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 over Closed Unlined MSWLF	2949 Hodges Farm Road LaGrange, NC 28501	54-03	.1600	January 11, 2010

Environmental Status: (Check all that apply)

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

Type of data submitted: (Check all that apply)

☒ Groundwater monitoring data from monitoring wells
☐ Groundwater monitoring data from private water supply wells
☐ Leachate monitoring data
☒ Surface water monitoring data
☐ Methane gas monitoring data
☐ Corrective action data (specify) _____
☐ 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.

Mark Brown, LG, PG — Senior Professional Geologist — (919) 772-5393

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

Signature — 11/23/10 Date

Affix NC Licensed/ Professional Geologist Seal

NORTH CAROLINA LICENSED SEAL 1711 GEOLOGIST STEPHEN MARK BROWN 11/23/10

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

Semi-Annual Water Quality Monitoring and Statistical Analysis Report

Prepared for

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

July 2010

Permit Number: 54-03
MESCO Project Number: G10015.0

Submittal Date: November 23, 2010

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

TABLE OF CONTENTS

SECTION	PAGE
Introduction	1
Sampling Procedures	1
Field and Laboratory Results	2
Groundwater Samples	2
Surfacewater Samples	2
Statistical Analysis	2
Groundwater Characterization	2
Findings	2
Closing	3

PLATES

Plate 1 ..... Topographic Map with Site Location

Plate 2 ..... Single Day Potentiometric Map of Uppermost Aquifer

TABLES

Table 1 ..... Appendix I Detections Above SWSL, GWP, 2L, or 2B

Table 2 ..... Appendix II Detections Above SWSL, GWP, 2L, or 2B

Table 3 ..... Hydrologic Properties

APPENDICIES

Appendix A ..... Statistical Analysis

Appendix B ..... Corrective Action Summary

Appendix C ..... Laboratory Analysis Report & Chains of Custody

OPERATION/CONSTRUCTION MANAGERS
Municipal Services
CIVIL/SANITARY ENGINEERS
Engineering Company, P.A.

November 23, 2010

Ms. Jaclynne Drummond
Solid Waste Section
Division of Waste Management
North Carolina Department of Environment and Natural Resources
401 Oberlin Road, Suite 150
Raleigh, NC 27605

Re: Semi-Annual Water Quality Monitoring and Statistical Analysis
Lenoir County Active C&D over Closed MSWLF
Permit No. 54-03
MESCO Project No. G10015.0

Dear Ms. Drummond:

Introduction

The Lenoir County Active C&D over Closed MSWLF located near LaGrange NC, currently operating under permit #54-03 is required to submit semi-annual compliance reports as a condition of 15A NCAC 13B.1630. The closed MSWLF ceased operation prior to 1998 and the C&D landfill continues operation over the closed MSWLF; therefore they are combined and treated as a single unit for overall reporting continuity. The water quality monitoring program outlined in the approved Sampling and Analysis Plan (SAP) contained in the approved *Corrective Action Plan* (CAP) dated February 13, 2009 includes a total of nine monitoring locations. Monitored natural attenuation (MNA) is the current, approved corrective action for this facility. Information regarding the status of the Corrective Action is contained in **Appendix B**. Environment 1 (E1) of Greenville, NC performed this monitoring event on July 21, 2010 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. The site location topographic map is included as **Plate 1**.

As specified in 15A NCAC 13B.1632(j) and the SWS Environmental Monitoring Report Form this report contains sampling procedures, field and laboratory results, statistical analysis, groundwater and surface water characterization, and findings. A "Detections compared to Standards" table, field data results, a single-day potentiometric map, groundwater flow direction and flow rate table, statistical analysis, quality assurance/quality control data, and laboratory analytical data results with chains-of-custody (C-O-C) are enclosed.

Sampling Procedure

E1 reportedly collected and performed laboratory analysis on water samples from six downgradient groundwater monitoring wells (MW-3, MW-4, MW-6, MW-9, MW-11 and MW-12), the background well (MW-1), and one upstream surface water point (SW-3). The downstream surface water point (SW-1) was reported as dry. Quality control measures were implemented including submittal and subsequent quantification of a travel blank (TB) and equipment blank (EB). Monitoring locations are shown on the single-day potentiometric map, **Plate 2**.

Sampling was reportedly conducted utilizing methodology outlined in the NCDENR *Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling* revised April 2008. 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, MW-10) to improve potentiometric map coverage. Collected samples were transported under proper C-O-C protocol and analyzed within the specified hold times for each method. In addition to the required field parameters (pH, specific conductance, and temperature) the field MNA parameters

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(turbidity, ORP, and DO) were also reported by E1.

Field and Laboratory Results

Monitoring locations were reportedly sampled and analyzed for the 40 CFR Part 258, Appendix I list of volatile organic compounds (VOCs) and total metals per EPA Test Method 8260B and EPA Test Method 200.8, respectively. Annual assessment monitoring continued to be performed on MW-3 for Appendix II constituents. Additionally, MNA monitoring was performed for MW-1, MW-3, MW-4, MW-6, MW-9, MW-11, and MW-12. The laboratory data report and C-O-Cs are attached in **Appendix C**.

Water samples were analyzed to the laboratory-established Method Detection Limits (MDL). **Table 1** summarizes the constituents detected in groundwater and surface water samples above the current Solid Waste Section detection limit (SWSL), Groundwater Protection Standards (GWP) or the North Carolina Groundwater Standards (2L).

The field parameter data is presented in the laboratory report and it appears to be generally consistent relative to each other and historically reported data.

Quality Control Samples

No target constituents were detected in quantifiable concentrations from either blank control sample for this event. The Appendix II exclusive metal tin was detected in the EB in a non-quantifiable but higher concentration then found in MW-3 which may indicate a false positive or high bias attributed to artifact contamination.

Groundwater Samples

There were a few metal detections and none were detected above their respective 2L or GWP Standard. MW-3 and MW-4 were the only locations to contain quantifiable concentrations of VOCs during this event. MW-3 contained a mixture of dissolved phase aromatics and chlorinated aliphatic hydrocarbons (CAHs) with benzene, tetrachloroethene (PCE), 1,2-dichloroethane (1,2-DCA), 1,1-dichloroethane (1,1-DCA), and vinyl chloride (VCM) detected in exceedance of their respective 2L Standard. Quantifiable aromatic concentrations were detected in MW-4 with benzene detected above the 2L Standard. No Appendix II exclusive parameters were detected in MW-3 during this event with the exception of a non-quantifiable concentration of tin.

Surfacewater Samples

The sample taken from surface water point SW-3 contained silver slightly above the 2B Standard. SW-3 is located upstream of the facility , therefore this detection is not attributed to landfill activities.

Statistical Analysis

Metal detections continue to be consistent with historical results. The interwell analysis results indicate that none of the detected metals have exhibited a statistically significant increase (SSI) in concentration over background levels established by the background well MW-1.

Due to the lack of historical VOC detections in the background well, the detection of any quantifiable VOC in a downgradient well is considered a statistically significant number of detections per Poisson Prediction Interval analysis. Quantifiable VOC(s) were only detected in samples collected from MW-3 and MW-4. VOCs detected during this event have previously been found at their respective locations and concentrations were found within a historically identified range. A qualitative evaluation of VOC concentrations over time indicate that none of the detected VOCs have exhibited an increasing trend. VOC concentrations in both MW-3 and MW-4 have exhibited a seasonal trend with VOC detections during this and previous events.

Groundwater Characterization

MESCO prepared the single-day potentiometric map from groundwater elevation data taken from the uppermost aquifer during this event. Groundwater flow rates and directions were calculated based upon this data and are included in **Table 3**. The calculated flow directions trend in a general northeasterly direction towards Falling Creek. The calculated groundwater flow rates ranged from approximately 7 feet/year (MW-3) to 46 feet/year (MW-9) averaging approximately 21 feet/year.

Findings

The laboratory data and statistical analysis results for this semi-annual sampling event indicate there is not an increasing trend in VOC detections. The non-quantifiable concentration of silver, detected in downstream sample SW-3, is likely naturally inherent and not attributed to landfill activities.

Closing

Semi-annual monitoring will continue, the facility is tentatively scheduled to be sampled again in January 2011. Please contact us either by phone at (919) 772-5393, or by email at jpfohl@mesco.com or mbrown@mesco.com should you have any questions or concerns regarding this report.

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

Madeline German *for* Jonathan Pfohl
Environmental Specialist

Mark Brown, LG, PG
Senior Professional Geologist

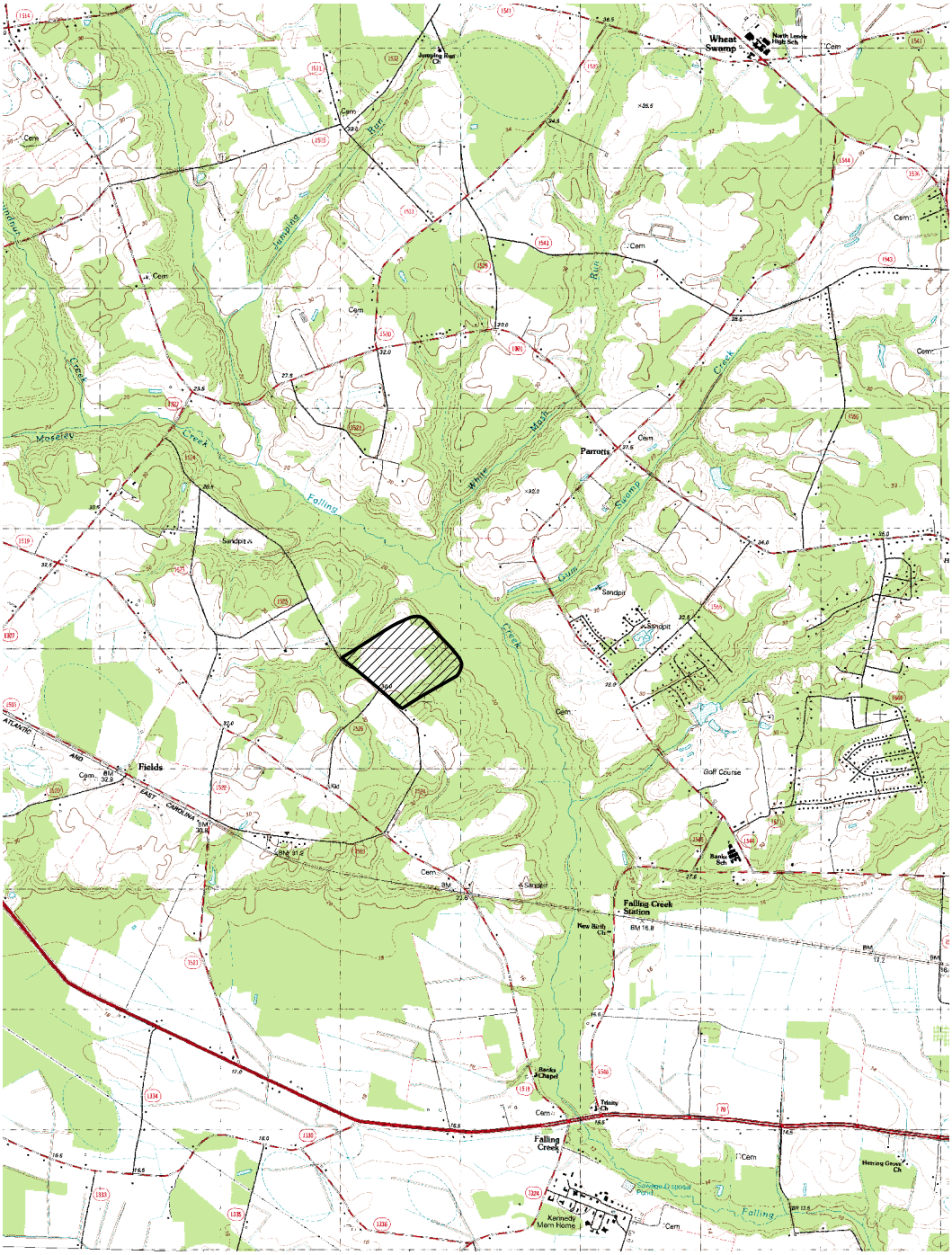
Enclosures
cc: Mr. Tom Miller
Lenoir County

Plates

Topographic Map with Site Location

Semi-Annual Water Quality Monitoring

PLATE 1 Lenoir County MSWLF Facility



QUADRANGLE LEGEND

ROAD CLASSIFICATION

Primary highway, hard surface

Light-duty road, hard or improved surface

Secondary highway, hard surface

Unimproved road

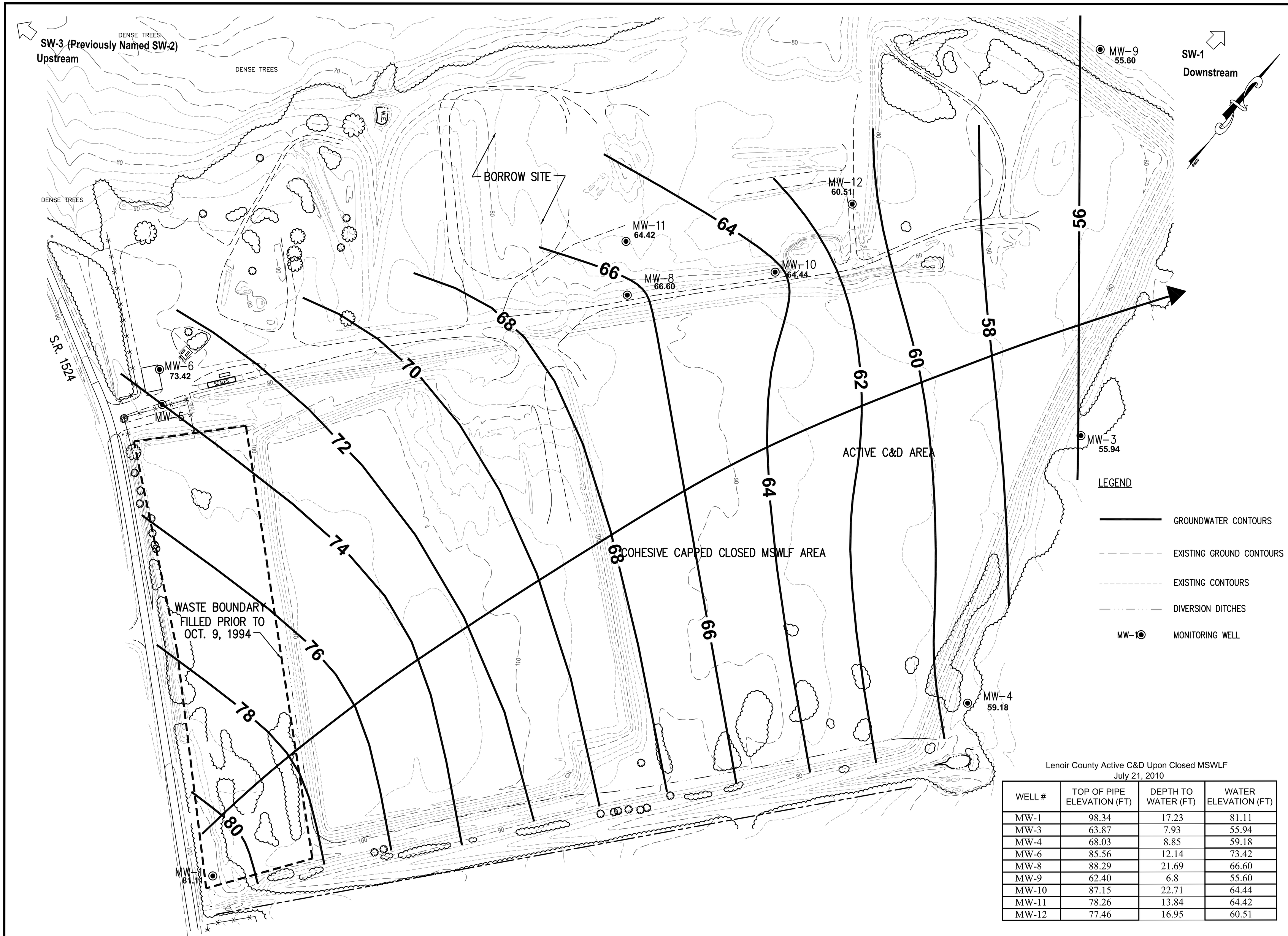
Interstate Route

U. S. Route

State Route

Date Completed	5/31/2007
Created By	M. Clement
Project Name	Semi-Annual Water Quality Monitoring
Site Name	Lenoir County MSWLF
Project Number	G10029.0

Municipal Engineering Services Company, PA



Lenoir County Active C&D Upon Closed MSWLF
July 21, 2010

WELL #	TOP OF PIPE ELEVATION (FT)	DEPTH TO WATER (FT)	WATER ELEVATION (FT)
MW-1	98.34	17.23	81.11
MW-3	63.87	7.93	55.94
MW-4	68.03	8.85	59.18
MW-6	85.56	12.14	73.42
MW-8	88.29	21.69	66.60
MW-9	62.40	6.8	55.60
MW-10	87.15	22.71	64.44
MW-11	78.26	13.84	60.51
MW-12	77.46	16.95	60.51

