	1		04/13/18 22:49	1868-53-7	
4-Bromofluorobenzene (S)	104	%.	82-120	1		04/13/18 22:49	460-00-4	
Toluene-d8 (S)	94	%.	82-109	1		04/13/18 22:49	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-2 **Lab ID: 263783007** Collected: 04/10/18 11:10 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 23:15	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 23:15	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 23:15	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 23:15	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 23:15	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 23:15	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 23:15	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 23:15	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 23:15	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 23:15	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 23:15	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 23:15	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 23:15	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 23:15	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 23:15	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 23:15	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 23:15	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 23:15	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 23:15	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 23:15	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 23:15	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 23:15	75-35-4	
cis-1,2-Dichloroethene	**6.2**	ug/L	1.0	1		04/13/18 23:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 23:15	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:15	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:15	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:15	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:15	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:15	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:15	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 23:15	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 23:15	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 23:15	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 23:15	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 23:15	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 23:15	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 23:15	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 23:15	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 23:15	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 23:15	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 23:15	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 23:15	79-34-5	
Tetrachloroethene	**911**	ug/L	50.0	50		04/16/18 13:25	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-2 **Lab ID: 263783007** Collected: 04/10/18 11:10 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 23:15	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:15	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 23:15	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 23:15	79-00-5	
Trichloroethene	**13.8**	ug/L	1.0	1		04/13/18 23:15	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 23:15	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 23:15	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 23:15	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 23:15	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 23:15	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 23:15	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 23:15	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	121	%.	81-119	1		04/13/18 23:15	17060-07-0	S0
Dibromofluoromethane (S)	102	%.	82-114	1		04/13/18 23:15	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		04/13/18 23:15	460-00-4	
Toluene-d8 (S)	93	%.	82-109	1		04/13/18 23:15	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-1 **Lab ID: 263783008** Collected: 04/10/18 13:05 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
RSK 175 Headspace	Analytical Method: RSK 175 Modified							
Ethane	ND	ug/L	10.0	1		04/13/18 16:11	74-84-0	
Ethene	ND	ug/L	10.0	1		04/13/18 16:11	74-85-1	
Methane	ND	ug/L	10.0	1		04/13/18 16:11	74-82-8	
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 23:40	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 23:40	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 23:40	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 23:40	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 23:40	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 23:40	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 23:40	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 23:40	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 23:40	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 23:40	75-00-3	
Chloroform	**13.5**	ug/L	1.0	1		04/13/18 23:40	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 23:40	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 23:40	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 23:40	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 23:40	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 23:40	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 23:40	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 23:40	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 23:40	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 23:40	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 23:40	107-06-2	
1,1-Dichloroethene	**1.4**	ug/L	1.0	1		04/13/18 23:40	75-35-4	
cis-1,2-Dichloroethene	**564**	ug/L	100	100		04/16/18 13:50	156-59-2	
trans-1,2-Dichloroethene	**3.2**	ug/L	1.0	1		04/13/18 23:40	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:40	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:40	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 23:40	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:40	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:40	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 23:40	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 23:40	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 23:40	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 23:40	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 23:40	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 23:40	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 23:40	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 23:40	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 23:40	1634-04-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: MW-1 **Lab ID: 263783008** Collected: 04/10/18 13:05 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Naphthalene	ND	ug/L	1.0	1		04/13/18 23:40	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 23:40	100-42-5	
1,1,1,2-Tetrachloroethane	**3.3**	ug/L	1.0	1		04/13/18 23:40	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 23:40	79-34-5	
Tetrachloroethene	**11200**	ug/L	100	100		04/16/18 13:50	127-18-4	
Toluene	ND	ug/L	1.0	1		04/13/18 23:40	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 23:40	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 23:40	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 23:40	79-00-5	
Trichloroethene	**119**	ug/L	1.0	1		04/13/18 23:40	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 23:40	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 23:40	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 23:40	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 23:40	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 23:40	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 23:40	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 23:40	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	81-119	1		04/13/18 23:40	17060-07-0	
Dibromofluoromethane (S)	104	%.	82-114	1		04/13/18 23:40	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		04/13/18 23:40	460-00-4	
Toluene-d8 (S)	91	%.	82-109	1		04/13/18 23:40	2037-26-5	
2320B Alkalinity Low Level	Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	ND	mg/L	1.0	1		04/17/18 11:28		
9034 Sulfide, Titration	Analytical Method: EPA 9034 Preparation Method: EPA 9030A							
Sulfide	ND	mg/L	1.0	1	04/12/18 14:25	04/12/18 16:20	18496-25-8	
9056 IC Anions 48hr	Analytical Method: EPA 9056A							
Nitrate as N	**7.0**	mg/L	0.050	1		04/11/18 11:25	14797-55-8	
9056 IC Anions	Analytical Method: EPA 9056A							
Chloride	**3.9**	mg/L	1.0	1		04/16/18 16:09	16887-00-6	
Sulfate	ND	mg/L	5.0	1		04/16/18 16:09	14808-79-8	
9060A Total Organic Carbon	Analytical Method: EPA 9060A							
Mean Total Organic Carbon	ND	mg/L	1.0	1		04/16/18 22:54	7440-44-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: Dup-1 **Lab ID: 263783009** Collected: 04/10/18 00:00 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/14/18 00:06	67-64-1	
Benzene	ND	ug/L	1.0	1		04/14/18 00:06	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/14/18 00:06	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/14/18 00:06	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/14/18 00:06	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/14/18 00:06	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/14/18 00:06	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/14/18 00:06	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/14/18 00:06	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/14/18 00:06	75-00-3	
Chloroform	**14.4**	ug/L	1.0	1		04/14/18 00:06	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/14/18 00:06	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/14/18 00:06	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/14/18 00:06	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/14/18 00:06	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/14/18 00:06	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/14/18 00:06	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/14/18 00:06	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/14/18 00:06	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/14/18 00:06	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/14/18 00:06	107-06-2	
1,1-Dichloroethene	**1.5**	ug/L	1.0	1		04/14/18 00:06	75-35-4	
cis-1,2-Dichloroethene	**638**	ug/L	100	100		04/16/18 14:15	156-59-2	
trans-1,2-Dichloroethene	**3.2**	ug/L	1.0	1		04/14/18 00:06	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/14/18 00:06	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/14/18 00:06	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/14/18 00:06	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/14/18 00:06	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/18 00:06	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/14/18 00:06	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/14/18 00:06	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/14/18 00:06	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/14/18 00:06	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/14/18 00:06	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/14/18 00:06	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/14/18 00:06	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/14/18 00:06	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/14/18 00:06	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/14/18 00:06	91-20-3	
Styrene	ND	ug/L	1.0	1		04/14/18 00:06	100-42-5	
1,1,1,2-Tetrachloroethane	**3.5**	ug/L	1.0	1		04/14/18 00:06	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/14/18 00:06	79-34-5	
Tetrachloroethene	**9990**	ug/L	100	100		04/16/18 14:15	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: Dup-1 **Lab ID: 263783009** Collected: 04/10/18 00:00 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/14/18 00:06	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/14/18 00:06	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/14/18 00:06	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/14/18 00:06	79-00-5	
Trichloroethene	**117**	ug/L	1.0	1		04/14/18 00:06	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/14/18 00:06	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/14/18 00:06	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/14/18 00:06	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/14/18 00:06	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/14/18 00:06	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/14/18 00:06	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/14/18 00:06	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	118	%.	81-119	1		04/14/18 00:06	17060-07-0	
Dibromofluoromethane (S)	102	%.	82-114	1		04/14/18 00:06	1868-53-7	
4-Bromofluorobenzene (S)	105	%.	82-120	1		04/14/18 00:06	460-00-4	
Toluene-d8 (S)	92	%.	82-109	1		04/14/18 00:06	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: Trip Blank **Lab ID: 263783010** Collected: 04/10/18 00:00 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Acetone	ND	ug/L	25.0	1		04/13/18 12:12	67-64-1	
Benzene	ND	ug/L	1.0	1		04/13/18 12:12	71-43-2	
Bromobenzene	ND	ug/L	1.0	1		04/13/18 12:12	108-86-1	
Bromochloromethane	ND	ug/L	1.0	1		04/13/18 12:12	74-97-5	
Bromodichloromethane	ND	ug/L	1.0	1		04/13/18 12:12	75-27-4	
Bromoform	ND	ug/L	1.0	1		04/13/18 12:12	75-25-2	
Bromomethane	ND	ug/L	2.0	1		04/13/18 12:12	74-83-9	
2-Butanone (MEK)	ND	ug/L	5.0	1		04/13/18 12:12	78-93-3	
Carbon tetrachloride	ND	ug/L	1.0	1		04/13/18 12:12	56-23-5	
Chlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	108-90-7	
Chloroethane	ND	ug/L	1.0	1		04/13/18 12:12	75-00-3	
Chloroform	ND	ug/L	1.0	1		04/13/18 12:12	67-66-3	
Chloromethane	ND	ug/L	1.0	1		04/13/18 12:12	74-87-3	
2-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 12:12	95-49-8	
4-Chlorotoluene	ND	ug/L	1.0	1		04/13/18 12:12	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	1.0	1		04/13/18 12:12	96-12-8	
Dibromochloromethane	ND	ug/L	1.0	1		04/13/18 12:12	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	1.0	1		04/13/18 12:12	106-93-4	
Dibromomethane	ND	ug/L	1.0	1		04/13/18 12:12	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	106-46-7	
Dichlorodifluoromethane	ND	ug/L	1.0	1		04/13/18 12:12	75-71-8	
1,1-Dichloroethane	ND	ug/L	1.0	1		04/13/18 12:12	75-34-3	
1,2-Dichloroethane	ND	ug/L	1.0	1		04/13/18 12:12	107-06-2	
1,1-Dichloroethene	ND	ug/L	1.0	1		04/13/18 12:12	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 12:12	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	1.0	1		04/13/18 12:12	156-60-5	
1,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 12:12	78-87-5	
1,3-Dichloropropane	ND	ug/L	1.0	1		04/13/18 12:12	142-28-9	
2,2-Dichloropropane	ND	ug/L	1.0	1		04/13/18 12:12	594-20-7	
1,1-Dichloropropene	ND	ug/L	1.0	1		04/13/18 12:12	563-58-6	
cis-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 12:12	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/L	1.0	1		04/13/18 12:12	10061-02-6	
Diisopropyl ether	ND	ug/L	10.0	1		04/13/18 12:12	108-20-3	
Ethylbenzene	ND	ug/L	1.0	1		04/13/18 12:12	100-41-4	
Hexachloro-1,3-butadiene	ND	ug/L	10.0	1		04/13/18 12:12	87-68-3	
2-Hexanone	ND	ug/L	5.0	1		04/13/18 12:12	591-78-6	
p-Isopropyltoluene	ND	ug/L	1.0	1		04/13/18 12:12	99-87-6	
Methylene Chloride	ND	ug/L	1.0	1		04/13/18 12:12	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/L	5.0	1		04/13/18 12:12	108-10-1	
Methyl-tert-butyl ether	ND	ug/L	10.0	1		04/13/18 12:12	1634-04-4	
Naphthalene	ND	ug/L	1.0	1		04/13/18 12:12	91-20-3	
Styrene	ND	ug/L	1.0	1		04/13/18 12:12	100-42-5	
1,1,1,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 12:12	630-20-6	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0	1		04/13/18 12:12	79-34-5	
Tetrachloroethene	ND	ug/L	1.0	1		04/13/18 12:12	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

