

LINCOLN COUNTY LANDFILL  
C&D LANDFILL ASSESSMENT  
GROUNDWATER MONITORING WELL INSTALLATION REPORT  
CROUSE, NORTH CAROLINA  
S&ME Project No. 1356-13-009

Prepared for:  
**North Carolina Department of Environment and Natural Resources**  
Division of Waste Management – Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

Prepared by:  
**S&ME, Inc.**  
9751 Southern Pine Blvd  
Charlotte, North Carolina 28273

August 12, 2013



August 12, 2013

North Carolina Department of Environment and Natural Resources (NCDENR)  
Division of Waste Management – Solid Waste Section  
1646 Mail Service Center  
Raleigh, North Carolina 27699-1646

Attention: Ms. Jaclynne Drummond  
Compliance Hydrogeologist

Reference: **Groundwater Monitoring Well Installation Report  
C&D Landfill Assessment**  
Lincoln County Landfill (Permit # 55-03)  
Crouse, North Carolina  
S&ME Project No. 1356-13-009

Dear Ms. Drummond:

S&ME, Inc., on behalf of Lincoln County, is pleased to present the enclosed Groundwater Monitoring Well Installation Report for the Lincoln County Landfill C&D Assessment. The above referenced activities were performed in accordance with our letter dated April 18, 2013 titled "C&D Assessment for Lincoln County Landfill" approved by the Solid Waste Section via a letter dated May 29, 2013.

If you should have any questions or need additional information please contact us at (704) 523-4726.

Respectfully submitted,

S&ME, Inc.

Courtney W. Murphy, P.G.  
Project Geologist

Julie P. Robertson, P.G.  
Project Manager/Senior Geologist



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## 1. INTRODUCTION AND BACKGROUND

Concentrations of PCE in monitoring well MW-28 have exceeded 2L standards since April 2008 and have been generally increasing in concentration since that time. Monitoring well MW-28 monitors groundwater upgradient of the C&D Landfill and is positioned in-between the unlined MSW landfill “Area E” and the C&D Landfill. Phase I of the C&D landfill was closed with an intermediate cover and remains hydraulically connected to Phase II of the C&D Landfill, therefore; 15A NCAC 13B.0545 (*Assessment and Corrective Action Program for C&D Landfill Facilities and Units*) is applicable.

Based on PCE exceedances in monitoring well MW-28 and the applicable rules, S&ME and the County have begun a C&D Assessment Program by installing one (1) compliance boundary well down-gradient of existing monitoring well MW-28. This report documents the installation activities associated with new compliance monitoring well MW-36 for the C&D Landfill.

## 2. DRILLING ACTIVITIES

The following sections describe S&ME field activities, including drilling and well installation, well development, and field rising-head permeability testing (slug testing).

### 2.1 Soil Test Boring and Soil Classification

The soil test boring for MW-36 was drilled into the residual soil/saprolite using 4¼-inch inside diameter hollow-stem augers. Split-spoon sampling (ASTM D1586) was utilized to sample soils at approximate 5-foot intervals. Drilling and soil sampling was advanced to a depth of 36 feet below land surface, which was approximately 10 feet below the time of boring water level of 25 feet below land surface.

Soil samples were visually classified in the field by an on-site geologist for origin, color, and soil type in accordance with the Unified Soil Classification System (ASTM D2487/D2488). A Soil Boring Log, portraying drilling depth, soil sample depths, blow counts (N-values), and soil classifications, is included in *Appendix I*.

### 2.2 Well Construction

Monitoring well MW-36 was constructed of 2-inch I.D., NSF Grade PVC (meeting ASTM D-178S and F480 standards) Schedule 40 flush-joint threaded casing and 0.01-inch machine slotted screen. Once the borehole was drilled, the on-site geologist selected the screened depth and approved the monitoring well construction based on site-specific hydrogeologic conditions.

The well screen interval is 15 feet in length and was installed at an elevation so that the stabilized water table intersected the screen interval with approximately 10 feet of screen submerged beneath the water table. The annular space between the borehole wall and the well screen was backfilled with clean, well rounded, washed, high grade #2 silica sand. The sand pack was placed to approximately two feet above the slotted screen. A pelletized

bentonite seal was placed above the filter pack. The remainder of the annular space was filled with a neat cement grout from the top of the bentonite seal to near ground surface.

The monitoring well was completed with a steel 4" x 4" x 5' protective casing with a locking cap. The protective casing was sealed and immobilized in a concrete collar placed around the protective casing. The protective casing was completed with a 2-foot square concrete pad. The well location was affixed with a permanent well tag. Well installation was performed by a North Carolina certified well driller and verified by a North Carolina registered geologist in accordance with 15A NCAC 2C standards.

A Well Log presenting a graphical depiction of the well construction details is included in *Appendix I*.

### **2.3 Well Development**

Following well installation, Monitoring Well MW-36 was developed in order to remove clay, silt, sand, and other fines that may have been introduced into the formation or sand pack during drilling and well installation, and to establish communication of the well with the aquifer. Well development was performed using a portable well pump and was performed after well construction. Development pumping continued until the removed water was relatively clear and sediment-free based on visual observations. A minimum of 5 well volumes was removed from the well.

### **2.4 Slug Testing and Hydraulic Conductivity Estimate**

Following the installation and development of Monitoring Well MW-36, an in-situ hydraulic conductivity test "slug test" was performed to evaluate the horizontal permeability or hydraulic conductivity of the subsurface materials surrounding the saturated portion of the screened interval. The slug test was performed by removing a field specified amount of water from the well using a portable well pump. The well was then allowed to recharge as measurements of increasing water level with time were recorded using a pressure transducer and data logger. Rising-head hydraulic conductivity was then computed from the field data using the Bouwer and Rice Graphical Method. The estimated hydraulic conductivity of MW-36 is  $1.219 \times 10^{-3}$  cm/sec. Slug test data and computations are included in *Appendix II*.

## **3. POST-DRILLING ACTIVITIES**

The following sections describe S&ME's coordination of surveying activities on-site, soil laboratory testing, and reporting of the well installation record to NCDENR - DWQ.