Municipal Services Engineering Company, P.A.
LICENSE NUMBER: C-0281
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P.O. BOX 349 BOONE, N.C. 27529 (704) 262-1767

ACTIVE C&D LANDFILL OVER CLOSED MSWLF
LENOIR COUNTY
NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

SINGLE DAY POTENTIOMETRIC MAP
JULY 21, 2010

SCALE: 1"=100'
DATE: 3/24/10
DRWN. BY: M. GERMAN
CHKD. BY: J. PFOHL
PROJECT NUMBER G10015.0
DRAWING NO. PM
SHEET NO. PLATE 2

Tables

Table 1
App I Detections above SWSL, GWP, 2L, or 2B
Lenoir County Active C&D over Closed MSWLF

Well ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause
MW-1	Zinc	7/21/10	143	ug/l	0.08	10	1050				
MW-3	**1,1-Dichloroethane**	**7/21/10**	**7.4**	**ug/l**	**0.2**	**5**	**6**			**1.4**	**L &/or LFG**
MW-3	**1,2-Dichloroethane**	**7/21/10**	**1.3**	**ug/l**	**0.21**	**1**	**0.38**			**0.92**	**L &/or LFG**
MW-3	1,4-Dichlorobenzene	7/21/10	1.2	ug/l	0.39	1	6				
MW-3	**Benzene**	**7/21/10**	**2.1**	**ug/l**	**0.24**	**1**	**1**			**1.1**	**L &/or LFG**
MW-3	Cis-1,2-Dichloroethene	7/21/10	13	ug/l	0.25	5	70				
MW-3	**Tetrachloroethene**	**7/21/10**	**2.1**	**ug/l**	**0.17**	**1**	**0.7**			**1.4**	**L &/or LFG**
MW-3	Trichloroethene	7/21/10	3	ug/l	0.23	1	3				
MW-3	**Vinyl Chloride**	**7/21/10**	**8.9**	**ug/l**	**0.63**	**1**	**0.03**			**8.87**	**L &/or LFG**
MW-3	Zinc	7/21/10	42	ug/l	0.08	10	1050				
MW-4	**Benzene**	**7/21/10**	**1.7**	**ug/l**	**0.24**	**1**	**1**			**0.7**	**L &/or LFG**
MW-4	Chlorobenzene	7/21/10	5.3	ug/l	0.3	3	50				
MW-4	Vanadium	7/21/10	4.3j	ug/l	0.03	25			3.5	0.8	
MW-4	Zinc	7/21/10	12	ug/l	0.08	10	1050				
MW-11	**Vinyl Chloride**	**7/21/10**	**0.7j**	**ug/l**	**0.63**	**1**	**0.03**			**0.67**	**L &/or LFG**
MW-12	Barium	7/21/10	312	ug/l	0.03	100	700				
SW-3	**Silver**	**7/28/10**	**0.1j**	**ug/l**	**0.03**	**10**		**0.06**		**0.04**	**B, N**

[1] Table contains only Appendix I constituents detected above SWSL, GWP, 2L, or 2B
[2] MDL = Method Detection Limit
[3] SWSL = Solid Waste Section Reporting Limit (Current as of Sampling Event)
[4] 2L = North Carolina 15A NCAC 2L Groundwater Qualtity Standard (Current as of Sampling Event)
[6] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification (Current as of Sampling Event)
[7] GWP = Groundwater Protection Standard (Current as of Sampling Event)
[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.
A = Artifact Contamination from Field &/or Laboratory
L = Leachate
LFG = Landfill Gas
N = Natural from erosion of natural deposits
B = Background
BOLD = Concentration > 2L, or 2B Standard (Current as of Sampling Event)

Table 2
App II Exclusive Detections above MDL
Lenoir County Active C&D over Closed MSWLF

Well ID	Parameter Name [1]	Sample Date	Result	Unit	MDL [2]	SWSL [3]	2L [4]	2B [5]	GWP [6]	Exceedance	Preliminary Cause
MW-3	Tin	7/21/10	0.4j	ug/l	0.11	100					
EB	Tin	7/21/10	0.6j	ug/l	0.11	100					

[1] Table contains only Appendix II constituents detected above MDL
[2] MDL = Method Detection Limit
[3] SWSL = Solid Waste Section Reporting Limit (Current as of Sampling Event)
[4] 2L = North Carolina 15A NCAC 2L Groundwater Qualtity Standard (Current as of Sampling Event)
[6] 2B = North Carolina 15 NCAC 2B Surface Water Quality Standard for this Specific Stream Classification (Current as of Sampling Event)
[7] GWP = Groundwater Protection Standard (Current as of Sampling Event)
[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.
A = Artifact Contamination from Field &/or Laboratory
L = Leachate
LFG = Landfill Gas
N = Natural from erosion of natural deposits
B = Background
BOLD = Concentration > 2L, or 2B Standard (Current as of Sampling Event)

Table 3
Hydrologic Properties at Monitoring Well Locations
Lenoir County Active C&D over Closed MSWLF

Monitoring Well	Hydraulic Conductivity (cm/sec)	Effective Porosity (%)	Hydraulic Gradient	Groundwater Velocity Rate (ft/yr)	Flow Direction	Water Table Depth (ft)	Water Table Elevation (ft)	Screened Interval Lithology
MW-1	4.30E-04	20%	0.01	24	N34E	17.23	81.11	Silty Sand
MW-3	1.30E-04	20%	0.01	7	N41E	7.93	55.94	Silty Sand
MW-4	5.40E-04	20%	0.01	32	N34E	8.85	59.18	Silty Sand
MW-6	-	-	0.01	-	N07W	12.14	73.42	Silty Sand
MW-9	3.80E-04	20%	0.02	46	N46E	6.8	55.6	Sandy Clay
MW-11	6.59E-04	20%	0.00	9	N08W	13.84	64.42	Sand
MW-12	2.10E-04	20%	0.008	9	N44E	16.95	60.51	Sand

NOTE: 1.Hydraulic conductivity (K), values for MW-1 through MW-10 were obtained from GAI Consultants (June 19
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 July 21, 2010.

Linear velocidty rate (Q) is defined by the equation:

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

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

Minimum v_x:	7
Mean v_x:	21
Median v_x:	17
Maximum v_x:	46

Appendix A
Statistical Analysis

Statistical Analysis Methodologies

A statistical analysis was performed on metal and VOC detections utilizing Chemstat software, which was developed specifically for RCRA Subtitle D sites and conforms to both current EPA and SWS protocols. A step-wise approach was utilized to evaluate trends in groundwater quality to identify a potential release from the landfill. Analytical data underwent preliminary data evaluation to reduce the data set and to determine if any "outliers" (defined as data that appears to be incongruent with respect to historical results) or seasonality exists that may potentially effect the results of the subsequent statistical analysis. All statistical tests were evaluated at the 0.05 level of significance, 95% confidence level, and were conducted as one-tailed tests. Statistical background values were calculated using un-manipulated data from historical semi-annual sampling events for this facility from 1994 to the current event. Historical data compiled for monitoring well(s) were used as the baseline. Groundwater data from the downgradient well(s) were compared to the pooled background groundwater data (inter-well) using methods which varied depending upon the percentage of non-detects. If necessary and applicable further intra-well analysis was conducted to compare current data from a single well is compared to it's own respective historical data. Finally parameters that indicated statistical significance after previous tests are evaluated to estimate the change in concentration over time to determine if there is an upward trend.

Preliminary Data Evaluation

A preliminary data screening was conducted upon detections. Parameters detected with concentrations found below quantifiable levels (SWSL) and below those detected within the background well were eliminated and a statistical analysis was not conducted for that particular constituent/well.

Data distributions were reviewed using box and whiskers plots (enclosed charts). In order to evaluate variability in concentrations with respect to time and season, time series plots were generated for select constituents (enclosed charts). Time series plots were also visually evaluated for seasonality and "outliers". Suspected outliers were than further evaluated through Dixon's Test for Outliers or Rosner's Test for Outliers depending upon the number of samples and the data distribution. Outliers are generally not censored from the current nor historical data set prior to statistical analysis but are further evaluated and or qualified as necessary.

Inter-well Analyses

Inter-well statistical analysis was conducted upon total metals detected during this sampling event. Monitoring well MW-1 was defined as the background well, and an upper tolerance limit (UTL) with 95% coverage was computed for each detected constituent from the background data at a 95% level of confidence. For each tested constituent, an appropriate statistical analysis method was selected based on the percentages of non-detects (%ND) in the historical background data. The following Table 1 summarizes the methods used for four different %ND ranges.

Table 1. Statistical Analysis Methods for Various %ND Ranges

%ND	Analysis Method	ND Substitution
%ND<15%	Parametric tolerance limit	1/2 ND
15%<%ND<50%	Parametric tolerance limit	Cohen or 1/2 ND
50%<%ND<90%	Non-parametric tolerance limit	1/2 ND
90%<%ND	Poisson tolerance limit	-

NOTE: For parametric tolerance interval, normality of the background data was checked by the Shapiro-Wilks normality test, as the method requires that the data be normally distributed.

Intra-well Analysis

Intra-well analysis was conducted only upon those constituents that were found to be statistically significant by inter-well analysis and there is sufficient historical samples known to not be impacted. With intra-well comparisons, data from a single well is compared to historical data from the same well. In general, intra-well analysis is typically used to differentiate true contamination from spatial variability. Intra-well analysis is generally conducted through interpretation of Shewhart-CUSUM and/or Exponentially Weighted Moving Average (EWMA) control charts. where applicable.

Poisson Prediction Interval (VOCs)

All historical VOC detections in the background well MW-1 were pooled in order to determine the total number of detections, from which the expected number of detections in a single downgradient monitoring point (y^*) was derived by utilizing the Poisson prediction interval (Table A2) The parameter y^* is defined by the following equation:

$$y^* = cy + \frac{t^2 c}{2} + tc\sqrt{y\left(1+\frac{1}{c}\right)+\frac{t^2}{4}}$$

where

c = 1/ n (n =number of background samples)
t = one-sided value of student's t -Statistic at 95% confidence [a]
y = number of events observed in n previous samples
y^* = expected number of events in a single future sample

[a] Gibbons, R.D., 1994, Statistical methods for groundwater monitoring: John Wiley & Sons, Inc., p.12.

For each monitoring location showing any VOC detections, the number of detected VOCs was counted with each detection being considered a "hit". The number was then compared with the expected number of detections derived from the background VOC data (Table A3). The value of Student's t -Statistic was derived from tabulated values included in Gibbons (1994).

Determine Data Trend Over Time

The parameters that indicated statistical significance a further qualitative evaluation is employed to determine trends in concentration over time. Implementation of Mann-Kendall Trend Analysis or Sen's Slope Analysis is generally used to determine if the concentration trend is increasing, decreasing, or remaining constant.

Basic Statistics

Parameter: Barium, total

Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL

Total Measurements	58
Total Non-Detects	53 (91.3793%)
Pooled Mean	209.466
Pooled Std Dev	80.1858
Compliance Meas.	23
Compliance Mean	217.348
Compliance Std Dev	73.0103
Background Meas.	35
Background Mean	204.286
Background Std Dev	85.2086

Background Locations

There is 1 background location

Location	Meas.	Non-Detects	% ND	Total
MW-1	35	35	100	7150

Location	Mean	Std Dev	Std Err	Rank Sum	Rank Mean
MW-1	204.286	85.2086	0	945	27

Compliance Locations

There is 1 compliance location

Location	Obs.	Non-Detects	% ND	Total
MW-12	23	18	78.2609	4999

Location	Mean	Std Dev	Dif From Bkg	Std Err	Rank Sum	Rank Mean
MW-12	217.348	73.0103	13.0621	21.6446	766	33.3043

Analysis of Variance Statistics

SS Wells	2368.07
SS Total	366496

Kruskal-Wallis Statistics

Non-Detect Rank	27
Background Rank Sum	945
Background Rank Mean	27
H Statistic	1.93441
H Adjusted for Ties	8.1617

Threshold Report
Parameter: Barium, total
Detected Values Only
Original Data (Not Transformed)
Non-Detects Replaced with 1/2 DL
There is 1 background location

Loc.	Obs.	ND	Date	Conc.
MW-1	35	35 (100%)		

There is 1 compliance location

Loc.	Obs.	ND	Date	Conc.
MW-12	23	18 (78.2609%)	7/15/2008	182
			1/28/2009	140
			7/29/2009	250
			1/12/2010	215
			7/21/2010	312

Poisson Tolerance Limit

Parameter: Barium, total

Natural Logarithm Transformation
Non-Detects Replaced with Detection Limit

Poisson Count of 35 background measurements = 204.636
Degrees of Freedom = 411

95% Confidence Values

Chi-Squared Value (95% Confidence) = 459.268
Lambda (from Zack's formula) = 6.56097
Smallest Degrees of Freedom = 24
Upper Tolerance Limit (95%) = 11

99% Confidence Values

Chi-Squared Value (99% Confidence) = 480.623
Lambda (from Zack's formula) = 6.86605
Smallest Degrees of Freedom = 29
Upper Tolerance Limit (99%) = 13.5

	Date	Conc.	Significant 95%	Significant 99%
MW-12	2/23/2000	ND<6.21461	FALSE	FALSE
	2/23/2000	ND<6.21461	FALSE	FALSE
	7/17/2000	ND<6.21461	FALSE	FALSE
	1/24/2001	ND<6.21461	FALSE	FALSE
	7/11/2001	ND<6.21461	FALSE	FALSE
	1/10/2002	ND<6.21461	FALSE	FALSE
	7/8/2002	ND<6.21461	FALSE	FALSE
	1/22/2003	ND<6.21461	FALSE	FALSE
	7/7/2003	ND<6.21461	FALSE	FALSE
	1/22/2004	ND<6.21461	FALSE	FALSE
	7/12/2004	ND<6.21461	FALSE	FALSE
	1/26/2005	ND<6.21461	FALSE	FALSE
	7/14/2005	ND<6.21461	FALSE	FALSE
	1/25/2006	ND<6.21461	FALSE	FALSE
	7/13/2006	ND<6.21461	FALSE	FALSE
	1/17/2007	ND<4.60517	FALSE	FALSE
	7/31/2007	ND<4.60517	FALSE	FALSE
	1/23/2008	ND<4.60517	FALSE	FALSE
	7/15/2008	5.20401	FALSE	FALSE
	1/28/2009	4.94164	FALSE	FALSE
	7/29/2009	5.52146	FALSE	FALSE
	1/12/2010	5.37064	FALSE	FALSE
	7/21/2010	5.743	FALSE	FALSE

Inter-Well Analysis Summary
Lenoir County Active C&D over Closed MSWLF

Background Well: MW-1

Barium, total

%ND	Normality	Method	ND Adj.	Upper Limit (a = 95%)	Unit
100	-	Poisson tolerance limit	ND	11.0	log[ug/l]

Well	Result	Significance
MW-12	5.743	no

NOTE: Bold-faced monitoring points indicate detected levels exceed North Carolina Groundwater 2L Standard.