ANALYTICAL RESULTS

Project: City of Duluth - 5365
Pace Project No.: 263783

Sample: Trip Blank **Lab ID: 263783010** Collected: 04/10/18 00:00 Received: 04/10/18 15:55 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
8260B MSV	Analytical Method: EPA 8260B							
Toluene	ND	ug/L	1.0	1		04/13/18 12:12	108-88-3	
1,2,3-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	87-61-6	
1,2,4-Trichlorobenzene	ND	ug/L	1.0	1		04/13/18 12:12	120-82-1	
1,1,1-Trichloroethane	ND	ug/L	1.0	1		04/13/18 12:12	71-55-6	
1,1,2-Trichloroethane	ND	ug/L	1.0	1		04/13/18 12:12	79-00-5	
Trichloroethene	ND	ug/L	1.0	1		04/13/18 12:12	79-01-6	
Trichlorofluoromethane	ND	ug/L	1.0	1		04/13/18 12:12	75-69-4	
1,2,3-Trichloropropane	ND	ug/L	1.0	1		04/13/18 12:12	96-18-4	
Vinyl acetate	ND	ug/L	2.0	1		04/13/18 12:12	108-05-4	
Vinyl chloride	ND	ug/L	1.0	1		04/13/18 12:12	75-01-4	
Xylene (Total)	ND	ug/L	2.0	1		04/13/18 12:12	1330-20-7	
m&p-Xylene	ND	ug/L	1.0	1		04/13/18 12:12	179601-23-1	
o-Xylene	ND	ug/L	1.0	1		04/13/18 12:12	95-47-6	
Surrogates								
1,2-Dichloroethane-d4 (S)	116	%.	81-119	1		04/13/18 12:12	17060-07-0	
Dibromofluoromethane (S)	102	%.	82-114	1		04/13/18 12:12	1868-53-7	
4-Bromofluorobenzene (S)	103	%.	82-120	1		04/13/18 12:12	460-00-4	
Toluene-d8 (S)	99	%.	82-109	1		04/13/18 12:12	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 406217 Analysis Method: RSK 175 Modified
QC Batch Method: RSK 175 Modified Analysis Description: RSK 175 HEADSPACE
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 2253571 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethane	ug/L	ND	10.0	04/13/18 15:10	
Ethene	ug/L	ND	10.0	04/13/18 15:10	
Methane	ug/L	ND	10.0	04/13/18 15:10	

LABORATORY CONTROL SAMPLE: 2253572

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	658	648	98	70-130	
Ethene	ug/L	1120	1050	94	70-130	
Methane	ug/L	396	383	97	70-130	

MATRIX SPIKE SAMPLE: 2253573

Parameter	Units	263783001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Ethane	ug/L	ND	658	622	94	70-130	
Ethene	ug/L	ND	1120	1220	109	70-130	
Methane	ug/L	ND	396	384	97	70-130	

