Semi-Annual Water Quality Monitoring Report with Corrective Action Update

Prepared for

Lenoir County Active C&D and Closed MSWLF
LaGrange, North Carolina

January 2014

Permit Number: 54-03
MESCO Project Number: G13015.0

Submittal Date: April 1, 2014

P.O. Box 97
Garner, NC 27529
License No. C-0281

Municipal Services Garner, NC
Engineering Company, P.A. Boone, NC
Municipal Engineering Services Company, P.A.
Garner and Boone, North Carolina

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):

Municipal Engineering Services Co., PA

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

Name: Jonathan Pfohl Phone: (919)772-5393

E-mail: jpfohl@mesco.com

Facility name:	Facility Address:	Facility Permit #	NC Landfill Rule: (.0500 or .1600)	Actual sampling dates (e.g., October 20-24, 2006)
Lenoir County Active C&D Landfill and Closed Unlined MSWLF	2949 Hodges Farm Road LaGrange, NC 28501	54-03	.1600	January 16, 2014

Environmental Status: (Check all that apply)

☐ Initial/Background Monitoring ☒ Detection Monitoring ☒ Assessment Monitoring MW-4 (Annually) Other Wells (Every 5 Years) ☒ 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 Analysis For 7 Wells per CAP
☐ 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.

Steven R. Gandy, Ph.D., P.E. Senior Project Manager (919) 772-5393

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

Steven R. Gandy PhD PE 4/1/14

Signature Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA PROFESSIONAL SEAL 031020 ENGINEER STEVEN RAY GANDY

P.O. Box 97, Garner, NC 27529

Facility Representative Address

C-0281

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

Revised 6/2009

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License No. C-0281

CIVIL/SANITARY/ENVIRONMENTAL ENGINEERS

SOLID WASTE MANAGEMENT

Municipal Services Engineering Company, P.A.

SITE PLANNING/SUBDIVISIONS

SUBSURFACE UTILITY ENGINEERING (SUE)

April 1, 2014

Jaclynne Drummond
Solid Waste Section
NC DENR Division of Waste Management
217 West Jones Street
Raleigh, NC 27603

Subject: ***Semi-Annual Water Quality Monitoring Report with Corrective Action Update***
Lenoir County Active C&D and Closed MSWLF
Permit No. 54-03
MESCO Project No. G13015.0
Event Date: January 16, 2014

Dear Ms. Drummond:

Introduction

On behalf of Lenoir County, Municipal Engineering Services Company, P.A. (MESCO) is pleased to present this *Semi-Annual Water Quality Monitoring Report with Corrective Action Update* for the winter 2014 event performed at the Lenoir County active construction and demolition (C&D) and closed municipal solid waste landfill (MSWLF). NCDENR Solid Waste Rule 15A NCAC 13B.1632 requires that Lenoir County provide this report to the NC Solid Waste Section (SWS) on a semi-annual basis. This report documents the quality of the ground and surface waters during this monitoring event performed on January 16, 2014. Laboratory analytical results indicate that the only constituent detected above applicable regulatory Standards was a low non-quantifiable ("j-qualified") concentration of vinyl chloride in sample MW-11. Corrective action via monitored natural attenuation (MNA) continues to be implemented with updated information presented herein.

Background

The Lenoir County Active Construction and Demolition (C&D) Landfill and Closed Unlined Sanitary Municipal Solid Waste Landfill (MSWLF) is located on Hodges Farm Road (SR 1524), La Grange, Lenoir County, North Carolina and operates under permit #54-03. Prior to operation as a C&D landfill, the site operated as an unlined MSWLF. Part of the southern portion of the MSWLF ceased receiving waste prior to October 1994 and was closed with a 24 inch soil cover. The remainder of the MSWLF closed prior to October 1998, with an 18-inch cohesive soil cap having a permeability of 1 x 10-5 cm/sec, and 18 inches of erosive layer, as part of the *Lenoir County Transition Plan.* The C&D landfill operates on top of the capped MSWLF, and both units are monitored together. Lenoir County's Subtitle D MSWLF, located on a contiguous property to the southeast is currently monitored separately under permit 54-09. A topographic map showing the facility location is included as **Figure 1**.

Water quality has been monitored at this facility on at least a semi-annual basis since 1994 and any data comparisons were made to all historical data believed to be reported. Municipal Engineering Services Company, P.A. (MESCO) submitted an *Assessment and Corrective Action* (*ACM*) report dated August 30, 2007. MESCO then developed a *Corrective Action Plan* (*CAP*) (DIN6843) on February 13, 2009. In response to improved water quality and changing geochemical conditions, the CAP was revised on April 30, 2009 *(CAP-Rev. 1) (*DIN 8710). Groundwater remediation using monitored natural attenuation (MNA) was initiated on July 29, 2009 and has continued on a semi-annual basis.

PO Box 97, Garner, North Carolina 27529 (919) 772-5393 PO Box 349, Boone, NC 28607 (828) 262-1767

Following establishment of the two year MNA baseline, MESCO completed a *Corrective Action Evaluation Report* (*CAER*) (DIN 13653) on April 12, 2011. Although the *CAER* demonstrated that water quality conditions have improved and there is adequate evidence that groundwater natural attenuation is occurring, the SWS *CAER* review response (DIN 15524) dated November 22, 2011 denied the proposed discontinuation of corrective action. The *Groundwater and Surface Water Sampling & Analysis Plan* (*SAP*) Revision 2 (*SAP-Rev.2*) (DIN 16358) was submitted by MESCO on March 23, 2012 at the request of the SWS. The SWS requested *SAP-Rev.2* specifies full Appendix II monitoring of all groundwater samples once every five years which was performed on June 25, 2012 and continuation of annual Appendix II monitoring of MW-3 which is planned for the next July 2014 event. Groundwater remediation through MNA is required to continue until the SWS authorizes a change.

As specified within rule 15A NCAC 13B.1632(i) and the SWS Environmental Monitoring Report Form, this report contains sampling procedures, field and laboratory results, corrective action update, groundwater and surface water characterization, and findings. Detections compared to Standards tables, hydrogeologic properties table, MNA parameters table, histograms of historical detections, potentiometric map, field parameters, laboratory analytical reports with quality assurance/quality control data and chains-of-custody (C-O-C) are also included in this report.

Sampling Procedures

Environment 1 (E1) of Greenville, NC, reportedly performed this monitoring event in accordance with the semi-annual monitoring schedule prescribed by the NC Solid Waste Section (SWS) rules/regulations as promulgated in 15A NCAC 13B.1600. E1 personnel reportedly conducted the sampling utilizing portable monitoring methodology in accordance with the approved Sampling & Analysis Plan (SAP) contained in the *CAP-Rev. 1*. Water and dissolved gas samples were collected from six downgradient groundwater monitoring wells (MW-3, MW-4, MW-6, MW-9, MW-11, MW-12), and the hydraulically upgradient background well (MW-1). Surface water samples were reportedly collected from SW-1 located upstream and SW-3 downstream of the facility. Quality control measures included submittal and analysis of an equipment blank (EB), field blank (FB) and travel blank (TB). Monitoring locations are shown in **Figure 2**.

Static water levels in each well were measured electronically prior to purging. Additional static water level readings were recorded from two supplementary monitoring wells (MW-8 and MW-10) to improve potentiometric contouring. E1 documentation indicates samples were transported under C-O-C protocols and analyzed within the specified hold times for each method.

Field Parameter Data

E1 quantified the field parameters static water depth, pH, specific conductivity, temperature, turbidity, oxidation reduction potential (ORP) and dissolved oxygen (DO), which is presented in the laboratory analysis report in **Appendix A**.

Laboratory Results

E1 reportedly analyzed the water samples for the constituents listed in Appendix I of 40 CFR 258 and total mercury (an Appendix II constituent). Additionally, groundwater samples were analyzed for the MNA performance parameter list specified by SWS. Microseeps Inc. of Pittsburgh, PA performed analysis for the MNA parameters volatile fatty acids, methane/ethene/ethane, and dissolved hydrogen. A sampling and analysis table summarizing the locations, targeted constituents, and methods is presented on **Table 1**.