### **3.1 Surveying**

WSP surveyed Monitoring Well MW-36 and provided state plane coordinates, ground surface elevation, and top of casing elevation. Horizontal control is provided relative to North Carolina Grid NAD 83; vertical control is provided relative to NGVD 29. Survey information for Monitoring Well MW-36 is provided below:

- Northing: 618011.66
- Easting: 1299447.84

- Ground Surface Elevation: 851.95 feet mean sea level
- Top of Casing Elevation: 854.83 feet mean sea level

The location of Monitoring Well MW-36 is identified on *Drawing 1 of 1 – Water Quality Monitoring Plan*.

### **3.2 Soil Laboratory Testing and Porosity Estimate**

Split-spoon samples referenced above were transported to our Charlotte, North Carolina soil laboratory for classification. S&ME performed a grain-size with hydrometer test on a split-spoon soil sample collected from within the saturated portion of the screened-interval for Monitoring Well MW-36. The grain-size analysis data was used to estimate the effective porosity of the soil. Effective porosity estimates calculated from the grain-size data are based on the soil classification and the “Variation of porosity, specific yield, and specific retention with grain size” table (Bear, J., 1972) in conjunction with the textural classification triangle for unconsolidated materials showing the relationship between particle size and specific yield (Fetter, C.W., 1994). The porosity values calculated for Monitoring Well MW-36 are as follows:

- Total porosity: 40%
- Effective porosity: 20%

Porosity calculation sheets are included in *Appendix II*. Soil laboratory data sheets are included in *Appendix III*.

### **3.3 Reporting to NCDENR - DWQ**

S&ME prepared and submitted a well construction record (GW-1b) for Monitoring Well MW-36 to the NCDENR – Division of Water Quality (DWQ) within 30-days of well completion. A Copy of the submittal to NCDENR-DWQ is included in *Appendix IV*.

## FIGURES





LINCOLN COUNTY, ANDPILL  
524 CROUSE ROAD  
CROUSE, NORTH CAROLINA



NO.	DATE	DESCRIPTION	CLD	BY
1	8-12-13	ADDED MONITOR WELL MW-36		

NO.	DATE	DESCRIPTION	CLD	BY
1	8-12-13	ADDED MONITOR WELL MW-36		

**WATER QUALITY MONITORING PLAN**

LINCOLN COUNTY LANDFILL  
CROUSE, NORTH CAROLINA

S&ME ENGINEERING LICENSE NO. F-0176

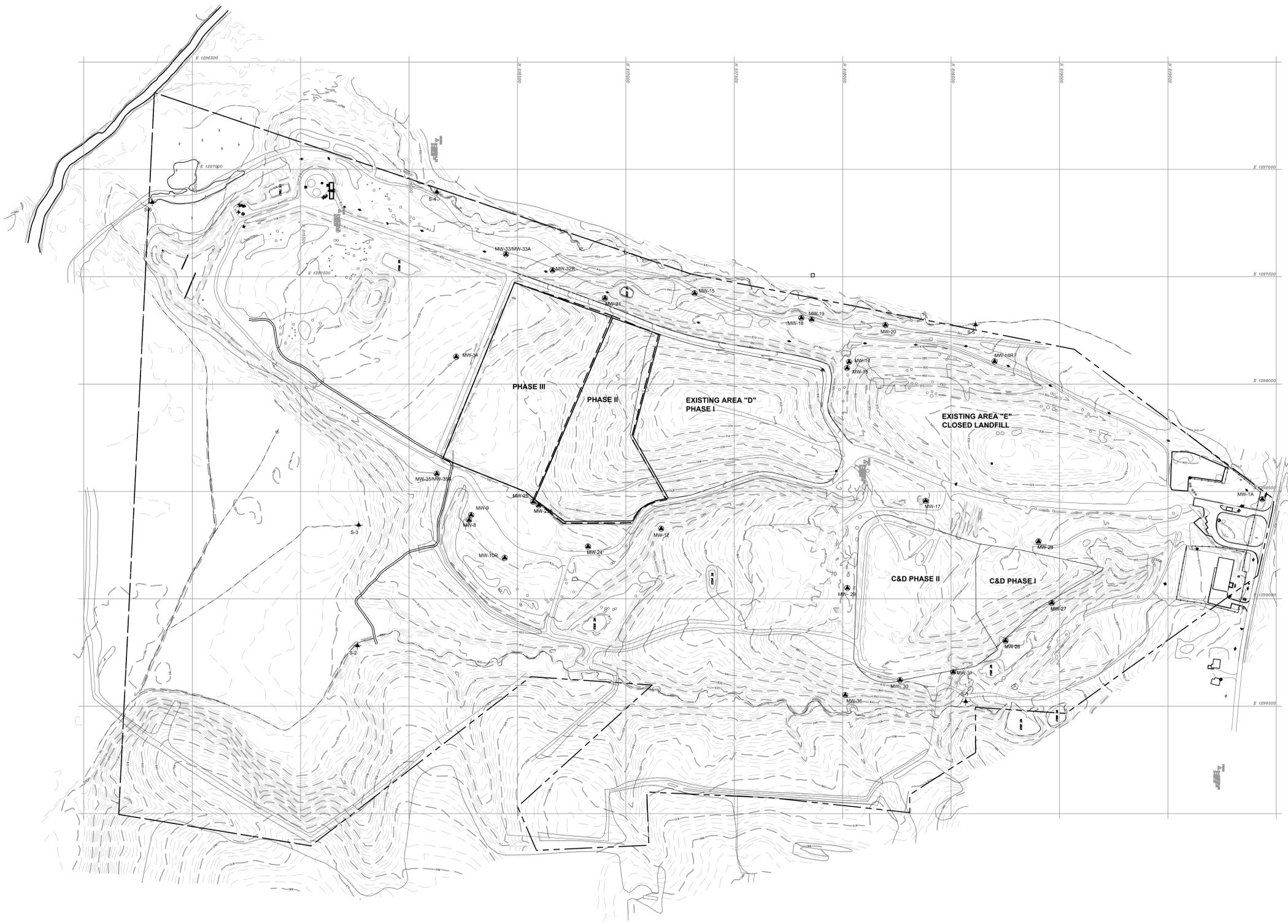
DRAWN BY: \_\_\_\_\_ CHECKED BY: \_\_\_\_\_

DESIGNED BY: CWM APPROVED BY: \_\_\_\_\_

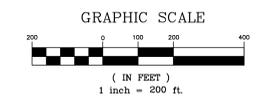
PROJECT NUMBER: 1356-07-004

SCALE: 1" = 200' DATE: 8-12-13

DRAWING: 1 OF 1



- LEGEND**
- MW-1A EXISTING MONITORING WELL
  - S-1 SURFACE WATER SAMPLING LOCATION
  - PROPERTY BOUNDARY



REFERENCE:  
TOPOGRAPHIC SURVEY FOR LINCOLN COUNTY LANDFILL BY SPATIAL DATA CONSULTANTS INC., DATED:  
APRIL 7, 2010.

