



March 1, 2012

John Murray, PE
NC DENR – DWM
610 East Center Avenue, Suite 301
 Mooresville, NC 28115
Phone: (704) 235-2163

Dear John:

Subject: Revised Certification Report Phase 2 Cell 1A
Greenway Waste Solutions at Apex, LLC
Permit No. 92-30
CEC Project No. 111-370

Attached is a revised Certification Report for the abovementioned facility. The revisions address the concerns presented in an e-mail from you on February 28, 2012. Specifically your comments are in **bold** and our response is in *italics* immediately following:

- 1. All documents also need to be submitted as a pdf file.**

Included with this submittal.

- 2. You certified Cell 1 of Phase 2. According to App. B the certified area is only a part of Cell 1 (Cell 1A would be appropriate).**

Changed as noted.

- 3. The photographs need to have a description and location specified.**

Changed as noted.

- 4. The record drawings shall be prepared to accurately locate the floor grade, surface water drainage features, haul roads and berms etc. If there are any changes in the location of the compost or any other auxiliary functions a new Facility Plan needs to be submitted within 30 days after permit issuance.**

Items addressed in the revised report. Auxiliary functions will be located per the Facility Plan.

Civil & Environmental Consultants, Inc.

Charlotte	2030 S. Tryon Street, Suite 3E Charlotte, North Carolina 28203 Ph: 980-224-8104 E-mail: sbrown@cecinc.com www.cecinc.com	Austin	855/365-2324	Detroit	866/380-2324	Pittsburgh	800/365-2324
		Chicago	887/963-6026	Export	800/899-3610	Phoenix	877/231-2324
		Cincinnati	800/759-5614	Indianapolis	877/746-0749		
		Cleveland	866/507-2324	Nashville	800/763-2326		
		Columbus	888/598-6808	North Central PA	877/389-1852		

John Murray, PE - NC DENR – DWM
CEC Project No. 111-370
March 1, 2012
Page 2

Please let me know if you have any questions or comments. I can be reached at (704) 773-6465.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

A handwritten signature in blue ink that reads "Scott L. Brown" followed by a horizontal line.

Scott L. Brown, PE
Project Manager



**CONSTRUCTION QUALITY ASSURANCE REPORT
PHASE 2 CELL 1A
REVISION 1**

**CONSTRUCTION AND DEMOLITION DEBRIS LANDFILL FACILITY
PERMIT No. 92-30**

Prepared For:

GREENWAY WASTE SOLUTIONS OF APEX, LLC

Prepared By:

**CIVIL & ENVIRONMENTAL CONSULTANT, INC.
CHARLOTTE, NORTH CAROLINA**

CEC Project 111-370

MARCH 1, 2012

North Carolina Board of Examiners
For
Engineers and Surveyors
License No. C-3035



March 1, 2012

Scott L. Brown



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1.0 INTRODUCTION

This report describes the results of the construction quality assurance (CQA) for cell construction of Cell 1A of Phase 2 (1.83 acres) at the Greenway Waste Solutions of Apex, LLC facility (Landfill) located in Apex, NC. Specifically, this report will summarize the construction activities and certify that the construction was completed in accordance with:

1. The CQA Plan.
2. The conditions of the Permit to Construct.
3. The Requirements of 15A NCAC 13B .0541.
4. Acceptable engineering practices

2.0 EARTHWORK

The cell subgrade was in cut and no soil testing was required per the CQA Plan. The field description of the soil observed for the subgrade is classified as SM by Enviro-Pro, PC (Appendix A). Though no soil testing was required in the CQA Plan, three soil samples were taken to establish permeability of the subgrade. The permeability of the soil samples were measured by Summit Laboratories with resulting values of 1.59×10^{-5} cm/sec, 1.64×10^{-4} cm/sec, and 1.33×10^{-4} cm/sec. Also, Summit Laboratories performed a Particle Size Distribution (USCS) to determine the Grain Size classification. The laboratory classification confirmed the field observation of a silty fine sand (SM). The cap system will be designed and constructed to a permeability less than or equal to these soils underlying the landfill, but not more permeable than 1×10^{-5} cm/sec. Visual inspection by Enviro-Pro, PC of the prepared subgrade verified that:

1. Angular or sharp rocks, rocks larger than the specified diameter, and other debris are not present on the surface.
2. There are no soft or yielding areas.

3.0 SURFACE WATER DRAINAGE STRUCTURES

The Soil Erosion & Sedimentation Control Plan for Phase II – Cell I (5.4 Acres) was submitted and approved by the Town of Apex. The design was based on calculations for Phase 2 at build-out, along with Construction Plans for Cell I of Phase 2. The structures were built according to approved plans.

4.0 AS-BUILT DRAWINGS

An as-built drawing performed by Patterson Land Surveying, PA is located in Appendix B. Subgrade elevations were verified on a 100-ft grid. Phase 2 Cell 1A will utilize the existing haul road. No additional berms were constructed and stormwater conveyance features towards storm water basin SB-3 will be formed as waste is placed in the cell. All locations met the minimum permitted subgrade elevations. Appendix C contains a certification that construction was completed in accordance with:

1. The CQA Plan.
2. The conditions of the Permit to Construct.
3. The Requirements of 15A NCAC 13B .0541.
4. Acceptable engineering practices

5.0 MAJOR PROJECT FEATURES

Appendix D consists of pictures of major project features across the 1.83 acre expansion.



Appendix A



January 27, 2012

Mr. Ron Gilkerson
Griffin Brothers Companies
19109 W. Catawba Avenue, Suite 200
Cornelius, North Carolina 28031-5613

RE: Greenway Waste Solutions at Apex, LLC
Highway 55 C&D Landfill
Wake County, North Carolina
Project No. EP-1306

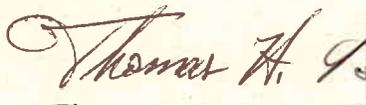
Dear Mr. Gilkerson:

On January 5, 2012 I performed a visual inspection of a little more than one acre of cleared subgrade within the planned Phase II landfilling area at the subject facility. No significant geological features such as bedrock outcrops were exposed on the cleared subgrade area. The subgrade soils appeared to be sandy silts to silty sands.

Three bulk soil samples (SB-1, SB-2, and SB-3) were collected from the subgrade area and were submitted to Summit Laboratories in Fort Mill, South Carolina on January 13, 2012. Permeability testing was performed on the remolded soil samples. SB-1, SB-2, and SB-3 were all classified as SM (silty sands) confirming my field observations. Calculated permeabilities for the three soil samples were 1.59×10^{-5} , 1.64×10^{-4} , and 1.33×10^{-4} cm/sec, respectively. Summit's results are included in the attached Appendix.

Please contact me at (803) 547-4955 if you have any questions concerning this reported information.

Sincerely,
ENVIRO-PRO, P.C.


Thomas H. Bolyard, P.G.
Senior Hydrogeologist





January 20, 2012

Mr. Ron Gilkerson
Griffin Bros. Companies
19109 W Catawba Avenue, Suite 200
Cornelius, NC 28031-5611

Subject: **Laboratory Permeability Test Results
Greenway Waste Solutions of Apex
HWY 55 C&D Landfill
SUMMIT Project No. SL-280-12**

Dear Mr. Gilkerson:

Summit Laboratories, LLC. (**SUMMIT**) has completed the requested laboratory testing on the 3 bulk soil samples submitted to **SUMMIT** on January 13, 2012. Permeability testing was performed on the remolded samples at approximately 95% maximum dry density and optimum moisture content of the standard proctor curve. In addition, USCS classifications were assigned to the soil samples. The following ASTM tests were performed:

- *ASTM D 5084 - Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeater*
- *ASTM D 698 - Laboratory Compaction Characteristics of Soil Using Standard Effort*
- *ASTM D 2487 - Classification of Soils for Engineering Purposes (USCS)*

The results of the laboratory testing are summarized on the attached Compaction Test Reports (proctors), Permeability Test Reports (hydraulic conductivity), and Particle Size Distribution (USCS).

SUMMIT appreciates the opportunity to provide our professional services to you on this project. If you have any questions concerning the information in this report or if we can provide any additional information, please contact me.

