

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)(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):
 Richardson Smith Gardner and Associates, Inc.

Contact for questions about data formatting. Include data preparer's name, telephone number and E-mail address:
 Name: Madeline German, PG Phone: 919-828-0577 x 222
 E-mail: madeline@rsgengineers.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Halifax Coal Ash Landfill	921 Liles Rd, Aurellan Springs, NC	42-04	.0500	February 20 & 21, 2012

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 Methane gas monitoring data
 Groundwater monitoring data from private water supply wells Corrective action data (specify) _____
 Leachate monitoring data
 Surface water monitoring data 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
 _____ 3/20/2012 Affix NC Licensed Professional Geologist Seal
 Signature Date

14 N. Boylan Avenue, Raleigh, NC 27603
 Facility Representative Address
 C0828
 NC PE Firm License Number (if applicable effective May 1, 2009)



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Halifax County Coal Ash Landfill

Ground Water Monitoring Report

**February 2012 Semi-annual
Monitoring Event**

**Halifax County Landfill
Halifax County, North Carolina
NC Solid Waste Permit # 42-04**

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

March 2012



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Halifax County Coal Ash Landfill

**Semi-Annual Ground Water Monitoring Report
February 2012 Monitoring Event**

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1.0 Introduction

Richardson Smith Gardner and Associates (RSG) is pleased to submit this semi-annual sampling report on behalf of the Halifax County Coal Ash Landfill, operating under Solid Waste Permit #42-04, in accordance with Solid Waste Section Rule 15A NCAC 13B. This report presents semi-annual monitoring results for the event performed February 20 & 21, 2012.

The Halifax County Coal Ash Landfill is a monofill landfill that only accepts coal ash from power generation. The ground water monitoring network includes six wells located around the landfill perimeter, a surface water sampling point, a sedimentation basin discharge location and two sediment sampling locations in the stream immediately upgradient and downgradient of the sedimentation basin discharge. This report includes a field procedure summary, laboratory analyses and summary tables and ground water characterization.

2.0 Site Hydrogeology

The *1985 North Carolina Geological Map and Ground Water in the Halifax Area, North Carolina* (Dept. of Conservation and Development Bulletin #51, 1946) indicates the Halifax County Coal Ash Landfill is situated on the eastern edge of the Eastern Piedmont Physiographic Province, just west of the Coastal Plain overlap. Western Halifax County is underlain by an assemblage of felsic to intermediate crystalline igneous and metamorphic rocks of early to late Paleozoic age. Eastern piedmont rocks exhibit a northeast strike and locally dip gently eastward as a result of regional metamorphism and folding that produced a broad plunging anticline. The area was simultaneously intruded by a number of felsic (granite) plutons. The rock formation underlying the subject site is a granitic pluton identified as the Butterwood Creek intrusive.

Depths to ground water generally range from near surface in lowland areas along Brewer's Creek and its tributary to around 45 ft. below grade in the MW-12 area. Ground water generally flows to the south.

3.0 Sampling Locations and Procedures

The sampling event, performed by Environment 1, Inc., on February 20 & 21, 2012 was conducted in accordance with the approved site Water Quality Monitoring Plan. Sampling methods followed the protocol outlined in the Solid Waste Section Guidelines for Groundwater, Soil and Surface Water Sampling¹. The depth to water in each well was gauged prior to purging and sampling. Field measurements for pH, specific conductivity, turbidity and temperature were recorded at each well.

The monitoring network at the Halifax Coal Ash Landfill currently includes six ground water wells (MW-8, MW-9, MW-10, MW-11, MW-12 and MW-17), a surface water location (SW-1) one sample collected from Sediment Basin 1 (Basin 1) and two sediment samples collected upstream and downstream of the sedimentation basin discharge point (Sediment 1 and Sediment 2). MW-8 and Basin 1 were unable to be sampled for this event.

Samples were collected by Environment 1, Inc. personnel in laboratory prepared containers for the specified analytical procedures. Sampling equipment (bailers) was cleaned at the laboratory and

¹ Solid Waste Section Guidelines for Groundwater, Soil and surface Water Sampling, NCDENR, DWM, April 2008.

transported to the site in aluminum foil. Ground water samples were properly preserved, placed on ice and transported to the laboratory facility within the specified hold times for each analysis.

Sampling locations are shown on **Figure 1**. Field parameter results are provided in **Table 1**.

4.0 Field and Laboratory Results

4.1 Field Results

Temperature, pH and specific conductance were measured in the field prior to sampling via direct read instruments. The field parameter results are summarized in **Table 2** and have remained consistent with previously reported sampling events.