DRAWING DATE: 8-12-13 LINCOLN COUNTY ENGINEER QUALITY INSPECTOR

# APPENDIX I

## BORING LOG AND WELL LOG



PROJECT:		C&D Landfill Assessment Lincoln County Landfill S&ME Project No. 1356-13-009		BORING LOG		MW-36	
CLIENT: Lincoln County		ELEVATION: 852.0 ft - MSL		NOTES: Boring terminated at 36 feet below land surface. Monitoring well installed to 35 feet below land surface.			
DATE DRILLED: 6/26/13 - 6/26/13		BORING DEPTH: 36.0 ft					
DRILL RIG: CME-550X		WATER LEVEL: 24.11' 24 hr					
DRILLER: Jay Little		AUGER REFUSAL DEPTH:					
HAMMER TYPE: Automatic		LOGGED BY: C. Murphy		NORTHING: 618011.66			
SAMPLING METHOD: Split Spoon		EASTING: 1299447.84					
DRILLING METHOD: 4 1/4" H.S.A.							
DEPTH (feet)	ELEV. (')	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL CONST.	BLOWS	SAMPLE DATA	STANDARD PENETRATION TEST DATA (blows/ft) 10 20 30 6080
850			RESIDUUM - (0' - 4') - Reddish Brown, Micaceous, Clayey SILT				
5			SAPROLITE - (4' - 8') - Yellowish Tan, Reddish Brown and Light Gray, Mottled, Micaceous, Fine Sandy Clayey SILT		3 4 6	1	10
845			SAPROLITE - (8' - 13') - Yellowish Tan, Micaceous, Slightly Clayey Silty Fine SAND		4 4 5	2	9
10			SAPROLITE - (13' - 36') - Brown, Tan, and White, Micaceous, Slightly Clayey Silty Coarse to Fine SAND with Quartz Seams (SM)		2 3 5	3	8
840					2 4 3	4	7
835					2 4 4	5	8
15					2 2 2	6	4
830					2 3 4	7	7
20							
825							
30							
820							
35							

S&ME BORING LOG - WELL BORING LOGS.GPJ S&ME.GDT 8/12/13

**NOTES:**

1. THIS LOG IS ONLY A PORTION OF A REPORT PREPARED FOR THE NAMED PROJECT AND MUST ONLY BE USED TOGETHER WITH THAT REPORT.
2. BORING, SAMPLING AND PENETRATION TEST DATA IN GENERAL ACCORDANCE WITH ASTM D-1586.
3. STRATIFICATION AND GROUNDWATER DEPTHS ARE NOT EXACT.
4. WATER LEVEL IS AT TIME OF EXPLORATION AND WILL VARY.



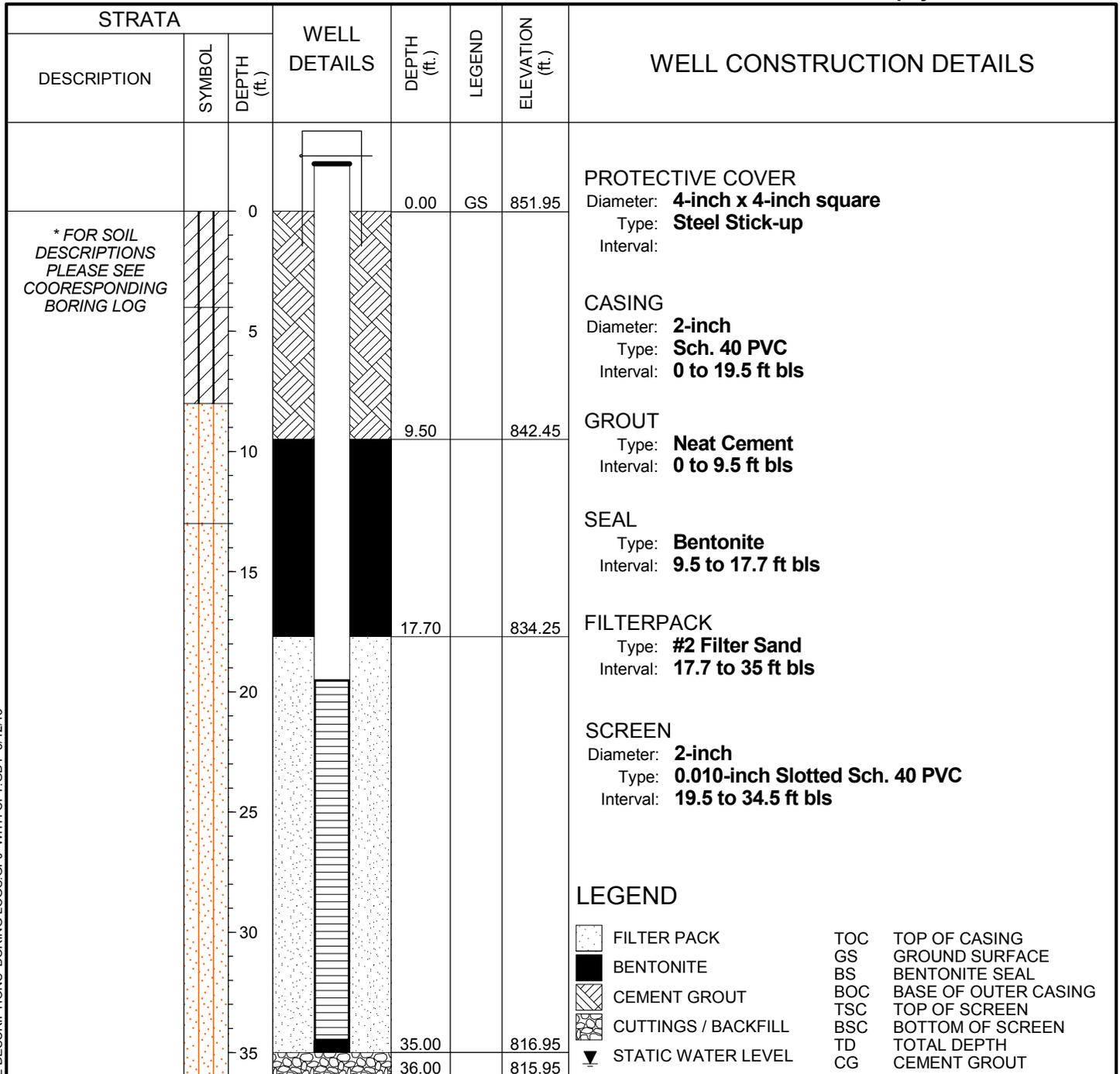
# COMPLETION REPORT OF WELL No. MW-36

PROJECT: **C&D Landfill Assessment**  
 PROJECT NO: **1356-13-009**  
 PROJECT LOCATION: **Lincoln County Landfill**