Water samples were analyzed to the laboratory-established Method Detection Limits (MDL), which are at or below current Solid Waste Section Limits (SWSL). **Table 2** summarizes constituents detected in groundwater and surface water samples above the current SWSL, Groundwater Protection Standards (GWP), North Carolina Groundwater Standards (2L) or the applicable Class C North Carolina Surface Water Standards (2B). **Table 3** summarizes Appendix II detections (defined in this report as not also listed in Appendix I and includes only mercury) above the MDL.

Quality Control Samples

Eight of the sixteen (50%) targeted total metals were detected in low non-quantifiable ("j" qualified) concentrations in the EB including the Appendix II exclusive metal total mercury. The low level detection of total mercury in the EB and background well MW-1 may indicate the detections at the other six wells has been influenced by false positives or high bias attributed to laboratory and or field induced artifact contamination. This is the second consecutive event low levels of total mercury has been detected in water samples including the blanks and background well.

Groundwater Samples

Total metals were not detected above 2L or GWP Standards.

Vinyl chloride was detected in MW-11 (0.8 ug/L) which is above the 2L Standard (0.3 ug/L) but below the SWSL ("j qualified"), therefore the value is uncertain.

Surface Water Samples

Samples collected from upstream (SW-3) and downstream (SW-1) of the landfill did not contain target analytes in concentrations above the 2B Standard.

Groundwater Characterization

A single-day potentiometric map of the surficial aquifer was created using groundwater elevation data reported during this event (**Figure 2).** Flow direction trends in a general northeasterly direction towards Falling Creek. Groundwater flow rates via modified Darcy's equation ranged from approximately 6 ft/yr in MW-3 to 76 ft/yr in MW-1 and averaged 29 ft/yr. Groundwater flow rates and directions are included in **Table 4.** Flow directions and gradients are generally consistent with historical observations.

Corrective Action Update

Groundwater remediation measures using MNA per *CAP-Rev. 1* continue to be implemented at the facility. Semi-annual MNA monitoring of seven wells was initiated on July 29, 2009 and has consistently been performed for the full suite of SWS recommended parameters for ten consecutive semi-annual events. The most recent MNA data presented in **Table 5** continues to support previous assertions that geochemical conditions exist in the groundwater that may be considered favorable for continued natural attenuation. Since constituents of concern have not been detected in quantifiable concentrations during the last 1.5 years (three events) screening models were not generated.

Findings

Samples collected from MW-11, located within the 250' compliance boundary, contained vinyl chloride slightly above the 2L Standard but since the reported level was below the SWSL the value is uncertain. Vinyl chloride is a common biodegredation daughter byproduct and it's emergence may be considered evidence of natural attenuation.

MW-4 had historically contained the highest levels of VOCs at this facility but all detections have consistently been below allowable levels for the past 2.5 years (5 events).

The low allowable "j-qualified" detections of total mercury are likely not attributed to anthropogenic causes as evidenced by similar levels reported in upgradient background well (MW-1) and quality control equipment blank (EB) during this and the previous event.

Natural attenuation of the low level contaminants appears to be occurring; therefore, the contingency remediation techniques outlined in the *CAP* are not planned at this time.

Closing

Groundwater remediation and semi-annual water quality monitoring will continue at the facility with the next event scheduled for July 2014. Please contact us by phone at (919) 772-5393 or by email at jpfohl@mesco.com or sgandy@mesco.com.

Sincerely,
MUNICIPAL ENGINEERING SERVICES CO., P.A.

