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Construction Quality Assurance Report

Johnston County MSW Landfill - Phase 4A - Cell 3
Smithfield, North Carolina

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 9-22-09 BY D. Wilson
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Prepared For:

Johnston County Department of Public Utilities
309 E. Market Street
Smithfield, North Carolina 27577

Prepared By:

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ENGINEERING & GEOLOGICAL SERVICES
14 N. BOYLAN AVENUE
RALEIGH, NORTH CAROLINA 27603
NC LIC. NO. C-0828 (ENGINEERING)

July 2009

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JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3

CONSTRUCTION QUALITY ASSURANCE REPORT

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JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3

CONSTRUCTION QUALITY ASSURANCE REPORT

1.0 INTRODUCTION

This Construction Quality Assurance (CQA) Report has been prepared to document the CQA activities performed during the construction of Phase 4A - Cell 3 of the Johnston County MSW Landfill. The landfill facility is located on County Home Road off of Highway 210 near Smithfield, North Carolina and is owned and operated by Johnston County under State Solid Waste Permit No. 51-03. A Permit to Construct for Cell 3 was issued by the North Carolina Division of Waste Management (NCDWM) on January 16, 2009.

2.0 PROJECT DESCRIPTION

2.1 General

Phase 4A - Cell 3 is a Subtitle D landfill unit designed by Richardson Smith Gardner & Associates, Inc. (RSG). Cell 3 is a 7.4 acre (lined) lateral expansion of active Cells 1 and 2 which overlies (piggybacks) an existing unlined landfill (Phase 4 MSW landfill unit and Area 1 C&D landfill unit). The components of the alternative liner include the following components (bottom-up):

- a textured 40 mil LLDPE geomembrane (secondary) liner;
- drainage geocomposite (leak detection system);
- geosynthetic clay liner (GCL);
- a textured 60 mil HDPE geomembrane (primary) liner; and
- a leachate collection system (LCS).

The leachate management system for Cell 3 includes both a leak detection system (LDS) and a leachate collection system (LCS). The LDS consists of a layer of drainage geocomposite directly overlying the secondary LLDPE geomembrane and a leak detection trench. Flow that is collected in the leak detection trench is routed through 4 inch diameter HDPE piping to the LDS pump station (installed as part of the Cell 1 construction). The LCS consists of a layer of drainage geocomposite directly overlying the primary HDPE geomembrane and HDPE collection piping and gravel columns. Leachate generated from Cell 3 will be routed to the Cell 1 sump.

In addition to the liners and the leachate management system, the Cell 3 design also includes associated perimeter berms, landfill gas, and erosion and sedimentation control measures. Also, part of the construction included covering Cell 3 with a thin geomembrane (geosynthetic rain cover) in order to provide stormwater/leachate separation and, thus, reduce the quantity of leachate generated during initial operations.

Also part of this project was the partial closure of 1.8 acres of the Area 1 C&D landfill unit. The closure of this unit will be certified at a later date upon completion of the remainder of the closure, which is scheduled for FY 2009-10. Note that the quantities of LLDPE geomembrane and drainage geocomposite stated in the report do include the partial closure area.

2.2 Reference Documents

Cell 3 was constructed in accordance with the following documents:

Construction Documents - Johnston County MSWLF - Phase 4A - Cell 3:
Includes general and technical specifications, CQA manual, and contract addenda prepared by Richardson Smith Gardner & Associates, Inc. and dated November, 2008.

Construction Drawings - Johnston County MSW LF - Phase 4A - Cell 3:
Includes construction drawings prepared by Richardson Smith Gardner & Associates, Inc. and dated November, 2008.

Permit To Construct Application - Johnston County MSWLF - Phase 4A - Cell 3:
Includes technical specifications, CQA manual, and permit drawings prepared by Richardson Smith Gardner & Associates as revised through January, 2009 (Approved by NCDWM - January 16, 2009).

2.3 Project Participants

The following parties were involved in the construction and CQA of Phase 4A - Cell 3:

2.3.1 Owner

Johnston County Department of Public Utilities
309 E. Market Street
P.O. Box 2263
Smithfield, NC 27577
Phone: (919) 209-8333
Fax: (919) 934-7174

Contacts: Tim Broome, P.E., Director

Johnston County Solid Waste Management Department
680 County Home Road
P.O. Box 2263
Smithfield, NC 27577
Phone: (919) 938-4750
Fax: (919) 989-7152

Contact: Rick Proctor, Solid Waste Manager

2.3.2 Engineer/CQA Engineer

Richardson Smith Gardner & Associates, Inc. (RSG)
14 N. Boylan Ave.
Raleigh, NC 27603
Phone: (919) 828-0577
Fax: (919) 828-3899

Contacts: Pieter Scheer, P.E., Project Manager
Byron Hackney, Field Technician

2.3.3 CQA Testing - Earthwork, Geosynthetics & Construction Monitoring

Geotechnics

Raleigh Office:
2200 Westinghouse Blvd., Suite 103
Raleigh, NC 27604
Phone: (919) 876-0405
Fax: (919) 876-0460

Contacts: Mike Smith, Regional Manager
Jessie Patton, Field Technician

Pittsburgh Office:
544 Braddock Ave.
East Pittsburgh, PA 15112
Phone: (412) 823-7600
Fax: (412) 823-8999

Contacts: Randy O'Rourke, President
J.P. Kline, P.E., Lab Director

2.3.4 Contractor

ES&J Enterprises, Inc. (ES&J)
1555 Holland Road
Autryville, NC 28318
Phone: (910) 567-6138
Fax: (910) 567-2891

Contacts: David Page, Project Manager
Clay Carter, Site Superintendent

2.3.5 Geosynthetics Installer

Hallaton, Inc.
1206 Sparks Road
Sparks, MD 21152
Phone: (410) 583-7700
Fax: (410) 583-7720

Contacts: Kennedy Garber, Project Manager

2.3.6 Contractor's Surveyor

4D Site Solutions, Inc.
3698 Johnson Mill Road
Raeford, NC 28476
Phone: (910) 904-5777
Fax: (910) 489-6779

Contacts: Jim Holland, PLS, Project Manager

3.0 SUMMARY OF CONSTRUCTION ACTIVITIES

3.1 Site Clearing and Grubbing

The construction of Cell 3 began in January, 2009 with the surveying/staking of clearing limits and the initiation of clearing and grubbing activities by ES&J.

3.2 Erosion and Sedimentation Control Measures

The construction of erosion and sedimentation control measures took place in conjunction with project activities and under the site permit issued by the Land Quality Section of the NC Division of Land Resources (Phase 4A - July 11, 2001). Permanent drainage channels were added as areas were brought to grade. Once areas reached final grade, the areas were vegetated in accordance with project requirements.

3.3 Excavation and Embankment

Once portions of the site were cleared and grubbed, excavation and stockpiling activities were performed. Excavated materials including stripped topsoil, unsuitable soils, and structural fill were identified and separated. Topsoil and unsuitable soils were taken to the stockpile area within Borrow Area E for future use as daily or intermediate cover by the County. The soils within the Cell 3 footprint identified for use as structural fill were excavated and placed and compacted where needed. As anticipated, during excavation activities, a few areas had to be overexcavated and backfilled due to the presence of unsuitable materials.

Additionally, during earthwork activities, four locations within the Cell 3 limits previously identified in the Cell 3 permit application[1] as having potential near-surface metal anomalies based on an earlier geophysical survey were excavated to a depth of 6 to 8 feet (based on the permit application for Cell 3[2], a minimum of 5 feet of separation is required beneath the liner system for a possible buried metal object such as a refrigerator). While some small near-surface metal objects were discovered around these locations during site clearing activities, no large objects were discovered upon excavation at these locations. It is likely that the small near-surface objects were the cause of the anomalies observed in the original geophysical survey. The attached **Figure 1** shows the locations which were excavated.

An as-built drawing showing completed subgrade elevations is provided in **Appendix J**.

3.4 Landfill Gas (LFG) Management System

Once subgrade elevations were reached on the landfill side slopes, ES&J began construction of LFG surface collector trenches. These trenches were completed in accordance with the approved design plans.

3.5 40 Mil LLDPE Geomembrane

Prior to the placement of geosynthetics, a geosynthetics CQA meeting was held in accordance with the requirements of the project CQA manual. A summary of this meeting can be found in **Appendix B2**.

In accordance with project requirements, textured LLDPE geomembrane was placed over the Cell 3 subgrade and tied into the Cell 1 LLDPE geomembrane. Hallaton reviewed and accepted the subgrade surface in advance of material placement. Note that during

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[1] RSG (2009), "Permit Amendment Application, Johnston County MSW Landfill - Phase 4A - Cell 3, Smithfield, North Carolina", as revised through January 2009.

[2] RSG (2009), "Permit Amendment Application, Johnston County MSW Landfill - Phase 4A - Cell 3, Smithfield, North Carolina", Facility and Engineering Plan Section 3.5.2.

installation of all geosynthetics by Hallaton, ES&J excavated and maintained the perimeter anchor trench for these materials.

An as-built drawing showing the orientation of geomembrane panels as well as destructive sample and repair locations is provided in **Appendix J**.

3.6 Leak Detection System (LDS)

Once the LLDPE geomembrane was placed, the drainage geocomposite component of the leak detection system (LDS) was placed over the LLDPE geomembrane and tied into the Cell 1 drainage geocomposite. In accordance with the approved plans, one leak detection trench was also installed along the eastern side of Cell 3, just to the west of the Cell 1 - Cell 3 tie-in.

3.7 Geosynthetic Clay Liner (GCL)

Interface shear strength testing performed during construction of Cell 2 indicated that the selected GCL and drainage geocomposite products had undesirably low interface shear strength values at low normal loads (same products were used in Cell 3 construction). Thus, in order to meet interface shear strength criteria between the GCL and the underlying drainage geocomposite, a small amount of coarse sand ($\pm$ 1 lb/sy) was added to the top of the drainage geocomposite prior to GCL placement as was done in the construction of Cell 2 (see **Appendix D**).

GCL placement by Hallaton began at the south end of Cell 3 and proceeded to the north. GCL was run down slope and overlapped with the Cell 1 GCL. The GCL installation continued to the north and followed the parameters of the project specifications and standard industry practices.

3.8 60 Mil HDPE Geomembrane

The GCL installation was followed closely by placement of the 60 mil HDPE geomembrane to minimize the potential for damage to the GCL by hydration. In accordance with project requirements, textured HDPE geomembrane was placed over the GCL and tied into the Cell 1 HDPE geomembrane.

An as-built drawing showing the orientation of geomembrane panels as well as destructive sample and repair locations is provided in **Appendix J**.

3.9 Leachate Collection System/Protective Cover

As the 60 mil HDPE geomembrane installation began, placement of drainage geocomposite followed closely behind. Once a portion of the drainage geocomposite had been placed, placement of protective cover was initiated by ES&J at the south end of Cell 3 and proceeded to the north. In order to protect the underlying geosynthetics from

damage, trucks operated on at least 3 feet of protective cover and low ground pressure dozers were used to push out the material. Only minor wrinkling of the geomembrane was observed during placement (as is typical) and good contact between the HDPE geomembrane and the underlying GCL was apparent.

Along with protective cover placement, ES&J constructed the leachate collection piping and gravel columns across the base of Cell 3. Once the gravel column and protective cover were in place over a portion of the slope, geosynthetic rain cover was placed and ballasted with tires placed on 8-foot centers.

Upon completion of construction of the leachate collection system, the piping system was flushed with water and inspected using a video camera by Jet Clean America, a subcontractor to ES&J.

3.10 Photographic Documentation

Photos documenting the construction of Cell 3 can be found in **Appendix A**.

4.0 CQA PROGRAM

4.1 Scope of Services

In satisfying the requirements of the Project CQA Manual for Cell 3, the following activities were performed:

- Observation and documentation of construction of prepared subgrade, structural fill, LLDPE geomembrane, leak detection system (LDS), GCL, HDPE geomembrane, leachate collection system (LCS), and protective cover.
- Field and/or laboratory testing of structural fill, geosynthetics, drainage aggregate, and protective cover.
- Review of submittals from the Contractor for conformance with project specification and CQA requirements.
- Review/preparation of record drawings.
- Preparation of the final CQA report.

5.0 EARTHWORK CQA

The criteria for construction of structural fill per the project specifications included the following:

- Materials: SM, SP, SC, ML, MH, CL-ML, CL, or CH (ASTM D 2488) with no topsoil or other deleterious material and no stones or rocks in excess of one half the lift thickness as compacted;

- Density: Minimum 95% Maximum Standard Proctor Dry Density (ASTM D 698);
- Moisture Content: As necessary for compaction; and
- Lift Thickness: 8-inch max. (compacted).

The number and results of material control and record tests performed on the structural fill is summarized in **Table 1**. Other tests performed on an on-going basis during construction included a visual classification of soils (ASTM D 2488) and monitoring of loose lift thickness. Note that the number of tests required was based on an approximate quantity of 29,000 CY of material placed (in-place measure). The results of field and laboratory testing of structural fill can be found in **Appendix C**. An as-built drawing showing completed subgrade elevations is provided in **Appendix J**.

6.0 40 MIL LLDPE GEOMEMBRANE CQA

6.1 Material Approval

RSG reviewed and approved the 40 mil LLDPE geomembrane product submittals provided by ES&J. The selected material was Ultraflex Textured 40 mil LLDPE geomembrane as manufactured by GSE Lining Technology, Inc. of Houston, Texas. Copies of selected product submittals for these products can be found in **Appendix E1**.

Note that, as part of the submittal information for all geosynthetics, interface shear strength testing was performed for the potential critical geosynthetic/soil or geosynthetic/geosynthetic interfaces within the liner systems. This testing was performed on representative material samples by Geotechnics of East Pittsburgh, PA under subcontract to the geosynthetics installer. A summary of this testing performed is provided in **Appendix D**. The results for each interface were found to exceed project design requirements.

6.2 Manufacturer's Quality Control Certificates

RSG reviewed and approved GSE's quality control certificates upon delivery to the site. Copies of these certificates can be found in **Appendix E1**.

6.3 Material Control Testing

The number and results of material control tests performed on the 40 mil LLDPE geomembrane is summarized in **Table 2**. Note that the number of tests required was based on a quantity of 515,200 SF (32 rolls/2 lots) of material received. A geosynthetics inventory log for LLDPE geomembrane can be found in **Appendix E2**. This log identifies the rolls which were sampled for material control testing. The results of material control testing of LLDPE geomembrane can be found in **Appendix E3**.

6.4 Field Seam Control Tests

The results of trial welds performed by Hallaton can be found in **Appendix E4**.

6.5 Field Seam Record Tests

Panel placement and seaming logs can be found in **Appendices E5 and E6**, respectively. The results of nondestructive and destructive CQC and CQA testing can be found in **Appendices E6 through E8**. A repair log documenting all repairs of defects and destructive sample locations can be found in **Appendix E9**. Record testing of LLDPE geomembrane seams is summarized in **Table 3**.

7.0 GCL CQA

7.1 Material Approval

RSG reviewed and approved the geosynthetic clay liner (GCL) product submittals provided by ES&J. The selected material was Bentomat SDN as manufactured by CETCO Lining Technologies of Arlington Heights, IL. Copies of selected product submittals for these products can be found in **Appendix F1**.

7.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved CETCO's quality control certificates upon delivery to the site. Copies of these certificates can be found in **Appendix F1**.

7.3 Material Control Testing

The number and results of material control tests performed on the GCL are summarized in **Table 4**. Note that the number of tests required was based on a quantity of 365,400 SF (168 rolls/1 lot) of material received. A geosynthetics inventory log for the GCL can be found in **Appendix F2**. This log identifies the rolls which were sampled for material control testing. The results of material control testing of GCL can be found in **Appendix F3**.

8.0 60 MIL HDPE GEOMEMBRANE CQA

8.1 Material Approval

RSG reviewed and approved the 60 mil HDPE geomembrane product submittals provided by ES&J. The selected material was HD Textured 60 mil HDPE geomembrane as manufactured by GSE Lining Technology, Inc. of Houston, Texas. Copies of selected product submittals for these products can be found in **Appendix E1**.

8.2 Manufacturer's Quality Control Certificates

RSG reviewed and approved GSE's quality control certificates upon delivery to the site. Copies of these certificates can be found in **Appendix E1**.

8.3 Material Control Testing

The number and results of material control tests performed on the 60 mil HDPE geomembrane is summarized in **Table 5**. Note that the number of tests required was based on a quantity of 370,760 SF (31 rolls/1 lot) of material received. A geosynthetics inventory log for HDPE geomembrane can be found in **Appendix E2**. This log identifies the rolls which were sampled for material control testing. The results of material control testing of HDPE geomembrane can be found in **Appendix E3**.

8.4 Field Seam Control Tests

The results of trial welds performed by Hallaton can be found in **Appendix E4**.

8.5 Field Seam Record Tests

Panel placement and seaming logs can be found in **Appendices E5 and E6**, respectively. The results of nondestructive and destructive CQC and CQA testing can be found in **Appendices E6 through E8**. A geomembrane repair log documenting all repairs of defects and destructive sample locations can be found in **Appendix E9**. Record testing of HDPE geomembrane seams is summarized in **Table 6**.

9.0 LEACHATE MANAGEMENT SYSTEM CQA

9.1 Material Approval

RSG reviewed and approved the leachate management system product submittals provided by ES&J. The selected materials included the following:

Drainage Aggregate (No. 57 Stone):	Martin Marietta - Benson, NC Quarry
HDPE Pipe/Fittings:	ISCO PE 3408 (DR 17) - 4", 6", & 8" Diam.
Geotextiles/Drainage Geocomposite:	See **Sections 10.0 and 11.0**.
Geosynthetic Rain Cover:	Raven Industries Dura-Skrim 12BV

Copies of selected product submittals for these products can be found in **Appendix G1**.

9.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved stone gradation from the Benson, NC Quarry related to the NCDOT No. 57 stone provided. The results of this test can be found in **Appendix G2**.

9.3 Material Control Testing

In that the source (Benson Quarry) was from a granitic source, no carbonate content testing (ASTM D 3042) was required as granite has a very low carbonate content.

One sample of the No. 57 stone was tested for gradation (ASTM C 136). This sample met project criteria.

9.4 Protective Cover

The criteria for construction of protective cover per the project specifications included the following:

- Materials: SW, SP, SM, SM-SC, or SC (ASTM D 2488) with no deleterious material;
- Gradation: Max. = 3 inches;
- Lift Thickness: 12-inch min.;
- Density: Tracked In Only; and
- Thickness: 24 inches min.

A visual classification of soils (ASTM D 2488) was performed on an on-going basis during placement of protective cover. Additionally, grain size (ASTM D 422) (5 tests) and Atterberg limits (ASTM D 4318) (3 tests) testing of soils used for protective cover was performed and results are provided in **Appendix G3**. Final thickness of the protective cover was verified by 4D Site Solutions. An as-built of the protective cover can be found in **Appendix J**.

10.0 GEOTEXTILE CQA

10.1 Material Approval

RSG reviewed and approved the geotextile product submittals provided by ES&J. The selected materials were SKAPS GE-112 (Type GT-C geotextile) as manufactured by SKAPS Industries of Commerce, Georgia and GTF-150EX (Type GT-S Geotextile) as manufactured by Thrace-Linq of Summerville, South Carolina. Copies of selected product submittals for this product can be found in **Appendix H1**.

10.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved manufacturer quality control certificates upon delivery to the site. Copies of these certificates can be found in **Appendix H1**.

10.3 Material Control Testing

The number and results of material control tests performed on the geotextiles is summarized in **Table 9**. Note that the number of tests required was based on a quantity of 36,000 SF (5 rolls/1 lot) and 117,000 SF (26 rolls/1 lot) of Type GT-C geotextile and Type GT-S geotextile received, respectively. A geosynthetics inventory log for both Type GT-C and Type GT-S geotextiles can be found in **Appendix H2**. The results of material control testing of geotextiles can be found in **Appendix H3**.

11.0 DRAINAGE GEOCOMPOSITE CQA

11.1 Material Approval

RSG reviewed and approved the drainage geocomposite product submittals provided by ES&J. The selected material was Transnet 270-2-6 geocomposite as manufactured by SKAPS Industries of Commerce, GA. Copies of selected product submittals for these products can be found in **Appendix I1**.

11.2 Manufacturer's Quality Control Submittals

RSG reviewed and approved SKAPS' quality control certificates upon delivery to the site. Copies of these certificates can be found in **Appendix I1**.

11.3 Material Control Testing

The number and results of material control tests performed on the drainage geocomposite is summarized in **Table 8**. Note that the number of tests required was based on a quantity of 899,000 SF (310 rolls/2 lots) of material received. A geosynthetics inventory log for the drainage geocomposite can be found in **Appendix I2**. This log identifies the rolls which were sampled for material control testing. The results of material control testing of drainage geocomposite can be found in **Appendix I3**.

12.0 RECORD DRAWINGS

The following record (as-built) drawings depicting the construction of Cell 3 can be found in **Appendix J**:

- As-Built Subgrade and Top of Protective Cover (prepared by 4D Site Solutions);
- 40 Mil LLDPE Geomembrane As-Built Drawing with Destructive Test and Repair Locations (prepared by Hallaton); and

- 60 Mil HDPE Geomembrane As-Built Drawing with Destructive Test and Repair Locations (prepared by Hallaton).

