DENR USE ONLY: ☐ Paper Report ☐ Electronic Data - Email CD (data loaded: Yes / No) Doc/Event #:

NC DENR
Division of Waste Management - Solid Waste

Environmental Monitoring Reporting Form

Notice: This form and any information attached to it are "Public Records" as defined in NC General Statute 132-1. As such, these documents are available for inspection and examination by any person upon request (NC General Statute 132-6).

Instructions:

- **Prepare one form for each individually monitored unit.**
- **Please type or print legibly.**
- Attach a notification table with values that attain or exceed NC 2L groundwater standards or NC 2B surface water standards. The notification must include a preliminary analysis of the cause and significance of each value. (e.g. naturally occurring, off-site source, pre-existing condition, etc.).
- Attach a notification table of any groundwater or surface water values that equal or exceed the reporting limits.
- Attach a notification table of any methane gas values that attain or exceed explosive gas levels. This includes any structures on or nearby the facility (NCAC 13B .1629 (4)(a)(i).
- Send the original signed and sealed form, any tables, and Electronic Data Deliverable to: Compliance Unit, NCDENR-DWM, Solid Waste Section, 1646 Mail Service Center, Raleigh, NC 27699-1646.

Solid Waste Monitoring Data Submittal Information

Name of entity submitting data (laboratory, consultant, facility owner):

Smith Gardner, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:

Name: Madeline German Phone: 919-828-0577 x222

E-mail: madeline@smithgardnerinc.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Halifax County Closed MSW Landfill	921 Liles Rd, Aurelian Springs, NC	42-04	.0500	August 24-26, 2015

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☐ Detection Monitoring ☒ Assessment Monitoring ☒ Corrective Action

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☒ Corrective action data (specify) MNA Parameters
☐ Other(specify)

Notification attached?

☐ No. No groundwater or surface water standards were exceeded.
☒ Yes, a notification of values exceeding a groundwater or surface water standard is attached. It includes a list of groundwater and surface water monitoring points, dates, analytical values, NC 2L groundwater standard, NC 2B surface water standard or NC Solid Waste GWPS and preliminary analysis of the cause and significance of any concentration.
☐ Yes, a notification of values exceeding an explosive methane gas limit is attached. It includes the methane monitoring points, dates, sample values and explosive methane gas limits.

Certification

To the best of my knowledge, the information reported and statements made on this data submittal and attachments are true and correct. Furthermore, I have attached complete notification of any sampling values meeting or exceeding groundwater standards or explosive gas levels, and a preliminary analysis of the cause and significance of concentrations exceeding groundwater standards. I am aware that there are significant penalties for making any false statement, representation, or certification including the possibility of a fine and imprisonment.

Madeline German, PG — Geologist — 919-828-0577 x 222

Facility Representative Name (Print) — Title — (Area Code) Telephone Number

Signature — Date 11/4/15

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 2275 GEOLOGIST MADELINE GERMAN 11/4/15

14 N. Boylan Avenue, Raleigh, NC 27603

Facility Representative Address

C0828

NC PE Firm License Number (if applicable effective May 1, 2009)

This page intentionally left blank.

August 2015 Groundwater Monitoring Report

Halifax County Closed MSW Landfill
NC Solid Waste Permit No. 42-04

Prepared for:

Halifax County Solid Waste Department
P.O. Box 70
Halifax, North Carolina 27839

November 2015

Prepared by:

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

PRINTED ON 100% RECYCLED PAPER

© 2015 Smith Gardner, Inc.
This document is intended for the sole use of the client for which it was prepared and for the purpose agreed upon by the client and Smith Gardner, Inc.

This page intentionally left blank.

August 2015 Groundwater Monitoring Report

Halifax County Closed MSW Landfill
NC Solid Waste Permit 42-04

Prepared For:

Halifax County Solid Waste Department
Halifax, North Carolina

S+G Project No. Halifax-8

NORTH CAROLINA LICENSED SEAL 2275 GEOLOGIST MADELINE GERMAN

11/4/15

Madeline German, P.G.
Project Geologist

Joan A, Smyth, P.G.
Senior Hydrogeologist

November 2015

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

This page intentionally left blank.

Halifax County Closed MSW Landfill
NC Solid Waste Permit No. 42-04

August 2015 Groundwater Monitoring Report

Table of Contents

Page

1.0 INTRODUCTION 1
2.0 SITE HYDROGEOLOGY 1
3.0 SAMPLING LOCATIONS 2
4.0 SAMPLING PROCEDURES 2
5.0 FIELD & LABORATORY RESULTS 2
5.1 Field Results 2
5.2 Laboratory Analysis 2
5.3 Laboratory Results 3
5.3.1 Inorganic Constituents 3
5.3.2 Organic Constituents 3
5.3.3 Surface Water Results 3
5.3.4 MNA Constituents 3
6.0 GROUNDWATER CHARACTERIZATION 4
7.0 CONCLUSIONS 4

FIGURE

Figure 1 Groundwater Potentiometric Map

TABLES

Table 1 Groundwater Elevations
Table 2 Field Parameters
Table 3 Detected Inorganic Constituents
Table 4 Detected Organic Constituents
Table 5 Indicator Parameter Summary
Table 6 Gradient and Velocity Calculations

APPENDICES

Appendix A Boring Logs
Appendix B Laboratory Analytical Report
Appendix C Time vs. Concentration Graphs
Appendix D Biochlor Evaluation

This page intentionally left blank.

1.0 INTRODUCTION

The Halifax County Landfill, operating under Solid Waste Permit #42-04, is required to submit semi-annual groundwater monitoring reports (15A NCAC 13B .0544) for assessment monitoring. This report presents the results from the semi-annual monitoring event conducted August 24-26, 2015.

The Halifax County Landfill is currently accepting C&D waste over the closed, unlined municipal solid waste (MSW) landfill. In December 1997 the landfill stopped accepting MSW; and the County is currently transferring MSW waste off-site to a lined landfill facility. The old landfill was closed per Solid Waste Regulations and a certification report was submitted to the Solid Waste Section (SWS) in September 1998. In 2007 an Assessment of Corrective Measures[1] was prepared to evaluate previously detected groundwater quality issues as well as remedial options for the site. A Corrective Action Plan (CAP)[2] for the site was approved June 8, 2009, and the Corrective Action Evaluation Report (CAER)[3] was approved October 2012. **Section 7.0** of this report provides an update regarding the current corrective action situation for this facility.

This report presents a field procedure summary, laboratory analyses, groundwater characterization and summary tables and graphs.

2.0 SITE HYDROGEOLOGY

According to the *1985 North Carolina Geological Map* and *Groundwater in the Halifax Area, North Carolina* (Dept. of Conservation and Development Bulletin #51, 1946) the landfill is situated on the eastern edge of the Eastern Piedmont Physiographic Province; slightly west of the Coastal Plain overlap. Generally, Western Halifax County is underlain by felsic to intermediate, crystalline igneous and metamorphic rocks of early to late Paleozoic age. Eastern Piedmont rocks generally exhibit a northeastern strike and locally dip gently eastward due to regional metamorphism and folding that produced a broad plunging anticline. The area was simultaneously intruded by a number of felsic (granite) plutons. The granitic pluton underlying the landfill is the Butterwood Creek intrusion.

Groundwater depths generally range from near surface level in the lowland areas along Brewer's Creek and its tributary up to 45 ft. below grade along the ridge east of the landfill. Groundwater at the site flows generally west towards Brewer's Creek and its tributary. There are minor seasonal variations in the flow pattern, but overall flow direction is consistent.

---

[1] Richardson Smith Gardner and Associates, Inc., Assessment of Corrective Measures Halifax County Landfill 12/07.

[2] Richardson Smith Gardner and Associates, Inc., Corrective Action Plan Halifax County Landfill 5/09.

3 Richardson Smith Gardner and Associates, Inc., Corrective Action Evaluation Report Halifax County Landfill 6/12

3.0 SAMPLING LOCATIONS

The sampling event performed by Environment 1, Inc. utilized the groundwater monitoring network that includes thirteen monitoring wells (MW-1, MW-2A, MW-2AD, MW-3AS, MW-3D, MW-6D, MW-7D, MW-15R, MW-16A, MW-17, MW-18S, G-13 and G-13D) located around the landfill perimeter, and three surface water sampling points (SW-1, SW-2 and SW-3) up and downstream of the landfill. Water level was also measured at two additional piezometer locations (BP-3 and BP-9) upgradient of the landfill.

Figure 1 illustrates sampling locations. Boring logs for the groundwater monitoring wells are included in **Appendix A**.

4.0 SAMPLING PROCEDURES

Sampling methods followed the protocol outlined in the North Carolina Water Quality Monitoring Guidance Document for Solid Waste Facilities (DENR, DWM) and the approved site Water Quality Monitoring Plan[4]. Each well was gauged to determine groundwater depth and then purged three to five well volumes or until dry. Depth to groundwater is presented in **Table 1**.

Samples were collected by Environment 1 personnel in laboratory prepared containers for the specified analytical procedures. Groundwater samples were properly preserved, placed on ice and transported to the laboratory facility within the specified hold times for each analysis. Trip and equipment blanks were also analyzed for quality control.

5.0 FIELD & LABORATORY RESULTS

5.1 Field Results

Temperature, pH, specific conductance, turbidity, ORP and DO were measured at each well in the field at the time of sampling via direct read instruments. The field parameter results are summarized in **Table 2**.

5.2 Laboratory Analysis

Samples were transported to Environment 1, Inc., in Greenville, NC, a North Carolina certified laboratory (NC Wastewater ID #10). Laboratory analysis included Appendix II metals and Volatile Organic Compounds (VOCs), pesticides, PCBs and semi-volatile organics analyzed via the EPA Test Method presented in the laboratory report.

Designated wells (MW-2A, MW-2AD, MW-3AS, MW-3D, MW-6D, MW-17, MW-18S, MW-18D and G-13 were also analyzed for MNA and indicator parameters by Solid Waste Section approved methods as reported on the laboratory report included in **Appendix B**.

[4] Water Quality Monitoring Plan, Halifax County Landfill, Richardson Smith Gardner & Associates, May 2009.

5.3 Laboratory Results

Analytical results were compared to the NCDWM Solid Waste Section Quantitation Limits (SWSLs), 15A NCAC 2L.0200 (2L Standard), Groundwater Protection Standard (GWP) and the Federal Maximum Contaminant Limit (MCL). Constituent concentrations reported by the laboratory between the method detection limit (MDL) and SWSL are considered estimated values and are denoted with a "J" qualifier. Many constituents were either below the MDL or were non-quantifiable "J-values".

Time versus concentration graphs for the constituents detected above their respective 2L Standards are included in **Appendix C**.

5.3.1 Inorganic Constituents

Iron (MW-2A, MW-2AD and MW-3AS) was the only inorganic constituent detected above its 2L or GWP Standard for this event. Inorganic detections are summarized in **Table 3**.

5.3.2 Organic Constituents

Six constituents were detected in samples at concentrations above their respective 2L Standards for this event:

- Benzene (MW-2AD, MNW-6D and MW-16A);
- 1,1-Dichloroethane (MW-2A, MW-2AD, MW-3AS, MW-3D, MW-16A and MW-18S);
- 1,2-Dichloropropane (MW-16A)
- Tetrachloroethene (MW-2AD, MW-15R, MW-16A, and MW-17);
- Trichloroethene (MW-2AD and MW-16A) and
- Vinyl chloride (MW-2A, MW-2AD, MW-3AS, MW-16A and MW-18S).

An organic detection summary is provided on **Table 4**. Several constituents, including tetrachloroethene and trichloroethene, are demonstrating an increasing trend in samples collected from MW-16A. Landfill gas is thought to be responsible due to the cross-gradient well location.

5.3.3 Surface Water Results

Results from surface water sample analysis indicated no inorganic or organic constituents were detected above 2B Standards for Class C waters this event.

5.3.4 MNA Constituents

The following parameters were measured for designated wells (listed in **Section 5.2**) for this event:

BOD	carbon dioxide
COD	ORP
nitrate nitrogen	dissolved oxygen
TOC	methane
chloride	ethane/ethane
sulfide	volatile fatty acids

Groundwater chemistry indicates anaerobic conditions in the downgradient wells. The presence of dissolved gasses, such as methane, indicates microbial activity in groundwater. Natural attenuation processes are occurring for chlorinated compounds. MNA indicator results from this event are summarized in **Table 5**, and will be utilized for future site geochemistry and remedial strategy evaluation.

Biochlor analysis was performed for the downgradient plume wells using both the lowest and highest possible 1st order decay coefficient, to generate the minimum and maximum possible aquifer degredation rates. Both cases yield increased rates of contaminant removal with biodegradation than if no degredation occurs. Results of Biochlor analysis are included as **Appendix D**.

6.0 GROUNDWATER CHARACTERIZATION

A potentiometric surface map was prepared using groundwater data from this sampling event. The data indicates that groundwater is flowing generally to the west towards Brewer's Creek. This is consistent with groundwater flow patterns previously reported for the site. The potentiometric surface map is attached as **Figure 1**.

Groundwater flow velocities during the sampling event were calculated for two monitoring wells using the equation:

$$V = Ki/n$$

where: K = hydraulic conductivity
i = groundwater gradient
n = porosity

Groundwater flow velocities ranged from 0.011 ft/day (MW-16A) to 0.119 ft/day (MW-2A). These calculated flow velocities are included in **Table 6**.

7.0 CONCLUSIONS

In general, the detected constituents are consistent with historically detected parameters. Groundwater chemistry in downgradient wells indicates anaerobic conditions. Dissolved methane levels in well samples indicate highly reduced, methanogenic, conditions. We will continue to watch groundwater chemistry in downgradient wells to follow the natural degradation processes.

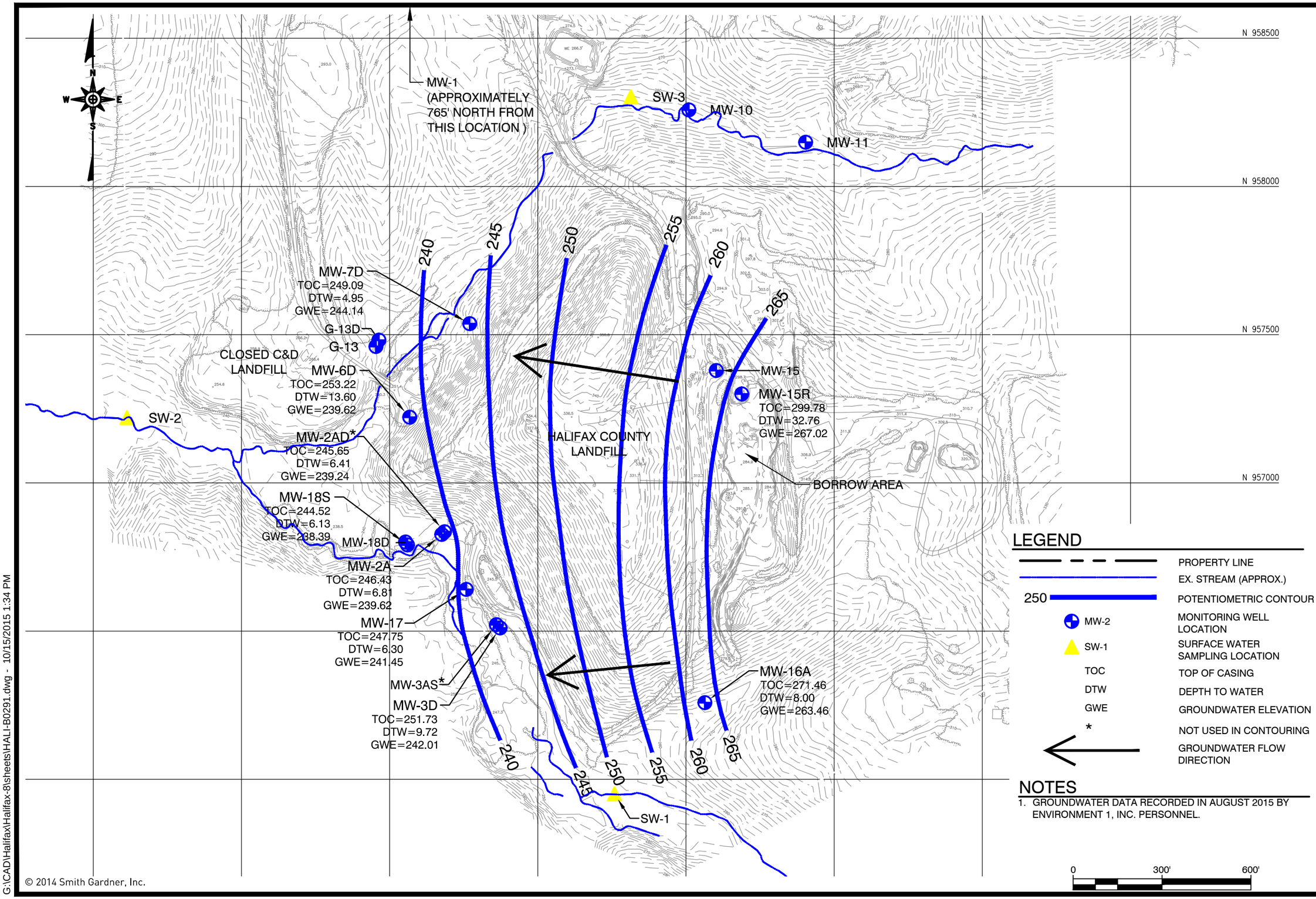
VOC concentrations in MW-16A continue to demonstrate an increasing trend. Due to this well's location up/cross-gradient, the source of this increase may be landfill gas. A landfill gas flare was located on a nearby landfill gas vent within the waste in an effort to reduce landfill gas pressure in this area as part of the CAP. We will continue to watch the trends in this well.

The next groundwater monitoring event is scheduled for February 2016. A groundwater monitoring report will be submitted to NCDENR after receipt and analysis of laboratory data.

This page intentionally left blank.

FIGURE

This page intentionally left blank.



© 2014 Smith Gardner, Inc.

G:\CAD\Halifax\Halifax-8\sheets\HALI-B0291.dwg - 10/15/2015 1:34 PM

PREPARED BY:

NC LIC. NO. C-0828 (ENGINEERING)

SMITH+GARDNER

14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

PREPARED FOR:

HALIFAX COUNTY
CLOSED MSW LANDFILL
POTENTIOMETRIC SURFACE MAP
AUGUST 2015

DRAWN:	T.R.S.
APPROVED:	M.M.G.
SCALE:	AS SHOWN
FIGURE NO.	1
DATE:	Oct 2015
PROJECT NO:	HALIFAX-8
FILENAME:	HALI-B0291

This page intentionally left blank.

TABLES

This page intentionally left blank.

SMITH+GARDNER

Table 1
Groundwater Elevations
Halifax County Closed Landfill
August 24-26, 2015

By: MG
Date: 10/07/2015

Monitoring Location	Well Installation Date	Latitude	Longitude	Well Diameter (inches)	Total Well Depth (ft. bgs)	Ground Surface Elevation (ft. amsl)	TOC Elevation (ft)	Depth to Water (ft)	Water Table Elevation (ft)	Screen Interval (ft. bgs)	Screen Geology
MW-1*	NA	36.3804	77.8143	2	42.61**	321.18	323.18 ⁂	28.22	294.96	NA	NA
MW-2A	07/26/1995	36.3731	77.8141	2	14	246.43	246.43	6.81	239.62	4-14	Silt & Sand
MW-2AD	09/01/1999	36.3732	77.8140	2	40	245.65	245.65	6.41	239.24	30 - 40	Coarse Sandy PWR
MW-3AS	07/25/1995	36.3723	77.8134	2	19	248.57	251.57 ⁂	10.31	241.26	9-19	Clayey Silty Sand
MW-3D	NA	36.3723	77.8134	2	52.20**	251.73	251.73	9.72	242.01	NA	NA
MW-6D	10/30/1991	36.3742	77.8144	2	40	253.22	253.22	13.60	239.62	25 - 40	Sandy Silt
MW-7D	10/31/1991	36.3751	77.8137	2	40	249.09	249.09	4.95	244.14	25 - 40	Sandy Silt
MW-15R	08/31/1999	36.3744	77.8106	2	43	299.78	299.78	32.76	267.02	33 - 43	Sandy Clayey Silt
MW-16A	07/26/1995	36.3715	77.8111	2	15	271.46	271.46	8.00	263.46	5 - 15	Clayey Sand
MW-17	10/03/2007	36.3726	77.8138	2	25	247.75	247.75	6.30	241.45	15 - 25	Saprolite
MW-18S	10/16/2007	36.3730	77.8144	2	18	244.52	244.52	6.13	238.39	8-18	Clayey Sand/Saprolite
MW-18D	10/17/2007	36.3731	77.8145	2	52	244.04	244.04	NM	-	47 - 52	Granite
G-13	NA	NA	NA	NA	NA	NA	NA	13.41	NA	NA	NA
G-13D	NA	NA	NA	NA	NA	NA	NA	13.43	NA	NA	NA
BP-3	NA	36.3732	77.8102	2	NA	NA	300.50	32.36	268.14	NA	NA
BP-9	NA	36.3750	77.8094	2	NA	NA	303.48	28.02	275.46	NA	NA

NOTE:

1.) *MW-1 is not used in the groundwater characterization calculations due to its remote location from the landfill
2.) ** Well depth from Environment 1 10/01/2015 Report client ID#6015
3.) ⁂3' stickup estimated, therefore groundwater elevation is also estimated
4.) NA = Not Available
5.) NM = Not Measured

SMITH+GARDNER

By: MG
Date: 10/23/2015

Table 2
Field Parameters
Halifax County Closed Landfill
August 24-26, 2015

Monitoring Location	pH (std units)	Specific Conductivity (umhos/cm)	Temperature (°C)	Turbidity (NTU)	Dissolved Oxygen (DO) (mg/l)	Oxygen Reduction Potential (ORP) (mv)
MW-1	6	156	18	110	5.99	80
MW-2A	6.1	254	21	54	0.41	11
MW-2AD	6.4	413	21	34	0.79	24
MW-3AS	6.4	357	19	350	0.39	-25
MW-3D	6.1	183	18	2.3	0.35	58
MW-6D	6.1	423	18	3.4	1.59	63
MW-7D	5.7	44	21	7.3	5.87	72
MW-15R	5.0	58	19	49	7.41	85
MW-16A	5.6	170	19	180	1.65	69
MW-17	6.1	126	24	430	1.41	40
MW-18S	6.3	330	22	130	0.79	-24
G-13	5.2	76	19	2.9	0.96	81
G-13D	6.0	76	19	23	5.46	74
SW-1	7.1	142	21	NA	NA	NA
SW-2	6.8	334	23	NA	NA	NA
SW-3	6.9	116	21	NA	NA	NA

NOTE:
1. Field data collected by Environment 1 personnel.
2. NA = Not Analyzed
3. Lab data analysis by Environment 1, Inc. Reports dated 09/17/2015 & 10/1/2015, Client ID#6015

SMITH+GARDNER

Table 3
Detected Inorganic Constituents
Halifax County Closed Landfill
August 24-26, 2015

By: MG
Date: 10/23/2015

Monitoring Location	MDL	SWSL	2L or GWP* Standard	MCL	2B Standard	MW-1	MW-2A	MW-2AD	MW-3AS	MW-3D	MW-6D	MW-7D	MW-15R	MW-16A	MW-17	MW-18S	G-13	G-13D	SW-1	SW-2	SW-3
Antimony	0.02	6	1 *	6	NE	2.4 J	<0.02	0.72 J	0.20 J	0.06 J	0.03 J	0.38 J	0.42 J	0.14 J	<0.02	<0.02	0.05 J	0.51 J	0.1 J	0.04 J	<0.02
Arsenic	0.14	10	10	10	10	0.26 J	1.8 J	3.1 J	2.5 J	<0.14	<0.14	<0.14	<0.14	0.33 J	0.76 J	1.6 J	<0.14	<0.14	0.22 J	0.6 J	<0.14
Barium	0.01	100	700	2000	1,000	51.1 J	113	117	27.1 J	81.8 J	560	30.5 J	57.6 J	169	109	76.7 J	56.3	47.8 J	11.5 J	66.3 J	17.6 J
Beryllium	0.02	1	4 *	4	6.5	0.28 J	0.33 J	0.09 J	0.07 J	0.10 J	0.32 J	0.04 J	0.25 J	2	2	0.07 J	1	0.30 J	<0.02	<0.02	<0.02
Cadmium	0.01	1	2	5	2	0.2 J	<0.01	<0.01	<0.01	<0.01	0.40 J	0.05 J	0.36 J	0.47 J	0.33 J	0.02 J	0.12 J	0.63 J	<0.01	<0.01	<0.01
Cobalt	0.03	10	1 *	NE	NE	0.84 J	8.3 J	7.6 J	2.5 J	0.05 J	2.8 J	0.04 J	0.55 J	1.6 J	1.8 J	7.5 J	2.1 J	0.45 J	0.11 J	0.61 J	0.13 J
Chromium, total	0.12	10	10	1000	50	1.9 J	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.17 J	0.18 J	2.5 J	<0.12	0.13 J	<0.12	<0.12	<0.12	<0.12
Copper	0.02	10	1000	1300	7	1.5 J	0.18 J	0.11 J	0.17 J	0.23 J	0.23 J	0.27 J	1.2 J	1.3 J	3.9 J	0.15 J	0.29 J	4.3 J	0.32 J	1.0 J	0.68 J
Iron	8.64	300	300	300**	1000	NA	**27928**	**6585**	**70338**	<8.64	NA	NA	NA	NA	NA	NA	216 J	NA	NA	NA	NA
Lead	0.03	10	15	15	25	2.5 J	<0.03	<0.03	0.04 J	<0.03	<0.03	0.16 J	1.1 J	5.3 J	9.2 J	<0.03	<0.03	0.60 J	<0.03	<0.03	<0.03
Nickel	0.01	50	100	NE	25	1.0 J	0.73 J	1.4 J	0.33 J	0.50 J	1.7 J	0.34 J	0.68 J	1.1 J	1.9 J	1.6 J	0.41 J	1.1 J	0.40 J	0.93 J	0.91 J
Selenium	0.22	10	20	50	5	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	1.0 J	<0.22	<0.22	<0.22	<0.22	1.6 J	<0.22
Silver	0.01	10	20	100	0	0.02 J	0.01 J	0.02 J	0.02 J	0.01 J	<0.01	<0.01	0.01 J	0.02 J	0.13 J	<0.01	0.02 J	0.01 J	0.02 J	<0.01	<0.01
Thallium	0.02	6	2.8*	2	0.47	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.11 J	0.02 J	0.09 J	<0.02	0.06 J	<0.02	<0.02	<0.02	<0.02
Tin	0.06	100	2000 *	NE	NE	NA	<0.06	<0.06	<0.06	<0.06	0.14 J	NA	<0.06	<0.06	0.12 J	<0.06	NA	NA	NA	NA	NA
Vanadium	0.22	25	0.3 *	NE	NE	2.6 J	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	0.78 J	2.4 J	8.7 J	<0.22	<0.22	<0.22	3.5 J	<0.22	1.2 J
Zinc	0.20	10	1000	5000**	50	4.3 J	<0.20	1.8 J	<0.20	1.5 J	3.7 J	2.5 J	6.7 J	21	43	3.7 J	1.9 J	12	<0.20	<0.20	<0.20

NOTES:

MDL	-	Method Detection Limit
SWSL	-	Solid Waste Section Quantitation Limits
2L	-	Groundwater Standards (15A NCAC 2L 0200)
GWP	-	Groundwater Protection Standards (noted by *)
MCL	-	Federal Maximum Contaminant Limit
**	-	National Secondary Drinking Water Standards
2B	-	NCAC 2B Standard for Class C waters
Bold	-	Detection above 2L or GWP Standard
J	-	Laboratory defined detection between MDL and SWSL limit
<MDL	-	Not detected at or above MDL value
NA	-	Parameter Not analyzed
NE	-	Standard Not Established

Table units are presented in ug/l.
Lab data analysis by Environment 1, Inc. Reports dated 09/17/2015 & 10/1/2015, Client ID#6015

This page intentionally left blank.