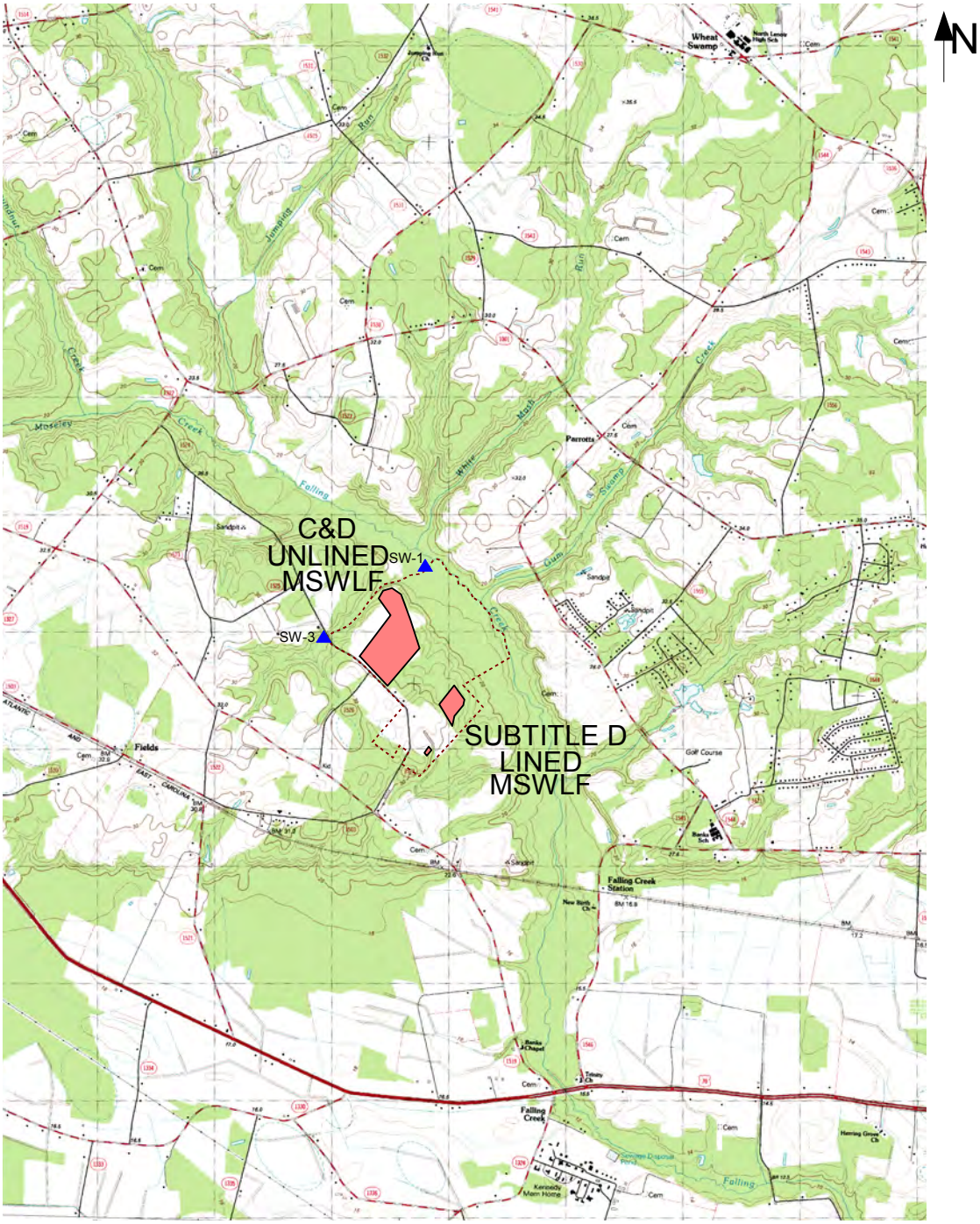
Jonathan Pfohl
Environmental Specialist

Steven R. Gandy, Ph.D, P.E.
Senior Project Manager

Enclosures
cc: Mr. Tom Miller
Lenoir County

Figures

Topographic Map with Site Location
Lenoir County Landfill Facility



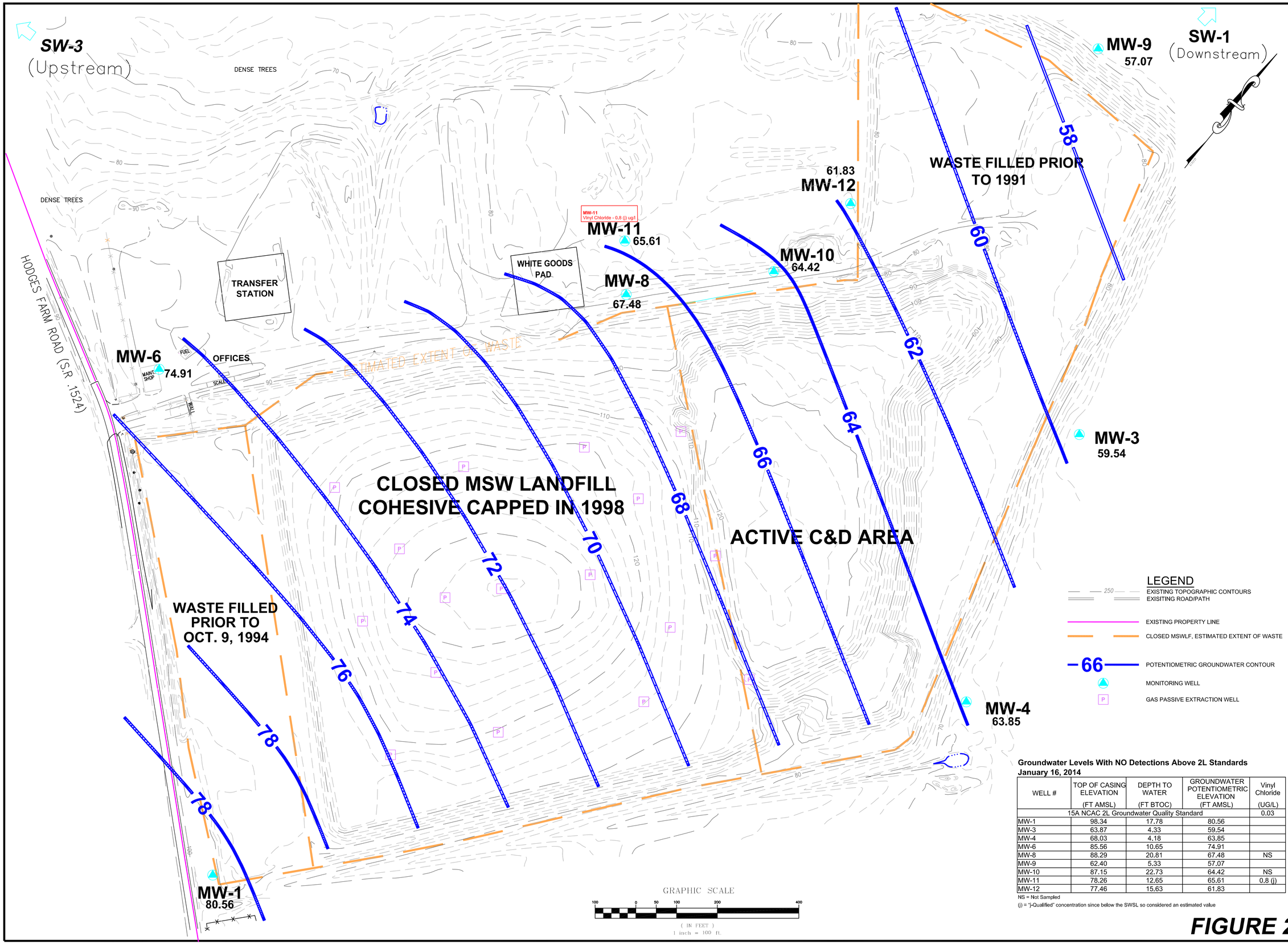
2949 Hodges Farm Rd (SR1524)
LaGrange, NC 28501
Lat:35-17-07.4269
Long:-77-42-32.7453
Northing:561295.59
Easting:2385220.32

QUADRANGLE LEGEND

ROAD CLASSIFICATION

Primary highway, hard surface
Light-duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U. S. Route
State Route

FIGURE 1



Groundwater Levels With NO Detections Above 2L Standards
January 16, 2014

WELL #	TOP OF CASING ELEVATION (FT AMSL)	DEPTH TO WATER (FT BTOC)	GROUNDWATER POTENTIOMETRIC ELEVATION (FT AMSL)	Vinyl Chloride (UG/L)
15A NCAC 2L Groundwater Quality Standard				0.03
MW-1	98.34	17.78	80.56	
MW-3	63.87	4.33	59.54	
MW-4	68.03	4.18	63.85	
MW-6	85.56	10.65	74.91	
MW-8	88.29	20.81	67.48	NS
MW-9	62.40	5.33	57.07	
MW-10	87.15	22.73	64.42	NS
MW-11	78.26	12.65	65.61	0.8 (j)
MW-12	77.46	15.63	61.83	

NS = Not Sampled
(j) = "j-Qualified" concentration since below the SWSL so considered an estimated value

FIGURE 2

Municipal Services Engineering Company, P.A.
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P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767
LICENSE NUMBER: C-0281

ACTIVE C&D LANDFILL and CLOSED MSW LANDFILL
LENOIR COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

POTENTIOMETRIC MAP OF UPPERMOST AQUIFER w/ DETECTIONS ABOVE 2L STANDARDS

SCALE:	SEE BAR SCALE
DATE:	3/17/14
DRWN. BY:	J. PFOHL
CHKD. BY:	S. GANDY
PROJECT NUMBER	G13015.0
DRAWING NO.	FIGURE 2
SHEET NO.	1 OF 1

Tables

Table 1
Sampling and Analysis Summary
January 16, 2014

		App. I		App II	MNA														Field Parameter						
	Reason Not Sampled	VOCs	Metals, Total	Total Mercury	VFA	Hydrogen	Methane/Ethene/Ethane	Dissolved CO2	Alkalinity	Sulfate	Sulfide	Chloride	TOC	COD	BOD	Iron, total	Iron, Ferrous	Nitrate	Dissolved Oxygen (DO)	Oxidation Reduction Potential (ORP)	Static Depth to Water	Temperature	Conductivity	pH	Turbidity
		Lab EPA 8260B	Lab EPA200.8	245.1 R3-94	AM23G	AM20GAX	AM20GAX	SM4500CO2C	2320B-97	4500SO42E97	4500S2D-00	4500CLB-97	5310C-00	H8000-79	5210B-01	EPA200.7	3500FEB-97	353.2 R2-93	SM4500OG	SM2580B		SM2550B	SM2510B	SM4500HB	SM2130-B
MW-1		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-3		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-4		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-6		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-8	E																				x				
MW-9		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-8	E																				x				
MW-11		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
MW-12		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
SW-1		x	x	x															x	x		x	x	x	x
SW-3		x	x	x															x	x		x	x	x	x
EB		x	x	x																					
FB		x	x																						
TB		x																							

App I & II= Appendix Lists from current 40 CFR 258

E = Exempt from water quality sampling

Table 2
Detections Above Established SWSL, GWP, 2L or 2B (Appendix I)
January 16, 2014

Sample ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance Amount	Preliminary Cause [7]
MW-1	Barium, total	1/16/14	115	ug/l	0.06	100	700				
MW-1	Zinc, total	1/16/14	16	ug/l	0.47	10	1000				
MW-3	Zinc, total	1/16/14	24	ug/l	0.47	10	1000				
MW-9	Zinc, total	1/16/14	11	ug/l	0.47	10	1000				
MW-11	**Vinyl Chloride**	**1/16/14**	**0.8 j**	**ug/l**	**0.63**	**1**	**0.03**			**0.77**	**L &/or LFG**
MW-12	Zinc, total	1/16/14	11	ug/l	0.01	10	1000				
SW-1	Zinc, total	1/16/14	12	ug/l	0.47	10		50			

1 Table contains Appendix I constituents detected at or above established SWSL, GWP, 2L, or 2B

[2] MDL = Method Detection Limit

[3] SWSL = Solid Waste Section Reporting Limit

[4] 2L = North Carolina 15A NCAC 2L Groundwater Quality Standard

[5] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification

[6] GWP = Groundwater Protection Standard

[7] Preliminary Cause = Refers to a preliminary analysis of the cause and/or source of a detection over the respective 2L/2B Standard.
A definitive source of the detection was not determined as part of this report.

j =The reported value is between the laboratory method detection limit (MDL) and the laboratory method reporting limit (MRL), adjusted for actual sample preparation data and moisture content, where applicable