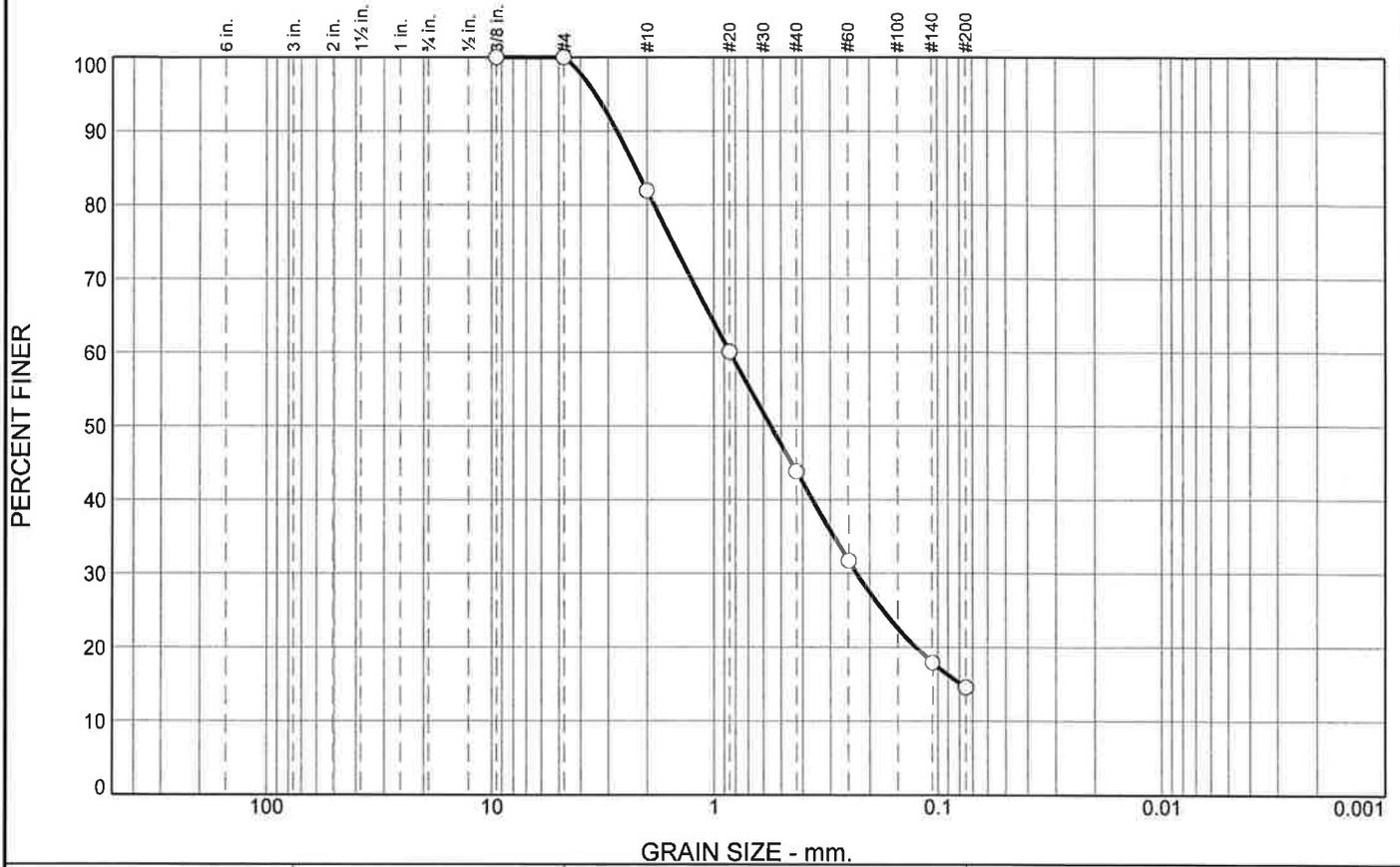
Respectfully Submitted,
SUMMIT LABORATORIES, LLC.

A handwritten signature in blue ink, appearing to read "Mimi S. Hourani", is written over a light blue horizontal line.

Mimi S. Hourani
Laboratory Services Manager

Enclosures: Perm. Report (9 pages)
 Proctor (3 pages)
 Grain Size (3 pages)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	18.0	38.2	29.3	14.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	100.0		
#10	82.0		
#20	60.1		
#40	43.8		
#60	31.8		
#140	17.9		
#200	14.5		

Material Description

Light-Brown Silty Fine to Coarse Sand

Atterberg Limits
 PL= NP LL= NV PI= NP

Coefficients
 D₉₀= 2.7314 D₈₅= 2.2437 D₆₀= 0.8463
 D₅₀= 0.5548 D₃₀= 0.2291 D₁₅= 0.0789
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO= A-1-b

Remarks

* (no specification provided)

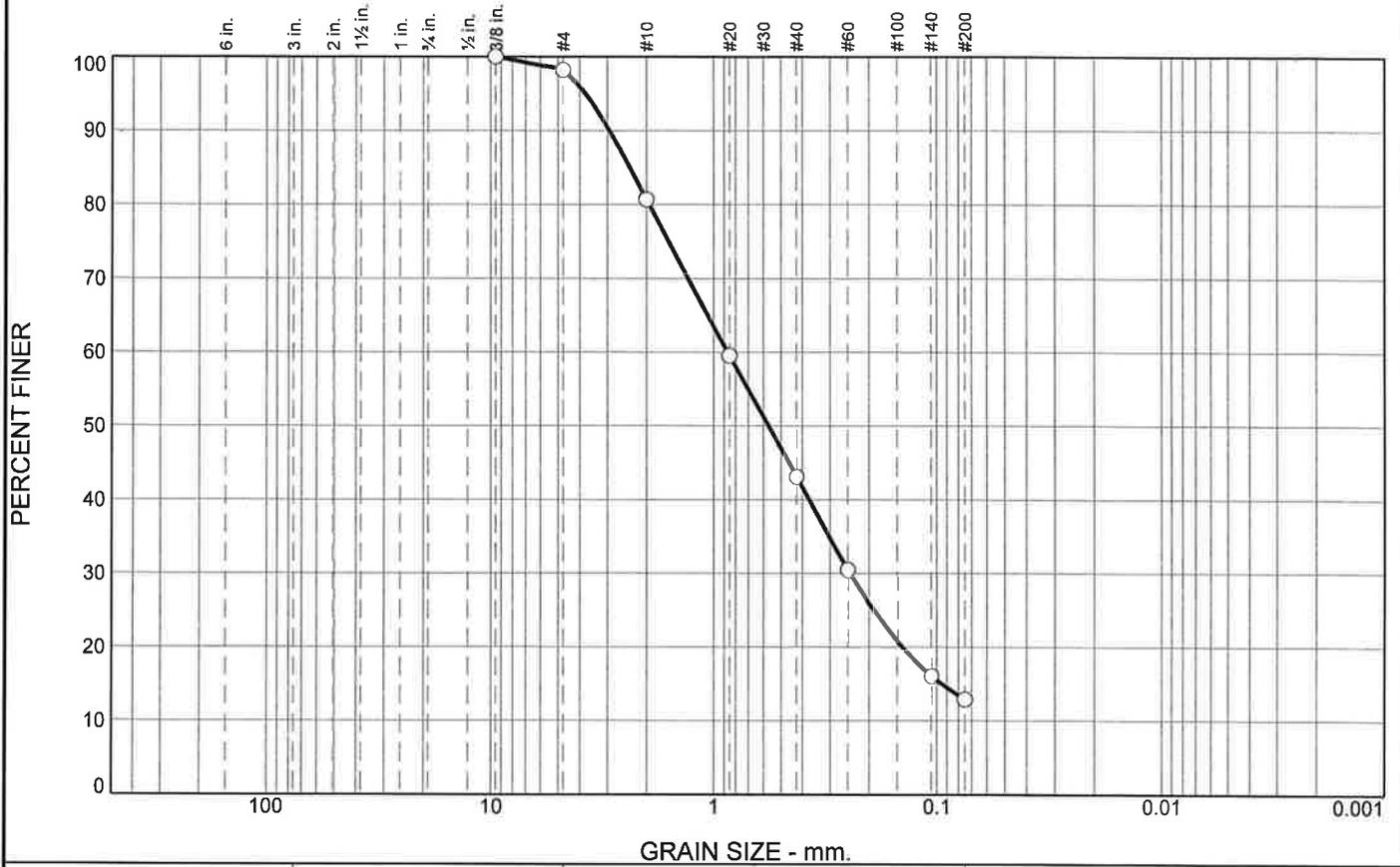
Location: SB-1

Date: 01-18-2012

<p style="text-align: center;">Summit Engineering</p> <p style="text-align: center;">Ft. Mill, South Carolina</p>	<p>Client: Griffin Bros. Companies</p> <p>Project: Greenway Waste Solutions of Apex HWY 55 C&D Landfill</p> <p>Project No: SL-280-12</p> <p style="text-align: right;">Figure</p>
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Tested By: Mimi Hourani