Summary of Pooled VOCs in Background Well (MW-1)
Lenoir County Active C&D over Closed MSWLF

Constituent	Samples	NDs	% NDs
1,1,1,2-Tetrachloroethane	35	35	100.00
1,1,1-Trichloroethane	35	35	100.00
1,1,2,2-Tetrachloroethane	35	35	100.00
1,1,2-Trichloroethane	35	35	100.00
1,1-Dichloroethane	35	35	100.00
1,1-Dichloroethene	35	35	100.00
1,2,3-Trichloropropane	35	35	100.00
1,2-Dibromo-3-chloropropane	35	35	100.00
1,2-Dibromoethane	35	35	100.00
1,2-Dichlorobenzene	35	35	100.00
1,2-Dichloroethane	35	35	100.00
1,2-Dichloropropane	35	35	100.00
1,4-Dichlorobenzene	35	35	100.00
2-Butanone	35	35	100.00
2-Hexanone	35	35	100.00
4-Methyl-2-Pentanone	35	35	100.00
Acetone	35	35	100.00
Acrylonitrile	35	35	100.00
Benzene	35	35	100.00
Bromochloromethane	35	35	100.00
Bromodichloromethane	35	35	100.00
Bromoform	35	35	100.00
Bromomethane	35	35	100.00
Carbon disulfide	35	35	100.00
Carbon tetrachloride	35	35	100.00
Chlorobenzene	35	35	100.00
Chloroethane	35	35	100.00
Chloroform	35	35	100.00
Chloromethane	35	35	100.00
cis-1,2-Dichloroethene	35	35	100.00
cis-1,3-Dichloropropene	35	35	100.00
Chlorodibromomethane	35	35	100.00
Dibromomethane	35	35	100.00
Ethylbenzene	35	35	100.00
Iodomethane	35	35	100.00
Dichloromethane	35	35	100.00
Styrene	35	35	100.00
Tetrachloroethylene	35	35	100.00
Toluene	35	35	100.00
trans-1,2-Dichloroethene	35	35	100.00
trans-1,3-Dichloropropene	35	35	100.00
trans-1,4-Dichloro-2-butene	35	35	100.00
Trichloroethylene	35	35	100.00
Trichlorofluoromethane	35	35	100.00
Vinyl acetate	35	35	100.00
Vinyl chloride	35	35	100.00
Xylene	35	35	100.00
Total	**1645**	**1645**	**100.00**

Poisson Prediction Interval Based upon Pooled Background VOCs
Lenoir County Active C&D over Closed MSWLF

All detected VOCs (Background Well: MW-1)

Well	1,4-DCB	CBE	Benzene	PCE	TCE	cis-1,2-DCE	VCM	1,2-DCA	1,1-DCA	Total Cumulative Concentration	Total Detections >SWSL
2L	**6**	**50**	**1**	**50**	**3**	**70**	**0.03**	**0.38**	**6**	**-**	**-**
MW-3	1.2		**2.1**	**2.1**	3	13	**8.9**	**1.3**	**7.4**	132.2	8
MW-4		5.3	**1.7**							7	2
TOTAL	1.2	5.3	3.8	2.1	3	13	**8.9**	**1.3**	**7.4**	139.2	10

All Concentrations in ug/L

"j" qualifiers omitted for statistical analysis purposes

Bold = Detected above 2L Standard (Current as of Sampling Event)

↑ = Increasing concentration trend per Sen's Slope Indicator Analysis

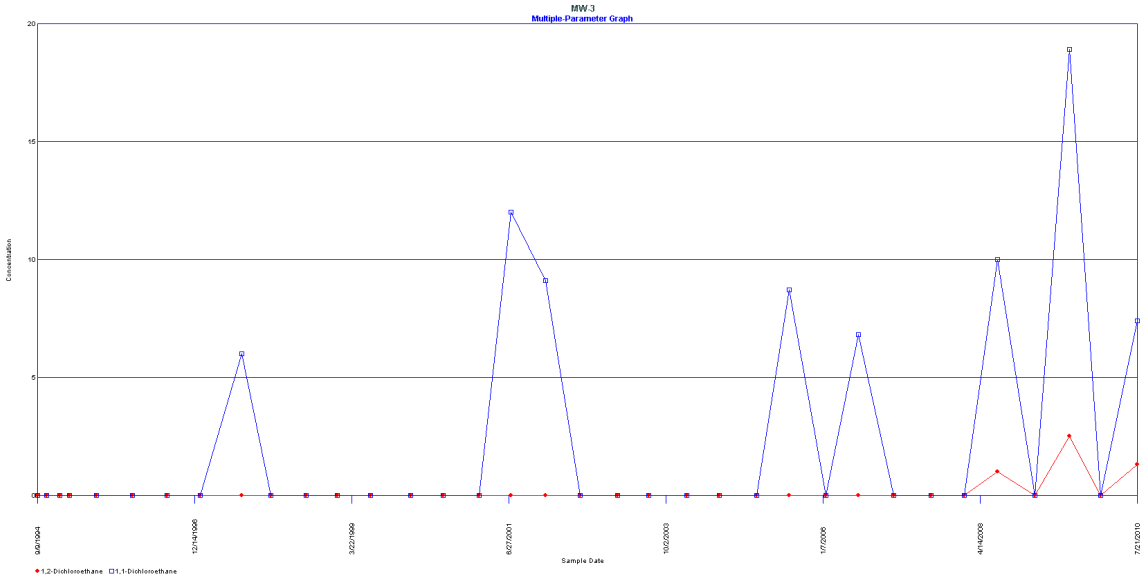
↓ = Decreasing concentration trend per Sen's Slope Indicator Analysis

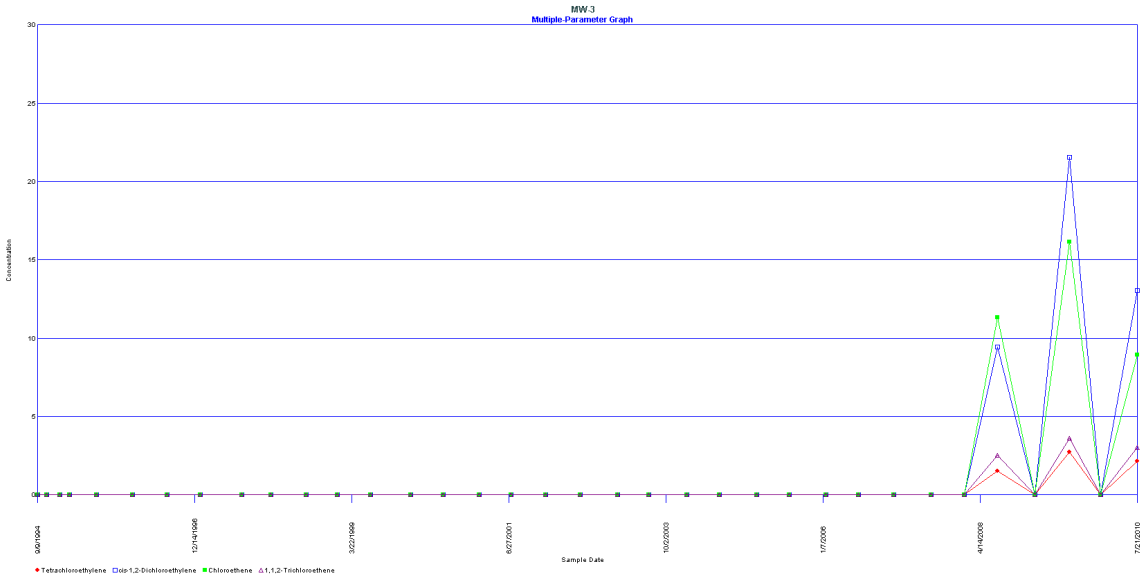
Underlined = Concentration detected outside own historically identified range

Total number of sampling events [n] = 35
Total number of detections in background wells [y] = 0
Number of comparisons (downgradient wells) [k] = 6
One-sided value of Student's t-statistic (95% confidence) [t] = 2.5
Expected number of detections in a single future sample [y*] = 0.03

Statistically Significant # of VOC Detections within MW-3 & MW-4
But no concentrations have exhibited an upward trend.

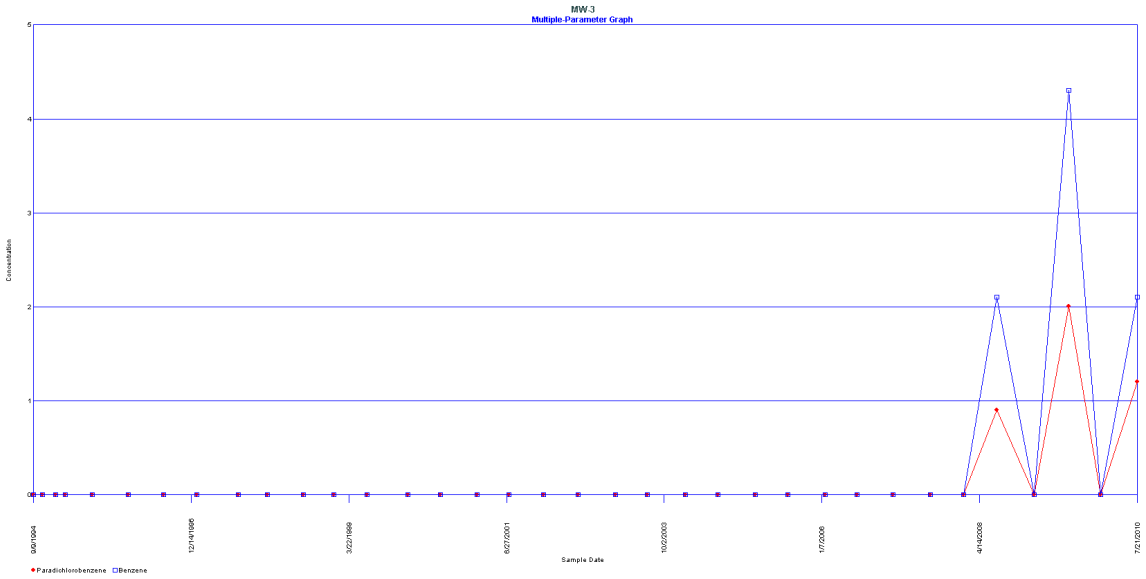
Time Series Plots for Select Constituents (VOCs)
Lenoir County Active C&D over Closed MSWLF

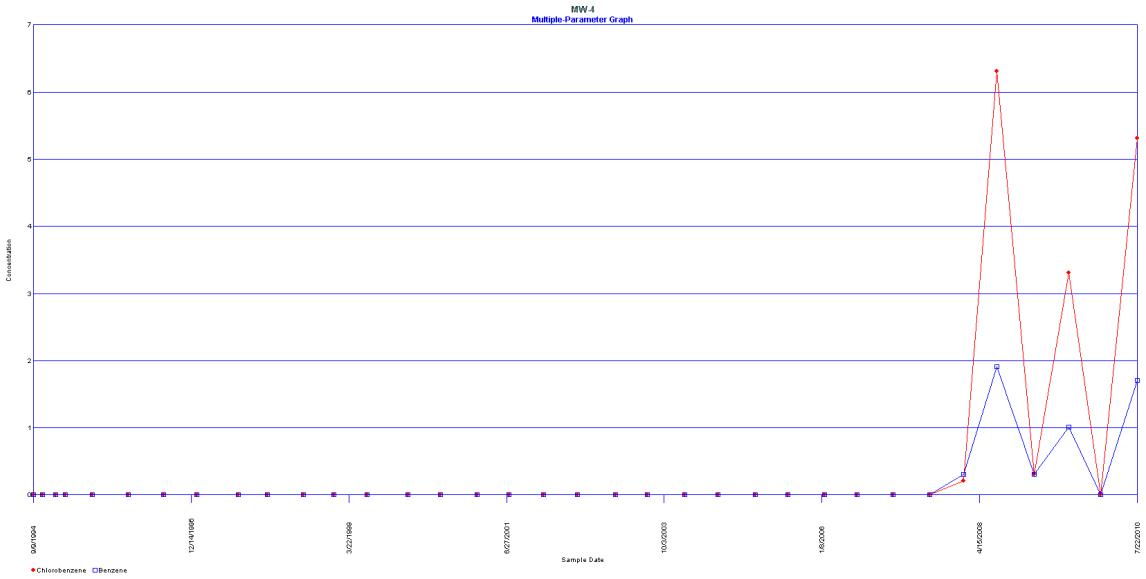




Non-Detects Represented at Zero

Time Series Plots for Select Constituents (VOCs)
Lenoir County Active C&D over Closed MSWLF





Non-Detects Represented at Zero

APPENDIX B
Monitored Natural Attenuation Update

Corrective Action Summary

The Lenoir County Closed Unlined Municipal Solid Waste Landfill (MSWLF) and Active Construction and Demolition (C&D) Landfill, currently operating under permit #54-03 has progressed with Monitored Natural Attenuation (MNA) monitoring in accordance with the Corrective Action Plan (CAP) approved October 2, 2009. This is the third MNA sampling event; collected with traditional semi-annual sampling on July 21, 2010.

As proposed in the CAP, Environment 1 (E1) reported groundwater sampling results and tested for MNA parameters from seven (7) monitoring wells (MW-1, MW-3 MW-4, MW-6, MW-9, MW-11 and MW-12). **Plate 1,** in this Appendix, depicts the most recent sampling event detections above the 2L standard at each respective well. VOCs exceeding the 2L Standard were detected in MW-3, MW-4 and MW-11. Detections occurred within the 250' compliance boundary.

Table 1 lists the wells with their required MNA sampling parameter results. The COCs include both hydrocarbons and chlorinated solvents; therefore, biodegradation can occur on two fronts. Both a Biochlor and Bioscreen model are included. The Corrective Action Evaluation Report (CAER), required by the Solid Waste Section, will be submitted following the fourth baseline sampling event.

Table 1: MNA Parameters at Monitoring Well Locations Summary

Parameters	Method	mdl*	Units	MW-1	MW-3	MW-4	MW-6	MW-9	MW-11	MW-12
				07/21/10	07/21/10	07/21/10	07/21/10	07/21/10	07/21/10	07/21/10
VFA – Acetic Acid	AM23G	70	ug/L	<70	<70	<70	<70	<70	<70	<70
VFA – Butyric Acid	AM23G	50	ug/L	<50	<50	<50	<50	<50	<50	<50
VFA – Hexanoic Acid	AM23G	50	ug/L	<50	<50	<50	<50	<50	0.096	130
VFA – i-Hexanoic Acid	AM23G	50	ug/L	<50	<50	<50	<50	<50	<50	<50
VFA – i-Pentanoic Acid	AM23G	150	ug/L	<150	<150	<150	<150	<150	<150	<150
VFA – Lactic Acid	AM23G	100	ug/L	<100	<100	<100	<100	<100	<100	<100
VFA – Pentaonic Acid	AM23G	70	ug/L	<70	<70	<70	<70	<70	<70	<70
VFA – Propionic Acid	AM23G	50	ug/L	<50	<50	<50	<50	<50	<50	<50
VFA – Pyruvic Acid	AM23G	150	ug/L	<150	<150	<150	<150	<150	<150	<150
Hydrogen	AM20GAX	0.600	nM	1.400	0.790	1.500	12	2	1.900	0.960
Methane	AM20GAX	0.015	ug/L	0.230	2200	1000	300	20	180	800
Ethene	AM20GAX	0.010	ug/L	0.012	0.180	0.032	<0.010	0.016	0.013	0.059
Ethane	AM20GAX	0.010	ug/L	<0.010	0.076	0.069	<0.010	0.019	<0.010	<0.010
CO2-Dissolved	SM4500CO2C	1	mg/L	28	246	361	192	197	43	513
Alkalinity	SM 2320B	1000	ug/L	<1000	86000	150000	<1000	<1000	1000	<1000
Sulfate	SM426C	5000	ug/L	5200	<5000	14700	27000	21500	64000	29200
Sulfide	SM4500-S2D	100	ug/L	<100	<100	<100	<100	<100	<100	<100
Chloride	SM 4500-CLB	5000	ug/L	6000	48000	10000	<5000	9000	5000	65000
TOC	SM 5310C	150	ug/L	<150	3420	10720	<150	2950	<150	8420
COD	HACH8000	10000	ug/L	18000	32000	42000	16000	19000	15000	32000
BOD	SM5210B	2000	ug/L	<2000	6300	5100	<2000	<2000	<2000	<2000
Iron	SM3111B	13.8	ug/L	322	53000	36675	244	8290	418	51
Nitrate	EPA 353.2	30	ug/L	8560	<30	<30	2360	2310	2190	390
Temperature	SM2550B	0	Degrees C	18.49	20.01	21.22	20.21	23.8	19.09	19.82
ORP	SM2580B	-900	mV	33.45	27.6	-23.7	240.1	175.4	252.8	179.3
DO	SM4500OG	0	mg/L	0.61	0.39	1.2	0.25	1.22	0.01	0.01
pH	SM4500HB	0	Standard Units	2.51	6.12	5.65	4.46	4.25	3.38	5.03
Specific Conductance	SM2510B	0	umhos	120	991	329	112	77	52	320
Turbidity	SM2130B	0	NTU	51.20	99.90	49.30	23.30	115.00	9.70	11.70

Notes:
VFA = Volatile Fatty Acids
mdl* = Lowest Method Detection Limit for Lab Parameters or Lowest Field Measurement Possible