BOLD = Concentration > 2L, or 2B Standard

L = Leachate

LFG = Landfill Gas

Table 3
Detections Above MDL (Appendix II Exclusive)
January 16, 2014

Sample ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance Amount	Preliminary Cause [7]
MW-1	Mercury, total	1/16/14	0.16 j	ug/l	0.01	0.2	1				
MW-11	Mercury, total	1/16/14	0.16 j	ug/l	0.01	0.2	1				
MW-12	Mercury, total	1/16/14	0.19 j	ug/l	0.01	0.2	1				
MW-3	Mercury, total	1/16/14	0.15 j	ug/l	0.01	0.2	1				
MW-4	Mercury, total	1/16/14	0.17 j	ug/l	0.01	0.2	1				
MW-6	Mercury, total	1/16/14	0.15 j	ug/l	0.01	0.2	1				
MW-9	Mercury, total	1/16/14	0.75 j	ug/l	0.01	0.2	1				
EB	Mercury, total	1/16/14	0.15 j	ug/l	0.01	0.2	1				

1 Table contains detected App II exclusive constituents (Not found on App I list)

[2] MDL = Method Detection Limit

[3] SWSL = Solid Waste Section Reporting Limit

[4] 2L = North Carolina 15A NCAC 2L Groundwater Quality Standard

[5] GWP = Groundwater Protection Standard

[7] Preliminary Cause = Refers to a preliminary analysis of the cause and/or source of a detection over the respective 2L/2B Standard.
A definitive source of the detection was not determined as part of this report.

j =The reported value is estimated & between the laboratory MDL & the SWSL, adjusted for actual sample preparation data and moisture content.

BOLD = Concentration >2L, or 2B Standard

Table 4
Hydrologic Properties at Monitoring Well Locations
January 16, 2014

Monitoring Well	Hydraulic Conductivity (cm/sec)	Effective Porosity (%)	Hydraulic Gradient (ft/ft)	Linear Velocity (ft/yr)	Flow Direction	Depth to Groundwater (ft btoc)	Groundwater Potentiometric Elevation (ft amsl)	Screened Interval Lithology
MW-1	4.30E-04	20	0.034	76	N21E	17.78	80.56	Silty Sand
MW-3	1.30E-04	20	0.009	6	N27E	4.33	59.54	Silty Sand
MW-4	5.40E-04	20	0.009	26	N30E	4.18	63.85	Silty Sand
MW-6	-	-	0.009	-	N00W	10.65	74.91	Silty Sand
MW-9	3.80E-04	20	0.007	13	N33E	5.33	57.07	Sandy Clay
MW-11	6.59E-04	20	0.014	47	N15E	12.65	65.61	Sand
MW-12	2.10E-04	20	0.007	8	N14E	15.63	61.83	Sand
Minimum	1.30E-04	20	0.007	6	-	4.18	57.07	-
Average	3.91E-04	20	0.013	29	-	10.08	66.20	-
Maximum	6.59E-04	20	0.034	76	-	17.78	80.56	-

NOTE: 1.Hydraulic conductivity (K) values for MW-1, MW-3, MW-4, MW-6 and MW-9 were obtained from GAI Consultants (June 1996).
K values for MW-11 and MW-12 were based on slug test results conducted by MESCO in July 1999.
2.Water levels were measured prior to sampling by Environment 1, Inc. on January 16, 2014.
Linear velocity rate (Q) is was calculated via modified Darcy's equation:

where

$$Q = -\frac{K}{n_e} \cdot \frac{dh}{dl}$$

K = hydraulic conductivity
ne = effective porosity
dh = head difference
dl = horizontal distance

Table 5
MNA Parameter Summary
January 16, 2014

Parameters	Method	MDL*	Units	MW-1	MW-3	MW-4	MW-6	MW-9	MW-11	MW-12
				01/16/14	01/16/14	01/16/14	01/16/14	01/16/14	01/16/14	01/16/14
VFA – Acetic Acid	AM23G	5	ug/L	9.8	22	17	23	26	14	46
VFA – Butyric Acid	AM23G	11	ug/L	<11	<11	<11	<11	<11	<11	<11
VFA – Hexanoic Acid	AM23G	220	ug/L	<220	<220	<220	<220	<220	<220	<220
VFA – i-Hexanoic Acid	AM23G	29	ug/L	<29	<29	<29	<29	<29	<29	<29
VFA – i-Pentanoic Acid	AM23G	9	ug/L	<9	<9	<9	<9	<9	<9	<9
VFA – Lactic Acid	AM23G	13	ug/L	78	67	110	67	58	77	95
VFA – Pentaonic Acid	AM23G	11	ug/L	<11	<11	<11	<11	<11	<11	<11
VFA – Propionic Acid	AM23G	8	ug/L	<8	27	23	27	24	21	36
VFA – Pyruvic Acid	AM23G	14	ug/L	<14	<14	<14	<14	<14	<14	<14
Hydrogen	AM20GAX	14.00	nM	0.90	0.62	0.77	0.88	0.8	0.99	0.94
Methane	AM20GAX	0.05	ug/L	0.86	0.32	420	1500	76	400	480
Ethene	AM20GAX	0	ug/L	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.07
Ethane	AM20GAX	0.01	ug/L	<0.002	<0.002	<0.002	0.03	0.01	0.02	0.01
CO2-Dissolved	4500CO2C	0	ug/L	31000	15000	125000	258000	155000	112000	462000
Alkalinity	2320B-97	1000	ug/L	<1000	7000	23000	13000	<1000	<1000	<1000
Sulfate	4500SO42E97	5000	ug/L	<5000	<5000	<5000	25400	17300	<5000	35400
Sulfide	4500S2D-00	100	ug/L	<100	<100	168	<100	<100	<100	<100
Chloride	4500CLB-97	5000	ug/L	11000	<5000	<5000	<5000	19000	8000	58000
TOC	5310C-00	5000	ug/L	<300	1310	6880	1180	1960	8690	6640
COD	H8000-79	20000	ug/L	<20000	<20000	<20000	<20000	<20000	22000	<20000
BOD	5210B-01	2000	ug/L	<2000	<2000	<2000	2400	<2000	13000	2300
Iron, total	EPA200.7	9.57	ug/L	<9.57	502	5225	3185	988	<9.57	89
Iron, Ferrous	3500FEB-97	50	ug/L	<50	<50	2690	1420	210	<50	<50
Nitrate	353.2 R2-93	50	ug/L	12360	2740	<30	640	4140	1750	1220
Temperature	2550B-00	30	Degrees C	15	10	12	14	16	11	16
ORP	2580B	-900	mV	246	58	30	87	360	156	349
DO	4500OG-01	0	ug/L	6240	4240	1760	2110	1440	2190	4570
pH	4500HB-00	0.00	SU	4.0	5.9	5.5	5.2	4.7	4.6	4.3
Specific Conductance	2510B-97	1	uMhos	170	47	69	109	152	48	336
Turbidity	2130B-01	1.00	NTU	<1.00	9.07	2.12	<1.00	7.13	<1.00	1.61

Notes:

VFA = Volatile Fatty Acids

MDL* = Lowest Method Detection Limit for Lab Parameters or Lowest Field Measurement Possible

Constituents Below Quantization Limit are shown as <MDL value

Appendix A
Laboratory Analysis Report
Field Analysis Report
Chains of Custody

Environment 1, Incorporated

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

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

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6009

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/16/14
DATE REPORTED : 02/14/14