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.8	17.5	37.6	30.2	12.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.2		
#10	80.7		
#20	59.5		
#40	43.1		
#60	30.5		
#140	16.1		
#200	12.9		

Material Description
Light-Brown Silty Fine to Coarse Sand

Atterberg Limits
 PL= NP LL= NV PI= NP

Coefficients
 D₉₀= 2.9404 D₈₅= 2.3768 D₆₀= 0.8669
 D₅₀= 0.5674 D₃₀= 0.2444 D₁₅= 0.0954
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO= A-1-b

Remarks

* (no specification provided)

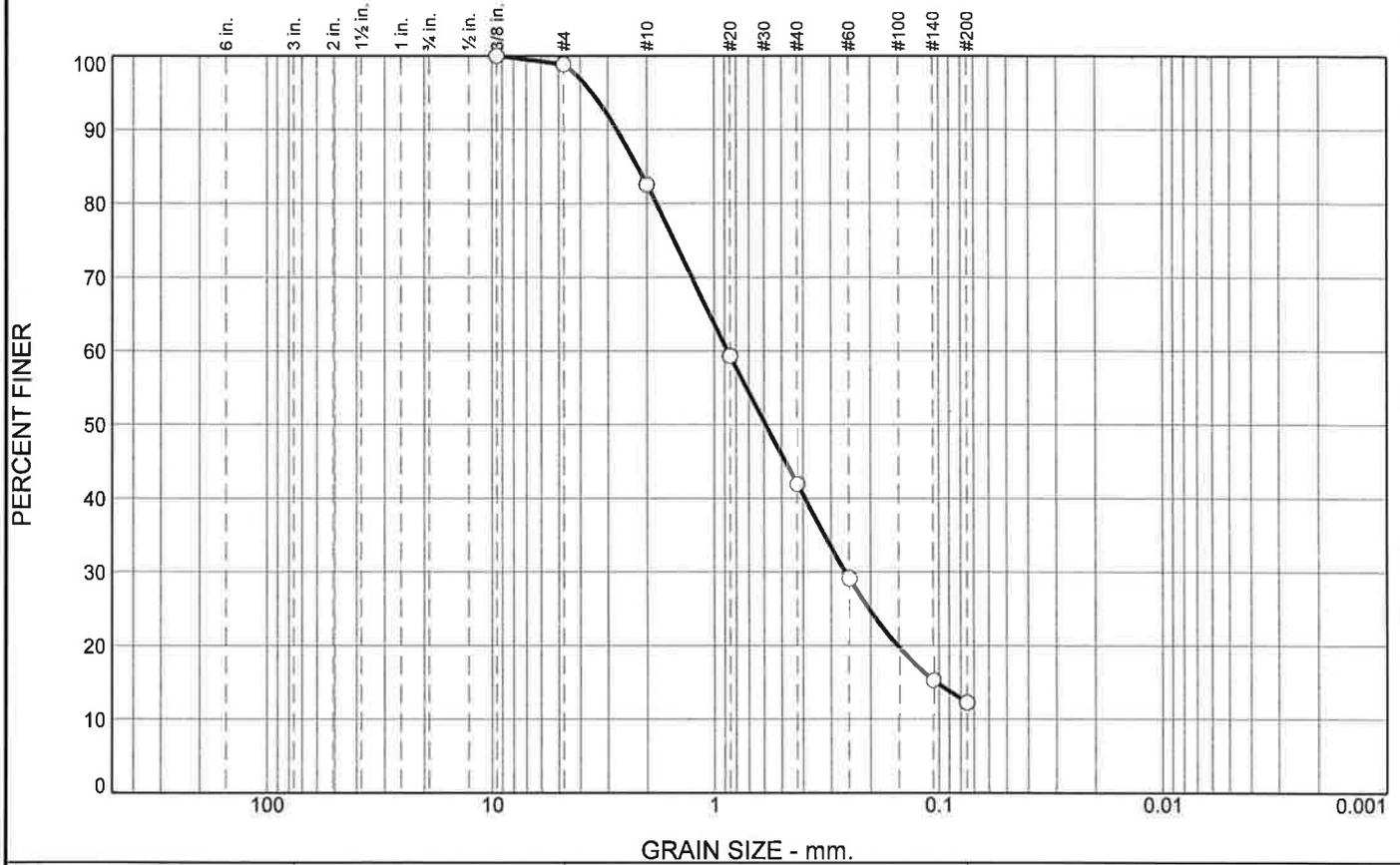
Location: SB-2

Date: 01-18-2012

<p style="font-size: 1.2em; margin: 0;">Summit Engineering</p> <p style="font-size: 1.2em; margin: 0;">Ft. Mill, South Carolina</p>	<p>Client: Griffin Bros. Companies</p> <p>Project: Greenway Waste Solutions of Apex HWY 55 C&D Landfill</p> <p>Project No: SL-280-12</p> <p style="text-align: right;">Figure</p>
---	---

Tested By: Mimi Hourani

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.2	16.2	40.6	29.8	12.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.375	100.0		
#4	98.8		
#10	82.6		
#20	59.3		
#40	42.0		
#60	29.2		
#140	15.3		
#200	12.2		

Material Description
Light-Brown Silty Fine to Coarse Sand

Atterberg Limits
 PL= NP LL= NV PI= NP

Coefficients
 D₉₀= 2.7293 D₈₅= 2.2034 D₆₀= 0.8721
 D₅₀= 0.5885 D₃₀= 0.2592 D₁₅= 0.1028
 D₁₀= C_u= C_c=

Classification
 USCS= SM AASHTO= A-1-b

Remarks

* (no specification provided)

Location: SB-3

Date: 01-18-2012

<p style="font-size: 1.2em; margin: 0;">Summit Engineering</p> <p style="font-size: 1.2em; margin: 0;">Ft. Mill, South Carolina</p>	<p>Client: Griffin Bros. Companies</p> <p>Project: Greenway Waste Solutions of Apex HWY 55 C&D Landfill</p> <p>Project No: SL-280-12</p> <p style="text-align: right;">Figure</p>
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Tested By: Mimi Hourani

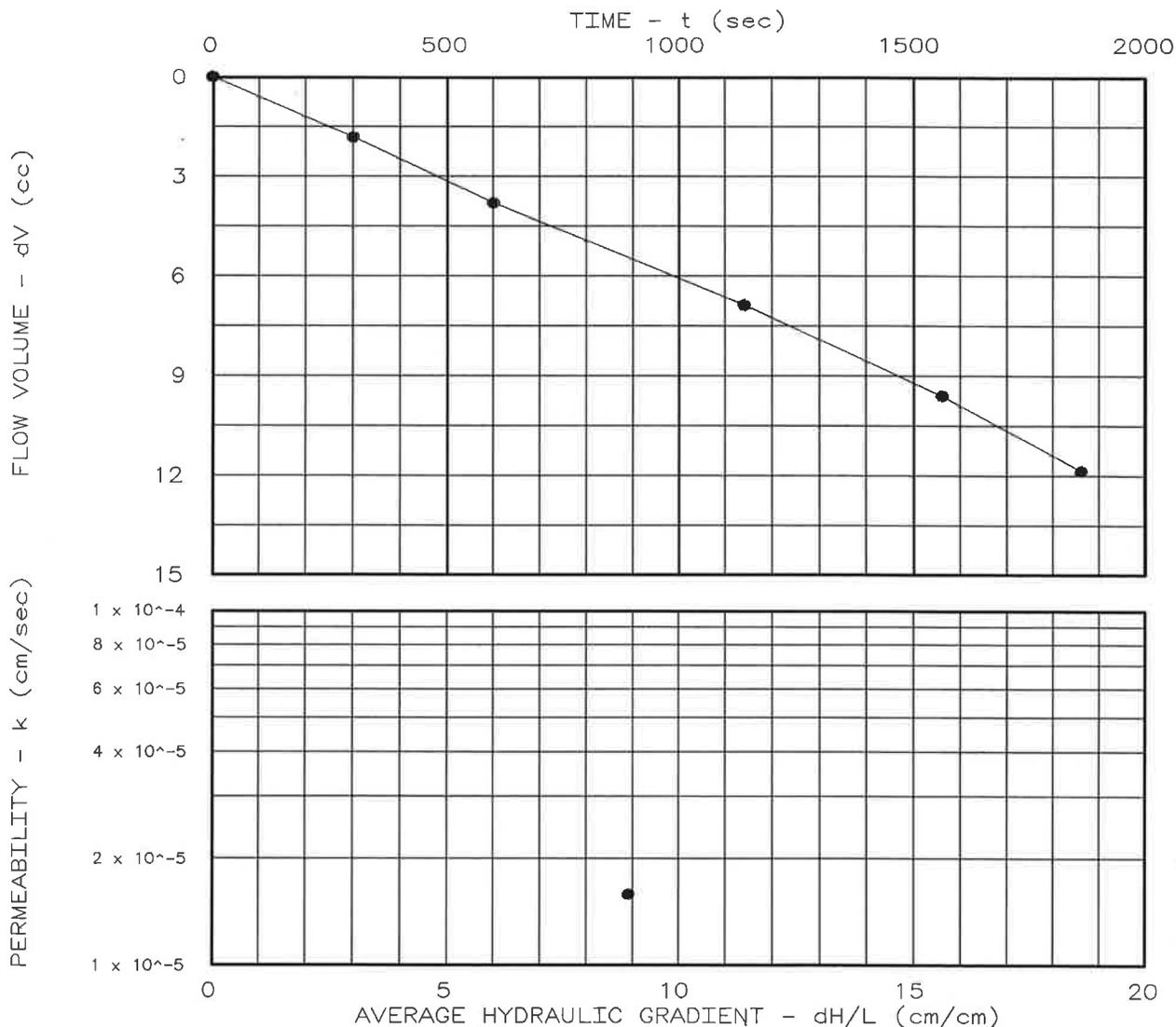
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.45
 Specimen Diameter (cm): 7.28
 Dry Unit Weight (pcf): 117.9
 Moisture Before Test (%): 12.5
 Moisture After Test (%): 15.2
 Run Number: 1 ● 2 ▲
 Cell Pressure (psi): 77.0
 Test Pressure (psi): 71.0
 Back Pressure (psi): 70.1
 Diff. Head (psi): 0.9
 Flow Rate (cc/sec): 6.28×10^{-3}
 Perm. (cm/sec): 1.59×10^{-5}