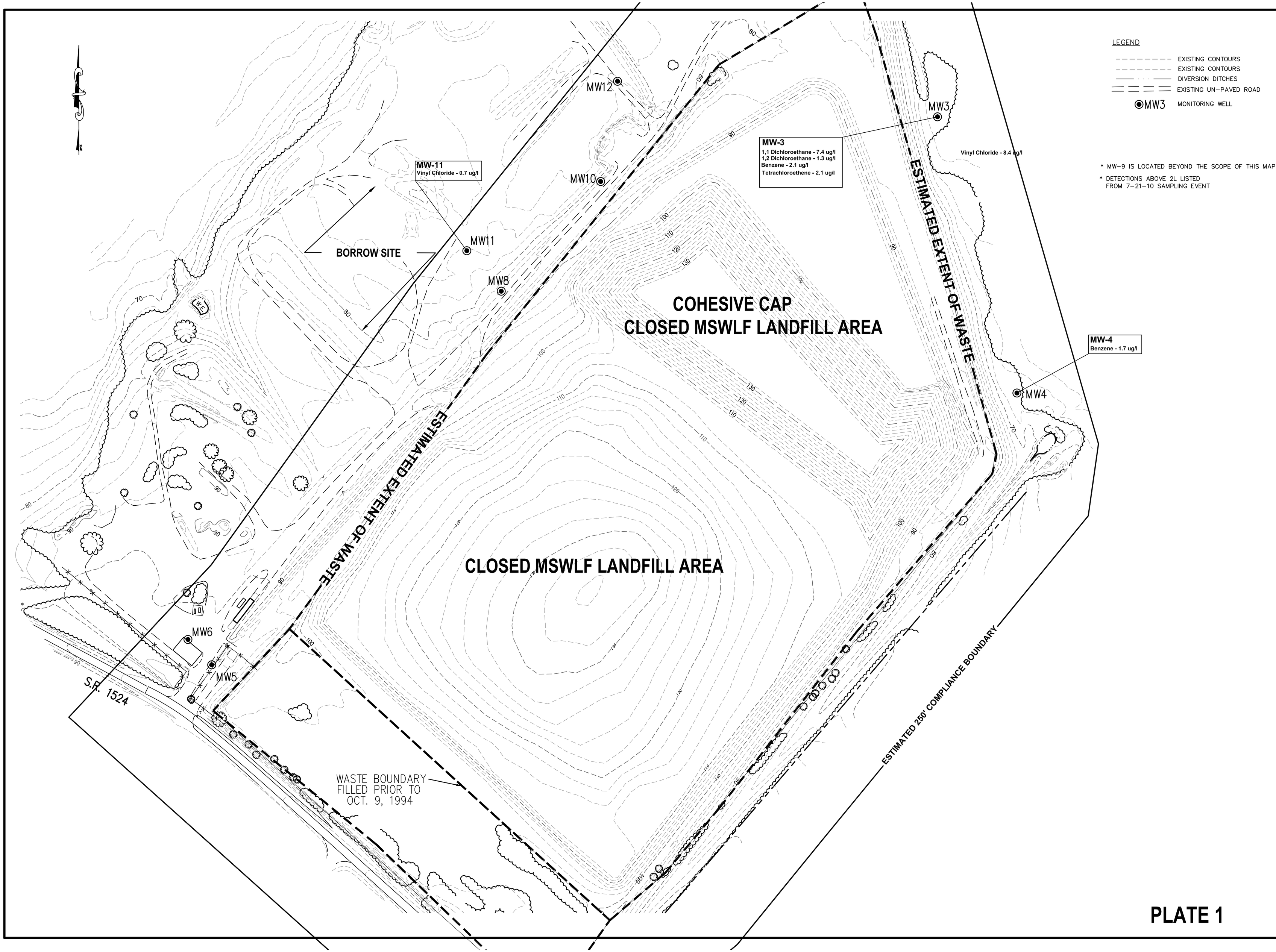


PLATE 1

Municipal Services Engineering Company, P.A.
LICENSE NUMBER: C-0281
P.O. BOX 97 GARNER, N.C. 27529 (919) 772-5393
P.O. BOX 349 BOONE, N.C. 28607 (828) 262-1767

CONSTRUCTION & DEMOLITION LANDFILL REVISION
LENOIR COUNTY NORTH CAROLINA

DATE	BY	REV.	DESCRIPTION

DETECTIONS ABOVE 2L STANDARD

SCALE:	1" = 100'
DATE:	11/09/2010
DRWN. BY:	M. GERMAN
CHKD. BY:	M. BROWN
PROJECT NUMBER	G07062.0
DRAWING NO.	PLATE 1
SHEET NO.	1 OF 1

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Lenoir County
MW-3 Area
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	6.7	(ft/yr)
or			
Hydraulic Conductivity	K	1.3E-04	(cm/sec)
Hydraulic Gradient	i	0.01	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	15	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.62	(-)
TCE	130	(L/kg)	2.11	(-)
DCE	125	(L/kg)	2.06	(-)
VC	30	(L/kg)	1.25	(-)
ETH	0	(L/kg)	1.00	(-)
Common R (used in model)* =			**2.06**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

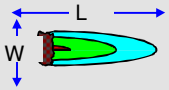
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	1.195	0.58	0.79
TCE → DCE	0.900	0.77	0.74
DCE → VC	3.300	0.21	0.64
VC → ETH	2.567	0.27	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	5	(yr)
Modeled Area Width*	100	(ft)
Modeled Area Length*	150	(ft)
Zone 1 Length*	150	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA

TYPE: Decaying Single Planar

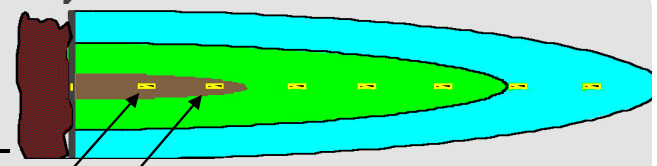
Source Options

Source Thickness in Sat. Zone* 8 (ft)

Y1
Width* (ft) 100

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.25	0.01
TCE	.05	0.01
DCE	.01	0.01
VC	.01	0.01
ETH	0	0.01

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.002										
TCE Conc. (mg/L)	.003										
DCE Conc. (mg/L)	0.0003										
VC Conc. (mg/L)	0.0089										
ETH Conc. (mg/L)	0.00018										
Distance from Source (ft)	90										
Date Data Collected	2010										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

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

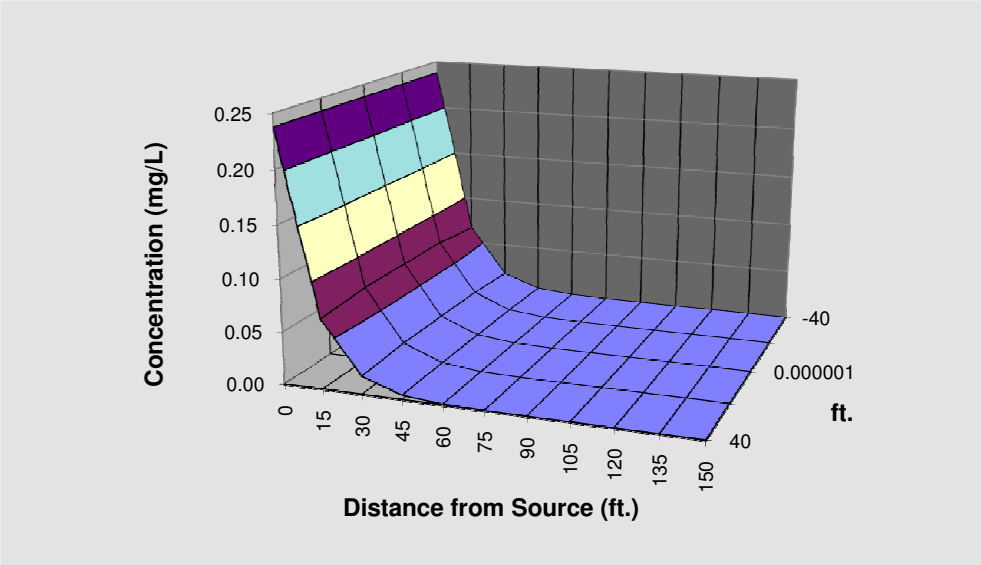
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.238	0.066	0.017	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000
20	0.238	0.071	0.020	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
0	0.238	0.071	0.020	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.238	0.071	0.020	0.005	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.238	0.066	0.017	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	2.0E+1	5.8E+0	1.6E+0	3.8E-1	7.4E-2	1.0E-2	1.0E-3	6.7E-5	2.9E-6	5.6E-8	9.9E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.1	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	+50.6%	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.05	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

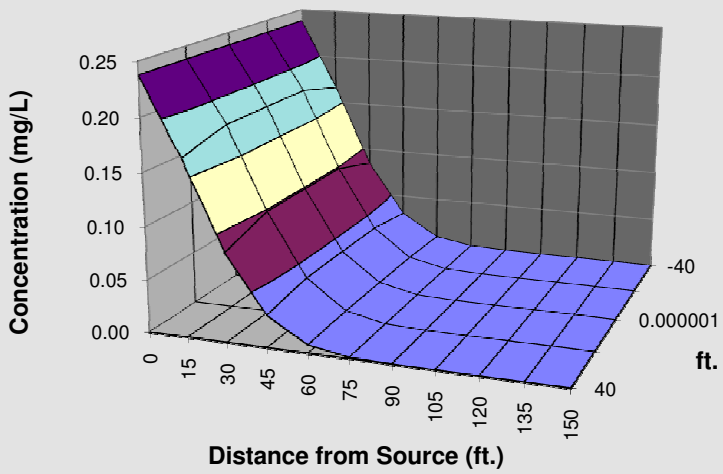
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.238	0.167	0.084	0.030	0.008	0.001	0.000	0.000	0.000	0.000	0.000
20	0.238	0.179	0.098	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
0	0.238	0.179	0.099	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
-20	0.238	0.179	0.098	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
-40	0.238	0.167	0.084	0.030	0.008	0.001	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	2.0E+1	1.4E+1	7.7E+0	2.9E+0	7.4E-1	1.2E-1	1.3E-2	9.5E-4	4.3E-5	7.0E-7	1.3E-8

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.1	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	+50.6%	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.09	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

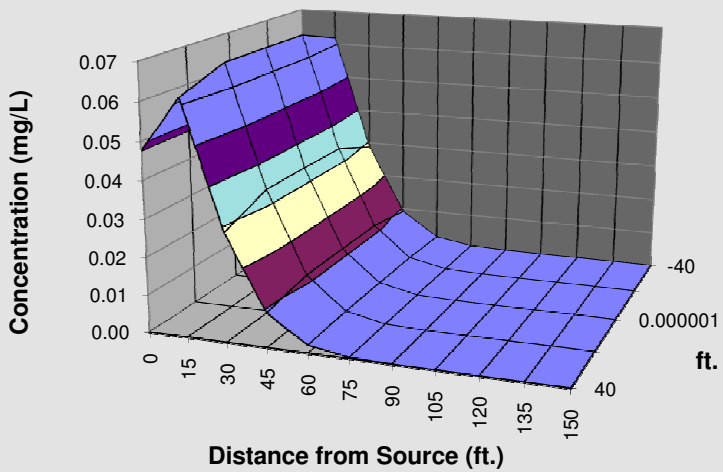
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.048	0.062	0.029	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000
20	0.048	0.066	0.034	0.011	0.003	0.000	0.000	0.000	0.000	0.000	0.000
0	0.048	0.066	0.034	0.011	0.003	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.048	0.066	0.034	0.011	0.003	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.048	0.062	0.029	0.009	0.002	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	4.0E+0	5.4E+0	2.6E+0	8.7E-1	2.0E-1	3.1E-2	3.3E-3	2.2E-4	9.9E-6	3.7E-7	3.3E-9

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-54.6 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.07	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

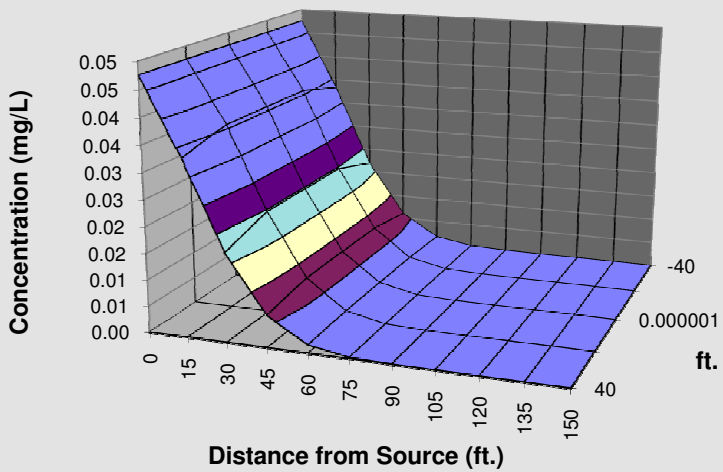
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.048	0.033	0.017	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000
20	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
0	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.048	0.033	0.017	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	4.0E+0	2.9E+0	1.5E+0	5.8E-1	1.5E-1	2.5E-2	2.7E-3	1.9E-4	8.7E-6	2.5E-7	4.7E-9

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-54.6 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.07	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

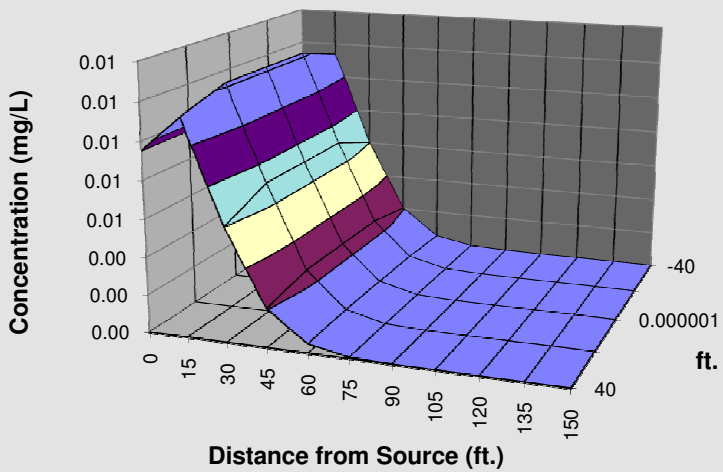
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.011	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.012	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.012	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.012	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.011	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	9.9E-1	5.5E-1	2.0E-1	4.6E-2	7.4E-3	7.8E-4	5.3E-5	2.4E-6	9.6E-8	7.9E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.070 mg/L Displayed Model: Biotransformation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)

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

% Biotransformed = -52.5 %

% Change in Mass Rate = 100.0 % (source to edge)

See acre-ft

Current Volume of Ground Water in Plume	0.05	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

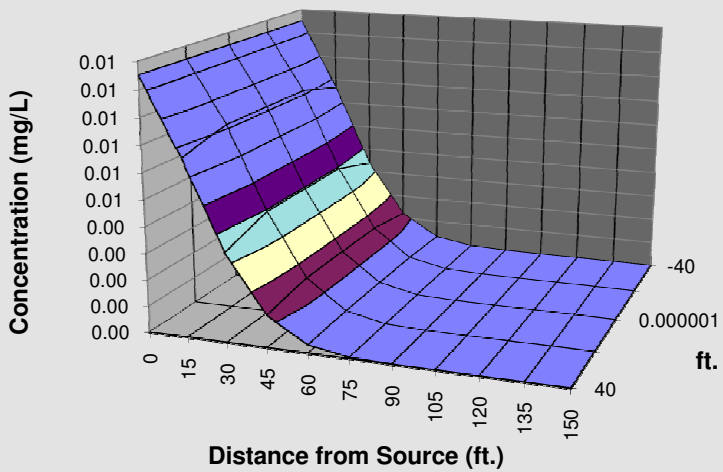
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	5.8E-1	3.1E-1	1.2E-1	2.9E-2	4.9E-3	5.4E-4	3.8E-5	1.7E-6	5.1E-8	9.4E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.070 mg/L Displayed Model: No Degradation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-52.5 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

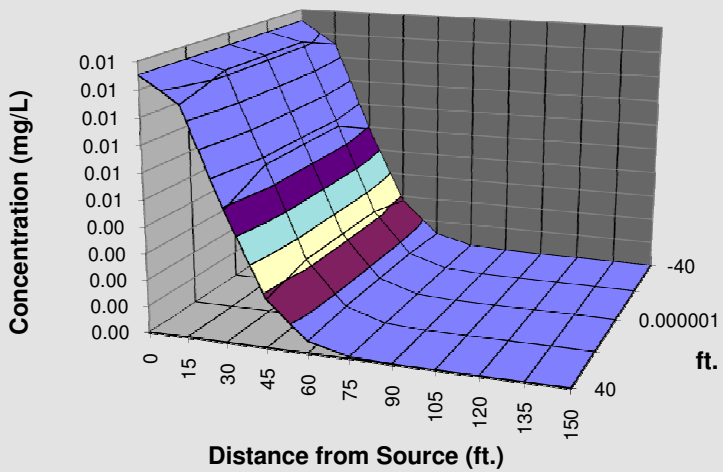
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.009	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.009	0.006	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.009	0.006	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.009	0.006	0.002	0.001	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.009	0.005	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	7.5E-1	4.5E-1	1.7E-1	4.3E-2	7.0E-3	7.5E-4	5.2E-5	2.3E-6	1.1E-7	7.7E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.002 mg/L Displayed Model: Biotransformation Displayed Compound: VC



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-26.3 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.05	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

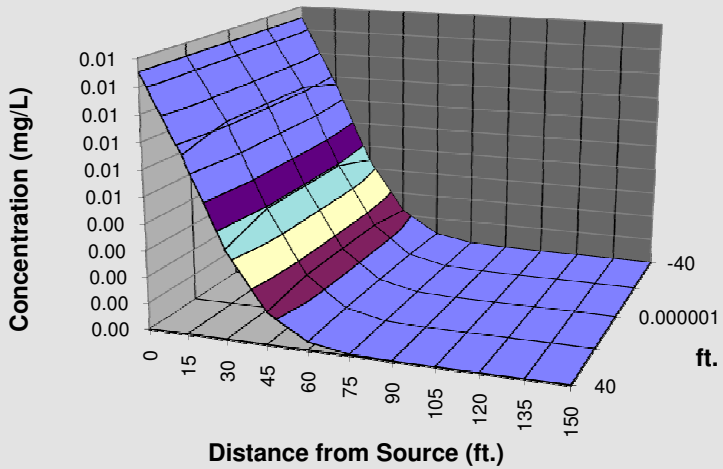
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	5.8E-1	3.1E-1	1.2E-1	2.9E-2	4.9E-3	5.4E-4	3.8E-5	1.7E-6	5.1E-8	9.4E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.002 mg/L Displayed Model: No Degradation Displayed Compound: VC



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-26.3 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

BIOCHLOR Natural Attenuation Decision Support System

Version 2.2
Excel 2000

Lenoir County
MW-3 Area
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ *or* 2. Calculate by filling in gray
0.02 cells. Press Enter, then C
(To restore formulas, hit "Restore Formulas" button)
Variable* → Data used directly in model.