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-1	MW-3	MW-4	MW-6	MW-8	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.0	5.9	5.5	5.2		01/16/14	BF	4500HB-00
BOD, mg/l	2.0	2.0	--- U	--- U	--- U	2.4		01/16/14	TRB	5210B-01
COD, mg/l	20.0	20.0	--- U	--- U	--- U	--- U		01/23/14	TRB	H8000-79
Nitrate Nitrogen as N, mg/l	0.03	10.0	12.36	2.74 J	--- U	0.64 J		01/17/14	ANO	353.2 R2-93
Total Organic Carbon, mg/l	0.30	1.0	--- U	1.31	6.88	1.18		01/17/14	SEJ	5310C-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	--- U	7	23	13		01/16/14	TRB	2320B-97
Chloride, mg/l	5.0	5.0	11	--- U	--- U	--- U		01/22/14	CMC	4500CLB-97
Sulfate, mg/l	5.0	250.0	--- U	--- U	--- U	25.4 J		01/21/14	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	0.47 J	0.08 J	0.03 J	0.12 J		01/22/14	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	--- U	0.06 J	0.63 J	--- U		01/22/14	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	115	56.7 J	16.0 J	37.1 J		01/22/14	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.22 J	0.03 J	--- U	0.06 J		01/22/14	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	0.55 J	--- U	--- U	0.08 J		01/22/14	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	3.2 J	0.20 J	0.34 J	0.42 J		01/22/14	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	0.90 J	0.67 J	0.35 J	1.2 J		01/22/14	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.12 J	0.23 J	--- U	--- U		01/22/14	LFJ	EPA200.8
Iron, ug/l	9.57	300.0	--- U	502	5225	3185		02/04/14	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	1.2 J	0.13 J	0.04 J	0.22 J		01/22/14	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.16 J	0.15 J	0.17 J	0.15 J		01/30/14	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	4.1 J	0.71 J	0.46 J	1.1 J		01/22/14	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	--- U	--- U	0.08 J	0.15 J		01/22/14	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U	--- U	--- U	--- U		01/22/14	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.05 J	--- U	--- U	--- U		01/22/14	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	0.11 J	0.39 J	0.95 J	0.31 J		01/22/14	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	16	24	0.94 J	4.3 J		01/22/14	LFJ	EPA200.8
Sulfide, ug/l	100	1000	--- U	--- U	168 J	--- U		01/21/14	LFJ	4500S2D-00
Conductivity (at 25c), uMhos/cm	1.0	1.0	170	47	69	109		01/16/14	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	6.24	4.24	1.76	2.11		01/16/14	BF	4500OG-01
Temperature, °C			15	10	12	14		01/16/14	BF	2550B-00
Iron, Ferrous, ug/l	50.00	300.0	--- U	--- U	2690	1420		01/17/14	SEJ	3500FEB-97
Static Water Level, feet			17.78	4.33	4.18	10.65	20.81	01/16/14	BF	
Well Depth, feet			39.37	15.90	15.78	16.72		01/16/14	BF	
Carbon Dioxide, mg/l	1.0	1.0	31	15	125	258		01/16/14	TRB	4500CO2C
ORP, mv			+246	+58	+30	+87		01/16/14	BF	2580B
Turbidity (Field), NTU	1.0	1.0	--- U	9.07	2.12	--- U		01/16/14	BF	2130B-01

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

Environment 1, Incorporated

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

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

Drinking Water ID: 37715
Wastewater ID: 10

ID#: 6009

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/16/14
DATE REPORTED : 02/14/14

REVIEWED BY:

PARAMETERS	MDL	SWSL	MW-9	MW-10	MW-11	MW-12	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.7		4.6	4.3	01/16/14	BF	4500HB-00
BOD, mg/l	2.0	2.0	--- U		13	2.3	01/16/14	TRB	5210B-01
COD, mg/l	20.0	20.0	--- U		22	--- U	01/23/14	TRB	H8000-79
Nitrate Nitrogen as N, mg/l	0.03	10.0	4.14 J		1.75 J	1.22 J	01/17/14	ANO	353.2 R2-93
Total Organic Carbon, mg/l	0.30	1.0	1.96		8.69	6.64	01/17/14	SEJ	5310C-00
Total Alkalinity (to pH 4.5), mg/l	1.0	1.0	--- U		--- U	--- U	01/16/14	TRB	2320B-97
Chloride, mg/l	5.0	5.0	19		8	58	01/22/14	CMC	4500CLB-97
Sulfate, mg/l	5.0	250.0	17.3 J		--- U	35.4 J	01/21/14	TRB	4500SO42E97
Antimony, ug/l	0.02	6.0	--- U		0.02 J	--- U	01/22/14	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	0.49 J		--- U	0.54 J	01/22/14	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	86.3 J		32.4 J	189	01/22/14	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	0.13 J		0.06 J	0.27 J	01/22/14	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	0.09 J		0.09 J	0.43 J	01/22/14	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	3.9 J		0.23 J	4.1 J	01/22/14	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	0.49 J		0.67 J	0.62 J	01/22/14	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	--- U		--- U	--- U	01/22/14	LFJ	EPA200.8
Iron, ug/l	9.57	300.0	988		--- U	89 J	02/04/14	LFJ	EPA200.7
Lead, ug/l	0.02	10.0	0.05 J		0.05 J	0.04 J	01/22/14	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.75		0.16 J	0.19 J	01/30/14	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	3.9 J		0.64 J	5.8 J	01/22/14	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	0.76 J		--- U	2.2 J	01/22/14	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U		--- U	--- U	01/22/14	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	0.07 J		--- U	0.04 J	01/22/14	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	0.35 J		0.18 J	0.51 J	01/22/14	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	11		3.2 J	11	01/22/14	LFJ	EPA200.8
Sulfide, ug/l	100	1000	--- U		--- U	--- U	01/21/14	LFJ	4500S2D-00
Conductivity (at 25c), uMhos/cm	1.0	1.0	152		48	336	01/16/14	BF	2510B-97
Dissolved Oxygen, mg/l	0.1	0.1	1.44		2.19	4.57	01/16/14	BF	45000G-01
Temperature, °C			16		11	16	01/16/14	BF	2550B-00
Iron, Ferrous, ug/l	50.00	300.0	210 J		--- U	--- U	01/17/14	SEJ	3500FEB-97
Static Water Level, feet			5.33	22.73	12.65	15.63	01/16/14	BF	
Well Depth, feet			21.17		35.89	38.76	01/16/14	BF	
Carbon Dioxide, mg/l	1.0	1.0	155		112	462	01/16/14	TRB	4500CO2C
ORP, mv			+360		+156	+349	01/16/14	BF	2580B
Turbidity (Field), NTU	1.0	1.0	7.13		--- U	1.61	01/16/14	BF	2130B-01

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: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 01/16/14
DATE ANALYZED: 01/27/14
DATE REPORTED: 02/14/14

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-1	MW-3	MW-4	MW-6	MW-9
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	--- U
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	--- U	--- U	--- U	--- U
5. Trichlorofluoromethane	0.24	1.0	--- U	--- U	--- U	--- U	--- U
6. 1,1-Dichloroethene	0.17	5.0	--- U	--- U	--- U	--- U	--- 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	--- U	--- U	--- U	--- U
12. 1,1-Dichloroethane	0.20	5.0	--- U	--- U	--- U	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	--- U	--- U	--- U	0.60 J	--- U
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	--- U	--- U	--- U	--- U	--- U
21. 1,2-Dichloroethane	0.27	1.0	--- U	--- U	--- U	--- U	--- U
22. Trichloroethene	0.23	1.0	--- U	--- U	--- U	--- U	--- U
23. 1,2-Dichloropropane	0.21	1.0	--- U	--- U	--- U	--- U	--- 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	--- U	--- U	--- U	--- 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	--- U	--- U	--- U	--- U	--- U
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	--- U	--- U	--- U	--- U	--- U
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

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: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 01/16/14
DATE ANALYZED: 01/27/14
DATE REPORTED: 02/14/14

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	MW-11	MW-12
1. Chloromethane	0.77	1.0	--- U	--- U
2. Vinyl Chloride	0.63	1.0	0.80 J	--- 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, Inc.
P.O. Box 7085, 114 Oakmont Dr.
Greenville, NC 27858

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

CHAIN OF CUSTODY RECORD

CLIENT: 6009 **Week:** 7

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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	8260 Dup. 1	8260 Dup. 2	CO2	ORP	Field Parmeter
						L2	L2			
						G	G	P	P	P
						E	E	A	A	A
MW-1	1-16-14	1255		15	15	G	G	G	G	G
MW-3	1-16-14	1030		10	14	G		G	G	G
MW-4	1-16-14	1125		12	14	G		G	G	G
MW-6	1-16-14	1350		14	14	G		G	G	G
MW-8	1-16-14				1					
MW-9	1-16-14	0945		16	14	G		G	G	G
MW-10	1-16-14				1					
MW-11	1-16-14	1210		11	14	G		G	G	G
MW-12	1-16-14	0830		16	14	G		G	G	G

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB)

CONTAINER TYPE, P/G

CHEMICAL PRESERVATION

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

PARAMETERS

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

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

SAMPLES COLLECTED BY: (Please Print)
Bobby / Tom

SAMPLES RECEIVED IN LAB AT 0-2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	1-16-14 3:05	[signature]	1/16/14 322
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.