13.0 PROJECT CERTIFICATION

Based on the observations and results of the CQA program documented herein, it is our professional opinion that the construction of Phase 4A - Cell 3 of the Johnston County MSW Landfill was completed in accordance with the following:

i. The Project CQA Manual;
ii. The conditions of the Permit to Construct Phase 4A - Cell 3;
iii. The requirements of 15A NCAC 13B.1624; and
iv. Acceptable engineering practices.

RICHARDSON SMITH GARDNER & ASSOCIATES, INC.

7/8/09

Pieter K. Scheer, P.E.
Principal, Project Manager

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TABLE 1
SUMMARY OF MATERIAL CONTROL AND RECORD TESTS STRUCTURAL FILL

	Property		
	Control Tests	Record Tests	
	Moisture-Density Relationship (Proctor)	In-Place Density	In-Place Moisture Content
Units	-----	% Std. Proctor	%
Test Method	ASTM D 698	ASTM D 2922[1]	ASTM D 3017[2]
Required Test Frequency	5,000 CY per each soil	20,000 ft^2 per lift & 1 per 500 LF of Berms (<200 ft. base width) (+/- 1 Per 500 CY)	20,000 ft^2 per lift & 1 per 500 LF of Berms (<200 ft. base width) (+/- 1 Per 500 CY)
No. of Tests Required	6	58	58
No. of Tests Performed	5 (See Note 3)	71	71
Specified Value	-----	≥ 95% Std. Proctor	As Required for Density
Minimum Value	-----	95	-4% Opt.
Maximum Value	-----	104	5% Opt.
Average Value	-----	98	0% Opt.
Quantity of Structural Fill (In-Place):		29,000 CY	

Notes:

1. Nuclear density values verified periodically by sand cone (ASTM D 1556), rubber balloon (ASTM D 2167), and/or drive cylinder (ASTM D 2937) test methods.
2. Nuclear moisture values verified periodically by oven (ASTM D 2216), microwave oven (ASTM D 4643), and/or direct heating (ASTM D 4959) test methods.
3. Due to the similarity of materials fewer moisture-density tests were performed.

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TABLE 2
SUMMARY OF MATERIAL CONTROL TESTS
LLDPE GEOMEMBRANE

	Property									
	Thickness	Density	Carbon Black Content	Carbon Black Dispersion[1]	Tensile Properties				Tear Resistance	
					Tensile Strength at Break		Elongation at Break			
					MD	CD	MD	CD	MD	CD
Units	mils	g/cm^3	%	Category	lb/inch		%		lbs	
Test Method	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693 (Type IV)				ASTM D 1004	
Required Test Frequency	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot				100,000 ft^2 or 1 per Lot	
No. of Tests Required	6	6	6	6	6		6		6	
No. of Tests Performed	6	6	6	6	6		6		6	
Specified Value	40 (See Note 3)	≤ 0.939	2.0 - 3.0	1, 2, or 3	≥ 60		≥ 250		≥ 22	
Sample I.D.	**Results**									
104144244	39	0.933	2.6	Pass	137	116	586	537	30	29
104144250	41	0.932	2.5	Pass	153	126	612	534	31	30
104144256	41	0.933	2.6	Pass	155	134	636	584	31	29
104144262	42	0.933	2.5	Pass	156	126	627	538	31	29
104144268	41	0.933	2.6	Pass	149	136	625	584	29	29
104144274	43	0.932	2.6	Pass	161	137	642	566	32	31
Minimum Value	39	0.932	2.5	Pass	137	116	586	534	29	29
Maximum Value	43	0.933	2.6	Pass	161	137	642	584	32	31
Average Value	41	0.933	2.5	Pass	152	129	621	557	31	30

Quantity of LLDPE Geomembrane Received: 515,200 ft^2

2 Lots

Notes:

1. Carbon black dispersion for 10 different views: Min. 9 of 10 in Categories 1 or 2; All 10 in Categories 1, 2, or 3.
2. MD = Machine Direction; CD = Cross Machine Direction
3. Thickness value is a nominal value. Minimum average can be -5% (38 mils).

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TABLE 3
SUMMARY OF MATERIAL RECORD TESTS
LLDPE GEOMEMBRANE SEAMS

	Property					
	Peel Strength[1]				Shear Strength[1]	
	Peak Load Outside Track (Weld "A")	Locus of Break & Incursion	Peak Load Inside Track (Weld "B")	Locus of Break & Incursion	Peak Load	Locus of Break & Incursion
Units	lbs/inch	----	lbs/inch	-----	lbs/inch	-----
Test Method	ASTM D 6392					
CQC Field Destructive Seam Testing						
Required Test Frequency	500 LF					
No. of Tests Required	31					
No. of Tests Performed	32					
Specified Value	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 60	(See Note 2)
	Results - See Appendix E					
CQA Laboratory Destructive Seam Testing						
Required Test Frequency	1 per day of Production Seaming					
No. of Tests Required	9					
No. of Tests Performed	32					
Specified Value (See Note 2)	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 60	(See Note 2)
Sample I.D.	**Results**					
DS-1	68	Pass	67	Pass	68	Pass
DS-2	68	Pass	68	Pass	68	Pass
DS-3	66	Pass	66	Pass	67	Pass
DS-4	68	Pass	65	Pass	70	Pass
DS-5	68	Pass	67	Pass	69	Pass
DS-6	67	Pass	65	Pass	67	Pass
DS-7	68	Pass	68	Pass	69	Pass
DS-8	69	Pass	66	Pass	69	Pass
DS-9	68	Pass	68	Pass	68	Pass
DS-10	65	Pass	64	Pass	65	Pass
DS-11	65	Pass	66	Pass	66	Pass
DS-12	69	Pass	68	Pass	72	Pass
DS-13	71	Pass	71	Pass	71	Pass
DS-14	67	Pass	65	Pass	67	Pass
DS-15	69	Pass	68	Pass	69	Pass
DS-16	69	Pass	70	Pass	71	Pass
DS-17	68	Pass	67	Pass	69	Pass
DS-18	69	Pass	67	Pass	69	Pass
DS-19	70	Pass	68	Pass	70	Pass
DS-20	70	Pass	68	Pass	71	Pass

TABLE 3
SUMMARY OF MATERIAL RECORD TESTS
LLDPE GEOMEMBRANE SEAMS

CQA Laboratory Destructive Seam Testing (Continued)						
Specified Value (See Note 2)	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 50 (Hot Wedge) ≥ 44 (Ex. Fillet)	(See Note 2)	≥ 60	(See Note 2)
Sample I.D.	**Results**					
DS-21	70	Pass	68	Pass	71	Pass
DS-22	69	Pass	68	Pass	70	Pass
DS-23	68	Pass	69	Pass	72	Pass
DS-24	68	Pass	68	Pass	69	Pass
DS-25	68	Pass	67	Pass	70	Pass
DS-26	67	Pass	67	Pass	68	Pass
DS-27 (Extrusion)	71	Pass	N/A	N/A	76	Pass
DS-28	66	Pass	67	Pass	70	Pass
DS-29	67	Pass	67	Pass	69	Pass
DS-30	68	Pass	65	Pass	71	Pass
DS-31 (Extrusion)	65	Pass	N/A	N/A	71	Pass
DS-32	67	Pass	66	Pass	69	Pass
Minimum Value	65	Pass	64	Pass	65	Pass
Maximum Value	71	Pass	71	Pass	76	Pass
Average Value	68	Pass	67	Pass	69	Pass
Quantity of Geomembrane Seams:				15,444 LF (+/-)		
Number of Production Seaming Days:				9 Days		

Notes:

1. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the specified values.
2. Regarding the locus-of-break patterns of the different seaming methods in shear and peel, refer to the project specifictions.

TABLE 4
SUMMARY OF MATERIAL CONTROL TESTS
GEOSYNTHETIC CLAY LINER

	Property		
	Hydraulic Conductivity	Bentonite Content[1]	Peel Strength
			Avgerage Peak
Units	cm/sec	psf	lbs
Test Method	ASTM D 5887	ASTM D 5993	ASTM D 6496
Required Test Frequency	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot
No. of Tests Required	4	4	4
No. of Tests Performed	4	4	4
Specified Value	$\leq 5 \times 10^{-9}$	≥ 0.75	≥ 5.3
Sample I.D.	**Results**		
700	1.7E-09	0.92	9.5
745	1.5E-09	0.95	5.7
792	4.0E-09	0.92	10.7
837	2.7E-09	0.96	9.1
Minimum Value	1.5E-09	0.92	5.70
Maximum Value	4.0E-09	0.96	10.70
Average Value	2.5E-09	0.94	8.75
Quantity of GCL Received:	365,400 ft^2		
	1 Lot		

Notes:

1. At 0% Moisture.

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TABLE 5
SUMMARY OF MATERIAL CONTROL TESTS
HDPE GEOMEMBRANE

	Property													
					Tensile Properties								Tear Resistance	
	Thickness	Density	Carbon Black Content	Carbon Black Dispersion[1]	Tensile Strength at Yield		Tensile Strength at Break		Elongation at Yield		Elongation at Break			
					MD[2]	CD[2]	MD	CD	MD	CD	MD	CD	MD	CD
Units	mils	g/cm^3	%	Category	lb/inch		lb/inch		%		%		lbs	
Test Method	ASTM D 5994	ASTM D 1505	ASTM D 1603	ASTM D 5596	ASTM D 6693 (Type IV)								ASTM D 1004	
Required Test Frequency	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot								100,000 ft^2 or 1 per Lot	
No. of Tests Required	4	4	4	4	4		4		4		4		4	
No. of Tests Performed	4	4	4	4	4		4		4		4		4	
Specified Value	60 (See Note 3)	≥ 0.940	2.0 - 3.0	1, 2, or 3	≥ 126		≥ 90		≥ 12		≥ 100		≥ 42	
Sample I.D.	Results													
102136707	63	0.944	2.6	Pass	163	161	175	173	16	16	445	490	56	54
102136715	61	0.944	2.4	Pass	162	160	180	171	15	16	509	438	52	53
102136723	62	0.945	2.5	Pass	164	167	173	170	16	15	436	445	55	53
102136731	63	0.954	2.5	Pass	167	171	182	163	16	15	441	435	56	53
Minimum Value	61	0.944	2.4	Pass	162	160	173	163	15	15	436	435	52	53
Maximum Value	63	0.954	2.6	Pass	167	171	182	173	16	16	509	490	56	54
Average Value	62	0.947	2.5	Pass	164	165	178	169	16	15	458	452	55	53

Quantity of HDPE Geomembrane Received: 370,760 ft^2

1 Lot

Notes:

1. Carbon black dispersion for 10 different views: Min. 9 of 10 in Categories 1 or 2; All 10 in Categories 1, 2, or 3.
2. MD = Machine Direction; CD = Cross Machine Direction
3. Thickness value is a nominal value. Minimum average can be -5% (57 mils).

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TABLE 6
SUMMARY OF MATERIAL RECORD TESTS
HDPE GEOMEMBRANE SEAMS

	Property					
	Peel Strength[1]				Shear Strength[1]	
	Peak Load Outside Track (Weld "A")	Locus of Break & Incursion	Peak Load Inside Track (Weld "B")	Locus of Break & Incursion	Peak Load	Locus of Break & Incursion
Units	lbs/inch	-----	lbs/inch	-----	lbs/inch	-----
Test Method	ASTM D 6392					
CQC Field Destructive Seam Testing						
Required Test Frequency	500 LF					
No. of Tests Required	32					
No. of Tests Performed	36					
Specified Value	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 120	(See Note 2)
	Results - See Appendix E					
CQA Laboratory Destructive Seam Testing						
Required Test Frequency	1 per day of Production Seaming					
No. of Tests Required	13					
No. of Tests Performed	36					
Specified Value (See Note 2)	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 120	(See Note 2)
Sample I.D.	**Results**					
DS-1	140	Pass	152	Pass	175	Pass
DS-2	139	Pass	152	Pass	176	Pass
DS-3	135	Pass	141	Pass	177	Pass
DS-4	131	Pass	144	Pass	174	Pass
DS-5	129	Pass	132	Pass	174	Pass
DS-6	132	Pass	145	Pass	173	Pass
DS-7	136	Pass	139	Pass	175	Pass
DS-8	131	Pass	140	Pass	173	Pass
DS-9	127	Pass	140	Pass	174	Pass
DS-10	142	Pass	141	Pass	175	Pass
DS-11	135	Pass	140	Pass	175	Pass
DS-12 (Extrusion)	106	Pass	N/A	N/Aa	168	Pass
DS-13	136	Pass	136	Pass	177	Pass
DS-14	143	Pass	135	Pass	177	Pass
DS-15	134	Pass	143	Pass	176	Pass
DS-16	141	Pass	141	Pass	173	Pass
DS-17	136	Pass	144	Pass	179	Pass
DS-18	136	Pass	131	Pass	180	Pass
DS-19	138	Pass	130	Pass	186	Pass
DS-20	132	Pass	130	Pass	179	Pass

TABLE 6
SUMMARY OF MATERIAL RECORD TESTS
HDPE GEOMEMBRANE SEAMS

CQA Laboratory Destructive Seam Testing (Continued)						
Specified Value (See Note 2)	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 91 (Hot Wedge) ≥ 78 (Ex. Fillet)	(See Note 2)	≥ 120	(See Note 2)
Sample I.D.	**Results**					
DS-21	133	Pass	129	Pass	183	Pass
DS-22	134	Pass	129	Pass	180	Pass
DS-23	137	Pass	129	Pass	180	Pass
DS-24	134	Pass	129	Pass	181	Pass
DS-25	126	Pass	139	Pass	176	Pass
DS-26	130	Pass	133	Pass	173	Pass
DS-27	137	Pass	129	Pass	176	Pass
DS-28	137	Pass	133	Pass	187	Pass
DS-29	137	Pass	132	Pass	185	Pass
DS-30	140	Pass	134	Pass	184	Pass
DS-31	131	Pass	131	Pass	183	Pass
DS-32 (Extrusion)	149	Pass	N/A	N/A	170	Pass
DS-33	130	Pass	135	Pass	173	Pass
DS-34	132	Pass	136	Pass	175	Pass
DS-35	123	Pass	124	Pass	173	Pass
DS-36	123	Pass	135	Pass	175	Pass
Minimum Value	106.4	Pass	124.2	Pass	168.2	Pass
Maximum Value	148.9	Pass	151.7	Pass	186.9	Pass
Average Value	133.7	Pass	136.2	Pass	176.9	Pass

Quantity of Geomembrane Seams: 15,587 LF (+/-)

Number of Production Seaming Days: 13 Days

Notes:

1. Values listed for shear and peel strengths are for 4 out of 5 test specimens; the 5th specimen can be as low as 80% of the specified values.
2. Regarding the locus-of-break patterns of the different seaming methods in shear and peel, refer to the project specifictions.

TABLE 7
SUMMARY OF MATERIAL CONTROL TESTS
GEOTEXTILES

	Property							
	Tensile Properties				Puncture Resistance	Trapezoidal Tear Strength		Apparent Opening Size (AOS)
	Grab Strength		Grab Elongation					
	MD[1]	CD[1]	MD	CD		MD	CD	
Units	lbs		%		lbs	lbs		U.S. Sieve
Test Method	ASTM D 4632		ASTM D 4632		ASTM D 4833	ASTM D 4533		ASTM D 4751
Required Test Frequency	100,000 ft^2 or 1 per Lot		100,000 ft^2 or 1 per Lot		100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot		100,000 ft^2 or 1 per Lot[2]
Type GT-C Geotextile								
No. of Tests Required	1		1		1	1		NA
No. of Tests Performed	2		2		2	2		---
Specified Value	≥ 205		≥ 50		≥ 80	≥ 80		-----
Sample I.D.	**Results**							
11110.02	413	456	107	115	238	186	278	-----
11110.05	410	478	103	112	205	184	213	-----
Minimum Value	410	456	103	112	205	184	213	-----
Maximum Value	413	478	107	115	238	186	278	-----
Average Value	411	467	105	114	221	185	245	-----
Quantity of Type GT-C Geotextile Received:	36,000 SF							
	1 Lot							
Type GT-S Geotextile								
No. of Tests Required	2		2		2	2		2
No. of Tests Performed	2		2		2	2		2
Specified Value	≥ 160		≥ 50		≥ 55	≥ 55		≥ 70
Sample I.D.	**Results**							
TX10431	243	226	68	80	123	87	98	120
7575925	199	231	88	92	96	76	94	100
Minimum Value	199	226	68	80	96	76	94	100
Maximum Value	243	231	88	92	123	87	98	120
Average Value	221	228	78	86	110	82	96	110
Quantity of Type GT-S Geotextile Received:	117,000 SF							
	1 Lot							

Notes:

1. MD = Machine Direction; CD = Cross Machine Direction

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TABLE 8
SUMMARY OF MATERIAL CONTROL TESTS
DRAINAGE GEOCOMPOSITE

	Property				
	Geonet Thickness	Geonet Density	Ply Adhesion		Transmissivity
			Side A	Side B	
			MD[1]	MD	
Units	inches	g/cm^3	lbs		$m^3/m/sec$
Test Method	ASTM D 5199	ASTM D 1505	ASTM D 413 or GRI GC7		ASTM D 4716
Required Test Frequency	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot	100,000 ft^2 or 1 per Lot		1 per Lot
No. of Tests Required	9	9	9		9
No. of Tests Performed	10	10	10		2
Specified Value	$\geq$ 0.25	$\geq$ 0.94	$\geq$ 2.0 (Typ.)/ $\geq$ 1.0 (Min. Avg.)		$\geq 5.0 \times 10^{-4}$
Sample I.D.	**Results**				
307910020	0.34	0.95	4.3	4.5	3.4E-03
307910050	0.34	0.95	3.4	3.9	
307910080	0.34	0.95	3.5	3.7	
307910110	0.33	0.95	4.1	4.5	
307910140	0.32	0.95	3.0	3.3	
307910170	0.33	0.95	4.3	4.3	
307910200	0.33	0.95	4.3	3.9	
3079110230	0.33	0.95	4.5	5.0	3.1E-03
307910260	0.32	0.95	3.5	4.3	
307910290	0.32	0.95	3.9	4.7	
Minimum Value	0.32	0.95	3.0	3.3	3.1E-03
Maximum Value	0.34	0.95	4.5	5.0	3.4E-03
Average Value	0.33	0.95	3.9	4.2	3.2E-03
	Quantity of Drainage Geocomposite Received:			899,000 ft^2	
				2 Lots	

Notes:

1. MD = Machine Direction

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MSW PHASE 4A-CELLS 1 AND 2
(ACTIVE)

MSW PHASE 4A-CELL 3

C&D VERTICAL
EXPANSION (AREA 1)
(INACTIVE)

ANOMALIES EVALUATED		
POINT	NORTHING	EASTING
1	644589.92	2170179.28
2	644485.00	2170223.66
3	644373.08	2170280.84
4	643991.80	2170256.78

0 100' 200' 300'

LEGEND

- 200 — EXISTING 10' CONTOUR (SEE REFERENCE 1)
- EXISTING 2' CONTOUR
- LIMIT OF LINER (LINED LANDFILL UNITS)
- APPROXIMATE EXISTING WASTE LIMITS (UNLINED UNITS)
- FUTURE LANDFILL AREAS
- NEAR SURFACE METAL ANOMALY (IDENTIFIED BY HUTCHINSON GROUP SURVEY 2002)

REFERENCES

1. OVERALL SITE TOPOGRAPHY PROVIDED BY GEODATA CORPORATION, BASED ON JUNE 6, 2008 AERIAL PHOTOGRAPHY.

RICHARDSON SMITH GARDNER & ASSOCIATES
14 N. Boylan Ave.
Raleigh, N.C. 27603
ph: 919-828-0577
fax: 919-828-3899
www.rsgengineers.com

FIGURE NO.	1
FILE NAME	JOHN-B0590
SCALE:	AS SHOWN
PROJECT NO.	JOHN 08-5
CHECKED BY:	
DRAWN BY:	W.R.B.
DATE:	Jul. 2009

TITLE:
JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
LOCATION OF NEAR-SURFACE METAL ANOMALIES EVALUATED

G:\CAD\Johnston\John 08-5\sheets\JOHN-B0590.dwg - 7/1/2009 1:12 PM

Appendix A

Photographic Documentation

1. Subgrade Construction Looking NW - 2/12/09
2. Testing of Structural Fill - 2/12/09
3. Excavation of Potential Near-Surface Metal Anomaly
4. LLDPE Geomembrane and LFG Trenches Looking SW
5. Vacuum Box Testing of LLDPE Geomembrane Along Tie-In with Cell 1 - 3/12/09
6. Geosynthetics Installation Looking W - 3/18/09
7. Placement of Protective Cover Looking SW - 4/10/09
8. Gravel Column Construction Looking N - 4/28/09
9. Partial Closure Construction Along South Berm Looking W - 5/26/09
10. Construction of South Berm Looking W - 6/18/09
11. Placement of Erosion Control Blanket Looking E - 6/26/09
12. View of Completed Cell 3 Looking S - 7/1/09

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Photo 1 (Subgrade Construction Looking NW – 2/12/09)

Photo 2 (Testing of Structural Fill – 2/12/09)

Photo 3 (Excavation of Potential Near-Surface Metal Anomaly – 2/23/09)

Photo 4 (LLDPE Geomembrane and LFG Trenches Looking SW – 3/11/09)

Photo 5 (Vacuum Box Testing of LLDPE Geomembrane Along Tie-In with Cell 1 – 3/16/09)

Photo 6 (Geosynthetics Installation Looking W – 3/18/09)

Photo 7 (Placement of Protective Cover Looking SW – 4/10/09)

Photo 8 (Gravel Column Construction Looking N – 4/28/09)

Photo 9 (Partial Closure Construction Along South Berm Looking W – 5/26/09)

Photo 10 (Construction of South Berm Looking W – 6/18/09)

Photo 11 (Placement of Erosion Control Blanket Looking E – 6/26/09)

Photo 12 (View of Completed Cell 3 Looking S – 7/1/09)

Appendix B

CQA Reporting

B1. CQA Reports

B2. CQA Meeting Minutes

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RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services
14 N. Boylan Avenue Tel: 919-828-0577
Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 1
Day: Tuesday
Date: 1/27/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	4pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		Wet		High:	45
				Low:	40

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to strip and grub cell 3, proof roll existing ground, and possibly install structural fill.