WATER LEVEL: 24.11' 24 hr

DRILLING CONTRACTOR: **S&ME, Inc.**  
 DRILLING METHOD: **4 1/4" H.S.A.**  
 DATE COMPLETED: **6/26/13**

LATITUDE: **35.4252949**  
 LONGITUDE: **-081.3518019**  
 TOP OF CASING ELEVATION: **854.83**  
 DATUM: **MSL**  
 LOGGED BY: **C. Murphy**



## COMPLETION REPORT OF WELL No. MW-36

WELL DIAGRAM - NO SOIL DESCRIPTIONS BORING LOGS.GPJ WITH CPT.GDT 8/12/13

## **APPENDIX II**

### **SLUG TEST AND POROSITY ANALYSIS**



# Calculation of Hydraulic Conductivity

## Rising Head Method (Slug Test)



**Site Name:** Lincoln County Landfill  
**Test Date:** 6/27/2013  
**Well Label:** MW-36  
**Aquifer Thickness:** 15.39  
**Screen Length:** 15. feet  
**Casing Radius:** 1. Inches  
**Effective Radius:** 4. Inches  
**Gravel Pack Porosity:** 30.00%  
**Static Water Level:** 24.11 feet  
**Water Table to Screen Bottom:** 10.39 feet  
**Anisotropy Ratio:** 1

**Time Adjustment:** 0. Seconds

Test starts with trial 0

There are 60 time and drawdown measurements

Maximum head is 2.11 feet

Minimum head is 0. feet

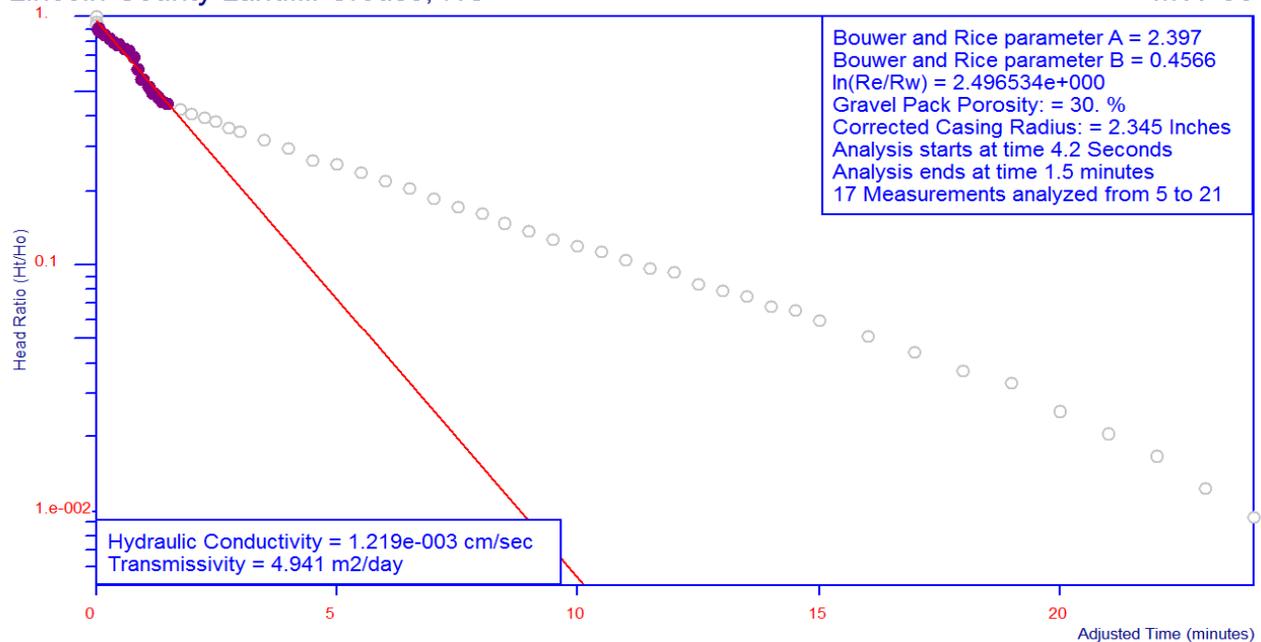
### Calculation by Bouwer and Rice Graphical Method