4.2 Laboratory Analysis

The samples were transported under proper chain of custody, in a cooler with ice to Environment 1, Inc., a North Carolina certified laboratory (NC Wastewater ID #10) located in Greenville, NC. Ground and surface water samples were analyzed for Appendix I metals plus mercury, total organic carbon (TOC), chloride and sulfate via the SWS approved test methods specified in the laboratory report. Sediment samples were analyzed by SGS North America (NC Certification ID #481) located in Wilmington, NC. Samples were analyzed for specific metals detailed in the laboratory report using approved TCLP methods. Parameters were reported at NC Solid Waste Section Practical Quantitation Limits (SWSLs).

The laboratory analytical report is included as **Appendix A**.

4.3 Laboratory Results

The laboratory analysis were compared with the 15A NCAC 2L 0200 Groundwater Standard (2L Standard) and SWSL. Inorganic results remain generally consistent with historically reported detections. Three inorganic constituents barium (MW-12 and MW-17), copper (MW-17) and zinc (MW-12 and MW-17) were detected above the SWSL. No metals were detected above the 2L Standard. Most inorganic levels were reported as “J-qualified” indicating they are a non-quantifiable value that falls between the method limit and the SWSL. High turbidity levels, indicating increased sediment in the samples, may have contributed to elevated metal concentrations for this event.

No metals were identified in the surface water sample; however, SW-1 had elevated TOC levels.

Lead was detected in sediment sample 1-upstream.

The field parameter results are provided in **Table 1**. Detected inorganic constituents from ground or surface water samples are presented in **Table 2**. Sediment sample results are shown in **Table 3**.

5.0 Ground Water Characterization

The depth to water data indicates that ground water is flowing generally south towards the unnamed tributary to Brewer’s Creek; which is consistent with historic ground water flow patterns. The ground water flow map is included as **Figure 1**.

6.0 Conclusions

Current and historic analytical data indicate no ground water impact at this site. Lead has historically been detected in samples during events with elevated turbidity. Turbidity levels for this event in MW-12 and MW-17 were reported at 1450 and 1000 nephelometric turbidity units (NTU) respectively. These elevated turbidity levels may have “biased high” inorganic results due to their natural occurrence in local soil. The landfill is not likely the contamination source. The next semi-annual event is scheduled for August 2012. An event report will be submitted after receipt and analysis of those sampling results.

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Figures

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**DIRECTION OF
GROUND WATER FLOW
HALIFAX COAL ASH LANDFILL
AURELIAN SPRINGS, NC**

TITLE:

DATE: Feb, 2008

PROJECT NO. HALIFAX-8

FILE NAME HALI-B0103

DRAWN BY: C.T.J.

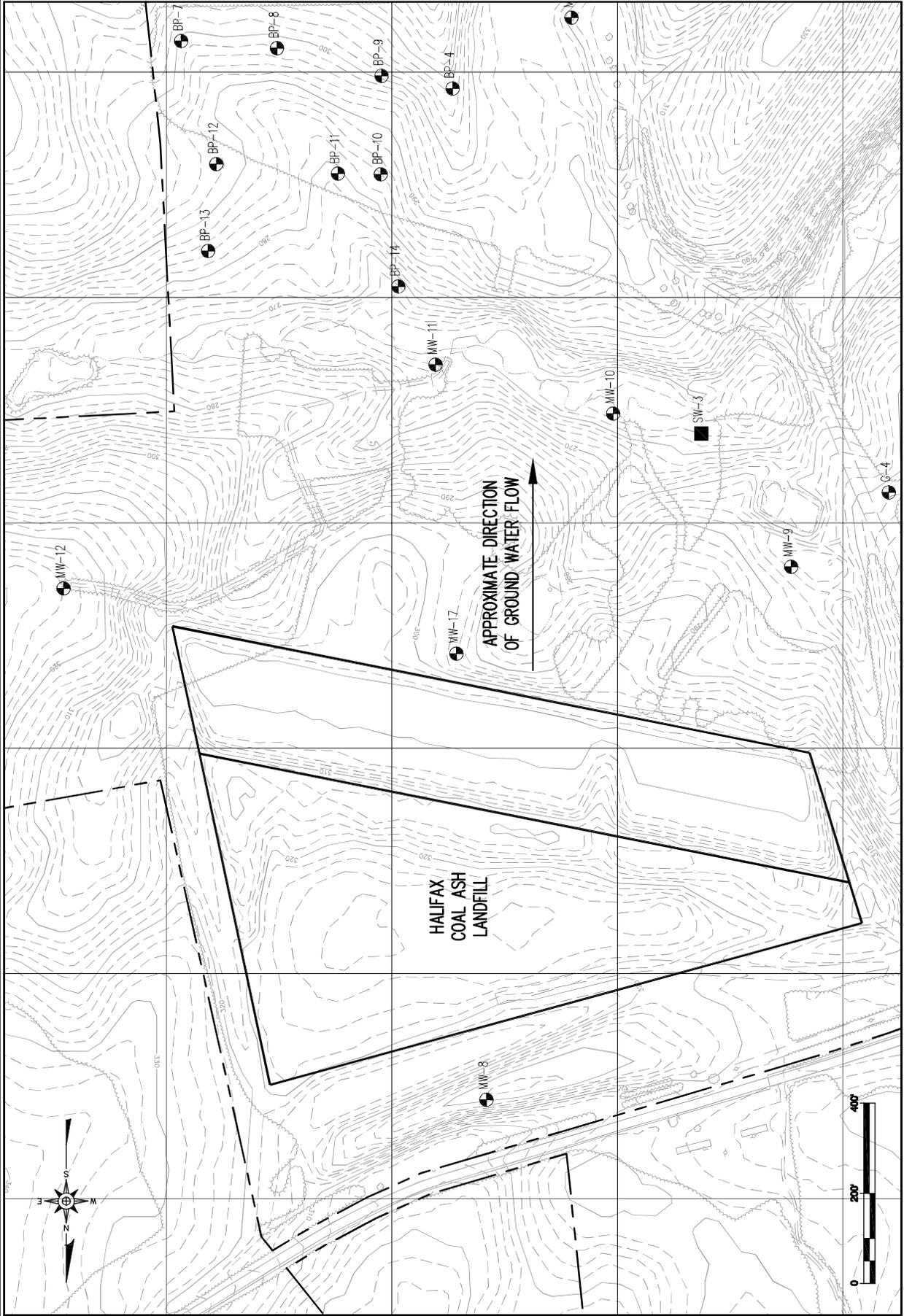
CHECKED BY: J.A.S.