SAMPLE DATA:

Sample Identification: SB-1
 Visual Description: Light-Brown Silty Fine to Coarse Sand (SM)
 Remarks:
 Maximum Dry Density (pcf): 122.0
 Optimum Moisture Content (%): 11.0
 ASTM(D698)
 Percent Compaction: 96.6%
 Permeameter type: Flexible Wall
 Sample type: Remolded



Project: Greenway Waste Solutions of Apex
 Location: HWY 55 C&D Landfill
 Date: 01-18-2012

Project No.: SL-280-12
 File No.:
 Lab No.:
 Tested by: MH
 Checked by: CPT
 Test: CH - Constant head

PERMEABILITY TEST REPORT

SUMMIT ENG. & CONST. SERV., INC.

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PERMEABILITY TEST DATA

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PROJECT DATA

Project Name: Greenway Waste Solutions of Apex
 File No.:
 Project Location: HWY 55 C&D Landfill
 Project No.: SL-280-12
 Sample Identification: SB-1

Lab No.:
 Description: Light-Brown Silty Fine
 to Coarse Sand (SM)
 Sample Type: Remolded
 Max. Dry Dens.: 122.0
 Method (D1557/D698): D698
 Opt. Water Content: 11.0
 Date: 01-18-2012
 Remarks:

Permeameter Type: Flexible Wall
 Tested by: MH
 Checked by: CPT
 Test type: CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.865 in	in		2.880 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.87 in	7.28 cm		2.88 in	7.32 cm	
Length:	1	2	3	1	2	3
	2.935 in	in	in	2.960 in	in	in
Average:	2.94 in	7.45 cm		2.96 in	7.52 cm	
 Moisture, Density and Sample Parameters:						
Specific Gravity:	2.65					
Wet Wt. & Tare:	658.79			674.69		
Dry Wt. & Tare:	585.59			585.59		
Tare Wt.:	0.00			0.00		
Moisture Content:	12.5 %			15.2 %		
Dry Unit Weight:	117.9 pcf			115.7 pcf		
Porosity:	0.2873			0.3007		
Saturation:	82.2 %			93.8 %		

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 4 Panel No.: 4 Positions: 1

Run Number: 1 2

Cell Pressure: 77.0 psi 0.0 psi

Saturation Pressure: 70.0 psi 0.0 psi

Inflow Corr. Factor: 1.00 1.00

Outflow Corr. Factor: 1.00 1.00

Test Temperature: 22.8 °C 0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE PRESSURE-psi		BURET READING-cc		OUTFLOW/ INFLOW RATIO
				IN	OUT	IN	OUT	
S	1/19/12	10:35:00	0	71.0	70.0	5.00	5.00	0.00
	1/19/12	10:40:00	300	71.0	70.0	6.82	3.18	1.00
R						6.82	3.18	
R						5.00	5.00	
R	1/19/12	10:45:00	600	71.0	70.0	6.98	3.02	1.00
						6.98	3.02	
R						5.00	5.00	
R	1/19/12	10:54:00	1,140	71.0	70.0	8.08	1.92	1.00
						8.08	1.92	
R						5.00	5.00	
R	1/19/12	11:01:00	1,560	71.0	70.0	7.72	2.28	1.00
						7.72	2.28	
R						5.00	5.00	
	1/19/12	11:06:00	1,860	71.0	70.0	7.26	2.74	1.00

Test Pressure = 71.0 psi Differential Head = 0.9 psi, 66.4 cm H2O
 Gradient = 8.901E 00 Flow rate = 6.283E-03 cc/sec R squared = 0.99871
 Permeability, K22.8° = 1.697E-05 cm/sec, K20° = 1.588E-05 cm/sec

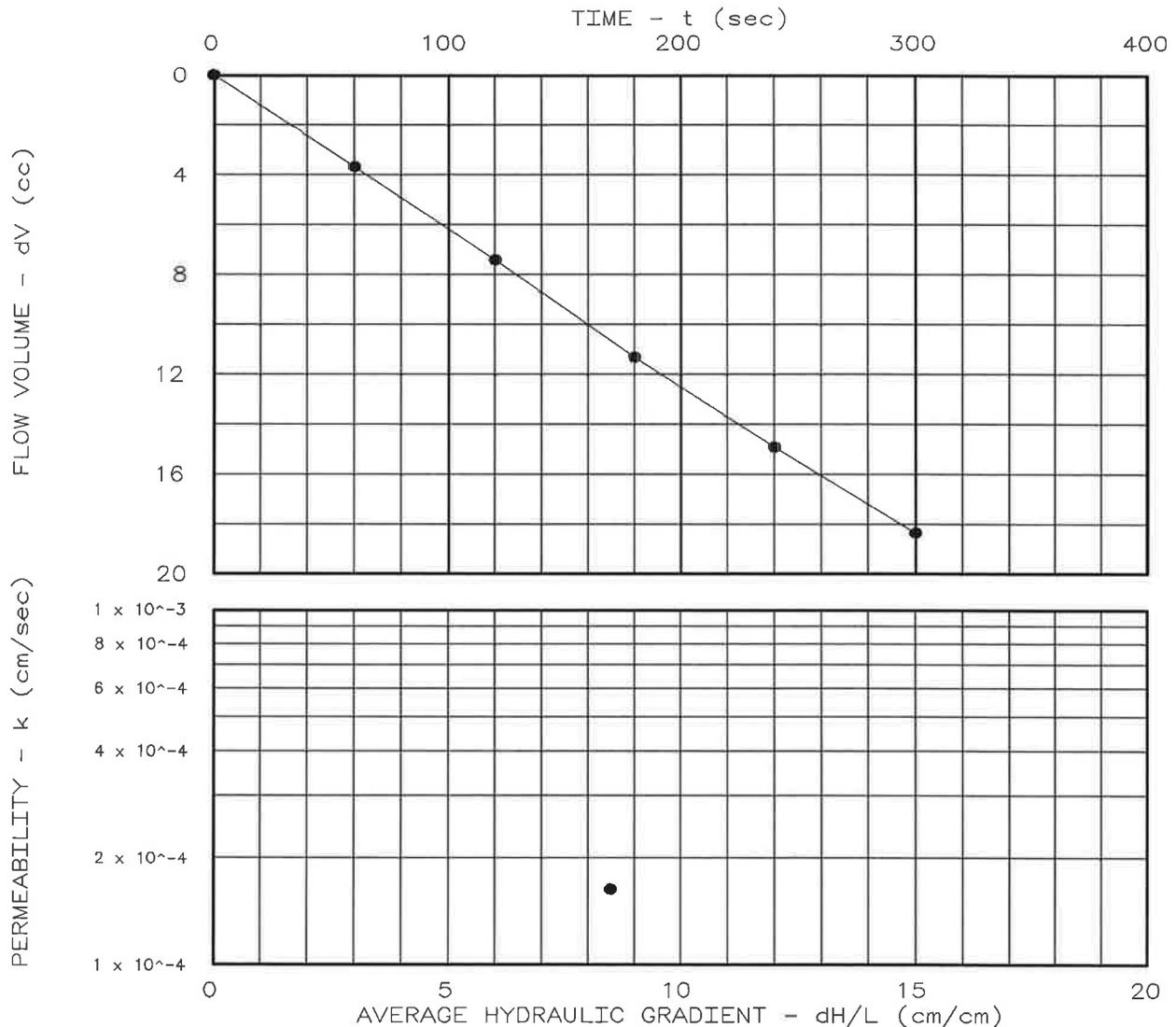
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.57
 Specimen Diameter (cm): 7.27
 Dry Unit Weight (pcf): 116.8
 Moisture Before Test (%): 11.6
 Moisture After Test (%): 14.9
 Run Number: 1 ● 2 ▲
 Cell Pressure (psi): 77.0
 Test Pressure (psi): 71.0
 Back Pressure (psi): 70.1
 Diff. Head (psi): 0.9
 Flow Rate (cc/sec): 6.16×10^{-2}
 Perm. (cm/sec): 1.64×10^{-4}