#### Slug Out MW-36 6/27/2013

Lincoln County Landfill Crouse, NC

#### Bouwer and Rice Graph

MW-36



Project Number: 1356-13-009 for Lincoln County  
 Analysis by Starpoint Software

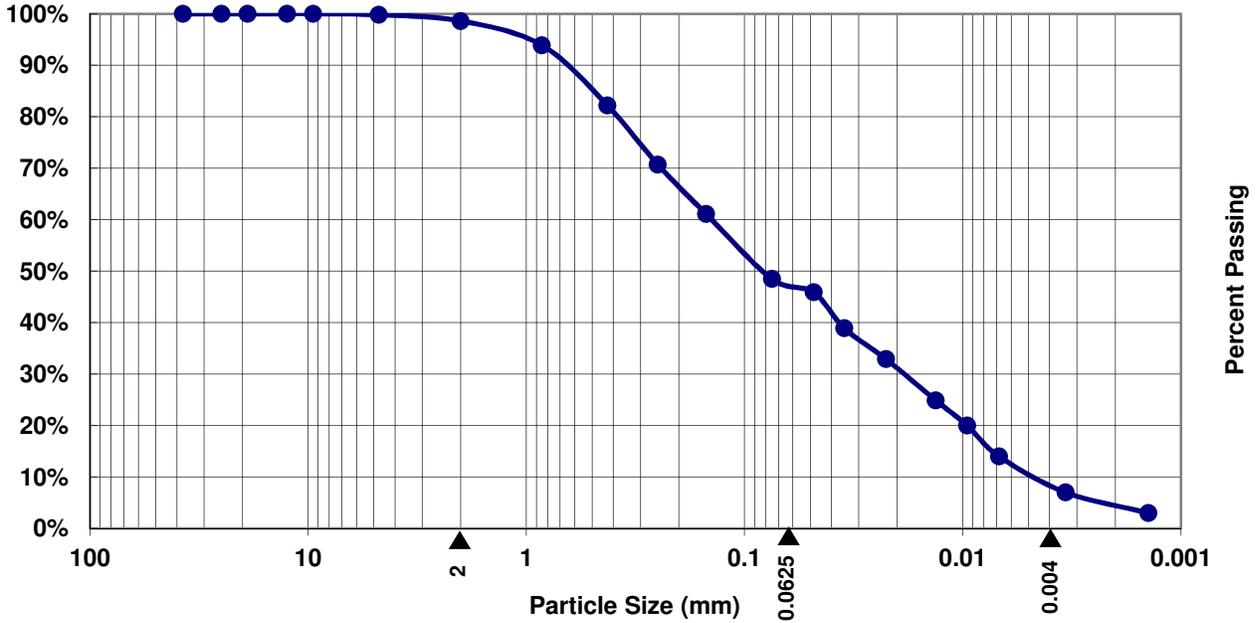
Ho is 2.11 feet at 0. Seconds

## HYDRAULIC CONDUCTIVITY

**1.219 x 10<sup>-03</sup> cm/sec**

# PARTICLE SIZE ANALYSIS OF SOILS FOR USE IN FETTER AND BEAR DIAGRAMS

<b>Boring No.:</b> MW-36	<b>Sample No.:</b> SS-6	<b>Depth:</b> 28.5 to 30 ft bls
<b>Sample Description:</b> Brown Tan White Micaceous Sl. Clayey Silty Coarse to Fine Sand (SM)		
<b>Hydrostratigraphic Unit:</b> Saprolite		



	> 2 mm	2 mm - 0.0625 mm	0.0625 mm - 0.004 mm	<0.004 mm
From Graph:	% Gravel 1.4%	% Sand 51.1%	% Silt 39.3%	% Clay 8.3%
Adjusted for Calculations	<b>0%</b>	<b>52%</b>	<b>40%</b>	<b>8%</b>

**Notes:**

Grain size distribution taken from grain size with hydrometer data located in Appendix III.  
Gravel, sand, silt and clay sizes based on Wentworth Scale.

<b>S&amp;ME Project:</b> Lincoln County Landfill C&D Assessment
<b>S&amp;ME Project No.:</b> 1356-13-009