Test if Biotransformation is Occurring → Natural Attenuation Screening Protocol

TYPE OF CHLORINATED SOLVENT: Ethenes ◉ Ethanes ○

1. ADVECTION

Seepage Velocity*	Vs	6.7	(ft/yr)
or			
Hydraulic Conductivity	K	1.3E-04	(cm/sec)
Hydraulic Gradient	i	0.01	(ft/ft)
Effective Porosity	n	0.2	(-)

2. DISPERSION

Alpha x*	15	(ft)
(Alpha y) / (Alpha x)*	0.1	(-)
(Alpha z) / (Alpha x)*	1.E-99	(-)

Calc. Alpha x

3. ADSORPTION

Retardation Factor* → R

or

Soil Bulk Density, rho	1.7	(kg/L)		
FractionOrganicCarbon, foc	1.0E-3	(-)		
Partition Coefficient	Koc			
PCE	426	(L/kg)	4.62	(-)
TCE	130	(L/kg)	2.11	(-)
DCE	125	(L/kg)	2.06	(-)
VC	30	(L/kg)	1.25	(-)
ETH	0	(L/kg)	1.00	(-)
Common R (used in model)* =			**2.06**	

4. BIOTRANSFORMATION

-1st Order Decay Coefficient*

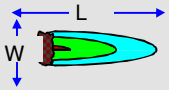
Zone 1	λ (1/yr)	half-life (yrs)	Yield
PCE → TCE	0.070	9.90	0.79
TCE → DCE	0.050	13.90	0.74
DCE → VC	0.178	3.90	0.64
VC → ETH	0.119	5.80	0.45

Zone 2	λ (1/yr)	half-life (yrs)
PCE → TCE	0.000	
TCE → DCE	0.000	
DCE → VC	0.000	
VC → ETH	0.000	

λ HELP

5. GENERAL

Simulation Time*	5	(yr)
Modeled Area Width*	100	(ft)
Modeled Area Length*	150	(ft)
Zone 1 Length*	150	(ft)
Zone 2 Length*	0	(ft)



Zone 2= L - Zone 1

6. SOURCE DATA

TYPE: Decaying Single Planar

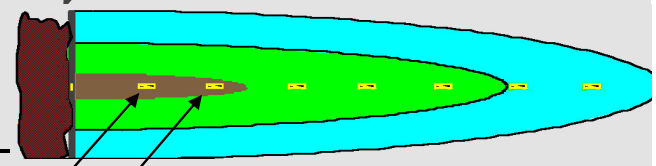
Source Options

Source Thickness in Sat. Zone* 8 (ft)

Y1
Width* (ft) 100

Conc. (mg/L)*	C1	k_s* (1/yr)
PCE	.25	0.01
TCE	.05	0.01
DCE	.01	0.01
VC	.01	0.01
ETH	0	0.01

Vertical Plane Source: Determine Source Well Location and Input Solvent Concentrations



View of Plume Looking Down

Observed Centerline Conc. at Monitoring Wells

7. FIELD DATA FOR COMPARISON

PCE Conc. (mg/L)	.002										
TCE Conc. (mg/L)	.003										
DCE Conc. (mg/L)	0.0003										
VC Conc. (mg/L)	0.0089										
ETH Conc. (mg/L)	0.00018										
Distance from Source (ft)	90										
Date Data Collected	2010										

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE | RUN ARRAY | Help | Restore Formulas | RESET | SEE OUTPUT | Paste Example

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

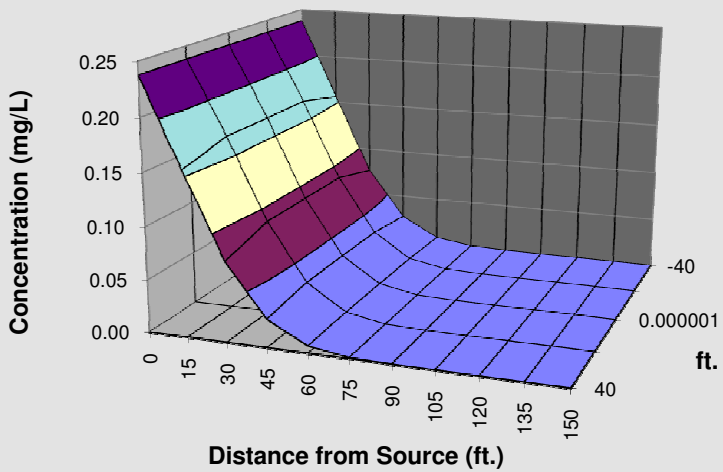
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.238	0.156	0.076	0.027	0.007	0.001	0.000	0.000	0.000	0.000	0.000
20	0.238	0.167	0.089	0.033	0.008	0.001	0.000	0.000	0.000	0.000	0.000
0	0.238	0.167	0.089	0.033	0.008	0.001	0.000	0.000	0.000	0.000	0.000
-20	0.238	0.167	0.089	0.033	0.008	0.001	0.000	0.000	0.000	0.000	0.000
-40	0.238	0.156	0.076	0.027	0.007	0.001	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	2.0E+1	1.4E+1	7.0E+0	2.6E+0	6.4E-1	1.1E-1	1.2E-2	8.1E-4	3.7E-5	1.1E-6	2.0E-8

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.1	(Kg)
- Plume Mass If Biotransformation/Production	0.1	(Kg)
Mass Removed	0.0	(Kg)

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

% Biotransformed = +5.9%

% Change in Mass Rate = 100.0 % (source to edge)

See acre-ft

Current Volume of Ground Water in Plume	0.09	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

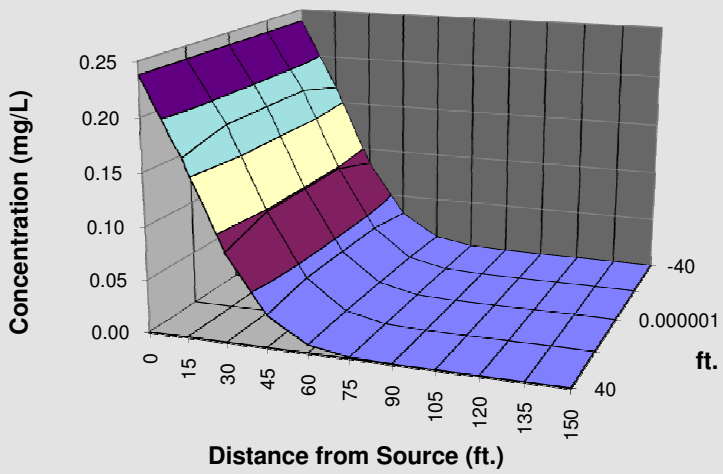
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.238	0.167	0.084	0.030	0.008	0.001	0.000	0.000	0.000	0.000	0.000
20	0.238	0.179	0.098	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
0	0.238	0.179	0.099	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
-20	0.238	0.179	0.098	0.038	0.010	0.002	0.000	0.000	0.000	0.000	0.000
-40	0.238	0.167	0.084	0.030	0.008	0.001	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	2.0E+1	1.4E+1	7.7E+0	2.9E+0	7.4E-1	1.2E-1	1.3E-2	9.5E-4	4.3E-5	1.3E-6	2.4E-8

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: PCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.1	(Kg)
- Plume Mass If Biotransformation/Production	0.1	(Kg)
Mass Removed	0.0	(Kg)

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

% Biotransformed = +5.9%

% Change in Mass Rate = 100.0 % (source to edge)

See acre-ft

Current Volume of Ground Water in Plume	0.09	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

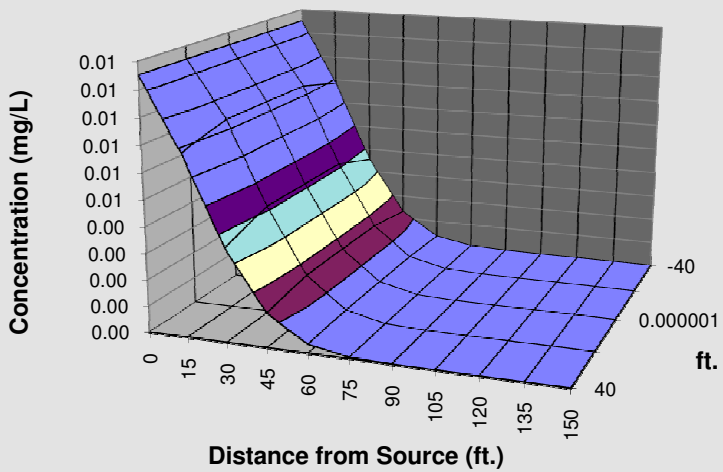
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	6.0E-1	3.3E-1	1.2E-1	3.2E-2	5.4E-3	5.9E-4	4.2E-5	1.9E-6	5.6E-8	1.1E-9

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.070 mg/L Displayed Model: Biotransformation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	**-3.0 %**	
% Change in Mass Rate =	**100.0 %**	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

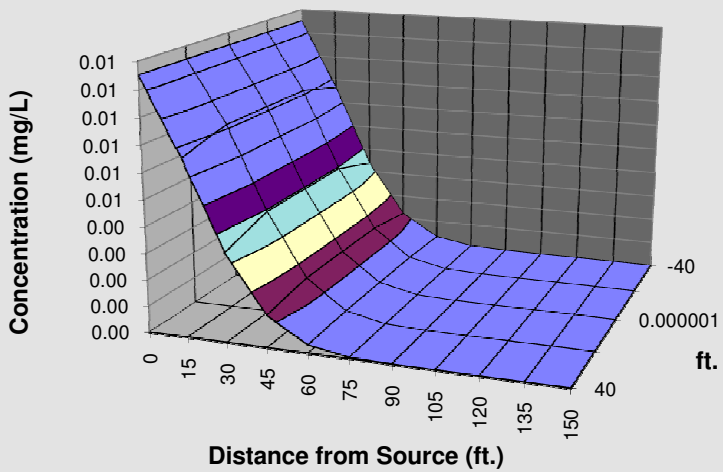
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	5.8E-1	3.1E-1	1.2E-1	2.9E-2	4.9E-3	5.4E-4	3.8E-5	1.7E-6	5.1E-8	9.4E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.070 mg/L Displayed Model: No Degradation Displayed Compound: DCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-3.0 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

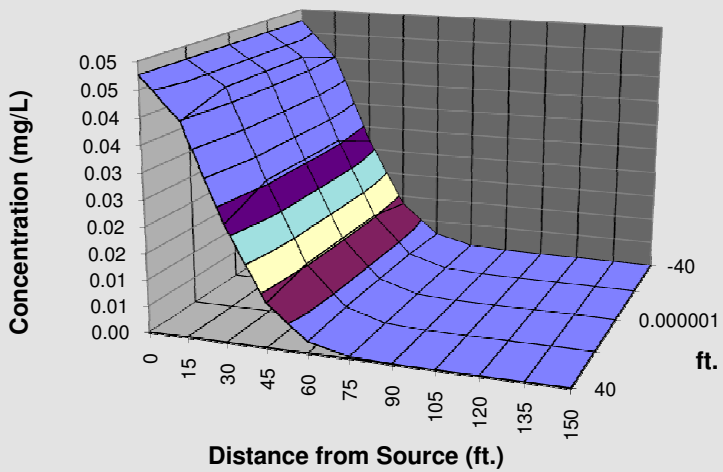
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.048	0.040	0.022	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
20	0.048	0.043	0.026	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000
0	0.048	0.043	0.026	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.048	0.043	0.026	0.010	0.003	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.048	0.040	0.022	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	4.0E+0	3.5E+0	2.0E+0	7.9E-1	2.1E-1	3.5E-2	3.9E-3	2.7E-4	1.3E-5	3.7E-7	6.8E-9

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: Biotransformation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)

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

% Biotransformed = -18.4 %

% Change in Mass Rate = 100.0 % (source to edge)

See acre-ft

Current Volume of Ground Water in Plume	0.07	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

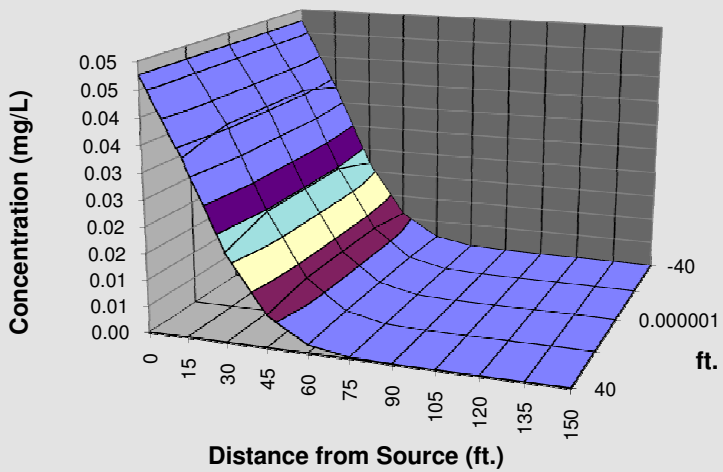
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.048	0.033	0.017	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000
20	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
0	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.048	0.036	0.020	0.008	0.002	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.048	0.033	0.017	0.006	0.002	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	4.0E+0	2.9E+0	1.5E+0	5.8E-1	1.5E-1	2.5E-2	2.7E-3	1.9E-4	8.7E-6	2.5E-7	4.7E-9

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.005 mg/L Displayed Model: No Degradation Displayed Compound: TCE



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	-18.4 %	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.07	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

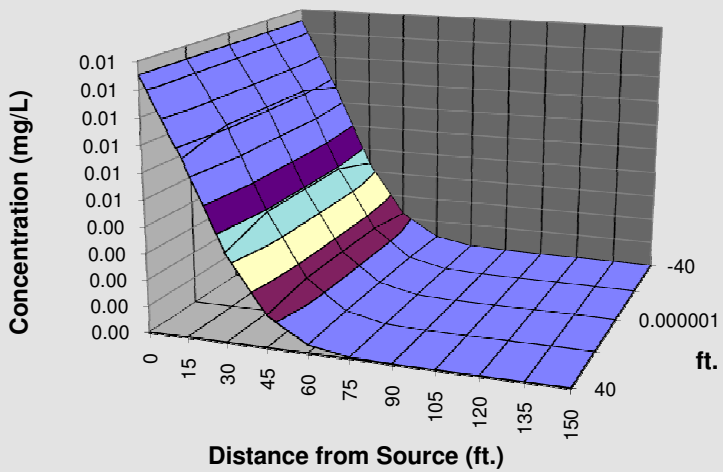
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	5.8E-1	3.1E-1	1.2E-1	2.9E-2	4.9E-3	5.4E-4	3.8E-5	1.7E-6	5.1E-8	9.8E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.002 mg/L Displayed Model: Biotransformation Displayed Compound: VC



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	+0.2%	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

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

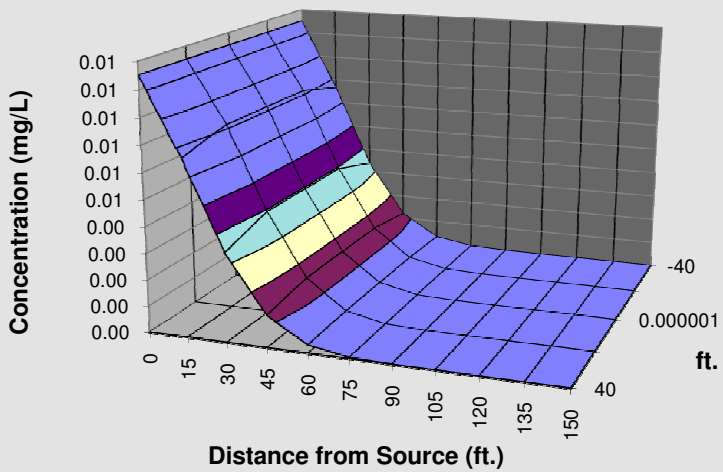
DISSOLVED SOLVENT CONCENTRATIONS IN PLUME

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	15	30	45	60	75	90	105	120	135	150
40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-20	0.010	0.007	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-40	0.010	0.007	0.003	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000
MASS RATE (mg/day)	7.9E-1	5.8E-1	3.1E-1	1.2E-1	2.9E-2	4.9E-3	5.4E-4	3.8E-5	1.7E-6	5.1E-8	9.4E-10

Show No Degradation

Show Biotransformation

Time: 5 yr Target Level: 0.002 mg/L Displayed Model: No Degradation Displayed Compound: VC



Plume Mass (Order-of-Magnitude Accuracy)

See Gallons

Plume Mass If No Degradation	0.0	(Kg)
- Plume Mass If Biotransformation/Production	0.0	(Kg)
Mass Removed	0.0	(Kg)
% Biotransformed =	+0.2%	
% Change in Mass Rate =	100.0 %	(source to edge)

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

See acre-ft

Current Volume of Ground Water in Plume	0.04	MGal
Flow Rate of Water Through Source Area	0.000	MGD

Compare to Pump and Treat

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

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

BIOSCREEN Natural Attenuation Decision Support System

Air Force Center for Environmental Excellence — *Version 1.4*

Lenoir County
MW-3: Benzene
Run Name

Data Input Instructions:

115 → 1. Enter value directly....or
↑ or
0.02 → 2. Calculate by filling in grey cells below. (To restore formulas, hit button below).