Nº 274192

FORM #5

Environment 1, Inc.
P.O. Box 7083, 114 Oakmont Dr.
Greenville, NC 27858

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

CHAIN OF CUSTODY RECORD

CLIENT: 6009 **Week:** 7

LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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	Alkalinity	Chloride	Sulfate	Metals	Sulfide	Conductivity	DO	Temperature	Ferrous Iron	Field Parameter	EPA 8260B
CHLORINE NEUTRALIZED AT COLLECTION																					
pH CHECK (LAB)							<2		<2				<2	>9						<2	
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P	P	P	P	P	P		G
CHEMICAL PRESERVATION						A	A	C	A	C	A	A	A	A	F	A	A	A	E		E
MW-1	1-16-14	1255		15	15	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-3	1-16-14	1030		10	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-4	1-16-14	1125		12	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-6	1-16-14	1350		14	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-8	1-16-14				1															G	
MW-9	1-16-14	0945		16	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-10	1-16-14				1															G	
MW-11	1-16-14	1210		11	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
MW-12	1-16-14	0830		16	14	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G

PARAMETERS

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 MAINTAINED DURING SHIPMENT/DELIVERY
(Y) N

SAMPLES COLLECTED BY: (Please Print)
Bobby / Tom

SAMPLES RECEIVED IN LAB AT 0-2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	1-16-14 3:05	[signature]	1/16/14 322
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.

Nº 274193

FORM #5

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

February 3, 2014

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

RE: **LENOIR COUNTY / 6009**
Microseeps Workorder: 11182

Dear Steve Jones:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, January 17, 2014. 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 CT 2/3/14

Robbin Robl 02/03/2014
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 24

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SAMPLE SUMMARY

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID	Sample ID	Matrix	Date Collected	Date Received
111820001	MW1	Water	1/16/2014 12:55	1/17/2014 10:20
111820002	MW1	Bubble Strip	1/16/2014 12:55	1/17/2014 10:20
111820003	MW3	Water	1/16/2014 10:30	1/17/2014 10:20
111820004	MW3	Bubble Strip	1/16/2014 10:30	1/17/2014 10:20
111820005	MW4	Water	1/16/2014 11:25	1/17/2014 10:20
111820006	MW4	Bubble Strip	1/16/2014 11:25	1/17/2014 10:20
111820007	MW6	Water	1/16/2014 13:50	1/17/2014 10:20
111820008	MW6	Bubble Strip	1/16/2014 13:50	1/17/2014 10:20
111820009	MW9	Water	1/16/2014 09:45	1/17/2014 10:20
111820010	MW9	Bubble Strip	1/16/2014 09:45	1/17/2014 10:20
111820011	MW11	Water	1/16/2014 12:10	1/17/2014 10:20
111820012	MW11	Bubble Strip	1/16/2014 12:10	1/17/2014 10:20
111820013	MW12	Water	1/16/2014 08:30	1/17/2014 10:20
111820014	MW12	Bubble Strip	1/16/2014 08:30	1/17/2014 10:20

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820001 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW1 Date Collected: 1/16/2014 12:55

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	**0.078J**	mg/l	0.10	0.013	1			1/27/2014 21:10	KB	
Acetic Acid	**0.0098J**	mg/l	0.070	0.0050	1			1/27/2014 21:10	KB	
Propionic Acid	**0.0080U**	mg/l	0.050	0.0080	1			1/27/2014 21:10	KB	
Butyric Acid	**0.011U**	mg/l	0.050	0.011	1			1/27/2014 21:10	KB	
Pyruvic Acid	**0.014U**	mg/l	0.15	0.014	1			1/27/2014 21:10	KB	
i-Pentanoic Acid	**0.0090U**	mg/l	0.15	0.0090	1			1/27/2014 21:10	KB	
Pentanoic Acid	**0.011U**	mg/l	0.070	0.011	1			1/27/2014 21:10	KB	
i-Hexanoic Acid	**0.029U**	mg/l	0.10	0.029	1			1/27/2014 21:10	KB	
Hexanoic Acid	**0.22U**	mg/l	0.50	0.22	1			1/27/2014 21:10	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820002 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW1 Date Collected: 1/16/2014 12:55

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	0.86	ug/l	0.015	0.0020	1			1/29/2014 10:30	GT	
Ethane	0.0020U	ug/l	0.010	0.0020	1			1/29/2014 10:30	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 10:30	GT	
Hydrogen	0.90	nM	0.60	0.049	1			1/29/2014 10:30	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820003 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW3 Date Collected: 1/16/2014 10:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	0.067J	mg/l	0.10	0.013	1			1/27/2014 21:56	KB	
Acetic Acid	0.022J	mg/l	0.070	0.0050	1			1/27/2014 21:56	KB	
Propionic Acid	0.027J	mg/l	0.050	0.0080	1			1/27/2014 21:56	KB	
Butyric Acid	0.011U	mg/l	0.050	0.011	1			1/27/2014 21:56	KB	
Pyruvic Acid	0.014U	mg/l	0.15	0.014	1			1/27/2014 21:56	KB	
i-Pentanoic Acid	0.0090U	mg/l	0.15	0.0090	1			1/27/2014 21:56	KB	
Pentanoic Acid	0.011U	mg/l	0.070	0.011	1			1/27/2014 21:56	KB	
i-Hexanoic Acid	0.029U	mg/l	0.10	0.029	1			1/27/2014 21:56	KB	
Hexanoic Acid	0.22U	mg/l	0.50	0.22	1			1/27/2014 21:56	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820004 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW3 Date Collected: 1/16/2014 10:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	0.32	ug/l	0.015	0.0020	1			1/29/2014 10:44	GT	
Ethane	0.0020U	ug/l	0.010	0.0020	1			1/29/2014 10:44	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 10:44	GT	
Hydrogen	0.62	nM	0.60	0.049	1			1/29/2014 10:44	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820005 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW4 Date Collected: 1/16/2014 11:25

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	0.11	mg/l	0.10	0.013	1			1/27/2014 22:42	KB	
Acetic Acid	0.017J	mg/l	0.070	0.0050	1			1/27/2014 22:42	KB	
Propionic Acid	0.023J	mg/l	0.050	0.0080	1			1/27/2014 22:42	KB	
Butyric Acid	0.011U	mg/l	0.050	0.011	1			1/27/2014 22:42	KB	
Pyruvic Acid	0.014U	mg/l	0.15	0.014	1			1/27/2014 22:42	KB	
i-Pentanoic Acid	0.0090U	mg/l	0.15	0.0090	1			1/27/2014 22:42	KB	
Pentanoic Acid	0.011U	mg/l	0.070	0.011	1			1/27/2014 22:42	KB	
i-Hexanoic Acid	0.029U	mg/l	0.10	0.029	1			1/27/2014 22:42	KB	
Hexanoic Acid	0.22U	mg/l	0.50	0.22	1			1/27/2014 22:42	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820006 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW4 Date Collected: 1/16/2014 11:25

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	420	ug/l	0.015	0.0020	1			1/29/2014 10:56	GT	
Ethane	0.0020U	ug/l	0.010	0.0020	1			1/29/2014 10:56	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 10:56	GT	
Hydrogen	0.77	nM	0.60	0.049	1			1/29/2014 10:56	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820007 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW6 Date Collected: 1/16/2014 13:50