SMITH+GARDNER

By:MG
Date: 10/26/2015

Table 4
Detected Organic Constituents
Halifax County Closed Landfill
August 24-26, 2015

Constituent	MDL	SWSL	2L Standard	MCL	MW-2A	MW-2AD	MW-3AS	MW-3D	MW-6D	MW-15R	MW-16A	MW-17	MW-18S
Benzene	0.24	1	1	5	0.60 J	**1.2**	0.80 J	0.80 J	**1.4**	<0.24	**4.80**	<0.24	0.60 J
1,1-Dichloroethane	0.20	5	6	NE	**7.70**	**22.40**	**11.0**	**9.70**	<0.20	2.9 J	**18.90**	5.1	**6.2**
1,1-Dichloroethene	0.17	5	7	7	<0.17	0.40 J	0.40 J	0.40 J	<0.17	<0.17	0.70 J	<0.17	<0.17
1,2-Dichlorobenzene	0.32	5	20	6000	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	1.5 J	<0.32	<0.32
1,2-Dichloroethane	0.21	1	0.4	5	<0.21	<0.21	<0.21	<0.21	<0.21	<0.21	0.40 J	<0.21	<0.21
1,2- Dichloropropane	0.21	1	0.6	5	<0.21	0.40 J	0.40 J	0.50 J	<0.21	<0.21	**1.0**	<0.21	<0.21
1,4-Dichlorobenzene	0.39	1	6	75	1.00	1.70	0.60 J	0.70 J	2.60	<0.39	2.80	<0.39	0.90 J
Dichlorodifluoromethane	0.51	5	1000	NE	0.80 J	1.3 J	<0.51	0.90 J	<0.51	<0.51	17.20	<0.51	<0.51
Cis-1,2-Dichloroethene	0.25	5	70	70	1.9 J	33.30	8.3	14.60	0.30 J	0.60 J	64.90	3.5 J	<0.25
Chlorobenzene	0.30	3	50	100	2.0 J	1.2 J	0.70 J	0.70 J	6.2	<0.30	1.8 J	<0.30	1.8 J
Chloroethane	0.48	10	3000	NE	<0.48	1.0 J	0.90 J	<0.48	0.60 J	<0.48	0.90 J	<0.48	0.70 J
Methylene Chloride	0.64	1	5	5	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	0.70 J	<0.64	<0.64
Tetrachloroethene	0.17	1	0.7	5	<0.17	**1.7**	0.30 J	0.90 J	<0.17	**1.50**	**72.10**	**1.00**	<0.17
Trans-1,2 Dichloroethene	0.23	5	100	100	<0.23	0.40 J	<0.23	<0.23	<0.23	<0.23	1.0 J	<0.23	<0.23
Trichloroethene	0.23	1	3	5	0.40 J	**10.20**	1.6	2.30	<0.23	<0.23	**35.50**	1.20	<0.23
Vinyl Chloride	0.63	1	0.03	2	**13.50**	**23.7**	**4.0**	<0.63	<0.63	<0.63	**1.8**	<0.63	**3.6**

NOTE:

MDL	-	Method Detection Limit
SWSL	-	Solid Waste Section Quantitation Limits .
2L	-	Groundwater Standards (15A NCAC 2L 0200)
GWP	-	Groundwater Protection Standards (noted by *)
MCL	-	Federal Maximum Contaminant Limit
Bold	-	Detection above 2L standard or GWP standard
J	-	Laboratory defined detection between the MDL and SWSL
<MDL	-	Not detected at or above MDL
NE	-	Not Established

Table units are presented in ug/l.
Lab data analysis by Environment 1, Inc. Report dated 10/1/2015, Client ID#6015 A

SMITH+GARDNER

Table 5
Indicator Parameter Summary
Halifax County Closed Landfill
August 24-26, 2015

By: MG
Date: 10/23/2015

	MDL	SWSL	MW-2A	MW-2AD	MW-3AS	MW-3D	MW-6D	MW-17	MW-18S	MW-18D	G-13
BOD, mg/l	2	NE	<2	<2	3.2	<2	<2	<2	<2	<2	<2
COD, mg/l	20	NE	<20	<20	<20	20	NA	NA	NA	NA	<20
Nitrate Nitrogen as N, mg/	0.04	10	<0.04	<0.04	<0.04	0.08 J	NA	NA	NA	NA	0.43 J
Total Organic Carbon, mg/	0.085	NE	2.88	<0.085	1.91	<0.085	NA	NA	NA	NA	1.04
Chloride, mg/l	5	NE	7	10	<5	7	NA	NA	NA	NA	7
Dissolved Oxygen, mg/l	0.1	NE	0.41	0.79	0.39	0.35	1.59	1.41	0.79	NA	0.96
Carbon Dioxide, mg/l	1	NE	193	122	175	87	212	NA	NA	18	82
ORP, mv	NE	NE	11	24	-25	58	63	40	-24	NA	81
Methane, ug/l	0.006	NE	3000	1600	1500	2100	150	1300	1200	30	1.4
Ethane, ug/l	0.001	NE	0.32	1.3	0.58	0.016	0.61	0.014	0.59	0.015	0.0043 J
Ethene, ug/l	0.008	NE	0.49	3.2	0.21	<0.008	0.046	0.013	0.048	0.097	0.012
Hydrogen, nM	0.13	NE	2.9	2.7	4.1	2.6	2.7	3.1	2.9	2.8	2.6
Lactic Acid, mg/l	0.012	NE	0.014 J	0.018 J	0.022 J	0.014 J	<0.012	<0.012	<0.012	0.015 J	<0.012
Acetic Acid mg/l	0.008	NE	0.048 J	0.039 J	0.055 J	0.036 J	0.022 J	0.037 J	0.066 J	0.042 J	0.042 J
Butyric Acid, mg/l	0.007	NE	0.019 J	0.021 J	0.018 J	0.017 J	<0.007	0.016 J	0.019 J	0.020 J	0.017 J

NOTES:

MDL	-	Method Detection Limit
SWSL	-	Solid Waste Section Quantitation Limits
J	-	Laboratory defined detection between the MDL and SWSL
<MDL	-	Not detected at or above MDL value
NE	-	Standard Not established
NA	-	Parameter Not Analyzed

Table presented in units of ug/l unless otherwise noted
Lab data analysis by Environment 1, Inc. Reports dated 09/17/2015 & 10/1/2015, Client ID#6015; and Microseeps Report Dated 10/10/2015

SMITH+GARDNER

Table 6
Gradient and Velocity Calculations
Halifax County Closed Landfill
August 24-26, 2015

By: LMH
Date: 4/24/2015

Monitoring Location	Water Table Elevation (ft)	Hydraulic Conductivity (ft/day)	Assumed Porosity	Hydraulic Gradient (ft/ft)	Groundwater Velocity (ft/day)
MW-2A	239.62	1.835	0.2	0.013	0.119
MW-16A	263.46	0.057	0.2	0.039	0.011

NOTE:

Hydraulic Conductivity data from slug tests performed by G.N. Richardson and Associates in 1997.
Porosity values assumed from Groundwater & Wells (Driscoll)
Velocity Calculated from V=K*i/n

V = velocity
K = Hydraulic Conductivity
i = Gradient
n = Porosity

Deep wells not used in velocity calculations

This page intentionally left blank.

Appendix A

Boring Logs

This page intentionally left blank.

FIELD BOREHOLE LOG

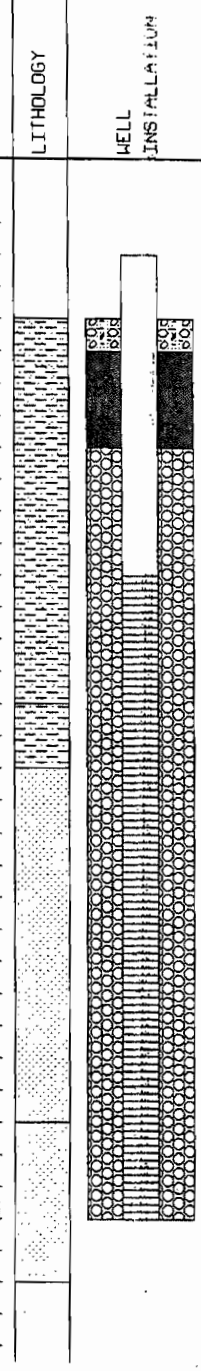
BOREHOLE NUMBER: MW-2A

PROJECT NUMBER HALIFAX-2
PROJECT NAME: HALIFAX COUNTY LANDFILL
LOCATION HALIFAX, NC
DRILLING COMPANY BORE & CORE
RIG TYPE & NUMBER MOBILE B-57 ATV
DRILLING METHOD HOLLOW STEM AUGER
WEATHER: HOT, HUMID
FIELD PARTY: BILL BROW
GEOLOGIST DAVID GARRETT
DATE BEGUN: 7/25/95 DATE COMPLETED: 7/26/95

TOP OF CASING ELEVATION -
TOTAL DEPTH: 16.0
GROUND SURFACE ELEVATION -
SHEET 1 OF 1

STATIC WATER LEVEL (BLS)		
WD=While Drilling AB=After Boring		
Depth(ft)	7.3 FT	
Time	2:00 PM	
Date	7/25/95	

DEPTH	BLOW COUNTS	SAMPLING METHOD	SAMPLE NUMBER	MOISTURE	CONSISTANCY	SAMPLE RECOVERY	DRILL METHOD	LITHOLOGY DESCRIPTION
0.0–3.0				D				SILTY SAND: Loose red-brown very silty clayey coarse-fine SAND; SM-ML; fill pad.
3.0–6.0	2, 3, 3	Ss	S1					SILT: M. stiff black-gray fine sandy clayey SILT; wet; alluvium; ML.
6.0–9.0	8, 10, 11	Ss	S2					SAND: Loose light-gray and red-gray slightly silty-clayey fine-coarse SAND; alluvium; very clayey from 9.5' to 10.5'; fine rounded gravel from 10.5' to 12.5'; Water level at 7.3 ft; SW-SM; SC, CL, SW.
9.0–12.0	10, 7, 7	Ss	S3	W				
12.0–15.0	26, 50/0	Ss	4'					SAND: V. dense brown clayey fine SAND w/ scattered coarse sand; SM-ML; residual soil; well developed upon completion by surging and overpumping.



FIELD BOREHOLE LOG

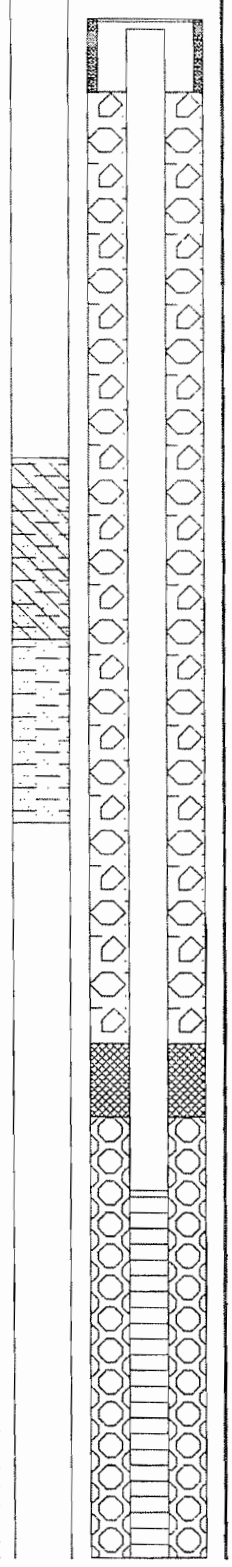
BOREHOLE NUMBER: MW-2aa

PROJECT NUMBER: HALIFAX-14
PROJECT NAME: Halifax County LandFill
LOCATION: Aurelian Springs, North Carolina
DRILLING COMPANY: Engineering Tectonics, P.A.
RIG TYPE & NUMBER: MOBILE B-60
DRILLING METHOD: Hollow Stem Auger
WEATHER: Cloudy, 70 degrees
FIELD PARTY: David Barron
GEOLOGIST: Philip May
DATE BEGUN: 9/1/99 DATE COMPLETED: 9/1/99

TOP OF CASING ELEVATION: TBD
TOTAL DEPTH: 40.0 FT
GROUND SURFACE ELEVATION: TBD
SHEET 1 OF 1

STATIC WATER LEVEL (BLS)		
WD-While Drilling AB-After Boring		
Depth(ft)	6.0'	5.25'
Time	12:00	9:00
Date:	9/1/99	9/2/99

DEPTH	BLOW COUNTS	SAMPLING METHOD	SAMPLE NUMBER	MOISTURE	CONSISTANCY	SAMPLE RECOVERY	DRILL METHOD	LITHOLOGY DESCRIPTION
10.0	5 5 6	Ss	61	W		10"		CLAYEY SILTY SAND: Grey clayey silty sand, wet, Fe staining and quartz gravel.
15.0	15 29 34	Ss	62	W		12"		SILTY SAND: Mottled white, tan-pink, grey & rust M-C slightly silty sand, moist, relict rock, quartz, some mica.
20.0	50/4	Ss	63	W		2"		PWR: Wet C sand, partially weathered rock, tan-pink gravel w/ white, brown, & grey mottling, micaceous;
25.0	50/3	Ss	64	W		1"		25.0' same as above;
30.0	50/4	Ss	65	W		2"		30.0' same as above;
35.0	50/2	Ss	66	W		0"		35.0' same as above;
40.0								40.0' Boring terminated at 40'.



North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
P.O. Box 29578 - Raleigh, N.C. 27626-0578-Phone (919) 733-3221

'VELL CONSTRUCTION RECORD

Well ID: MW-2ad

DRILLING CONTRACTOR: Engineering Tectonics, P.A.
DRILLER REGISTRATION #: 835
STATE WELL CONSTRUCTION PERMIT#:

1. WELL USE (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☒
Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use:

2. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Aurelian Springs County: Halifax
Liles Road
(Road, Community, or Subdivision and Lot No.)

3. OWNER Halifax County
ADDRESS
(Street or Route No.)
Halifax NC
City or Town State Zip Code

4. DATE DRILLED 9/1/99
5. TOTAL DEPTH 40.0
6. CUTTINGS COLLECTED YES ☐ NO ☒
7. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
8. STATIC WATER LEVEL Below Top of Casing: 5.26 FT.
(Use '+' if Above Top of Casing)
9. TOP OF CASING IS 2.5 FT. Above Land Surface *
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .01 18
10. YIELD(gpm): METHOD OF TEST
11. WATER ZONES (depth):

12. CHLORINATION: Type Amount

DEPTH From	To	DRILLING LOG Formation Description
See attached boring log		

If additional space is needed use back of form

13. CASING:

	Depth From	TO	Ft.	Diameter	Wall Thickness or Weight/Ft	Material
	2.0	30.0		2"		PVC

14. GROUT:

	Depth From	TO	Ft.	Material	Method
	0	26.0		Portland cement	Tremie
	26.0	28.0		Bentonite	

15. SCREEN:

	Depth From	TO	Ft	Diameter	Slot Size	Material
	30.0	40.0		2 in.	10 in.	PVC
				in.	in.	
				in.	in.	

16. SAND/GRAVEL PACK:

	Depth From	To	Ft.	Size	Material
	28.0	40.0		No. 2 Filter Sand	

17. REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

FOR OFFICE USE ONLY
Quad No:

SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Water Quality and copy to well owner.

FIELD BOREHOLE LOG

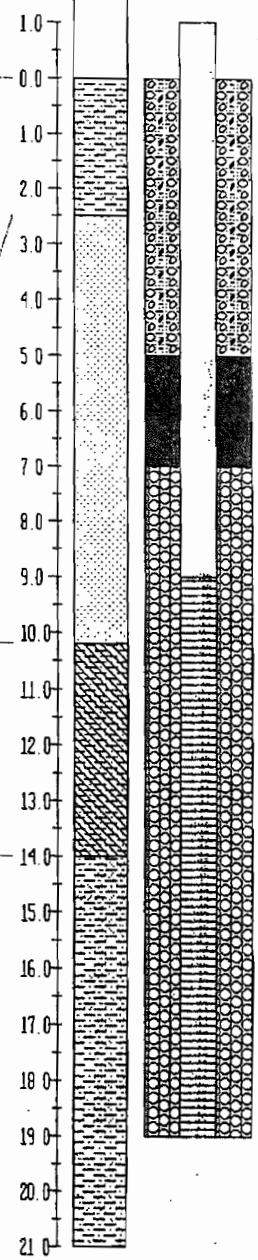
BOREHOLE NUMBER: MW-3A-S

PROJECT NUMBER HALIFAX-2
PROJECT NAME HALIFAX COUNTY LANDFILL
LOCATION HALIFAX, NC
DRILLING COMPANY BORE & CORE
RIG TYPE & NUMBER MOBILE B-57 ATV
DRILLING METHOD HOLLOW STEM AUGER
WEATHER HOT, HUMID
FIELD PARTY BILL BROW
GEOLOGIST DAVID GARRETT
DATE BEGUN 7/25/95 DATE COMPLETED 7/25/95

TOP OF CASING ELEVATION -
TOTAL DEPTH 21
GROUND SURFACE ELEVATION -
SHEET 1 OF 1

STATIC WATER LEVEL (BLS)		
WD=While Drilling AB=After Boring		
Depth(ft)	6.0 FT	
Time	3:45PM	
Date	7/25/95	

DEPTH	BLOW COUNTS	SAMPLING METHOD	SAMPLE NUMBER	MOISTURE	CONSISTANCY	SAMPLE RECOVERY	DRILL METHOD	LITHOLOGY DESCRIPTION
1.0								
0.0								SILTY SAND: Loose brwon-gray dry silty fine SAND w/ scattered roots, sticks, and inert debris on surface; SM.
1.0								
2.0				D				
3.0	2	Ss	S1					
4.0	1							SAND: Soft, dark brown wet clayey silty fine SAND w/ small sticks, rounded pebbles; alluvium; CL/ML.
	1							
5.0								
6.0								
7.0								
8.0								
9.0	4	Ss	S2					
10.0	4			W				
	6							
11.0								CLAYEY SILT: Stiff orange-yellow clayey SILT w/ coarse sand, scattered mica; relict rock texture; residual soil; ML; saturated below 11'.
12.0								
13.0								
14.0	6	Ss	S3					SILTY SAND: Orange-white mottled silty fine-coarse SAND, trace clay, mica; residual soil, weathered granite; SM.
15.0	6							
	7							
16.0								
17.0								
18.0								
19.0	8	Ss	S4					
20.0	9							
	13							
21.0								



WELL COMPLETION RECORD

MW-6A MW-6d

'I ETE ALL INFORMATION REQUESTED BELOW FOR EACH WELL INSTALLED, AND RETURN FORM TO THE N.C. ' MENT OF HUMAN RESOURCES, SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH, 91, RALEIGH, N.C. 27602

OF SITE: Halifax County Sanitary Landfill	PERMIT NO.: 41-0176-WM-0033
ES: R. 1417 Aurelian Springs, N.C.	OWNER (print): Halifax County
G CONTRACTOR: ore & Core, Inc.	REGISTRATION NO.: 763

Type:	PVC dia. 2 in.	Grout Depth:	from 0' to -21' ft. - dia. 4 in.
Depth:	from 2' to -25 ft. - dia. 2 in.	Bentonite Seal:	from -21' to -23 ft. - dia. 4 in.
Type:	slotted .010 dia. 2 in.	Sand/Gravel PK:	from -23 to -40 ft. - dia. 4 in.
Depth:	from -25 to -40 ft. - dia. 2 in.	Total Well Depth:	from 2' to -41 ft. - dia. 4 in.

Water Level: 11' 7" Below ground surface ~~feet from top of casing~~ Date Measured 11 / 26 / 91

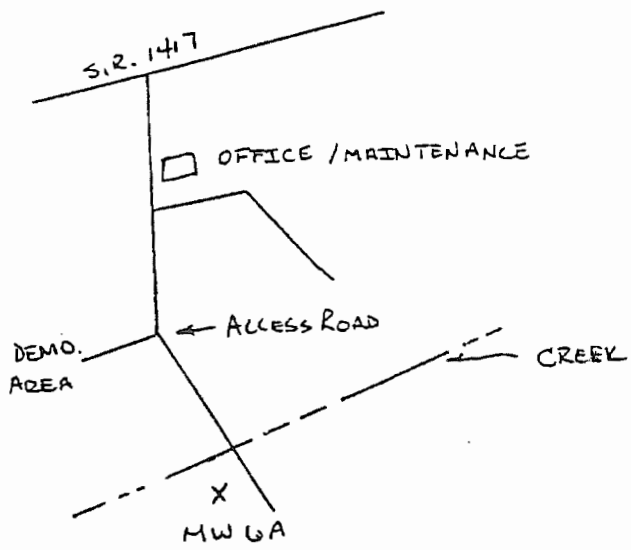
(m): _____ Method of Testing: _____ Casing is _____ feet above land surface

DRILLING LOG

DEPTH FROM	TO	FORMATION DESCRIPTION
	2.8	Brown fine sandy silt
	10.6	Brown medium to fine silt
C 6	22.4	Damp DrkBr.Med. sandy silt
2.4	40.0	Wet Br. fine sandy silt

LOCATION SKETCH

(show distance to numbered roads, or other map reference points)



RKS: Well screened too deep.
Static water level is above the screen.

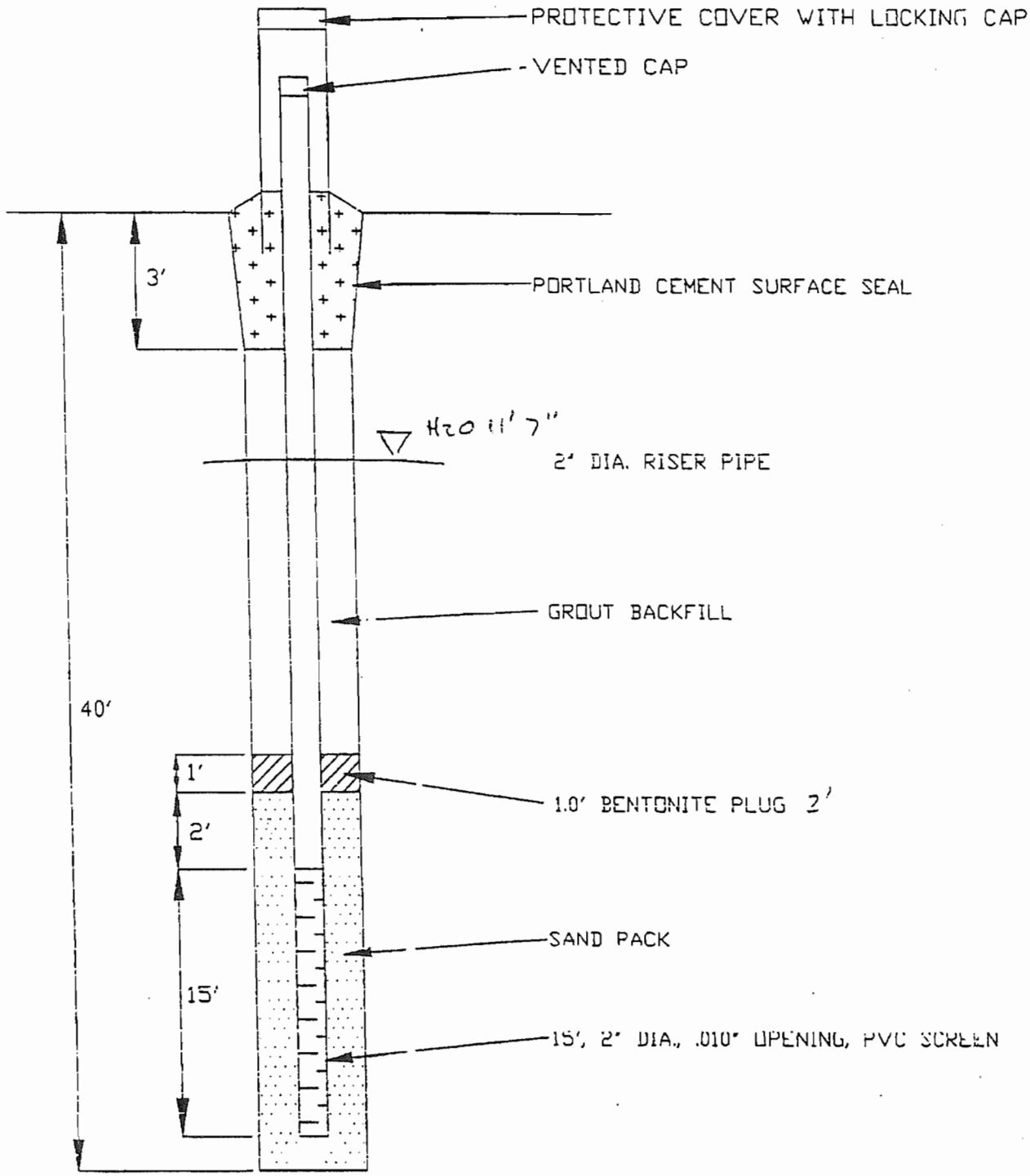
_____ SIGNATURE: _____

3342 (6/85)
& Hazardous Waste Management Branch

TYPICAL MONITORING WELL SCHEMATIC

PROJECT HALIFAX COUNTY LANDFILL VERTICAL EXPANSION
WELL NUMBER MW-6A

6d



TEST BORING FIELD REPORT

MW6d

Name Halifax County Landfill Vertical Expansion Job No. _____

Supervisor Tony Crew Ben Hrs. Drilling ____ Hrs. Moving ____ Boring # MW6

a e 10/30/91 Weather _____ Ground Surface Elevation _____

Soil Strata			Sampling/Blows per Ft.				
o	To	Soil Description and Remarks	No.	Depth	1st6"	2nd6"	3rd6"
.0	2.8	Brown fine sandy silt w/rocks					
.8	10.6	Brown medium to fine sandy silt					
.6	22.4	Damp dark brown medium sandy silt					
.4	40.0	Wet brown fine sandy silt					
		B.T. 40.0					
		Set 2"x15' PVC screen at 40.0 with 30' PVC riser 4 bags					
		sand, ½ bucket bentonite 1 2" locking cap, 1 4"x5'					
		protective casing					

ter Level _____ at TOB

er Level _____ at _____

er Level _____ at 24 Hours

Losses _____

sing, Size _____ Length _____

Note: (Record Methods of Drilling & Depths)

CME 450 ATV
4¼" ID hollow stem auger
0.0 - 40.0

WELL COMPLETION RECORD

MW-7 MW-7d

'I ETE ALL INFORMATION REQUESTED BELOW FOR EACH WELL INSTALLED, AND RETURN FORM TO THE N.C. ' MENT OF HUMAN RESOURCES, SOLID AND HAZARDOUS WASTE MANAGEMENT BRANCH, 091, RALEIGH, N.C. 27602

.C.F SITE: ifax County Sanitary Landfill	PERMIT NO.: 41-0176-WM-0033
.E S: .. 1417 Aurelian Springs, N.C.	OWNER (print): Halifax County
.I G CONTRACTOR: 'e & Core, Inc.	REGISTRATION NO.: 763

'pe:	PVC	dia.	2 in.	Grout Depth:	from	0	to	-21'	ft. - dia. 4" in.
epth:	from 2	to -25	ft. - dia. 2 in.	Bentonite Seal:	from	-21'	to	-23'	ft. - dia. 4" in.
Type:	slotted PVC .010	dia.	2 in.	Sand/Gravel PK:	from	-23'	to	40'	ft. - dia. 4" in.
Depth:	from -25	to -40	ft. - dia. 2 in.	Total Well Depth:	from	2'	to	-40'	ft. - dia. 4" in.