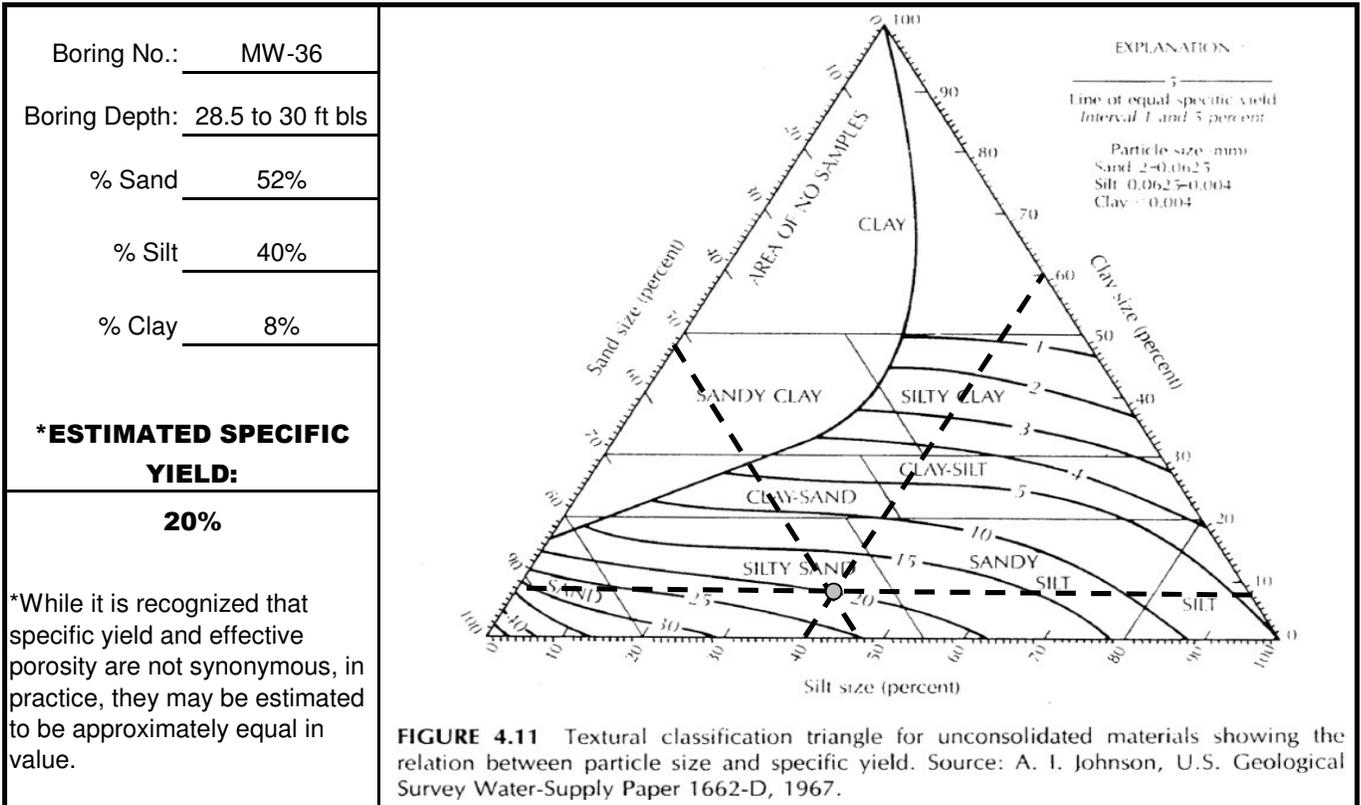


# FETTER AND BEAR DIAGRAMS

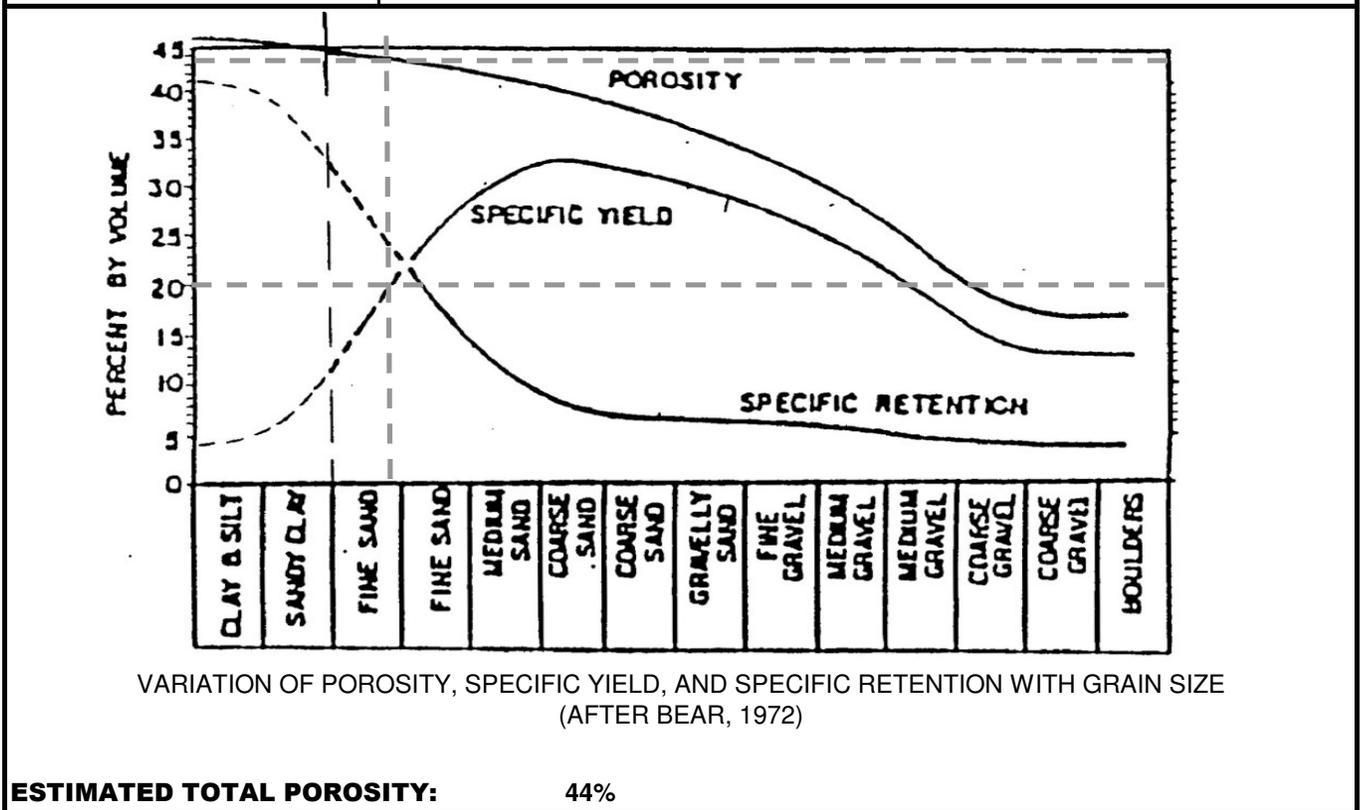


**S&ME PROJECT:** Lincoln County Landfill C&D Assessment

**S&ME PROJECT NO.:** 1356-13-009



**FIGURE 4.11** Textural classification triangle for unconsolidated materials showing the relation between particle size and specific yield. Source: A. I. Johnson, U.S. Geological Survey Water-Supply Paper 1662-D, 1967.



# APPENDIX III

## SOIL LABORATORY DATA SHEETS



### Particle Size Analysis of Soils

ASTM D 422



S&ME, Inc. ~ 9751 Southern Pine Boulevard ~ Charlotte, NC 28273

Project #: **1356-13-009 Phase 02** Report Date: 7/10/13

Project Name: Lincoln County Landfill C&D Assessment Test Date(s): 7/1-10/13

Client Name: Lincoln County	Address: 5291 Crouse Road, Crouse, NC 28033			Sieve	Retained Wt.	Percent Passing	
Boring #: MW-36	Sample #: 6	Sample Date: 6/26/13		3.0"	0.0	Pan # (washed)	100.0%
Location: MW-36 Borehole	Offset: NA	Elevation: 28.5-30'		1.5"	0.0		100.0%
Sample Description: Brown Tan White Sl. Clayey Silty Coarse to Fine Sand (SM)				1.0"	0.0		100.0%
Pan #:	Beaker #:	Apparent Relative Density (Assumed) <b>2.650</b>		3/4"	0.0	Soil Mortar	100.0%
Hydrometer Jar #:				1/2"	0.0		100.0%
Pan Tare Weight (grams):		Moisture Content		Hygroscopic	Natural	3/8"	0.0
Total Sample Air Dried Wt. + tare wt. (grams):	263.37	Tare #	OO	ND	#4	0.5	99.8%
Weight of Total Sample Air Dried:	263.37	A	Tare Wt.	16.31	#10	3.69	100.0% 98.6%
Weight of Air Dried Hydrometer Sample (g):	50.00	B	Wet Wt. + A	27.03	#20	2.37	95.2% 93.9%
Total Sample Oven Dried:	260.22	C	Dry Wt. + A	26.90	#40	8.23	83.3% 82.2%
Hydrometer Sample Oven Dried (W):	49.39	D	Water Wt. (B-C)	0.13	#60	13.99	71.7% 70.7%
% Passing #10:	98.6%	E	Dry Wt. (C-A)	10.59	#100	18.77	62.0% 61.1%
Correction Factor a (Table 1):	1.00	% Moisture (100 x D/E)		1.23%	#200	25.10	49.2% 48.5%

Description of Sand & Gravel Particles Rounded  Angular  Hard & Durable  Soft  Weathered & Friable

Stirring Apparatus: A  B  Dispersion Time: 1 min. Sodium Hexametaphosphate: 40 g./ Liter

Balance: ID No. 3222 Cal. Date: 6/18/2013 Hydrometer: ID No. 3901 Cal. Date: 3/25/2012