SCALE: AS SHOWN

FIGURE NO. 1

14 N. Ragsdale Ave.
Raleigh, N.C. 27603
919-853-8877
www.rsgardner.com

**RICHARDSON SMITH GARDNER
& ASSOCIATES**



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Tables

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Table 1
Halifax County Coal Ash Landfill
Field Parameters
February 20 & 21, 2012

Monitoring Location	pH (std units)	Static Water Level (feet)	Specific Conductivity (umhos/cm)	Temperature degrees C	Turbidity (NTU)
MW-8	NS	NS	NS	NS	NS
MW-9	5.3	13.42	33	17	600
MW-10	5.7	3.64	44	13	40
MW-11	6.5	4.91	108	12	45
MW-12	5.1	45.82	30	16	1450
MW-17	5.5	22.22	34	17	1000
SW-1	6.9	-	106	9	6.8
Basin 1	NS	NS	NS	NS	NS

NS = Not Sampled

Table 2
Halifax County Coal Ash Landfill
Inorganic Constituents Detected in Water Samples
February 20 & 21, 2012

Monitoring Location	MDL	SWSL	2L Standard	MW-9	MW-10	MW-11	MW-12	MW-17	SW-1
Total Organic Carbon	300	NE	NE	<300	<300	<300	<300	<300	5310
Chloride	5000	--	250000	<5000	<5000	<5000	5000	<5000	<5000
Sulfate	5000	250000	250000	<5000	<5000	<5000	11500 J	<5000	<5000
Arsenic	0.10	10	10	0.32 J	<0.10	<0.10	0.34 J	0.25 J	0.38 J
Barium	0.02	100	700	42.2 J	29.8 J	10.8 J	109	129	10.6 J
Cadmium	0.02	1	2	0.13 J	0.43 J	0.06 J	0.32 J	0.32 J	0.05 J
Chromium, total	0.04	10	10	0.22 J	<0.04	0.15 J	2.5 J	5.6 J	0.22 J
Copper	0.02	10	1000	0.16 J	0.56 J	0.90 J	5.1 J	24	0.72 J
Lead	0.02	10	15	1.2 J	0.60 J	0.16 J	4.4 J	4.7 J	0.24 J
Silver	0.02	10	20	<0.02	<0.02	<0.02	0.05 J	<0.02	<0.02
Zinc	0.24	10	1000	9.7 J	3.1 J	4.2 J	36	41	1.1 J

NOTE:

- MDL - Method Detection Limit
- SWSL - Solid Waste Section Quantitation Limit
- 2L - Groundwater Standard (15A NCAC 2L 0200)
- < MDL - Not detected at or above the MDL
- Shading - Levels above 2L Standard
- Bold Letters - Constituent detected above SWSL
- J - "J-qualified" reported from laboratory as data between the MDL and SWSL

Results are presented in ug/l.