Variable* → *Data used directly in model.*
20 → *Value calculated by model. (Don't enter any data).*

1. HYDROGEOLOGY

Seepage Velocity*	*Vs*	6.7	*(ft/yr)*
or		↑ or	
Hydraulic Conductivity	*K*	1.3E-04	*(cm/sec)*
Hydraulic Gradient	*i*	0.01	*(ft/ft)*
Porosity	*n*	0.2	*(-)*

2. DISPERSION

Longitudinal Dispersivity*	*alpha x*	7.1	*(ft)*
Transverse Dispersivity*	*alpha y*	0.7	*(ft)*
Vertical Dispersivity*	*alpha z*	0.0	*(ft)*
or		↑ or	
Estimated Plume Length	*Lp*	100	*(ft)*

3. ADSORPTION

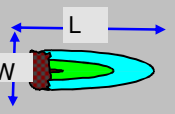
Retardation Factor*	*R*	1.0	*(-)*
or		↑ or	
Soil Bulk Density	*rho*		*(kg/l)*
Partition Coefficient	*Koc*		*(L/kg)*
FractionOrganicCarbon	*foc*		*(-)*

4. BIODEGRADATION

1st Order Decay Coeff*	*lambda*	0.35	*(per yr)*
or		↑ or	
Solute Half-Life	*t-half*	2.00	*(year)*
or Instantaneous Reaction Model			
Delta Oxygen*	*DO*	0.00039	*(mg/L)*
Delta Nitrate*	*NO3*	0.03	*(mg/L)*
Observed Ferrous Iron*	*Fe2+*	53	*(mg/L)*
Delta Sulfate*	*SO4*	0.1	*(mg/L)*
Observed Methane*	*CH4*	2.2	*(mg/L)*

5. GENERAL

Modeled Area Length*	100	*(ft)*
Modeled Area Width*	700	*(ft)*
Simulation Time*	5	*(yr)*



6. SOURCE DATA

Source Thickness in Sat.Zone* 10 *(ft)*

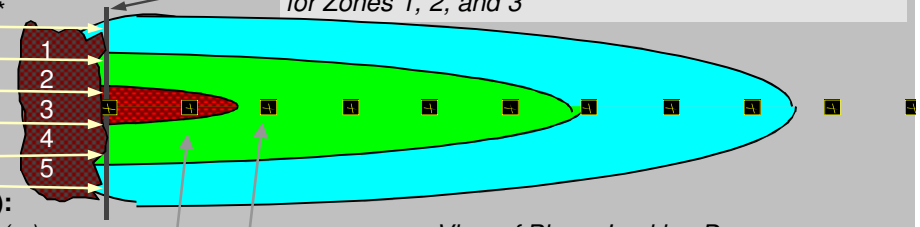
Source Zones:

Width* (ft)	Conc. (mg/L)*
10	0.0019
200	0.003
500	0.004
200	0.003
10	0.0019

Source Halflife (see Help):

Infinite	Infinite	*(yr)*
Inst. React.	↑ 1st Order	
Soluble Mass	Infinite	*(Kg)*
In Source NAPL, Soil		

Vertical Plane Source: Look at Plume Cross-Section and Input Concentrations & Widths for Zones 1, 2, and 3



View of Plume Looking Down

Observed Centerline Concentrations at Monitoring Wells
If No Data Leave Blank or Enter "0"

7. FIELD DATA FOR COMPARISON

Concentration (mg/L)		0.0021									
Dist. from Source (ft)	0	10	20	30	40	50	60	70	80	90	100

8. CHOOSE TYPE OF OUTPUT TO SEE:

RUN CENTERLINE — **View Output**

RUN ARRAY — **View Output**

Help

Recalculate This Sheet

Paste Example Dataset

Restore Formulas for Vs, Dispersivities, R, lambda, other

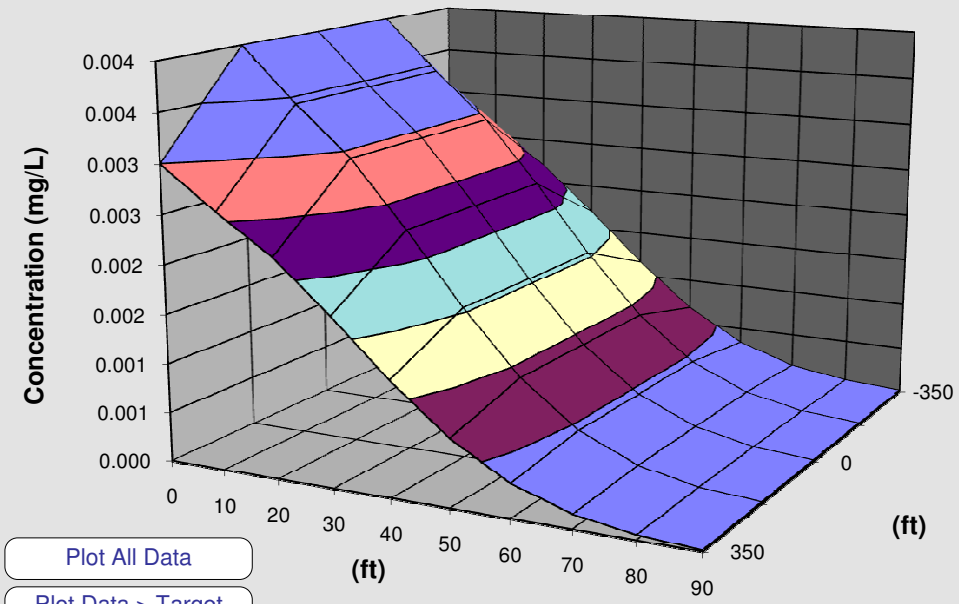
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	10	20	30	40	50	60	70	80	90	100
350	3.000E-03	2.583E-03	2.202E-03	1.698E-03	1.155E-03	6.786E-04	3.393E-04	1.426E-04	5.000E-05	1.453E-05	3.481E-06
175	4.000E-03	3.443E-03	2.936E-03	2.264E-03	1.540E-03	9.048E-04	4.524E-04	1.902E-04	6.667E-05	1.937E-05	4.641E-06
0	4.000E-03	3.443E-03	2.936E-03	2.264E-03	1.540E-03	9.048E-04	4.524E-04	1.902E-04	6.667E-05	1.937E-05	4.641E-06
-175	4.000E-03	3.443E-03	2.936E-03	2.264E-03	1.540E-03	9.048E-04	4.524E-04	1.902E-04	6.667E-05	1.937E-05	4.641E-06
-350	3.000E-03	2.583E-03	2.202E-03	1.698E-03	1.155E-03	6.786E-04	3.393E-04	1.426E-04	5.000E-05	1.453E-05	3.481E-06
MASS FLUX (mg/day)	3.4E+0	2.8E+0	2.4E+0	1.9E+0	1.3E+0	7.4E-1	3.7E-1	1.6E-1	5.5E-2	1.6E-2	3.8E-3

Model to Display:

- *No Degradation Model*
- *1st Order Decay Model*
- *Instantaneous Reaction Model*

Time: **5 Years** Target Level: **0.005** mg/L Displayed Model: **No Degradation**



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	0.0	*(Kg)*
- Actual Plume Mass	0.0	*(Kg)*
= Plume Mass Removed by Biodeg	**0.0**	*(Kg)*
	0 %	

Change in Electron Acceptor/Byproduct Masses:

Oxygen	*Nitrate*	*Iron II*	*Sulfate*	*Methane*	
na	na	na	na	na	*(Kg)*

Contam. Mass in Source (t=0 Years)	Infinite	*(Kg)*
Contam. Mass in Source Now (t=5Years)	Infinite	*(Kg)*
Current Volume of Groundwater in Plume	0.0	*(ac-ft)*
Flowrate of Water Through Source Zone	0.284	*(ac-ft/yr)*

Mass HELP

Recalculate

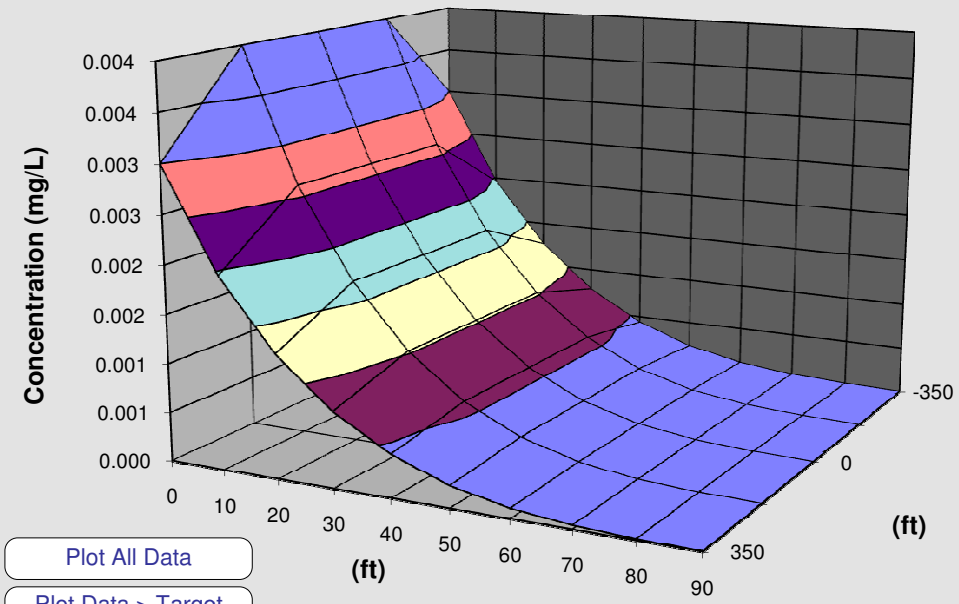
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	10	20	30	40	50	60	70	80	90	100
350	3.000E-03	1.958E-03	1.254E-03	7.657E-04	4.335E-04	2.213E-04	9.947E-05	3.856E-05	1.270E-05	3.515E-06	8.106E-07
175	4.000E-03	2.610E-03	1.672E-03	1.021E-03	5.780E-04	2.951E-04	1.326E-04	5.141E-05	1.693E-05	4.686E-06	1.081E-06
0	4.000E-03	2.610E-03	1.672E-03	1.021E-03	5.780E-04	2.951E-04	1.326E-04	5.141E-05	1.693E-05	4.686E-06	1.081E-06
-175	4.000E-03	2.610E-03	1.672E-03	1.021E-03	5.780E-04	2.951E-04	1.326E-04	5.141E-05	1.693E-05	4.686E-06	1.081E-06
-350	3.000E-03	1.958E-03	1.254E-03	7.657E-04	4.335E-04	2.213E-04	9.947E-05	3.856E-05	1.270E-05	3.515E-06	8.106E-07
MASS FLUX (mg/day)	3.4E+0	2.1E+0	1.4E+0	8.4E-1	4.7E-1	2.4E-1	1.1E-1	4.2E-2	1.4E-2	3.8E-3	8.9E-4

Model to Display:

- *No Degradation Model*
- *1st Order Decay Model*
- *Instantaneous Reaction Model*

Time: **5 Years** Target Level: **0.005** mg/L Displayed Model: **1st Order Decay**



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	0.0	*(Kg)*
- Actual Plume Mass	0.0	*(Kg)*
= Plume Mass Removed by Biodeg	**0.0**	*(Kg)* (39 %)

Change in Electron Acceptor/Byproduct Masses:

Oxygen	*Nitrate*	*Iron II*	*Sulfate*	*Methane*	
na	na	na	na	na	*(Kg)*

Contam. Mass in Source (t=0 Years)	Infinite	*(Kg)*
Contam. Mass in Source Now (t=5Years)	Infinite	*(Kg)*
Current Volume of Groundwater in Plume	0.0	*(ac-ft)*
Flowrate of Water Through Source Zone	0.284	*(ac-ft/yr)*

Mass HELP

Recalculate

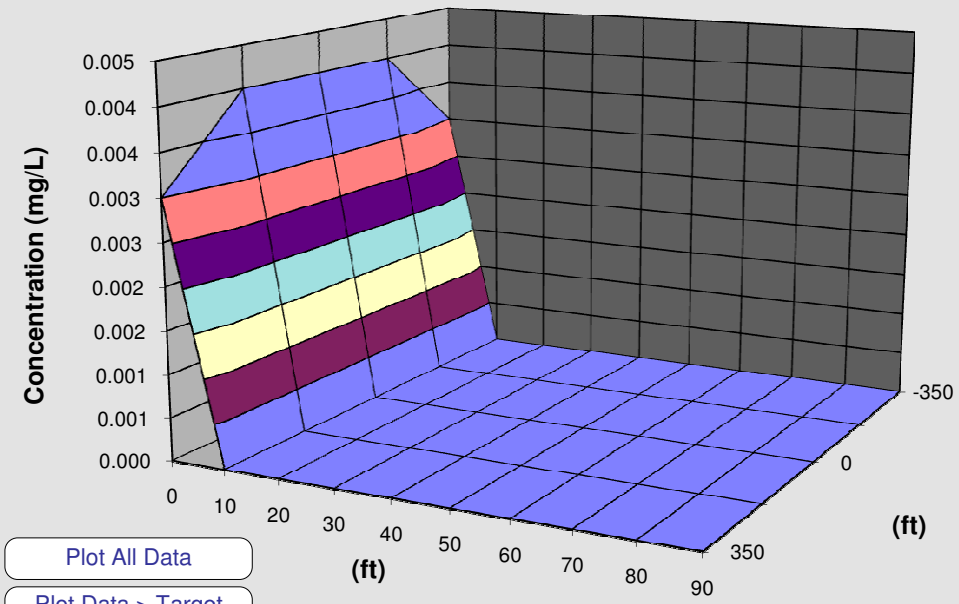
DISSOLVED HYDROCARBON CONCENTRATIONS IN PLUME (mg/L at Z=0)

Transverse Distance (ft) ↓ / Distance from Source (ft)	0	10	20	30	40	50	60	70	80	90	100
350	3.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
175	4.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
0	4.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-175	4.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
-350	3.000E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MASS FLUX (mg/day)	3.4E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0	0.0E+0

Time: **5 Years** Target Level: **0.005** mg/L Displayed Model: **Inst. Reaction**

Model to Display:

- *No Degradation Model*
- *1st Order Decay Model*
- *Instantaneous Reaction Model*



Plot All Data

Plot Data > Target

Plume and Source Masses (Order-of-Magnitude Accuracy)

Plume Mass if No Biodegradation	9.2	*(Kg)*
- Actual Plume Mass	0.0	*(Kg)*
= Plume Mass Removed by Biodeg	**9.2**	*(Kg)* (100 %)

Change in Electron Acceptor/Byproduct Masses:

Oxygen	*Nitrate*	*Iron II*	*Sulfate*	*Methane*	
-0.0	-0.1	+92.9	-0.2	+3.9	*(Kg)*

Contam. Mass in Source (t=0 Years)	Infinite	*(Kg)*
Contam. Mass in Source Now (t=5Years)	Infinite	*(Kg)*
Current Volume of Groundwater in Plume	0.0	*(ac-ft)*
Flowrate of Water Through Source Zone	0.284	*(ac-ft/yr)*

Mass HELP

Recalculate

APPENDIX C
Laboratory Analysis Report
Chains of Custody
Field Sampling Parameter Data Sheet(s)

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#: 6009

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #1	Well #3	Well #4	Well #6	Well #8	Analysis Date	Analyst	Method Code
PH (field measurement), Units			2.51	6.12	5.65	4.46		07/21/10	RJH	SM4500HB
Cyanide, ug/l	5.0	10.0		--- U				07/30/10	SEJ	SM4500 CN-
Antimony, ug/l	0.22	6.0	--- U	--- U	0.6 J	--- U		07/28/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	--- U	2.3 J	8.4 J	--- U		07/28/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	69.8 J	81.5 J	20.9 J	70.0 J		07/28/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.2 J	0.1 J	0.1 J	0.1 J		07/28/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	--- U	--- U	--- U	0.1 J		07/28/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	2.0 J	0.7 J	0.8 J	0.7 J		07/28/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	1.2 J	0.4 J	0.7 J	0.2 J		07/28/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	--- U	0.5 J	1.0 J	--- U		07/28/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	1.3 J	0.4 J	0.7 J	1.1 J		07/28/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	3.3 J	0.8 J	0.7 J	0.7 J		07/28/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	--- U	2.0 J	1.0 J	0.4 J		07/28/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	0.1 J	--- U	0.1 J	--- U		07/28/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	0.1 J	--- U	--- U	--- U		07/28/10	CMF	EPA200.8
Tin, ug/l	0.11	100.0		0.4 J				07/28/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	--- U	2.0 J	4.3 J	--- U		07/28/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	143	42	12	3.6 J		07/28/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	51.2	99.9	49.3	23.3		07/21/10	RJH	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	120	991	329	112		07/21/10	RJH	SM2510B
Temperature, °C			18.49	20.01	21.22	20.21		07/21/10	RJH	SM2550B
Static Water Level, feet			17.23	7.93	8.85	12.14	21.69	07/21/10	RJH	
Well Depth, feet			38.94	15.82	15.84	16.96		07/21/10	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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#: 6009