W. ater Level: 3' 11" Below ground surface feet from top of casing Date Measured 11 / 26 / 91

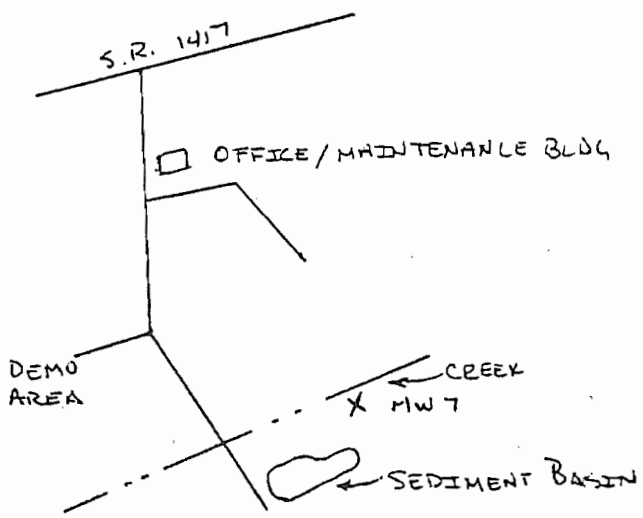
(g m): _____ Method of Testing: _____ Casing is _____ feet above land surface

DRILLING LOG

DEPTH FROM	TO	FORMATION DESCRIPTION
	1.4	Brown fine sandy silt
4	6.7	Brown fine sandy silt
.7	14.3	Damp DrkBr. fine very sandy silt.
4 ?	40.0	Wet Brown medium sandy silt/gravel

LOCATION SKETCH

(show distance to numbered roads, or other map reference points)



1 RKS: Well screened too deep.
Static water table is above the screen.

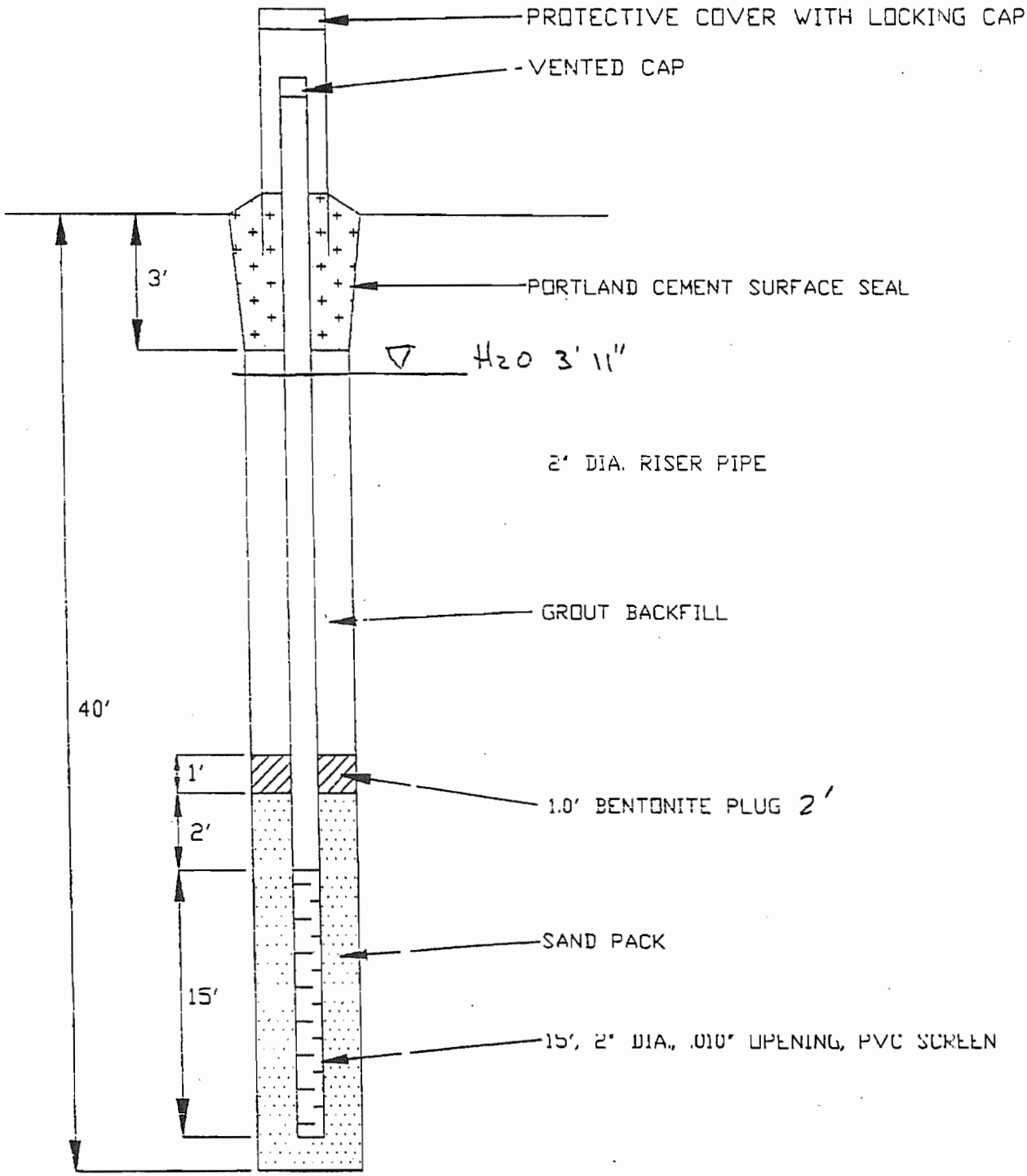
SIGNATURE: _____

3342 (6/85)
& Hazardous Waste Management Branch

TYPICAL MONITORING WELL SCHEMATIC

PROJECT HALIFAX COUNTY LANDFILL VERTICAL EXPANSION
WELL NUMBER MW-7

7d



TEST BORING FIELD REPORT

MW7d

Name Halifax County Landfill Vertical Expansion Job No. _____

Supervisor Tony Crew Ben Hrs. Drilling ____ Hrs. Moving ____ Boring # MW7

Date 10/31/91 Weather _____ Ground Surface Elevation _____

Soil Strata			Sampling/Blows per Ft				
From	To	Soil Description and Remarks	No.	Depth	1st6"	2nd6"	3rd6"
.0	1.4	Brown fine sandy silt with roots					
.4	6.7	Brown fine sandy silt					
.	14.3	Damp dark brown fine very sandy silt					
.3	40.0	Wet brown medium sandy silt with gravel B.T. 40.0					
		Set 2" PVC screen (15') at 40.0 with 30' PVC riser 4 bags					
		sand, ½ bucket Bentonite 1 2" locking cap, 1 4"x5'					
		protective casing					

ater Level _____ at TOB

er Level _____ at _____

Level _____ at 24 Hours

Losses _____

asing, Size _____ Length _____

Note: (Record Methods of Drilling & Depths)

CME 450 ATV
4¼" ID hollow stem auger
0.0 - 40.0

FIELD BOREHOLE LOG

BOREHOLE NUMBER: MW-15R

PROJECT NUMBER: HALIFAX-14
PROJECT NAME: Halifax County Landfill
LOCATION: Aurelian Springs, North Carolina
DRILLING COMPANY: Engineering Tectonics, P.A.
RIG TYPE & NUMBER: MOBILE B-60
DRILLING METHOD: Hollow Stem Auger
WEATHER: Cloudy, 70 degrees
FIELD PARTY: David Barron
GEOLOGIST: Philip May
DATE BEGUN: 8/31/99 DATE COMPLETED: 8/31/99

TOP OF CASING ELEVATION TBD
TOTAL DEPTH 43.0 FT
GROUND SURFACE ELEVATION: TBD
SHEET: 1 OF: 1

STATIC WATER LEVEL (BLS)		
WD=While Drilling AB=After Boring		
Depth(Ft)	31.5'	31.55'
Time	2:00	12:00
Date	8/31/99	9/1/99

DEPTH	BLOW COUNTS	SAMPLING METHOD	SAMPLE NUMBER	MOISTURE	CONSISTANCY	SAMPLE RECOVERY	DRILL METHOD	LITHOLOGY DESCRIPTION
5.0	5 6 8	Ss	81	SM		8"		SANDY CLAYEY SILT: Slightly moist rust-brown F sandy clayey silt, mottled (20%) w/ grey clay & some gravel, lower 1" moist white F sandy silt w/ rust mottling, some Mn & quartz throughout.
10.0	6 10 15	Ss	82	SM		12"		CLAYEY SILTY SAND: Slightly moist tan-pink clayey silty F sand w/ grey, white, yellow, & rust mottles (50%);
15.0	9 12 15	Ss	83	SM		12"		15.0' same as above, grading into rust orange matrix w/ other mottles, some mica & quartz.
20.0	10 14 17	Ss	84	M		12"		SANDY CLAYEY SILT: Moist M-C sandy clayey silt, mottled tan-pink, grey-black, white, & rust, quartz gravel;
25.0	8 11 15	Ss	85	M		6"		25.0' Moist M-C sandy clayey silt, grey-tan-pink, brown-black, grey-tan, & white mottles, quartz, Feldspar, Mn, Mica;
30.0	9 17 25	Ss	86	M		8"		30.0' same as above;
35.0	20 29 11	Ss	87	W		12"		35.0' same as above, very moist;
43.0	11 20 33	Ss	88	W		14"		43.0' same as above, wet, boring terminated at 43.0'.

LITHOLOGY

WELL INSTALLATION

North Carolina - Department of Environment and Natural Resources - Division of Water Quality - Groundwater Section
P.O. Box 29578 - Raleigh, N.C. 27626-0578-Phone (919) 733-3221

WELL CONSTRUCTION RECORD

Well ID: MW-15r

DRILLING CONTRACTOR: Engineering Tectonics, P.A.
DRILLER REGISTRATION #: 835
STATE WELL CONSTRUCTION PERMIT#:

1. WELL USE (Check Applicable Box): Residential ☐ Municipal ☐ Industrial ☐ Agricultural ☐ Monitoring ☒
Recovery ☐ Heat Pump Water Injection ☐ Other ☐ If Other, List Use:

2. WELL LOCATION: (Show sketch of the location below)
Nearest Town: Aurelian Springs County: Halifax
Liles Road
(Road, Community, or Subdivision and Lot No.)

3. OWNER Halifax County
ADDRESS
(Street or Route No.)
Halifax NC
City or Town State Zip Code

4. DATE DRILLED 8/31/99
5. TOTAL DEPTH 43.0
6. CUTTINGS COLLECTED YES ☐ NO ☒
7. DOES WELL REPLACE EXISTING WELL? YES ☐ NO ☒
8. STATIC WATER LEVEL Below Top of Casing: 31.55 FT
(Use + if Above Top of Casing)
9. TOP OF CASING IS 2.5 FT. Above Land Surface *
* Casing Terminated at/or below land surface is illegal unless a variance is issued in accordance with 15A NCAC 2C .01 18
10. YIELD(gpm): METHOD OF TEST
11. WATER ZONES (depth):

DEPTH From	DEPTH To	DRILLING LOG Formation Description
See attached boring log		

If additional space is needed use back of form

12. CHLORINATION: Type Amount

13. CASING:

	Depth From	Depth TO	Ft.	Diameter	Wall Thickness or Weight/Ft	Material
	2.0	33.0		2"		PVC

14. GROUT:

	Depth From	Depth TO	Ft.	Material	Method
	0	29.0		Portland cement	Tremie
	29.0	31.0		Bentonite	

15. SCREEN:

	Depth From	Depth TO	Ft	Diameter	in.	Slot Size	in.	Material
	33.0	43.0		2		10		PVC

16. SAND/GRAVEL PACK:

	Depth From	Depth To	Ft.	Size	Material
	31.0	43.0		No. 2 Filter Sand	

17. REMARKS:

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

FOR OFFICE USE ONLY
Quad No:

SIGNATURE OF CONTRACTOR OR AGENT DATE
Submit original to Division of Water Quality and copy to well owner.

FIELD BOREHOLE LOG

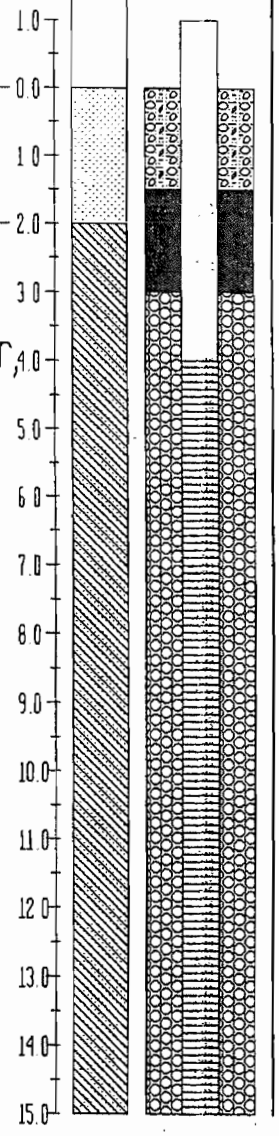
BOREHOLE NUMBER: MW-16A

PROJECT NUMBER HALIFAX-2
PROJECT NAME HALIFAX COUNTY LANDFILL
LOCATION HALIFAX, NC
DRILLING COMPANY: BORE & CORE
RIG TYPE & NUMBER: MOBILE B-57 ATV
DRILLING METHOD: HOLLOW STEM AUGER
WEATHER HOT, HUMID
FIELD PARTY: BILL BROW
GEOLOGIST: GREG MILLS
DATE BEGUN: 7/26/95 DATE COMPLETED: 7/26/95

TOP OF CASING ELEVATION -
TOTAL DEPTH 16.0
GROUND SURFACE ELEVATION -
SHEET 1 OF 1

STATIC WATER LEVEL (BLS)		
WO=While Drilling AB=After Boring		
Depth(Ft)	7.2 FT	
Time	3:00 PM	
Date	7/26/95	

DEPTH	BLOW COUNTS	SAMPLING METHOD	SAMPLE NUMBER	MOISTURE	CONSISTANCY	SAMPLE RECOVERY	DRILL METHOD	LITHOLOGY DESCRIPTION
1.0								
0.0								SAND: Tan coarse grained SAND w/ some organics.
1.0								
2.0				D				CLAYEY SAND: White, pink and orange coarse grained clayey SAND with mica, feldspar, K-feldspar, and some quartz; weathered granite; residual soil; SC.
3.0								
4.0	6	Ss	S1					
5.0	7 9							
6.0								
7.0								
8.0								
9.0	5	Ss	S2					
10.0	8 8			W				
11.0								
12.0								
13.0								
14.0	86	Ss	S3					
15.0	50/0	4'						



Richardson Smith Gardner and Assoc
14 North Boylan Avenue, Raleigh NC 27603
(919) 828-0577

FIELD BOREHOLE LOG

BOREHOLE NUMBER **MW-17**

PROJECT NAME: **Halifax Landfill**
OCATION: **Halifax Co.**
DRILLING CO: **McCall Bros.**
DRILLING METHOD: **HSA**
FIELD PARTY: **Ken McDonald**
GEOLOGIST: **J. Smyth**
DATE BEGUN: **10/03/07** DATE COMPLETED: **10/03/07**

TOTAL DEPTH: **25**
GROUND SURFACE ELEVATION:
TOP OF CASING ELEVATION:

STATIC WATER LEVEL (TOC)		
Depth (ft)		
Time		
Date		

DEPTH	BLOW COUNT	SAMPLING METHOD	RECOVERY	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH	WELL INSTALLATION
0.0				HSA	SILTY CLAY: Wet, dark brown silty clay with organic matter.		0.0	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0	2,2,4,6	SS	16"				5.0	
6.0							6.0	
7.0							7.0	
8.0							8.0	
9.0							9.0	
10.0	4,6,10,12	SS	14"		SAPROLITE: Wet, very weathered to weathered K-spar granitic saprolite. Boring terminated at 25' below grade.		10.0	
11.0							11.0	
12.0							12.0	
13.0							13.0	
14.0							14.0	
15.0	11,16,22,27	SS	8"				15.0	
16.0							16.0	
17.0							17.0	
18.0							18.0	
19.0							19.0	
20.0	7,22,29,33	SS	6"				20.0	
21.0							21.0	
22.0							22.0	
23.0							23.0	
24.0							24.0	
25.0							25.0	

Richardson Smith Gardner and Assoc
14 North Boylan Avenue, Raleigh NC 27603
(919) 828-0577

FIELD BOREHOLE LOG

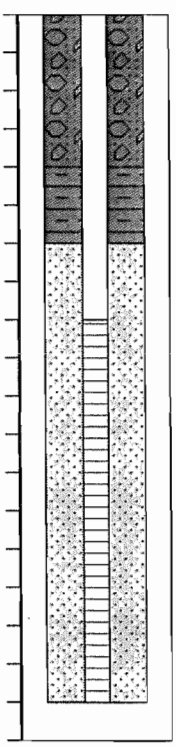
BOREHOLE NUMBER **MW-18s**

PROJECT NAME: **Halifax Landfill**
LOCATION: **Halifax Co.**
DRILLING CO: **McCall Bros.**
DRILLING METHOD: **HSA**
FIELD PARTY: **Ken McDonald**
GEOLOGIST: **J. Smyth**
DATE BEGUN: **10/16/07** DATE COMPLETED: **10/16/07**

TOTAL DEPTH: **19**
GROUND SURFACE ELEVATION:
TOP OF CASING ELEVATION:

STATIC WATER LEVEL (TOC)		
Depth (ft)		
Time		
Date		

DEPTH	BLOW COUNT	SAMPLING METHOD	RECOVERY	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH	WELL INSTALLATION
0.0				HSA	SILTY CLAY: Moist to Wet gray green silty clay		0.0	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0	2,2,1,2	SS	6"				5.0	
6.0							6.0	
7.0							7.0	
8.0							8.0	
							9.0	
10.0	3,2,3,11	SS	8"		CLAYEY SILTY SAND: Wet, dark gray, clayey silty sand with some partially weathered rock.		10.0	
11.0							11.0	
12.0							12.0	
13.0							13.0	
14.0							14.0	
15.0	18,26,27,26	SS	12"		SAPROLITE: Wet weathered potassium feldspar granite saprolite. Auger Refusal at 19 feet. Running sands backfilled hole to 18' where well was then set.		15.0	
16.0							16.0	
17.0							17.0	
18.0							18.0	
19.0							19.0	



Richardson Smith Gardner and Assoc
14 North Boylan Avenue, Raleigh NC 27603
(919) 828-0577

FIELD BOREHOLE LOG

BOREHOLE NUMBER **MW-18d**

PROJECT NAME: **Halifax Landfill**
LOCATION: **Halifax Co.**
DRILLING CO: **McCall Bros.**
DRILLING METHOD: **HSA**
FIELD PARTY: **Ken McDonald**
GEOLOGIST: **J. Smyth**
DATE BEGUN: **10/16/07** DATE COMPLETED: **10/17/07**

TOTAL DEPTH: **52**
GROUND SURFACE ELEVATION:
TOP OF CASING ELEVATION:

STATIC WATER LEVEL (TOC)		
Depth (ft)		
Time		
Date		

DEPTH	BLOW COUNT	SAMPLING METHOD	RECOVERY	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH	WELL INSTALLATION
0.0				HSA	SILTY CLAY: Moist to Wet gray green silty clay		0.0	
1.0							1.0	
2.0							2.0	
3.0							3.0	
4.0							4.0	
5.0	2,2,1,2	SS	6"				5.0	
6.0							6.0	
7.0							7.0	
8.0							8.0	
							9.0	
10.0	3,2,3,11	SS	8"		CLAYEY SILTY SAND: Wet, dark gray, clayey silty sand with some partially weathered rock.		10.0	
11.0							11.0	
12.0							12.0	
13.0							13.0	
14.0							14.0	
15.0	18,26,27,26	SS	12"		SAPROLITE: Wet weathered potassium feldspar granite saprolite. Auger Refusal at 32 feet.		15.0	
16.0							16.0	
17.0							17.0	
18.0							18.0	
19.0							19.0	
20.0		Grab					20.0	
21.0							21.0	
22.0							22.0	
23.0							23.0	
24.0							24.0	
25.0		Grab					25.0	
26.0							26.0	
27.0							27.0	
28.0							28.0	
29.0							29.0	
		Grab					30.0	

Richardson Smith Gardner and Assoc
14 North Boylan Avenue, Raleigh NC 27603
(919) 828-0577

FIELD BOREHOLE LOG

BOREHOLE NUMBER **MW-18d**

PROJECT NAME: **Halifax Landfill**
LOCATION: **Halifax Co.**
DRILLING CO: **McCall Bros.**
DRILLING METHOD: **HSA**
FIELD PARTY: **Ken McDonald**
GEOLOGIST: **J. Smyth**
DATE BEGUN: **10/16/07** DATE COMPLETED: **10/17/07**

TOTAL DEPTH: **52**
GROUND SURFACE ELEVATION:
TOP OF CASING ELEVATION:

STATIC WATER LEVEL (TOC)		
Depth (ft)		
Time		
Date		

DEPTH	BLOW COUNT	SAMPLING METHOD	RECOVERY	DRILL METHOD	DESCRIPTION	LITHOLOGY	DEPTH	WELL INSTALLATION
31.0							31.0	
32.0				AH	GRANITE: Wet Potassium Feldspar Granite (observed by cuttings). Boring terminated at 52'.		32.0	
33.0							33.0	
34.0							34.0	
35.0		Grab					35.0	
36.0							36.0	
37.0							37.0	
38.0							38.0	
39.0							39.0	
40.0		Grab					40.0	
41.0							41.0	
42.0							42.0	
43.0							43.0	
44.0							44.0	
45.0		Grab					45.0	
46.0							46.0	
47.0							47.0	
48.0							48.0	
49.0							49.0	
50.0		Grab					50.0	
51.0							51.0	
52.0							52.0	

This page intentionally left blank.

Appendix B

Laboratory Analytical Report

This page intentionally left blank.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6015 A

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 08/24/15
DATE REPORTED : 09/17/15

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-2	SW-3	Analysis Date	Analyst	Method Code
PH (field measurement), Units			7.1	6.8	6.9	08/24/15	BF	4500HB-00
Antimony, ug/l	0.02	6.0	0.10 J	0.04 J	--- U	09/11/15	LFJ	EPA200.8
Arsenic, ug/l	0.14	10.0	0.22 J	0.60 J	--- U	09/11/15	LFJ	EPA200.8
Barium, ug/l	0.01	100.0	11.5 J	66.3 J	17.6 J	09/11/15	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Cadmium, ug/l	0.01	1.0	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	0.11 J	0.61 J	0.13 J	09/11/15	LFJ	EPA200.8
Total Chromium, ug/l	0.12	10.0	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	0.32 J	1.0 J	0.68 J	09/11/15	LFJ	EPA200.8
Lead, ug/l	0.03	10.0	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Nickel, ug/l	0.01	50.0	0.40 J	0.93 J	0.91 J	09/11/15	LFJ	EPA200.8
Selenium, ug/l	0.22	10.0	--- U	1.6 J	--- U	09/11/15	LFJ	EPA200.8
Silver, ug/l	0.01	10.0	0.02 J	--- U	--- U	09/11/15	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Vanadium, ug/l	0.22	25.0	3.5 J	--- U	1.2 J	09/11/15	LFJ	EPA200.8
Zinc, ug/l	0.20	10.0	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Conductivity (at 25c), uMhos/cm	1.0	1.0	142	334	116	08/24/15	BF	2510B-97
Temperature, °C			21	23	21	08/24/15	BF	2550B-00

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 A

ANALYST: MAO
DATE COLLECTED: 08/24/15
DATE ANALYZED: 08/27/15
DATE REPORTED: 09/17/15

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	SW-1	SW-2	SW-3
1. Chloromethane	0.77	1.0	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 11 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 A **Week: 35**

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION
- [ ] CHLORINE
- [ ] UV
- [ ] NONE
- [ ] _____

																				CHLORINE NEUTRALIZED AT COLLECTION
							12			12	12									pH CHECK (LAB)
							P	P	P	P	G	G								CONTAINER TYPE, P/G
							A	A	A	A	E	E								CHEMICAL PRESERVATION
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Metals	Conductivity	Temperature	EPA 8260B	8260 Dup. 1									PARAMETERS/TESTS
SW-1	8-24-15	0920		21	4	G	G	G	G	G	G									
SW-2	8-24-15	1105		23	4	G	G	G	G	G	G									
SW-3	8-24-15	1015		21	4	G	G	G	G	G	G									

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
- [ ] WASTEWATER (NPDES)
- [ ] DRINKING WATER
- [ ] DWQ/GW
- [x] SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY
(Y) N

SAMPLES COLLECTED BY: (Please Print)
Bobby Ford / Tom Beasley

SAMPLES RECEIVED IN LAB AT 0.5 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Ford	8-24-15 1410	[signature]	8/24/15 2:30
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

FORM #5

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

No 207718

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6015

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 08/25/15
DATE REPORTED : 10/01/15

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-1	MW-7D	MW-15R	MW-16A	Equipment Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.0	5.7	5.0	5.6		08/25/15	BF	4500HB-00
Antimony, ug/l	0.02	6.0	2.4 J	0.38 J	0.42 J	0.14 J		09/11/15	LFJ	EPA200.8
Arsenic, ug/l	0.14	10.0	0.26 J	--- U	--- U	0.33 J		09/11/15	LFJ	EPA200.8
Barium, ug/l	0.01	100.0	51.1 J	30.5 J	57.6 J	169		09/11/15	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	0.28 J	0.04 J	0.25 J	2		09/11/15	LFJ	EPA200.8
Cadmium, ug/l	0.01	1.0	0.20 J	0.05 J	0.36 J	0.47 J		09/11/15	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	0.84 J	0.04 J	0.55 J	1.6 J		09/11/15	LFJ	EPA200.8
Total Chromium, ug/l	0.12	10.0	1.9 J	--- U	0.17 J	0.18 J		09/11/15	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	1.5 J	0.27 J	1.2 J	1.3 J		09/11/15	LFJ	EPA200.8
Lead, ug/l	0.03	10.0	2.5 J	0.16 J	1.1 J	5.3 J		09/11/15	LFJ	EPA200.8
Mercury, ug/l	0.05	0.20			--- U	--- U		08/28/15	MTM	245.1 R3-9
Nickel, ug/l	0.01	50.0	1.0 J	0.34 J	0.68 J	1.1 J		09/11/15	LFJ	EPA200.8
Selenium, ug/l	0.22	10.0	--- U	--- U	--- U	--- U		09/11/15	LFJ	EPA200.8
Silver, ug/l	0.01	10.0	0.02 J	--- U	0.01 J	0.02 J		09/11/15	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	0.11 J	0.02 J		09/11/15	LFJ	EPA200.8
Tin, ug/l	0.06	100.0			--- U	--- U		09/11/15	LFJ	EPA200.8
Vanadium, ug/l	0.22	25.0	2.6 J	--- U	0.78 J	2.4 J		09/11/15	LFJ	EPA200.8
Zinc, ug/l	0.20	10.0	4.3 J	2.5 J	6.7 J	21		09/11/15	LFJ	EPA200.8
Turbidity, NTU	1.0	1.0	110	7.3	49.0	180		08/25/15	KKF	2130B-01
Conductivity (at 25c), uMhos/cm	1.0	1.0	156	44	58	170		08/25/15	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	5.99	5.87	7.41	1.65		08/25/15	BF	4500OG-01
Temperature, °C			18	21	19	19		08/25/15	BF	2550B-00
Static Water Level, feet			28.22	4.95	32.76	8.00		08/25/15	BF	
Well Depth, feet			42.61	39.45	46.51	22.22		08/25/15	BF	
ORP, mv			+80	+72	+85	+69		08/25/15	BF	2580B

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/25/15
DATE EXTRACTED: 08/29/15
DATE ANALYZED: 09/30/15
DATE REPORTED: 10/01/15

REVIEWED BY:

PESTICIDES AND PCB'S
EPA METHOD 8081B R2(07)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A
1. Aldrin	0.029	0.05	--- U	--- U
2. Alpha-BHC	0.032	0.05	--- U	--- U
3. Beta-BHC	0.031	0.05	--- U	--- U
4. Delta-BHC	0.030	0.05	--- U	--- U
5. Gamma-BHC (Lindane)	0.032	0.05	--- U	--- U
6. Chlordane	0.320	0.50	--- U	--- U
7. 4,4-DDD	0.051	0.10	--- U	--- U
8. 4,4-DDE	0.049	0.10	--- U	--- U
9. 4,4-DDT	0.052	0.10	--- U	--- U
10. Dieldrin	0.042	0.075	--- U	--- U
11. Endosulfan I	0.056	0.10	--- U	--- U
12. Endosulfan II	0.046	0.10	--- U	--- U
13. Endosulfan Sulfate	0.072	0.10	--- U	--- U
14. Endrin	0.053	0.10	--- U	--- U
15. Endrin Aldehyde	0.068	0.10	--- U	--- U
16. Heptachlor	0.039	0.05	--- U	--- U
17. Heptachlor Epoxide	0.042	0.075	--- U	--- U
18. Methoxychlor	0.530	1.00	--- U	--- U
19. Pcb's (Aroclors)	0.500	2.00	--- U	--- U
20. Toxaphene	0.690	1.50	--- U	--- U

NOTE: EPA METHOD 8081B R2 (07): MW-16A surrogate recovery exceeded control limits due to matrix effects.

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/25/15
DATE EXTRACTED: 09/01/15
DATE ANALYZED: 09/08/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8151A R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A
1. 2,4-D	0.36	2.0	--- U	--- U
2. Dinoseb	0.54	1.0	--- U	--- U
3. 2,4,5-TP	0.42	2.0	--- U	--- U
4. 2,4,5-T	0.47	2.0	--- U	--- U

NOTE: EPA METHOD 8151A R1 (96): MW-16A surrogate recovery exceeded control limits.