SAMPLE DATA:

Sample Identification: SB-2
 Visual Description: Light-Brown Silty Fine to Coarse Sand (SM)
 Remarks:
 Maximum Dry Density (pcf): 121.9
 Optimum Moisture Content (%): 10.4
 ASTM(D698)
 Percent Compaction: 95.8%
 Permeameter type: Flexible Wall
 Sample type: Remolded



Project: Greenway Waste Solutions of Apex
 Location: HWY 55 C&D Landfill
 Date: 01-18-2012

Project No.: SL-280-12
 File No.:
 Lab No.:
 Tested by: MH
 Checked by: CPT
 Test: CH - Constant head

PERMEABILITY TEST REPORT
SUMMIT ENG. & CONST. SERV., INC.

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PERMEABILITY TEST DATA

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PROJECT DATA

Project Name: Greenway Waste Solutions of Apex
 File No.:
 Project Location: HWY 55 C&D Landfill
 Project No.: SL-280-12
 Sample Identification: SB-2

Lab No.:
 Description: Light-Brown Silty Fine
 to Coarse Sand (SM)
 Sample Type: Remolded
 Max. Dry Dens.: 121.9
 Method (D1557/D698): D698
 Opt. Water Content: 10.4
 Date: 01-18-2012
 Remarks:

Permeameter Type: Flexible Wall
 Tested by: MH
 Checked by: CPT
 Test type: CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.862 in	in		2.877 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.86 in	7.27 cm		2.88 in	7.31 cm	
Length:	1	2	3	1	2	3
	2.980 in	in	in	2.995 in	in	in
Average:	2.98 in	7.57 cm		3.00 in	7.61 cm	
 Moisture, Density and Sample Parameters:						
Specific Gravity:	2.65					
Wet Wt. & Tare:	655.98			675.19		
Dry Wt. & Tare:	587.80			587.80		
Tare Wt.:	0.00			0.00		
Moisture Content:	11.6 %			14.9 %		
Dry Unit Weight:	116.8 pcf			95.8 % of max		
Porosity:	0.2939			115.0 pcf		
Saturation:	73.8 %			0.3048		
				89.9 %		

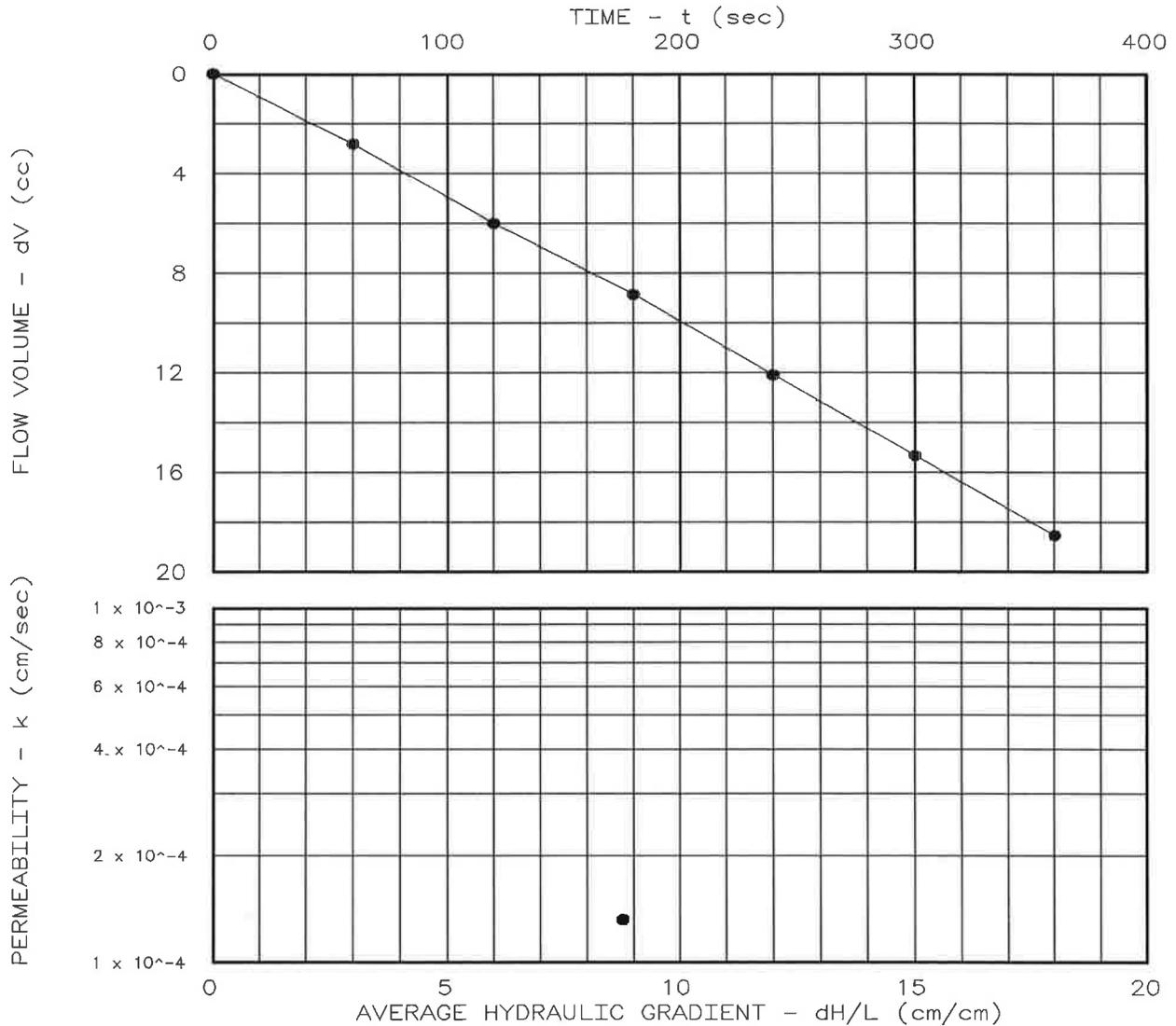
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.42
 Specimen Diameter (cm): 7.27
 Dry Unit Weight (pcf): 117.7
 Moisture Before Test (%): 12.0
 Moisture After Test (%): 14.8
 Run Number: 1 ● 2 ▲
 Cell Pressure (psi): 77.0
 Test Pressure (psi): 71.0
 Back Pressure (psi): 70.1
 Diff. Head (psi): 0.9
 Flow Rate (cc/sec): 5.16×10^{-2}
 Perm. (cm/sec): 1.33×10^{-4}

SAMPLE DATA:

Sample Identification: SB-3
 Visual Description: Light-Brown Silty Fine to Coarse Sand (SM)
 Remarks:
 Maximum Dry Density (pcf): 120.8
 Optimum Moisture Content (%): 10.9
 ASTM(D698)
 Percent Compaction: 97.4%
 Permeameter type: Flexible Wall
 Sample type: Remolded



Project: Greenway Waste Solutions of Apex
 Location: HWY 55 C&D Landfill
 Date: 01-18-2012

Project No.: SL-280-12
 File No.:
 Lab No.:
 Tested by: MH
 Checked by: CPT
 Test: CH - Constant head

PERMEABILITY TEST REPORT

SUMMIT ENG. & CONST. SERV., INC.