Data from 03/07/2012 Environment 1, Incorporated Laboratory Report #6042.



By: MG
Date: 3/8/2012

Table 3
Halifax County Coal Ash Landfill
Inorganic Constituents Detected in Sediment
February 20 & 21, 2012

Monitoring Location	LOQ/CL	SWSL	2L Standard	Sediment #1 Upstream	Sediment #2 Downstream
Arsenic	100	10	10	<100	<100
Barium	1000	100	700	<1000	<1000
Cadmium	50	1	2	<50	<50
Chromium, total	100	10	10	<100	<100
Lead	100	10	15	122	<100
Mercury	0.3	0.2	1	<0.3	<0.3
Selenium	200	10	20	<200	<200
Silver	100	10	20	<100	<100

NOTE:

- LOQ/CL - Reporting Limit/Control Limit for the parameter recovery result
- SWSL - Solid Waste Section Quantitation Limit
- 2L - Groundwater Standard (15A NCAC 2L 0200)
- < LOQ/CL - Not detected at or above the LOQ/CL
- Shading - Levels above 2L Standard
- Bold Letters - Constituent detected above SWSL
- J - "J-qualified" reported from laboratory as data between the MDL and SWSL

Results are presented in ug/l unless otherwise noted.

Results by SW-846 7470A TCLP and SW-846 6010C TCLP, as reported by SGS report #31200482.

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Appendix A

Laboratory Analytical Report

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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#: 6042

HALIFAX CO. (COAL ASH LANDFILL)
MS. GWEN MATTHEWS
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 02/21/12
DATE REPORTED : 03/07/12

REVIEWED BY: 

PARAMETERS	MDL	Well SWSL #8	Well #9	Well #10	Well #11	Well #12	Analysis Date	Method Analyst Code
PH (field measurement), Units		Missing	5.3	5.7	6.5	5.1	02/21/12RJH	SM4500HB
Total Organic Carbon, mg/l	0.30	1.0 Missing	---	U	---	U	02/27/12SEJ	SM5310C
Chloride, mg/l	5.0	5.0 Missing	---	U	---	U	02/24/12HLB	SM4500-CLB
Sulfate, mg/l	5.0	250.0 Missing	---	U	---	U	02/24/12TRB	SM426C
Arsenic, ug/l	0.10	10.0 Missing	0.32 J	---	U		02/23/12LFFJ	EPA200.8
Arsenic, ug/l	0.10	10.0			---	U	03/05/12LFFJ	EPA200.8
Barium, ug/l	0.02	100.0 Missing	42.2 J	29.8 J			02/23/12LFFJ	EPA200.8
Barium, ug/l	0.02	100.0			10.8 J	109	03/05/12LFFJ	EPA200.8
Cadmium, ug/l	0.02	1.0 Missing	0.13 J	0.43 J			02/23/12LFFJ	EPA200.8
Cadmium, ug/l	0.02	1.0			0.06 J	0.32 J	03/05/12LFFJ	EPA200.8
Copper, ug/l	0.02	10.0 Missing	1.6 J	0.56 J			02/23/12LFFJ	EPA200.8
Copper, ug/l	0.02	10.0			0.90 J	5.1 J	03/05/12LFFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0 Missing	0.22 J	---	U		02/23/12LFFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0			0.15 J	2.5 J	03/05/12LFFJ	EPA200.8
Lead, ug/l	0.02	10.0 Missing	1.2 J	0.60 J			02/23/12LFFJ	EPA200.8
Lead, ug/l	0.02	10.0			0.16 J	4.4 J	03/05/12LFFJ	EPA200.8
Mercury, ug/l	0.05	0.20 Missing	---	U	---	U	02/23/12LFFJ	EPA200.8
Mercury, ug/l	0.05	0.20			---	U	03/05/12LFFJ	EPA200.8
Selenium, ug/l	0.20	10.0 Missing	---	U	---	U	02/23/12LFFJ	EPA200.8
Selenium, ug/l	0.20	10.0			---	U	03/05/12LFFJ	EPA200.8
Silver, ug/l	0.02	10.0 Missing	---	U	---	U	02/23/12LFFJ	EPA200.8
Silver, ug/l	0.02	10.0			---	U	03/05/12LFFJ	EPA200.8
Zinc, ug/l	0.24	10.0 Missing	9.7 J	3.1 J			02/23/12LFFJ	EPA200.8
Zinc, ug/l	0.24	10.0			4.2 J	36	03/05/12LFFJ	EPA200.8
Turbidity, NTU	1.0	1.0 Missing	600	40	45	1450	02/21/12MBL	SM2130B
Conductivity (at 25c), uMhos/cm	1.0	1.0 Missing	33	44	108	30	02/21/12RJH	SM2510B
Temperature, °C		Missing	17	13	12	16	02/21/12RJH	SM2550B
Static Water Level, feet		Missing	13.42	3.64	4.91	45.82	02/21/12RJH	
Well Depth, feet		Missing	24.97	16.22	21.71	51.02	02/21/12RJH	