SAMPLE DUPLICATE: 2253574

Parameter	Units	263783004 Result	Dup Result	RPD	Max RPD	Qualifiers
Ethane	ug/L	ND	ND		20	
Ethene	ug/L	ND	ND		20	
Methane	ug/L	ND	ND		20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 4338 Analysis Method: EPA 8260B
QC Batch Method: EPA 8260B Analysis Description: 8260B MSV
Associated Lab Samples: 263783001, 263783002, 263783003, 263783004, 263783005, 263783006, 263783007, 263783008, 263783009, 263783010

METHOD BLANK: 21484 Matrix: Water
Associated Lab Samples: 263783001, 263783002, 263783003, 263783004, 263783005, 263783006, 263783007, 263783008, 263783009, 263783010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,1,1-Trichloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,1,2,2-Tetrachloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,1,2-Trichloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,1-Dichloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,1-Dichloroethene	ug/L	ND	1.0	04/13/18 11:47	
1,1-Dichloropropene	ug/L	ND	1.0	04/13/18 11:47	
1,2,3-Trichlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
1,2,3-Trichloropropane	ug/L	ND	1.0	04/13/18 11:47	
1,2,4-Trichlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
1,2-Dibromo-3-chloropropane	ug/L	ND	1.0	04/13/18 11:47	
1,2-Dibromoethane (EDB)	ug/L	ND	1.0	04/13/18 11:47	
1,2-Dichlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
1,2-Dichloroethane	ug/L	ND	1.0	04/13/18 11:47	
1,2-Dichloropropane	ug/L	ND	1.0	04/13/18 11:47	
1,3-Dichlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
1,3-Dichloropropane	ug/L	ND	1.0	04/13/18 11:47	
1,4-Dichlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
2,2-Dichloropropane	ug/L	ND	1.0	04/13/18 11:47	
2-Butanone (MEK)	ug/L	ND	5.0	04/13/18 11:47	
2-Chlorotoluene	ug/L	ND	1.0	04/13/18 11:47	
2-Hexanone	ug/L	ND	5.0	04/13/18 11:47	
4-Chlorotoluene	ug/L	ND	1.0	04/13/18 11:47	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	5.0	04/13/18 11:47	
Acetone	ug/L	ND	25.0	04/13/18 11:47	
Benzene	ug/L	ND	1.0	04/13/18 11:47	
Bromobenzene	ug/L	ND	1.0	04/13/18 11:47	
Bromochloromethane	ug/L	ND	1.0	04/13/18 11:47	
Bromodichloromethane	ug/L	ND	1.0	04/13/18 11:47	
Bromoform	ug/L	ND	1.0	04/13/18 11:47	
Bromomethane	ug/L	ND	2.0	04/13/18 11:47	
Carbon tetrachloride	ug/L	ND	1.0	04/13/18 11:47	
Chlorobenzene	ug/L	ND	1.0	04/13/18 11:47	
Chloroethane	ug/L	ND	1.0	04/13/18 11:47	
Chloroform	ug/L	ND	1.0	04/13/18 11:47	
Chloromethane	ug/L	ND	1.0	04/13/18 11:47	
cis-1,2-Dichloroethene	ug/L	ND	1.0	04/13/18 11:47	
cis-1,3-Dichloropropene	ug/L	ND	1.0	04/13/18 11:47	
Dibromochloromethane	ug/L	ND	1.0	04/13/18 11:47	
Dibromomethane	ug/L	ND	1.0	04/13/18 11:47	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

METHOD BLANK: 21484 Matrix: Water
Associated Lab Samples: 263783001, 263783002, 263783003, 263783004, 263783005, 263783006, 263783007, 263783008, 263783009, 263783010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Dichlorodifluoromethane	ug/L	ND	1.0	04/13/18 11:47	
Diisopropyl ether	ug/L	ND	10.0	04/13/18 11:47	
Ethylbenzene	ug/L	ND	1.0	04/13/18 11:47	
Hexachloro-1,3-butadiene	ug/L	ND	10.0	04/13/18 11:47	
m&p-Xylene	ug/L	ND	1.0	04/13/18 11:47	
Methyl-tert-butyl ether	ug/L	ND	10.0	04/13/18 11:47	
Methylene Chloride	ug/L	ND	1.0	04/13/18 11:47	
Naphthalene	ug/L	1.3	1.0	04/13/18 11:47	
o-Xylene	ug/L	ND	1.0	04/13/18 11:47	
p-Isopropyltoluene	ug/L	ND	1.0	04/13/18 11:47	
Styrene	ug/L	ND	1.0	04/13/18 11:47	
Tetrachloroethene	ug/L	ND	1.0	04/13/18 11:47	
Toluene	ug/L	ND	1.0	04/13/18 11:47	
trans-1,2-Dichloroethene	ug/L	ND	1.0	04/13/18 11:47	
trans-1,3-Dichloropropene	ug/L	ND	1.0	04/13/18 11:47	
Trichloroethene	ug/L	ND	1.0	04/13/18 11:47	
Trichlorofluoromethane	ug/L	ND	1.0	04/13/18 11:47	
Vinyl acetate	ug/L	ND	2.0	04/13/18 11:47	
Vinyl chloride	ug/L	ND	1.0	04/13/18 11:47	
Xylene (Total)	ug/L	ND	2.0	04/13/18 11:47	
1,2-Dichloroethane-d4 (S)	%.	116	81-119	04/13/18 11:47	
4-Bromofluorobenzene (S)	%.	103	82-120	04/13/18 11:47	
Dibromofluoromethane (S)	%.	102	82-114	04/13/18 11:47	
Toluene-d8 (S)	%.	99	82-109	04/13/18 11:47	

LABORATORY CONTROL SAMPLE: 21485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	50	48.1	96	68-137	
1,1,1-Trichloroethane	ug/L	50	53.6	107	72-134	
1,1,2,2-Tetrachloroethane	ug/L	50	44.1	88	51-158	
1,1,2-Trichloroethane	ug/L	50	50.9	102	78-131	
1,1-Dichloroethane	ug/L	50	50.4	101	69-151	
1,1-Dichloroethene	ug/L	50	44.6	89	64-158	
1,1-Dichloropropene	ug/L	50	48.8	98	70-133	
1,2,3-Trichlorobenzene	ug/L	50	46.8	94	73-130	
1,2,3-Trichloropropane	ug/L	50	40.7	81	78-133	
1,2,4-Trichlorobenzene	ug/L	50	46.3	93	51-163	
1,2-Dibromo-3-chloropropane	ug/L	50	44.2	88	58-124	
1,2-Dibromoethane (EDB)	ug/L	50	55.5	111	71-134	
1,2-Dichlorobenzene	ug/L	50	47.5	95	70-135	
1,2-Dichloroethane	ug/L	50	54.4	109	72-129	
1,2-Dichloropropane	ug/L	50	47.4	95	64-135	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