- I asked Mr. Carter to perform a proof roll of the west slope of cell 3 prior to adding structural fill. Mr. Carter directed a smooth drum roller w/operator to roll a strip every 100 feet along the west slope working south to north.
- I observed the proof roll of the west slope and observed no pumping or rutting. I relayed this information to Mr. Carter.
- I contacted Mike Smith of Geotechnics (Raleigh office) and explained that some structural fill could be placed today, and that I would need a technician on the site on Thursday the 29th. Mr. Smith agreed.
- I spoke with Pieter Scheer by phone and explained that Mr. Carter intended to clean out the existing drainage channel along the east side of cell 3 and connect drainage laterals to the channel to de-water the cell floor. Mr. Scheer agreed.
- I discussed the construction of the gas collection trenches with Mr. Scheer and Mr. Carter. Mr. Scheer indicated that the collection trenches needed to be constructed in the top 4 feet of the subgrade so as to allow a conduit for gas to be released from beneath the synthetic liner system.
- 3:30pm - Sight rain event. Mr. Carter indicated that he would not be attempting to place structural fill today.
- I photographed stripping, grubbing and the de-watering activities of the cell 3 area.
- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 1/27/09 **Reviewed By:** PKS

RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services
14 N. Boylan Avenue Tel: 919-828-0577
Raleigh, NC 27603 Fax: 919-828-3899

Log No.: 2
Day: Wednesday
Date: 1/28/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	4pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		Wet		High:	60
				Low:	50

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to strip and grub cell 3, and possibly install structural fill.

- Mr. Carter and I discussed the requirement by project specification to provide a copy of all trucking manifests as project material arrive on the site for CQA purposes. Mr. Carter agreed.
- I received an electronic copy of the synthetic liner systems (geocomposite and 12oz geotextile) w/roll numbers and total square feet from Hallaton requesting that I indicate roll numbers to be conformance tested.
- I forwarded the documents received from Hallaton to Pieter Scheer via e-mail. I delivered a 5gal bucket of material to be used as structural fill to Geotechnics in Raleigh for conformance sampling. This was the second sample of structural fill material sent to Geotechnics in Raleigh.
- I received a hard copy of test results for SF-01 (Structural Fill 01) from Geotechnics (Raleigh). The data included Sieve Analysis, Atteberg Limits, Proctor, and visual classification.
- Slight rain starting at 1pm. ES&J continues to place structural fill.
- I spoke with Rick Proctor regarding site activities. Mr. Proctor indicated that he would visit the construction site and discuss plans for directing storm runoff to existing sediment basins, or the possibility of temporary containment and pumping into existing lift stations.
- Mr. Proctor indicated that the storm runoff appeared to be acceptable for directing into existing sediment basins, but requested that daily inspections of runoff flows be performed and reported to him. I agreed.
- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 1/28/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse (Geotechnics)	Rep:	
Arrived:	7am	Arrived:	10:00am	Arrived:	
Departed:	5pm	Departed:	1pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny - rain during the night		Wet		High:	60
				Low:	50

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to install structural fill, and maintain haul roads.

- Jesse (Geotechnics) arrived on the site at 10am and began performing moisture/density testing of recently placed compacted fill material. Jesse indicated that based on data determined from SF-01 the structural fill placed on the 28th is 2-4 percent over optimum moisture and between 89 and 94 percent compaction.
- I relayed this information to ES&J and Jackie (ES&J) indicated that he would add about 3 inches of material over the 6inches of material that has been recently deployed. Jackie indicated that he would then deploy compaction efforts to pump the water out of the lift.
- I instructed Jesse (Geotechnics) to perform a minimum of six (6) moisture/density tests using the Troxler density gauge and at least one (1) drive tube before leaving the site and returning tomorrow morning at 9am to re-test the same area as today. Jesse agreed.
- 1pm - Jesse (Geotechnics) left the site after performing six (6) moisture/density tests and one (1) drive tube. Jesse also bagged several samples for determining moisture content of the material before leaving the site.
-
-
-
- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 1/29/09 **Reviewed By:** PKS

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Log No.: 4
Day: Friday
Date: 1/30/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	
Arrived:	7am	**Arrived:**	9am	**Arrived:**	
Departed:	5pm	**Departed:**	5pm	**Departed:**	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		drying		**High:**	55
				Low:	30

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	**Description**
N/A	N/A

Visitor Information:

Firm Name(s)	**Representative's Name**	**Representative's Title**
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	**Description**
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to install structural fill.

- Jesse Patton (Geotechnics) is on the site performing moisture/density tests of recently placed structural fill along the west slope of cell 3. Mr. Patton indicates moisture of material as being over optimum and density below minimal standards.
- Mr. Carter requested that a sample of material be taken directly from the borrow area and tested for moisture to determine if the moisture is in the material prior to it being deployed on the slope of cell 3.
- Mr. Carter also suggested that record testing be performed in areas that had structural fill placed later in the day yesterday (1-29-09) to determine if that material was dryer and better compacted than material placed on Wednesday 1-28-09. I agreed.
- Mr. Carter and I spoke with Pieter Scheer by phone and explained that an additional lift may need to be placed prior to receiving passing of minimal standards for moisture/density to affectively bridge the compacted trash laying directly beneath recently placed structural fill. Mr. Scheer agreed, but indicated that the drive tube sampled yesterday should not be affected by the underlying trash.
- Jesse Patton (Geotechnics) observed and tested a "test pad" of structural fill being placed in a 2' bridge lift to effectively bridge the trash beneath recently placed structural fill. The "test pad" passed minimal standards where as structural fill lifts placed within 18" of the compacted trash lifts did not. I contacted Pieter Scheer and made him aware of these activities and the test results. Mr. Scheer indicated that record testing could start as much as 2' above compacted trash.
- Mr. Scheer phoned and requested a power pole identification number from a pole on the north east side of sediment basin 2. I verified that the number on the pole was11D578 and provided Mr. Scheer with that data.
- Jesse Patton (Geotechnics) completed record testing of recently placed structural fill and left the site. I scheduled Mr. Patton to return to the site for further record testing of structural fill on Monday, February 2, 2009 at 12pm.
- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 1/30/09 **Reviewed By:** PKS

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Log No.: 5
Day: Monday
Date: 2/2/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	9am	Arrived:	12pm	Arrived:	
Departed:	5pm	Departed:	5pm	Departed:	

Weather Conditions:	Ground Conditions:	Temperature:	
Partly Cloudy	drying	High:	55
		Low:	30

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
HDPE Pipe	4", 6", 8" Perforated and Solid DR 17

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to install structural fill.

- Jesse Patton (Geotechnics) is on the site performing moisture/density tests of recently placed structural fill along the west slope of cell 3.
- Mr. Carter made me aware of a shipment of HDPE pipe that had arrived today and provided me with a copy of the shipping manifest. I verified that the type and quantity of the pipe listed has been delivered.
- I contacted Pieter Scheer regarding the HDPE pipe delivered to the site today and Mr. Scheer indicated that he had the submittals for that material. I indicated that I would provide him with a hard copy of the shipping manifest on Wednesday the 4th of February during the construction meeting. Mr. Scheer agreed.
- Jesse Patton (Geotechnics) continues to report passing record tests of recently deployed structural fill. Mr. Patton explained that moisture and compaction vary from location to location and that 6-8 passes using the CS 563 C CAT Smooth Drum Roller is required to achieve minimal standards.
- I spoke with Mr. Carter regarding the number of passes required to achieve minimal standards for moisture/density of compacted fill. Mr. Carter indicated that he felt that the underlying trash is absorbing the compaction efforts, and that is why so much energy is required to achieve minimal standards.
- I discussed compaction efforts and results with Pieter Scheer by phone. Mr. Scheer indicated that he would be on the site Wednesday for the construction meeting and he would observe the construction and compaction of structural fill.
-
- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/2/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	
Arrived:	9am	**Arrived:**	9am	**Arrived:**	
Departed:	5pm	Departed:	5pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		drying		**High:**	45
				Low:	30

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue to install structural fill.

- Jesse Patton (Geotechnics) is on the site performing moisture/density tests of recently placed structural fill along the west slope of cell 3.
- I discussed site activities and progress with Rick Proctor (JCLF). I asked Mr. Proctor if the landfill had a rain gauge. Mr. Proctor indicated that there was a rain gauge and pointed out it's location.
- I discussed the recording of record tests for the structural fill with Jesse Patton. I explained that Mr. Scheer expected to receive a daily field log, daily drawing indicating test locations, and results of moisture/density testing to include Troxler density gauge and drive tube results. Mr. Patton indicated that he understood.
- Jesse Patton (Geotechnics) continues to report passing record tests of recently deployed structural fill.
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- RSG Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/3/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	9am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/Cold/Snow		Wet		High:	35
				Low:	25

Contractor's Equipment:

Mobilization of equipment incomplete at this time.

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that site conditions due to snow did not allow for any work to be performed today.

- 10:00am - Construction Meeting.
- 11:30am - Site inspection with Pieter Scheer, Rick Proctor, and Billy Thornton.
- 2:00pm - RSG Rep. departed site.
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-
-

Prepared By: Byron S. Hackney **Date :** 2/4/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	9am	Arrived:	11:00am	Arrived:	
Departed:	5pm	Departed:	4:30pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/Cold/		Frozen		High:	35
				Low:	15

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be placing structural fill along the slope of cell 3.

- I spoke with Mr. Carter regarding ground conditions and temperatures not being favorable for successfully constructing compacted fill material. Mr. Carter indicated that he would install a thin lift over previously constructed and recorded tested fill and not attempt compaction until temperatures improved. I agreed.
- I contacted Pieter Scheer by phone and explained the conversation that I had with Mr. Carter and the site conditions, i.e. freezing temperatures and frozen ground conditions.
- Mr. Scheer agreed with continuing to deploy structural fill material over areas of compacted fill that had passed recorded testing, but that compaction efforts would have to wait until temperatures allowed the ground to thaw. I agreed and relayed this conversation to Mr. Carter.
- Jesse Patton and I worked on daily documentation records of compacted fill and test location drawings.
- 1:pm - Temperatures are above freezing and structural fill material is such that it can be interlocked with underlying lifts. Jesse Patton is performing moisture/density testing of recently placed material and is reporting passing tests after approximately 4 passes with the "Pad Foot" compactor and 4 passes with the "Smooth Drum Roller".
- RSG Rep and Geotechnics Rep. departed site.
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-

Prepared By: Byron S. Hackney **Date :** 2/5/09 **Reviewed By:** PKS

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Log No.: 9
Day: Friday
Date: 2/6/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	8am	Arrived:	11:00am	Arrived:	
Departed:	2pm	Departed:	4:30pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Drying		High:	60
				Low:	45

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be placing structural fill along the slope of cell 3.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working on the 4th lift of structural fill and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- 11:00am - Jesse Patton is on the site and has started performing moisture/density testing of recently placed structural fill.
- Mr. Patton is reporting failing moisture/density tests in lift #4. I instructed Mr. Patton to perform a drive tube to verify the compaction rate indicated by the Troxler density gauge.
- Mr. Patton indicated that the drive tube and the Troxler density gauge are indicating similar compaction and moisture based on current proctor curves.
- I relayed these test results to both Clay Carter (ES&J) and Pieter Scheer (RSG). I explained that the 4th lift was not meeting minimal standards and would need additional compaction effort. Both Mr. Carter and Mr. Scheer agreed. Mr. Carter indicated that he would smooth drum roll the remainder of the lift to seal in the moisture and that additional compaction effort would start on Monday the 9th of February. I agreed.
- RSG Rep and Geotechnics Rep. departed site.
-
-

Prepared By: Byron S. Hackney **Date :** 2/6/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:

Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	Mike Smith
Arrived:	7am	**Arrived:**	10:00am	**Arrived:**	9am
Departed:	5pm	**Departed:**	4:30pm	Departed:	11:30am

Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny	Drying	**High:** 60 **Low:** 45

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be placing structural fill along the slope of cell 3.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working on the 4th and 5th lift of structural fill and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- 10:00am - Jesse Patton is on the site and has started performing moisture/density testing of recently placed structural fill.
- Mr. Patton is reporting passing moisture/density tests in lift #4 in the areas that have been re-worked by ES&J. I instructed Mr. Patton to perform a moisture/density test along the top of the slope to determine if flatter areas are achieving higher density.
- Mr. Patton indicated that the top of the slope is at a significantly higher density than the slope (approximately 100% of standard proctor vs. 92-95 on the slope).
- I relayed these test results to both Clay Carter (ES&J) and Pieter Scheer (RSG). I explained that the structural fill being placed on the slope is meeting minimal requirements for compaction, when testing at the minimal number of tests, but that some areas do not achieve 95% compaction of any of the three proctors available at this time. I further explained the structural fill being placed in the flat area at the top of the slope using the same compaction equipment and number of passes exceeds the minimal standards.
- Mr. Scheer requested that I continue testing and observe heavy equipment as it travels along the slope to check for pumping or rutting and to have those areas re-worked. I agreed.
- Mr. Patton is reporting failing moisture/density testing of the 5th lift. I requested that the smooth drum roller make two more passes over areas that received failing record testing results. Mr. Patton reported passing moisture/density testing after the additional compaction efforts.
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/9/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	8am	Arrived:	10:00am	Arrived:	
Departed:	5pm	Departed:	3:00pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Drying		High:	60
				Low:	45

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
N/A	N/A

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be starting the over excavation of unsuitable materials in the north end of the cell floor.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working on the 5th lift of structural fill and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- 10:00am - Jesse Patton is on the site and has started performing moisture/density testing of recently placed structural fill.
- Mr. Patton is reporting passing moisture/density tests in lift #5 in the areas that ES&J have indicated as being ready for testing. I instructed Mr. Patton to perform a moisture/density test along the bottom of the cell to determine if over excavated and backfilled areas are achieving minimal standards for embankment.
- Mr. Patton indicated that the over excavation and backfill areas have passed minimal standards.
- Mr. Patton indicated that he had received word from Geotechnics regarding samples for interface friction testing, but that Geotechnics did not have the soils required for testing against either the 40mil LLDPE or the 60mil HDPE. I contacted Pieter Scheer regarding interface sheer testing and Mr. Scheer requested that samples from the sub-grade material and clean sand from the borrow area be sent to Geotechnics. I indicated that I would get Mr. Patton to deliver the samples to Geotechnics on his trip back to the office this evening.
- Clay Carter indicated that he had leachate running out of the slope at the north end of the cell that would need to be contained and possibly pumped out of the cell area to continue with work. I contacted Rick Proctor and he visited the site. Mr. Proctor instructed a vacuum truck to pump the leachate from the temporary sump area and remove it from the construction area.
- The Johnston County vacuum truck is experiencing mechanical difficulties and ES&J (Clay Carter) indicates that he will dedicate a 3" pump to the sump area and pump the leachate into nearby 8" Leachate Clean-out pipe.
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/10/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	8am	Arrived:	9:00am	Arrived:	
Departed:	5pm	Departed:	10:30am	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Drying		High:	74
				Low:	50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Coarse Aggregate	#57 stone from

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be continuing the over excavation of unsuitable materials in the north end of the cell floor.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working on the 6th lift of structural fill and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- 9:00am - Jesse Patton is on the site and has started performing moisture/density testing of recently placed structural fill.
- Mr. Patton is reporting passing moisture/density tests in lift #6, 7, and 8 in the areas that ES&J have indicated as being ready for testing. I instructed Mr. Patton to collect samples of structural fill, and #57 stone for conformance testing. Mr. Patton and I collected samples of borrow area material and existing material on the south end of the west slope for interface testing with 40 and 60 mil synthetics.
- Mr. Patton indicated that the over excavation and backfill areas have passed minimal standards.
- The wet area in the north end of the cell has been over excavated and a bridge lift of approximately 1.5 feet installed. Mr. Carter indicated that as he excavates the gas collection trenches he will continue to dewater the area.
- I discussed the de-watering of the north end of the cell with Pieter Scheer and Rick Proctor. Both indicated that they expected the possibility of additional de-watering efforts.
- ES&J is removing recently over excavated unsuitable material from the cell 3 area and hauling this material to both the C&D cell and cell 1&2 to be used as daily cover material.
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/11/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 8am	Arrived:	Arrived:
Departed: 5pm	Departed:	Departed:
Weather Conditions: Sunny	**Ground Conditions:** Drying	**Temperature:** High: 74 Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Coarse Aggregate	#57 stone from Martin Marietta (Benson)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be continuing the over excavation of unsuitable materials in the north end of the cell floor.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working placement of structural fill in the northwest corner of cell 3 and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- 9:00am - Haywood Phthisic, Rick Proctor, and Billie Thornton arrived on the site and inquired about the amount of fill being placed in the project area. I explained that slopes were required to be 3:1 or flatter and that fill efforts where to achieve that percent of slope as well as containment issues. I further explained that Pieter Scheer was more qualified to discuss design issues and I contacted Mr. Scheer by phone. The group then discussed with Mr. Scheer.
- I contacted Jesse Patton (Geotechnics) by phone and requested that he concentrate on completion of daily reports, daily drawings, and a summary of earthwork related conformance and record testing taken to date. Mr. Patton agreed and indicated that he would be on the site tomorrow morning at 8am to complete record testing of structural fill placed to date. I agreed.
- Mr. Patton indicated that the samples for interface friction tests had been sent to Geotechnics in Pittsburgh.
- The wet area in the north end of the cell has been over excavated and a bridge lift of approximately 1.5 feet installed. Mr. Carter indicated that as he excavates the gas collection trenches he will continue to dewater the area.
- Mr. Carter discussed a tentative plan to start construction of the gas header pipe line as early as today. Mr. Carter explained that stripping and grubbing in the area of the existing gas header pipe could be performed today and removal of the existing pipe, "T's", and Flares might also start today.
- ES&J is removing recently over excavated unsuitable material from the cell 3 area and hauling this material to both the C&D cell and cell 1&2 to be used as daily cover material.
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/12/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:** Johnston 08-5	
Client Name:	Johnston County Landfill	**Client Contact(s):** Rick Proctor	
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:** Clay Carter	
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	
Arrived:	8am	**Arrived:**	8am	**Arrived:**	
Departed:	5pm	Departed:	1:30pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Drying		**High:**	74
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
HDPE Plastic	Caps, Reducers, Tee's, Crosses, Wye's, Elbow's, and Electro fusion Couplings

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would be continuing with the addition of structural fill, and possibly get started on the de-construction of the existing gas header pipe.

- ES&J continues to place structural fill along the slope of cell 3. ES&J is currently working placement of structural fill in the northwest corner of cell 3 and continues to use both the Pad Foot Compactor and the Smooth drum Roller to achieve required compaction.
- Jesse Patton is on the site performing moisture/density testing of recently placed compacted fill. Mr. Patton indicated that he would also perform at least one drive tube for calibration of the Troxler density gauge.
- Rick Proctor visited the construction site and discussed the current condition of the area that had been pumping leachate earlier in the week. I indicated that there are a few small areas that appear to be pumping, but that I am hopeful that those areas will be captured in the gas collection trenches.
- Jesse Patton is reporting passing moisture/density testing of recently placed compacted fill along the cell floor and the north end of the west slope. Jesse explained that he would take a drive tube sample of the area in the north end of the cell.
- Mr. Patton left the site at 1:30pm to ship a sample of GT-S (6oz, roll # TX10431) geotextile to Geotechnics in Pittsburgh for conformance testing.
-
-
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/13/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	8am	Arrived:	8am	Arrived:	
Departed:	5pm	Departed:		Departed:	

Weather Conditions:	Ground Conditions:	Temperature:	
Sunny	Drying	High:	45
		Low:	30

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would start on the de-construction of the existing gas header pipe, have surveyors on the site to survey top of sub-grade, and various other aspects of the project.

- I spoke with Pieter Scheer regarding today's activities. Mr. Scheer requested that I remind Mr. Carter and 4D Site Solutions to locate the suspected metal (4 locations) in the northern end of the cell. Mr. Carter indicated that he had discussed this with the surveyor today.
- Jesse Patton is on the site performing moisture/density testing of recently placed compacted fill. Mr. Patton indicated that he would also perform at least one drive tube for calibration of the Troxler density gauge.
- Mr. Scheer, Mr. Carter and myself discussed the abandonment of the existing 6-8 inch PVC pipe (Addendum 1). Mr. Scheer pointed out the correct addendum which explained the abandonment procedure.
- Jesse Patton is reporting passing moisture/density testing of recently placed compacted fill along the cell floor and the west slope. Jesse explained that he would take a drive tube sample of the southern end of the cell.
- 4D Site Solutions is creating a 50X50 grid system of the sub-grade elevations as well as locating suspected metal deposits and location of drainage channels, and gas collection trenches.
- 2pm - Jesse Patton has left the site with instructions to complete the Geotechnics daily diaries, drawings, and record test summaries. A tentative schedule of Jesse to return to the site on Thursday 2-19-09.
-
- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney Date : 2/16/09 Reviewed By: PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Drying		High:	45
				Low:	30

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that he would continue with the de-construction of the existing gas header pipe, have surveyors on the site to survey top of sub-grade, and various other aspects of the project.