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/25/15
DATE REPORTED: 10/01/15

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	08/29/15 MW-1	08/27/15 MW-7D
	Date Analyzed:			
1. Chloromethane	0.77	1.0	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/25/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A
1. Acenaphthene	2.66	10.0	--- U	--- U
2. Acenaphthylene	2.60	10.0	--- U	--- U
3. Anthracene	2.97	10.0	--- U	--- U
4. Benzo[a]antrhacene	4.16	10.0	--- U	--- U
5. Benzo[b]fluoranthene	3.32	10.0	--- U	--- U
6. Benzo[k]fluoranthene	4.23	10.0	--- U	--- U
7. Benzo[g,h,i]perylene	2.61	10.0	--- U	--- U
8. Benzo[a]pyrene	3.27	10.0	--- U	--- U
9. 4-Bromophenyl Phenyl Ether	2.63	10.0	--- U	--- U
10. Butyl Benzyl Phthalate	5.78	10.0	--- U	--- U
11. Bis-(2-Chloroethoxy) Methane	3.14	10.0	--- U	--- U
12. Bis-(2-Chloroethyl) Ether	2.58	10.0	--- U	--- U
13. Bis-(2-Chloroisopropyl) Ether	2.58	10.0	--- U	--- U
14. 2-Chloronaphthalene	2.17	10.0	--- U	--- U
15. 4-Chlorophenyl Phenyl Ether	2.42	10.0	--- U	--- U
16. Chrysene	4.04	10.0	--- U	--- U
17. Dibenzo[a,h]anthracene	2.78	10.0	--- U	--- U
18. Di-N-Butyl Phthalate	3.09	10.0	--- U	--- U
19. Dimethyl Phthalate	3.78	10.0	--- U	--- U
20. Diethyl Phthalate	3.92	10.0	--- U	--- U
21. 2,4-Dinitrotoluene	3.95	10.0	--- U	--- U
22. 2,6-Dinitrotoluene	3.88	10.0	--- U	--- U
23. Di-N-Octyl Phthalate	2.81	10.0	--- U	--- U
24. Bis-(2-Ethylhexyl) Phthalate	9.97	15.0	--- U	--- U
25. Fluoranthene	3.92	10.0	--- U	--- U
26. Fluorene	2.95	10.0	--- U	--- U
27. Hexachlorobenzene	2.61	10.0	--- U	--- U
28. Hexachlorocyclopentadiene	4.16	10.0	--- U	--- U
29. Indeno[1,2,3-Cd]pyrene	2.91	10.0	--- U	--- U
30. Isophorone	3.74	10.0	--- U	--- U
31. Nitrobenzene	2.85	10.0	--- U	--- U
32. N-Nitrosodimethylamine	4.25	10.0	--- U	--- U
33. N-Nitrosodiphenylamine	3.95	10.0	--- U	--- U
34. N-Nitrosodi-N-Propylamine	4.06	10.0	--- U	--- U
35. Phenanthrene	3.24	10.0	--- U	--- U
36. Pyrene	3.63	10.0	--- U	--- U
37. 4-Chloro-3-Methylphenol	3.79	20.0	--- U	--- U
38. 2-Chlorophenol	2.75	10.0	--- U	--- U
39. O-Cresol	3.68	10.0	--- U	--- U
40. P-Cresol	4.12	10.0	--- U	--- U
41. 2,4-Dichlorophenol	5.19	10.0	--- U	--- U
42. 2,6-Dichlorophenol	4.89	10.0	--- U	--- U
43. 2,4-Dimethylphenol	3.21	10.0	--- U	--- U
44. 4,6-Dinitro-2-Methylphenol	4.77	50.0	--- U	--- U
45. 2,4-Dinitrophenol	4.37	50.0	--- U	--- U
46. Ethyl Methanesulfonate	5.26	20.0	--- U	--- U
47. Methyl Methanesulfonate	4.92	10.0	--- U	--- U
48. 2-Nitrophenol	3.64	10.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/25/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY: _____

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A
49. 4-Nitrophenol	3.17	50.0	--- U	--- U
50. Pentachlorophenol	5.33	25.0	--- U	--- U
51. Phenol	1.86	10.0	--- U	--- U
52. 2,3,4,6-Tetrachlorophenol	3.12	10.0	--- U	--- U
53. 2,4,5-Trichlorophenol	4.17	10.0	--- U	--- U
54. 2,4,6-Trichlorophenol	3.84	10.0	--- U	--- U
55. Acetophenone	2.89	10.0	--- U	--- U
56. 2-Acetylaminofluorene	3.98	20.0	--- U	--- U
57. 4-Aminobiphenyl	4.12	20.0	--- U	--- U
58. Benzyl Alcohol	4.47	20.0	--- U	--- U
59. 4-Chloroaniline	3.36	20.0	--- U	--- U
60. Chlorobenzilate	5.12	10.0	--- U	--- U
61. Diallate	2.98	10.0	--- U	--- U
62. Dibenzofuran	4.28	10.0	--- U	--- U
63. 3,3-Dichlorobenzidine	4.22	20.0	--- U	--- U
64. Dimethoate	3.98	20.0	--- U	--- U
65. P-Dimethylaminoazobenzene	2.89	10.0	--- U	--- U
66. 7,12-Dimethylbenz[a]anthracene	5.26	10.0	--- U	--- U
67. 3,3-Dimethylbenzadine	3.21	10.0	--- U	--- U
68. 1,3-Dinitrobenzene	2.89	20.0	--- U	--- U
69. Diphenylamine	5.10	10.0	--- U	--- U
70. Disulfoton	4.28	10.0	--- U	--- U
71. Famphur	3.98	20.0	--- U	--- U
72. Hexachloropropene	4.31	10.0	--- U	--- U
73. Isosafrole	2.88	10.0	--- U	--- U
74. Kepone	2.78	20.0	--- U	--- U
75. Methapyrilene	3.54	100.0	--- U	--- U
76. 3-Methylchloroanthrene	4.21	10.0	--- U	--- U
77. 2-Methylnaphthalene	3.79	10.0	--- U	--- U
78. Methyl Parathion	4.32	10.0	--- U	--- U
79. m-Cresol	3.81	10.0	--- U	--- U
80. 1,4-Naphthoquinone	4.00	10.0	--- U	--- U
81. 1-Naphthylamine	5.61	10.0	--- U	--- U
82. 2-Naphthylamine	4.62	10.0	--- U	--- U
83. 2-Nitroaniline	3.61	50.0	--- U	--- U
84. 3-Nitroaniline	4.81	50.0	--- U	--- U
85. 4-Nitroaniline	4.22	20.0	--- U	--- U
86. 5-Nitro-O-Toluidine	4.01	10.0	--- U	--- U
87. N-Nitrosodi-n-butylamine	3.63	10.0	--- U	--- U
88. N-Nitrosodiethylamine	3.83	20.0	--- U	--- U
89. N-Nitrosomethylethylamine	3.83	10.0	--- U	--- U
90. N-Nitrosopiperidine	5.19	20.0	--- U	--- U
91. N-Nitrosopyrrolidine	2.89	10.0	--- U	--- U
92. Parathion	3.12	10.0	--- U	--- U
93. Pentachlorobenzene	3.92	10.0	--- U	--- U
94. Pentachloronitrobenzene	3.71	20.0	--- U	--- U
95. Phenacetin	4.41	20.0	--- U	--- U
96. 1,4 Benzenediamine	2.99	10.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/25/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY: _____

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A
97. Phorate	3.86	10.0	--- U	--- U
98. Pronamide	3.69	10.0	--- U	--- U
99. Safrole	4.12	10.0	--- U	--- U
100. 1,2,4,5-Tetrachlorobenzene	5.01	10.0	--- U	--- U
101. Thionazin	4.62	20.0	--- U	--- U
102. O-Toluidine	4.11	10.0	--- U	--- U
103. 1,3,5-Trinitrobenzene	3.98	10.0	--- U	--- U
104. 0,0,0-Triethyl Phosphorothioate	3.61	10.0	--- U	--- U
105. Hexachloroethane	1.49	10.0	--- U	--- U
106. Isodrin	3.11	20.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/25/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A	Equipment Blank	Trip Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	1.80	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	0.90 J	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	0.70 J	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	0.70 J	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	1.00 J	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	2.90 J	18.90	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	0.60 J	64.90	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U	2.30 J	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	--- U	4.80	--- U	--- U
21. 1,2-Dichloroethane	0.21	1.0	--- U	0.40 J	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	35.50	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	1.00	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	1.50	72.10	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	1.80 J	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	2.80	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	1.50 J	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U
48. Acrolein	40.57	53.0	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/25/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-15R	MW-16A	Equipment Blank	Trip Blank
49. Allyl Chloride	0.20	10.0	--- U	--- U	--- U	--- U
50. Chloroprene	0.21	20.0	--- U	--- U	--- U	--- U
51. 1,3-Dichlorobenzene	0.41	5.0	--- U	--- U	--- U	--- U
52. Dichlorodifluoromethane	0.51	5.0	--- U	17.20	--- U	--- U
53. 1,3-Dichloropropane	0.28	1.0	--- U	--- U	--- U	--- U
54. 2,2-Dichloropropane	0.17	15.0	--- U	--- U	--- U	--- U
55. 1,1-Dichloropropene	0.22	5.0	--- U	--- U	--- U	--- U
56. Ethyl Methacrylate	0.16	10.0	--- U	--- U	--- U	--- U
57. Hexachlorobutadiene	0.57	10.0	--- U	--- U	--- U	--- U
58. Isobutyl Alcohol	12.80	100.0	--- U	--- U	--- U	--- U
59. Methacrylonitrile	1.93	100.0	--- U	--- U	--- U	--- U
60. Methyl Methacrylate	0.25	30.0	--- U	--- U	--- U	--- U
61. Naphthalene	0.47	10.0	--- U	--- U	--- U	--- U
62. Propionitrile	3.26	150.0	--- U	--- U	--- U	--- U
63. 1,2,4-Trichlorobenzene	0.50	10.0	--- U	--- U	--- U	--- U
64. Acetonitrile	36.29	55.0	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 **Week: 35**

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	BOD	COD	Nitrate	TOC	Chloride	Metals	Turbidity	Sulfide	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	EPA 8270D
CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)										<2		<2							<2	<2	
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P	P	P	P		G	G	G
CHEMICAL PRESERVATION						A	A	C	A	C	A	A	A	F	A	A	A		E	E	A
MW-1	8-25-15	0930		18	5	G						G	G		G	G	G	G	G	G	
[redacted]																					
[redacted]					16																
[redacted]																					
[redacted]																					
MW-7D	8-25-15	1140		21	5	G						G	G		G	G	G	G	G	G	
MW-15R	8-25-15	1115		19	9	G						G	G		G	G	G	G			G
MW-16A	8-25-15	1045		19	9	G						G	G		G	G	G	G			G
Equipment Blank	8-25-15	1035			2																
Trip Blank	8-25-15				2																

PARAMETERS/TESTS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beagle

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-25-15 2:00	[signature]	8/25/15 200
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 305140

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 **Week: 35**

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB): <2 <2 <2

CONTAINER TYPE, P/G: G G G G G G P P

CHEMICAL PRESERVATION: A A E E E A A A

PARAMETERS/TESTS: A - NONE, B - HNO_3, C - H_2SO_4, D - NAOH, E - HCL, F - ZINC ACETATE/NAOH, G - NA THIOSULFATE

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	8270D Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8260 App. II 2	8151A Landfill	CO2	ORP
MW-1	8-25-15	0930		18	5								G
[redacted]					15								
[redacted]					14								
[redacted]					16								
M[redacted]					15								
[redacted]					11								
MW-7D	8-25-15	1140			5								G
MW-15R	8-25-15	1115			9	G	G	G	G		G		G
MW-16A	8-25-15	1045			9	G	G	G	G		G		G
Equipment Blank	8-25-15	1035			2			G	G				
Trip Blank	8-25-15				2			G	G				

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beasley

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-25-15 2:06	[signature]	8/25/15 2:00
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 305139

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6015

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 08/26/15
DATE REPORTED : 10/01/15

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.1	6.4	6.1	6.4	6.1	08/26/15	BF	4500HB-00
BOD, mg/l	2.0	2.0	--- U	--- U	--- U	3.2	--- U	08/27/15	CMC	5210B-01
COD, mg/l	20.0	20.0	--- U	--- U	20	--- U		08/31/15	SEJ	H8000-79
Nitrate Nitrogen as N, mg/l	0.04	10.0	--- U	--- U	0.08 J	--- U		08/28/15	AKS	353.2 R2-9
Total Organic Carbon, mg/l	0.085	1.0	2.88	--- U	--- U	1.91		09/03/15	SEJ	5310C-00
Chloride, mg/l	5.0	5.0	7	10	7	--- U		08/31/15	SDB	4500CLB-97
Antimony, ug/l	0.02	6.0	--- U	0.72 J	0.06 J	0.20 J	0.03 J	09/11/15	LFJ	EPA200.8
Arsenic, ug/l	0.14	10.0	1.8 J	3.1 J	--- U	2.5 J	--- U	09/11/15	LFJ	EPA200.8
Barium, ug/l	0.01	100.0	113	117	81.8 J	27.1 J	560	09/11/15	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	0.33 J	0.09 J	0.10 J	0.07 J	0.32 J	09/11/15	LFJ	EPA200.8
Cadmium, ug/l	0.01	1.0	--- U	--- U	--- U	--- U	0.40 J	09/11/15	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	8.3 J	7.6 J	0.05 J	2.5 J	2.8 J	09/11/15	LFJ	EPA200.8
Total Chromium, ug/l	0.12	10.0	--- U	--- U	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	0.18 J	0.11 J	0.23 J	0.17 J	0.23 J	09/11/15	LFJ	EPA200.8
Iron, ug/l	8.64	300.0	27928	6585	--- U	70338		09/10/15	LFJ	EPA200.7
Lead, ug/l	0.03	10.0	--- U	--- U	--- U	0.04 J	--- U	09/11/15	LFJ	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U	--- U	--- U	--- U	08/28/15	MTM	245.1 R3-9
Nickel, ug/l	0.01	50.0	0.73 J	1.4 J	0.50 J	0.33 J	1.7 J	09/11/15	LFJ	EPA200.8
Selenium, ug/l	0.22	10.0	--- U	--- U	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Silver, ug/l	0.01	10.0	0.01 J	0.02 J	0.01 J	0.02 J	--- U	09/11/15	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U	--- U	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Tin, ug/l	0.06	100.0	--- U	--- U	--- U	--- U	0.14 J	09/11/15	LFJ	EPA200.8
Vanadium, ug/l	0.22	25.0	--- U	--- U	--- U	--- U	--- U	09/11/15	LFJ	EPA200.8
Zinc, ug/l	0.20	10.0	--- U	1.8 J	1.5 J	--- U	3.7 J	09/11/15	LFJ	EPA200.8
Turbidity, NTU	1.0	1.0	54.0	34.0	2.3	350	3.4	08/27/15	SDB	2130B-01
Sulfide, ug/l	100	1000	--- U	--- U	--- U	--- U		09/01/15	LFJ	4500S2D-00
Conductivity (at 25c), uMhos/cm	1.0	1.0	254	413	183	357	423	08/26/15	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	0.41	0.79	0.35	0.39	1.59	08/26/15	BF	4500OG-01
Temperature, °C			21	21	18	19	18	08/26/15	BF	2550B-00
Static Water Level, feet			6.81	6.41	9.72	10.31	13.60	08/26/15	BF	
Well Depth, feet			16.91	41.20	52.20	22.29	42.00	08/26/15	BF	
Carbon Dioxide, mg/l	1.0	1.0	193	122	87	175	212	08/27/15	SEJ	4500CO2C
ORP, mv			+11	+24	+58	-25	+63	08/26/15	BF	2580B

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/29/15
DATE ANALYZED: 09/30/15
DATE REPORTED: 10/01/15

REVIEWED BY:

PESTICIDES AND PCB'S
EPA METHOD 8081B R2(07)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
1. Aldrin	0.029	0.05	--- U	--- U	--- U	--- U	--- U
2. Alpha-BHC	0.032	0.05	--- U	--- U	--- U	--- U	--- U
3. Beta-BHC	0.031	0.05	--- U	--- U	--- U	--- U	--- U
4. Delta-BHC	0.030	0.05	--- U	--- U	--- U	--- U	--- U
5. Gamma-BHC (Lindane)	0.032	0.05	--- U	--- U	--- U	--- U	--- U
6. Chlordane	0.320	0.50	--- U	--- U	--- U	--- U	--- U
7. 4,4-DDD	0.051	0.10	--- U	--- U	--- U	--- U	--- U
8. 4,4-DDE	0.049	0.10	--- U	--- U	--- U	--- U	--- U
9. 4,4-DDT	0.052	0.10	--- U	--- U	--- U	--- U	--- U
10. Dieldrin	0.042	0.075	--- U	--- U	--- U	--- U	--- U
11. Endosulfan I	0.056	0.10	--- U	--- U	--- U	--- U	--- U
12. Endosulfan II	0.046	0.10	--- U	--- U	--- U	--- U	--- U
13. Endosulfan Sulfate	0.072	0.10	--- U	--- U	--- U	--- U	--- U
14. Endrin	0.053	0.10	--- U	--- U	--- U	--- U	--- U
15. Endrin Aldehyde	0.068	0.10	--- U	--- U	--- U	--- U	--- U
16. Heptachlor	0.039	0.05	--- U	--- U	--- U	--- U	--- U
17. Heptachlor Epoxide	0.042	0.075	--- U	--- U	--- U	--- U	--- U
18. Methoxychlor	0.530	1.00	--- U	--- U	--- U	--- U	--- U
19. Pcb's (Aroclors)	0.500	2.00	--- U	--- U	--- U	--- U	--- U
20. Toxaphene	0.690	1.50	--- U	--- U	--- U	--- U	--- U

NOTE: EPA METHOD 8081B R2 (07): MW-2AD surrogate recovery exceeded control limits due to matrix effects.

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 09/01/15
DATE ANALYZED: 09/08/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8151A R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
1. 2,4-D	0.36	2.0	--- U	--- U	--- U	--- U	--- U
2. Dinoseb	0.54	1.0	--- U	--- U	--- U	--- U	--- U
3. 2,4,5-TP	0.42	2.0	--- U	--- U	--- U	--- U	--- U
4. 2,4,5-T	0.47	2.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
1. Acenaphthene	2.66	10.0	--- U	--- U	--- U	--- U	--- U
2. Acenaphthylene	2.60	10.0	--- U	--- U	--- U	--- U	--- U
3. Anthracene	2.97	10.0	--- U	--- U	--- U	--- U	--- U
4. Benzo[a]antrhacene	4.16	10.0	--- U	--- U	--- U	--- U	--- U
5. Benzo[b]fluoranthene	3.32	10.0	--- U	--- U	--- U	--- U	--- U
6. Benzo[k]fluoranthene	4.23	10.0	--- U	--- U	--- U	--- U	--- U
7. Benzo[g,h,i]perylene	2.61	10.0	--- U	--- U	--- U	--- U	--- U
8. Benzo[a]pyrene	3.27	10.0	--- U	--- U	--- U	--- U	--- U
9. 4-Bromophenyl Phenyl Ether	2.63	10.0	--- U	--- U	--- U	--- U	--- U
10. Butyl Benzyl Phthalate	5.78	10.0	--- U	--- U	--- U	--- U	--- U
11. Bis-(2-Chloroethoxy) Methane	3.14	10.0	--- U	--- U	--- U	--- U	--- U
12. Bis-(2-Chloroethyl) Ether	2.58	10.0	--- U	--- U	--- U	--- U	--- U
13. Bis-(2-Chloroisopropyl) Ether	2.58	10.0	--- U	--- U	--- U	--- U	--- U
14. 2-Chloronaphthalene	2.17	10.0	--- U	--- U	--- U	--- U	--- U
15. 4-Chlorophenyl Phenyl Ether	2.42	10.0	--- U	--- U	--- U	--- U	--- U
16. Chrysene	4.04	10.0	--- U	--- U	--- U	--- U	--- U
17. Dibenzo[a,h]anthracene	2.78	10.0	--- U	--- U	--- U	--- U	--- U
18. Di-N-Butyl Phthalate	3.09	10.0	--- U	--- U	--- U	--- U	--- U
19. Dimethyl Phthalate	3.78	10.0	--- U	--- U	--- U	--- U	--- U
20. Diethyl Phthalate	3.92	10.0	--- U	--- U	--- U	--- U	--- U
21. 2,4-Dinitrotoluene	3.95	10.0	--- U	--- U	--- U	--- U	--- U
22. 2,6-Dinitrotoluene	3.88	10.0	--- U	--- U	--- U	--- U	--- U
23. Di-N-Octyl Phthalate	2.81	10.0	--- U	--- U	--- U	--- U	--- U
24. Bis-(2-Ethylhexyl) Phthalate	9.97	15.0	--- U	--- U	--- U	--- U	--- U
25. Fluoranthene	3.92	10.0	--- U	--- U	--- U	--- U	--- U
26. Fluorene	2.95	10.0	--- U	--- U	--- U	--- U	--- U
27. Hexachlorobenzene	2.61	10.0	--- U	--- U	--- U	--- U	--- U
28. Hexachlorocyclopentadiene	4.16	10.0	--- U	--- U	--- U	--- U	--- U
29. Indeno[1,2,3-Cd]pyrene	2.91	10.0	--- U	--- U	--- U	--- U	--- U
30. Isophorone	3.74	10.0	--- U	--- U	--- U	--- U	--- U
31. Nitrobenzene	2.85	10.0	--- U	--- U	--- U	--- U	--- U
32. N-Nitrosodimethylamine	4.25	10.0	--- U	--- U	--- U	--- U	--- U
33. N-Nitrosodiphenylamine	3.95	10.0	--- U	--- U	--- U	--- U	--- U
34. N-Nitrosodi-N-Propylamine	4.06	10.0	--- U	--- U	--- U	--- U	--- U
35. Phenanthrene	3.24	10.0	--- U	--- U	--- U	--- U	--- U
36. Pyrene	3.63	10.0	--- U	--- U	--- U	--- U	--- U
37. 4-Chloro-3-Methylphenol	3.79	20.0	--- U	--- U	--- U	--- U	--- U
38. 2-Chlorophenol	2.75	10.0	--- U	--- U	--- U	--- U	--- U
39. O-Cresol	3.68	10.0	--- U	--- U	--- U	--- U	--- U
40. P-Cresol	4.12	10.0	--- U	--- U	--- U	--- U	--- U
41. 2,4-Dichlorophenol	5.19	10.0	--- U	--- U	--- U	--- U	--- U
42. 2,6-Dichlorophenol	4.89	10.0	--- U	--- U	--- U	--- U	--- U
43. 2,4-Dimethylphenol	3.21	10.0	--- U	--- U	--- U	--- U	--- U
44. 4,6-Dinitro-2-Methylphenol	4.77	50.0	--- U	--- U	--- U	--- U	--- U
45. 2,4-Dinitrophenol	4.37	50.0	--- U	--- U	--- U	--- U	--- U
46. Ethyl Methanesulfonate	5.26	20.0	--- U	--- U	--- U	--- U	--- U
47. Methyl Methanesulfonate	4.92	10.0	--- U	--- U	--- U	--- U	--- U
48. 2-Nitrophenol	3.64	10.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
49. 4-Nitrophenol	3.17	50.0	--- U	--- U	--- U	--- U	--- U
50. Pentachlorophenol	5.33	25.0	--- U	--- U	--- U	--- U	--- U
51. Phenol	1.86	10.0	--- U	--- U	--- U	--- U	--- U
52. 2,3,4,6-Tetrachlorophenol	3.12	10.0	--- U	--- U	--- U	--- U	--- U
53. 2,4,5-Trichlorophenol	4.17	10.0	--- U	--- U	--- U	--- U	--- U
54. 2,4,6-Trichlorophenol	3.84	10.0	--- U	--- U	--- U	--- U	--- U
55. Acetophenone	2.89	10.0	--- U	--- U	--- U	--- U	--- U
56. 2-Acetylaminofluorene	3.98	20.0	--- U	--- U	--- U	--- U	--- U
57. 4-Aminobiphenyl	4.12	20.0	--- U	--- U	--- U	--- U	--- U
58. Benzyl Alcohol	4.47	20.0	--- U	--- U	--- U	--- U	--- U
59. 4-Chloroaniline	3.36	20.0	--- U	--- U	--- U	--- U	--- U
60. Chlorobenzilate	5.12	10.0	--- U	--- U	--- U	--- U	--- U
61. Diallate	2.98	10.0	--- U	--- U	--- U	--- U	--- U
62. Dibenzofuran	4.28	10.0	--- U	--- U	--- U	--- U	--- U
63. 3,3-Dichlorobenzidine	4.22	20.0	--- U	--- U	--- U	--- U	--- U
64. Dimethoate	3.98	20.0	--- U	--- U	--- U	--- U	--- U
65. P-Dimethylaminoazobenzene	2.89	10.0	--- U	--- U	--- U	--- U	--- U
66. 7,12-Dimethylbenz[a]anthracene	5.26	10.0	--- U	--- U	--- U	--- U	--- U
67. 3,3-Dimethylbenzadine	3.21	10.0	--- U	--- U	--- U	--- U	--- U
68. 1,3-Dinitrobenzene	2.89	20.0	--- U	--- U	--- U	--- U	--- U
69. Diphenylamine	5.10	10.0	--- U	--- U	--- U	--- U	--- U
70. Disulfoton	4.28	10.0	--- U	--- U	--- U	--- U	--- U
71. Famphur	3.98	20.0	--- U	--- U	--- U	--- U	--- U
72. Hexachloropropene	4.31	10.0	--- U	--- U	--- U	--- U	--- U
73. Isosafrole	2.88	10.0	--- U	--- U	--- U	--- U	--- U
74. Kepone	2.78	20.0	--- U	--- U	--- U	--- U	--- U
75. Methapyrilene	3.54	100.0	--- U	--- U	--- U	--- U	--- U
76. 3-Methylchloroanthrene	4.21	10.0	--- U	--- U	--- U	--- U	--- U
77. 2-Methylnaphthalene	3.79	10.0	--- U	--- U	--- U	--- U	--- U
78. Methyl Parathion	4.32	10.0	--- U	--- U	--- U	--- U	--- U
79. m-Cresol	3.81	10.0	--- U	--- U	--- U	--- U	--- U
80. 1,4-Naphthoquinone	4.00	10.0	--- U	--- U	--- U	--- U	--- U
81. 1-Naphthylamine	5.61	10.0	--- U	--- U	--- U	--- U	--- U
82. 2-Naphthylamine	4.62	10.0	--- U	--- U	--- U	--- U	--- U
83. 2-Nitroaniline	3.61	50.0	--- U	--- U	--- U	--- U	--- U
84. 3-Nitroaniline	4.81	50.0	--- U	--- U	--- U	--- U	--- U
85. 4-Nitroaniline	4.22	20.0	--- U	--- U	--- U	--- U	--- U
86. 5-Nitro-O-Toluidine	4.01	10.0	--- U	--- U	--- U	--- U	--- U
87. N-Nitrosodi-n-butylamine	3.63	10.0	--- U	--- U	--- U	--- U	--- U
88. N-Nitrosodiethylamine	3.83	20.0	--- U	--- U	--- U	--- U	--- U
89. N-Nitrosomethylethylamine	3.83	10.0	--- U	--- U	--- U	--- U	--- U
90. N-Nitrosopiperidine	5.19	20.0	--- U	--- U	--- U	--- U	--- U
91. N-Nitrosopyrrolidine	2.89	10.0	--- U	--- U	--- U	--- U	--- U
92. Parathion	3.12	10.0	--- U	--- U	--- U	--- U	--- U
93. Pentachlorobenzene	3.92	10.0	--- U	--- U	--- U	--- U	--- U
94. Pentachloronitrobenzene	3.71	20.0	--- U	--- U	--- U	--- U	--- U
95. Phenacetin	4.41	20.0	--- U	--- U	--- U	--- U	--- U
96. 1,4 Benzenediamine	2.99	10.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
97. Phorate	3.86	10.0	--- U	--- U	--- U	--- U	--- U
98. Pronamide	3.69	10.0	--- U	--- U	--- U	--- U	--- U
99. Safrole	4.12	10.0	--- U	--- U	--- U	--- U	--- U
100. 1,2,4,5-Tetrachlorobenzene	5.01	10.0	--- U	--- U	--- U	--- U	--- U
101. Thionazin	4.62	20.0	--- U	--- U	--- U	--- U	--- U
102. O-Toluidine	4.11	10.0	--- U	--- U	--- U	--- U	--- U
103. 1,3,5-Trinitrobenzene	3.98	10.0	--- U	--- U	--- U	--- U	--- U
104. 0,0,0-Triethyl Phosphorothioate	3.61	10.0	--- U	--- U	--- U	--- U	--- U
105. Hexachloroethane	1.49	10.0	--- U	--- U	--- U	--- U	--- U
106. Isodrin	3.11	20.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	13.50	23.70	--- U	4.00	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	1.00 J	--- U	0.90 J	0.60 J
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	0.40 J	0.40 J	0.40 J	--- U
7. Acetone	9.06	100.0	--- U	--- U	--- U	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U	--- U	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U	--- U	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U	--- U	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	0.40 J	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	7.70	22.40	9.70	11.00	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	1.90 J	33.30	14.60	8.30	0.30 J
15. 2-Butanone	2.21	100.0	--- U	--- U	--- U	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U	--- U	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U	--- U	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U	--- U	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U	--- U	--- U	--- U
20. Benzene	0.24	1.0	0.60 J	1.20	0.80 J	0.80 J	1.40
21. 1,2-Dichloroethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	0.40 J	10.20	2.30	1.60	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	0.40 J	0.50 J	0.40 J	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U	--- U	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U	--- U	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U	--- U	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U	--- U	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U	--- U	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	1.70	0.90 J	0.30 J	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U	--- U	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U	--- U	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U	--- U	--- U	--- U
34. Chlorobenzene	0.30	3.0	2.00 J	1.20 J	0.70 J	0.70 J	6.20
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U	--- U	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U	--- U	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U	--- U	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U	--- U	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U	--- U	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U	--- U	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U	--- U	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	1.00	1.70	0.70 J	0.60 J	2.60
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U	--- U	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U	--- U	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U	--- U	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U	--- U	--- U	--- U
48. Acrolein	40.57	53.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-2A	MW-2AD	MW-3D	MW-3AS	MW-6D
49. Allyl Chloride	0.20	10.0	--- U	--- U	--- U	--- U	--- U
50. Chloroprene	0.21	20.0	--- U	--- U	--- U	--- U	--- U
51. 1,3-Dichlorobenzene	0.41	5.0	--- U	--- U	--- U	--- U	--- U
52. Dichlorodifluoromethane	0.51	5.0	0.80 J	1.30 J	0.90 J	--- U	--- U
53. 1,3-Dichloropropane	0.28	1.0	--- U	--- U	--- U	--- U	--- U
54. 2,2-Dichloropropane	0.17	15.0	--- U	--- U	--- U	--- U	--- U
55. 1,1-Dichloropropene	0.22	5.0	--- U	--- U	--- U	--- U	--- U
56. Ethyl Methacrylate	0.16	10.0	--- U	--- U	--- U	--- U	--- U
57. Hexachlorobutadiene	0.57	10.0	--- U	--- U	--- U	--- U	--- U
58. Isobutyl Alcohol	12.80	100.0	--- U	--- U	--- U	--- U	--- U
59. Methacrylonitrile	1.93	100.0	--- U	--- U	--- U	--- U	--- U
60. Methyl Methacrylate	0.25	30.0	--- U	--- U	--- U	--- U	--- U
61. Naphthalene	0.47	10.0	--- U	--- U	--- U	--- U	--- U
62. Propionitrile	3.26	150.0	--- U	--- U	--- U	--- U	--- U
63. 1,2,4-Trichlorobenzene	0.50	10.0	--- U	--- U	--- U	--- U	--- U
64. Acetonitrile	36.29	55.0	--- U	--- U	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	Trip Blank
1. Chloromethane	0.77	1.0	--- U
2. Vinyl Chloride	0.63	1.0	--- U
3. Bromomethane	0.67	10.0	--- U
4. Chloroethane	0.48	10.0	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U
7. Acetone	9.06	100.0	--- U
8. Iodomethane	0.26	10.0	--- U
9. Carbon Disulfide	0.23	100.0	--- U
10. Methylene Chloride	0.64	1.0	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U
13. Vinyl Acetate	0.20	50.0	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U
15. 2-Butanone	2.21	100.0	--- U
16. Bromochloromethane	0.27	3.0	--- U
17. Chloroform	0.25	5.0	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U
20. Benzene	0.24	1.0	--- U
21. 1,2-Dichloroethane	0.21	1.0	--- U
22. Trichloroethene	0.23	1.0	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U
24. Bromodichloromethane	0.21	1.0	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U
27. Toluene	0.23	1.0	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U
30. Tetrachloroethene	0.17	1.0	--- U
31. 2-Hexanone	1.57	50.0	--- U
32. Dibromochloromethane	0.24	3.0	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U
34. Chlorobenzene	0.30	3.0	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U
36. Ethylbenzene	0.21	1.0	--- U
37. Xylenes	0.68	5.0	--- U
38. Dibromomethane	0.28	10.0	--- U
39. Styrene	0.19	1.0	--- U
40. Bromoform	0.20	3.0	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U
46. Acrylonitrile	2.72	200.0	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U
48. Acrolein	40.57	53.0	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	Trip Blank
49. Allyl Chloride	0.20	10.0	--- U
50. Chloroprene	0.21	20.0	--- U
51. 1,3-Dichlorobenzene	0.41	5.0	--- U
52. Dichlorodifluoromethane	0.51	5.0	--- U
53. 1,3-Dichloropropane	0.28	1.0	--- U
54. 2,2-Dichloropropane	0.17	15.0	--- U
55. 1,1-Dichloropropene	0.22	5.0	--- U
56. Ethyl Methacrylate	0.16	10.0	--- U
57. Hexachlorobutadiene	0.57	10.0	--- U
58. Isobutyl Alcohol	12.80	100.0	--- U
59. Methacrylonitrile	1.93	100.0	--- U
60. Methyl Methacrylate	0.25	30.0	--- U
61. Naphthalene	0.47	10.0	--- U
62. Propionitrile	3.26	150.0	--- U
63. 1,2,4-Trichlorobenzene	0.50	10.0	--- U
64. Acetonitrile	36.29	55.0	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 Week: 35