LABORATORY CONTROL SAMPLE: 21485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,3-Dichlorobenzene	ug/L	50	47.3	95	71-134	
1,3-Dichloropropane	ug/L	50	55.3	111	70-140	
1,4-Dichlorobenzene	ug/L	50	46.0	92	70-131	
2,2-Dichloropropane	ug/L	50	46.9	94	34-170	
2-Butanone (MEK)	ug/L	100	89.7	90	52-143	
2-Chlorotoluene	ug/L	50	47.0	94	77-128	
2-Hexanone	ug/L	100	81.8	82	61-136	
4-Chlorotoluene	ug/L	50	46.1	92	79-126	
4-Methyl-2-pentanone (MIBK)	ug/L	100	93.3	93	71-129	
Acetone	ug/L	100	89.7	90	48-224	
Benzene	ug/L	50	50.3	101	68-132	
Bromobenzene	ug/L	50	45.7	91	75-122	
Bromochloromethane	ug/L	50	57.9	116	73-133	
Bromodichloromethane	ug/L	50	47.8	96	67-121	
Bromoform	ug/L	50	41.1	82	57-125	
Bromomethane	ug/L	50	50.2	100	35-156	
Carbon tetrachloride	ug/L	50	50.4	101	66-122	
Chlorobenzene	ug/L	50	48.4	97	71-126	
Chloroethane	ug/L	50	43.4	87	43-143	
Chloroform	ug/L	50	54.8	110	71-136	
Chloromethane	ug/L	50	46.3	93	47-123	
cis-1,2-Dichloroethene	ug/L	50	51.4	103	74-131	
cis-1,3-Dichloropropene	ug/L	50	48.2	96	78-120	
Dibromochloromethane	ug/L	50	48.7	97	65-115	
Dibromomethane	ug/L	50	51.8	104	79-129	
Dichlorodifluoromethane	ug/L	50	47.3	95	29-124	
Diisopropyl ether	ug/L	50	49.4	99	70-130	
Ethylbenzene	ug/L	50	47.6	95	68-129	
Hexachloro-1,3-butadiene	ug/L	50	50.3	101	58-142	
m&p-Xylene	ug/L	100	99.4	99	67-137	
Methyl-tert-butyl ether	ug/L	100	108	108	59-130	
Methylene Chloride	ug/L	50	53.9	108	61-147	
Naphthalene	ug/L	50	50.2	100	48-144	
o-Xylene	ug/L	50	49.5	99	52-141	
p-Isopropyltoluene	ug/L	50	41.5	83	58-137	
Styrene	ug/L	50	48.2	96	77-128	
Tetrachloroethene	ug/L	50	42.2	84	51-139	
Toluene	ug/L	50	49.1	98	60-133	
trans-1,2-Dichloroethene	ug/L	50	54.3	109	69-144	
trans-1,3-Dichloropropene	ug/L	50	47.6	95	74-128	
Trichloroethene	ug/L	50	47.3	95	73-126	
Trichlorofluoromethane	ug/L	50	56.9	114	55-132	
Vinyl acetate	ug/L	50	45.6	91	52-141	
Vinyl chloride	ug/L	50	47.2	94	50-133	
Xylene (Total)	ug/L	150	149	99	78-132	
1,2-Dichloroethane-d4 (S)	%.			114	81-119	
4-Bromofluorobenzene (S)	%.			101	82-120	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

LABORATORY CONTROL SAMPLE: 21485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Dibromofluoromethane (S)	%.			108	82-114	
Toluene-d8 (S)	%.			98	82-109	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 21486 21487

Parameter	Units	263783001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1,2-Tetrachloroethane	ug/L	ND	50	50	54.8	53.9	110	108	68-137	2	11	
1,1,1-Trichloroethane	ug/L	ND	50	50	68.8	69.0	138	138	66-142	0	11	
1,1,2,2-Tetrachloroethane	ug/L	ND	50	50	51.7	50.3	103	101	39-171	3	13	
1,1,2-Trichloroethane	ug/L	ND	50	50	58.5	57.7	117	115	73-136	1	12	
1,1-Dichloroethane	ug/L	ND	50	50	59.3	59.5	119	119	66-155	0	15	
1,1-Dichloroethene	ug/L	ND	50	50	58.0	58.7	116	117	33-181	1	34	
1,1-Dichloropropene	ug/L	ND	50	50	63.3	63.8	127	128	70-133	1	12	
1,2,3-Trichlorobenzene	ug/L	ND	50	50	48.7	50.6	97	101	73-130	4	22	
1,2,3-Trichloropropane	ug/L	ND	50	50	43.9	44.2	88	88	78-133	1	14	
1,2,4-Trichlorobenzene	ug/L	ND	50	50	50.6	51.0	101	102	44-164	1	13	
1,2-Dibromo-3-chloropropane	ug/L	ND	50	50	47.1	49.3	94	99	58-124	5	15	
1,2-Dibromoethane (EDB)	ug/L	ND	50	50	63.7	63.7	127	127	71-134	0	12	
1,2-Dichlorobenzene	ug/L	ND	50	50	53.0	52.5	106	105	69-135	1	10	
1,2-Dichloroethane	ug/L	ND	50	50	63.1	62.8	126	126	36-159	0	10	
1,2-Dichloropropane	ug/L	ND	50	50	53.9	53.2	108	106	68-132	1	11	
1,3-Dichlorobenzene	ug/L	ND	50	50	53.9	53.2	108	106	68-135	1	10	
1,3-Dichloropropane	ug/L	ND	50	50	64.5	63.1	129	126	70-138	2	10	
1,4-Dichlorobenzene	ug/L	ND	50	50	52.4	50.3	105	101	49-153	4	9	
2,2-Dichloropropane	ug/L	ND	50	50	44.8	45.1	90	90	34-170	1	9	
2-Butanone (MEK)	ug/L	ND	100	100	82.3	87.0	82	87	10-189	6	23	
2-Chlorotoluene	ug/L	ND	50	50	55.2	53.8	110	108	77-128	3	10	
2-Hexanone	ug/L	ND	100	100	92.7	93.4	93	93	40-135	1	18	
4-Chlorotoluene	ug/L	ND	50	50	53.5	52.5	107	105	79-126	2	10	
4-Methyl-2-pentanone (MIBK)	ug/L	ND	100	100	102	102	102	102	30-177	1	10	
Acetone	ug/L	ND	100	100	62.3	68.6	62	69	44-223	10	14	
Benzene	ug/L	ND	50	50	57.8	57.7	116	115	66-139	0	10	
Bromobenzene	ug/L	ND	50	50	51.6	52.0	103	104	75-122	1	12	
Bromochloromethane	ug/L	ND	50	50	64.8	64.8	130	130	73-133	0	13	
Bromodichloromethane	ug/L	ND	50	50	55.0	53.3	110	107	57-120	3	13	
Bromoform	ug/L	ND	50	50	45.8	48.5	92	97	48-128	6	13	
Bromomethane	ug/L	ND	50	50	55.2	59.0	110	118	10-187	7	32	
Carbon tetrachloride	ug/L	ND	50	50	64.1	63.5	128	127	58-127	1	14	M1
Chlorobenzene	ug/L	ND	50	50	55.7	54.7	111	109	63-137	2	10	
Chloroethane	ug/L	ND	50	50	53.1	53.0	106	106	52-146	0	16	
Chloroform	ug/L	ND	50	50	64.6	64.3	129	129	74-137	0	9	
Chloromethane	ug/L	ND	50	50	55.8	57.7	112	115	41-127	3	10	
cis-1,2-Dichloroethene	ug/L	ND	50	50	62.5	61.8	125	124	71-138	1	16	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 21486 21487