Control Cylinder  Composite Correction  Type: 151H  152H

Time	Temp.	Hydrometer	Corrections		Hydrometer	Percent Passing		Effective Depth	Table 3	Diameter
			Control Cylinder	Composite Correction		R	P(-#10) = (R x a / W) x 100			
T (Min.)	(0.5 °C)	Reading								
1	20.0	28.0	5.0		23.00	46.6%	45.9%	12.5	0.01365	0.04830
2	20.0	24.5	5.0		19.50	39.5%	38.9%	13.1	0.01365	0.03493
5	20.0	21.5	5.0		16.50	33.4%	32.9%	13.6	0.01365	0.02250
15	20.0	17.5	5.0		12.50	25.3%	24.9%	14.2	0.01365	0.01330
30	20.0	15.0	5.0		10.00	20.2%	20.0%	14.7	0.01365	0.00954
60	20.5	12.0	5.0		7.00	14.2%	14.0%	15.1	0.01357	0.00682
250	21.0	8.5	5.0		3.50	7.1%	7.0%	15.7	0.01348	0.00338
1440	21.5	6.5	5.0		1.50	3.0%	3.0%	16.0	0.01340	0.00141

References / Comments / Deviations ASTM D422, D 2487, D 4318

Karen Warner  
Technician Name

Certification #

Julie Robertson *JRR*  
Technical Responsibility

Project Manager  
Position

7/10/13  
Date

### Particle Size Analysis of Soils

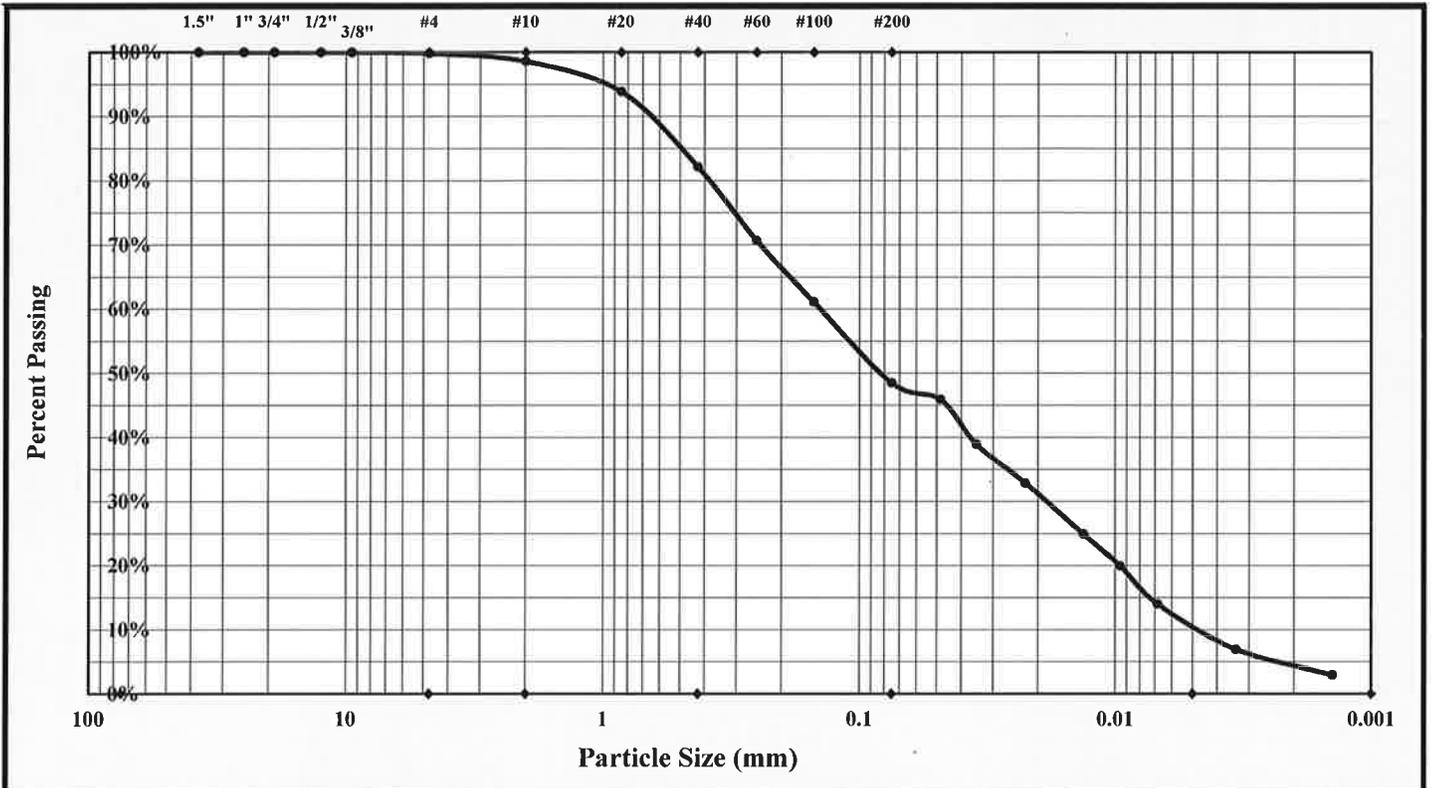


ASTM D422

Quality Assurance

**S&ME, Inc. ~ 9751 Southern Pine Boulevard ~ Charlotte, NC 28273**

S&ME Project #:	1356-13-009 Phase 02	Report Date:	7/10/13
Project Name:	Lincoln County Landfill C&D Assessment	Test Date(s):	7/1-10/13
Client Name:	Lincoln County		
Address:	5291 Crouse Road, Crouse, NC 28033		
Boring #:	MW-36	Sample #:	6
		Sample Date:	6/26/13
Location:	MW-36 Borehole	Offset:	NA
		Elevation:	28.5-30'
Sample Description:	Brown Tan White Sl. Clayey Silty Coarse to Fine Sand (SM)		



Cobbles	< 300 mm (12") and > 75 mm (3")	Fine Sand	< 0.425 mm and > 0.075 mm (#200)
Gravel	< 75 mm and > 4.75 mm (#4)	Silt	< 0.075 and > 0.005 mm
Coarse Sand	< 4.75 mm and > 2.00 mm (#10)	Clay	< 0.005 mm
Medium Sand	< 2.00 mm and > 0.425 mm (#40)	Colloids	< 0.001 mm