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PERMEABILITY TEST DATA

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PROJECT DATA

Project Name: Greenway Waste Solutions of Apex
 File No.:
 Project Location: HWY 55 C&D Landfill
 Project No.: SL-280-12
 Sample Identification: SB-3

Lab No.:
 Description: Light-Brown Silty Fine
 to Coarse Sand (SM)
 Sample Type: Remolded
 Max. Dry Dens.: 120.8
 Method (D1557/D698): D698
 Opt. Water Content: 10.9
 Date: 01-18-2012
 Remarks:

Permeameter Type: Flexible Wall
 Tested by: MH
 Checked by: CPT
 Test type: CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	2.864 in	in		2.877 in	in	
Middle:	in	in		in	in	
Bottom:	in	in		in	in	
Average:	2.86 in	7.27 cm		2.88 in	7.31 cm	
Length:	1	2	3	1	2	3
	2.921 in	in	in	2.916 in	in	in
Average:	2.92 in	7.42 cm		2.92 in	7.41 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.65	
Wet Wt. & Tare:	650.83	667.16
Dry Wt. & Tare:	581.16	581.16
Tare Wt.:	0.00	0.00
Moisture Content:	12.0 %	14.8 %
Dry Unit Weight:	117.7 pcf	97.4 % of max
Porosity:	0.2888	116.8 pcf
Saturation:	78.2 %	0.2940
		94.2 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 6 Panel No.: 6 Positions: 1

Run Number: 1 2

Cell Pressure: 77.0 psi 0.0 psi

Saturation Pressure: 70.0 psi 0.0 psi

Inflow Corr. Factor: 1.00 1.00

Outflow Corr. Factor: 1.00 1.00

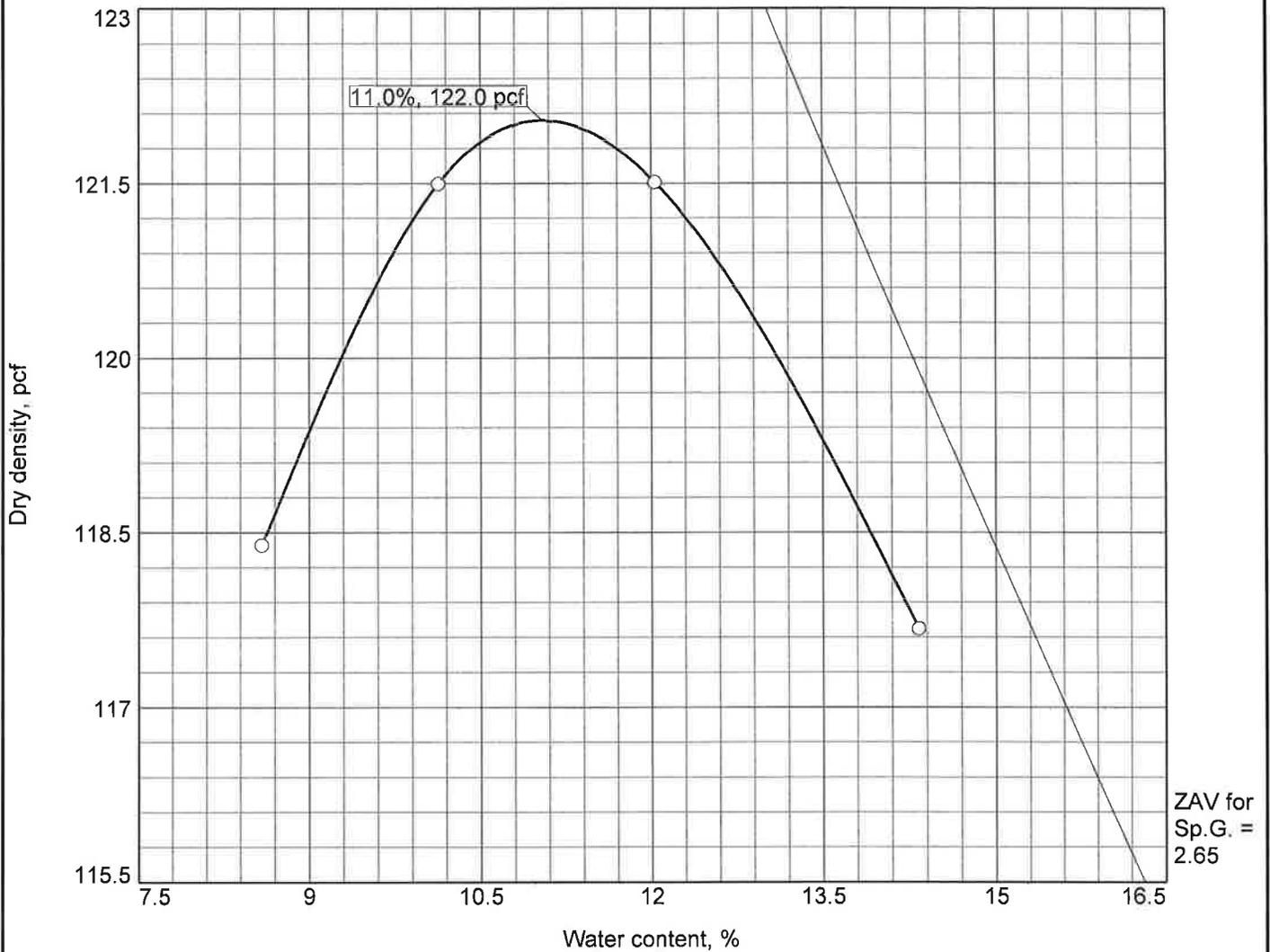
Test Temperature: 22.8 °C 0.0 °C

PERMEABILITY TEST READINGS DATA

CASE D X S R	DATE	TIME (24 hr)	ELAPSED TIME-sec	GAUGE		BURET		OUTFLOW/ INFLOW RATIO
				IN	OUT	IN	OUT	
S	1/19/12	11:08:00	0	71.0	70.0	5.00	5.00	0.00
	1/19/12	11:09:00	60	71.0	70.0	7.82	2.18	1.00
R						7.82	2.18	
R						5.00	5.00	
R	1/19/12	11:10:00	120	71.0	70.0	8.18	1.82	1.00
						8.18	1.82	
R						5.00	5.00	
R	1/19/12	11:11:00	180	71.0	70.0	7.86	2.14	1.00
						7.86	2.14	
R						5.00	5.00	
R	1/19/12	11:12:00	240	71.0	70.0	8.24	1.76	1.00
						8.24	1.76	
R						5.00	5.00	
R	1/19/12	11:13:00	300	71.0	70.0	8.24	1.76	1.00
						8.24	1.76	
R						5.00	5.00	
	1/19/12	11:14:00	360	71.0	70.0	8.20	1.80	1.00

Test Pressure = 71.0 psi Differential Head = 0.9 psi, 65.0 cm H2O
 Gradient = 8.762E 00 Flow rate = 5.164E-02 cc/sec R squared = 0.99950
 Permeability, K_{22.8°} = 1.418E-04 cm/sec, K_{20°} = 1.326E-04 cm/sec