Parameter	Units	263783001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
cis-1,3-Dichloropropene	ug/L	ND	50	50	53.6	52.4	107	105	32-145	2	12	
Dibromochloromethane	ug/L	ND	50	50	58.4	56.8	117	114	52-116	3	13	M1
Dibromomethane	ug/L	ND	50	50	61.6	60.8	123	122	79-129	1	14	
Dichlorodifluoromethane	ug/L	ND	50	50	80.7	79.1	161	158	36-126	2	15	M1
Diisopropyl ether	ug/L	ND	50	50	54.7	55.5	109	111	70-130	1	20	
Ethylbenzene	ug/L	ND	50	50	57.9	56.6	116	113	31-174	2	10	
Hexachloro-1,3-butadiene	ug/L	ND	50	50	55.3	58.0	111	116	58-142	5	11	
m&p-Xylene	ug/L	ND	100	100	119	116	119	116	27-179	3	10	
Methyl-tert-butyl ether	ug/L	ND	100	100	116	120	116	120	38-120	3	12	
Methylene Chloride	ug/L	ND	50	50	59.7	61.6	119	123	61-146	3	15	
Naphthalene	ug/L	ND	50	50	50.0	53.7	99	107	25-159	7	14	
o-Xylene	ug/L	ND	50	50	59.3	59.0	119	118	52-141	0	65	
p-Isopropyltoluene	ug/L	ND	50	50	49.7	48.5	99	97	59-134	3	9	
Styrene	ug/L	ND	50	50	55.3	54.8	111	110	77-128	1	14	
Tetrachloroethene	ug/L	ND	50	50	69.0	56.5	138	113	36-155	20	14	R1
Toluene	ug/L	ND	50	50	60.3	58.0	121	116	52-146	4	11	
trans-1,2-Dichloroethene	ug/L	ND	50	50	63.7	67.6	127	135	61-152	6	14	
trans-1,3-Dichloropropene	ug/L	ND	50	50	53.2	51.5	106	103	37-146	3	12	
Trichloroethene	ug/L	ND	50	50	60.2	57.3	120	115	61-141	5	12	
Trichlorofluoromethane	ug/L	ND	50	50	89.7	89.1	179	178	51-141	1	13	M1
Vinyl acetate	ug/L	ND	50	50	44.4	45.0	89	90	52-141	1	14	
Vinyl chloride	ug/L	ND	50	50	60.2	61.5	120	123	22-156	2	26	
Xylene (Total)	ug/L	ND	150	150	179	175	119	117	78-132	2	7	
1,2-Dichloroethane-d4 (S)	%.						117	118	81-119			
4-Bromofluorobenzene (S)	%.						106	104	82-120			
Dibromofluoromethane (S)	%.						113	111	82-114			
Toluene-d8 (S)	%.						97	99	82-109			

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REPORT OF LABORATORY ANALYSIS

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(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 4484 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity, Low Level
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 22079 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	1.0	04/17/18 11:13	

LABORATORY CONTROL SAMPLE: 22080

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	51.0	102	85-115	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 4226 Analysis Method: EPA 9034
QC Batch Method: EPA 9030A Analysis Description: 9034 Sulfide Waste Water
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 21005 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfide	mg/L	ND	1.0	04/12/18 16:12	

LABORATORY CONTROL SAMPLE: 21006

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide	mg/L	4	2.6	64	40-104	

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REPORT OF LABORATORY ANALYSIS

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(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 3358 Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A Analysis Description: 9056 IC Anions
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 17140 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrate as N	mg/L	ND	0.050	04/11/18 03:24	

LABORATORY CONTROL SAMPLE: 17141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrate as N	mg/L	10	10.9	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 17142 17143

Parameter	Units	263324003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrate as N	mg/L	0.58	10	10	10.7	10.8	102	102	90-110	0	15	H1

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REPORT OF LABORATORY ANALYSIS

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(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 4409 Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A Analysis Description: 9056 IC Anions
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 21836 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/16/18 13:23	
Sulfate	mg/L	ND	5.0	04/16/18 13:23	

LABORATORY CONTROL SAMPLE: 21837

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10	10.2	102	90-110	
Sulfate	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 21838 21839

Parameter	Units	263783001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.2	10	10	15.2	15.2	100	100	90-110	0	15	
Sulfate	mg/L	ND	10	10	10.8	10.9	106	107	90-110	1	15	

MATRIX SPIKE SAMPLE: 21840

Parameter	Units	263783004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.1	10	12.8	97	90-110	
Sulfate	mg/L	55.7	10	60.9	52	90-110	E

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA

Project: City of Duluth - 5365
Pace Project No.: 263783

QC Batch: 4459 Analysis Method: EPA 9060A
QC Batch Method: EPA 9060A Analysis Description: 9060A Total Organic Carbon
Associated Lab Samples: 263783001, 263783004, 263783008

METHOD BLANK: 22004 Matrix: Water
Associated Lab Samples: 263783001, 263783004, 263783008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mean Total Organic Carbon	mg/L	ND	1.0	04/16/18 20:31	

LABORATORY CONTROL SAMPLE: 22005

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mean Total Organic Carbon	mg/L	20	19.4	97	88-112	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 22006 22007

Parameter	Units	263773001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mean Total Organic Carbon	mg/L	1.7	20	20	20.9	20.2	96	92	67-141	3	14	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALIFIERS

Project: City of Duluth - 5365
Pace Project No.: 263783

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte
PASI-GA	Pace Analytical Services - Atlanta, GA

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H1	Analysis conducted outside the EPA method holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.
S0	Surrogate recovery outside laboratory control limits.

Pace Analytical Services, LLC
110 Technology Parkway
Peachtree Corners, GA 30092
(770)734-4200

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: City of Duluth - 5365
Pace Project No.: 263783

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
263783001	**MW-8**	RSK 175 Modified	406217		
263783004	**MW-13**	RSK 175 Modified	406217		
263783008	**MW-1**	RSK 175 Modified	406217		
263783001	**MW-8**	EPA 8260B	4338		
263783002	**MW-6**	EPA 8260B	4338		
263783003	**MW-5**	EPA 8260B	4338		
263783004	**MW-13**	EPA 8260B	4338		
263783005	**MW-4**	EPA 8260B	4338		
263783006	**MW-3**	EPA 8260B	4338		
263783007	**MW-2**	EPA 8260B	4338		
263783008	**MW-1**	EPA 8260B	4338		
263783009	**Dup-1**	EPA 8260B	4338		
263783010	**Trip Blank**	EPA 8260B	4338		
263783001	**MW-8**	SM 2320B	4484		
263783004	**MW-13**	SM 2320B	4484		
263783008	**MW-1**	SM 2320B	4484		
263783001	**MW-8**	EPA 9030A	4226	EPA 9034	4262
263783004	**MW-13**	EPA 9030A	4226	EPA 9034	4262
263783008	**MW-1**	EPA 9030A	4226	EPA 9034	4262
263783001	**MW-8**	EPA 9056A	3358		
263783004	**MW-13**	EPA 9056A	3358		
263783008	**MW-1**	EPA 9056A	3358		
263783001	**MW-8**	EPA 9056A	4409		
263783004	**MW-13**	EPA 9056A	4409		
263783008	**MW-1**	EPA 9056A	4409		
263783001	**MW-8**	EPA 9060A	4459		
263783004	**MW-13**	EPA 9060A	4459		
263783008	**MW-1**	EPA 9060A	4459		