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	0.067J	mg/l	0.10	0.013	1			1/27/2014 23:28	KB	
Acetic Acid	0.023J	mg/l	0.070	0.0050	1			1/27/2014 23:28	KB	
Propionic Acid	0.027J	mg/l	0.050	0.0080	1			1/27/2014 23:28	KB	
Butyric Acid	0.011U	mg/l	0.050	0.011	1			1/27/2014 23:28	KB	
Pyruvic Acid	0.014U	mg/l	0.15	0.014	1			1/27/2014 23:28	KB	
i-Pentanoic Acid	0.0090U	mg/l	0.15	0.0090	1			1/27/2014 23:28	KB	
Pentanoic Acid	0.011U	mg/l	0.070	0.011	1			1/27/2014 23:28	KB	
i-Hexanoic Acid	0.029U	mg/l	0.10	0.029	1			1/27/2014 23:28	KB	
Hexanoic Acid	0.22U	mg/l	0.50	0.22	1			1/27/2014 23:28	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820008 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW6 Date Collected: 1/16/2014 13:50

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	1500	ug/l	0.015	0.0020	1			1/29/2014 11:08	GT	
Ethane	0.030	ug/l	0.010	0.0020	1			1/29/2014 11:08	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 11:08	GT	
Hydrogen	0.88	nM	0.60	0.049	1			1/29/2014 11:08	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820009 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW9 Date Collected: 1/16/2014 09:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	0.058J	mg/l	0.10	0.013	1			1/28/2014 00:14	KB	
Acetic Acid	0.026J	mg/l	0.070	0.0050	1			1/28/2014 00:14	KB	
Propionic Acid	0.024J	mg/l	0.050	0.0080	1			1/28/2014 00:14	KB	
Butyric Acid	0.011U	mg/l	0.050	0.011	1			1/28/2014 00:14	KB	
Pyruvic Acid	0.014U	mg/l	0.15	0.014	1			1/28/2014 00:14	KB	
i-Pentanoic Acid	0.0090U	mg/l	0.15	0.0090	1			1/28/2014 00:14	KB	
Pentanoic Acid	0.011U	mg/l	0.070	0.011	1			1/28/2014 00:14	KB	
i-Hexanoic Acid	0.029U	mg/l	0.10	0.029	1			1/28/2014 00:14	KB	
Hexanoic Acid	0.22U	mg/l	0.50	0.22	1			1/28/2014 00:14	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820010 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW9 Date Collected: 1/16/2014 09:45

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	76	ug/l	0.015	0.0020	1			1/29/2014 11:23	GT	
Ethane	0.0077J	ug/l	0.010	0.0020	1			1/29/2014 11:23	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 11:23	GT	
Hydrogen	0.80	nM	0.60	0.049	1			1/29/2014 11:23	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820011 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW11 Date Collected: 1/16/2014 12:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	**0.077J**	mg/l	0.10	0.013	1			1/28/2014 01:00	KB	
Acetic Acid	**0.014J**	mg/l	0.070	0.0050	1			1/28/2014 01:00	KB	
Propionic Acid	**0.021J**	mg/l	0.050	0.0080	1			1/28/2014 01:00	KB	
Butyric Acid	**0.011U**	mg/l	0.050	0.011	1			1/28/2014 01:00	KB	
Pyruvic Acid	**0.014U**	mg/l	0.15	0.014	1			1/28/2014 01:00	KB	
i-Pentanoic Acid	**0.0090U**	mg/l	0.15	0.0090	1			1/28/2014 01:00	KB	
Pentanoic Acid	**0.011U**	mg/l	0.070	0.011	1			1/28/2014 01:00	KB	
i-Hexanoic Acid	**0.029U**	mg/l	0.10	0.029	1			1/28/2014 01:00	KB	
Hexanoic Acid	**0.22U**	mg/l	0.50	0.22	1			1/28/2014 01:00	KB	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820012 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW11 Date Collected: 1/16/2014 12:10

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	400	ug/l	0.015	0.0020	1			1/29/2014 11:36	GT	
Ethane	0.016	ug/l	0.010	0.0020	1			1/29/2014 11:36	GT	
Ethene	0.0060U	ug/l	0.010	0.0060	1			1/29/2014 11:36	GT	
Hydrogen	0.99	nM	0.60	0.049	1			1/29/2014 11:36	GT	

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ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820013 Date Received: 1/17/2014 10:20 Matrix: Water
Sample ID: MW12 Date Collected: 1/16/2014 08:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
EDonors - MICR										
Analysis Desc: AM23G			Analytical Method: AM23G							
Lactic Acid	0.095J	mg/l	0.10	0.013	1			1/28/2014 01:46	KB	
Acetic Acid	0.046J	mg/l	0.070	0.0050	1			1/28/2014 01:46	KB	
Propionic Acid	0.036J	mg/l	0.050	0.0080	1			1/28/2014 01:46	KB	
Butyric Acid	0.011U	mg/l	0.050	0.011	1			1/28/2014 01:46	KB	
Pyruvic Acid	0.014U	mg/l	0.15	0.014	1			1/28/2014 01:46	KB	
i-Pentanoic Acid	0.0090U	mg/l	0.15	0.0090	1			1/28/2014 01:46	KB	
Pentanoic Acid	0.011U	mg/l	0.070	0.011	1			1/28/2014 01:46	KB	
i-Hexanoic Acid	0.029U	mg/l	0.10	0.029	1			1/28/2014 01:46	KB	
Hexanoic Acid	0.22U	mg/l	0.50	0.22	1			1/28/2014 01:46	KB	

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220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID: 111820014 Date Received: 1/17/2014 10:20 Matrix: Bubble Strip
Sample ID: MW12 Date Collected: 1/16/2014 08:30

Parameters	Results	Units	PQL	MDL	DF	Prepared	By	Analyzed	By	Qual
RISK - MICR										
Analysis Desc: AM20GAX			Analytical Method: AM20GAX							
Methane	480	ug/l	0.015	0.0020	1			1/29/2014 11:48	GT	
Ethane	0.012	ug/l	0.010	0.0020	1			1/29/2014 11:48	GT	
Ethene	0.074	ug/l	0.010	0.0060	1			1/29/2014 11:48	GT	
Hydrogen	0.94	nM	0.60	0.049	1			1/29/2014 11:48	GT	

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 11182 LENOIR COUNTY / 6009

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).

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QUALITY CONTROL DATA

Workorder: 11182 LENOIR COUNTY / 6009

QC Batch: EDON/1985 Analysis Method: AM23G

QC Batch Method: AM23G

Associated Lab Samples: 111820001, 111820003, 111820005, 111820007, 111820009, 111820011, 111820013

METHOD BLANK: 25423

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
EDonors				
Lactic Acid	mg/l	0.046J	0.013	
Acetic Acid	mg/l	0.0050U	0.0050	
Propionic Acid	mg/l	0.0080U	0.0080	
Butyric Acid	mg/l	0.011U	0.011	
Pyruvic Acid	mg/l	0.014U	0.014	
i-Pentanoic Acid	mg/l	0.0090U	0.0090	
Pentanoic Acid	mg/l	0.011U	0.011	
i-Hexanoic Acid	mg/l	0.029U	0.029	
Hexanoic Acid	mg/l	0.22U	0.22	

LABORATORY CONTROL SAMPLE: 25424

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
EDonors						
Lactic Acid	mg/l	2	2.2	110	70-130	
Acetic Acid	mg/l	2	2.0	101	70-130	
Propionic Acid	mg/l	2	1.9	97	70-130	
Butyric Acid	mg/l	2	2.1	107	70-130	
Pyruvic Acid	mg/l	2	1.9	96	70-130	
i-Pentanoic Acid	mg/l	2	1.9	95	70-130	
Pentanoic Acid	mg/l	2	2.0	101	70-130	
i-Hexanoic Acid	mg/l	2	2.1	105	70-130	
Hexanoic Acid	mg/l	2	1.9	94	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 25425 25426 Original: 111870001

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	0.15	2	2.1	2.4	97	111	70-130	13	30	
Acetic Acid	mg/l	0.24	2	2.4	2.6	106	116	70-130	9	30	
Propionic Acid	mg/l	0.13	2	2.2	2.7	105	129	70-130	21	30	