COMPACTION TEST REPORT



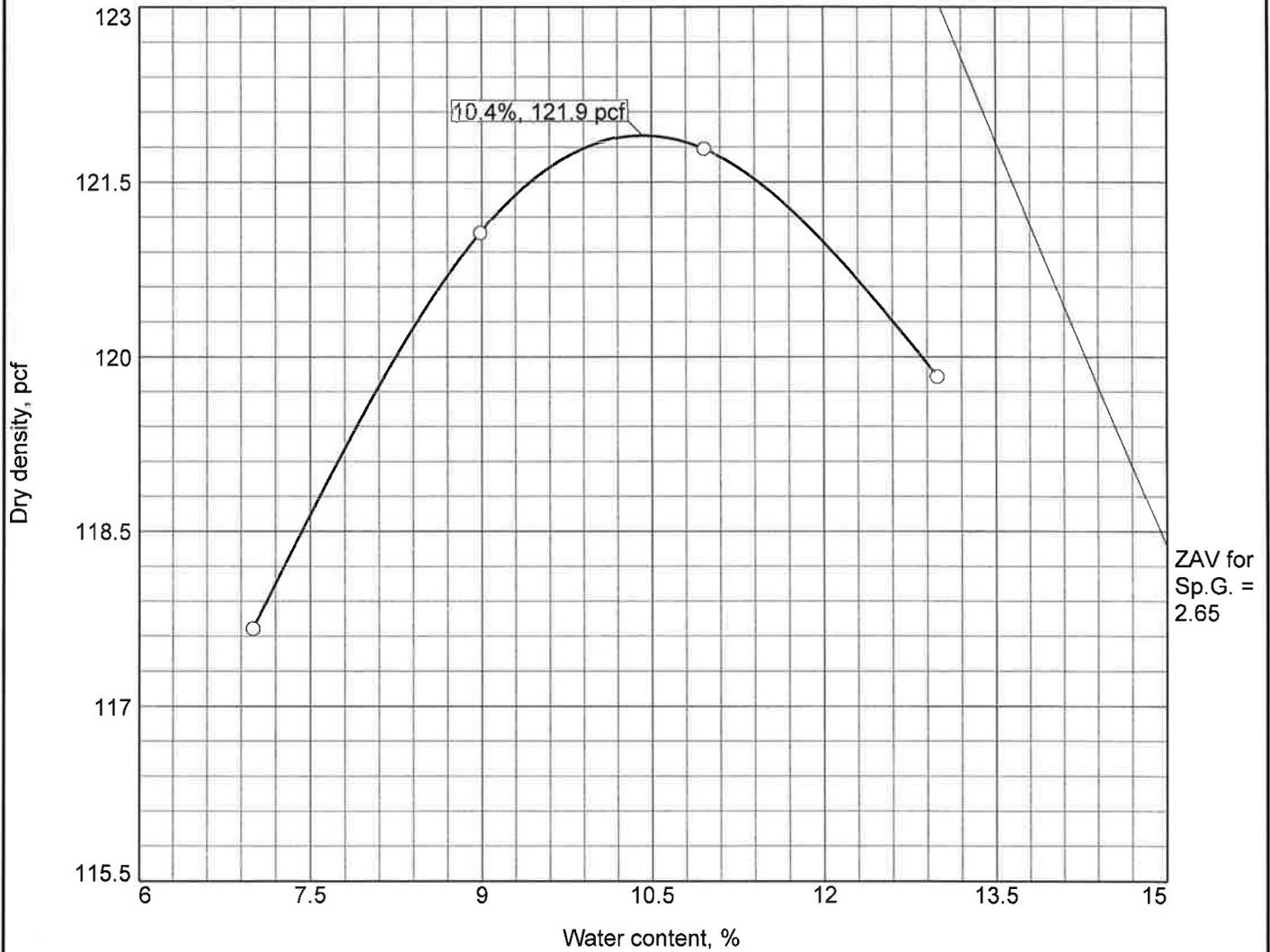
Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	0.0	14.5

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 122.0 pcf Optimum moisture = 11.0 %	Light-Brown Silty Fine to Coarse Sand
Project No. SL-280-12 Client: Griffin Bros. Companies Project: Greenway Waste Solutions of Apex HWY 55 C&D Landfill ○ Location: SB-1	Remarks:
Summit Engineering Ft. Mill, South Carolina	

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	1.8	12.9

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 121.9 pcf Optimum moisture = 10.4 %	Light-Brown Silty Fine to Coarse Sand

Project No. SL-280-12 **Client:** Griffin Bros. Companies
Project: Greenway Waste Solutions of Apex
 HWY 55 C&D Landfill
 ○ **Location:** SB-2

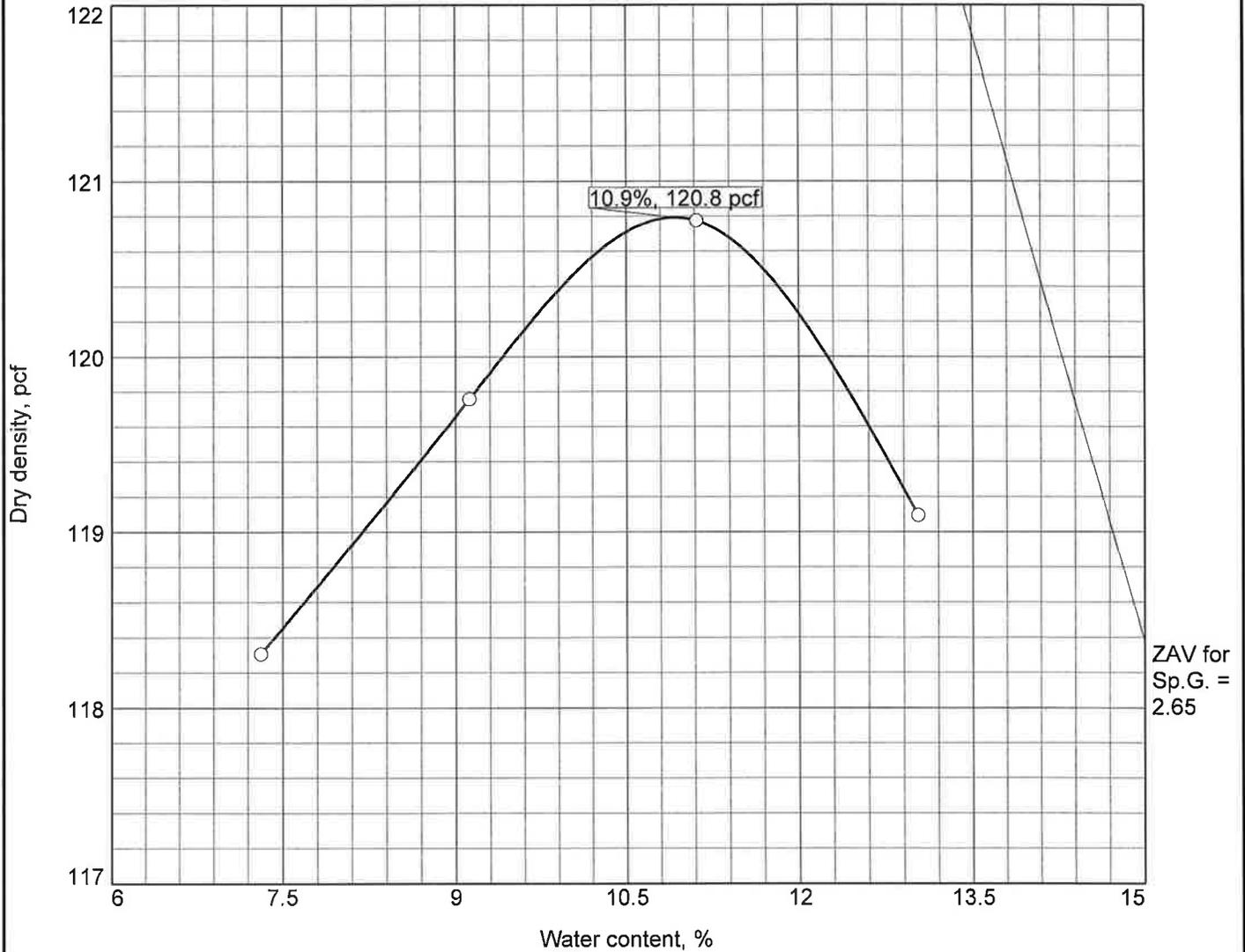
Summit Engineering

Ft. Mill, South Carolina

Remarks:

Figure

COMPACTION TEST REPORT



Test specification: ASTM D 698-07 Method A Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > #4	% < No.200
	USCS	AASHTO						
	SM	A-1-b			NV	NP	1.2	12.2

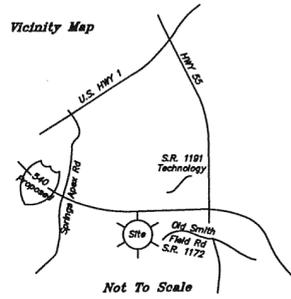
TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 120.8 pcf Optimum moisture = 10.9 %	Light-Brown Silty Fine to Coarse Sand
Project No. SL-280-12 Client: Griffin Bros. Companies Project: Greenway Waste Solutions of Apex HWY 55 C&D Landfill ○ Location: SB-3	Remarks:
Summit Engineering Ft. Mill, South Carolina	