CHAIN OF CUSTODY RECORD

Pace Analytical® www.pacelabs.com

Pace Analytical Services, LLC - Atlanta GA
110 TECHNOLOGY PARKWAY, PEACHTREE CORNERS, GA 30092
(770) 734-4200 : FAX (770) 734-4201

PAGE: 1 OF 1

CLIENT NAME: Wenck Associates

CLIENT ADDRESS/PHONE NUMBER/FAX NUMBER: 1080 Holcomb Bridge Road Bldg 100 Ste 190 Roswell, GA 30076

REPORT TO: Katie Ross

CC: KRoss@Wenck.com

REQUESTED COMPLETION DATE: Standard TAT

PO #:

PROJECT NAME/STATE: City of Duluth/GA

PROJECT #: 5365

ANALYSIS REQUESTED

Collection DATE	Collection TIME	MATRIX CODE*	COMP	GRAB	SAMPLE IDENTIFICATION	# of CONTAINERS	VOCs	TOC	MEE	Sulfide	Alkalinity	Nitrate, chloride, sulfate				LAB ID NUMBER	REMARKS/ADDITIONAL INFORMATION
					CONTAINER TYPE:		V	V	V	P	P	P					
					PRESERVATION:		1	1		5							
4/9/18	1245	GW		X	MW-8	11	3	2	3	1	1	1					
4/9/18	1719	↓		↓	MW-6	3	3										
4/9/18	1655				MW-5	3	3										
4/9/18	1937				MW-13	11	3	2	3	1	1	1					
4/9/18	1950				MW-4	3	3										
4/10/18	1050				MW-3	3	3										
4/10/18	1110				MW-2	3	3										
4/10/18	1305				MW-1	11	3	2	3	1	1	1					
		↓		↓	DUP-1	3	3										
					Trip Blank	3	3	2	3	1	1	1					

WO# : 263783

263783

CONTAINER TYPE	PRESERVATION
P - PLASTIC	1 - HCl, ≤6°C
A - AMBER GLASS	2 - H_2SO_4, ≤6°C
G - CLEAR GLASS	3 - HNO_3
V - VOA VIAL	4 - NaOH, ≤6°C
S - STERILE	5 - NaOH/ZnAc, ≤6°C
O - OTHER	6 - $Na_2S_2O_3$, ≤6°C
	7 - ≤6°C not frozen

*MATRIX CODES:

DW - DRINKING WATER	S - SOIL
WW - WASTEWATER	SL - SLUDGE
GW - GROUNDWATER	SD - SOLID
SW - SURFACE WATER	A - AIR
ST - STORM WATER	L - LIQUID
W - WATER	P - PRODUCT

SAMPLED BY AND TITLE: Shannon Fuller — DATE/TIME: 4/10/18 14:00

RELINQUISHED BY: Shannon Fuller — DATE/TIME: 4/10/18 15:55

RECEIVED BY: — DATE/TIME:

RELINQUISHED BY: — DATE/TIME:

RECEIVED BY LAB: [signature] — DATE/TIME: 04/10/18 1555

SAMPLE SHIPPED VIA: UPS FED-EX USPS COURIER (CLIENT) OTHER FS

pH checked: (Yes) No NA — Ice: (Yes) No NA — Temperature: Min: 5.4 Max:

Custody Seal: (Intact) Broken Not Present N/A — # of Coolers — Cooler ID:

FOR LAB USE ONLY
LAB #:
Entered into LIMS:
Tracking #:

Rev. 12/15/2016

Sample Condition Upon Receipt

Pace Analytical

Client Name: Wenck Associates Project #

WO#: 263783

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace Other

Tracking #:

PM: EDB Due Date: 04/17/18

CLIENT: WENCK

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer Used 83 Type of Ice: (Wet) Blue None ☐ Samples on ice, cooling process has begun

Cooler Temperature 5.4 Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: 4/10/18 MR

Temp should be above freezing to 6°C

			Comments:
Chain of Custody Present:	☑Yes	☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes	☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes	☑No ☐N/A	7.
Sufficient Volume:	☑Yes	☐No ☐N/A	8.
Correct Containers Used:	☑Yes	☐No ☐N/A	9.
-Pace Containers Used:	☑Yes	☐No ☐N/A	
Containers Intact:	☑Yes	☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No ☑N/A	11.
Sample Labels match COC:	☐Yes	☑No ☐N/A	12. see Comment
-Includes date/time/ID/Analysis Matrix: GW			
All containers needing preservation have been checked.	☑Yes	☐No ☐N/A	13
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes	☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☑Yes	☐No	Initial when completed / Lot # of added preservative
Samples checked for dechlorination:	☐Yes	☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☑No ☐N/A	15
Trip Blank Present:	☑Yes	☐No ☐N/A	16
Trip Blank Custody Seals Present	☑Yes	☐No ☐N/A	
Pace Trip Blank Lot # (if purchased):			

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution: The Trip Blank sample present only for VOC's.

Project Manager Review: **Date:**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Appendix D

IDW Disposal Manifests

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
CES QG	1	(800) 275-8629	113366

5. Generator's Name and Mailing Address
CITY OF DULUTH
3146 MAIN STREET
DULUTH, GA 30096
Generator's Phone:

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: EQ INDUSTRIAL SERVICES — U.S. EPA ID Number: MIK 435 642 742

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
EQIS ATLANTA TRANSFER & PROCESSII
5600 FULTON INDUSTRIAL BLVD,SW
ATLANTA, GA 30336
Facility's Phone: (404) 494-3520
U.S. EPA ID Number: GAR 000 039 776

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (WATER)	001	DM	00055	G	
2.	NON-HAZARDOUS, NON-DOT REGULATED MATERIAL (SOIL)	001	DM	00100	P	
3.						
4.						

13. Special Handling Instructions and Additional Information
1. G150854EQATL / DECON WATER 2. G151643EQATL / IDW SOIL

14. GENERATOR'S CERTIFICATION: I certify the materials described above on this manifest are not subject to federal regulations for reporting proper disposal of Hazardous Waste.