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #9	Well #10	Well #11	Well #12	Equipment Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.25		3.38	5.03		07/21/10	RJH	SM4500HB
Cyanide, ug/l	5.0	10.0					--- U	07/30/10	SEJ	SM4500 CN-
Antimony, ug/l	0.22	6.0	--- U		--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	3.0 J		--- U	05 J	--- U	07/28/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	75.0 J		39.5 J	312	--- U	07/28/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.2 J		0.1 J	0.2 J	--- U	07/28/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J		--- U	0.4 J	--- U	07/28/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	4.4 J		0.3 J	4.1 J	--- U	07/28/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	0.4 J		0.3 J	0.5 J	0.1 J	07/28/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	--- U		--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	0.3 J		0.1 J	--- U	--- U	07/28/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	3.3 J		0.7 J	5.9 J	--- U	07/28/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	0.6 J		--- U	2.8 J	--- U	07/28/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	0.1 J		--- U	0.1 J	--- U	07/28/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	--- U		--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Tin, ug/l	0.11	100.0					0.6 J	07/28/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	1.2 J		--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	13		4.0 J	4.1 J	0.2 J	07/28/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	115		9.70	11.7		07/21/10	RJH	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	77		52	320		07/21/10	RJH	SM2510B
Temperature, °C			23.80		19.09	19.82		07/21/10	RJH	SM2550B
Static Water Level, feet			6.80	22.71	13.84	16.95		07/21/10	RJH	
Well Depth, feet			21.82		35.61	38.39		07/21/10	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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

REVIEWED BY:

CLIENT ID: 6009

ANALYST: CHS
DATE COLLECTED: 07/21/10
DATE EXTRACTED: 07/22/10
DATE ANALYZED: 08/18/10
DATE REPORTED: 08/24/10

PESTICIDES AND PCB'S
EPA METHOD 8081B

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

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

Environment 1, Incorporated

Drinking Water ID: 37715
Wastewater ID: 10

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

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

REVIEWED BY:

CLIENT ID: 6009

ANALYST: CHS
DATE COLLECTED: 07/21/10
DATE EXTRACTED: 07/27/10
DATE ANALYZED: 08/04/10
DATE REPORTED: 08/24/10

LANDFILL APPENDIX II
EPA METHOD 8151A

PARAMETERS, ug/l	MDL	SWSL	Well #3	Equipment Blank
1. 2,4-D	0.36	2.0	--- U	--- U
2. Dinoseb	0.54	1.0	--- U	--- U
3. 2,4,5-TP	0.42	2.0	--- U	--- U
4. 2,4,5-T	0.47	2.0	--- U	--- U

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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

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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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Well #1	Well #4	Well #6	Well #9	Well #11
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	0.70 J
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	0.60 J	--- 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	0.70 J	--- 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	--- U	--- 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	1.70	--- 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	0.30 J	--- 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	5.30	--- 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	0.90 J	--- 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 Quanititation 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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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
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CLIENT: LENOIR CO. LANDFILL (OLD)
COUNTY OF LENOIR
MR. TOM MILLER
P.O. BOX 756
KINSTON, NC 28502

REVIEWED BY:

CLIENT ID: 6009

ANALYST: CHS
DATE COLLECTED: 07/21/10
DATE EXTRACTED: 07/26/10
DATE ANALYZED: 08/06/10
DATE REPORTED: 08/24/10

SEMI-VOLATILE ORGANICS
EPA METHOD 8270C

PARAMETERS, ug/l	MDL	SWSL	Well #3	Equipment Blank
1. Acenaphthene	2.66	10.0	--- U	--- U
2. Acenaphthylene	2.60	10.0	--- U	--- U
3. Anthracene	2.97	10.0	--- U	--- U
4. Benzo[a]antrhacene	4.16	10.0	--- U	--- U
5. Benzo[b]fluoranthene	3.32	10.0	--- U	--- U
6. Benzo[k]fluoranthene	4.23	10.0	--- U	--- U
7. Benzo[g,h,i]perylene	2.61	10.0	--- U	--- U
8. Benzo[a]pyrene	3.27	10.0	--- U	--- U
9. 4-Bromophenyl Phenyl Ether	2.63	10.0	--- U	--- U
10. Butyl Benzyl Phthalate	5.78	10.0	--- U	--- U
11. Bis-(2-Chloroethoxy) Methane	3.14	10.0	--- U	--- U
12. Bis-(2-Chloroethyl) Ether	2.58	10.0	--- U	--- U
13. Bis-(2-Chloroisopropyl) Ether	2.58	10.0	--- U	--- U
14. 2-Chloronaphthalene	2.17	10.0	--- U	--- U
15. 4-Chlorophenyl Phenyl Ether	2.42	10.0	--- U	--- U
16. Chrysene	4.04	10.0	--- U	--- U
17. Dibenzo[a,h]anthracene	2.78	10.0	--- U	--- U
18. Di-N-Butyl Phthalate	3.09	10.0	--- U	--- U
19. Dimethyl Phthalate	3.78	10.0	--- U	--- U
20. Diethyl Phthalate	3.92	6000	--- U	--- U
21. 2,4-Dinitrotoluene	3.95	10.0	--- U	--- U
22. 2,6-Dinitrotoluene	3.88	10.0	--- U	--- U
23. Di-N-Octyl Phthalate	2.81	10.0	--- U	--- U
24. Bis-(2-Ethylhexyl) Phthalate	9.97	15.0	--- U	--- U
25. Fluoranthene	3.92	10.0	--- U	--- U
26. Fluorene	2.95	10.0	--- U	--- U
27. Hexachlorobenzene	2.61	10.0	--- U	--- U
28. Hexachlorocyclopentadiene	4.16	10.0	--- U	--- U
29. Indeno[1,2,3-Cd]pyrene	2.91	10.0	--- U	--- U
30. Isophorone	3.74	10.0	--- U	--- U
31. Nitrobenzene	2.85	10.0	--- U	--- U
32. N-Nitrosodimethylamine	4.25	10.0	--- U	--- U
33. N-Nitrosodiphenylamine	3.95	10.0	--- U	--- U
34. N-Nitrosodi-N-Propylamine	4.06	10.0	--- U	--- U
35. Phenanthrene	3.24	10.0	--- U	--- U
36. Pyrene	3.63	10.0	--- U	--- U
37. 4-Chloro-3-Methylphenol	3.79	20.0	--- U	--- U
38. 2-Chlorophenol	2.75	10.0	--- U	--- U
39. O-Cresol	3.68	10.0	--- U	--- U
40. P-Cresol	4.12	10.0	--- U	--- U
41. 2,4-Dichlorophenol	5.19	10.0	--- U	--- U
42. 2,6-Dichlorophenol	4.89	10.0	--- U	--- U
43. 2,4-Dimethylphenol	3.21	10.0	--- U	--- U
44. 4,6-Dinitro-2-Methylphenol	4.77	50.0	--- U	--- U
45. 2,4-Dinitrophenol	4.37	50.0	--- U	--- U
46. Ethyl Methanesulfonate	5.26	20.0	--- U	--- U
47. Methyl Methanesulfonate	4.92	10.0	--- U	--- U
48. 2-Nitrophenol	3.64	10.0	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation 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

REVIEWED BY:

CLIENT ID: 6009

ANALYST: CHS
DATE COLLECTED: 07/21/10
DATE EXTRACTED: 07/26/10
DATE ANALYZED: 08/06/10
DATE REPORTED: 08/24/10

SEMI-VOLATILE ORGANICS
EPA METHOD 8270C

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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

REVIEWED BY:

CLIENT ID: 6009

ANALYST: CHS
DATE COLLECTED: 07/21/10
DATE EXTRACTED: 07/26/10
DATE ANALYZED: 08/06/10
DATE REPORTED: 08/24/10

SEMI-VOLATILE ORGANICS
EPA METHOD 8270C

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Well #3	Equipment Blank	Trip Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	8.90	--- 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	0.30 J	--- 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	7.40	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	13.00	--- 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	2.10	--- U	--- U
21. 1,2-Dichloroethane	0.21	1.0	1.30	--- U	--- U
22. Trichloroethene	0.23	1.0	3.00	--- 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	2.10	--- 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	0.70 J	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	0.30 J	--- 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	0.50 J	--- 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	1.20	--- 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
48. Acrolein	40.57	53.0	--- U	--- U	--- U

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

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

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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#: 6009

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

DATE COLLECTED: 07/28/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-3	Analysis Date	Analyst	Method Code
PH (field measurement), Units			Missing	6.5	07/28/10	BF	SM4500HB
Antimony, ug/l	0.22	6.0	Missing	--- U	08/10/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	Missing	2.8 J	08/10/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	Missing	79.9 J	08/10/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	Missing	0.3 J	08/10/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	Missing	0.2 J	08/10/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	Missing	0.7 J	08/10/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	Missing	0.6 J	08/10/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	Missing	1.1 J	08/10/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	Missing	--- U	08/10/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	Missing	--- U	08/10/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	Missing	1.6 J	08/10/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	Missing	5.0 J	08/10/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	Missing	37.1	07/28/10	BF	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	Missing	356	07/28/10	BF	SM2510B
Temperature, °C			Missing	28	07/28/10	BF	SM2550B

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 07/28/10
DATE ANALYZED: 08/02/10
DATE REPORTED: 08/24/10

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 30**

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

(252) 566-5408

DISINFECTION: ☐ CHLORINE ☐ UV ☐ NONE ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																			
pH CHECK (LAB)								<2	<2	<2				<2	<2				
CONTAINER TYPE, P/G			P	P	P	P	P	P		G	G	G	G	G	G	G	G	G	
CHEMICAL PRESERVATION			A	D	A	A	A	A		E	E	E	A	A	A	E	E	A	
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Cyanide	Metals	Turbidity	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	EPA 8270C	8270C Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8151A Landfill
Well #1	07/21/10	1515		18.49	5	G		G	G	G	G	G	G	G	G						
Well #3		2020		20.01	9	G	G	G	G	G	G	G				G	G	G	G	G	G
Well #4		1505		21.22	5	G		G	G	G	G	G	G	G	G						
Well #6		2021		20.21	4	G		G	G	G	G	G	G	G							
Well #8					1							G									
Well #9		2380		23.86	4	G		G	G	G	G	G	G	G							
Well #10					1							G									
Well #11		950		19.09	4	G		G	G	G	G	G	G	G							
Well #12		1055		19.82	4	G		G		G	G	G	G	G							
~~SW-1~~					4																
~~SW-3~~					4																

PARAMETERS

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

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

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

SAMPLES COLLECTED BY: (Please Print) HILGOE / FOX

SAMPLES RECEIVED IN LAB AT 1.6 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Hilgoe	07/21/10 4:42	[signature]	7/21/10 4:40
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:
NO FLOW IN SW1, WILL RE-SAMPLE
BOTH SW1 + SW3 ON 07/28/10

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

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

FORM #5

№ 202379

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:** 30

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

(252) 566-5408

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION																				
pH CHECK (LAB)			7D	<2											<2	<2				
CONTAINER TYPE, P/G			P	P	P	P	P	P		G	G	G	G	G	G	G	G	G		
CHEMICAL PRESERVATION			A	D	A	A	A	A		E	E	E	A	A	A	E	E	A		
SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Cyanide	Metals	Turbidity	Conductivity	Temperature	Field Parameter	EPA 8260B	8260 Dup. 1	8260 Dup. 2	EPA 8270C	8270C Dup. 1	EPA 8081B	8260B App. II	8260 App. II 1	8151A Landfill	PARAMETERS
Equipment Blank	07/21/10				8		G	G								G	G	G	G	G	G	
Trip Blank					2																	

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

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

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

SAMPLES COLLECTED BY: (Please Print)
HIGGOE / FOX

SAMPLES RECEIVED IN LAB AT 1.6 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Higgoe	07/21/10 4:40p	[illegible]	7/21/10 4:40p
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:

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

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

FORM #5

№ 202376

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: 30**

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

(252) 566-5408

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

CHLORINE NEUTRALIZED AT COLLECTION

pH CHECK (LAB)

CONTAINER TYPE, P/G

CHEMICAL PRESERVATION

PARAMETERS

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

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Field pH	Metals	Turbidity	Conductivity	Temperature	EPA 8260B	8260 Dup. 1	8260B App. II	8260 App. II 1
						P	P	P	P	P	G	G	G	G
						A	A	A	A	A	E	E	E	E
SW-1					4	G	G	G	G	G	G	G		
SW-3	7-28-10	1505			4	G	G	G	G	G	G	G		
Trip Blank					2								G	G

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 Fox

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	7-28-10	[illegible]	7/28 1418
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:
SW-1 Dry

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

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

FORM #5

№ 202386

Environment 1, Incorporated

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

Drinking Water ID: 37715
Wastewater ID: 10

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

ID#: 6009

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #1	Well #3	Well #4	Well #6	Analysis Date	Analyst	Method Code
PH (field measurement), Units			2.51	6.12	5.65	4.46	07/21/10	RJH	SM4500HB
Antimony, ug/l	0.22	6.0	--- U	--- U	0.6 J	--- U	07/28/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	--- U	2.3 J	8.4 J	--- U	07/28/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	69.8 J	81.5 J	20.9 J	70.0 J	07/28/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.2 J	0.1 J	0.1 J	0.1 J	07/28/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	--- U	--- U	--- U	0.1 J	07/28/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	2.0 J	0.7 J	0.8 J	0.7 J	07/28/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	1.2 J	0.4 J	0.7 J	0.2 J	07/28/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	--- U	0.5 J	1.0 J	--- U	07/28/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	1.3 J	0.4 J	0.7 J	1.1 J	07/28/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	3.3 J	0.8 J	0.7 J	0.7 J	07/28/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	--- U	2.0 J	1.0 J	0.4 J	07/28/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	0.1 J	--- U	0.1 J	--- U	07/28/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	0.1 J	--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	--- U	2.0 J	4.3 J	--- U	07/28/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	143	42	12	3.6 J	07/28/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	51.2	99.9	49.3	23.3	07/21/10	RJH	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	120	991	329	112	07/21/10	RJH	SM2510B
Temperature, °C			18.49	20.01	21.22	20.21	07/21/10	RJH	SM2550B
Static Water Level, feet			17.23	7.93	8.85	12.14	07/21/10	RJH	
Well Depth, feet			38.94	15.82	15.84	16.96	07/21/10	RJH	

RECEIVED
AUG 26 2010
Municipal Engineering Services
Company, PA

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

Environment 1, Incorporated

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

Drinking Water ID: 37715
Wastewater ID: 10

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

ID#: 6009

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #9	Well #11	Well #12	Equipment Blank	Analysis Date	Analyst	Method Code
PH (field measurement), Units			4.25	3.38	5.03		07/21/10	RJH	SM4500HB
Antimony, ug/l	0.22	6.0	--- U	--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	3.0 J	--- U	05 J	--- U	07/28/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	75.0 J	39.5 J	312	--- U	07/28/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	0.2 J	0.1 J	0.2 J	--- U	07/28/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	0.1 J	--- U	0.4 J	--- U	07/28/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	4.4 J	0.3 J	4.1 J	--- U	07/28/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	0.4 J	0.3 J	0.5 J	0.1 J	07/28/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	--- U	--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	0.3 J	0.1 J	--- U	--- U	07/28/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	3.3 J	0.7 J	5.9 J	--- U	07/28/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	0.6 J	--- U	2.8 J	--- U	07/28/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	0.1 J	--- U	0.1 J	--- U	07/28/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	--- U	--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	1.2 J	--- U	--- U	--- U	07/28/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	13	4.0 J	4.1 J	0.2 J	07/28/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	115	9.70	11.7		07/21/10	RJH	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	77	52	320		07/21/10	RJH	SM2510B
Temperature, °C			23.80	19.09	19.82		07/21/10	RJH	SM2550B
Static Water Level, feet			6.80	13.84	16.95		07/21/10	RJH	
Well Depth, feet			21.82	35.61	38.39		07/21/10	RJH	

J = Between MDL and SWSL, U = Below ALL Quanititation 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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Well #1	Well #4	Well #6	Well #9	Well #11
1. Chloromethane	0.77	1.0	--- U	--- U	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	--- U	--- U	--- U	--- U	0.70 J
3. Bromomethane	0.67	10.0	--- U	--- U	--- U	--- U	--- U
4. Chloroethane	0.48	10.0	--- U	0.60 J	--- 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	0.70 J	--- 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	--- U	--- 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	1.70	--- 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	0.30 J	--- 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	5.30	--- 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	0.90 J	--- 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 Quanititation 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

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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

VOLATILE ORGANICS
EPA METHOD 8260B

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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

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: 07/21/10
DATE ANALYZED: 07/30/10
DATE REPORTED: 08/24/10

REVIEWED BY:

LANDFILL APPENDIX II
EPA METHOD 8260B

PARAMETERS, ug/l	MDL	SWSL	Well #3	Equipment Blank	Trip Blank
1. Chloromethane	0.77	1.0	--- U	--- U	--- U
2. Vinyl Chloride	0.63	1.0	8.90	--- 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	0.30 J	--- 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	7.40	--- U	--- U
13. Vinyl Acetate	0.20	50.0	--- U	--- U	--- U
14. Cis-1,2-Dichloroethene	0.25	5.0	13.00	--- 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	2.10	--- U	--- U
21. 1,2-Dichloroethane	0.21	1.0	1.30	--- U	--- U
22. Trichloroethene	0.23	1.0	3.00	--- 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	2.10	--- 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	0.70 J	--- U	--- U
35. 1,1,1,2-Tetrachloroethane	0.22	5.0	--- U	--- U	--- U
36. Ethylbenzene	0.21	1.0	0.30 J	--- 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	0.50 J	--- 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	1.20	--- 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 Quanititation Limits.