- I spoke with Pieter Scheer regarding today's activities. Mr. Scheer asked about site conditions and predicted weather conditions. I explained that ES&J is currently working on final grading of sub-grade as indicated by recent topo survey and that rain is in the forecast for Wednesday 2-18-09.
- I further explained to Mr. Scheer that I had scheduled Jesse Patton (Geotechnics) to return to the site on Thursday depending on ES&J's progress with the remaining structural fill.
- Mr. Scheer indicated that he would discuss the process and payment of removal of the suspected metal at indicated locations during the construction meeting on Wednesday 2-18-09.
- I explained to Mr. Scheer that I had requested Geotechnics (Jesse Patton) daily's, drawings, testing summaries, and both conformance and record testing data to be e-mailed to me ASAP, and if possible prior to the construction meeting on Wednesday.
- 4D Site Solutions is creating a 50X50 foot grid system of the sub-grade elevations as well as locating suspected metal deposits and location of drainage channels, and gas collection trenches.
- The stripping and grubbing efforts along the divider berm between cell 1 and cell 3 has been completed and all solid gas conveyance piping has been removed. ES&J has protected the remaining open ended "T's" and Elbows with geotextile to prevent infiltration of foreign materials into the existing system prior to connection to the future gas collection trenches.
- The existing PVC gas wells remain to be excavated 3' below sub-grade and capped according to Addendum 1 of the project specifications.
- RSG Rep and Geotechnics Rep. departed site.

Prepared By:	Byron S. Hackney	Date :	2/17/09	Reviewed By:	PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	1pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Rain (1/2")		Wet		**High:**	45
				Low:	30

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that rain had stopped all work for the day, but that he would remain on the site until after the construction meeting.

- 10am - Construction Progress meeting.
- 11:30am - Pieter Scheer and I performed a brief site inspection before leaving the site for the day.
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- RSG Rep and Geotechnics Rep. departed site.

Prepared By: Byron S. Hackney **Date :** 2/18/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep:	Rep:	Rep:
Arrived:	Arrived:	Arrived:
Departed:	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Overcast - rain in the morning	Wet	High: 45 Low: 30

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that site conditions had stopped all work for the day, but that he would remain on the site until after the construction meeting.

- No site visit on this day after a phone conversation with Clay Carter indicating that ES&J would not be working or receiving any materials today.
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-

Prepared By: Byron S. Hackney **Date :** 2/19/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 8am	Arrived:	Arrived:
Departed:	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Sunny	frozen	High: 45 Low: 25

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would work on erosion control and removing silt from the area between cell 3 and the cell 1 & 3 divider berm, as well as continuing to remove excess fill in the areas indicated during recent survey of the sub-grade.

- ES&J continues to remove material from the divider berm to uncover the plywood and folded back synthetics at the tie-in between cells 1&3. This material is remaining inside the construction area to be used as compacted fill as necessary.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. Mr. Proctor asked about the need for removal of the entire divider berm in regards to air space. I explained that details did not indicate that the berm was to be entirely removed vs. just uncovering the underlying synthetics.
- I spoke with Pieter Scheer (RSG) regarding the removal of the diversion berm and he agreed that the portion of the berm outside of the cell 3 construction limits should remain in place during construction for containment reasons.
- Mr. Scheer and I also discussed the excavation of the metals from the 4 locations that have been survey located. Mr. Scheer explained that he wanted a 10'X10' area excavated to a minimum of 6 feet below sub-grade elevation during the removal process.
- I relayed this conversation to Clay Carter (ES&J) and requested that I be given as much advanced notice to the start of the metal removal activity as possible. Mr. Carter agreed.
- Mr. Carter indicated that due to weather and site conditions on Wednesday and Thursday, ES&J would have a dozer operator w/two ground crew on the site Saturday the 21st to continue final grading of the sub-grade.
- RSG Rep. left the site.
-

Prepared By: Byron S. Hackney **Date :** 2/20/09 **Reviewed By:** PKS

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Log No.: 20
Day: Monday
Date: 2/23/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	4pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		frozen		High:	45
				Low:	25

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Geonet Drainage Media	(SKAPS) DGC 4 truck loads at 27 rolls per truck (108 rolls)
#57 stone	Martin Marietta (Benson Quarry)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on fine grading of sub-grade, and that he (Mr. Carter) expected to receive deliveries of DGC.

- Four flat bed truck loads of DGC arrived on the site (108 rolls). I verified the rolls against approved roll numbers and the truck manifest provided by the trucking company.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. I explained to Mr. Proctor that ES&J would be excavating in the areas indicated to have suspected metal objects on Tuesday the 24th of February. Mr. Proctor indicated that the waste from the excavations should go to the MSW cell. I relayed this information to Clay Carter (ES&J).
- I spoke with Pieter Scheer (RSG) regarding the observance of trash during excavation of existing ground to design sub-grade. Mr. Scheer indicated that a minimum of 6 inches of material over any "flagging" was acceptable, and that maintaining a 3:1 or flatter slope was required.
- Clay Carter has indicated that he will start excavation of the four locations that have been survey located as possible locations for metal Tuesday morning at 8am. I reminded Mr. Carter that each location needed to be excavated to 10' wide by 10' long by 6' min. deep. Mr. Carter agreed.
- I made copies of the shipping manifest for the DGC and provided Mr. Carter with the originals and one copy.
- Mr. Carter assisted in verifying roll numbers on the actual rolls of DGC matched those roll numbers on the shipping manifests.
- RSG Rep. left the site.
-

Prepared By: Byron S. Hackney **Date :** 2/23/09 **Reviewed By:** PKS

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Log No.: 21
Day: Tuesday
Date: 2/24/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	4pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		frozen		High:	45
				Low:	25

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Geonet Drainage Media	(SKAPS) DGC 4 truck loads at 27 rolls per truck (108 rolls)
#57 stone	Martin Marietta (Benson Quarry)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on fine grading of sub-grade, and that he (Mr. Carter) expected to receive deliveries of DGC.

- Four flat bed truck loads of DGC arrived on the site (108 rolls). I verified the rolls against approved roll numbers and the truck manifest provided by the trucking company.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. I explained to Mr. Proctor that ES&J would be excavating in the areas indicated to have suspected metal objects on Tuesday the 24th of February. Mr. Proctor indicated that the waste from the excavations should go to the MSW cell. I relayed this information to Clay Carter (ES&J).
- I spoke with Pieter Scheer (RSG) regarding the excavation of the four suspected metal locations. I explained to Mr. Scheer that all four locations had been excavated to the required dimensions (10' X 10' X 6' min.) and that no large metal had been observed. Mr. Scheer requested that I create a picture layout of the four locations indicating the type of trash found at each location. I agreed.
- Mr. Carter started excavation of the existing 6" PVC gas probes. The gas probes are to be excavated to 3' below sub grade and capped off. I photographed that activity.
- I made copies of the shipping manifest for the DGC and provided Mr. Carter with the originals and one copy.
- Mr. Carter assisted in verifying roll numbers on the actual rolls of DGC matched those roll numbers on the shipping manifests.
- RSG Rep. left the site.
-

Prepared By: Byron S. Hackney **Date :** 2/24/09 **Reviewed By:** PKS

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Log No.: 22
Day: Wednesday
Date: 2/25/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	4pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Dry		High:	55
				Low:	25

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on fine grading of sub-grade, and that he (Mr. Carter) expected to receive deliveries of DGC.

- 4D Site Solutions is on the site conducting an as-built survey of the sub-grade.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. I explained to Mr. Proctor that ES&J had scheduled 4D Site Solutions to as-built survey the sub-grade.
- I spoke with Pieter Scheer (RSG) regarding site activities. I explained that ES&J had completed sub-grade elevations to the point of having the as-built survey performed and that as 4D Site Solutions was indicating cuts and fills in areas that ES&J would make the adjustments. I further explained that adjustments that unearthed trash would be backfilled to provide adequate cover over the trash and re-surveyed. I further explained that these elevations would be recorded and e-mailed to him for final approval.
- I contacted Geotechnics (George Moyer) and requested that Jesse Patton be on the site Thursday at 9am to conduct moisture/density testing of recently compacted structural fill. Mr. Moyer indicated that Mr. Patton was available and that he would be on the site at 9am on 2-26-09.
- ES&J has started construction of the gas collection trenches. ES&J has started the construction of the 7th gas collection trench from the southern end of the cell and will work from the north to the south.
- ES&J is taking the spoils for the excavation of the gas collection trenches to the active MSW landfill (cells 1&2).
- RSG Rep. left the site.
-

Prepared By: Byron S. Hackney **Date :** 2/25/09 **Reviewed By:** PKS

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Log No.: 23
Day: Thursday
Date: 2/26/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	
Arrived:	8am	**Arrived:**	9am	**Arrived:**	
Departed:	5pm	Departed:	2pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Dry		**High:**	60
				Low:	25

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Geonet Drainage Media	SKAPS DGC (50 rolls) total on site 268 rolls
Geosynthetic Clay Liner	Cetco GCL (64 rolls)
GE112 Geotextile	SKAPS 12oz Geotextile (4 rolls)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities
Pieter Scheer	Regarding required minimum depth of gas collection piping

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on fine grading of sub-grade, and that he (Mr. Carter) expected to receive deliveries of DGC.

- ES&J is receiving shipments of DGC, GT-C Geotextile (GT112), and GCL. I contacted Kennedy Garber (Hallaton) regarding conformance sampling of the GCL and roll numbers confirming that the rolls delivered to site match those rolls that will be conformance tested. Mr. Garber indicated that he had MQC for 4 truck loads of GCL and that he would e-mail that information to me. I received that data minutes later.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. I explained to Mr. Proctor that ES&J had started construction of the gas collection trenches and that Clay Carter had been in contact with Billy Thornton regarding placement of the spoils from the excavations into the active MSW cell (cells 1&2).
- I spoke with Pieter Scheer (RSG) regarding site activities. I explained that 4D Site Solutions had indicated that the sub-grade was at design elevation in all areas other than those areas that had been adjusted to bridge trash and that ES&J had started construction of the gas collection trenches.
- I spoke with Pieter Scheer regarding Clay Carter's question of the amount of depth required for the gas collection pipe that does not go under the perimeter drainage channel. Mr. Scheer indicated that the pipe needed to have a minimum of 2' of cover and maintain at least .5% drainage away from the header/flare.
- Jesse Patton is on the site (9am) to perform moisture/density testing of recently compacted structural fill material. Mr. Patton has indicated that the southern berm is passing record testing, but that the northern berm is below minimal standards. Mr. Carter is re-working the north berm and will contact Mr. Patton when the berm is ready to be re-tested.
-
- RSG Rep. left the site.
-

Prepared By: Byron S. Hackney **Date :** 2/26/09 **Reviewed By:** PKS

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Log No.: 24
Day: Friday
Date: 2/27/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Dry		High:	60
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Geonet Drainage Media	SKAPS DGC (50 rolls) total on site 268 rolls
Geosynthetic Clay Liner	Cetco GCL (64 rolls)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on fine grading of sub-grade, and that he (Mr. Carter) expected to receive deliveries of DGC.

- ES&J is receiving shipments of GCL. I collected the shipping manifests and verified roll numbers on existing rolls matched those on the shipping manifest.
- I spoke with Rick Proctor (JCLF) regarding site activities and progress. I explained to Mr. Proctor that ES&J will continue with construction of the gas collection trenches and that Clay Carter had been in contact with Billy Thornton regarding placement of the spoils from the excavations into the active MSW cell (cells 1&2).
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer indicated that he understood and that construction sounded as if it was moving along as well as could be expected.
- I contacted Kennedy Garber and checked on the amount and type of material expected to be delivered to the site today. Mr. Garber indicated that he had ordered 11 truck loads of GCL totaling 168 rolls of the material, and that he expected the last three truck loads to arrive on Monday the 2nd of March.
- ES&J has completed 5 gas collection trenches working from the south toward the north. The two southern most gas collection trenches that tie-into the 8" header pipe have been extended across the top of the slope beyond the point that they connect at a "Y" junction.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 2/27/09 **Reviewed By:** PKS

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Log No.: 25
Day: Monday
Date: 3/2/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	9am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Rain/Snow		Wet/Frozen		High:	32
				Low:	18

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would have a skeleton crew on the site to unload materials as they arrive and to attend the pre-synthetics construction meeting.

- ES&J is unloading shipments of GCL (Geosynthetic Clay Liner)
- 2pm - Construction meeting (pre-synthetics).
- Pieter Scheer, Clay Carter and myself walked the site and performed a site inspection.
-
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney Date : 3/2/09 **Reviewed By:** PKS

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Log No.: 26
Day: Tuesday
Date: 3/3/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	9am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Wet/Frozen		High:	32
				Low:	18

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell. ES&J has prepared six of the "T" intersections of the existing gas header pipe between cells 1 and future cell 3 for tying into recently constructed gas collection trenches.
- I pointed out to Mr. Carter that recently installed 6" HDPE perforated pipe that had not been covered in stone had filled with silt during the recent rain and snow event. Mr. Carter indicated that he planned to either flush the lines or cut off the clogged section and weld on new pipe.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer indicated that he understood and that construction sounded as if it was moving along as well as could be expected.
-
- ES&J has completed 5 gas collection trenches working on the 6th from the south toward the north.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/3/09 **Reviewed By:** PKS

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Log No.: 27
Day: Wednesday
Date: 3/4/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):		**Subcontractor's Rep.(s):**	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:			
Rep:	Byron Hackney	**Rep:**	**Rep:**
Arrived:	9am	**Arrived:**	**Arrived:**
Departed:	5pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**	
Sunny	Wet/Frozen	**High:** 50	
		Low: 18	

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
40mil LLDPE Liner	32 rolls (3 truck loads) (GSE)
60mil HDPE Liner	4 rolls (GSE)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- ES&J received 32 rolls of 40mil LLDPE Liner today as well as 4 rolls of 60mil HDPE. I collected the shipping manifests and verified roll numbers on the existing rolls matched those on the shipping manifest and the inventory list provided by GSE.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer and I discussed the use of concrete as a solid foundation for the Utility Flares. Mr. Scheer indicated that if the underlying trash or compacted fill appeared to be able to support the flares then no concrete would be required. Mr. Scheer further explained that if after construction of the Utility Flares it appeared that additional support was required then ES&J could support the flares with collars. I relayed this information to Mr. Carter (ES&J).
-
- ES&J has completed 6 gas collection trenches working from the south toward the north.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/4/09 **Reviewed By:** PKS

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Log No.: 28
Day: Thursday
Date: 3/5/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	9am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Wet in low areas -drying		High:	65
				Low:	35

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel: -

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- ES&J continues to push washed material from the bottom of the cell up the slope. Recent rain events created some erosion and this material is being pushed back up slope and re-compacted.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer and I discussed the number of moisture/density tests taken during compacted fill efforts. I indicated that I did not have a up to date copy of summary of tests taken by Geotechnics, but that I would contact Mike Smith at Geotechnics for this information. Mr. Sheer indicated that he wanted a minimum of 65 tests total and that if needed additional testing of re-worked sub-grade material should be performed.
- Conversations with Pieter Scheer indicate that ES&J should install the stub-ups for the Utility Flares with a minimum of 2' above ground level. I relayed this conversation to Clay Carter.
- ES&J has completed 6 gas collection trenches working from the south toward the north as well as construction of approximately 500 feet of the 8" Header Pipe at the top of the slope.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/5/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	9am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Wet in low areas -drying		High:	65
				Low:	35

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- ES&J continues to push washed material from the bottom of the cell up the slope. Recent rain events created some erosion and this material is being pushed back up slope and re-compacted.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer and I discussed the number of moisture/density tests taken during compacted fill efforts. I contacted Mike Smith (Geotechnics) and Mr. Smith indicated that he would provide me with an updated copy as soon as he received the remaining test data. I scheduled Jesse Patton (Geotechnics) to be on the site Monday at 12pm to re-test some re-worked areas.
- ES&J has excavated the tie-in points for the gas collection system to expose the 6" solid HDPE pipe for installation of the future collection pipe using electro fusion couplings.
- ES&J has completed 6 gas collection trenches working from the south toward the north as well as construction of approximately 500 feet of the 8" Header Pipe at the top of the slope.
-
- RSG Rep. left the site.

Prepared By: Byron S Hackney **Date :** 3/6/09 **Reviewed By:** PKS

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Log No.: 30
Day: Monday
Date: 3/9/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston C
Client Name:	Johnston C
Site Location:	Johnston C
General Contractor:	ES&J
Subcontractor(s):	

RSG Project No.: Johnston 08-5
Client Contact(s): Rick Proctor
Contractor's Rep.: Clay Carter
ntractor's Rep.(s):

RSG Representative(s) Time(s) on Site:			
Rep:	Byron Hackney	Rep:	Rep:
Arrived:	9am	Arrived:	Arrived:
Departed:	5pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Sunny	Wet in low areas -drying	High: 65 Low: 35

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- I contacted Jesse Patton (Geotechnics) regarding re-scheduling for Tuesday 3-10-09. I explained that ES&J had difficulties with electro fusion welding existing gas collection pipe to recently constructed gas collection pipe and no compaction had been performed on re-graded areas.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer and I discussed my re-scheduling of Geotechnics for Tuesday 3-10-09 due to ES&J not having any areas ready for record testing of re-worked structural fill.
- ES&J has excavated the tie-in points for the gas collection system to expose the 6" solid HDPE pipe for installation of the future collection pipe using electro fusion couplings. ES&J has had some difficulty with electro fusion efforts, but after contacting the supplier the welding is advancing.
- ES&J has completed 6 gas collection trenches working from the south toward the north as well as construction of approximately 500 feet of the 8" Header Pipe at the top of the slope.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/9/09 **Reviewed By:** PKS

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Log No.: 31
Day: Tuesday
Date: 3/10/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):		Subcontractor's Rep.(s):	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:	Jesse Patton	Rep:	
Arrived:	7am	Arrived:	1pm	Arrived:	
Departed:	5pm	Departed:	4pm	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Dry		High:	75
				Low:	55

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and re-grading of sub-grade after recent rain fall events.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- I spoke with Kennedy Barber via e-mail. Mr. Barber indicated that Holland (Liner Crew) would be on the site in the morning (Wednesday 3-11-09) to start deploying the 40mil liner system.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations. Mr. Scheer and I discussed the approval of the sub-grade based on survey data provided by 4D Site Solutions. Mr. Scheer indicated that design elevations had been achieved and that the sub-grade was acceptable for liner
- ES&J has completed electro fusion welding 9 connections to the existing gas collection system and is smooth drum rolling the cell area in preparation of liner deployment. ES&J has started excavation of the anchor trench for the 40mil LLDPE liner system.
- Jesse Patton is on the site performing moisture/density testing of the re-worked structural fill and in areas of structural fill that had not been tested. Mr. Patton is performing drive cylinders per every 10 moisture/density tests.
- Mr. Patton is reporting passing moisture/density testing of structural fill. Mr. Patton indicated that he had taken 20 moisture/density tests along the cell floor, slope and top of slope as well as 3 drive cylinders in various locations.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/10/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 7:30pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Overcast	Dry	High: 75
		Low: 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and maintaining the sub-grade for liner installation. Mr. Carter indicated that Hallaton Inc. would be on the site today and would start deployment of the 40mil LLDPE liner system

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- I spoke with Kennedy Garber via e-mail. Mr. Garber indicated that Holland (Liner Crew) was on the site this morning (Wednesday 3-11-09) and was prepared to start deploying the 40mil liner system. I indicated that some minor sub-grade adjustments needed to be made (smoothing out of tire ruts in sub-grade), and deployment of DGC over the gas collection trenches prior to deployment of the 40mil liner.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations and I explained that Hallaton was on the site and had started deploying the 40mil liner system.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 500 feet of the leak detection trench for the 40mil LLDPE liner system.
- Hallaton has deployed 40mil LLDPE Liner over approximately 3 acres working from the south (upper end) to the north. I marked 9 Destructive Samples at a rate of 1 per 500 feet per welder.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for tomorrow. Omara indicated that he would start air testing and repairs on the 40mil liner system in the morning and possibly deploy liner later in the day if ES&J has a sufficient amount of sub-grade ready.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/11/09 **Reviewed By:** PKS

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Log No.: 33
Day: Thursday
Date: 3/12/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:

Rep:	Byron Hackney	**Rep:**	Richard Sheehan	**Rep:**	
Arrived:	7am	**Arrived:**	8am	**Arrived:**	
Departed:	6pm	Departed:	7pm	Departed:	

Weather Conditions:	**Ground Conditions:**	**Temperature:**
Overcast	Dry	**High:** 55 **Low:** 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches, and maintaining the sub-grade for liner installation. Mr. Carter indicated that Hallaton Inc. would be on the site today and would continue with deployment of the 40mil LLDPE liner

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Richard Sheehan is on the site assisting with CQA activities. Mr. Sheehan will be performing the CQA responsibilities this weekend 3-14 and 3-15 if necessary. Mr. Sheehan and I observed air testing of fusion welded seams on a spot check basis and documented the results. Mr. Sheehan and I observed fusion welding of 40mil LLDPE liner panels on a spot check basis and measured the deployment lengths while inspecting for defects.
- I observed the construction of the gas collection trenches as ES&J excavated the trenches, lined the trenches with GT-S geotextile and backfilled to within 1.5 feet of the top of the trench with #57 stone before installing the 6" HDPE perforated pipe.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations and I explained that Hallaton was on the site and had deployed approximately 3 acres of the 40mil liner system, and was currently extrusion welding repairs, air testing fusion welded seams, and fusion welding seams.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 500 feet of the leak detection trench for the 40mil LLDPE liner system.
- Hallaton has deployed 40mil LLDPE Liner over approximately 3 acres working from the south (upper end) to the north. I marked 11 Destructive Samples at a rate of 1 per 500 feet per welder.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for tomorrow. Omara indicated that he would start air testing and repairs on the 40mil liner system in the morning and possibly deploy liner later in the day if ES&J has a sufficient amount of sub-grade ready.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/12/09 **Reviewed By:** PKS

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Log No.: 34
Day: Friday
Date: 3/13/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	11am	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/rain		wet		High:	55
				Low:	55

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches as long as weather permitted.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Richard Sheehan contacted me by phone and explained that he would not be on the site today due to other responsibilities.
- Mr. Sheehan e-mailed copies of repair logs, and air test results for the recently deployed 40 mil liner system to me.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations and I explained that Hallaton was on the site and deploying DGC over recently deployed, detailed, and survey as-built 40mil liner.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 500 feet of the leak detection trench for the 40mil LLDPE liner system.
- Hallaton has deployed 40mil LLDPE Liner over approximately 3 acres working from the south (upper end) to the north. I marked 11 Destructive Samples at a rate of 1 per 500 feet per welder.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would continue vacuum testing of repairs and extrusion welded panels (tie-in) in preparation of deploying DGC. I documented the vacuum test results and indicated the area of liner that was ready for DGC deployment.
- 11:00am - Rain stopped all work for the day. RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/13/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	11am	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/rain		wet		High:	55
				Low:	55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches as long as weather permitted.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would continue vacuum testing of repairs and extrusion welded panels (tie-in) in preparation of deploying drainage geocomposite. I documented the vacuum test results and indicated the area of liner that was ready for drainage geocomposite deployment.
- 12-00pm - Approximately 2/10" of rain starting at 11am.
- 11:00am - Rain stopped all work for the day. RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/16/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/rain		wet		High:	55
				Low:	55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J could not work due to current site conditions.