Generator's/Offeror's Printed/Typed Name — Signature — Month — Day — Year

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name — Signature — Month 11 — Day 16 — Year 17

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month — Day — Year

GENERATOR'S/SHIPPER'S INITIAL COPY

Appendix E

Non-Residential RSL Calculator Outputs

Site-specific

Resident Equation Inputs for Tap Water

Variable	Value
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	1.0E-5
LT (lifetime) years	70
K (volatilization factor of Andelman) L/m^3	0.5
l_{sc} (apparent thickness of stratum corneum) cm	0.001
ED_{res} (exposure duration - resident) years	26
ED_{res-c} (exposure duration - child) years	6
ED_{res-a} (exposure duration - adult) years	20
ED_{0-2} (mutagenic exposure duration first phase) years	2
ED_{2-6} (mutagenic exposure duration second phase) years	4
ED_{6-16} (mutagenic exposure duration third phase) years	10
ED_{16-26} (mutagenic exposure duration fourth phase) years	10
EF_{res} (exposure frequency) days/year	350
EF_{res-c} (exposure frequency - child) days/year	350
EF_{res-a} (exposure frequency - adult) days/year	350
EF_{0-2} (mutagenic exposure frequency first phase) days/year	350
EF_{2-6} (mutagenic exposure frequency second phase) days/year	350
EF_{6-16} (mutagenic exposure frequency third phase) days/year	350
EF_{16-26} (mutagenic exposure frequency fourth phase) days/year	350
$ET_{event\ res-adj}$ (age-adjusted exposure time) hours/event	0.67077
$ET_{res-madj}$ (mutagenic age-adjusted exposure time) hours/event	0.67077
ET_{res} (exposure time) hours/day	24
ET_{res-c} (dermal exposure time - child) hours/event	0.54
ET_{res-a} (dermal exposure time - adult) hours/event	0.71
ET_{res-c} (inhalation exposure time - child) hours/day	24
ET_{res-a} (inhalation exposure time - adult) hours/day	24
ET_{0-2} (mutagenic inhalation exposure time first phase) hours/day	24
ET_{2-6} (mutagenic inhalation exposure time second phase) hours/day	24
ET_{6-16} (mutagenic inhalation exposure time third phase) hours/day	24
ET_{16-26} (mutagenic inhalation exposure time fourth phase) hours/day	24
ET_{0-2} (mutagenic dermal exposure time first phase) hours/event	0.54
ET_{2-6} (mutagenic dermal exposure time second phase) hours/event	0.54
ET_{6-16} (mutagenic dermal exposure time third phase) hours/event	0.71
ET_{16-26} (mutagenic dermal exposure time fourth phase) hours/event	0.71

Site-specific

Resident Equation Inputs for Tap Water

Variable	Value
BW_{res-a} (body weight - adult) kg	80
BW_{res-c} (body weight - child) kg	15
BW_{0-2} (mutagenic body weight) kg	15
BW_{2-6} (mutagenic body weight) kg	15
BW_{6-16} (mutagenic body weight) kg	80
BW_{16-26} (mutagenic body weight) kg	80
$IFW_{res-adj}$ (adjusted intake factor) L/kg	327.95
$IFW_{res-adj}$ (adjusted intake factor) L/kg	327.95
$IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg	1019.9
$IFWM_{res-adj}$ (mutagenic adjusted intake factor) L/kg	1019.9
IRW_{res-c} (water intake rate - child) L/day	0.78
IRW_{res-a} (water intake rate - adult) L/day	2.5
IRW_{0-2} (mutagenic water intake rate) L/day	0.78
IRW_{2-6} (mutagenic water intake rate) L/day	0.78
IRW_{6-16} (mutagenic water intake rate) L/day	2.5
IRW_{16-26} (mutagenic water intake rate) L/day	2.5
EV_{res-a} (events - adult) per day	1
EV_{res-c} (events - child) per day	1
EV_{0-2} (mutagenic events) per day	1
EV_{2-6} (mutagenic events) per day	1
EV_{6-16} (mutagenic events) per day	1
EV_{16-26} (mutagenic events) per day	1
$DFW_{res-adj}$ (age-adjusted dermal factor) cm^2-event/kg	2610650
$DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	8191633
$DFW_{res-adj}$ (age-adjusted dermal factor) cm^2-event/kg	2610650
$DFWM_{res-adj}$ (mutagenic age-adjusted dermal factor) cm^2-event/kg	8191633
SA_{res-c} (skin surface area - child) cm^2	6365
SA_{res-a} (skin surface area - adult) cm^2	19652
SA_{0-2} (mutagenic skin surface area) cm^2	6365
SA_{2-6} (mutagenic skin surface area) cm^2	6365
SA_{6-16} (mutagenic skin surface area) cm^2	19652
SA_{16-26} (mutagenic skin surface area) cm^2	19652

Site-specific

Resident Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	CAS Number	Mutagen?	VOC?	Chemical Type	Ingestion SF (mg/kg-day) $^{-1}$	SFO Ref	Inhalation Unit Risk (ug/m ^{3})$^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m ^{3})	Chronic RfC Ref	GIABS	K_p (cm/hr)	MW
Chloroform	67-66-3	No	Yes	Organics	3.10E-02	C	2.30E-05	I	1.00E-02	IR	9.77E-02	AT	1	0.00683	119.38
Dichloroethylene, 1,2-cis-	156-59-2	No	Yes	Organics	-		-		2.00E-03	IR	-		1	0.011	96.944
Dichloroethylene, 1,2-trans-	156-60-5	No	Yes	Organics	-		-		2.00E-02	IR	-		1	0.011	96.944
Tetrachloroethane, 1,1,1,2-	630-20-6	No	Yes	Organics	2.60E-02	I	7.40E-06	I	3.00E-02	IR	-		1	0.0159	167.85
Tetrachloroethylene	127-18-4	No	Yes	Organics	2.10E-03	I	2.60E-07	I	6.00E-03	IR	4.00E-02	IR	1	0.0334	165.83
Trichloroethylene	79-01-6	Yes	Yes	Organics	4.60E-02	I	4.10E-06	I	5.00E-04	IR	2.00E-03	IR	1	0.0116	131.39
Vinyl Chloride	75-01-4	Yes	Yes	Organics	7.20E-01	I	4.40E-06	I	3.00E-03	IR	1.00E-01	IR	1	0.00838	62.499

Site-specific

Resident Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	B (unitless)	tSUP (hr)	τ $_{event}$ (hr/event)	FA (unitless)	In EPD?	$DA_{event\ (ca)}$	$DA_{event\ (nc\ child)}$	$DA_{event\ (nc\ adult)}$	MCL (ug/L)	Ingestion SL TR=1.0E-5 (ug/L)	Dermal SL TR=1.0E-5 (ug/L)	Inhalation SL TR=1.0E-5 (ug/L)
Chloroform	0.0287021	1.1764893	0.4902039	1	Yes	0.003157	0.0245764	0.042453	8.00E+01	2.51E+01	2.92E+02	2.44E+00
Dichloroethylene, 1,2-cis-	0.0416562	0.8809401	0.3670584	1	Yes	-	0.0049153	0.0084906	7.00E+01	-	-	-
Dichloroethylene, 1,2-trans-	0.0416562	0.8809401	0.3670584	1	Yes	-	0.0491527	0.0849059	1.00E+02	-	-	-
Tetrachloroethane, 1,1,1,2-	0.0792291	2.197961	0.9158171	1	Yes	0.0037642	0.0737291	0.1273589	-	3.00E+01	1.09E+02	7.59E+00
Tetrachloroethylene	0.1654263	2.1414503	0.8922709	1	Yes	0.046604	0.0147458	0.0254718	5.00E+00	3.71E+02	6.53E+02	2.16E+02
Trichloroethylene	0.0511406	1.3735485	0.5723119	1	Yes	0.0014797	0.0012288	0.0021226	5.00E+00	1.18E+01	7.45E+01	9.57E+00
Vinyl Chloride	0.0254805	0.5650077	0.2354199	1	Yes	0.0000264	0.0073729	0.0127359	2.00E+00	2.14E-01	2.77E+00	3.35E+00