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#: 6042

HALIFAX CO. (COAL ASH LANDFILL)
MS. GWEN MATTHEWS
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 02/21/12
DATE REPORTED : 03/07/12

REVIEWED BY: 

PARAMETERS	MDL	Well		Analysis		Method Code
		SWSL	#17	Date	Analyst	
PH (field measurement), Units				5.5	02/21/12RJH	SM4500HB
Total Organic Carbon, mg/l	0.30	1.0	---	U	02/27/12SEJ	SM5310C
Chloride, mg/l	5.0	5.0	---	U	02/24/12HLB	SM4500-CLB
Sulfate, mg/l	5.0	250.0	5.7	J	02/24/12TRB	SM426C
Arsenic, ug/l	0.10	10.0	0.25	J	03/05/12LFFJ	EPA200.8
Barium, ug/l	0.02	100.0	129		03/05/12LFFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.32	J	03/05/12LFFJ	EPA200.8
Copper, ug/l	0.02	10.0	24		03/05/12LFFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	5.6	J	03/05/12LFFJ	EPA200.8
Lead, ug/l	0.02	10.0	4.7	J	03/05/12LFFJ	EPA200.8
Mercury, ug/l	0.05	0.20	---	U	03/05/12LFFJ	EPA200.8
Selenium, ug/l	0.20	10.0	---	U	03/05/12LFFJ	EPA200.8
Silver, ug/l	0.02	10.0	---	U	03/05/12LFFJ	EPA200.8
Zinc, ug/l	0.24	10.0	41		03/05/12LFFJ	EPA200.8
Turbidity, NTU	1.0	1.0	1000		02/21/12MEL	SM2130B
Conductivity (at 25c), uMhos/cm	1.0	1.0	34		02/21/12RJH	SM2510B
Temperature, °C			17		02/21/12RJH	SM2550B
Static Water Level, feet			22.22		02/21/12RJH	
Well Depth, feet			26.81		02/21/12RJH	

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

Environment 1, Inc.
 P.O. Box 7085, 114 Oakmont Dr.
 Greenville, NC 27858

CHAIN OF CUSTODY RECORD

Phone (252) 756-6208 • Fax (252) 756-0633

CLIENT: 6042 Week: 9

HALIFAX CO. (COAL ASH LANDFILL)
 MS. GWEN MATTHEWS
 P.O. BOX 70
 HALIFAX NC 27839

(252) 583-1807

SAMPLE LOCATION	COLLECTION		TOTAL CHLORINE, mg/L AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	TOC	Chloride	Sulfate	Metals	Turbidity	Conductivity	Temperature	Field Parameter	PARAMETERS	CLASSIFICATION:
	DATE	TIME														
Well #8					6											
Well #9	02	21/12/050			6											
Well #10	02	21/12/1232			6											
Well #11	02	21/12/1025			6											
Well #12	02	21/12/1205			6											
Well #17	02	21/12/1825			6											
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)

DISINFECTION
 CHLORINE
 UV
 NONE

CHLORINE NEUTRALIZED AT COLLECTION
 pH CHECK (LAB)
 CONTAINER TYPE: PIG
 CHEMICAL PRESERVATION
 A - NONE D - NAOH
 B - HNO₃ E - HCL
 C - H₂SO₄ F - ZINC ACETATE
 G - NA THIOSULFATE

CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY
 SOLID WASTE SECTION
 WASTEWATER (NPDES)
 DRINKING WATER
 DMO/GW

SAMPLES COLLECTED BY: (Please Print)
 H. Gage / S. G. Gage
 SAMPLES RECEIVED IN LAB AT 6.2 °C

COMMENTS:
 WELL & DRG

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 234484

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#: 6042 A

HALIFAX CO. (COAL ASH LANDFILL)
MS. GWEN MATTHEWS
P.O. BOX 70
HALIFAX ,NC 27839

DATE COLLECTED: 02/20/12
DATE REPORTED : 03/02/12

REVIEWED BY: 