- Rain has stopped ES&J from constructing the gas collection trenches. Hallaton indicates that they will continue to vacuum test repairs and deploy drainage geocomposite.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would continue vacuum testing of repairs in preparation of deploying drainage geocomposite. I documented the vacuum test results and indicated the area of liner that was ready for drainage geocomposite deployment.
- I observed and photographed site activities.
-
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/17/09 **Reviewed By:** PKS

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Log No.: 37
Day: Wednesday
Date: 3/18/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	6pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Clear		drying		High:	75
				Low:	55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton continues to deploy drainage geocomposite and indicates that they will start deployment of the 60mil liner today.
- Hallaton has started spreading clean sand over the drainage geocomposite and deploying GCL.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations and I explained that Hallaton was on the site and deploying GCL and 60mil HDPE over recently deployed, detailed, and survey as-built 40mil liner.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the construction of approximately 500 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, measured and documented panel and seam lengths, and marked destructive samples for fusion welded seams.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would continue spreading clean sand over the drainage geocomposite, deploying GCL, and 60mil HDPE.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/18/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 6pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Clear	drying	**High:** 75
		Low: 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton continues to deploy GCL and 60mil HDPE Liner. I have marked DS-1 through DS-4 on panels 1-13 of the 60 mil HDPE Liner.
- I observed the repair and vacuum test of four (4) separate repairs that have been performed on the 40mil LLDPE liner system. These repairs were caused by razor blade cuts during DGC deployment. I cannot locate these repairs due to DGC overlying the panels and panel numbers. Hallaton located the repair using GPS.
- I spoke with Pieter Scheer regarding site activities and the progress of the gas collection trench excavations and I explained that Hallaton was on the site and deploying GCL and 60mil HDPE over recently deployed, detailed, and survey as-built 40mil liner.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 500 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, measured and documented panel and seam lengths, and marked destructive samples for fusion welded seams.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would continue spreading clean sand over the DGC, deploying GCL, and 60mil HDPE
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/13/09 **Reviewed By:** PKS

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Log No.: 39
Day: Friday
Date: 3/20/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 6pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Clear/rain during the night (.5 inches)	drying	**High:** 75 **Low:** 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton is extrusion welding repairs and the tie-in. I have marked DS-1 through DS-11 on panels 1-29 of the 60 mil HDPE Liner and Hallaton has removed the destructive samples for field and laboratory testing.
- ES&J continues to excavate gas collection trenches and backfill with 6oz geotextile, #57 stone, and 6" perforated HDPE pipe.
- I marked and located repairs 1-30 on the 60 mil liner system.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 500 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, to include non-destructive testing (air tests) of fusion welded seams 1-29, and marked destructive samples for fusion welded seams.
- I spoke with Omara (Hallaton Supervisor) regarding his plans for today. Omara indicated that he would be performing air tests, and welding repairs today, and possibly extrusion welding the tie-in seam between cell 3 and cell 1.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/20/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 6pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Clear/rain during the night (.5 inches)	drying	**High:** 75 **Low:** 55

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton continues to deploy and double fusion weld adjoining panels of 40mil LLDPE Liner. I observed and documented air testing of fusion welded seams on a spot check basis.
- ES&J continues to excavate gas collection trenches and backfill with 6oz geotextile, #57 stone, and 6" perforated HDPE pipe.
- I marked and located repairs 59-83 to include DS 12-20 on the 40 mil liner system.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 800 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, to include non-destructive testing (air tests) of fusion welded seams 37-51, and marked destructive samples for fusion welded seams.
- I contacted Pieter Scheer by phone and requested that he visit the site on Tuesday the 24th of March if possible. Mr. Scheer indicated that he would try and make it to the site in the late morning, or early afternoon.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/23/09 **Reviewed By:** PKS

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Log No.: 41
Day: Tuesday
Date: 3/24/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	6pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Clear		drying		High:	75
				Low:	55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton continues to deploy and double fusion weld adjoining panels of 40mil LLDPE Liner. I observed and documented air testing of fusion welded seams on a spot check basis.
- ES&J continues to excavate gas collection trenches and backfill with 6oz geotextile, #57 stone, and 6" perforated HDPE pipe.
- I received lab results of destructive samples 1-12 (60 mil HDPE) by e-mail from Geotechnics in Pittsburgh. Lab results indicated passing of minimal standards. I relayed this information to Hallaton and ES&J.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 800 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, to include non-destructive testing (air tests) of fusion welded seams 37-51, and marked destructive samples for fusion welded seams.
- 11:00am - Pieter Scheer arrived on the site and performed a walk through inspection of site activities and current progress. Mr. Scheer indicated that he was satisfied with what he had seen.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/24/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 6pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Overcast	drying	High: 55
		Low: 40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton continues to air test, weld repairs, and vacuum test recently deployed panels of 40mil LLDPE Liner. I observed and documented air testing of fusion welded seams and vacuum testing of extrusion welded repairs and tie-in on a spot check basis.
- ES&J continues to excavate gas collection trenches and backfill with 6oz geotextile, #57 stone, and 6" perforated HDPE pipe.
- I shipped destructive samples12-20 (40 mil LLDPE) to Geotechnics in Pittsburgh.
- ES&J has completed the excavation of a portion of the anchor trench along the southern end of the cell and along the top of the western slope. ES&J has also completed the excavation of approximately 800 feet of the leak detection trench w/#57 stone and 4" HDPE perforated pipe for the 40mil LLDPE liner system.
- I observed and photographed site activities, to include non-destructive testing (air tests) of fusion welded seams 51-65, and marked destructive samples for fusion welded seams.
- ES&J has completed the excavation of the gas collection trenches along the slopes and at the connection to existing gas collection from cell 1. Hallaton Inc has completed the deployment of the 40mil LLDPE, but still have detail work to complete on recently deployed 40mil LLDPE.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/26/09 **Reviewed By:** PKS

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Log No.: 43
Day: Thursday
Date: 3/26/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	12pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Rain		Wet		High:	55
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton indicates that they cannot weld repairs or perform air tests on recently deployed liner, and that they are having equipment problems (mechanical) that prevents them from deploying DGC and will be leaving the site.
- ES&J is concentrating on excavation of the gas header pipe trench and will continue as long as weather and conditions allow.
- I shipped destructive samples 21 through 27 (40 mil LLDPE) to Geotechnics in Pittsburgh on March 25th (evening).
- I marked and located DS-28 through DS-32 on panels 67 through 75 and along the extrusion welded tie-in seam.
- I observed and photographed site activities, to include non-destructive testing (air tests) of fusion welded seams 66-68.
- ES&J is correcting some of the rutting that has occurred during storage and retrieval of materials on top of the old C&D landfill.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/26/09 **Reviewed By:** PKS

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Log No.: 44
Day: Friday
Date: 3/27/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	12pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Rain		Wet		High:	55
				Low:	40

Contractor's Equipment:

- D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to work on the construction of gas collection trenches.

- ES&J continues to haul the material excavated from the gas collection trenches to the active MSW landfill cell.
- Hallaton indicates that they cannot weld repairs or perform air tests on recently deployed liner, but will deploy DGC over 40mil liner that has been approved for DGC deployment. I reminded Nacho (Hallaton) that DS-12 through DS-27 had not been laboratory tested and that any deployment of material over those destructive samples would be "at risk". Nacho indicated that he understood.
- ES&J is concentrating on excavation of the gas header pipe trench (last three connections at north end) and will continue as long as weather and conditions allow.
- I contacted Geotechnics in PA and requested results of DS-12 through DS-27. Bob Finley indicated that those samples had not been received at this time, but that he would contact me as soon as they arrived.
- I marked and located DS-28 through DS-32 on panels 67 through 75 and along the extrusion welded tie-in seam.
- I observed and photographed site activities.
- ES&J is correcting some of the rutting that has occurred during storage and retrieval of materials on top of the old C&D landfill.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/26/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 12pm	Departed:	Departed:
Weather Conditions: Overcast/Rain	**Ground Conditions:** Wet	**Temperature:** High: 55 Low: 40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would stay on the site with Hallaton during DGC deployment.

- ES&J will remain on the site and support Hallaton with DGC deployment.
- Hallaton indicates that they cannot weld repairs or perform air tests on recently deployed liner, but will deploy DGC over 40mil liner that has been approved for DGC deployment. I reported that DS-12 through DS-27 had passed minimal standards according to laboratory test results.
- 12:00pm - All work stopped on the site due to weather and site conditions.
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-
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- RSG Rep. left the site.

Prepared By: Byron S. Hackney Date : 3/26/09 Reviewed By: PKS

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Log No.: 46
Day: Monday
Date: 3/30/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	7pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/Windy		drying		High:	55
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakia SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would focus on construction of the leak detection trench (adding stone and 4" perf. pipe).

- ES&J is adding stone and 4" perforated HDPE pipe to the leak detection trench.
- Hallaton indicates that they will weld patches over repair locations (40mil LLDPE) in the northern end of the cell (Panels 66-75). I marked and located repairs 107 through 129 on panels 66 through 75.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- I pointed out several adjoining panels of DGC that had not had the textile fusion welded over the seams. Nacho (Hallaton) indicated that he would have those welded prior to deploying GCL in that area. I agreed.
- Hallaton is extrusion welding the tie-in (40mil LLDPE) along the southern end of the cell in the vicinity of DS-31.
- 2:30pm - Hallaton has started deployment of the 60mil HDPE.
- 5pm - I packaged and shipped DS-28 through DS-32 (40mil LLDPE).
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/30/09 **Reviewed By:** PKS

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Log No.: 47
Day: Tuesday
Date: 3/31/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/Windy		drying		High:	70
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would focus adding fill in the northern portion of the cell around the area of the connection to the existing leak detection pipe.

- ES&J is adding and compacting a small amount of fill material in the northern end of the cell..
- ES&J is removing the 8" gas vent pipe at the southern end of the cell outside of containment and capping the remaining pipe approximately 4' below grade. I photographed this activity.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- I observed and documented air testing of 60mil HDPE fusion welded seams between panels 27 and 40. I marked and located destructive samples (DS-13 through DS-17) on fusion welded seams between panels 27 and 40.
- I shipped DS-13 through 17 to Geotechnics in Pittsburgh PA for laboratory testing.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 3/31/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Windy		drying		High:	70
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would start deployment of the protective cover in the southern end of the cell.

- Construction Progress Meeting started at 10am. Pieter Scheer, Tim Broome and Rick Proctor performed a walk through inspection of the site after the construction meeting.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- I marked and located destructive samples (DS-18 through DS-20) on fusion welded seams between panels 42 and 46.
- I observed site activities on a spot check basis and photographed those activities.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/1/09 **Reviewed By:** PKS

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Log No.: 49
Day: Thursday
Date: 4/2/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Windy		drying		High:	70
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would start deployment of the protective cover in the southern end of the cell.

- Jesse Patton is on the site assisting in CQA of liner installation. Mr. Patton will perform the CQA responsibilities from 4-2-09 through 4-5-09.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- I observed Jesse Patton documenting air tests, and marking and locating destructive samples on recently deployed 60mil liner.
- I observed site activities on a spot check basis and photographed those activities.
- Rain stopped liner deployment after lunch. ES&J continues to deploy protective cover in the southern end of the cell working north.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/2/09 **Reviewed By:**

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Log No.: 50
Day: Monday
Date: 4/6/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**	Jesse Patton	**Rep:**	
Arrived:	7am	**Arrived:**	7am	**Arrived:**	
Departed:	3pm	Departed:	10am	Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Windy/Rain		wet		**High:**	70
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover in the southern end of the cell.

- Jesse Patton is on the site assisting in CQA of liner installation. Mr. Patton provided me with the documentation of the liner CQA performed from 4-2-09 through 4-5-09.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- Mr. Patton and I discussed the site activities that occurred over the weekend. I asked Mr. Patton if he had observed the vacuum testing of the repairs and tie-in in the north end of the cell (40 mil LLDPE). Mr. Patton indicated that he had, and that there had been some defective extrusion welds that had been re-welded due to leaks.
- I observed site activities on a spot check basis and photographed those activities.
- Rain stopped liner deployment around 10am. ES&J continues to deploy protective cover in the southern end of the cell working north.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/6/09 **Reviewed By:** PKS

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Log No.: 51
Day: Tuesday
Date: 4/7/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	3pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Windy		drying		High:	60
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover in the southern end of the cell.

- I spoke with Nacho (Hallaton) regarding patching damaged DGC prior to ES&J needing to deploy protective cover in areas that need repair. I also pointed out that the DGC needed to have scrap materials removed prior to having protective cover deployed. Nacho indicated that he would start clean-up and repairs to prevent slowing ES&J's work progress.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE liner after spreading clean sand (delivered to the site) over the DGC that has been deployed over the 40mil LLDPE.
- I spoke with Clay Carter (ES&J) regarding location of future leachate collection piping along the east side of the cell. Mr. Carter and I reviewed the drawings and details regarding leachate collection pipe construction.
- I observed site activities on a spot check basis and photographed those activities.
- I marked and located destructive samples 25 through 29 on panels 57 through 66.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/7/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		Ground **Conditions:**		**Temperature:**	
Sunny/Windy		drying		**High:**	60
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
(GSE) 60mil HDPE Plastic	7 rolls

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I spoke with Nacho (Hallaton) regarding patching damaged DGC prior to ES&J needing to deploy protective cover in areas that need repair. I also pointed out that the DGC needed to have scrap materials removed prior to having protective cover deployed. Nacho indicated that he would start clean-up and repairs to prevent slowing ES&J's work progress.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying DGC (drainage geocomposite) over recently approved 60mil liner. Hallaton is expecting a partial shipment of 60mil HDPE Liner (4 rolls). I spoke with Kennedy Garber regarding the material that is being shipped to the site and Mr. Garber indicated that three of the four rolls had already been approved and that the fourth roll would not be deployed unless absolutely necessary to complete the project.
- I spoke with Clay Carter (ES&J) regarding location of future leachate collection piping along the east side of the cell. Mr. Carter and I reviewed the drawings and details regarding leachate collection pipe construction.
- I observed site activities on a spot check basis and photographed those activities.
- I marked and located destructive samples 30 through 32 on panels 67 through 72.
- Seven (7) rolls of 60mil HDPE Liner arrived on the site. I contacted Kennedy Garber and relayed this information and the roll numbers associated with the materials. Three of the rolls are of a lot that has been conformance tested and are approved for deployment. The other four rolls are of a separate lot. Mr. Garber indicated that he would contact GSE regarding the extra 3 rolls that had not been ordered.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/8/09 **Reviewed By:** PKS

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Log No.: 53
Day: Thursday
Date: 4/9/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	**Departed:**		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/Windy		drying		**High:**	70
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I spoke with Nacho (Hallaton) regarding completion of the liner systems and CQC documents. Nacho indicated that he expected to finish the liner systems by Friday and that he would provide me (Byron) with a copy of the CQC documents prior to leaving the site. I agreed.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE from panels 73 to the north end of the cell. I spoke with Kennedy Garber regarding the CQC documents. Mr. Garber indicated that Hallaton would create an electronic version of the field notes and e-mail those documents to RSG 2-3 weeks after completion of the liner systems.
- I spoke with Clay Carter (ES&J) regarding location of future leachate collection piping along the east side of the cell. Mr. Carter also contacted Pieter Scheer regarding the placement of the pipe and the need for as-built survey of the existing location of the piping after construction.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer regarding the conformance sampling of the protective cover. Mr. Scheer indicated that he expected at least four samples to be taken during the placement of the protective cover and tested at Geotechnics in Raleigh.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/9/09 **Reviewed By:** PKS

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Log No.: 54
Day: Friday
Date: 4/10/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 3:30pm	Departed:	Departed:
Weather Conditions: Sunny/Windy	**Ground Conditions:** drying	**Temperature:** High: 70, Low: 40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I spoke with Nacho (Hallaton) regarding completion of the liner systems and CQC documents. Nacho indicated that he expected to finish the liner systems by 1pm and that he would provide me (Byron) with a copy of the CQC documents prior to leaving the site. I agreed.
- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite) starting in the southern end of the cell and working north pushing the material up the slope.
- Hallaton is deploying GCL and 60mil HDPE from panels 73 to the north end of the cell. I spoke with Kennedy Garber regarding the CQC documents. Mr. Garber indicated that Hallaton would create an electronic version of the field notes and e-mail those documents to RSG 2-3 weeks after completion of the liner systems.
- I spoke with Clay Carter (ES&J) regarding his work schedule for the day. Mr. Carter indicated that he would be stopping all work around 3pm and would not return to the site until Monday the 13th.
- I observed site activities on a spot check basis and photographed those activities. I collected 2 samples of protective cover and hand delivered them to Geotechnics in Raleigh. I have now taken three (3) samples of protective cover.
- I spoke with Pieter Scheer regarding the conformance sampling of the protective cover. Mr. Scheer indicated that he expected at least four samples to be taken during the placement of the protective cover and tested at Geotechnics in Raleigh.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/10/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	10:00am	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		drying		High:	70
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite). ES&J continues to use the John Deer Tractors with double pans to haul the protective cover to the cell. ES&J also has two D-6 dozers to spread the PC material as it arrives in the cell area. The material is being pushed up or across the slope and temperatures have been such that very little wrinkling of the underlying materials has been present.
- I contacted Richard Sheehan (RSG) and requested that he visit the site and observe site activities during my absence (doctors appointment). I also requested that Mr. Sheehan collect two samples of the protective cover material from inside the cell area (north end of the cell) and deliver this material to Geotechnics in Raleigh tomorrow (4-14-09). Mr. Sheehan agreed.
- I observed site activities on a spot check basis and photographed those activities. 10:30am - Richard Sheehan arrived on the site.
- RSG Rep.(Byron Hackney) left the site.
-
-
-
-

Prepared By: Byron S. Hackney **Date :** 4/13/09 **Reviewed By:** PKS

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Log No.: 56
Day: Tuesday
Date: 4/14/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:00pm	**Departed:**		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/light rain		drying		**High:**	70
				Low:	40

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite). ES&J continues to use the John Deer Tractors with double pans to haul the protective cover to the cell. ES&J also has two D-6 dozers to spread the PC material as it arrives in the cell area. The material is being pushed up or across the slope and temperatures have been such that very little wrinkling of the underlying materials has been present.
- I contacted Richard Sheehan by phone to discuss the protective cover samples that had been collected yesterday. Mr. Sheehan indicated that he would deliver the samples to Geotechnics by 12pm. I agreed.
- I observed site activities on a spot check basis and photographed those activities.
- 4D Site Solutions (Surveyor Group) is on the site to locate and mark the location of the leachate collection system, and verify depth of recently deployed protective cover.
- I observed protective cover being pushed onto the DGC (drainage geocomposite) and watched for excessive wrinkling of underlying geosynthetics. Temperatures and deployment methods have reduced the amount and height of wrinkles to within specifications.
- Mr. Carter and I discussed the use of the John Deer Tractors with one pan over areas of protective cover that have been surveyed and require additional PC. I explained that this would be acceptable as long as no twisting or turning of the tractors was required.
- Mr. Carter indicated that he would instruct the operators to maintain straight lines and stop before any loss of traction could cause the wheels to spin in place.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/14/09 **Reviewed By:** PKS

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Log No.: 57
Day: Wednesday
Date: 4/15/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:00pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/light rain		drying		High:	70
				Low:	40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite). ES&J continues to use the John Deer Tractors with double pans to haul the protective cover to the cell. ES&J also has two D-6 dozers to spread the PC material as it arrives in the cell area. The material is being pushed up or across the slope and temperatures have been such that very little wrinkling of the underlying materials has been present.
- ES&J is concentrating hauling efforts to the southern end of the cell creating the channel for the leachate collection pipe to be installed at that location.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone to discuss site activities and current progress.
- I observed protective cover being pushed onto the DGC (drainage geocomposite) and watched for excessive wrinkling of underlying geosynthetics. Temperatures and deployment methods have such that the wrinkling of the underlying material has been minimal.
- Mr. Carter and I discussed the use of the John Deer Tractors with one pan over areas of protective cover that have been surveyed and require additional PC. I explained that this would be acceptable as long as no twisting or turning of the tractors was required.
- Mr. Carter indicated that he would instruct the operators to maintain straight lines and stop before any loss of traction could cause the wheels to spin in place.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/15/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Clear/Sunny/Windy	drying	High: 70 Low: 40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue deployment of the protective cover working from the south toward the northern end of the cell.