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	BOD	COD	Nitrate	TOC	Chloride	Metals	Turbidity	Sulfide	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	EPA 8270D
CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)							<2		<2		<2	>9							<2	<2	
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P	P	P	P		G	G	G
CHEMICAL PRESERVATION						A	A	C	A	C	A	A	A	F	A	A	A		E	E	A
[redacted]																					
MW-2A	8-26-15	1000		21	15	G	G	G	G	G	G	G	G	G	G	G	G	G			G
MW-2AD	8-26-15	1040		21	14	G	G	G	G	G	G	G	G	G	G	G	G	G			G
MW-3D	8-26-15	1230		18	16	G	G	G	G	G	G	G	G	G	G	G	G	G			G
MW-3AS	8-26-15	1310		19	15	G	G	G	G	G	G	G	G	G	G	G	G	G			G
MW-6D	8-26-15	1355		18	11	G	G					G	G		G	G	G	G			G
[redacted]					4																
[redacted]					8																
[redacted]																					
[redacted]					2																
Trip Blank					2																

PARAMETERS/TESTS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beasley

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-26-15 5:30	[signature]	8/27/15 820
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 **Week:** 35

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	8270D Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8260 App. II 2	8151A Land(ii)	CO2	ORP
CHLORINE NEUTRALIZED AT COLLECTION													
pH CHECK (LAB)													
CONTAINER TYPE, P/G						G	G	G	G	G	G	P	P
CHEMICAL PRESERVATION						A	A	E	E	E	A	A	A
[redacted]													
MW-2A	8-26-15	1000		21	15	G	G	G	G		G	G	G
MW-2AD	8-26-15	1040		21	14	G	G	G	G		G	G	G
MW-3D	8-26-15	1230		18	16	G	G	G	G	G	G	G	G
MW-3AS	8-26-15	1310		19	15	G	G	G	G	G	G	G	G
MW-6D	8-26-15	1355		18	11	G	G	G	G		G	G	G
[redacted]													
[redacted]													
[redacted]													
~~Equipment Blank~~					2								
Trip Blank					2								

PARAMETERS/TESTS

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beasley

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-26-15 5:36	[signature]	8/27/15 820
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested

FORM #5

No 207719

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6015 C

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 08/26/15
DATE REPORTED : 10/01/15

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-17	MW-18S	MW-18D	BP-3	BP-9	Analysis Date	Analyst	Method Code
PH (field measurement), Units			6.1	6.3				08/26/15	BF	4500HB-00
BOD, mg/l	2.0	2.0	--- U	--- U	--- U			08/27/15	CHC	5210B-01
Antimony, ug/l	0.02	6.0	--- U	--- U				09/11/15	LFJ	EPA200.8
Arsenic, ug/l	0.14	10.0	0.76 J	1.6 J				09/11/15	LFJ	EPA200.8
Barium, ug/l	0.01	100.0	109	76.7 J				09/11/15	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	2	0.07 J				09/11/15	LFJ	EPA200.8
Cadmium, ug/l	0.01	1.0	0.33 J	0.02 J				09/11/15	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	1.8 J	7.5 J				09/11/15	LFJ	EPA200.8
Total Chromium, ug/l	0.12	10.0	2.5 J	--- U				09/11/15	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	3.9 J	0.15 J				09/11/15	LFJ	EPA200.8
Lead, ug/l	0.03	10.0	9.2 J	--- U				09/11/15	LFJ	EPA200.8
Mercury, ug/l	0.05	0.20	--- U	--- U				08/28/15	MTM	245.1 R3-9
Nickel, ug/l	0.01	50.0	1.9 J	1.6 J				09/11/15	LFJ	EPA200.8
Selenium, ug/l	0.22	10.0	1.0 J	--- U				09/11/15	LFJ	EPA200.8
Silver, ug/l	0.01	10.0	0.13 J	--- U				09/11/15	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.09 J	--- U				09/11/15	LFJ	EPA200.8
Tin, ug/l	0.06	100.0	0.12 J	--- U				09/11/15	LFJ	EPA200.8
Vanadium, ug/l	0.22	25.0	8.7 J	--- U				09/11/15	LFJ	EPA200.8
Zinc, ug/l	0.20	10.0	43	3.7 J				09/11/15	LFJ	EPA200.8
Turbidity, NTU	1.0	1.0	430	130				08/27/15	SDB	2130B-01
Conductivity (at 25c), uMhos/cm	1.0	1.0	126	330				08/26/15	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	1.41	0.79				08/26/15	BF	4500OG-01
Temperature, °C			24	22				08/26/15	BF	2550B-00
Static Water Level, feet			6.30	6.13		32.36	28.02	08/26/15	BF	
Well Depth, feet			26.98	20.00				08/26/15	BF	
Carbon Dioxide, mg/l	1.0	1.0	60	79	18			08/27/15	SBJ	4500CO2C
ORP, mv			+40	-24				08/26/15	BF	2580B

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

ID#: 6015 C

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 08/26/15
DATE REPORTED : 10/01/15

REVIEWED BY:

PARAMETERS	MDL	SWSL	G-13	G-13D	Analysis Date	Analyst	Method Code
PH (field measurement), Units			5.2	6.0	08/26/15	BF	4500HB-00
BOD, mg/l	2.0	2.0	--- U		08/27/15	CMC	5210B-01
COD, mg/l	20.0	20.0	--- U		08/31/15	SEJ	H8000-79
Nitrate Nitrogen as N, mg/l	0.04	10.0	0.43 J		08/28/15	AKS	353.2 R2-93
Total Organic Carbon, mg/l	0.085	1.0	1.04		09/03/15	SEJ	5310C-00
Chloride, mg/l	5.0	5.0	7		08/31/15	SDB	4500CLB-97
Antimony, ug/l	0.02	6.0	0.05 J	0.51 J	09/11/15	LFJ	EPA200.8
Arsenic, ug/l	0.14	10.0	--- U	--- U	09/11/15	LFJ	EPA200.8
Barium, ug/l	0.01	100.0	56.3 J	47.8 J	09/11/15	LFJ	EPA200.8
Beryllium, ug/l	0.02	1.0	1	0.30 J	09/11/15	LFJ	EPA200.8
Cadmium, ug/l	0.01	1.0	0.12 J	0.63 J	09/11/15	LFJ	EPA200.8
Cobalt, ug/l	0.03	10.0	2.1 J	0.45 J	09/11/15	LFJ	EPA200.8
Total Chromium, ug/l	0.12	10.0	0.13 J	--- U	09/11/15	LFJ	EPA200.8
Copper, ug/l	0.02	10.0	0.29 J	4.3 J	09/11/15	LFJ	EPA200.8
Iron, ug/l	8.64	300.0	216 J		09/10/15	LFJ	EPA200.7
Lead, ug/l	0.03	10.0	--- U	0.60 J	09/11/15	LFJ	EPA200.8
Nickel, ug/l	0.01	50.0	0.41 J	1.1 J	09/11/15	LFJ	EPA200.8
Selenium, ug/l	0.22	10.0	--- U	--- U	09/11/15	LFJ	EPA200.8
Silver, ug/l	0.01	10.0	0.02 J	0.01 J	09/11/15	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.06 J	--- U	09/11/15	LFJ	EPA200.8
Vanadium, ug/l	0.22	25.0	--- U	--- U	09/11/15	LFJ	EPA200.8
Zinc, ug/l	0.20	10.0	1.9 J	12	09/11/15	LFJ	EPA200.8
Turbidity, NTU	1.0	1.0	2.9	23.0	08/27/15	SDB	2130B-01
Sulfide, ug/l	100	1000	--- U	--- U	09/01/15	LFJ	4500S2D-00
Conductivity (at 25c), uMhos/cm	1.0	1.0	76	76	08/26/15	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	0.96	5.46	08/26/15	BF	4500OG-01
Temperature, °C			19	19	08/26/15	BF	2550B-00
Static Water Level, feet			13.41	13.43	08/26/15	BF	
Well Depth, feet			21.49	56.70	08/26/15	BF	
Carbon Dioxide, mg/l	1.0	1.0	82		08/27/15	SEJ	4500CO2C
ORP, mv			+81	+74	08/26/15	BF	2580B

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/29/15
DATE ANALYZED: 09/30/15
DATE REPORTED: 10/01/15

REVIEWED BY:

PESTICIDES AND PCB'S
EPA METHOD 8081B R2(07)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
1. Aldrin	0.029	0.05	--- U	--- U
2. Alpha-BHC	0.032	0.05	--- U	--- U
3. Beta-BHC	0.031	0.05	--- U	--- U
4. Delta-BHC	0.030	0.05	--- U	--- U
5. Gamma-BHC (Lindane)	0.032	0.05	--- U	--- U
6. Chlordane	0.320	0.50	--- U	--- U
7. 4,4-DDD	0.051	0.10	--- U	--- U
8. 4,4-DDE	0.049	0.10	--- U	--- U
9. 4,4-DDT	0.052	0.10	--- U	--- U
10. Dieldrin	0.042	0.075	--- U	--- U
11. Endosulfan I	0.056	0.10	--- U	--- U
12. Endosulfan II	0.046	0.10	--- U	--- U
13. Endosulfan Sulfate	0.072	0.10	--- U	--- U
14. Endrin	0.053	0.10	--- U	--- U
15. Endrin Aldehyde	0.068	0.10	--- U	--- U
16. Heptachlor	0.039	0.05	--- U	--- U
17. Heptachlor Epoxide	0.042	0.075	--- U	--- U
18. Methoxychlor	0.530	1.00	--- U	--- U
19. Pcb's (Aroclors)	0.500	2.00	--- U	--- U
20. Toxaphene	0.690	1.50	--- U	--- U

NOTE: EPA METHOD 8081B R2 (07): MW-17 surrogate recovery exceeded control limits due to matrix effects.

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 09/01/15
DATE ANALYZED: 09/08/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8151A R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
1. 2,4-D	0.36	2.0	--- U	--- U
2. Dinoseb	0.54	1.0	--- U	--- U
3. 2,4,5-TP	0.42	2.0	--- U	--- U
4. 2,4,5-T	0.47	2.0	--- U	--- U

NOTE: EPA METHOD 8151A R1 (96): MW-17 surrogate recovery exceeded control limits.

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY: _____

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	G-13	G-13D
1. Chloromethane	0.77	1.0	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U
20. Benzene	0.24	1.0	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U
30. Tetrachloroethene	0.17	1.0	--- U	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	--- U
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY: _____

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
1. Acenaphthene	2.66	10.0	--- U	--- U
2. Acenaphthylene	2.60	10.0	--- U	--- U
3. Anthracene	2.97	10.0	--- U	--- U
4. Benzo[a]antrhacene	4.16	10.0	--- U	--- U
5. Benzo[b]fluoranthene	3.32	10.0	--- U	--- U
6. Benzo[k]fluoranthene	4.23	10.0	--- U	--- U
7. Benzo[g,h,i]perylene	2.61	10.0	--- U	--- U
8. Benzo[a]pyrene	3.27	10.0	--- U	--- U
9. 4-Bromophenyl Phenyl Ether	2.63	10.0	--- U	--- U
10. Butyl Benzyl Phthalate	5.78	10.0	--- U	--- U
11. Bis-(2-Chloroethoxy) Methane	3.14	10.0	--- U	--- U
12. Bis-(2-Chloroethyl) Ether	2.58	10.0	--- U	--- U
13. Bis-(2-Chloroisopropyl) Ether	2.58	10.0	--- U	--- U
14. 2-Chloronaphthalene	2.17	10.0	--- U	--- U
15. 4-Chlorophenyl Phenyl Ether	2.42	10.0	--- U	--- U
16. Chrysene	4.04	10.0	--- U	--- U
17. Dibenzo[a,h]anthracene	2.78	10.0	--- U	--- U
18. Di-N-Butyl Phthalate	3.09	10.0	--- U	--- U
19. Dimethyl Phthalate	3.78	10.0	--- U	--- U
20. Diethyl Phthalate	3.92	10.0	--- U	--- U
21. 2,4-Dinitrotoluene	3.95	10.0	--- U	--- U
22. 2,6-Dinitrotoluene	3.88	10.0	--- U	--- U
23. Di-N-Octyl Phthalate	2.81	10.0	--- U	--- U
24. Bis-(2-Ethylhexyl) Phthalate	9.97	15.0	--- U	--- U
25. Fluoranthene	3.92	10.0	--- U	--- U
26. Fluorene	2.95	10.0	--- U	--- U
27. Hexachlorobenzene	2.61	10.0	--- U	--- U
28. Hexachlorocyclopentadiene	4.16	10.0	--- U	--- U
29. Indeno[1,2,3-Cd]pyrene	2.91	10.0	--- U	--- U
30. Isophorone	3.74	10.0	--- U	--- U
31. Nitrobenzene	2.85	10.0	--- U	--- U
32. N-Nitrosodimethylamine	4.25	10.0	--- U	--- U
33. N-Nitrosodiphenylamine	3.95	10.0	--- U	--- U
34. N-Nitrosodi-N-Propylamine	4.06	10.0	--- U	--- U
35. Phenanthrene	3.24	10.0	--- U	--- U
36. Pyrene	3.63	10.0	--- U	--- U
37. 4-Chloro-3-Methylphenol	3.79	20.0	--- U	--- U
38. 2-Chlorophenol	2.75	10.0	--- U	--- U
39. O-Cresol	3.68	10.0	--- U	--- U
40. P-Cresol	4.12	10.0	--- U	--- U
41. 2,4-Dichlorophenol	5.19	10.0	--- U	--- U
42. 2,6-Dichlorophenol	4.89	10.0	--- U	--- U
43. 2,4-Dimethylphenol	3.21	10.0	--- U	--- U
44. 4,6-Dinitro-2-Methylphenol	4.77	50.0	--- U	--- U
45. 2,4-Dinitrophenol	4.37	50.0	--- U	--- U
46. Ethyl Methanesulfonate	5.26	20.0	--- U	--- U
47. Methyl Methanesulfonate	4.92	10.0	--- U	--- U
48. 2-Nitrophenol	3.64	10.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
49. 4-Nitrophenol	3.17	50.0	--- U	--- U
50. Pentachlorophenol	5.33	25.0	--- U	--- U
51. Phenol	1.86	10.0	--- U	--- U
52. 2,3,4,6-Tetrachlorophenol	3.12	10.0	--- U	--- U
53. 2,4,5-Trichlorophenol	4.17	10.0	--- U	--- U
54. 2,4,6-Trichlorophenol	3.84	10.0	--- U	--- U
55. Acetophenone	2.89	10.0	--- U	--- U
56. 2-Acetylaminofluorene	3.98	20.0	--- U	--- U
57. 4-Aminobiphenyl	4.12	20.0	--- U	--- U
58. Benzyl Alcohol	4.47	20.0	--- U	--- U
59. 4-Chloroaniline	3.36	20.0	--- U	--- U
60. Chlorobenzilate	5.12	10.0	--- U	--- U
61. Diallate	2.98	10.0	--- U	--- U
62. Dibenzofuran	4.28	10.0	--- U	--- U
63. 3,3-Dichlorobenzidine	4.22	20.0	--- U	--- U
64. Dimethoate	3.98	20.0	--- U	--- U
65. P-Dimethylaminoazobenzene	2.89	10.0	--- U	--- U
66. 7,12-Dimethylbenz[a]anthracene	5.26	10.0	--- U	--- U
67. 3,3-Dimethylbenzadine	3.21	10.0	--- U	--- U
68. 1,3-Dinitrobenzene	2.89	20.0	--- U	--- U
69. Diphenylamine	5.10	10.0	--- U	--- U
70. Disulfoton	4.28	10.0	--- U	--- U
71. Famphur	3.98	20.0	--- U	--- U
72. Hexachloropropene	4.31	10.0	--- U	--- U
73. Isosafrole	2.88	10.0	--- U	--- U
74. Kepone	2.78	20.0	--- U	--- U
75. Methapyrilene	3.54	100.0	--- U	--- U
76. 3-Methylchloroanthrene	4.21	10.0	--- U	--- U
77. 2-Methylnaphthalene	3.79	10.0	--- U	--- U
78. Methyl Parathion	4.32	10.0	--- U	--- U
79. m-Cresol	3.81	10.0	--- U	--- U
80. 1,4-Naphthoquinone	4.00	10.0	--- U	--- U
81. 1-Naphthylamine	5.61	10.0	--- U	--- U
82. 2-Naphthylamine	4.62	10.0	--- U	--- U
83. 2-Nitroaniline	3.61	50.0	--- U	--- U
84. 3-Nitroaniline	4.81	50.0	--- U	--- U
85. 4-Nitroaniline	4.22	20.0	--- U	--- U
86. 5-Nitro-O-Toluidine	4.01	10.0	--- U	--- U
87. N-Nitrosodi-n-butylamine	3.63	10.0	--- U	--- U
88. N-Nitrosodiethylamine	3.83	20.0	--- U	--- U
89. N-Nitrosomethylethylamine	3.83	10.0	--- U	--- U
90. N-Nitrosopiperidine	5.19	20.0	--- U	--- U
91. N-Nitrosopyrrolidine	2.89	10.0	--- U	--- U
92. Parathion	3.12	10.0	--- U	--- U
93. Pentachlorobenzene	3.92	10.0	--- U	--- U
94. Pentachloronitrobenzene	3.71	20.0	--- U	--- U
95. Phenacetin	4.41	20.0	--- U	--- U
96. 1,4 Benzenediamine	2.99	10.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: CHS
DATE COLLECTED: 08/26/15
DATE EXTRACTED: 08/27/15
DATE ANALYZED: 09/19/15
DATE REPORTED: 10/01/15

REVIEWED BY:

SEMI-VOLATILE ORGANICS
EPA METHOD 8270D R4(07)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
97. Phorate	3.86	10.0	--- U	--- U
98. Pronamide	3.69	10.0	--- U	--- U
99. Safrole	4.12	10.0	--- U	--- U
100. 1,2,4,5-Tetrachlorobenzene	5.01	10.0	--- U	--- U
101. Thionazin	4.62	20.0	--- U	--- U
102. O-Toluidine	4.11	10.0	--- U	--- U
103. 1,3,5-Trinitrobenzene	3.98	10.0	--- U	--- U
104. 0,0,0-Triethyl Phosphorothioate	3.61	10.0	--- U	--- U
105. Hexachloroethane	1.49	10.0	--- U	--- U
106. Isodrin	3.11	20.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
1. Chloromethane	0.77	1.0	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	3.60
3. Bromomethane	0.67	10.0	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	0.70 J
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U
7. Acetone	9.06	100.0	--- U	--- U
8. Iodomethane	0.26	10.0	--- U	--- U
9. Carbon Disulfide	0.23	100.0	--- U	--- U
10. Methylene Chloride	0.64	1.0	--- U	--- U
11. trans-1,2-Dichloroethene	0.23	5.0	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	5.10	6.20
13. Vinyl Acetate	0.20	50.0	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	3.50 J	--- U
15. 2-Butanone	2.21	100.0	--- U	--- U
16. Bromochloromethane	0.27	3.0	--- U	--- U
17. Chloroform	0.25	5.0	--- U	--- U
18. 1,1,1-Trichloroethane	0.19	1.0	--- U	--- U
19. Carbon Tetrachloride	0.22	1.0	--- U	--- U
20. Benzene	0.24	1.0	--- U	0.60 J
21. 1,2-Dichloroethane	0.21	1.0	--- U	--- U
22. Trichloroethene	0.23	1.0	1.20	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U
24. Bromodichloromethane	0.21	1.0	--- U	--- U
25. Cis-1,3-Dichloropropene	0.24	1.0	--- U	--- U
26. 4-Methyl-2-Pentanone	1.19	100.0	--- U	--- U
27. Toluene	0.23	1.0	--- U	--- U
28. trans-1,3-Dichloropropene	0.28	1.0	--- U	--- U
29. 1,1,2-Trichloroethane	0.25	1.0	--- U	--- U
30. Tetrachloroethene	0.17	1.0	1.00	--- U
31. 2-Hexanone	1.57	50.0	--- U	--- U
32. Dibromochloromethane	0.24	3.0	--- U	--- U
33. 1,2-Dibromoethane	0.26	1.0	--- U	--- U
34. Chlorobenzene	0.30	3.0	--- U	1.80 J
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U
36. Ethylbenzene	0.21	1.0	--- U	--- U
37. Xylenes	0.68	5.0	--- U	--- U
38. Dibromomethane	0.28	10.0	--- U	--- U
39. Styrene	0.19	1.0	--- U	--- U
40. Bromoform	0.20	3.0	--- U	--- U
41. 1,1,2,2-Tetrachloroethane	0.26	3.0	--- U	--- U
42. 1,2,3-Trichloropropane	0.43	1.0	--- U	--- U
43. 1,4-Dichlorobenzene	0.39	1.0	--- U	0.90 J
44. 1,2-Dichlorobenzene	0.32	5.0	--- U	--- U
45. 1,2-Dibromo-3-Chloropropane	0.34	13.0	--- U	--- U
46. Acrylonitrile	2.72	200.0	--- U	--- U
47. trans-1,4-Dichloro-2-Butene	0.42	100.0	--- U	--- U
48. Acrolein	40.57	53.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

P.O. BOX 7085, 114 OAKMONT DRIVE
GREENVILLE, N.C. 27835-7085

PHONE (252) 756-6208
FAX (252) 756-0633

CLIENT: HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX, NC 27839

CLIENT ID: 6015 C

ANALYST: MAO
DATE COLLECTED: 08/26/15
DATE ANALYZED: 08/29/15
DATE REPORTED: 10/01/15

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-17	MW-18S
49. Allyl Chloride	0.20	10.0	--- U	--- U
50. Chloroprene	0.21	20.0	--- U	--- U
51. 1,3-Dichlorobenzene	0.41	5.0	--- U	--- U
52. Dichlorodifluoromethane	0.51	5.0	1.60 J	--- U
53. 1,3-Dichloropropane	0.28	1.0	--- U	--- U
54. 2,2-Dichloropropane	0.17	15.0	--- U	--- U
55. 1,1-Dichloropropene	0.22	5.0	--- U	--- U
56. Ethyl Methacrylate	0.16	10.0	--- U	--- U
57. Hexachlorobutadiene	0.57	10.0	--- U	--- U
58. Isobutyl Alcohol	12.80	100.0	--- U	--- U
59. Methacrylonitrile	1.93	100.0	--- U	--- U
60. Methyl Methacrylate	0.25	30.0	--- U	--- U
61. Naphthalene	0.47	10.0	--- U	--- U
62. Propionitrile	3.26	150.0	--- U	--- U
63. 1,2,4-Trichlorobenzene	0.50	10.0	--- U	--- U
64. Acetonitrile	36.29	55.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quantitation Limits.