PARAMETERS	MDL	SWSL	SW-1	Basin #1	Analysis	Method
					Date	Analyst
PH (field measurement), Units			6.9	Missing	02/20/12RJH	SM4500HB
Total Organic Carbon, mg/l	0.30	1.0	5.31	Missing	02/27/12SEJ	SM5310C
Chloride, mg/l	5.0	5.0	---	U Missing	02/24/12HLB	SM4500-CLB
Sulfate, mg/l	5.0	250.0	10.4	J Missing	02/21/12TRB	SM426C
Arsenic, ug/l	0.10	10.0	0.38	J Missing	02/23/12LFJ	EPA200.8
Barium, ug/l	0.02	100.0	10.6	J Missing	02/23/12LFJ	EPA200.8
Cadmium, ug/l	0.02	1.0	0.05	J Missing	02/23/12LFJ	EPA200.8
Copper, ug/l	0.02	10.0	0.72	J Missing	02/23/12LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.22	J Missing	02/23/12LFJ	EPA200.8
Lead, ug/l	0.02	10.0	0.24	J Missing	02/23/12LFJ	EPA200.8
Mercury, ug/l	0.05	0.20	---	U Missing	02/23/12LFJ	EPA200.8
Selenium, ug/l	0.20	10.0	---	U Missing	02/23/12LFJ	EPA200.8
Silver, ug/l	0.02	10.0	---	U Missing	02/23/12LFJ	EPA200.8
Zinc, ug/l	0.24	10.0	1.1	J Missing	02/23/12LFJ	EPA200.8
Turbidity, NTU	1.0	1.0	6.8	Missing	02/21/12MEL	SM2130B
Conductivity (at 25c), uMhos/cm	1.0	1.0	106	Missing	02/20/12RJH	SM2510B
Temperature, °C			9	Missing	02/20/12RJH	SM2550B

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

Environment 1, Inc.
 P.O. Box 7085, 114 Oakmont Dr.
 Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CLIENT: 6042 A Week: 9

HALIFAX CO. (COAL ASH LANDFILL)
 MS. GWEN MATTHEWS
 P.O. BOX 70
 HALIFAX NC 27839

(252) 583-1807

CHAIN OF CUSTODY RECORD

SAMPLE LOCATION	COLLECTION		TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	DISINFECTION		Field pH	TOC	Chloride	Sulfate	Metals	Turbidity	Conductivity	Temperature	TCLP Metals	PARAMETERS	CLASSIFICATION:	
	DATE	TIME				CHLORINE	UV												
SW-1	00	00120810	9		6	<input type="checkbox"/>	<input type="checkbox"/>												
Basin #1					6	<input type="checkbox"/>	<input type="checkbox"/>												
Sediment Sample #1	00	0012			1	<input type="checkbox"/>	<input type="checkbox"/>												
Sediment Sample #2	02	0012			1	<input type="checkbox"/>	<input type="checkbox"/>												
RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12
RELINQUISHED BY (SIG.)	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12
RELINQUISHED BY (SIG.)	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12	[Signature]	02/02/12
COMMENTS: RASID 1 DRY																			
CHAIN OF CUSTODY MAINTAINED DURING SHIPMENT/DELIVERY <input checked="" type="checkbox"/> SOLID WASTE SECTION <input type="checkbox"/> WASTEWATER (NPDES) <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> DWQ/GW SAMPLES COLLECTED BY: N Ogel fck (Please Print) SAMPLES RECEIVED IN LAB AT 0.3 °C																			

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 234483



Laboratory Report of Analysis

To: Dee Dee Woolard
ENVIRONMENT 1, INC.
P.O. Box 7085
Greenville, NC 27835

Report Number: 31200482

Client Project: 6042A Halifax Co. (Coal LF)

Dear Dee Dee Woolard,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of five years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of thirty (30) days from the date of this report unless other arrangements are requested.

If there are any questions about the report or services performed during this project, please call Michael D. Page at (910) 350-1903. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Digitally signed by: Michael Page
Date: 2012.03.01 15:40:11 -05'00'

Michael D. Page
Project Manager
michael.page@sgs.com

Date

Print Date: 03/01/2012

N.C. Certification # 481

SGS North America Inc.

5500 Business Drive, Wilmington, NC 28405
t 910.350.1903 f 910.350.1557 www.us.sgs.com

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Laboratory Qualifiers

Report Definitions

DL	Method, Instrument, or Estimated Detection Limit per Analytical Method
CL	Control Limits for the recovery result of a parameter
LOQ	Reporting Limit
DF	Dilution Factor
RPD	Relative Percent Difference
LCS(D)	Laboratory Control Spike (Duplicate)
MS(D)	Matrix Spike (Duplicate)
MB	Method Blank