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Fax: (412) 826-3433

QUALITY CONTROL DATA

Workorder: 11182 LENOIR COUNTY / 6009

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 25425 25426 Original: 111870001

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	2	2.1	2.1	104	104	70-130	0	30	
Pyruvic Acid	mg/l	0	2	2.1	2.0	103	103	70-130	0	30	
I-Pentanoic Acid	mg/l	0	2	2.1	2.0	106	101	70-130	4.8	30	
Pentanoic Acid	mg/l	0	2	2.2	2.0	109	102	70-130	6.6	30	
I-Hexanoic Acid	mg/l	0	2	2.4	2.1	118	104	70-130	13	30	
Hexanoic Acid	mg/l	0.12	2	2.4	2.2	113	105	70-130	7.3	30	

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QUALITY CONTROL DATA

Workorder: 11182 LENOIR COUNTY / 6009

QC Batch: DISG/3559 Analysis Method: AM20GAX

QC Batch Method: AM20GAX

Associated Lab Samples: 111820002, 111820004, 111820006, 111820008, 111820010, 111820012, 111820014

METHOD BLANK: 25547

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Methane	ug/l	0.0020U	0.0020	
Ethane	ug/l	0.0020U	0.0020	
Ethene	ug/l	0.0060U	0.0060	

METHOD BLANK: 25549

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	0.049U	0.049	

LABORATORY CONTROL SAMPLE & LCSD: 25550 25553

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Methane	ug/l	8.3	8.3	8.3	101	101	80-120	0	20	
Ethane	ug/l	6.5	6.5	6.5	100	100	80-120	0	20	
Ethene	ug/l	16	16	16	98	98	80-120	0	20	

LABORATORY CONTROL SAMPLE & LCSD: 25552 25555

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
RISK										
Hydrogen	nM	24	27	27	111	111	80-120	0	20	

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Pittsburgh, PA 15238
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 11182 LENOIR COUNTY / 6009

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
111820001	MW1			AM23G	EDON/1985
111820003	MW3			AM23G	EDON/1985
111820005	MW4			AM23G	EDON/1985
111820007	MW6			AM23G	EDON/1985
111820009	MW9			AM23G	EDON/1985
111820011	MW11			AM23G	EDON/1985
111820013	MW12			AM23G	EDON/1985
111820002	MW1			AM20GAX	DISG/3559
111820004	MW3			AM20GAX	DISG/3559
111820006	MW4			AM20GAX	DISG/3559
111820008	MW6			AM20GAX	DISG/3559
111820010	MW9			AM20GAX	DISG/3559
111820012	MW11			AM20GAX	DISG/3559
111820014	MW12			AM20GAX	DISG/3559

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CHAIN-OF-CUSTODY / Analytical Request Document

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

11182

Page: 1 of 1

001720

Section A Required Client Information:
Company: ENVIRONMENT 1
Address: 114 OAKMONT DR GREENVILLE, NC 27858
Email To: SJONES1@AOL.COM
Phone: 252-756-6208 Fax: 252-756-0833
Requested Due Date/TAT:

Section B Required Project Information:
Report To: STEVE JONES
Copy To:
Purchase Order No.:
Project Name: LENOIR COUNTY
Project Number: 6009

Section C Invoice Information:
Attention:
Company Name: SAME
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY
☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NC

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	TSP	BAK	Zink Acetate & NaOH	Other	Analysis Test (Y/N)	HYDROGEN	LLUFA	METHANE, ETHANE, ETHENE	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW1 A	WT	G			1/16/14	12:55P		5										✓	✓	✓		
2	MW3						10:30A		5										✓	✓	✓		
3	MW4						11:05A		5										✓	✓	✓		
4	MW6						1:50P		5										✓	✓	✓		
5	MW9						9:45A		5										✓	✓	✓		
6	MW11						12:10P		5										✓	✓	✓		
7	MW12						8:30A		5										✓	✓	✓		
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
FACILITY ID # 5403	Bobby Fox / ENV 1	1/16/14	3:10P	[signature] / ENV 1	1/16/14	3:10P				
	[signature] / ENV 1	1/16/14		[signature]	1.17.14	1020	1°C	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: BOBBY FOX
SIGNATURE of SAMPLER: Bobby Fox
DATE Signed (MM/DD/YY): 1/16/14

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

*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.

F-ALL-Q-020rev.07, 15-May-2007

Cooler Receipt Form

Client Name: Environment 1 Project: Lenoir County / 6009 Lab Work Order: 11182

A. Shipping/Container Information (circle appropriate response)

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

Tracking Number: 1Z 203 705 01 6422 2785

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°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	✓			
Microseeps 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: 1.17.14

Project Manager Review: CT Date: 1/20/14

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#: 6010

LENOIR CO. LANDFILL (BLANKS)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON ,NC 28502

DATE COLLECTED: 01/16/14
DATE REPORTED : 02/14/14

REVIEWED BY:

PARAMETERS	MDL	SWSL	Equipment Blank	Trip Blank	Field Blank	Analysis Date	Analyst	Method Code
Antimony, ug/l	0.02	6.0	0.04 J		0.04 J	02/06/14	LFJ	EPA200.8
Arsenic, ug/l	0.05	10.0	--- U		--- U	02/06/14	LFJ	EPA200.8
Barium, ug/l	0.06	100.0	0.15 J		0.14 J	02/04/14	LFJ	EPA200.8
Beryllium, ug/l	0.03	1.0	--- U		--- U	02/07/14	LFJ	EPA200.8
Cadmium, ug/l	0.05	1.0	--- U		--- U	02/04/14	LFJ	EPA200.8
Cobalt, ug/l	0.02	10.0	--- U		--- U	02/04/14	LFJ	EPA200.8
Copper, ug/l	0.06	10.0	0.29 J		0.28 J	02/04/14	LFJ	EPA200.8
Total Chromium, ug/l	0.04	10.0	0.59 J		0.22 J	02/04/14	LFJ	EPA200.8
Lead, ug/l	0.02	10.0	0.02 J		--- U	02/04/14	LFJ	EPA200.8
Mercury, ug/l	0.01	0.20	0.15 J			01/30/14	ADD	245.1 R3-94
Nickel, ug/l	0.45	50.0	--- U		--- U	02/04/14	LFJ	EPA200.8
Selenium, ug/l	0.06	10.0	--- U		--- U	02/04/14	LFJ	EPA200.8
Silver, ug/l	0.03	10.0	--- U		--- U	02/06/14	LFJ	EPA200.8
Thallium, ug/l	0.02	5.5	--- U		--- U	02/04/14	LFJ	EPA200.8
Vanadium, ug/l	0.07	25.0	0.09 J		--- U	02/04/14	LFJ	EPA200.8
Zinc, ug/l	0.47	10.0	3.3 J		2.2 J	02/04/14	LFJ	EPA200.8

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: LENOIR CO. LANDFILL (BLANKS)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

CLIENT ID: 6010

ANALYST: MAO
DATE COLLECTED: 01/16/14
DATE ANALYZED: 01/27/14
DATE REPORTED: 02/14/14

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B R1(96)

PARAMETERS, ug/l	MDL	SWSL	Equipment Blank	Trip Blank	Field Blank
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, 114 Oakmont Dr.
Greenville, NC 27858

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

CHAIN OF CUSTODY RECORD

CLIENT: 6010 **Week:** 7

LENOIR CO. LANDFILL (BLANKS)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON NC 28502

(252) 566-4194

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	Metals	EPA 8260B	8260 Dup. 1
						12	12	12
						P	G	G
						A	E	E
Equipment Blank	1-16-14	0800			3	G	G	G
Trip Blank	1-16-14	0800			2		G	G
Field Blank	1-16-14	0800			3	G	G	G

PARAMETERS

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB)

CONTAINER TYPE, P/G

CHEMICAL PRESERVATION

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 MAINTAINED DURING SHIPMENT/DELIVERY
(Y) N

SAMPLES COLLECTED BY: (Please Print)
Bobby / Tom

SAMPLES RECEIVED IN LAB AT 0.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Tom	1-14-14 3:05	[signature]	1/16/14 322
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.

Nº 274190

FORM #5