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 C **Week:** 35

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																			
pH CHECK (LAB)			<2		<2		<2	>9					<2	<2					
CONTAINER TYPE, P/G	P	P	P	P	P	P	P	P	P	P	P	P		G	G	G			
CHEMICAL PRESERVATION	A	A	C	A	C	A	A	A	F	A	A	A		E	E	A			
PARAMETERS/TESTS	Field pH	BOD	COD	Nitrate	TOC	Chloride	Metals	Turbidity	Sulfide	Conductivity	DO	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	EPA 8270D	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS
SAMPLE LOCATION / COLLECTION DATE / TIME																			
MW-17 B.F 26 8-25-15 1140	G	G					G	G		G	G	G	G			G		24	12
MW-18S B.F 26 8-25-15 0855	G	G					G	G		G	G	G	G			G		22	12
MW-18D C.F 26 8-25-15 0925		G																21	2
BP-3 8-26-15 1030													G						1
BP-9 8-26-15 1036													G						1
G-13 8-26-15 1435	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G			19	11
G-13D 8-26-15 1450	G						G	G	G	G	G	G	G	G	G			19	6

A - NONE D - NAOH
B - HNO_3 E - HCL
C - H_2SO_4 F - ZINC ACETATE/NAOH
G - NA THIOSULFATE

CLASSIFICATION:
☐ WASTEWATER (NPDES)
☐ DRINKING WATER
☐ DWQ/GW
☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beasley

SAMPLES RECEIVED IN LAB AT 8.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-26-15 5:30	[signature]	8/27/15 820
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

№ 297717

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858
environment1inc.com
Phone (252) 756-6208 • Fax (252) 756-0633

CHAIN OF CUSTODY RECORD

CLIENT: 6015 C **Week:** 35

HALIFAX CO. LANDFILL (CLOSED MSW)
GREG GRIFFIN
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																			
pH CHECK (LAB)			<2	<2															
CONTAINER TYPE, P/G	G	G	G	G	G	G	G	P	P										
CHEMICAL PRESERVATION	A	A	E	E	E	A	A	A	A										
PARAMETERS/TESTS	8270D Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8260 App. II 2	8151A Landfill	8151A Duplicate	CO2	ORP										

A - NONE, B - HNO_3, C - H_2SO_4, D - NAOH, E - HCL, F - ZINC ACETATE/NAOH, G - NA THIOSULFATE

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l OR ug/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	8270D Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8260 App. II 2	8151A Landfill	8151A Duplicate	CO2	ORP
MW-17	8-26-15	1140		24	12	G	G	G	G	G	G	G	G	G
MW-18S	8-26-15	0855		22	12	G	G	G	G	G	G	G	G	G
MW-18D	8-26-15	0925		21	2								G	
BP-3	8-26-15	1030			1									
BP-9	8-26-15	1036			1									
G-13	8-26-15	1435		19	11								G	G
G-13D	8-26-15	1435		19	6									G

CLASSIFICATION:
- ☐ WASTEWATER (NPDES)
- ☐ DRINKING WATER
- ☐ DWQ/GW
- ☒ SOLID WASTE SECTION

CHAIN OF CUSTODY (SEAL) MAINTAINED DURING SHIPMENT/DELIVERY: (Y) N

SAMPLES COLLECTED BY: (Please Print) Bobby Fox / Tom Beasley

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	8-26-15 5:30	[illegible]	8/27/15 820
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

PLEASE READ Instructions for completing this form on the reverse side.

Sampler must place a "C" for composite sample or a "G" for Grab sample in the blocks above for each parameter requested.

FORM #5

No 207716

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

September 10, 2015

Steve Jones
Environment 1, Inc.
PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

RE: **HALIFAX CO. / 6015**
Pace Workorder: 16524

Dear Steve Jones:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, August 28, 2015. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

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

Sincerely,

Robbin Robl 09/10/2015 RW 9-11-15
rrobl@microseeps.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email info@microseeps.com.

Total Number of Pages 31

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water and Solid & Hazardous Waste
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water; Solid and Chemical Materials
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water; Solid and Hazardous Waste
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 16524 HALIFAX CO. / 6015

Lab ID	Sample ID	Matrix	Date Collected	Date Received
165240001	MW2A	Water	8/26/2015 10:00	8/28/2015 10:00
165240002	MW2A	Bubble Strip	8/26/2015 10:00	8/28/2015 10:00
165240003	W2AD	Water	8/26/2015 10:40	8/28/2015 10:00
165240004	W2AD	Bubble Strip	8/26/2015 10:40	8/28/2015 10:00
165240005	MW3D	Water	8/26/2015 12:30	8/28/2015 10:00
165240006	MW3D	Bubble Strip	8/26/2015 12:30	8/28/2015 10:00
165240007	W3AS	Water	8/26/2015 13:10	8/28/2015 10:00
165240008	W3AS	Bubble Strip	8/26/2015 13:10	8/28/2015 10:00
165240009	MW6D	Water	8/26/2015 13:55	8/28/2015 10:00
165240010	MW6D	Bubble Strip	8/26/2015 13:55	8/28/2015 10:00
165240011	MW17	Water	8/26/2015 11:40	8/28/2015 10:00
165240012	MW17	Bubble Strip	8/26/2015 11:40	8/28/2015 10:00
165240013	W18S	Water	8/26/2015 08:55	8/28/2015 10:00
165240014	W18S	Bubble Strip	8/26/2015 08:55	8/28/2015 10:00
165240015	W18D	Water	8/26/2015 09:25	8/28/2015 10:00
165240016	W18D	Bubble Strip	8/26/2015 09:25	8/28/2015 10:00
165240017	G13	Water	8/26/2015 14:35	8/28/2015 10:00
165240018	G13	Bubble Strip	8/26/2015 14:35	8/28/2015 10:00

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

PROJECT SUMMARY

Workorder: 16524 HALIFAX CO. / 6015

Batch Comments

Batch: EDON/2625 - Low Level Volatile Fatty Acids

The method blank contain a concentration above the MDL, but below the PQL. Analyte Acetic, Formic and Butyric acid. Results for this analyte in associated samples may be bias high.

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240001** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **MW2A** Date Collected: 8/26/2015 10:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.014J**	mg/l	0.10	0.012	1	9/3/2015 23:01	KB	
Acetic Acid	**0.048J**	mg/l	0.070	0.0080	1	9/3/2015 23:01	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/3/2015 23:01	KB	
Butyric Acid	**0.019J**	mg/l	0.050	0.0070	1	9/3/2015 23:01	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/3/2015 23:01	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/3/2015 23:01	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/3/2015 23:01	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/3/2015 23:01	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/3/2015 23:01	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240002** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip
Sample ID: **MW2A** Date Collected: 8/26/2015 10:00

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**3000**	ug/l	0.015	0.0060	1	9/1/2015 04:56	TD	n
Ethane	**0.32**	ug/l	0.010	0.0010	1	9/1/2015 04:56	TD	n
Ethene	**0.49**	ug/l	0.010	0.0080	1	9/1/2015 04:56	TD	n
Hydrogen	**2.9**	nM	0.60	0.13	1	9/1/2015 04:56	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240003** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **W2AD** Date Collected: 8/26/2015 10:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.018J**	mg/l	0.10	0.012	1	9/4/2015 01:27	KB	
Acetic Acid	**0.039J**	mg/l	0.070	0.0080	1	9/4/2015 01:27	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 01:27	KB	
Butyric Acid	**0.021J**	mg/l	0.050	0.0070	1	9/4/2015 01:27	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 01:27	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 01:27	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 01:27	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 01:27	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 01:27	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240004** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip
Sample ID: **W2AD** Date Collected: 8/26/2015 10:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**1600**	ug/l	0.015	0.0060	1	9/1/2015 05:14	TD	n
Ethane	**1.3**	ug/l	0.010	0.0010	1	9/1/2015 05:14	TD	n
Ethene	**3.2**	ug/l	0.010	0.0080	1	9/1/2015 05:14	TD	n
Hydrogen	**2.7**	nM	0.60	0.13	1	9/1/2015 05:14	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240005** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **MW3D** Date Collected: 8/26/2015 12:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.014J**	mg/l	0.10	0.012	1	9/4/2015 02:15	KB	
Acetic Acid	**0.036J**	mg/l	0.070	0.0080	1	9/4/2015 02:15	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 02:15	KB	
Butyric Acid	**0.017J**	mg/l	0.050	0.0070	1	9/4/2015 02:15	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 02:15	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 02:15	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 02:15	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 02:15	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 02:15	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240006** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip

Sample ID: **MW3D** Date Collected: 8/26/2015 12:30

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**2100**	ug/l	0.015	0.0060	1	9/1/2015 05:27	TD	n
Ethane	**0.016**	ug/l	0.010	0.0010	1	9/1/2015 05:27	TD	n
Ethene	**0.0080U**	ug/l	0.010	0.0080	1	9/1/2015 05:27	TD	n
Hydrogen	**2.6**	nM	0.60	0.13	1	9/1/2015 05:27	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240007** Date Received: 8/28/2015 10:00 Matrix: Water

Sample ID: **W3AS** Date Collected: 8/26/2015 13:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.022J**	mg/l	0.10	0.012	1	9/4/2015 03:04	KB	
Acetic Acid	**0.055J**	mg/l	0.070	0.0080	1	9/4/2015 03:04	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 03:04	KB	
Butyric Acid	**0.018J**	mg/l	0.050	0.0070	1	9/4/2015 03:04	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 03:04	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 03:04	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 03:04	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 03:04	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 03:04	KB	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240008** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip
Sample ID: **W3AS** Date Collected: 8/26/2015 13:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**1500**	ug/l	0.015	0.0060	1	9/1/2015 05:39	TD	n
Ethane	**0.58**	ug/l	0.010	0.0010	1	9/1/2015 05:39	TD	n
Ethene	**0.21**	ug/l	0.010	0.0080	1	9/1/2015 05:39	TD	n
Hydrogen	**4.1**	nM	0.60	0.13	1	9/1/2015 05:39	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240009** Date Received: 8/28/2015 10:00 Matrix: Water

Sample ID: **MW6D** Date Collected: 8/26/2015 13:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.012U**	mg/l	0.10	0.012	1	9/4/2015 03:53	KB	
Acetic Acid	**0.022J**	mg/l	0.070	0.0080	1	9/4/2015 03:53	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 03:53	KB	
Butyric Acid	**0.0070U**	mg/l	0.050	0.0070	1	9/4/2015 03:53	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 03:53	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 03:53	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 03:53	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 03:53	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 03:53	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240010** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip

Sample ID: **MW6D** Date Collected: 8/26/2015 13:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**150**	ug/l	0.015	0.0060	1	9/1/2015 05:52	TD	n
Ethane	**0.61**	ug/l	0.010	0.0010	1	9/1/2015 05:52	TD	n
Ethene	**0.046**	ug/l	0.010	0.0080	1	9/1/2015 05:52	TD	n
Hydrogen	**2.7**	nM	0.60	0.13	1	9/1/2015 05:52	TD	n

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240011** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **MW17** Date Collected: 8/26/2015 11:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.012U**	mg/l	0.10	0.012	1	9/4/2015 04:41	KB	
Acetic Acid	**0.037J**	mg/l	0.070	0.0080	1	9/4/2015 04:41	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 04:41	KB	
Butyric Acid	**0.016J**	mg/l	0.050	0.0070	1	9/4/2015 04:41	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 04:41	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 04:41	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 04:41	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 04:41	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 04:41	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240012** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip
Sample ID: **MW17** Date Collected: 8/26/2015 11:40

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**1300**	ug/l	0.015	0.0060	1	9/1/2015 06:05	TD	n
Ethane	**0.014**	ug/l	0.010	0.0010	1	9/1/2015 06:05	TD	n
Ethene	**0.013**	ug/l	0.010	0.0080	1	9/1/2015 06:05	TD	n
Hydrogen	**3.1**	nM	0.60	0.13	1	9/1/2015 06:05	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240013** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **W18S** Date Collected: 8/26/2015 08:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.012U**	mg/l	0.10	0.012	1	9/4/2015 05:30	KB	
Acetic Acid	**0.066J**	mg/l	0.070	0.0080	1	9/4/2015 05:30	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 05:30	KB	
Butyric Acid	**0.019J**	mg/l	0.050	0.0070	1	9/4/2015 05:30	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 05:30	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 05:30	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 05:30	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 05:30	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 05:30	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240014** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip

Sample ID: **W18S** Date Collected: 8/26/2015 08:55

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**1200**	ug/l	0.015	0.0060	1	9/1/2015 06:17	TD	n
Ethane	**0.59**	ug/l	0.010	0.0010	1	9/1/2015 06:17	TD	n
Ethene	**0.048**	ug/l	0.010	0.0080	1	9/1/2015 06:17	TD	n
Hydrogen	**2.9**	nM	0.60	0.13	1	9/1/2015 06:17	TD	n

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240015** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **W18D** Date Collected: 8/26/2015 09:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.015J**	mg/l	0.10	0.012	1	9/4/2015 06:18	KB	
Acetic Acid	**0.042J**	mg/l	0.070	0.0080	1	9/4/2015 06:18	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 06:18	KB	
Butyric Acid	**0.020J**	mg/l	0.050	0.0070	1	9/4/2015 06:18	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 06:18	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 06:18	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 06:18	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 06:18	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 06:18	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240016** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip

Sample ID: **W18D** Date Collected: 8/26/2015 09:25

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**30**	ug/l	0.015	0.0060	1	9/1/2015 06:30	TD	n
Ethane	**0.015**	ug/l	0.010	0.0010	1	9/1/2015 06:30	TD	n
Ethene	**0.097**	ug/l	0.010	0.0080	1	9/1/2015 06:30	TD	n
Hydrogen	**2.8**	nM	0.60	0.13	1	9/1/2015 06:30	TD	n

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240017** Date Received: 8/28/2015 10:00 Matrix: Water
Sample ID: **G13** Date Collected: 8/26/2015 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
EDonors - MICR								
Analysis Desc: AM23G			Analytical Method: AM23G					
Lactic Acid	**0.012U**	mg/l	0.10	0.012	1	9/4/2015 07:07	KB	
Acetic Acid	**0.042J**	mg/l	0.070	0.0080	1	9/4/2015 07:07	KB	B
Propionic Acid	**0.011U**	mg/l	0.050	0.011	1	9/4/2015 07:07	KB	
Butyric Acid	**0.017J**	mg/l	0.050	0.0070	1	9/4/2015 07:07	KB	B
Pyruvic Acid	**0.0090U**	mg/l	0.15	0.0090	1	9/4/2015 07:07	KB	
i-Pentanoic Acid	**0.0080U**	mg/l	0.15	0.0080	1	9/4/2015 07:07	KB	
Pentanoic Acid	**0.014U**	mg/l	0.070	0.014	1	9/4/2015 07:07	KB	
i-Hexanoic Acid	**0.10U**	mg/l	0.20	0.10	1	9/4/2015 07:07	KB	
Hexanoic Acid	**0.12U**	mg/l	0.50	0.12	1	9/4/2015 07:07	KB	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 16524 HALIFAX CO. / 6015

Lab ID: **165240018** Date Received: 8/28/2015 10:00 Matrix: Bubble Strip

Sample ID: **G13** Date Collected: 8/26/2015 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - MICR								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Methane	**1.4**	ug/l	0.015	0.0060	1	9/1/2015 06:44	TD	n
Ethane	**0.0043J**	ug/l	0.010	0.0010	1	9/1/2015 06:44	TD	n
Ethene	**0.012**	ug/l	0.010	0.0080	1	9/1/2015 06:44	TD	n
Hydrogen	**2.6**	nM	0.60	0.13	1	9/1/2015 06:44	TD	n

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 16524 HALIFAX CO. / 6015

DEFINITIONS/QUALIFIERS

Disclaimer : The Pennsylvania Department of Environmental Protection (PADEP) has decided to no longer recognize analyses that do not produce data for primary compliance, for NELAP accreditation. The methods affected by this decision are AM20GAx, AM21G, SW846 7199 and AM4.02. The laboratory shall continue to administer the NELAP/TNI standard requirements in the performance of these methods.

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.
B	The analyte was detected in the associated blank.

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 16524 HALIFAX CO. / 6015

QC Batch: DISG/4812 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 165240002, 165240004, 165240006, 165240008, 165240010, 165240012, 165240014, 165240016, 165240018

METHOD BLANK: 36932

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.0060U	0.0060	n
Ethane	ug/l	0.0010U	0.0010	n
Ethene	ug/l	0.0080U	0.0080	n

METHOD BLANK: 36934

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.13U	0.13	n

LABORATORY CONTROL SAMPLE & LCSD: 36935 36938

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	8.3	8.0	8.0	96	97	80-120	1	20	n
Ethane	ug/l	6.5	6.2	6.3	97	97	80-120	0	20	n
Ethene	ug/l	16	16	16	96	96	80-120	0	20	n

LABORATORY CONTROL SAMPLE & LCSD: 36937 36940

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	22	22	89	89	80-120	0	20	n

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 16524 HALIFAX CO. / 6015

QC Batch: EDON/2625 Analysis Method: AM23G

QC Batch Method: AM23G

Associated Lab Samples: 165240001, 165240003, 165240005, 165240007, 165240009, 165240011, 165240013, 165240015, 165240017

METHOD BLANK: 36980

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EDonors				
Lactic Acid	mg/l	0.012U	0.012	
Acetic Acid	mg/l	0.038J	0.0080	B
Propionic Acid	mg/l	0.011U	0.011	
Butyric Acid	mg/l	0.018J	0.0070	B
Pyruvic Acid	mg/l	0.0090U	0.0090	
i-Pentanoic Acid	mg/l	0.0080U	0.0080	
Pentanoic Acid	mg/l	0.014U	0.014	
i-Hexanoic Acid	mg/l	0.10U	0.10	
Hexanoic Acid	mg/l	0.12U	0.12	

LABORATORY CONTROL SAMPLE: 36981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.0	98	70-130	
Acetic Acid	mg/l	2	2.0	102	70-130	B
Propionic Acid	mg/l	2	2.1	105	70-130	
Butyric Acid	mg/l	2	2.1	105	70-130	B
Pyruvic Acid	mg/l	2	1.9	96	70-130	
i-Pentanoic Acid	mg/l	2	2.0	101	70-130	
Pentanoic Acid	mg/l	2	2.0	99	70-130	
i-Hexanoic Acid	mg/l	2	2.0	99	70-130	
Hexanoic Acid	mg/l	2	1.9	96	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 36982 36983 Original: 165240001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
EDonors											
Lactic Acid	mg/l	0.014	2	2.0	2.0	101	101	70-130	0	30	
Acetic Acid	mg/l	0.048	2	2.1	2.2	104	106	70-130	1.9	30	B
Propionic Acid	mg/l	0.0053	2	2.2	2.2	107	108	70-130	0.93	30	

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 16524 HALIFAX CO. / 6015

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 36982 36983 Original: 165240001

Parameter	Units	Original Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Butyric Acid	mg/l	0.019	2	2.1	2.2	106	107	70-130	0.94	30	B
Pyruvic Acid	mg/l	0	2	2.0	2.0	99	99	70-130	0	30	
i-Pentanoic Acid	mg/l	0	2	2.1	2.1	104	104	70-130	0	30	
Pentanoic Acid	mg/l	0	2	2.0	2.1	103	103	70-130	0	30	
i-Hexanoic Acid	mg/l	0	2	2.1	2.1	107	107	70-130	0	30	
Hexanoic Acid	mg/l	0	2	2.1	2.1	106	104	70-130	1.9	30	

CERTIFICATE OF ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA QUALIFIERS

Workorder: 16524 HALIFAX CO. / 6015

QUALITY CONTROL PARAMETER QUALIFIERS

B	The analyte was detected in the associated blank.
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical Energy Services, LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 16524 HALIFAX CO. / 6015

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
165240002	MW2A			AM20GAX	DISG/4812
165240004	W2AD			AM20GAX	DISG/4812
165240006	MW3D			AM20GAX	DISG/4812
165240008	W3AS			AM20GAX	DISG/4812
165240010	MW6D			AM20GAX	DISG/4812
165240012	MW17			AM20GAX	DISG/4812
165240014	W18S			AM20GAX	DISG/4812
165240016	W18D			AM20GAX	DISG/4812
165240018	G13			AM20GAX	DISG/4812
165240001	MW2A			AM23G	EDON/2625
165240003	W2AD			AM23G	EDON/2625
165240005	MW3D			AM23G	EDON/2625
165240007	W3AS			AM23G	EDON/2625
165240009	MW6D			AM23G	EDON/2625
165240011	MW17			AM23G	EDON/2625
165240013	W18S			AM23G	EDON/2625
165240015	W18D			AM23G	EDON/2625
165240017	G13			AM23G	EDON/2625

CERTIFICATE OF ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Energy Services, LLC.

Pace Analytical®
www.pacelabs.com

220 William Pitt Way
Pittsburgh, PA 15238
412-826-5245

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Microseeps

16524

Page: 1 of 1

004791

Section A Required Client Information:

Company: ENVIRONMENT A
Address: 114 OAKMONT DR
GREENVILLE, NC 27858
Email To: JJONES01@AOL.COM
Phone: 252-756-6040 Fax: 252-756-0633
Requested Due Date/TAT:

Section B Required Project Information:

Report To: STEVE JONES
Copy To:
Purchase Order No.:
Project Name: HALIFAX CO.
Project Number: 6015

Section C Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference: SAME
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zinc Acetate & NaOH	Other	Analysis Test (Y/N)	HYDRO 25J	MORANONE/ETHANOL/GLYCOL	LLVOA	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW2A	WT	G						6														
2	W2AD																						
3	MW3D																						
4	W3AS																						
5	MW6D																						
6	MW17																						
7	W18S																						
8	W18D																						
9	G13																						
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Tom Beasley / E-1	8-27-15	0645	[illegible] / E1	8/27/15	0645				
FACILITY ID # 4204	[illegible] / E-1	8/27/15	1000	[illegible] PACE	8/28/15	1000	1.2	Y	N	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: TOM BEASLEY

SIGNATURE of SAMPLER: Tom Beasley

DATE Signed (MM/DD/YY): 8-27-15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

NON-CONFORMANCE FORM

PAES Work Order #: 16524

Date: 8.28.15 Time of Receipt: 1000 Receiver: CY

Client: Environment 1.

REASON FOR NON-CONFORMANCE:

1. W2AD: 3rd TSP vial I.D was MW2AD.
2. No date & time on COC. Taken from vials
Collection date for all was 8/26/15.

1: 10:00
2: 1040
3. 1230
4: 1310
5: 1355
6. 11:40
7. 0855
8. 0925
9. 1435

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

OK to proceed

Customer Service Initials: _____ Date: _____

Cooler Receipt Form

Client Name: Environment 1 Project: Halifax Co. Lab Work Order: 16524

A. Shipping/Container Information (circle appropriate response)

Courier: FedEx UPS USPS Client Other:_____ Air bill Present: Yes No

Tracking Number: 1Z2037050779145 49

Custody Seal on Cooler/Box Present: Yes No Seals Intact: Yes No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam Other:_____

Type of Ice: Wet Blue None Ice Intact: Yes Melted

Cooler Temperature: 1.2°C Radiation Screened: Yes No Chain of Custody Present: Yes No

Comments:_____

B. Laboratory Assignment/Log-in (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	✓			
Chain of Custody relinquished	✓			
Sampler Name & Signature on COC	✓			
Containers intact	✓			
Were samples in separate bags	✓			
Sample container labels match COC Sample name/date and time collected		✓		
Sufficient volume provided	✓			
PAES containers used	✓			
Are containers properly preserved for the requested testing? (as labeled)	✓			
If an unknown preservation state, were containers checked? Exception: VOA's coliform			✓	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			✓	

Comments:_____

Cooler contents examined/received by: LY Date: 8.28.15

Project Manager Review: RW Date: 8-28-15

This page intentionally left blank.

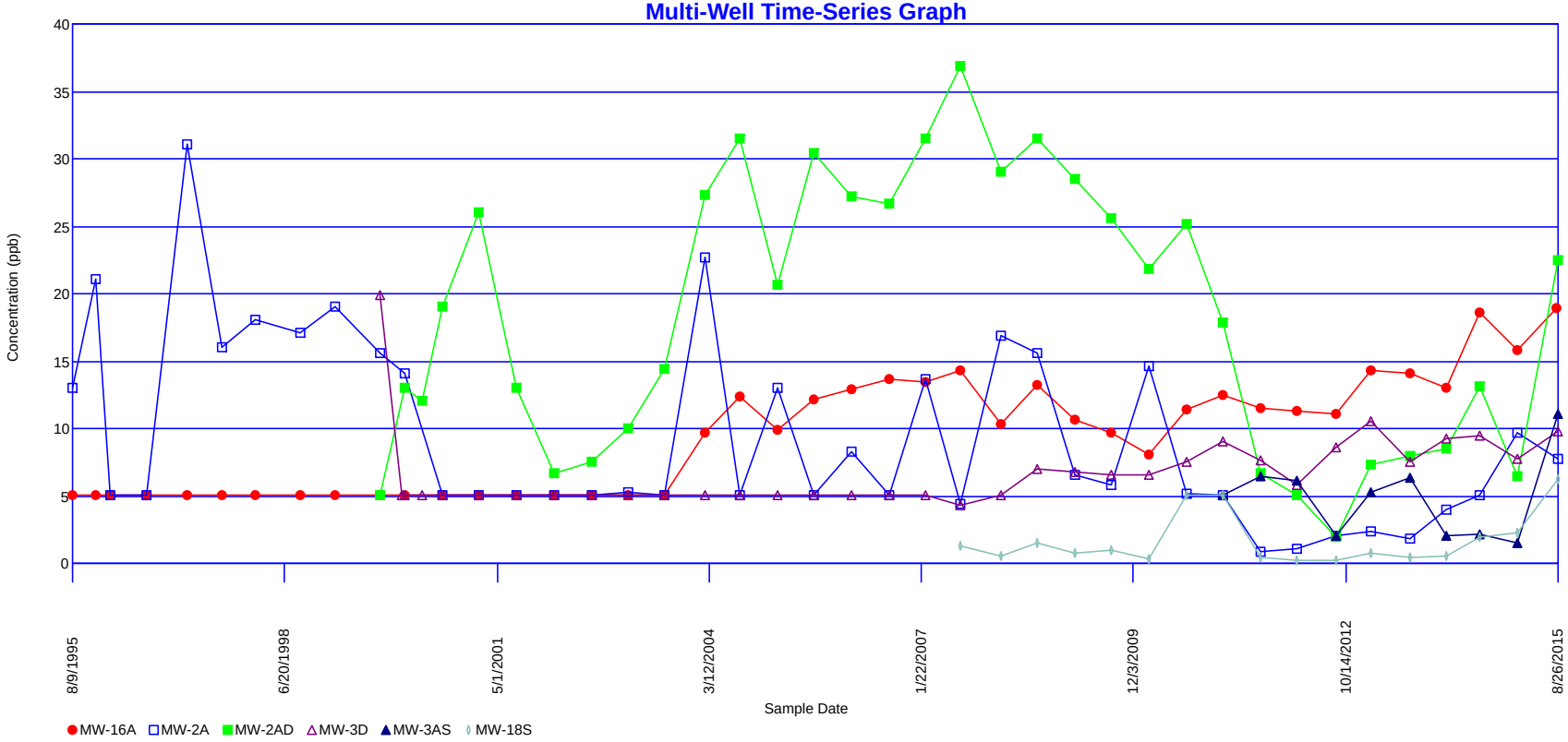
Appendix C

Time vs. Concentration Graphs

This page intentionally left blank.