Qualifier Definitions

*	Recovery or RPD outside of control limits
B	Analyte was detected in the Lab Method Blank at a level above the LOQ
U	Undetected (Reported as ND or < DL)
V	Recovery is below quality control limit. The data has been validated based on a favorable signal-to-noise and detection limit
A	Amount detected is less than the Lower Method Calibration Limit
J	Estimated Concentration.
O	The recovery of this analyte in the OPR is above the Method QC Limits and the reported concentration in the sample may be biased high
E	Amount detected is greater than the Upper Calibration Limit
S	The amount of analyte present has saturated the detector. This situation results in an underestimation of the affected analyte(s)
Q	Indicates the presence of a quantitative interference. This situation may result in an underestimation of the affected analyte(s)
I	Indicates the presence of a qualitative interference that could cause a false positive or an overestimation of the affected analyte(s)
DPE	Indicates the presence of a peak in the polychlorinated diphenylether channel that could cause a false positive or an overestimation of the affected analyte(s)
TIC	Tentatively Identified Compound
EMPC	Estimated Maximum possible Concentration due to ion ratio failure
ND	Not Detected
K	Result is estimated due to ion ratio failure in High Resolution PCB Analysis
P	RPD > 40% between results of dual columns
D	Spike or surrogate was diluted out in order to achieve a parameter result within instrument calibration range

Samples requiring manual integrations for various congeners and/or standards are marked and dated by the analyst. A code definition is provided below:

M1	Mis-identified peak
M2	Software did not integrate peak
M3	Incorrect baseline construction (i.e. not all of peak included; two peaks integrated as one)
M4	Pattern integration required (i.e. DRO, GRO, PCB, Toxaphene and Technical Chlordane)
M5	Other - Explained in case narrative

Note Results pages that include a value for "Solids (%)" have been adjusted for moisture content.



Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
Sediment Sample #1	31200482001	02/20/2012 00:00	02/24/2012 10:40	Soil-Solid as dry weight
Sediment Sample #2	31200482002	02/20/2012 00:00	02/24/2012 10:40	Soil-Solid as dry weight

Print Date: 03/01/2012

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Case Narrative

MIP1440 [MXX1827]

6010C - The low level check associated with batch MIP1440 has a reported recovery for Lead that is above the QC limit. This may indicate an increased sensitivity for this analyte.



Results of Sediment Sample #1

Client Sample ID: Sediment Sample #1
Client Project ID: 6042A Halifax Co. (Coal LF)
Lab Sample ID: 31200482001-A
Lab Project ID: 31200482

Collection Date: 02/20/2012 00:00
Received Date: 02/24/2012 10:40
Matrix: Soil-Solid as dry weight
Solids (%): 100.00

Results by SW-846 6010C -TCLP

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Arsenic	ND		0.100	mg/L	1	02/29/2012 15:32
Barium	ND		1.00	mg/L	1	02/29/2012 15:32
Cadmium	ND		0.0500	mg/L	1	02/29/2012 15:32
Chromium	ND		0.100	mg/L	1	02/29/2012 15:32
Lead	0.122		0.100	mg/L	1	02/29/2012 15:32
Selenium	ND		0.200	mg/L	1	02/29/2012 15:32
Silver	ND		0.100	mg/L	1	02/29/2012 15:32

Batch Information

Analytical Batch: MIP1440
Analytical Method: SW-846 6010C -TCLP
Instrument: ICP1
Analyst: NTM
Analytical Date/Time: 02/29/2012 15:32

Prep Batch: MXX1827
Prep Method: SW-846 3010A TCLP
Prep Date/Time: 02/28/2012 14:38
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 50 mL

Print Date: 03/01/2012

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Results of Sediment Sample #1

Client Sample ID: Sediment Sample #1
Client Project ID: 6042A Halifax Co. (Coal LF)
Lab Sample ID: 31200482001-A
Lab Project ID: 31200482

Collection Date: 02/20/2012 00:00
Received Date: 02/24/2012 10:40
Matrix: Soil-Solid as dry weight
Solids (%): 100.00

Results by SW-846 7470A-TCLP

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Mercury	ND		0.000300	mg/L	1	02/29/2012 12:51

Batch Information

Analytical Batch: MHG1205
Analytical Method: SW-846 7470A-TCLP
Instrument: HG2
Analyst: NTM
Analytical Date/Time: 02/29/2012 12:51

Prep Batch: MXX1830
Prep Method: SW-846 7470A PREP TCLP
Prep Date/Time: 02/29/2012 08:25
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 57 mL

Print Date: 03/01/2012

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Results of Sediment Sample #2

Client Sample ID: **Sediment Sample #2**
Client Project ID: **6042A Halifax Co. (Coal LF)**
Lab Sample ID: 31200482002-A
Lab Project ID: 31200482

Collection Date: 02/20/2012 00:00
Received Date: 02/24/2012 10:40
Matrix: Soil-Solid as dry weight
Solids (%): 100.00