- I observed ES&J adding protective cover over the DGC (Drainage Geocomposite). ES&J continues to use the John Deer Tractors with double pans to haul the protective cover to the cell. ES&J also has two D-6 dozers to spread the PC material as it arrives in the cell area. The material is being pushed up or across the slope and temperatures have been such that very little wrinkling of the underlying materials has been present.
- ES&J has started the removal of access points in the southern end of the cell in preparation for the leachate collection pipe to be installed along the bottom of the slope.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone to discuss site activities and current progress.
- I observed protective cover being pushed onto the DGC (drainage geocomposite) and watched for excessive wrinkling of underlying geosynthetics. Temperatures and deployment methods have such that the wrinkling of the underlying material has been minimal.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/16/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 5:00pm	**Departed:**	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Overcast/slight rain	damp	**High:** 70 **Low:** 40

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would start construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J starting the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and covering the northern edge with PC (protective cover)
- Mr. Carter indicates that ES&J will "key" the southern edge of the geotextile into the PC after the pipe and stone have been constructed according to details and drawings.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone to discuss site activities and current progress.
- ES&J completed the most southern section of the leachate collection pipe to the point of the intersection with the leachate collection pipe that runs along the toe of the slope flowing north and started construction of the next section of leachate collection to the north from the top of the slope.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/20/09 **Reviewed By:** PKS

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Log No.: 60
Day: Tuesday
Date: 4/21/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:
Weather Conditions: Partly Cloudy	**Ground Conditions:** dry	**Temperature:** High: 80, Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J starting the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- Mr. Carter indicates that ES&J will "key" the southern edge of the geotextile into the PC after the pipe and stone have been constructed according to details and drawings for a type 2 gravel column.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone to discuss site activities and current progress.
- ES&J has started construction of the leachate collection system that runs south to north along the toe of the slope (type 1 gravel column). Mr. Carter is anchoring the geotextile beneath the stone column instead of 18" into the PC.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/21/09 **Reviewed By:** PKS

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Log No.: 61
Day: Wednesday
Date: 4/22/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:00pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		dry		**High:**	65
				Low:	50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing the second (from the south working north) vertical leachate collection pipe w/gravel column. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone to discuss site activities and current progress. Mr. Scheer, Mr. Carter and I discussed the amount of stone being used during the construction of a type 1 gravel column. Mr. Scheer indicated that due to the variable nature of the actual toe of slope that ES&J could construct the type 1 gravel column in such a way as to provide a minimum of 7' of top of column and then slope into the PC at both the east and west side of the column.
- Britt Ransom and Richard Sheehan are on the site performing Tier 2 sampling.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/22/09 **Reviewed By:** PKS

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Log No.: 62
Day: Thursday
Date: 4/23/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:00pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		dry		High:	65
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing the Type 1 gravel column between the second and third vertical Type 2 gravel column (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (2') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has started construction of the 3rd vertical (type 2 gravel column) by placing the 6" perforated pipe and GT-S geotextile.
- Britt Ransom and Don Misenheimer are on the site performing Tier 2 sampling.
- ES&J indicates that they will not work Friday and will return to the site on Monday, 4-27-09.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/23/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Sunny	dry	High: 65 Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 2 gravel column (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has started construction of the 3rd vertical (type 2 gravel column) by placing the 6" perforated pipe and GT-S geotextile prior to hauling and placing the #57 stone.
- Britt Ransom, Matt Lamb and Don Misenheimer are on the site performing Tier 2 sampling.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/27/09 **Reviewed By:** PKS

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Log No.: 64
Day: Tuesday
Date: 4/28/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny	dry	High: 90
		Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 2 gravel column (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has started construction of the 3rd and 4th vertical (type 2 gravel column) by placing the 6" perforated pipe and GT-S geotextile prior to hauling and placing the #57 stone.
- ES&J has completed the construction of the 3rd and 4th vertical (type 2 gravel column) and has started construction of the type 1 gravel column that connects the 3rd and 4th vertical (type 2 gravel column).
- I checked for methane gas at the three stub-ups for future solar powered candle flares. My gas meter indicated that the methane gas at each of the three stub-ups exceeded the LEL as measurable by that particular meter.
- I contacted Pieter Scheer and relayed my findings regarding the methane gas.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/28/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny	dry	High: 90 Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 1 and Type 2 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (2' and 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- Pieter Scheer is on the site for the 10am Construction Meeting.
- ES&J has completed the construction of the 3rd and 4th vertical (type 2 gravel column) and has completed construction of the type 1 gravel column that connects the 3rd and 4th vertical (type 2 gravel column).
- ES&J has started construction of the Type 1 gravel column between the 4th and 5th vertical (Type 2 gravel column). ES&J has not started the 5th (Type 2) vertical gravel column.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/29/09 **Reviewed By:** PKS

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Log No.: 66
Day: Thursday
Date: 4/30/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 5:00pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Overcast	dry	**High:** 80
		Low: 50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 1 and Type 2 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (2' and 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- Pieter Scheer noticed a small high point in the northern end of the cell that concerned him. I un-covered the high point and (removed the DGC from over the 60mil HDPE) and photographed the area. I noted that the high point appeared to be a 6-10 foot long by 4" high ridge of soil beneath the geosynthetics. This may have occurred during removal of material from over the tie-in.
- ES&J has completed the construction of the 3rd and 4th vertical (type 2 gravel column) and has completed construction of the type 1 gravel column that connects the 4th vertical (type 2 gravel column) to the 5th, most northerly Type 2 gravel column.
- Clay Carter (ES&J) indicates that he will start construction of the Type 3 Gravel Column in the southern portion of the cell and will work toward the northern end of the cell. Mr. Carter and I discussed the details of the type 2 and type 3 gravel columns and the instructions to create a 5-10 foot channel at the ends of these columns to allow storm water to flow south to north over top of the rain cover.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 4/30/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:00pm	Departed:	Departed:
Weather Conditions: Sunny	**Ground Conditions:** dry	**Temperature:** High: 80 Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 1 and Type 2 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (2' and 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has completed the construction of the 3rd and 4th vertical (type 2 gravel column) and has completed construction of the type 1 gravel column that connects the 4th vertical (type 2 gravel column) to the 5th, most northerly Type 2 gravel column.
- Clay Carter (ES&J) indicates that he will start construction of the Type 3 Gravel Column in the southern portion of the cell and will work toward the northern end of the cell. Mr. Carter and I discussed the details of the type 2 and type 3 gravel columns and the instructions to create a 5-10 foot channel at the ends of these columns to allow storm water to flow south to north over top of the rain cover.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/4/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	10:00am	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/Rain		Wet		High:	70
				Low:	65

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 3 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 4') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- 9:30am - Rain has stopped all work for the day. ES&J has left the site.
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney Date : 5/5/09 Reviewed By: PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		Wet/Drying		**High:**	85
				Low:	65

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 3 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 4') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Clay Carter regarding the placement of the #57 stone in regards to the construction of the Type 3 Gravel Column. I reminded Mr. Carter that the stone is required to be 4' in height and 6' west of the HDPE pipe with a slope of 1:1.5. Mr. Carter agreed and pointed out that he had painted a dashed line on the DGC six feet west of the pipe placement.
- ES&J has fusion welded the 6" HDPE pipe for the Type 3 gravel columns and placed this pipe to within 120' of the north end of the cell.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/6/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:30pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Rain early - Partly Cloudy	Wet/Drying	High: 85
		Low: 65

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 3 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 4') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- Rain during the night and into the morning (approximately 6/10 of an inch) has ES&J concentrating on grading protective cover and waiting to start hauling stone for the construction of the leachate collection system.
- ES&J has fusion welded the 6" HDPE pipe for the Type 3 gravel columns and placed this pipe to within 120' of the north end of the cell.
- 3pm - ES&J is constructing the 4th "T" intersection of the Type 2 and Type 3 gravel column.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/7/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		Wet/Drying		High:	85
				Low:	65

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the south toward the northern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 3 gravel columns (from the south working north) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 4') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- Rain during the night and into the morning (approximately 4/10 of an inch).
- ES&J has fusion welded the 6" HDPE pipe for the Type 3 gravel columns and placed this pipe to the north end of the cell where it will connect with the existing leachate collection/clean-out from cell 1. ES&J placed a piece of 3/4" plywood along the ridge of soil under the geosynthetics in the north end of the cell to allow the ridge of soil to be compacted using the bucket of an excavator.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/8/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/windy		Wet		**High:**	60
				Low:	55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the north toward the southern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 2 gravel columns (from the north working south) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- Rain during the night and into the morning (approximately 1/10 of an inch).
- ES&J has fusion welded the 6" HDPE pipe for the Type 3 gravel columns and placed this pipe to the north end of the cell where it will connect with the existing leachate collection/clean-out from cell 1. ES&J is now constructing the Type 2 gravel column between the Type 1 and Type 3.
- I spoke with Kennedy Garber regarding corrections to the CQC documents that had been e-mailed to me earlier last week. I pointed out that a typing error had reported an 1887 foot long seam and a few other minor corrections.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/8/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:30pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Clear/Sunny	Drying	High: 75 Low: 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the north toward the southern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 2 gravel columns (from the north working south) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has fusion welded the 6" HDPE pipe for the Type 3 gravel columns and placed this pipe to the north end of the cell where it will connect with the existing leachate collection/clean-out from cell 1. ES&J is now constructing the Type 2 gravel column between the Type 1 and Type 3.
- ES&J is constructing the Type 2 gravel column (3rd on from north to south, 1st one from south to north).
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/12/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Clear/Sunny		Drying		High:	75
				Low:	55

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection piping working from the north toward the southern end of the cell.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing Type 2 gravel columns (from the north working south) w/6" HDPE leachate collection pipe. ES&J is placing 1" pvc pipes as marker stakes to indicate the correct depth (approximately 3') of the #57 stone during placement.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has completed constructing the Type 2 gravel channel between the Type 1 and Type 3 gravel column.
- ES&J is constructing the Type 3 gravel column at the south end of the cell. This is the section of this portion of the leachate collection system that leads to the clean-out at the southern end of the cell. Mr. Carter indicates that after ES&J completes this activity at the southern end of the cell they will move to the northern end of the cell and complete the leachate collection at the tie-in to the existing leachate collection system for cells 1 & 2.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/13/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:30pm	Departed:	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Clear/Sunny	Drying	High: 75
		Low: 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the leachate collection system to include leachate collection clean-outs.

- I observed ES&J continuing the placement of the leachate collection pipe w/57 stone and 6oz fabric (6" perforated HDPE and GT-S Geotextile). ES&J is constructing the leachate collection system and all of the components of this system by first deploying the geotextile and anchoring this material in either the PC or the #57 stone.
- ES&J is constructing the leachate collection system in the north end of the cell, but will not connect to the 8" existing leachate collection until deployment of the geosynthetic rain cover has started.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has completed constructing the Type 2 gravel channel between the Type 1 and Type 3 gravel column.
- Clay Carter and I discussed the connection between the cell 3 and existing cell 1 leachate collection system with Pieter Scheer by phone. Mr. Scheer indicated that the connection should not be made until deployment of the GRC has been started to prevent excessive storm water from entering into the existing leachate collection.
- I observed the delivery of the Rip Rap for the perimeter drainage channels. I noted that the Rip Rap appeared to meet the D50 of 12" rip rap as specified, but asked Mr. Carter to contact the Martin Marietta in Dunn and request more 12" or larger stone to be included in the remaining deliveries.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/14/09 **Reviewed By:** PKS

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Engineering and Geological Services
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Raleigh, NC 27603 Fax: 919-828-3899

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 7am	Arrived:	Arrived:
Departed: 5:30pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Clear/Sunny	Drying	High: 75 Low: 55

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to final grade the protective cover and start construction of the perimeter drainage channel.

- I arrived on the site and observed ES&J placing grade stakes along the perimeter drainage channel for construction of the perimeter drainage.
- Mr. Carter indicated that ES&J would be constructing a the drainage channel as staked by 4D Site Solutions, concentrating on creating a 7' bottom of channel with 3:1 side slopes.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J has started cleaning up the top of slope (geosynthetics) in the area of the 8' overlap of geosynthetics for the partial closure and cell 3 geosynthetics.
- I spoke with Clay Carter regarding ES&J's' schedule for the upcoming Memorial Day weekend. Mr. Carter indicated that ES&J may take Memorial Day (Monday the 25th of May) off if work progress allows.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/15/09 **Reviewed By:** PKS

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Log No.: 77
Day: Monday
Date: 5/18/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	**Departed:**		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast/rain in the morning		Wet		**High:**	65
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to final grade the protective cover and start construction of the perimeter drainage channel.

- I observed ES&J excavating material from the northern end of the cell for construction of the perimeter drainage channel.
- Mr. Carter indicated that ES&J would excavate to design grade and remove any unearthed waste and haul this waste material to the MSW Landfill Cell as directed by Mr. Rick Proctor (JCLF).
- I observed site activities on a spot check basis and photographed those activities.
- Mr. Carter and I (Byron Hackney) discussed the over excavation of the waste during the construction of the perimeter drainage channel and the requirement of the construction drawings to have a minimum of 1' of clean well graded, sandy material placed over the underlying waste prior to deployment of the overlying geosynthetics.
- Mr. Carter and I (Byron Hackney) discussed the over excavation of the waste during the construction of the perimeter drainage channel in regards to the volume of material that would need to be removed/over excavated. Mr. Carter and I agreed on a channel with a 10' wide bottom, 4' deep, with 3:1 side slopes on both sides of the channel. The length of the over excavated channel is 300' at this time.
-
-
- RSG Rep. left the site.

Prepared By: Byron S Hackney **Date :** 5/18/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/windy		drying		High:	65
				Low:	50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drainage channel, removal of waste and hauling operations.

- I observed ES&J using two John Deer Tractors, (one w/double pans, and one w/single pan) and a dump truck to haul waste (mostly C&D waste) to the MSW active face. Mr. Carter and I discussed the drainage channel, the areas that require ECB, TRM, and Rip Rap, and how to slope the bottom of the channel in areas that survey stakes indicate a vertical drop of between 4-6 inches.
- Mr. Carter indicated that ES&J would excavate to design grade and blend the slope of the bottom of the trench to create a gradual slope from south to north.
- I observed site activities on a spot check basis and photographed those activities.
- I pointed out to Mr. Carter that at least two of the clean-outs did not extend far enough out from the geosynthetics to allow for the support to be constructed without coming into contact with the geosynthetics. Mr. Carter indicated that as he constructed the supports for the clean-outs he would extend the pipe beyond the geosynthetics.
- During construction of the perimeter drainage channel the 8" HDPE Header Pipe was damaged at the north end of the pipe as it 90's down toward the east (cells 1&2). The damaged area was uncovered to the next field weld and did not appear to have any damage beyond the point of contact. I inspected the recently constructed stub-ups for the solar flares and they appeared to not have changed their orientation (remained vertical).
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/19/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:

Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	4:30pm	Departed:		Departed:	

Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny/windy	drying	**High:** 75 **Low:** 50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drainage channel, removal of waste and hauling operations.

- I observed ES&J using two John Deer Tractors, (one w/double pans, and one w/single pan) and a dump truck to haul waste (mostly C&D waste) to the MSW active face. Mr. Carter and I discussed the drainage channel, the areas that require ECB, TRM, and Rip Rap, and how to slope the bottom of the channel in areas that survey stakes indicate a vertical drop of between 4-6 inches.
- Mr. Carter indicated that ES&J would excavate to design grade and blend the slope of the bottom of the trench to create a gradual slope from south to north.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone and updated him regarding current site activities. I asked Mr. Scheer why the perimeter drainage channel swung north at the north end of the cell before tying back into the existing rip rap drainage channel. Mr. Scheer indicated that this was to reduce the slope of the channel in that area.
- Mr. Scheer asked that I communicate with the county (Rick Proctor) that the ballasting of the GRC would take a minimum of 5000 tires.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/20/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:			
Rep:	Byron Hackney	**Rep:**	**Rep:**
Arrived:	7am	**Arrived:**	**Arrived:**
Departed:	4:30pm	Departed:	Departed:

Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny/windy	drying	**High:** 75 **Low:** 50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	**Description**

Visitor Information:

Firm Name(s)	**Representative's Name**	**Representative's Title**
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	**Description**
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drainage channel, removal of waste and hauling operations.

- I observed ES&J using two John Deer Tractors, (one w/double pans, and one w/single pan) to haul waste (mostly C&D waste) to the MSW active face. Mr. Carter and I discussed the drainage channel, the areas that require ECB, TRM, and Rip Rap, and how to slope the bottom of the channel in areas that survey stakes indicate a vertical drop of between 4-6 inches.
- Mr. Carter indicated that ES&J would excavate to design grade and blend the slope of the bottom of the trench to create a gradual slope from south to north.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone and updated him regarding current site activities. Mr. Scheer and I discussed the flatter portion of the perimeter drainage channel at the southern end of the cell. Mr. Scheer indicated that he intended for that portion of the perimeter drain to slope north and west away from the cell area. I relayed this conversation to Clay Carter.
- Mr. Scheer asked that I communicate with the county (Rick Proctor) that the ballasting of the GRC would take a minimum of 5000 tires.
- I spoke with Rick Proctor regarding current site activities, progress, and Mr. Scheer calculations regarding the number of tires needed to create an 8X8 grid system for ballast of the GRC. Mr. Proctor and I also discussed the availability to work on Monday the 25th (Memorial Day). Mr. Proctor indicated that he would discuss this with Tim Broome.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/21/09 **Reviewed By:** PKS

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Log No.: 81
Day: Monday
Date: 5/25/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	3pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		drying		**High:**	75
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drains and preparing for Hallaton Inc. to mobilize onto the site on 5-26-09

- I observed ES&J constructing the perimeter drain along the southern end of the cell. Clay Carter indicates that ES&J will complete the construction of the drainage channels today as well as completing the 8 foot runout locations for the geosynthetics to be deployed during the construction of the partial closure.
- Mr. Carter indicated that ES&J would excavate to design grade and blend the slope of the bottom of the trench to create a gradual slope from south to north.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone and updated him regarding current site activities. Mr. Scheer and I discussed the flatter portion of the perimeter drainage channel at the southern end of the cell. Mr. Scheer indicated that he intended for that portion of the perimeter drain to slope north and west away from the cell area. I relayed this conversation to Clay Carter.
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/25/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 3pm	**Departed:**	Departed:
Weather Conditions: Overcast	**Ground Conditions:** drying	**Temperature:** High: 75 Low: 50

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drains and preparing for Hallaton Inc. to mobilize onto the site on 5-26-09

- I observed ES&J smooth drum rolling the perimeter drain along the southern end of the cell. Clay Carter indicates that ES&J will smooth drum roll the sub-grade of the drainage channels today as well as completing the 8 foot runout locations for the geosynthetics to be deployed during the construction of the partial closure.
- I observed Hallaton Inc. deploying 40mil LLDPE (Partial Closure, Area 1). I marked and located DS-1, and DS-2 as well as observing air testing of fusion welded seems on a spot check basis.
- I observed site activities on a spot check basis and photographed those activities.
- I spoke with Pieter Scheer by phone and updated him regarding current site activities. Mr. Scheer and I discussed the panel layout of the 40 mil LLDPE to be used during construction of the partial closure. Mr. Scheer indicated that deployment and seaming direction could be determined in the field.
- 2:30pm - Rain stopped all work for the day.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/26/09 **Reviewed By:** PKS

RICHARDSON SMITH GARDNER & ASSOCIATES
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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		drying		High:	75
				Low:	50

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Rip Rap	Class "B" Rip Rap from Martin Marietta in Benson

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the perimeter drains and preparing for Hallaton Inc. to mobilize onto the site on 5-26-09

- I observed ES&J smooth drum rolling the perimeter drain along the northern end of the cell. Clay Carter indicates that ES&J will smooth drum roll the sub-grade of the drainage channels today as covering recently deployed GT-C geotextile with protective cover.
- I observed Hallaton Inc. deploying 40mil LLDPE (Partial Closure, Area 1)panels 5-18. I marked and located DS-3, through DS-7 as well as observing air testing of fusion welded seems on a spot check basis.
- I observed site activities on a spot check basis and photographed those activities.
- 10:00am - Construction Meeting.
- Pieter Scheer performed a walk through inspection of the site. Matt Lamb was on the site to perform gas sampling in Phase 4.
- ES&J continues to place protective cover over the 8' overlap of geosynthetics as Hallaton completes this portion of the partial closure.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/27/09 **Reviewed By:** PKS