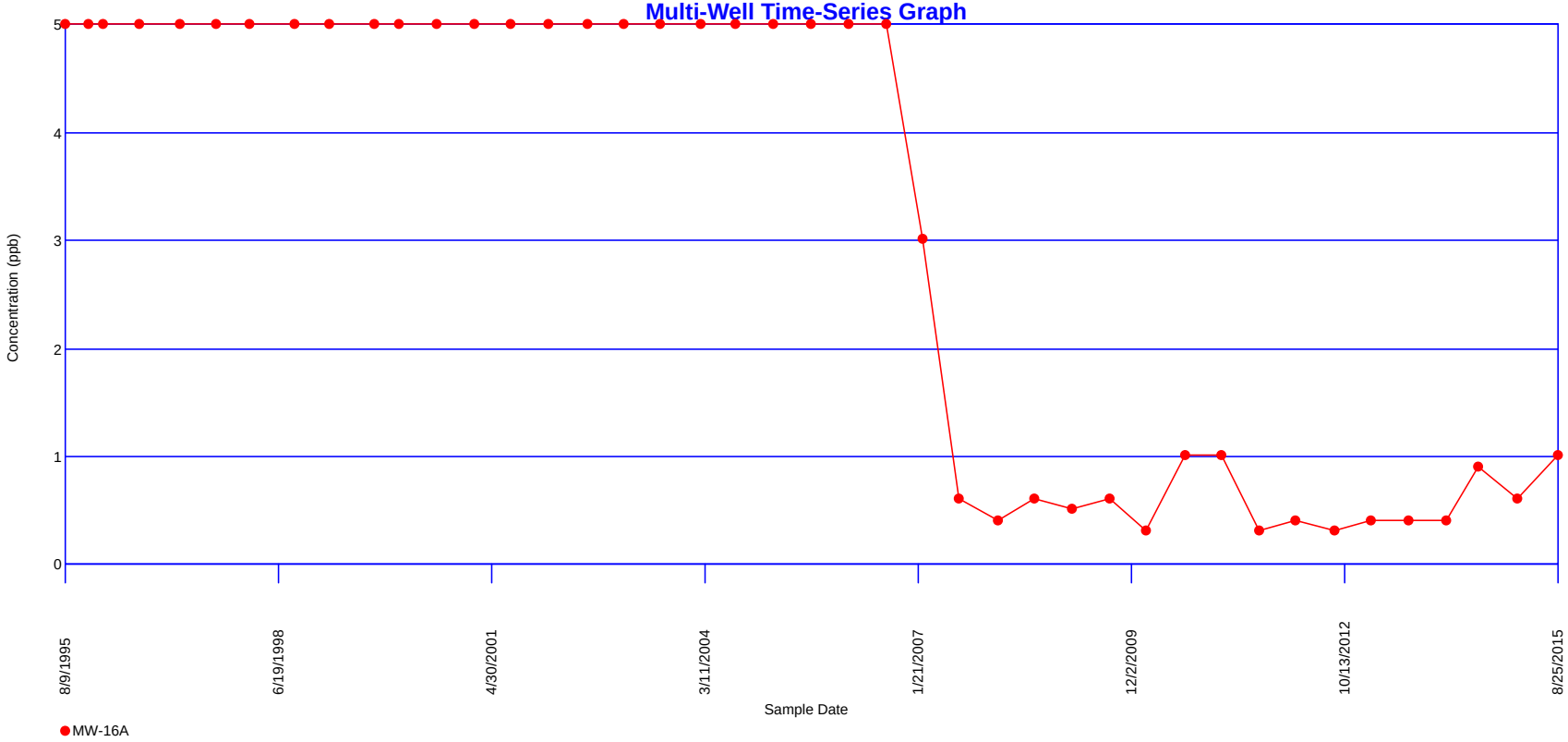
1,1-Dichloroethane

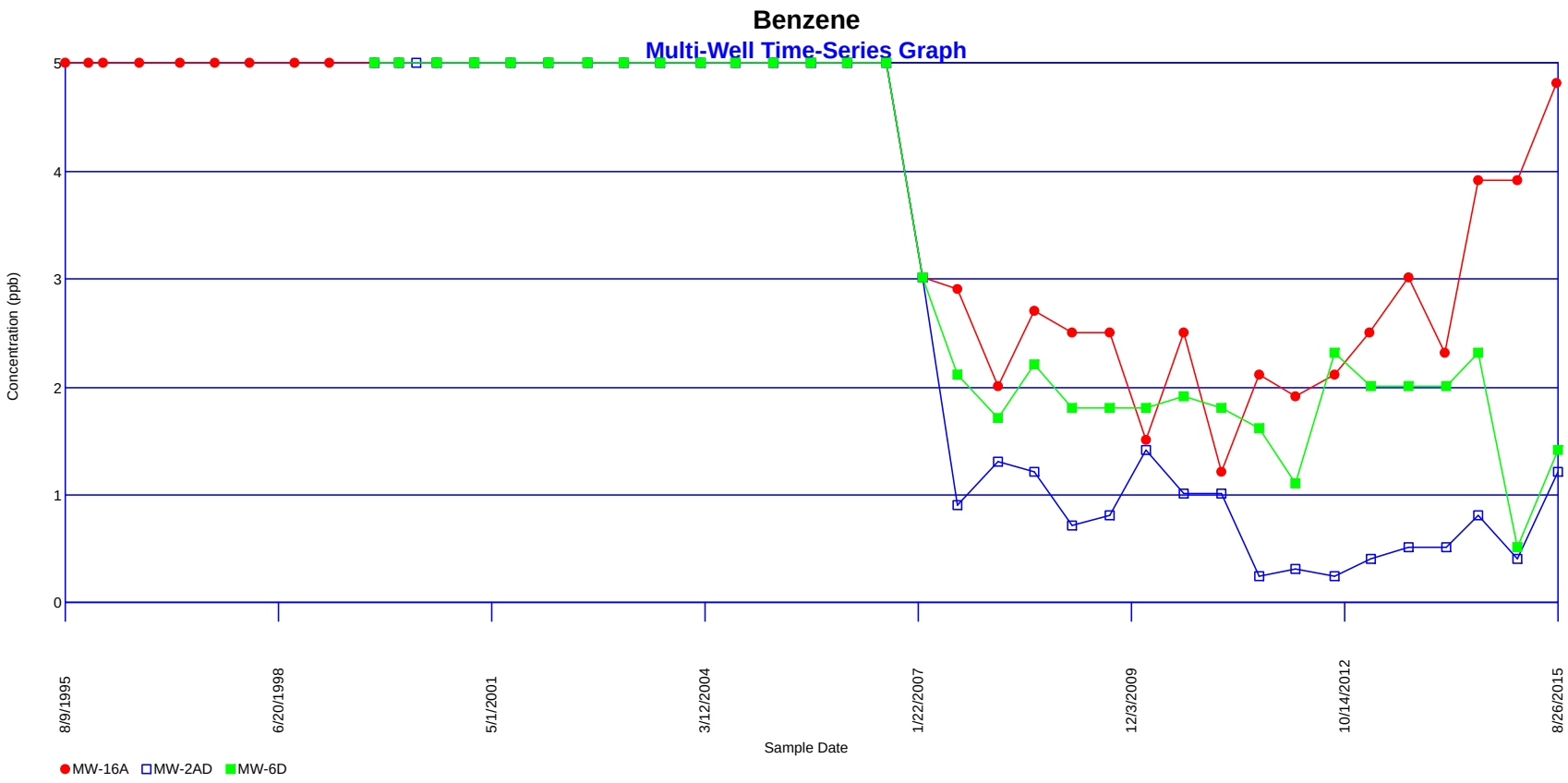
Multi-Well Time-Series Graph



1,2-Dichloropropane

Multi-Well Time-Series Graph



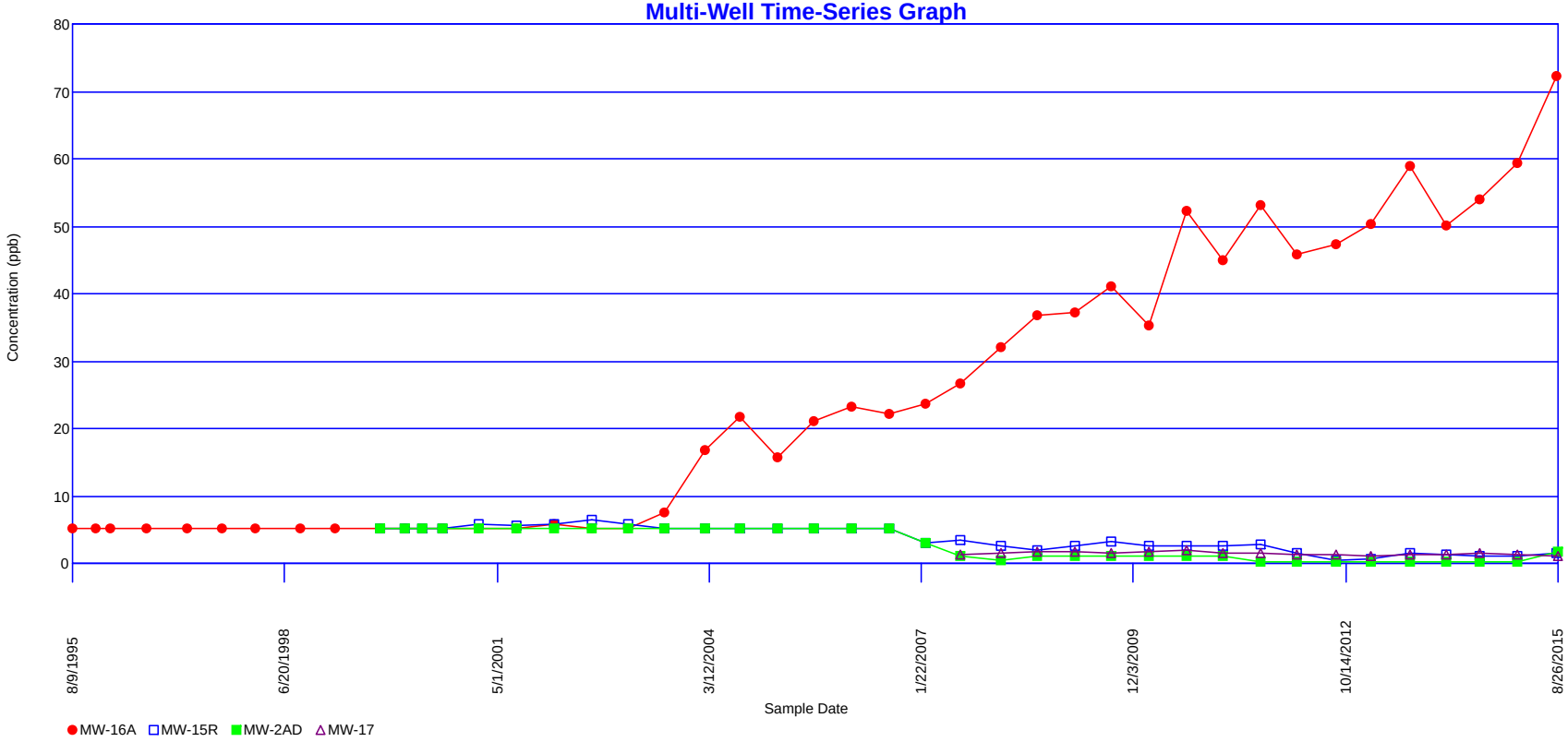

Benzene
Multi-Well Time-Series Graph
Concentration (ppb)
0
1
2
3
4
5
8/9/1995
6/20/1998
5/1/2001
3/12/2004
1/22/2007
12/3/2009
10/14/2012
8/26/2015
Sample Date
MW-16A
MW-2AD
MW-6D

Iron, total

Multi-Well Time-Series Graph

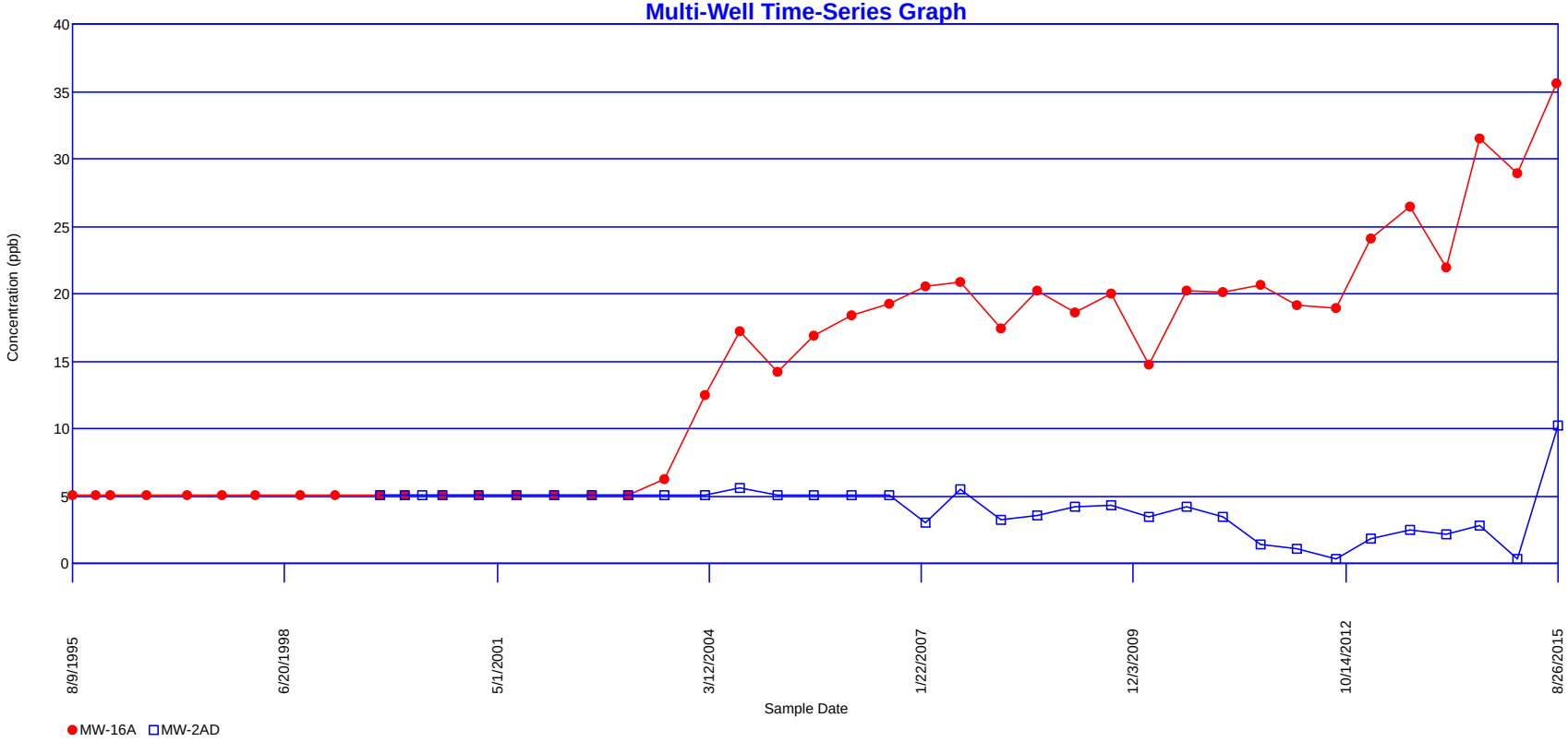
Tetrachloroethene (-ethylene)

Multi-Well Time-Series Graph



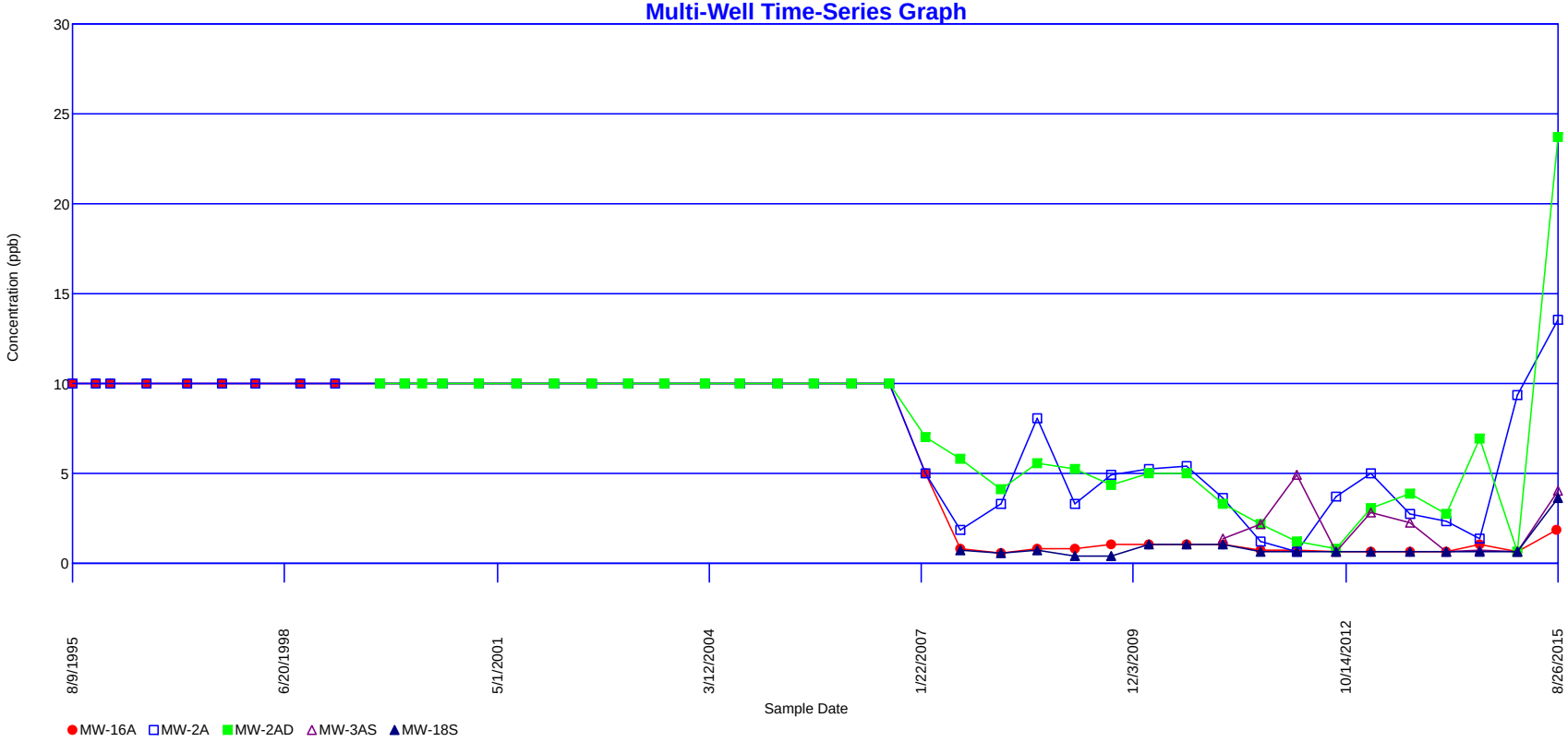
Trichloroethene (-ethylene)

Multi-Well Time-Series Graph



Vinyl chloride

Multi-Well Time-Series Graph



This page intentionally left blank.

Appendix D

Biochlor Evaluation

This page intentionally left blank.

Start Here → ◉ PCE
○ TCE
○ DCE
○ VC
○ ETH

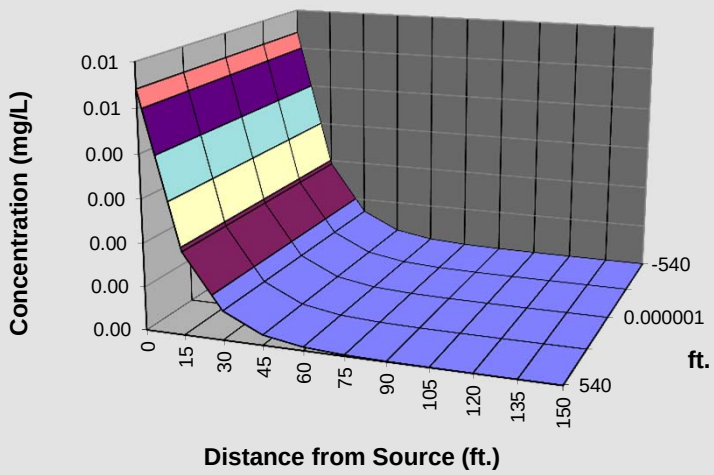
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
270	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-270	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-540	0.005	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	1.9E+2	6.6E+1	2.3E+1	8.2E+0	2.9E+0	1.0E+0	3.6E-1	1.3E-1	4.4E-2	1.6E-2	5.5E-3

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.6	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.6	(Kg)
% Biotransformed =	+94.2%	
% Change in Mass Rate =	100.0 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	0.76	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.	0.00	
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ◉ TCE ○ DCE ○ VC ○ ETH

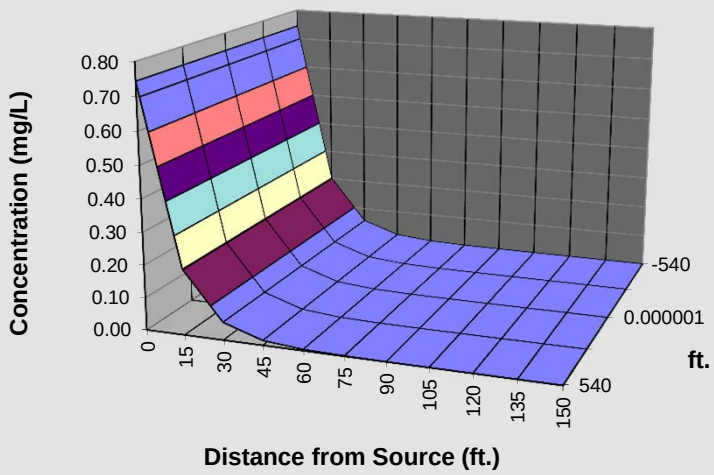
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.744	0.202	0.055	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000
270	0.744	0.202	0.055	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000
0	0.744	0.202	0.055	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000
-270	0.744	0.202	0.055	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000
-540	0.744	0.202	0.055	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	2.6E+4	7.0E+3	1.9E+3	5.2E+2	1.4E+2	3.8E+1	1.1E+1	2.9E+0	8.0E-1	2.2E-1	6.3E-2

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	83.1	(Kg)
- Plume Mass If Biotransformation/Production	3.9	(Kg)
Mass Removed	79.2	(Kg)
% Biotransformed =	+95.3%	
% Change in Mass Rate =	100.0 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	3.03	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.	0.00	
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ○ TCE ◉ DCE ○ VC ○ ETH

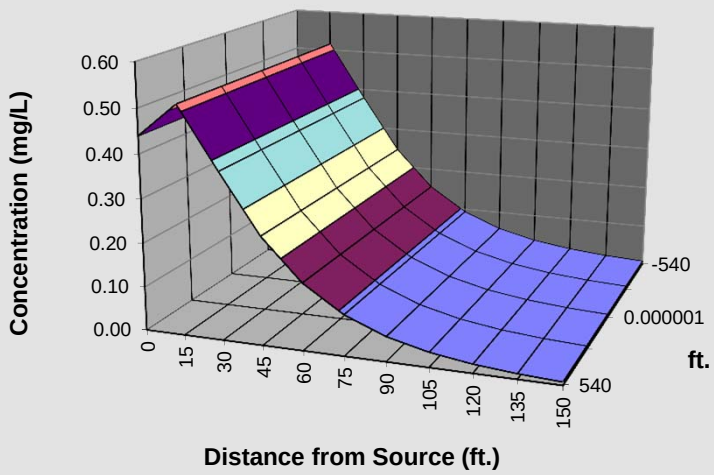
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.440	0.516	0.377	0.245	0.152	0.093	0.056	0.034	0.020	0.012	0.007
270	0.440	0.516	0.377	0.245	0.152	0.093	0.056	0.034	0.020	0.012	0.007
0	0.440	0.516	0.377	0.245	0.152	0.093	0.056	0.034	0.020	0.012	0.007
-270	0.440	0.516	0.377	0.245	0.152	0.093	0.056	0.034	0.020	0.012	0.007
-540	0.440	0.516	0.377	0.245	0.152	0.093	0.056	0.034	0.020	0.012	0.007
MASS RATE (mg/day)	1.5E+4	1.8E+4	1.3E+4	8.5E+3	5.3E+3	3.2E+3	1.9E+3	1.2E+3	7.0E+2	4.2E+2	2.5E+2

Show No

Show

Time: 10 yr Target Level: **0.070** mg/L Displayed Model: **Biotransformation** Displayed Compound: **DCE**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	49.1	(Kg)
- Plume Mass If Biotransformation/Production	10.4	(Kg)
Mass Removed	38.7	(Kg)
% Biotransformed =	**+78.7%**	
% Change in Mass Rate =	**98.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
◉ VC
○ ETH

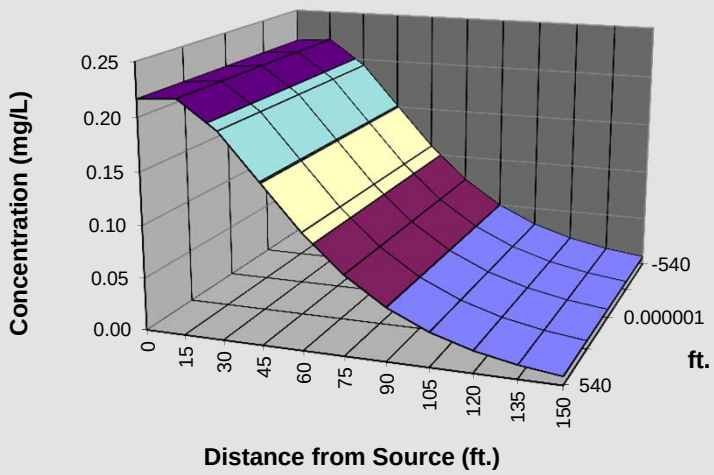
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.217	0.220	0.193	0.151	0.109	0.075	0.050	0.032	0.021	0.013	0.008
270	0.217	0.220	0.193	0.151	0.109	0.075	0.050	0.032	0.021	0.013	0.008
0	0.217	0.220	0.193	0.151	0.109	0.075	0.050	0.032	0.021	0.013	0.008
-270	0.217	0.220	0.193	0.151	0.109	0.075	0.050	0.032	0.021	0.013	0.008
-540	0.217	0.220	0.193	0.151	0.109	0.075	0.050	0.032	0.021	0.013	0.008
MASS RATE (mg/day)	7.5E+3	7.7E+3	6.7E+3	5.3E+3	3.8E+3	2.6E+3	1.7E+3	1.1E+3	7.2E+2	4.5E+2	2.8E+2

Show No

Show

Time: 10 yr Target Level: **0.002** mg/L Displayed Model: **Biotransformation** Displayed Compound: **VC**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	24.2	*(Kg)*
- Plume Mass If Biotransformation/Production	5.9	*(Kg)*
Mass Removed	18.3	*(Kg)*
% Biotransformed =	**+75.5%**	
% Change in Mass Rate =	**96.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	*MGal*
Flow Rate of Water Through Source Area	0.009	*MGD*

Compare to Pump and Treat

Pumping Rate		*(gpm)*
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		*(yr)*

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
○ VC
◉ ETH

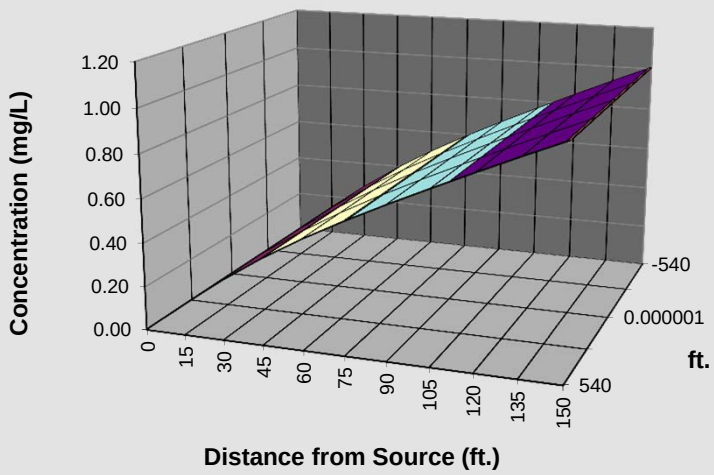
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.004	0.141	0.272	0.390	0.496	0.591	0.680	0.765	0.848	0.928	1.007
270	0.004	0.141	0.272	0.390	0.496	0.591	0.680	0.765	0.848	0.928	1.007
0	0.004	0.141	0.272	0.390	0.496	0.591	0.680	0.765	0.848	0.928	1.007
-270	0.004	0.141	0.272	0.390	0.496	0.591	0.680	0.765	0.848	0.928	1.007
-540	0.004	0.141	0.272	0.390	0.496	0.591	0.680	0.765	0.848	0.928	1.007
MASS RATE (mg/day)	1.4E+2	4.9E+3	9.5E+3	1.4E+4	1.7E+4	2.1E+4	2.4E+4	2.7E+4	3.0E+4	3.2E+4	3.5E+4

Show No

Show

Time: 10 yr Target Level: mg/L Displayed Model: **Biotransformation** Displayed Compound: **ETH**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.5	*(Kg)*
- Plume Mass If Biotransformation/Production	36.9	*(Kg)*
Mass Removed	-36.5	*(Kg)*

If "Can't Calc.", make model area longer

% Biotransformed = **-8042.2 %**

% Change in Mass Rate = **-24699.1 %** (source to edge)

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	*MGal*
Flow Rate of Water Through Source Area	0.009	*MGD*

Compare to Pump and Treat

Pumping Rate		*(gpm)*
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		*(yr)*

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ◉ PCE
○ TCE
○ DCE
○ VC
○ ETH

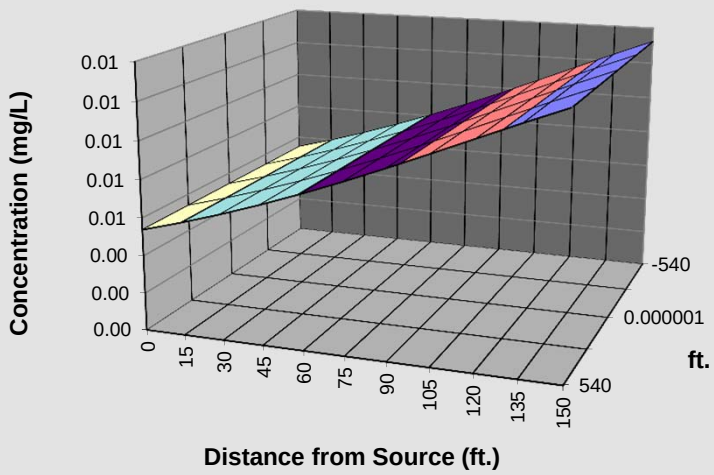
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.013
270	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.013
0	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.013
-270	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.013
-540	0.005	0.006	0.007	0.007	0.008	0.009	0.010	0.011	0.011	0.012	0.013
MASS RATE (mg/day)	1.9E+2	2.1E+2	2.3E+2	2.5E+2	2.8E+2	3.1E+2	3.4E+2	3.7E+2	4.0E+2	4.3E+2	4.6E+2

Show No

Show

Time: 10 yr Target Level: **0.005** mg/L Displayed Model: **No Degradation** Displayed Compound: **PCE**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.6	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.6	(Kg)
% Biotransformed =	**+94.2%**	
% Change in Mass Rate =	**-145.7 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ◉ TCE ○ DCE ○ VC ○ ETH