Environment 1, Incorporated

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

Drinking Water ID: 37715
Wastewater ID: 10

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

ID#: 6009

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

DATE COLLECTED: 07/28/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-3	Analysis Date	Analyst	Method Code
PH (field measurement), Units			Missing	6.5	07/28/10	BF	SM4500HB
Antimony, ug/l	0.22	6.0	Missing	--- U	08/10/10	CMF	EPA200.8
Arsenic, ug/l	0.04	10.0	Missing	2.8 J	08/10/10	CMF	EPA200.8
Barium, ug/l	0.03	100.0	Missing	79.9 J	08/10/10	CMF	EPA200.8
Beryllium, ug/l	0.02	1.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Cadmium, ug/l	0.02	1.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Cobalt, ug/l	0.10	10.0	Missing	0.3 J	08/10/10	CMF	EPA200.8
Copper, ug/l	0.03	10.0	Missing	0.2 J	08/10/10	CMF	EPA200.8
Total Chromium, ug/l	0.03	10.0	Missing	0.7 J	08/10/10	CMF	EPA200.8
Lead, ug/l	0.01	10.0	Missing	0.6 J	08/10/10	CMF	EPA200.8
Nickel, ug/l	0.05	50.0	Missing	1.1 J	08/10/10	CMF	EPA200.8
Selenium, ug/l	0.32	10.0	Missing	--- U	08/10/10	CMF	EPA200.8
Silver, ug/l	0.03	10.0	Missing	0.1 J	08/10/10	CMF	EPA200.8
Thallium, ug/l	0.05	5.5	Missing	--- U	08/10/10	CMF	EPA200.8
Vanadium, ug/l	0.03	25.0	Missing	1.6 J	08/10/10	CMF	EPA200.8
Zinc, ug/l	0.08	10.0	Missing	5.0 J	08/10/10	CMF	EPA200.8
Turbidity, NTU	1.0	1.0	Missing	37.1	07/28/10	BF	SM2130B
Conductivity (at 25c), uMhos	1.0	1.0	Missing	356	07/28/10	BF	SM2510B
Temperature, °C			Missing	28	07/28/10	BF	SM2550B

J = Between MDL and SWSL, U = Below ALL Quanititation 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

REVIEWED BY:

CLIENT ID: 6009

ANALYST: MAO
DATE COLLECTED: 07/28/10
DATE ANALYZED: 08/02/10
DATE REPORTED: 08/24/10

VOLATILE ORGANICS
EPA METHOD 8260B

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

J = Between MDL and SWSL, U = Below ALL Quanititation 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 A

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #1	Well #3	Well #4	Well #6	Well #9	Analysis Date	Analyst	Method Code
BOD, mg/l	2.0	2.0	--- U	6.3	5.1	--- U	--- U	07/22/10	TRB	SM5210B
COD, mg/l	10.0	10.0	18	32	42	16		07/27/10	TRB	HACH8000
COD, mg/l	10.0	10.0					19	07/28/10	TRB	HACH8000
Nitrate Nitrogen as N, mg/l	0.03	10.0	8.56 J	--- U	--- U	2.36 J	2.31 J	07/23/10	TWA	EPA353.2
Total Organic Carbon, mg/l	0.15	1.0	--- U	3.42	10.72	--- U	2.95	07/28/10	SEJ	SM5310C
Total Alkalinity, mg/l	1.0	1.0	--- U	86	150	--- U	--- U	07/22/10	TRB	SM2320B
Chloride, mg/l	5.0	5.0	6	58	10	--- U	9	07/22/10	MEL	SM4500-CLB
Sulfate, mg/l	5.0	250.0	5.2 J	--- U	14.7 J	27.0 J	21.5 J	07/26/10	TRB	SM426C
Iron, ug/l	13.8	300.0	322	53000	36675	244 J	8290	07/29/10	ADD	SM3111B
Mercury, ug/l	0.08	0.20	--- U	--- U	--- U	--- U	0.41	07/28/10	CMF	EPA200.8
Sulfide, ug/l	100	1000	--- U	--- U	--- U	--- U	--- U	07/26/10	LFJ	SM4500-S2D
Dissolved Oxygen, mg/l			0.61	0.39	1.20	0.25	1.22	07/21/10	RJH	SM4500OG
Carbon Dioxide, mg/l			28	246	361	192	197	07/22/10	TRB	SM4500CO2C
ORP, mv			33.45	27.6	-23.7	240.1	175.4	07/21/10	RJH	SM2580B

J = Between MDL and SWSL, U = Below ALL Quanititation 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#: 6009 A

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #11	Well #12	Analysis Date	Analyst	Method Code
BOD, mg/l	2.0	2.0	--- U	--- U	07/22/10	TRB	SM5210B
COD, mg/l	10.0	10.0	15	32	07/27/10	TRB	HACH8000
Nitrate Nitrogen as N, mg/l	0.03	10.0	2.19 J	0.39 J	07/23/10	TWA	EPA353.2
Total Organic Carbon, mg/l	0.15	1.0	--- U	8.42	07/28/10	SEJ	SM5310C
Total Alkalinity, mg/l	1.0	1.0	1.0		07/22/10	TRB	SM2320B
Total Alkalinity, mg/l	1.0	1.0		--- U	07/26/10	TRB	SM2320B
Chloride, mg/l	5.0	5.0	5	65	07/22/10	MEL	SM4500-CLB
Sulfate, mg/l	5.0	250.0	6.4 J	29.2 J	07/26/10	TRB	SM426C
Iron, ug/l	13.8	300.0	418	51 J	07/29/10	ADD	SM3111B
Mercury, ug/l	0.08	0.20	--- U	--- U	07/28/10	CMF	EPA200.8
Sulfide, ug/l	100	1000	--- U	--- U	07/26/10	LFJ	SM4500-S2D
Dissolved Oxygen, mg/l			0.01	0.01	07/21/10	RJH	SM4500OG
Carbon Dioxide, mg/l			43	513	07/22/10	TRB	SM4500CO2C
ORP, mv			252.8	179.3	07/21/10	RJH	SM2580B

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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
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ID#: 6009 A

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

DATE COLLECTED: 07/28/10
DATE REPORTED : 08/13/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	SW-1	SW-3	Analysis Date	Analyst	Method Code
Mercury, ug/l	0.07	0.20	Missing	0.07 J	08/12/10	ADD	EPA245.1
Dissolved Oxygen, mg/l			Missing	1.74	07/28/10	BF	SM4500OG
ORP, mv			Missing	-31	07/28/10	BF	SM2580B
Carbon Dioxide, mg/l			Missing	37	07/28/10	SEJ	SM4500CO2C

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

microseeps
from insight comes solutions

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Page: Page 1 of 8
Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Laboratory Results

Total pages in data package: 9

Lab Sample #	Client Sample ID
P1007299-01	MW1
P1007299-02	MW3
P1007299-03	MW4
P1007299-04	MW6
P1007299-05	MW9
P1007299-06	MW11
P1007299-07	MW12

Microseeps test results meet all the requirements of the NELAC standards or provide reasons and/or justification if they do not.

Approved By: Heather Hauser (OH) ***Date:*** 8-5-10

Project Manager: Heather Hauser

The analytical results reported here are reliable and usable to the precision expressed in this report. As required by some regulating authorities, a full discussion of the uncertainty in our analytical results can be obtained at our web site or through customer service. Unless otherwise specified, all results are reported on a wet weight basis.

As a valued client we would appreciate your comments on our service.
Please call customer service at (412)826-5245 or email customerservice@microseeps.com.

Case Narrative:

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW1	Vapor	P1007299-01	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	<0.010	0.010	ug/L	AM20GAX	7/30/10	sl
N Ethene	0.012	0.010	ug/L	AM20GAX	7/30/10	sl
N Hydrogen	1.400	0.600	nM	AM20GAX	7/30/10	sl
N Methane	0.230	0.015	ug/L	AM20GAX	7/30/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW3	Vapor	P1007299-02	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	0.076	0.010	ug/L	AM20GAX	7/30/10	sl
N Ethene	0.180	0.010	ug/L	AM20GAX	7/30/10	sl
N Hydrogen	0.790	0.600	nM	AM20GAX	7/30/10	sl
N Methane	2200.000	0.015	ug/L	AM20GAX	7/30/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW4	Vapor	P1007299-03	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	0.069	0.010	ug/L	AM20GAX	7/30/10	sl
N Ethene	0.032	0.010	ug/L	AM20GAX	7/30/10	sl
N Hydrogen	1.500	0.600	nM	AM20GAX	7/30/10	sl
N Methane	1000.000	0.015	ug/L	AM20GAX	7/30/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW6	Vapor	P1007299-04	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	<0.010	0.010	ug/L	AM20GAX	8/3/10	sl
N Ethene	<0.010	0.010	ug/L	AM20GAX	8/3/10	sl
N Hydrogen	12.000	0.600	nM	AM20GAX	8/3/10	sl
N Methane	300.000	0.015	ug/L	AM20GAX	8/3/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW9	Vapor	P1007299-05	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	0.019	0.010	ug/L	AM20GAX	8/3/10	sl
N Ethene	0.016	0.010	ug/L	AM20GAX	8/3/10	sl
N Hydrogen	2.000	0.600	nM	AM20GAX	8/3/10	sl
N Methane	20.000	0.015	ug/L	AM20GAX	8/3/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW11	Vapor	P1007299-06	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	<0.010	0.010	ug/L	AM20GAX	8/3/10	sl
N Ethene	0.013	0.010	ug/L	AM20GAX	8/3/10	sl
N Hydrogen	1.900	0.600	nM	AM20GAX	8/3/10	sl
N Methane	180.000	0.015	ug/L	AM20GAX	8/3/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	0.096	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Client Name: Environment 1, Inc.
Contact: Steve Jones
Address: PO Box 7085
114 Oakmont Drive
Greenville, NC 27835

Lab Proj #: P1007299
Report Date: 08/05/10
Client Proj Name: Lenoir County
Client Proj #: Lenoir County

Sample Description	Matrix	Lab Sample #	Sampled Date/Time	Received
MW12	Vapor	P1007299-07	21 Jul. 10	23 Jul. 10 11:55

Analyte(s)	Result	PQL	Units	Method #	Analysis Date	By
RiskAnalysis						
N Ethane	<0.010	0.010	ug/L	AM20GAX	8/3/10	sl
N Ethene	0.059	0.010	ug/L	AM20GAX	8/3/10	sl
N Hydrogen	0.960	0.600	nM	AM20GAX	8/3/10	sl
N Methane	800.000	0.015	ug/L	AM20GAX	8/3/10	sl
SemiVolatiles						
N Acetic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Butyric Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Hexanoic Acid	0.130	0.050	mg/L	AM23G	7/28/10	kb
N i-Hexanoic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N i-Pentanoic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb
N Lactic Acid	<0.100	0.100	mg/L	AM23G	7/28/10	kb
N Pentanoic Acid	<0.070	0.070	mg/L	AM23G	7/28/10	kb
N Propionic Acid	<0.050	0.050	mg/L	AM23G	7/28/10	kb
N Pyruvic Acid	<0.150	0.150	mg/L	AM23G	7/28/10	kb

N - NELAC certified analysis

Microseeps Lab. Proj. # P1007299

CHAIN - OF - CUSTODY RECORD

Microseeps COC cont. # 926

Phone: (412) 826-5245 Microseeps, Inc. - 220 William Pitt Way - Pittsburgh, PA 15238 Fax No. : (412) 826-3433

Company : ENVIRONMENT 1, INC.

Co. Address : 114 OAKMONT DR, GREENVILLE, NC, 27858

Phone # : 252-756-6208 Fax # : 252-756-0633

Proj. Manager : STEVE JONES

Proj. Name/Number : LENOIR COUNTY

Sampler's signature : Robert Hogan

Cooler Temp.

Results to :

Invoice to :

Sample ID	Sample Description	Sample Type Water	Vapor	Solid	Date	Time	# bottles		AMMONIA NITROGEN	LL VFA	METHANE/ETHANE/ETHENE							Remarks :
MW 1		✓	✓		7/21/10		4		✓	✓	✓							
MW 3		✓	✓				4		✓	✓	✓							
MW 4		✓	✓				4		✓	✓	✓							
MW 6		✓	✓				4		✓	✓	✓							
MW 9		✓	✓				4		✓	✓	✓							
MW 11		✓	✓				4		✓	✓	✓							
MW 12		✓	✓				4		✓	✓	✓							

Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
[signature]	ENVIRONMENT 1	7/21/10	9 AM	[signature]	[signature]	7/23	1000
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :
Relinquished by :	Company :	Date :	Time :	Received by :	Company :	Date :	Time :

WHITE COPY : Accompany Samples YELLOW COPY : Laboratory File PINK COPY : Submitter

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 A **Week: 30**

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

(252) 566-5408

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	BOD	COD	Nitrate	TOC	Alkalinity	Chloride	Sulfate	Metals	Sulfide	DO	CO2	ORP
CHLORINE NEUTRALIZED AT COLLECTION																	
pH CHECK (LAB)							<2		<2				<2	>9			
CONTAINER TYPE, P/G						P	P	P	P	P	P	P	P	P	P	P	P
CHEMICAL PRESERVATION						A	C	A	C	A	A	A	A	F D	A	A	A
Well #1	07/21/10	1515		18.48	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #3		1220		20.01	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #4		1305		21.22	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #6		1415		20.21	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #9		1120		23.80	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #11		0950		19.09	11	G	G	G	G	G	G	G	G	G	G	G	G
Well #12		1035		19.62	11	G	G	G	G	G	G	G	G	G	G	G	G
~~SW-1~~					2												
~~SW-3~~					2												

PARAMETERS

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

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

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

SAMPLES COLLECTED BY:
(Please Print)
HILGOE/FOX

SAMPLES RECEIVED IN LAB AT 1.2 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bob Hilgoe	07 21 10 4:40PM	[illegible]	[illegible]
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS:
NO FLOW IN SW1, WILL RESAMPLE
BOTH SW1 + SW3 ON 07/28/10

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

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

FORM #5

№ 202375

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 A **Week: 30**

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

(252) 566-5408

DISINFECTION
- ☐ CHLORINE
- ☐ UV
- ☐ NONE
- ☐ _____

CHLORINE NEUTRALIZED AT COLLECTION: L2

pH CHECK (LAB): P P P

CONTAINER TYPE, P/G: A A A

CHEMICAL PRESERVATION

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

SAMPLE LOCATION	COLLECTION DATE	COLLECTION TIME	TOTAL CHLORINE, mg/l AT COLLECTION	TEMPERATURE, °C AT COLLECTION	# OF CONTAINERS	Metals	DO	ORP / CO2
SW-1					2			
SW-3	7-28-10	1505		28	2	G	G	G

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

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

SAMPLES COLLECTED BY: (Please Print) Bobby Fox

SAMPLES RECEIVED IN LAB AT 02 °C

RELINQUISHED BY (SIG.) (SAMPLER)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
Bobby Fox	7-28-10	[illegible]	7/28/418
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME
RELINQUISHED BY (SIG.)	DATE/TIME	RECEIVED BY (SIG.)	DATE/TIME

COMMENTS: SW-1 Dry

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

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

FORM #5

№ 202385

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#: 6009

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

DATE COLLECTED: 07/21/10
DATE REPORTED : 08/24/10

REVIEWED BY:

PARAMETERS	MDL	SWSL	Well #3	Analysis Date	Analyst	Method Code
Mercury, ug/l	0.20	0.08	---U	07/28/10	CMF	EPA200.8

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