Site-specific

Resident Screening Levels (RSL) for Tap Water

Key: I = IRIS; P = PPRTV; D = DWSHA; O = OPP; A = ATSDR; C = Cal EPA; X = APPENDIX PPRTV SCREEN (See FAQ #27); H = HEAST; F = See FAQ; J = New Jersey; E = see user guide Section 2.3.5; L = see user guide on lead; M = mutagen; S = see user guide Section 5; V = volatile; R = RBA applied (See User Guide for Arsenic notice) ; c = cancer; n = noncancer; * = where: n SL < 100X c SL; ** = where n SL < 10X c SL; SSL values are based on DAF=1; m = Concentration may exceed ceiling limit (See User Guide); s = Concentration may exceed Csat (See User Guide)

Chemical	Carcinogenic SL TR=1.0E-5 (ug/L)	Ingestion SL Child THQ=1 (ug/L)	Dermal SL Child THQ=1 (ug/L)	Inhalation SL Child THQ=1 (ug/L)	Noncarcinogenic SL Child THI=1 (ug/L)	Ingestion SL Adult THQ=1 (ug/L)	Dermal SL Adult THQ=1 (ug/L)	Inhalation SL Adult THQ=1 (ug/L)	Noncarcinogenic SL Adult THI=1 (ug/L)	Screening Level (ug/L)
Chloroform	2.21E+00	2.01E+02	2.53E+03	2.04E+02	9.72E+01	3.34E+02	3.81E+03	2.04E+02	1.22E+02	2.21E+00 ca*
Dichloroethylene, 1,2-cis-	-	4.01E+01	3.63E+02	-	3.61E+01	6.67E+01	5.47E+02	-	5.95E+01	3.61E+01 nc
Dichloroethylene, 1,2-trans-	-	4.01E+02	3.63E+03	-	3.61E+02	6.67E+02	5.47E+03	-	5.95E+02	3.61E+02 nc
Tetrachloroethane, 1,1,1,2-	5.74E+00	6.02E+02	2.39E+03	-	4.80E+02	1.00E+03	3.59E+03	-	7.83E+02	5.74E+00 ca*
Tetrachloroethylene	1.13E+02	1.20E+02	2.30E+02	8.34E+01	4.06E+01	2.00E+02	3.47E+02	8.34E+01	5.03E+01	4.06E+01 nc
Trichloroethylene	4.94E+00	1.00E+01	6.89E+01	4.17E+00	2.83E+00	1.67E+01	1.04E+02	4.17E+00	3.23E+00	2.83E+00 nc
Vinyl Chloride	1.88E-01	6.02E+01	8.93E+02	2.09E+02	4.44E+01	1.00E+02	1.29E+03	2.09E+02	6.43E+01	1.88E-01 ca

Site-specific

Resident Risk for Tap Water

Chemical	Chemical Type	Ingestion SF (mg/kg-day) $^{-1}$	SFO Ref	Inhalation Unit Risk (ug/m ^{3})$^{-1}$	IUR Ref	Chronic RfD (mg/kg-day)	Chronic RfD Ref	Chronic RfC (mg/m ^{3})	Chronic RfC Ref	K_p (cm/hr)	MW	B (unitless)	tSUP (hr)
Chloroform	Organics	3.10E-02	C	2.30E-05	I	1.00E-02	IR	9.77E-02	AT	0.00683	119.38	0.0287021	1.1764893
Dichloroethylene, 1,2-cis-	Organics	-		-		2.00E-03	IR	-		0.011	96.944	0.0416562	0.8809401
Dichloroethylene, 1,2-trans-	Organics	-		-		2.00E-02	IR	-		0.011	96.944	0.0416562	0.8809401
Tetrachloroethane, 1,1,1,2-	Organics	2.60E-02	I	7.40E-06	I	3.00E-02	IR	-		0.0159	167.85	0.0792291	2.197961
Tetrachloroethylene	Organics	2.10E-03	I	2.60E-07	I	6.00E-03	IR	4.00E-02	IR	0.0334	165.83	0.1654263	2.1414503
Trichloroethylene	Organics	4.60E-02	I	4.10E-06	I	5.00E-04	IR	2.00E-03	IR	0.0116	131.39	0.0511406	1.3735485
Vinyl Chloride	Organics	7.20E-01	I	4.40E-06	I	3.00E-03	IR	1.00E-01	IR	0.00838	62.499	0.0254805	0.5650077
**Total Risk/HI*		-		-		-		-		-	-	-	-

Site-specific

Resident Risk for Tap Water

Chemical	τ $_{event}$ (hr/event)	FA (unitless)	In EPD?	MCL (ug/L)	Concentration (ug/L)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion Child HQ	Dermal Child HQ
Chloroform	0.4902039	1	Yes	8.00E+01	8.00E+01	3.18E-05	2.74E-06	3.28E-04	3.62E-04	3.99E-01	3.16E-02
Dichloroethylene, 1,2-cis-	0.3670584	1	Yes	7.00E+01	7.00E+01	-	-	-	-	1.75E+00	1.93E-01
Dichloroethylene, 1,2-trans-	0.3670584	1	Yes	1.00E+02	1.00E+02	-	-	-	-	2.49E-01	2.75E-02
Tetrachloroethane, 1,1,1,2-	0.9158171	1	Yes	-	7.00E+02	2.34E-04	6.41E-05	9.22E-04	1.22E-03	1.16E+00	2.93E-01
Tetrachloroethylene	0.8922709	1	Yes	5.00E+00	5.00E+00	1.35E-07	7.66E-08	2.32E-07	4.43E-07	4.16E-02	2.17E-02
Trichloroethylene	0.5723119	1	Yes	5.00E+00	5.00E+00	4.23E-06	6.71E-07	5.23E-06	1.01E-05	4.99E-01	7.25E-02
Vinyl Chloride	0.2354199	1	Yes	2.00E+00	2.00E+00	9.34E-05	7.22E-06	5.97E-06	1.07E-04	3.32E-02	2.24E-03
**Total Risk/HI*	-	-		-	-	*3.63E-04*	*7.48E-05*	*1.26E-03*	*1.70E-03*	*4.13E+00*	*6.42E-01*

Site-specific

Resident Risk for Tap Water

Chemical	Inhalation Child HQ	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Chloroform	3.93E-01	8.23E-01	2.40E-01	2.10E-02	3.93E-01	6.53E-01
Dichloroethylene, 1,2-cis-	-	1.94E+00	1.05E+00	1.28E-01	-	1.18E+00
Dichloroethylene, 1,2-trans-	-	2.77E-01	1.50E-01	1.83E-02	-	1.68E-01
Tetrachloroethane, 1,1,1,2-	-	1.46E+00	6.99E-01	1.95E-01	-	8.94E-01
Tetrachloroethylene	5.99E-02	1.23E-01	2.50E-02	1.44E-02	5.99E-02	9.93E-02
Trichloroethylene	1.20E+00	1.77E+00	3.00E-01	4.81E-02	1.20E+00	1.55E+00
Vinyl Chloride	9.59E-03	4.51E-02	2.00E-02	1.55E-03	9.59E-03	3.11E-02
**Total Risk/HI*	*1.66E+00*	*6.43E+00*	*2.48E+00*	*4.26E-01*	*1.66E+00*	*4.57E+00*

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