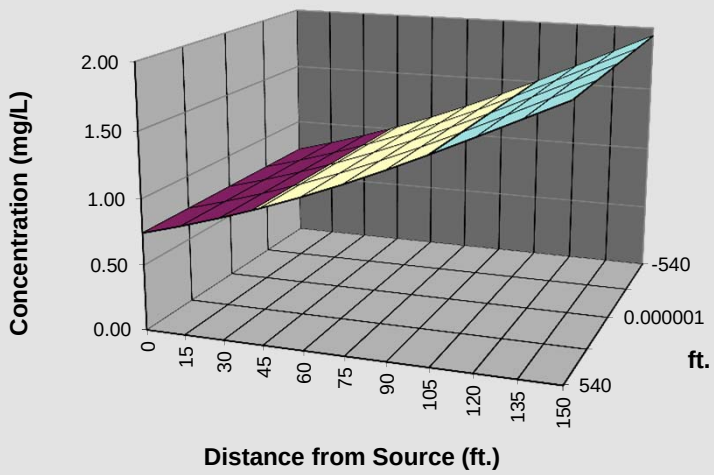
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
270	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
0	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
-270	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
-540	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
MASS RATE (mg/day)	2.6E+4	2.9E+4	3.2E+4	3.5E+4	3.9E+4	4.3E+4	4.8E+4	5.3E+4	5.8E+4	6.3E+4	6.7E+4

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	83.1	(Kg)
- Plume Mass If Biotransformation/Production	3.9	(Kg)
Mass Removed	79.2	(Kg)
% Biotransformed =	**+95.3%**	
% Change in Mass Rate =	**-160.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ○ TCE ◉ DCE ○ VC ○ ETH

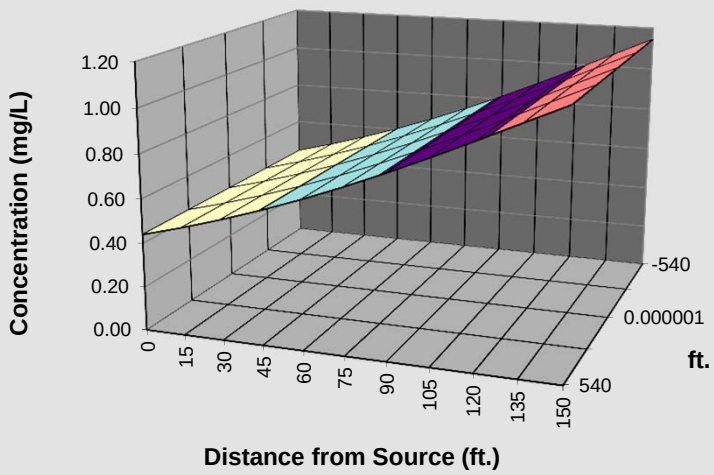
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
270	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
0	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
-270	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
-540	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
MASS RATE (mg/day)	1.5E+4	1.7E+4	1.9E+4	2.1E+4	2.3E+4	2.6E+4	2.8E+4	3.1E+4	3.4E+4	3.7E+4	4.0E+4

Show No

Show

Time: 10 yr Target Level: 0.070 mg/L Displayed Model: No Degradation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	49.1	(Kg)
- Plume Mass If Biotransformation/Production	10.4	(Kg)
Mass Removed	38.7	(Kg)
% Biotransformed =	+78.7%	
% Change in Mass Rate =	-160.3 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ○ TCE ○ DCE ◉ VC ○ ETH

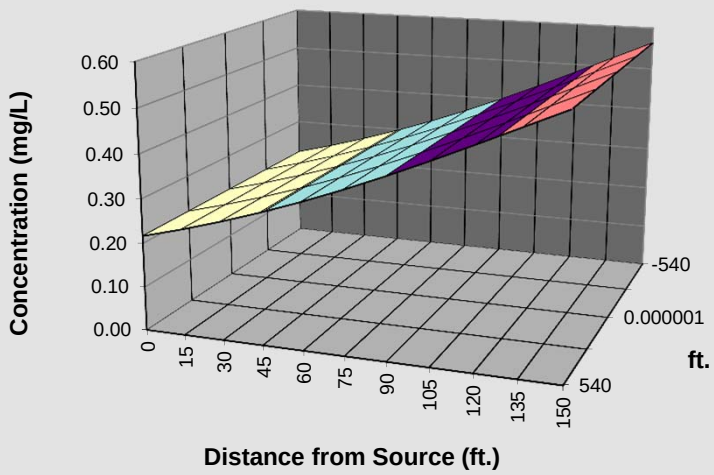
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
270	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
0	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
-270	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
-540	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
MASS RATE (mg/day)	7.5E+3	8.4E+3	9.3E+3	1.0E+4	1.1E+4	1.3E+4	1.4E+4	1.5E+4	1.7E+4	1.8E+4	2.0E+4

Show No

Show

Time: 10 yr Target Level: **0.002** mg/L Displayed Model: **No Degradation** Displayed Compound: **VC**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	24.2	(Kg)
- Plume Mass If Biotransformation/Production	5.9	(Kg)
Mass Removed	18.3	(Kg)
% Biotransformed =	**+75.5%**	
% Change in Mass Rate =	**-160.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
○ VC
◉ ETH

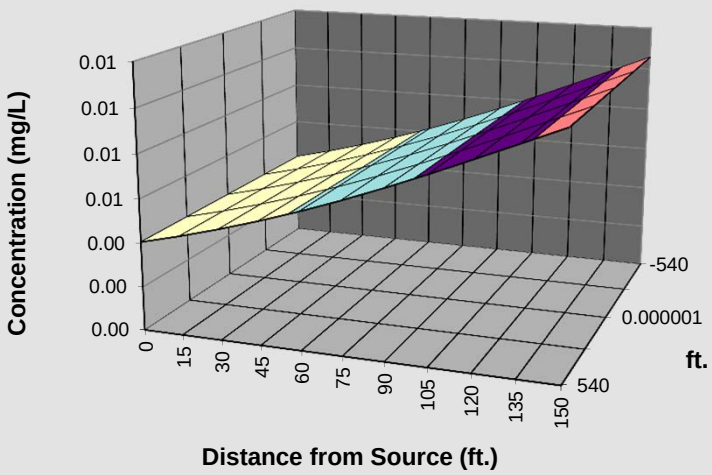
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
270	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
0	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
-270	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
-540	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
MASS RATE (mg/day)	1.4E+2	1.6E+2	1.7E+2	1.9E+2	2.1E+2	2.4E+2	2.6E+2	2.9E+2	3.1E+2	3.4E+2	3.7E+2

Show No

Show

Time: 10 yr Target Level: mg/L Displayed Model: No Degradation Displayed Compound: ETH



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.5	(Kg)
- Plume Mass If Biotransformation/Production	36.9	(Kg)
Mass Removed	-36.5	(Kg)
% Biotransformed =	-8042.2 %	
% Change in Mass Rate =	-160.3 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ◉ PCE
○ TCE
○ DCE
○ VC
○ ETH

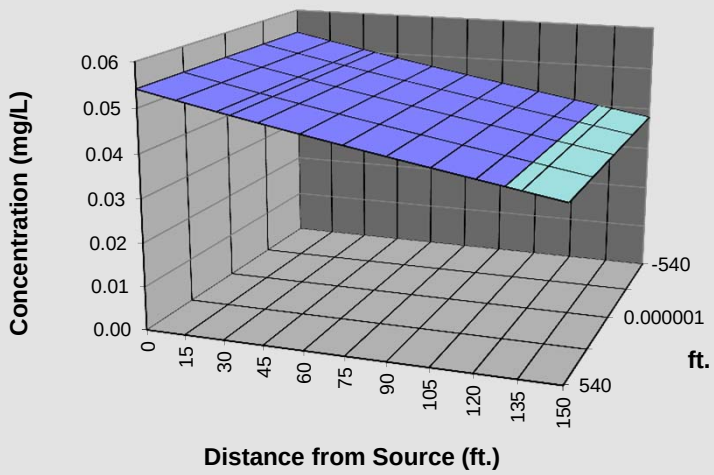
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.054	0.052	0.051	0.049	0.047	0.046	0.044	0.042	0.041	0.039	0.038
270	0.054	0.052	0.051	0.049	0.047	0.046	0.044	0.042	0.041	0.039	0.038
0	0.054	0.052	0.051	0.049	0.047	0.046	0.044	0.042	0.041	0.039	0.038
-270	0.054	0.052	0.051	0.049	0.047	0.046	0.044	0.042	0.041	0.039	0.038
-540	0.054	0.052	0.051	0.049	0.047	0.046	0.044	0.042	0.041	0.039	0.038
MASS RATE (mg/day)	1.9E+3	1.8E+3	1.8E+3	1.7E+3	1.6E+3	1.6E+3	1.5E+3	1.5E+3	1.4E+3	1.4E+3	1.3E+3

Show No

Show

Time: 10 yr Target Level: **0.005** mg/L Displayed Model: **Biotransformation** Displayed Compound: **PCE**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	6.0	*(Kg)*
- Plume Mass If Biotransformation/Production	2.9	*(Kg)*
Mass Removed	3.2	*(Kg)*
% Biotransformed =	**+52.5%**	
% Change in Mass Rate =	**30.0 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	*MGal*
Flow Rate of Water Through Source Area	0.009	*MGD*

Compare to Pump and Treat

Pumping Rate		*(gpm)*
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		*(yr)*

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ◉ TCE ○ DCE ○ VC ○ ETH

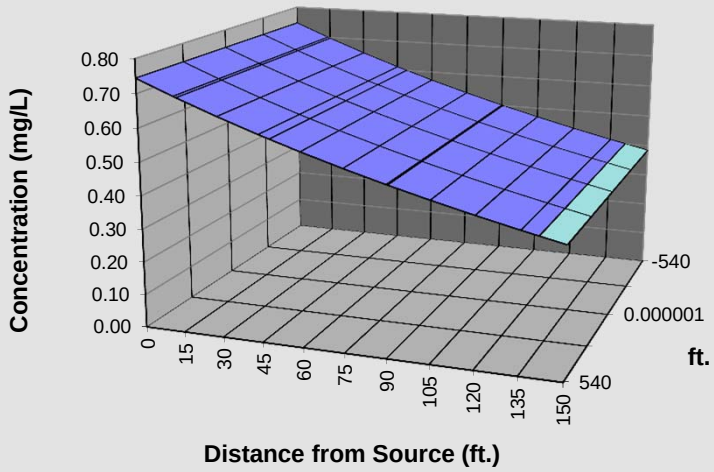
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.744	0.697	0.652	0.610	0.571	0.535	0.501	0.469	0.439	0.411	0.384
270	0.744	0.697	0.652	0.610	0.571	0.535	0.501	0.469	0.439	0.411	0.384
0	0.744	0.697	0.652	0.610	0.571	0.535	0.501	0.469	0.439	0.411	0.384
-270	0.744	0.697	0.652	0.610	0.571	0.535	0.501	0.469	0.439	0.411	0.384
-540	0.744	0.697	0.652	0.610	0.571	0.535	0.501	0.469	0.439	0.411	0.384
MASS RATE (mg/day)	2.6E+4	2.4E+4	2.3E+4	2.1E+4	2.0E+4	1.9E+4	1.7E+4	1.6E+4	1.5E+4	1.4E+4	1.3E+4

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	83.1	(Kg)
- Plume Mass If Biotransformation/Production	34.0	(Kg)
Mass Removed	49.1	(Kg)
% Biotransformed =	+59.1%	
% Change in Mass Rate =	48.4 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
◉ DCE
○ VC
○ ETH

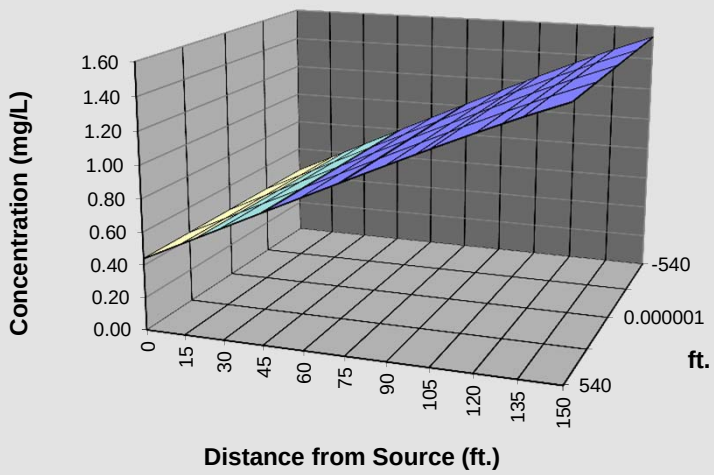
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.440	0.555	0.670	0.785	0.899	1.013	1.125	1.236	1.343	1.446	1.541
270	0.440	0.555	0.670	0.785	0.899	1.013	1.125	1.236	1.343	1.446	1.541
0	0.440	0.555	0.670	0.785	0.899	1.013	1.125	1.236	1.343	1.446	1.541
-270	0.440	0.555	0.670	0.785	0.899	1.013	1.125	1.236	1.343	1.446	1.541
-540	0.440	0.555	0.670	0.785	0.899	1.013	1.125	1.236	1.343	1.446	1.541
MASS RATE (mg/day)	1.5E+4	1.9E+4	2.3E+4	2.7E+4	3.1E+4	3.5E+4	3.9E+4	4.3E+4	4.7E+4	5.0E+4	5.4E+4

Show No

Show

Time: 10 yr Target Level: 0.070 mg/L Displayed Model: Biotransformation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	49.1	(Kg)
- Plume Mass If Biotransformation/Production	65.3	(Kg)
Mass Removed	-16.2	(Kg)
% Biotransformed =	-33.1 %	
% Change in Mass Rate =	-250.3 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
◉ VC
○ ETH

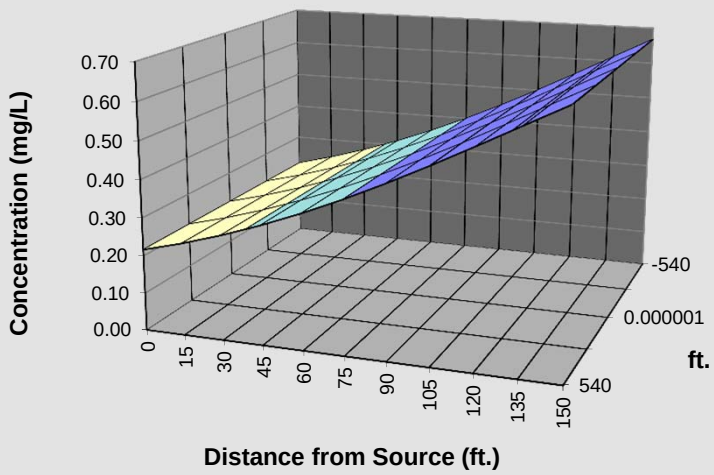
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.217	0.244	0.276	0.313	0.354	0.400	0.449	0.501	0.556	0.612	0.668
270	0.217	0.244	0.276	0.313	0.354	0.400	0.449	0.501	0.556	0.612	0.668
0	0.217	0.244	0.276	0.313	0.354	0.400	0.449	0.501	0.556	0.612	0.668
-270	0.217	0.244	0.276	0.313	0.354	0.400	0.449	0.501	0.556	0.612	0.668
-540	0.217	0.244	0.276	0.313	0.354	0.400	0.449	0.501	0.556	0.612	0.668
MASS RATE (mg/day)	7.5E+3	8.5E+3	9.6E+3	1.1E+4	1.2E+4	1.4E+4	1.6E+4	1.7E+4	1.9E+4	2.1E+4	2.3E+4

Show No

Show

Time: 10 yr Target Level: **0.002** mg/L Displayed Model: **Biotransformation** Displayed Compound: **VC**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	24.2	(Kg)
- Plume Mass If Biotransformation/Production	27.0	(Kg)
Mass Removed	-2.9	(Kg)
% Biotransformed =	**-11.8 %**	
% Change in Mass Rate =	**-208.5 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
○ VC
◉ ETH

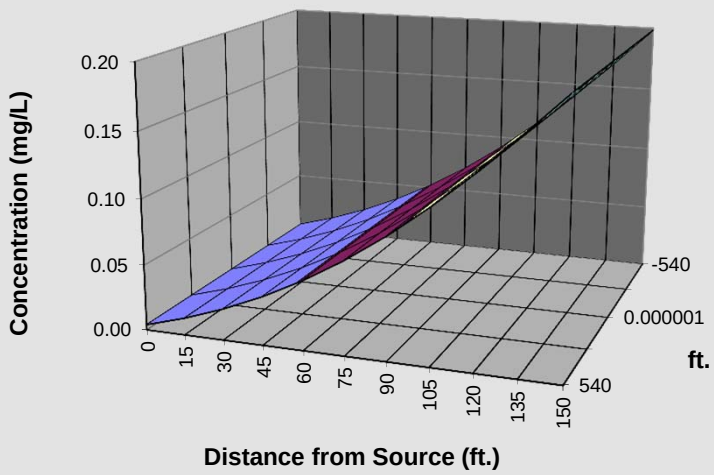
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.004	0.013	0.024	0.037	0.052	0.070	0.091	0.115	0.141	0.169	0.198
270	0.004	0.013	0.024	0.037	0.052	0.070	0.091	0.115	0.141	0.169	0.198
0	0.004	0.013	0.024	0.037	0.052	0.070	0.091	0.115	0.141	0.169	0.198
-270	0.004	0.013	0.024	0.037	0.052	0.070	0.091	0.115	0.141	0.169	0.198
-540	0.004	0.013	0.024	0.037	0.052	0.070	0.091	0.115	0.141	0.169	0.198
MASS RATE (mg/day)	1.4E+2	4.5E+2	8.2E+2	1.3E+3	1.8E+3	2.4E+3	3.2E+3	4.0E+3	4.9E+3	5.9E+3	6.9E+3

Show No

Show

Time: 10 yr Target Level: mg/L Displayed Model: **Biotransformation** Displayed Compound: **ETH**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.5	(Kg)
- Plume Mass If Biotransformation/Production	5.5	(Kg)
Mass Removed	-5.0	(Kg)
% Biotransformed =	**-1112.0 %**	
% Change in Mass Rate =	**-4787.9 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ◉ PCE
○ TCE
○ DCE
○ VC
○ ETH

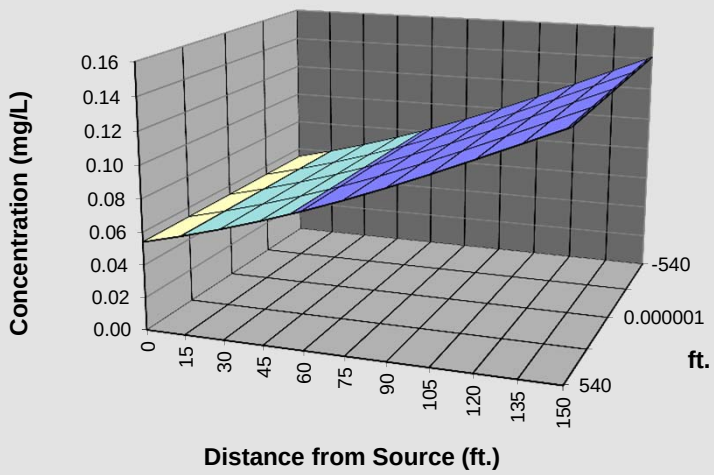
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.054	0.060	0.067	0.074	0.082	0.091	0.100	0.110	0.120	0.130	0.141
270	0.054	0.060	0.067	0.074	0.082	0.091	0.100	0.110	0.120	0.130	0.141
0	0.054	0.060	0.067	0.074	0.082	0.091	0.100	0.110	0.120	0.130	0.141
-270	0.054	0.060	0.067	0.074	0.082	0.091	0.100	0.110	0.120	0.130	0.141
-540	0.054	0.060	0.067	0.074	0.082	0.091	0.100	0.110	0.120	0.130	0.141
MASS RATE (mg/day)	1.9E+3	2.1E+3	2.3E+3	2.6E+3	2.9E+3	3.2E+3	3.5E+3	3.8E+3	4.2E+3	4.5E+3	4.9E+3

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	6.0	(Kg)
- Plume Mass If Biotransformation/Production	2.9	(Kg)
Mass Removed	3.2	(Kg)
% Biotransformed =	+52.5%	
% Change in Mass Rate =	-160.3 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ◉ TCE ○ DCE ○ VC ○ ETH

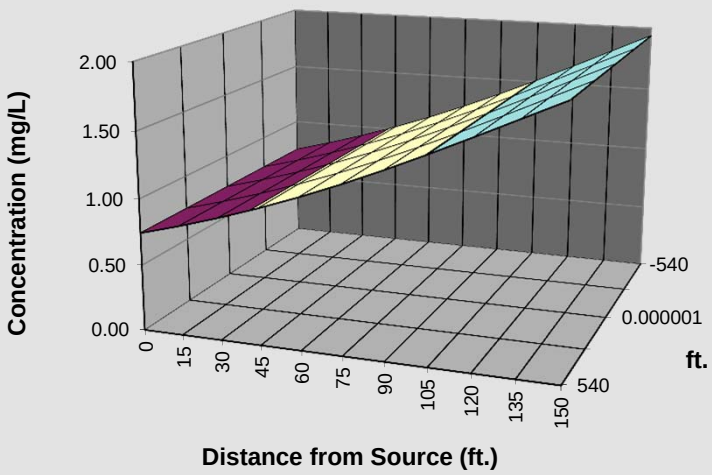
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
270	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
0	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
-270	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
-540	0.744	0.827	0.918	1.019	1.128	1.247	1.375	1.510	1.650	1.794	1.937
MASS RATE (mg/day)	2.6E+4	2.9E+4	3.2E+4	3.5E+4	3.9E+4	4.3E+4	4.8E+4	5.3E+4	5.8E+4	6.3E+4	6.7E+4

Show No

Show

Time: 10 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	83.1	(Kg)
- Plume Mass If Biotransformation/Production	34.0	(Kg)
Mass Removed	49.1	(Kg)
% Biotransformed =	**+59.1%**	
% Change in Mass Rate =	**-160.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
◉ DCE
○ VC
○ ETH

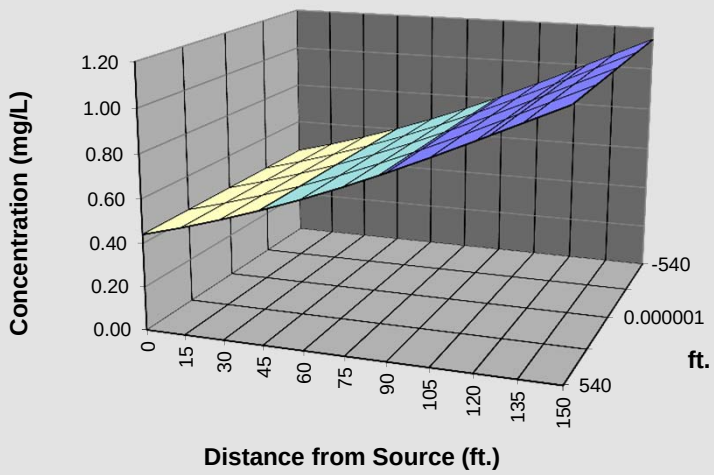
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
270	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
0	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
-270	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
-540	0.440	0.489	0.543	0.602	0.667	0.737	0.812	0.892	0.975	1.060	1.145
MASS RATE (mg/day)	1.5E+4	1.7E+4	1.9E+4	2.1E+4	2.3E+4	2.6E+4	2.8E+4	3.1E+4	3.4E+4	3.7E+4	4.0E+4

Show No

Show

Time: 10 yr Target Level: **0.070** mg/L Displayed Model: **No Degradation** Displayed Compound: **DCE**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	49.1	*(Kg)*
- Plume Mass If Biotransformation/Production	65.3	*(Kg)*
Mass Removed	-16.2	*(Kg)*
% Biotransformed =	**-33.1 %**	
% Change in Mass Rate =	**-160.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	*MGal*
Flow Rate of Water Through Source Area	0.009	*MGD*

Compare to Pump and Treat

Pumping Rate		*(gpm)*
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		*(yr)*

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE ○ TCE ○ DCE ◉ VC ○ ETH

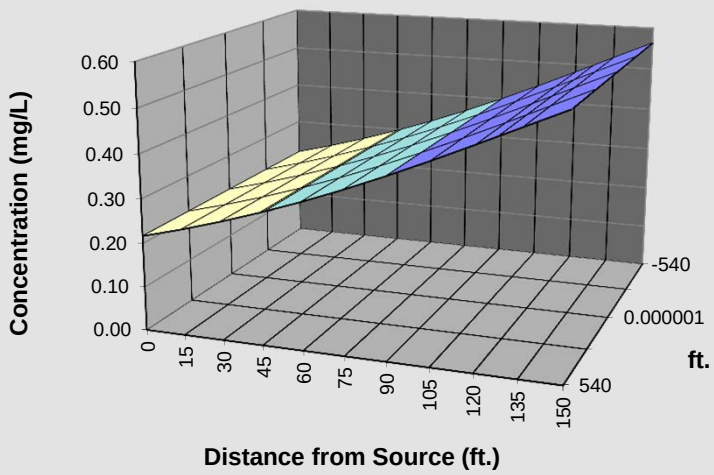
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
270	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
0	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
-270	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
-540	0.217	0.241	0.267	0.296	0.328	0.363	0.400	0.439	0.480	0.522	0.564
MASS RATE (mg/day)	7.5E+3	8.4E+3	9.3E+3	1.0E+4	1.1E+4	1.3E+4	1.4E+4	1.5E+4	1.7E+4	1.8E+4	2.0E+4

Show No

Show

Time: 10 yr Target Level: **0.002** mg/L Displayed Model: **No Degradation** Displayed Compound: **VC**



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	24.2	*(Kg)*
- Plume Mass If Biotransformation/Production	27.0	*(Kg)*
Mass Removed	-2.9	*(Kg)*
% Biotransformed =	**-11.8 %**	
% Change in Mass Rate =	**-160.3 %**	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	*MGal*
Flow Rate of Water Through Source Area	0.009	*MGD*

Compare to Pump and Treat

Pumping Rate		*(gpm)*
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		*(yr)*

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input

Start Here → ○ PCE
○ TCE
○ DCE
○ VC
◉ ETH

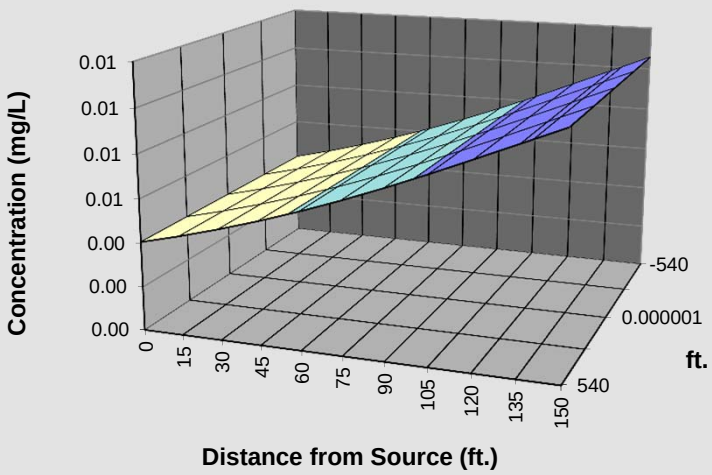
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft) →	0	15	30	45	60	75	90	105	120	135	150
540	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
270	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
0	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
-270	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
-540	0.004	0.005	0.005	0.006	0.006	0.007	0.007	0.008	0.009	0.010	0.011
MASS RATE (mg/day)	1.4E+2	1.6E+2	1.7E+2	1.9E+2	2.1E+2	2.4E+2	2.6E+2	2.9E+2	3.1E+2	3.4E+2	3.7E+2

Show No

Show

Time: 10 yr Target Level: mg/L Displayed Model: No Degradation Displayed Compound: ETH



Plume Mass (Order-of-Magnitude Accuracy)

See Gallon

Plume Mass If No Degradation	0.5	(Kg)
- Plume Mass If Biotransformation/Production	5.5	(Kg)
Mass Removed	-5.0	(Kg)
% Biotransformed =	-1112.0 %	
% Change in Mass Rate =	-160.3 %	(source to edge)

If "Can't Calc.", make model area longer

See acre-ft

Current Volume of Ground Water in Plume	Can't Calc.	MGal
Flow Rate of Water Through Source Area	0.009	MGD

Compare to Pump and Treat

Pumping Rate		(gpm)
# Pore Volumes Removed Per Yr.		
# Pore Volumes to Clean-Up		
Clean-Up Time		(yr)

Plot All Data Plot Data > Target Mass HELP To Centerline Return to Input