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Log No.: 84
Day: Thursday
Date: 5/28/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	7am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		drying		High:	85
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Rip Rap	Class "B" Rip Rap from Martin Marietta in Benson

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- Hallaton completed field testing of DS-1 through DS-7 and I delivered/drove those destructive samples (1-7) to Geotechnics in Raleigh for laboratory testing.
- Hallaton is performing vacuum testing of extrusion welded repairs prior to starting deployment of the DGC (drainage geocomposite).
- I observed site activities on a spot check basis and photographed those activities.
- I observed vacuum testing of extrusion welded repairs on a spot check basis and recorded those results. I made copies of Hallaton's CQC documents for the 40mil partial closure geosynthetics that have been performed to date.
- I received destructive sample results for DS-1 through DS-7. All samples passed minimal standards.
- ES&J continues to place protective cover over the 8' runoff/overlap of geosynthetics as Hallaton completes this portion of the partial closure.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/28/09 **Reviewed By:** PKS

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Log No.: 85
Day: Friday
Date: 5/29/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	7am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Partly Cloudy		drying		**High:**	85
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Rip Rap	Class "B" Rip Rap from Martin Marietta in Benson
Drainage Geocomposite	SKAPS Bi-Planar Geonet Drainage Composite (14 Rolls)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- I contacted Kennedy Garber (Hallaton) regarding a shipment of DGC. Mr. Garber indicated that the rolls of DGC are of the same lot number and are in fact part of the original order. 14 Rolls of DGC arrived on the site. Hallaton indicates that they will deploy 40mil liner today as soon as ES&J re-grades the perimeter drainage channel after yesterday's rain event
- Rain yesterday around 5:30pm (6/10").
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton is stockpiling tires that will be used as ballast for the rain cover at the top of cell 3 on the Area 1 side of the top of slope.
- Storm water from yesterday's rain event appears to have inadvertently been diverted into the existing leachate collection through some exposed stone around the existing leachate collection were the down chute is to be constructed.
- ES&J continues to place protective cover over the 8' runoff/overlap of geosynthetics as Hallaton completes this portion of the partial closure.
- I contacted Pieter Scheer and made him aware of JCLF's leachate collection system needing additional pumping after last nights rain event. I explained that ES&J had re-covered the stone around the existing leachate collection and created a plug of clay material and scrap 40 mil liner to assist in preventing further storm water from entering the existing leachate collection system.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 5/29/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:** Johnston 08-5	
Client Name:	Johnston County Landfill	**Client Contact(s):** Rick Proctor	
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:** Clay Carter	
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):** Kennedy Garber	

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	**Rep:**	**Rep:**
Arrived: 7am	**Arrived:**	**Arrived:**
Departed: 5:30pm	**Departed:**	Departed:
Weather Conditions:	**Ground Conditions:**	**Temperature:**
Partly Cloudy	drying	**High:** 85
		Low: 70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Rip Rap	Class "B" Rip Rap from Martin Marietta in Benson
Drainage Geocomposite	SKAPS Bi-Planar Geonet Drainage Composite (14 Rolls)

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- I drove to Geotechnics in Raleigh to deliver a conformance sample of 12oz geotextile and 40mil destructive sample #8 (DS-8) for record testing.
- I spoke with Rick Proctor regarding the stockpiling of used tires for ballasting of the rain cover and explained that additional tires may be needed to replace tires that are not acceptable for use as ballast.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton is stockpiling tires that will be used as ballast for the rain cover at the top of cell 3 on the Area 1 side of the top of slope.
- I spoke with Clay Carter regarding the stockpiling of tires and the need to keep the construction site clear of random used tires. Mr. Carter indicated that he would discuss keeping the random used tires in organized piles with Hallaton.
- ES&J continues to place protective cover over the 8' runoff/overlap of geosynthetics as Hallaton completes this portion of the partial closure.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/1/09 **Reviewed By:** PKS

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Log No.: 87
Day: Tuesday
Date: 6/2/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		drying		**High:**	95
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- I spoke with Mr. Carter regarding the surveying of the protective cover to verify depth. Mr. Carter indicated that 4D Site Solutions would be on the site tomorrow.
- Hallaton continues to deploy GRC and install the 8X8 foot grid system of used tires anchored and connected with 3/8th inch nylon rope along the slopes and just tires along the cell floor.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton is stockpiling tires that will be used as ballast for the rain cover at the top of cell 3 on the Area 1 side of the top of slope as well as along the tie-in between Cells 1&2 and Cell 3.
- Mr. Carter indicated that ES&J would final grade the north end of the cell to allow Hallaton to deploy the remaining 40mil LLDPE (Closure). Mr. Carter indicated that ES&J would complete this work by tomorrow, and hopefully Hallaton would be able to deploy first thing Thursday morning.
- I "pot hole" inspected the depth of the protective cover in the southern end of Cell 3. Random inspection of the protective covered indicated 2' depth.
- I discussed anchor system of the 8X8 foot grid system with Hallaton. Hallaton will anchor the nylon rope to the 1X1 stakes and tie onto sandbags that will be covered in the anchor trench.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/2/09 **Reviewed By:** PKS

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Log No.: 88
Day: Wednesday
Date: 6/3/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		**Departed:**	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		drying		**High:**	95
				Low:	70

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Fool Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- 4D Site Solutions is on the site verifying the depth of the protective cover. The data collected during survey activities is being sent to 4D Site Solution for Jimmy Holland to review. After Mr. Holland reviews the data he contacts Mr. Carter and indicates if the depth is acceptable.
- Hallaton continues to deploy GRC and install the 8X8 foot grid system of used tires anchored and connected with 3/8th inch nylon rope along the slopes and just tires along the cell floor.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton is stockpiling tires that will be used as ballast for the rain cover at the top of cell 3 on the Area 1 side of the top of slope as well as along the tie-in between Cells 1&2 and Cell 3.
- Mr. Carter indicated that ES&J would final grade the north end of the cell to allow Hallaton to deploy the remaining 40mil LLDPE (Closure). Mr. Carter indicated that ES&J would complete this work by tomorrow, and hopefully Hallaton would be able to deploy first thing Thursday morning.
- I spoke with Rick Proctor (JCLF) regarding site activities. Mr. Proctor asked about the time table for making the connection to the existing leachate collection system. I explained that ES&J and Hallaton are indicating that the GRC and 40mil LLDPE (Closure) would be completed by Tuesday of next week and that the connection would be made during that time frame.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/3/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		drying		**High:**	85
				Low:	70

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover.

- ES&J has completed the grading of the perimeter drainage channel and Hallaton is deploying 40mil LLDPE at the north end of Cell 3 and tying into the existing rip rap channel.
- I observed fusion welding, extrusion welding, air testing of fusion welded seams and vacuum testing of extrusion welded repairs. I marked and located DS-9.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton is stockpiling tires that will be used as ballast for the rain cover at the top of cell 3 on the Area 1 side of the top of slope as well as along the tie-in between Cells 1&2 and Cell 3. Gabby (Hallaton) requested more tires and asked if those tires could be delivered and stockpiled at the north end of the site. I contacted Rick Proctor regarding this request and left a voice mail on his cell phone.
- JCLF stockpiled a load of tires at the north end of Cell 3 as requested by Hallaton.
- ES&J started adding rip rap to the drainage channel along the southern end of Cell 3.
- I delivered DS-9 to Geotechnics in Raleigh for laboratory testing.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/4/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5:30pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		wet		High:	85
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the protective cover and final grading of the protective cover as well as adding rip rap to the rip rap channels.

- I spoke with Gabriel (Hallaton Supervisor) regarding the 4X4 posts that had been used to stack the GCL on during storage of this material. Gabriel asked if these posts needed to be thrown away. I explained that those posts would be used as the "Edge of Liner" markers.
- I received the record testing results for DS-9 from Geotechnics in Raleigh. Destructive testing data indicated a passing of minimal standards. I relayed this information to Clay Carter (ES&J) and Gabriel (Hallaton).
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton continues to deploy and ballast the GRC. Hallaton has deployed GRC to the 4th Leachate Collection Gravel Column (vertical) from the south.
- ES&J is adding protective cover at the north end of the perimeter drainage channel. I reminded ES&J (Clay Carter) about the requirement to create a barrier between the protective cover and the rip rap using the 6oz geotextile as described in detail 1/EC1 on sheet 11 of the construction drawings.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/5/09 **Reviewed By:** PKS

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Log No.: 91
Day: Saturday
Date: 6/6/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	12:00pm	Departed:		**Departed:**	
Weather Conditions:		Ground Conditions:		**Temperature:**	
Overcast		drying		**High:**	75
				Low:	60

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Chris W. regarding his planned daily activities. Chris W. indicated that ES&J would continue placement of the rip rap in the perimeter drainage channel, and that Hallaton would deploy geosynthetic rain cover w/ballast.

- I spoke with Gabriel (Hallaton Supervisor) regarding his planned activities. Gabriel indicated that he (Hallaton) would be deploying GRC (one panel) and placing the ballast for that panel before cleaning up the construction site and leaving for the day.
- I spoke with Gabriel (Hallaton Supervisor) regarding Sunday work this week. Gabriel indicated that Hallaton would not work on Sunday, but that they (Hallaton) would be back on the site Monday morning at 7am.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton continues to deploy and ballast the GRC. Hallaton has deployed GRC to the 4th Leachate Collection Gravel Column (vertical) from the south and continues to work toward the north end of the cell.
- ES&J is adding rip rap at the north end of the perimeter drainage channel. I reminded ES&J (Chris W.) about the requirement to create a barrier between the protective cover and the rip rap using the 6oz geotextile as described in detail 1/EC1 on sheet 11 of the construction drawings.
- I reminded Gabriel (Hallaton) that any used tires that Johnston County has provided as ballast for the GRC that is not placed as ballast would have to be put into a organized pile in a location to be determined by Johnston County.
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/6/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:			
Rep:	Byron Hackney	**Rep:**	**Rep:**
Arrived:	8am	**Arrived:**	**Arrived:**
Departed:	5pm	Departed:	Departed:

Weather Conditions:	**Ground Conditions:**	**Temperature:**
Sunny	drying	**High:** 95 **Low:** 75

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue placement of the rip rap in the perimeter drainage channel, and that Hallaton would deploy geosynthetic rain cover w/ballast.

- I spoke with Gabriel (Hallaton Supervisor) regarding his planned activities. Gabriel indicated that he (Hallaton) would be deploying GRC (one panel) and placing the ballast for that panel before cleaning up the construction site.
- ES&J completed the connection of the leachate collection system between Cells 1&2 and Cell 3 using a electro fusion coupling and a 8" to 6" reducer coupling. ES&J then completed the connection with the new collection stone to the existing collection stone before covering with 6oz geotextile and starting construction of the down chute.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton continues to deploy and ballast the GRC. Hallaton has deployed GRC to between the 4th and 5th Leachate Collection Gravel Column (vertical) from the south and continues to work toward the north end of the cell.
- ES&J is adding rip rap at the north end of the perimeter drainage channel. I reminded ES&J (Chris W.) about the requirement to create a barrier between the protective cover and the rip rap using the 6oz geotextile as described in detail 1/EC1 on sheet 11 of the construction drawings.
- I reminded Gabriel (Hallaton) that any used tires that Johnston County has provided as ballast for the GRC that is not placed as ballast would have to be put into the container provided by Johnston County.
- I spoke with Rick Proctor regarding current site activities and planned activities. I explained that Hallaton was cleaning up the used tires that could not be placed as ballast for the rain cover and returning those tires to the container provided by JCLF. I further explained that ES&J had finished the connection of the leachate collection system between Cells 1&2 and Cell 3 and that the Down Chute should be completed prior to the next rain event.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/8/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5pm	Departed:		**Departed:**	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny		drying		**High:**	95
				Low:	75

Contractor's Equipment:
D-6 Cal. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would final grade the north end of the cells protective cover, and that Hallaton would deploy geosynthetic rain cover w/ballast.

- I spoke with Gabriel (Hallaton Supervisor) regarding his planned activities. Gabriel indicated that he (Hallaton) would be deploying GRC (one panel) before deploying the 40mil LLDPE in the down chute.
- ES&J completed the connection of the leachate collection system between Cells 1&2 and Cell 3 using a electro fusion coupling and a 8" to 6" reducer coupling. ES&J then completed the connection with the new collection stone to the existing collection stone before covering with 6oz geotextile and starting construction of the down chute.
- I observed site activities on a spot check basis and photographed those activities.
- Hallaton continues to deploy and ballast the GRC. Hallaton has deployed GRC to between the 4th and 5th Leachate Collection Gravel Column (vertical) from the south and continues to work toward the north end of the cell.
- ES&J is constructing the down chute with a 6 foot bottom and 2:1 side slopes. Mr. Carter indicated that Hallaton would start deployment of the 40mil LLDPE in the down chute after lunch.
- I reminded Gabriel (Hallaton) that any used tires that Johnston County has provided as ballast for the GRC that is not placed as ballast would have to be put into the container provided by Johnston County.
- 3:30pm - Rain stopped work until around 4:30pm. Hallaton left the site, and ES&J started placing GT-S geotextile and rip rap in the rip rap channel along the south end of the cell.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/9/09 **Reviewed By:** PKS

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Log No.: 94
Day: Wednesday
Date: 6/10/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5pm	**Departed:**		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		wet		**High:**	95
				Low:	75

Contractor's Equipment:

D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description
Concrete Manhole	Three 7' sections w/base

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would re-construct the down chute, and continue with adding rip rap and GT-S geotextile to the perimeter drainage channel.

- Hallaton is not on the site, but will arrive on the site when contacted to deploy the 40mil liner in the down chute. Hallaton does not have any more GRC on the site, but has ordered GRC that should arrive either Wednesday or Thursday 6-10 or 6-11-09.
- 10:00am - Phase 4A - Cell 3 Construction Meeting and Miscellaneous Site Improvements Pre-Construction Meeting.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J is completing the construction of the rip rap channels by adding additional rip rap and heat welding GT-S geotextile to the existing drainage geocomposite to create a filter between the protective cover and the rip rap.
- ES&J is constructing the down chute with a 6 foot bottom and 2:1 side slopes. Mr. Carter indicated that Hallaton would start deployment of the 40mil LLDPE in the down chute after lunch.
- I reminded Gabriel (Hallaton) that any used tires that Johnston County has provided as ballast for the GRC that is not placed as ballast would have to be put into the container provided by Johnston County.
- Hallaton completed the down chute, and left the site. I spoke with Gabriel (Hallaton) by phone regarding the status of the remaining GRC. Gabriel indicated that the remaining GRC should arrive on the site by noon on 6-11-09.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/10/09 **Reviewed By:** PKS

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Engineering and Geological Services
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Fax: 919-828-3899

Log No.: 95
Day: Thursday
Date: 6/11/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 8am	Arrived:	Arrived:
Departed: 5pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Overcast	wet	High: 90 Low: 70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would start construction of the road realignment and continue with adding rip rap and GT-S geotextile to the perimeter drainage channel.

- Hallaton is on the site cleaning up the construction area, de-mobilizing un-used materials, and preparing to deploy the remaining GRC as soon as it arrives on the site.
- ES&J has started clearing and grubbing of the contract limits for the miscellaneous site improvements.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J is completing the construction of the rip rap channels by adding additional rip rap and heat welding GT-S geotextile to the existing drainage geocomposite to create a filter between the protective cover and the rip rap.
- I spoke with Pieter Scheer by phone and discussed the need for moisture/density testing of compacted fill for the road realignment. Mr. Scheer indicated that he required compaction testing of the top foot of the road and it needed to be 98% based on a standard proctor. I relayed this information to Clay Carter and scheduled Geotechnics to be on the site early next week to test the road.
- I reminded Gabriel (Hallaton) that any used tires that Johnston County has provided as ballast for the GRC that is not placed as ballast would have to be put into the container provided by Johnston County.
- Hallaton has completed the installation of the GRC, and attached the GRC to the 40mil LLDPE that lines the down chute. The GRC has been taped to the 40mil LLDPE on the upstream end of the down chute.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/11/09 **Reviewed By:** PKS

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Log No.: 99
Day: Wednesday
Date: 6/17/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:		
Rep: Byron Hackney	Rep:	Rep:
Arrived: 8am	Arrived:	Arrived:
Departed: 5pm	Departed:	Departed:

Weather Conditions:	Ground Conditions:	Temperature:
Overcast - (2" of rain on site 6-16-09)	wet	High: 80 Low: 65

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities
Wilber Spell	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to haul material from the borrow area for construction of the road realignment and start adding top soil in the area of the perimeter drainage channel.

- 4D Site Solutions is on the site survey locating the edge of liner, verifying the thickness of the protective cover and staking out the erosion control measures.
- ES&J is installing additional silt fencing in the area of the pump station for the miscellaneous site improvements.
- I observed site activities on a spot check basis and photographed those activities.
- Wilber Spell requested that I check with the County (Rick Proctor) regarding location/locating the force main from the C&D and the MSW Landfill (cells 1&2). I spoke with Mr. Proctor and he arranged for personnel to locate and mark the force main.
- I spoke with Mike Smith (Geotechnics) regarding the re-scheduling of a technician to perform moisture/density testing of compacted fill at the road realignment project for Friday the 19th of June. Mr. Smith indicated that he could provide a technician.
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-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/17/09 **Reviewed By:** PKS

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DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		wet		High:	90
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would start construction of the road realignment and continue with adding rip rap and GT-S geotextile to the perimeter drainage channel.

- Hallaton has completed the installation of the GRC and mobilized off of the site.
- ES&J has started clearing and grubbing of the contract limits for the miscellaneous site improvements.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J is completing the construction of the rip rap channels by adding additional rip rap and heat bonding GT-S geotextile to the existing drainage geocomposite to create a filter between the protective cover and the rip rap.
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/12/09 **Reviewed By:** PKS

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Log No.: 97
Day: Monday
Date: 6/15/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	**RSG Project No.:**	Johnston 08-5
Client Name:	Johnston County Landfill	**Client Contact(s):**	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	**General Contractor's Rep.:**	Clay Carter
Subcontractor(s):	Hallaton	**Subcontractor's Rep.(s):**	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	**Rep:**		**Rep:**	
Arrived:	8am	**Arrived:**		**Arrived:**	
Departed:	5pm	**Departed:**		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast		wet		**High:**	90
				Low:	70

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue construction of the road realignment and continue with adding rip rap and GT-S geotextile to the perimeter drainage channel as well as continue with construction of the miscellaneous site improvements.

- Hallaton has completed the installation of the GRC and mobilized off of the site.
- ES&J has completed the clearing and grubbing of the contract limits for the miscellaneous site improvements (pump station) and started construction of the concrete manhole.
- I observed site activities on a spot check basis and photographed those activities.
- ES&J is completing the construction of the rip rap channels by adding additional rip rap and heat bonding GT-S geotextile to the existing drainage geocomposite to create a filter between the protective cover and the rip rap.
- I spoke with Wilbur Spell (ES&J) regarding the type of pipe to be used in the seep collection trenches. Mr. Spell and I verified the types of pipe present on the site and noted that there did not appear to be enough of the 6" CPE (type CP) to complete all of the laterals.
- Mr. Spell indicated that he would look into the type and quantities of pipe required.
- I pointed out to Mr. Spell that the concrete manhole sections did not appear to have prefabricated hole at the correct elevation for the pipe penetrations. Mr. Spell indicated that he would contact the manufacturer and have the pipe penetrations drilled as needed.
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/15/09 **Reviewed By:** PKS

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Log No.: 98
Day: Tuesday
Date: 6/16/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Overcast - (2" of rain on site 6-16-09)		wet		High:	80
				Low:	65

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities
Wilber Spell	Regarding site activities

Description of Daily Activities and Events:

7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would not work today due to weather and site conditions.

- No work due to site conditions and weather.
-
-
-
-
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/16/09 **Reviewed By:** PKS

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Engineering and Geological Services
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Log No.: 100
Day: Thursday
Date: 6/18/09
Page: 1 of 1

DAILY CQA REPORT

PROJECT INFORMATION

Project Name:	Johnston County LF Phase 4A-Cell 3	RSG Project No.:	Johnston 08-5
Client Name:	Johnston County Landfill	Client Contact(s):	Rick Proctor
Site Location:	Johnston County NC		
General Contractor:	ES&J	General Contractor's Rep.:	Clay Carter
Subcontractor(s):	Hallaton	Subcontractor's Rep.(s):	Kennedy Garber

DAILY INFORMATION

RSG Representative(s) Time(s) on Site:					
Rep:	Byron Hackney	Rep:		Rep:	
Arrived:	8am	Arrived:		Arrived:	
Departed:	5pm	Departed:		Departed:	
Weather Conditions:		**Ground Conditions:**		**Temperature:**	
Sunny/hot		wet		High:	95
				Low:	75

Contractor's Equipment:
D-6 Cat. Dozer (2), John Deere Tractors 9520 w/dual pans (3), John Deere Tractor 542 w/box blade (1), Excavator 320B (1), Excavator 312B (1), Smooth Drum Roller CS563C (1), Pad Foot Compactor Sakai SV505T (1), Pick-ups (4), and Case End Loader 621B^{XT}

Contractor's Personnel:

Materials Received:

Material(s)	Description

Visitor Information:

Firm Name(s)	Representative's Name	Representative's Title
N/A	N/A	N/A

Important Conversation(s):

Conversation(s)	Description
Clay Carter	Regarding site activities
Wilber Spell	Regarding site activities

Description of Daily Activities and Events:
7am - I arrived on the site and spoke with Clay Carter regarding his planned daily activities. Mr. Carter indicated that ES&J would continue to haul material from the borrow area for construction of the road realignment and continue adding top soil in the area of the perimeter drainage channel.