Figure



Appendix B

Vicinity Map



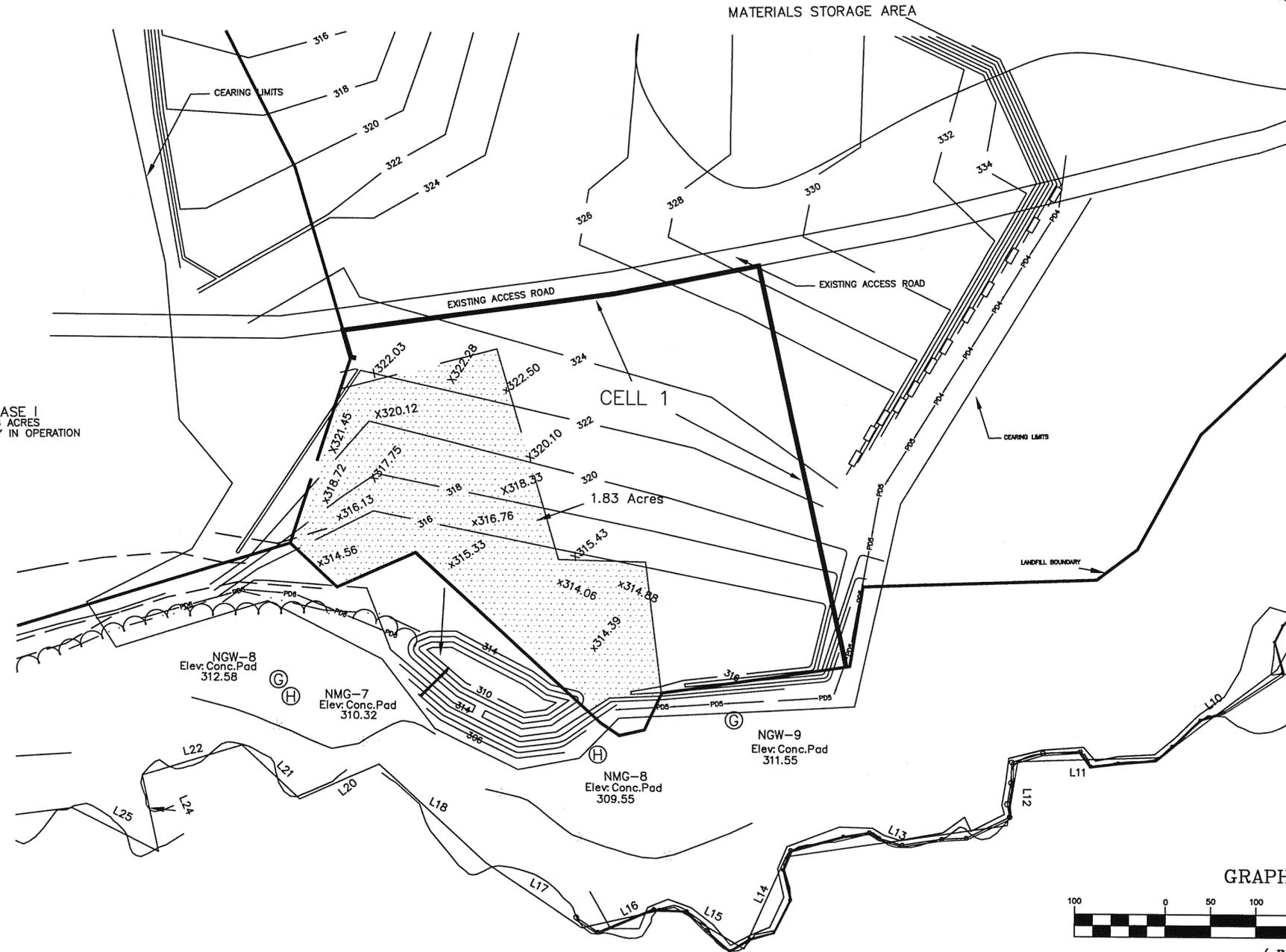
Not To Scale

I Joel H. Patterson III, certify that this plat was drawn under my supervision from an actual topographical survey made under my supervision that the ratio of precision is one half the contour interval as shown. Witness my original signature, registration number and seal.
This 1 day of FEBRUARY, 2012.

Joel H. Patterson III
JOEL H. PATTERSON III, PLS
LICENSE NUMBER: L-3717

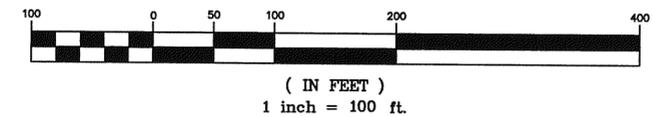


PHASE I
17.8 ACRES
CURRENTLY IN OPERATION



LINE	LENGTH	BEARING
L10	162.59	S52°26'45"W
L11	156.63	S87°55'40"W
L12	72.11	S08°53'46"W
L13	245.52	S81°30'48"W
L14	112.34	S23°58'09"W
L15	89.83	N5°36'51"W
L16	104.07	S76°33'09"W
L17	128.16	N56°10'48"W
L18	160.15	N47°22'08"W
L19	95.59	S65°28'28"W
L20	87.66	N46°48'20"W
L21	114.69	S72°22'09"W
L22	87.05	S12°12'19"E
L23	106.40	N63°15'10"W
L24	152.16	S82°24'23"W

GRAPHIC SCALE



JOB NAME:		
TOPOGRAPHICAL OF A PORTION OF CELL 1 OF "GREENWAY WASTE OF APEX"		
LOCATION:	WAKE COUNTY, NORTH CAROLINA	DRAWN BY: JHP
		CHECKED BY: JHP
		SCALE: 1" = 100'
OWNER:	GREENWAY OF APEX 19109 W. CATAWBA AVE. SUITE 200 CORNELIUS, NC 28031-5611	DATE OF FIELD SURVEY: JANUARY, 2012
		DATE OF MAP: FEBRUARY 1, 2012
JOB NUMBER:	10006	BOOK NO:

Land Surveying by:
PATTERSON LAND SURVEYING, PA
C-3390
P.O. Box 5010, Mooresville, NC 28117
704/361-0415 * Fax 704/799-8565



Appendix C



March 1, 2012

John Murray, PE
NC DENR – DWM
610 East Center Avenue, Suite 301
 Mooresville, NC 28115
Phone: (704) 235-2163

Dear John:

Subject: Certification Phase 2, Cell 1A
Greenway Waste Solutions at Apex, LLC
Permit No. 92-30
CEC Project No. 111-370

Civil & Environmental Consultants, Inc. has verified subgrade elevations on a 100-ft grid of the as-built survey for the 1.83 acre cell. All point locations met the minimum permitted subgrade elevations. The construction was completed in accordance with:

1. The CQA Plan.
2. The conditions of the Permit to Construct.
3. The Requirements of 15A NCAC 13B .0541.
4. Acceptable engineering practices

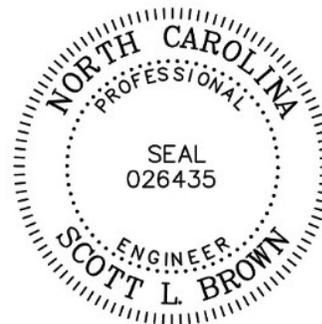
Please let me know if you have any questions or comments. I can be reached at (704) 773-6465.

Sincerely,

CIVIL & ENVIRONMENTAL CONSULTANTS, INC.

Scott L. Brown, PE
Project Manager

Cc: Mr. Ron Gilkerson



Civil & Environmental Consultants, Inc.

Charlotte	2030 S. Tryon Street, Suite 3E Charlotte, North Carolina 28203 Ph: 980-224-8104 E-mail: sbrown@cecinc.com www.cecinc.com	Austin	855/365-2324	Detroit	866/380-2324	Pittsburgh	800/365-2324
		Chicago	887/963-6026	Export	800/899-3610	Phoenix	877/231-2324
		Cincinnati	800/759-5614	Indianapolis	877/746-0749		
		Cleveland	866/507-2324	Nashville	800/763-2326		
		Columbus	888/598-6808	North Central PA	877/389-1852		



Appendix D

Photograph 1



Southwest (down-gradient) section of Phase 2 Cell 1A along waste limits. Sediment basin SB-3 included.

Photograph 2



Central section of Phase 2 Cell 1A. View from west to east along certified sub-grade.

Photograph 3



Northeast (up-gradient) section of Phase 2 Cell 1A near existing haul road.

Photograph 4



West section of Phase 2 Cell 1A. View from existing haul road to down-gradient waste limits.

Photograph 5



East-southeast section of Phase 2 Cell1A looking down-gradient towards waste limits.

Photograph 6



Central section of Phase 2 Cell 1A. View from north limits along existing haul road to south limits towards sediment basin SB-3 and waste boundary.

Photograph 7



Central section of Phase 2 Cell 1A looking up-gradient towards existing haul road.

Photograph 8



Sediment Basin SB-3 at down gradient limit of Phase 2 Cell 1A.