Maximum Particle Size:	#4	Gravel:	0.2%	Silt	38.0%
Silt & Clay (% Passing #200):	48.5%	Total Sand:	51.3%	Clay	10.5%
Relative Density (Assumed)	2.650	Moisture Content		Colloids	
Liquid Limit	ND	Plastic Limit	ND	Plastic Index	ND

Coarse Sand:	1.2%	Medium Sand:	16.4%	Fine Sand:	33.7%
--------------	------	--------------	-------	------------	-------

Description of Sand and Gravel    Rounded     Angular     Hard & Durable     Soft     Weathered & Friable

Mechanical Stirring Apparatus     Dispersion Period: 1 min.    Dispersing Agent: Sodium Hexametaphosphate: 40 g./ Liter

References / Comments / Deviations:    ASTM D 4318, D 854, D 2487

Technician Name: *Julie Robertson*    Date: *7/10/13*

Julie Robertson  
Technical Responsibility

*John Robert*  
Signature

Project Manager  
Position

*7/10/13*  
Date

This report shall not be reproduced, except in full, without the written approval of S&ME, Inc.

# APPENDIX IV

## WELL RECORD SUBMITTAL





July 9, 2013

North Carolina Department of Environment and Natural Resources  
Division of Water Quality  
1617 Mail Service Center  
Raleigh, North Carolina 27699-1617

Attention: Information Processing

**Reference: NON-RESIDENTIAL WELL CONSTRUCTION RECORD  
LINCOLN COUNTY LANDFILL**  
Crouse, North Carolina  
S&ME Project No. 1356-13-009

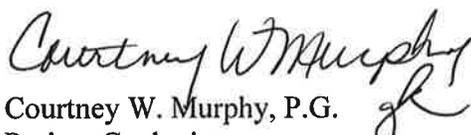
Ladies and Gentlemen:

On behalf of Lincoln County, S&ME, Inc. (S&ME) is submitting the enclosed completed and signed Non-Residential Well Construction Record for a well associated with the Lincoln County Landfill. Please find attached one (1) well construction record for Groundwater Monitoring Well MW-36. Installation of the well was performed in accordance with NCAC 2C standards by North Carolina Registered Well Driller, Mr. Jay Little, NC License No. 2717-A.

On behalf of Lincoln County, S&ME thanks you for your receipt of this record. Should you have any questions or need additional information, please contact us.

Respectfully submitted,

**S&ME, Inc.**

  
Courtney W. Murphy, P.G.  
Project Geologist  
NC Registration No. 2203

  
Julie P. Robertson, P.G.  
Senior Geologist  
NC Registration No. 1995

Enclosures: One (1) GW-1b form

cc: Mr. Mark Bivins, Lincoln County Landfill  
Ms. Jackie Drummond, NCDENR - SWS





# NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2717-A

### 1. WELL CONTRACTOR:

Jay Little

Well Contractor (Individual) Name

S&ME, Inc.

Well Contractor Company Name

STREET ADDRESS 9751 Southern Pine Blvd

Charlotte

NC

28273

City or Town

State

Zip Code

(704) 523-4726

Area code- Phone number

### 2. WELL INFORMATION:

SITE WELL ID #(if applicable) MW-36

WELL CONSTRUCTION PERMIT #(if applicable) N/A

OTHER ASSOCIATED PERMIT #(if applicable) N/A

### 3. WELL USE (Check Applicable Box) Monitoring Municipal/Public

Industrial/Commercial  Agricultural  Recovery  Injection

Irrigation  Other  (list use) \_\_\_\_\_

DATE DRILLED 6/26/13

TIME COMPLETED 16:00

AM  PM

### 4. WELL LOCATION:

CITY: Crouse COUNTY Lincoln

Lincoln County Landfill, 5291 Crouse Road

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

TOPOGRAPHIC / LAND SETTING:

Slope  Valley  Flat  Ridge  Other \_\_\_\_\_  
(check appropriate box)

LATITUDE 35.4252677°

LONGITUDE -081.3517110°

May be in degrees, minutes, seconds or in a decimal format

Latitude/longitude source:  GPS  Topographic map

(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

### 5. FACILITY- is the name of the business where the well is located.

FACILITY ID #(if applicable) N/A

NAME OF FACILITY Lincoln County Landfill

STREET ADDRESS 5291 Crouse Road

Crouse

NC

28033

City or Town

State

Zip Code

CONTACT PERSON Mark Bivins

MAILING ADDRESS same as above

City or Town

State

Zip Code

(704) 732-9030

Area code - Phone number

### 6. WELL DETAILS:

a. TOTAL DEPTH: 35

b. DOES WELL REPLACE EXISTING WELL? YES  NO

c. WATER LEVEL Below Top of Casing: 27.11 FT.

(Use "+" if Above Top of Casing)

d. TOP OF CASING IS ~3 FT. Above Land Surface\*

\*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):

From N/A To N/A From N/A To N/A

From N/A To N/A From N/A To N/A

From N/A To N/A From N/A To N/A

7. CASING: Depth Diameter Thickness/Weight Material

From 0 To 19.5 Ft. 2-in sch40 PVC

From N/A To N/A Ft. N/A N/A N/A

From N/A To N/A Ft. N/A N/A N/A

8. GROUT: Depth Material Method

From 0 To 9.5 Ft. Neat Cement pour

From 9.5 To 17.7 Ft. Bentonite pour

From N/A To N/A Ft. N/A N/A

9. SCREEN: Depth Diameter Slot Size Material

From 19.5 To 34.5 Ft. 2 in. 0.010 in. PVC

From N/A To N/A Ft. N/A in. N/A in. N/A

From N/A To N/A Ft. N/A in. N/A in. N/A

10. SAND/GRAVEL PACK:

Depth Size Material

From 17.7 To 35 Ft. #2 Silica Sand

From N/A To N/A Ft. N/A N/A

From N/A To N/A Ft. N/A N/A

11. DRILLING LOG

From To

Formation Description

0 4

Residual: Clayey Silt

4 8

Saprolite: Clayey Silt

8 13

Saprolite: Silty Sand

13 36

Saprolite: Silty Sand

### 12. REMARKS:

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

Jay Little  
SIGNATURE OF CERTIFIED WELL CONTRACTOR

7-9-13  
DATE

Jay Little

PRINTED NAME OF PERSON CONSTRUCTING THE WELL