Results by SW-846 6010C -TCLP

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Arsenic	ND		0.100	mg/L	1	02/29/2012 15:49
Barium	ND		1.00	mg/L	1	02/29/2012 15:49
Cadmium	ND		0.0500	mg/L	1	02/29/2012 15:49
Chromium	ND		0.100	mg/L	1	02/29/2012 15:49
Lead	ND		0.100	mg/L	1	02/29/2012 15:49
Selenium	ND		0.200	mg/L	1	02/29/2012 15:49
Silver	ND		0.100	mg/L	1	02/29/2012 15:49

Batch Information

Analytical Batch: MIP1440
Analytical Method: SW-846 6010C -TCLP
Instrument: ICP1
Analyst: NTM
Analytical Date/Time: 02/29/2012 15:49

Prep Batch: MXX1827
Prep Method: SW-846 3010A TCLP
Prep Date/Time: 02/28/2012 14:38
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 50 mL



Results of Sediment Sample #2

Client Sample ID: **Sediment Sample #2**
Client Project ID: **6042A Halifax Co. (Coal LF)**
Lab Sample ID: 31200482002-A
Lab Project ID: 31200482

Collection Date: 02/20/2012 00:00
Received Date: 02/24/2012 10:40
Matrix: Soil-Solid as dry weight
Solids (%): 100.00

Results by SW-846 7470A-TCLP

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Mercury	ND		0.000300	mg/L	1	02/29/2012 13:00

Batch Information

Analytical Batch: MHG1205
Analytical Method: SW-846 7470A-TCLP
Instrument: HG2
Analyst: NTM
Analytical Date/Time: 02/29/2012 13:00

Prep Batch: MXX1830
Prep Method: SW-846 7470A PREP TCLP
Prep Date/Time: 02/29/2012 08:25
Prep Initial Wt./Vol.: 20 mL
Prep Extract Vol: 57 mL

Print Date: 03/01/2012

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312 00482

CHAIN OF CUSTODY RECORD

Page 1 of 1

Environment 1, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

Phone (252) 756-6208 • Fax (252) 756-0633

CLIENT: 6042 A Week: 9

HALIFAX CO. (COAL ASH LANDELL)
MS. GWEN MATTHEWS
P.O. BOX 70
HALIFAX NC 27839

(252) 583-1807

SAMPLE LOCATION	COLLECTION		TOTAL CHLORINE, mg/l	DISINFECTION	AT COLLECTION TEMPERATURE, °C	# OF CONTAINERS AT COLLECTION	AT COLLECTION	P	P	P	P	P	P	P	P	G	PARAMETERS	CHEMICAL PRESERVATION	CONTAINER TYPE, P/G	pH CHECK (LAB)	CHLORINE NEUTRALIZED AT COLLECTION	
	DATE	TIME																				
SW-1	00	80 12 810		<input type="checkbox"/> CHLORINE <input type="checkbox"/> UV <input type="checkbox"/> NONE	9	6																
Basin #1						6																
Sediment Sample #1	02	00 12				1																
Sediment Sample #2	02	00 12				1																
RELINQUISHED BY (SIG./SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	COMMENTS:
[Signature]	02 24 2012	[Signature]	02 24 2012	[Signature]	02 24 2012	10:30	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	Basin 1 DRY									
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	RECEIVED BY (SIG.)		DATE/TIME	COMMENTS:
[Signature]	02 24 2012	[Signature]	02 24 2012	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	[Signature]	02 24 2012	10:40	0.1 no seal

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 234483

SGS North America Inc.

Sample Receipt Checklist (SRC)

Client: Environment 1

Work Order No.: 31200482

- 1. Shipped
 Hand Delivered
- 2. COC Present on Receipt
 No COC
 Additional Transmittal Forms
- 3. Custody Tape on Container
 No Custody Tape
- 4. Samples Intact
 Samples Broken / Leaking
- 5. Chilled on Receipt Actual Temp.(s) in °C: 0.1
 Ambient on Receipt
 Walk-in on Ice; Coming down to temp.
 Received Outside of Temperature Specifications
- 6. Sufficient Sample Submitted
 Insufficient Sample Submitted
- 7. Chlorine absent
 HNO3 < 2
 HCL < 2
 Additional Preservatives verified (see notes)
- 8. Received Within Holding Time
 Not Received Within Holding Time
- 9. No Discrepancies Noted
 Discrepancies Noted
 NCDENR notified of Discrepancies*
- 10. No Headspace present in VOC vials
 Headspace present in VOC vials >6mm

Notes: _____

Comments: _____

Inspected and Logged in by: JJ
Date: Fri-2/24/12 00:00