- ES&J has started construction of the seep collection trenches in the Phase 5 area. ES&J is excavating the header pipe trench and the southern most lateral.
- ES&J is installing additional silt fencing in the area of the pump station for the miscellaneous site improvements.
- I observed site activities on a spot check basis and photographed those activities.
- Wilber Spell requested that I check with the County (Rick Proctor) regarding location/locating the force main from the C&D and the MSW Landfill (cells 1&2). I spoke with Mr. Proctor and he arranged for personnel to locate and mark the force main.
- I spoke with Mike Smith (Geotechnics) regarding the re-scheduling of a technician to perform moisture/density testing of compacted fill at the road realignment project for next week. Mr. Smith indicated that he could provide a technician.
-
-
- RSG Rep. left the site.

Prepared By: Byron S. Hackney **Date :** 6/18/09 **Reviewed By:** PKS

RICHARDSON SMITH GARDNER & ASSOCIATES
Engineering and Geological Services

MEMORANDUM

TO: Distribution

FROM: Byron Hackney, Field Technician
Richardson Smith Gardner & Associates

DATE: March 17, 2009

SUBJECT: **Johnston County**
Johnston County MSW Landfill - Phase 4A - Cell 3
Geosynthetics Construction Meeting Summary - March 2, 2009

On March 2, 2009, a construction meeting was held at the Johnston County Landfill. The purpose of the meeting was to discuss construction progress and future stages of construction. The following is a summary of major topics discussed during the meeting:

Attendees:

Tim Broome, Johnston County
Haywood Phthisic, Johnston County
Rick Proctor, Johnston County
Billie Thornton, Johnston County
Clay Carter, ES&J
Sandra C. Williams, ES&J
Kennedy Garber, Hallaton, Inc.
Pieter Scheer, RSG
Byron Hackney, RSG

Current Progress:

ES&J is currently working on maintaining subgrade elevations and has started construction of the "Gas Collection Trenches". The sub-grade (design elevations) have been surveyed by 4D Site Solutions (Jim Holland) and Mr. Holland indicates that he can provide "as-built" survey of the project in one drawing at the end of the project, or in pieces throughout the project. Mr. Scheer requested that he receive individual pieces of the survey results (such as the sub-grade elevations) during the project as each element is completed.

Mr. Carter (ES&J) indicates that ES&J has five (5) gas collection trenches constructed in the southern end of the cell (slope only), but that he intends to have those five trenches connected to the existing gas collection trenches from Cell 1 within a week from this date (3-2-09).

Planned Construction Activities:

Excavation and construction of the gas collection trenches will continue.
Hallaton will mobilize onto the site the week of 3-7-09, and start construction of the 40mil LLDPE Liner System on or about 3-9-09.

A discussion then ensued between Mr. Carter and Mr. Garber regarding the area of sub-grade w/gas collection that would be available for deployment. Mr. Garber indicated that the Hallaton Liner Crew could mobilize equipment onto the site and assist with material stockpiling then return when Mr. Carter indicated that liner deployment was possible.

Submittals

Mr. Scheer indicated that he had received Pay Application Number 2 and that he would address that as quickly as possible. Mr. Scheer also explained that all other submittals had been received and accepted, but that he had not received any survey data regarding the sub-grade. Mr. Holland indicated that he could provide Mr. Scheer with a PDF drawing of the sub-grade by Tuesday (3-3-09).

Other Items

A discussion ensued regarding adjustments to the elevations of the sub-grade to maintain separation between sub-grade and compacted trash. Mr. Carter discussed adjusting sub-grade elevations in localized areas to ensure that trash was adequately covered while maintaining a 3:1 or flatter slope. Mr. Scheer agreed and indicated that he was not concerned with specific elevations, but more with maintaining 3:1 or flatter slopes and positive flow to the north end of the cell.

Mr. Scheer discussed the need to control storm water in such a way as to minimize additional water being introduced into the leak detection system.

Material Approval

Mr. Scheer explained that he had reviewed and approved material testing results for the following items:
40mil LLDPE
60mil HDPE
Drainage Geocomposite
Geotextiles

Mr. Scheer indicated that laboratory testing of the GCL was in progress and that test results would be reported as they are received.

Mr. Hackney explained that the GCL for the project had been delivered to the site and inventoried along with the other geosynthetics.

Geosynthetics (CQA and CQC)

Mr. Scheer discussed the required CQA and CQC to be performed and recorded by Hallaton in the form of daily logs. Mr. Scheer requested that these logs be made available to Mr. Hackney on a weekly basis for review.

Mr. Hackney discussed the availability of the CQC Logs and hand drawn as-built of the liner systems be made available to him for review to assist in tracking the record testing of seams and repairs. Mr. Garber indicated that Hallaton did not create hand drawn as-built records of the liner systems, but instead relied on GPS data to create each as-built drawing.

A conversation then ensued between Hallaton and 3D Site Solutions regarding accuracy of equipment and compatible software for sharing of survey data. Mr. Scheer discussed the number of peel and shear samples required for both Trial Welds and Destructive Sampling of the 60 mil and 40 mil liner systems. Mr. Scheer indicated 4 coupons (2 peel/2 shear) for the Trial Welds and 10 coupons (5 peel/5 shear) for the Destructive Samples.

Mr. Scheer then discussed the use of sand over top of the Drainage Geocomposite that lies beneath the GCL to create additional interface friction between those geosynthetics (approximately 1lb/SY). Mr. Scheer and Mr. Carter agreed to the use of "Brick Sand" as an acceptable sand for this application. Mr. Scheer further explained that CQA of this activity could be performed by marking out a 3X3 foot "test pad" area and applying one pound of sand. The remaining sand could be applied between the two layers in such a way as to copy the appearance of the test pad.

Mr. Scheer then explained that the GCL should be deployed in such a way as to place the "Black, (3 oz/sy) side down in contact with the underlying GDM, and the light grey (6oz./sy) side facing up in contact with the next layer of synthetics (60 mil HDPE). Mr. Scheer explained that the interface testing of the material had been conducted in this fashion.

Mr. Scheer briefly summarized the overlaps of adjoining panels of each layer of the liner system to include overlap of roll edges and horizontal end seams.

Mr. Garber asked about the availability of tires for use as ballast on the Geosynthetic Rain Cover. Mr. Scheer indicated that the landfill could provide the tires for this application.

Review of CQA Requirements

Mr. Scheer discussed communication between the surveyors, liner crew and CQA Technician to maintain an identifiable marking system of the synthetic layers.

Mr. Scheer asked about tensiometer calibration documents and Mr. Garber indicated that he would provide the most current calibration records of the tensiometer to be used on this project.

Mr. Scheer briefly discussed the documentation and frequency of the non-destructive and destructive testing of the fusion and extrusion welded seams.

Partial Closure

A discussion regarding the construction of the drainage channels and erosion control measures in the area of the partial closure ensued. Hallaton and ES&J (Kennedy Garber and Clay Carter) agreed that the drainage channels and partial closure would be constructed after the geosynthetics in the cell area had been completed.

Next Meeting:

The next meeting is scheduled for Wednesday March 18th at 10:00 a.m.

If you should have any questions, comments, or revisions concerning these minutes, please notify us as soon as possible.

Attachment

cc: Distribution:

Tim Broome, Johnston County
Haywood Phthisic, Johnston County
Rick Proctor, Johnston County
David Page, ES&J
Mike Smith, Geotechnics
Pieter Scheer, RSG

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GEOSYNTHETICS CQA MEETING

AGENDA

1. Status of Approvals

Material	CQA Status
Subgrade	• Awaiting survey information
40 mil Textured LLDPE Geomembrane	• GSE UltraFlex Textured passed material testing • Material being shipped
Drainage Geocomposite	• SKAPS Transnet 270-2-6 passed material testing • Most material on-site
Geosynthetic Clay Liner (GCL)	• Material testing underway • Most material on-site
60 mil Textured HDPE Geomembrane	• GSE HD Textured passed material testing • Material on-site
Geotextiles	• Type GT-S (Thrace-Linq) and Type GT-C (SKAPS) geotextiles passed material testing • Type GT-S material on-site

2. Review of Specification Requirements

Geomembranes (Tech. Specification Sections 02775 (HDPE) & 02778 (LLDPE)):

- Installation in accordance with specs. and approved procedures.

- Hallaton to provide the following:
  - Trial seam log
  - Panel/Seam log
  - Non-destructive testing (vacuum/air pressure tests) log
  - Destructive sampling log
  - Repairs log

  Provide copies of the above forms to RSG at least weekly for review.

- <u>Record Information:</u>

  Per Paragraphs C.2.c. and D.8 of Sections 02775 & 02778, the following information is required for each geomembrane:

CQC Documentation: Includes trial weld logs, panel placement logs, panel seaming logs, non-destructive seam testing report forms, field destructive seam testing report forms, and repair logs.

As-Built Drawing:

(1) Location and numbering of all panels/seams;
(2) Location of all repairs/patches;
(3) Location of all destructive test locations; and
(4) Location of all pipe penetrations and other appurtenances (if applicable).

Survey information needs to be obtained/reviewed prior to placement of overlying materials.

GCL (Tech. Specification Section 02776):

- Installation in accordance with specs. and approved procedures.
- Place approximately 1 lb/SY of coarse sand on surface of drainage geocomposite prior to placement of GCL. Visual observation will be made by CQA personnel.
- Install GCL with light gray (6 oz./sy) side up (against 60 mil HDPE geomembrane) (Black 3 oz/sy side down).
- 6" min. overlap on roll edges and 12" min. along roll ends with 0.25 lbs/LF bentonite (No bentonite is required on roll edges with "Supergroove" system.).
- No horizontal (end) seams on 3H:1V slopes (horizontal seams shall be kept to a minimum on all slopes $\geq$ 6H:1V).
- Shingle all GCL seams (upper panel over lower panel).
- Cover GCL with geomembrane in timely manner (especially when rain is forecast).

Drainage Geocomposite (Tech. Specification Section 02712):

- Installation in accordance with specs. and approved procedures.
- 3" overlap of geonet drainage core on roll edges and 6" along roll ends. Ties every 5' on slopes $\geq$ 6H:1V or 10' on flatter slopes.

- Hallaton plan for seaming geotextile component?

Geotextiles (Tech. Specification Section 02240):

- Installation in accordance with specs. and approved installation procedures
- Hallaton plan for seaming geotextiles?

3. Review of CQA Requirements (CQA Manual Sections 5.0 through 10.0)

Conformance Testing of Geosynthetics Materials:

- See Status of Approvals above.

Geomembrane (LLDPE & HDPE):

- Marking on liner for panel identification, sampling, repairs, etc. (Hallaton/RSG/Surveyor) (pen colors?)
- Field tensiometer provided by Hallaton - should have recent calibration data
- Trial seam procedures in accordance with Section 5.4.5.1 (Hallaton to document) (Note: minimum of four coupons)
- Non-Destructive Testing: Vacuum or air pressure testing to be done continuously by Hallaton on all seams in accordance with Section 5.4.6.1
- Destructive Testing: Samples to be cut and tested at minimum one per 500 LF of weld in accordance with Section 5.4.6.2. (Hallaton to document) (Note: minimum of five coupons). Samples also to be sent to CQA laboratory (Geotechnics) (Typical 1 day turnaround on test results).
- Repairs and Verification: In accordance with Section 5.4.7

4. Review of Project Drawings

Key Item:

- Hallaton's Incremental Construction Strategy/Issues

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Appendix C

Earthwork CQA Data

C1. CQA Test Results - Control Tests

C2. CQA Test Results - Record Tests

Construction Quality Assurance Report
Johnston County MSW Landfill - Phase 4A - Cell 3
Smithfield, North Carolina

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STRUCTURAL FILL
CONTROL TEST SUMMARY

Project Name: Johnston County MSWLF - Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J Enterprises

Grain Size Analysis (ASTM D 422) Test Results:

Test Number	+3" (%)	Pass #4 (%)	Pass #200 (%)	Gravel (%)	Sand (%)	Silt/Clay (%)	USGS Classification
SF-01	0.0	100.0	15.7	0.0	84.3	15.7	SC
SF-02	0.0	100.0	16.4	0.0	83.6	16.4	SC-SM
SF-04	0.0	99.7	8.0	0.3	91.7	8.0	SP-SM
SF-05	0.0	99.8	29.1	0.2	70.7	29.1	SC

Atterberg Limits (ASTM D 4318) Test Results:

Test Number	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	USGS Classification
SF-01	29	18	11	SC
SF-02	24	19	5	SC-SM
SF-04	21	19	2	SP-SM
SF-05	46	22	24	SC

Moisture-Density Relationship (ASTM D 698) Test Results:

Test Number	Optimum Water Content (%)	Maximum Dry Density (pcf)
SF-01	12.1	119.3
SF-02	11.7	120.1
SF-03	11.2	118.1
SF-04	11.9	114.7
SF-05	12.2	120.6

Number of Tests Performed:

Grain Size Analysis:	4
Atterberg Limits:	4
Moisture Density Relationship:	5

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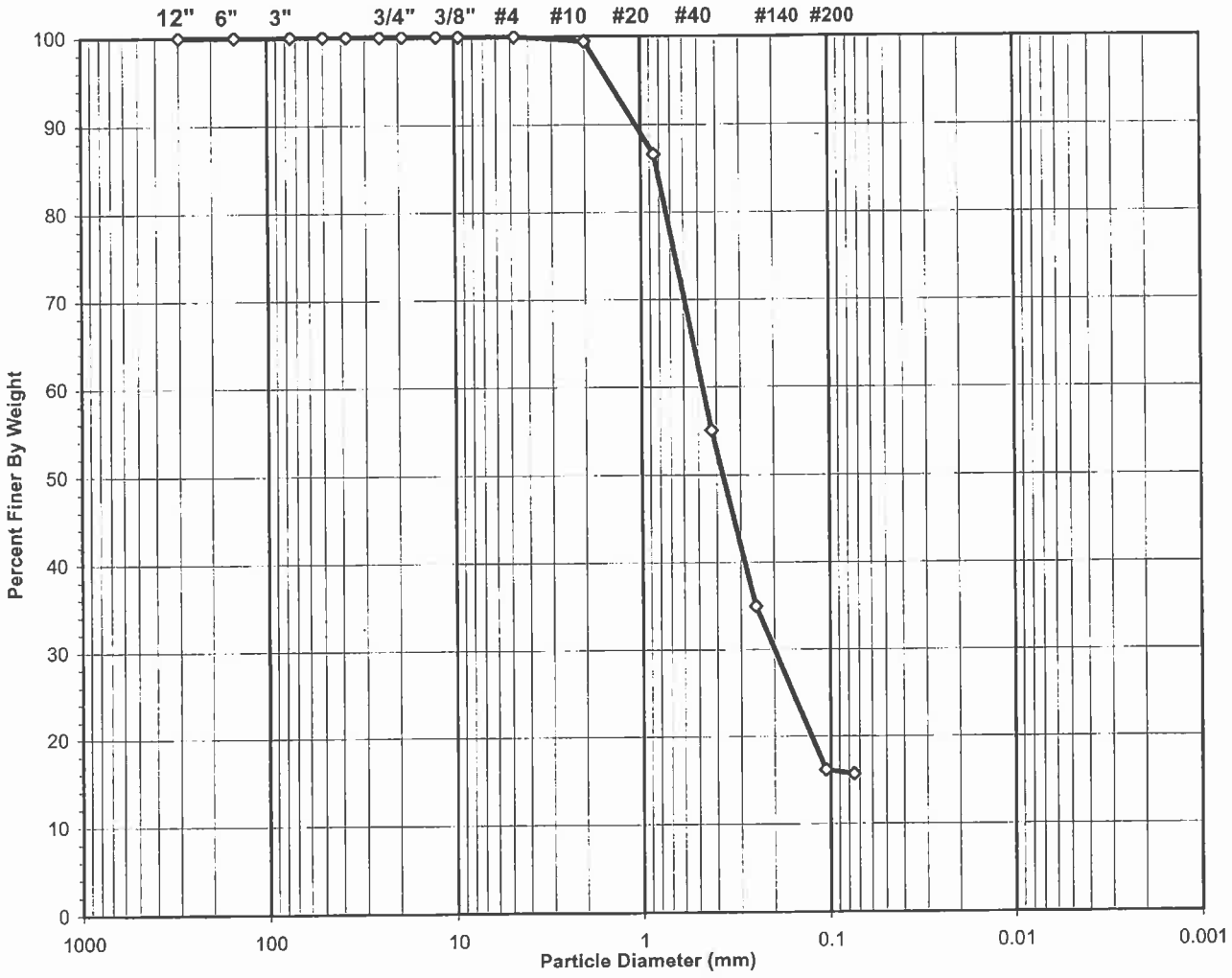
geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	SF-01
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2008-610-01	Sample No.	NA
Lab ID	2008-610-01-01	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By SD Date 1/26/2009 Checked By GEM Date 1-28-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 Drive\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-01-01 SIEVON REV 4.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	SF-01
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2008-610-01	Sample No.	NA
Lab ID	2008-610-01-01	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	217	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	933.29	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	855.06	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.11	Weight of Tare (gm)	NA
Weight of Water (gm)	78.23	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	683.95	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**11.4**	**Moisture Content** (%)	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	683.95
Dry Weight - 3/4" Sample (gm)	576.8	Weight of minus #200 material (gm)	107.17
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	576.78
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	0.00	0.0	0.0	100.0	**100.0**
#10	2.00	3.91	0.6	0.6	99.4	**99.4**
#20	0.850	87.79	12.8	13.4	86.6	**86.6**
#40	0.425	215.91	31.6	45.0	55.0	**55.0**
#60	0.250	137.32	20.1	65.1	34.9	**34.9**
#140	0.106	128.63	18.8	83.9	16.1	**16.1**
#200	0.075	3.22	0.5	84.3	15.7	**15.7**
Pan	-	107.17	15.7	100.0	-	**-**

Tested By SD Date 1/26/2009 Checked By GEM Date 1-28-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *Server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-01-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	SF-01
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-01	Sample No.	NA
Lab ID	2009-610-01-01	Soil Description	**ORANGE LEAN CLAY**

***Note: The* USCS symbol used with this test refers only to the minus No. 40** (Minus No. 40 sieve material, Airdried)
sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

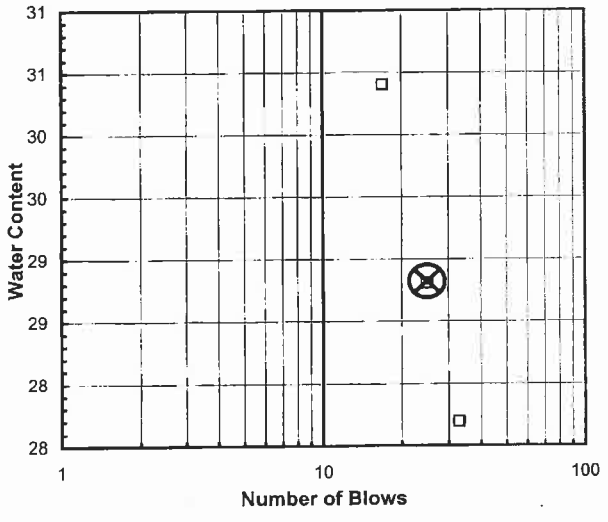
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	Z-1	E-2	M-1	
Wt. of Tare & WS (gm)	29.88	30.48	31.19	
Wt. of Tare & DS (gm)	26.56	27.15	27.87	
Wt. of Tare (gm)	15.64	15.59	15.88	
Wt. of Water (gm)	3.3	3.3	3.3	
Wt. of DS (gm)	10.9	11.6	12.0	
Moisture Content (%)	**30.4**	**28.8**	**27.7**	
Number of Blows	**17**	**25**	**33**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	W	A-Q	
Wt. of Tare & WS (gm)	22.05	22.07	
Wt. of Tare & DS (gm)	20.99	21.06	
Wt. of Tare (gm)	15.15	15.51	
Wt. of Water (gm)	1.1	1.0	
Wt. of DS (gm)	5.8	5.6	
Moisture Content (%)	**18.2**	**18.2**	**0.0**

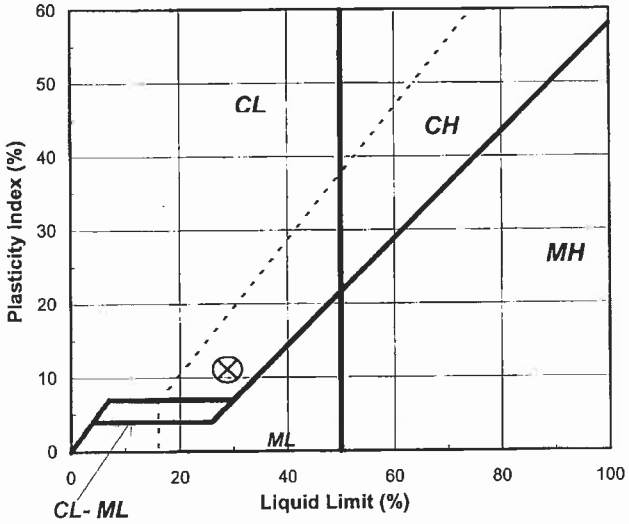
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**29**
Plastic Limit (%)	**18**
Plasticity Index (%)	**11**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

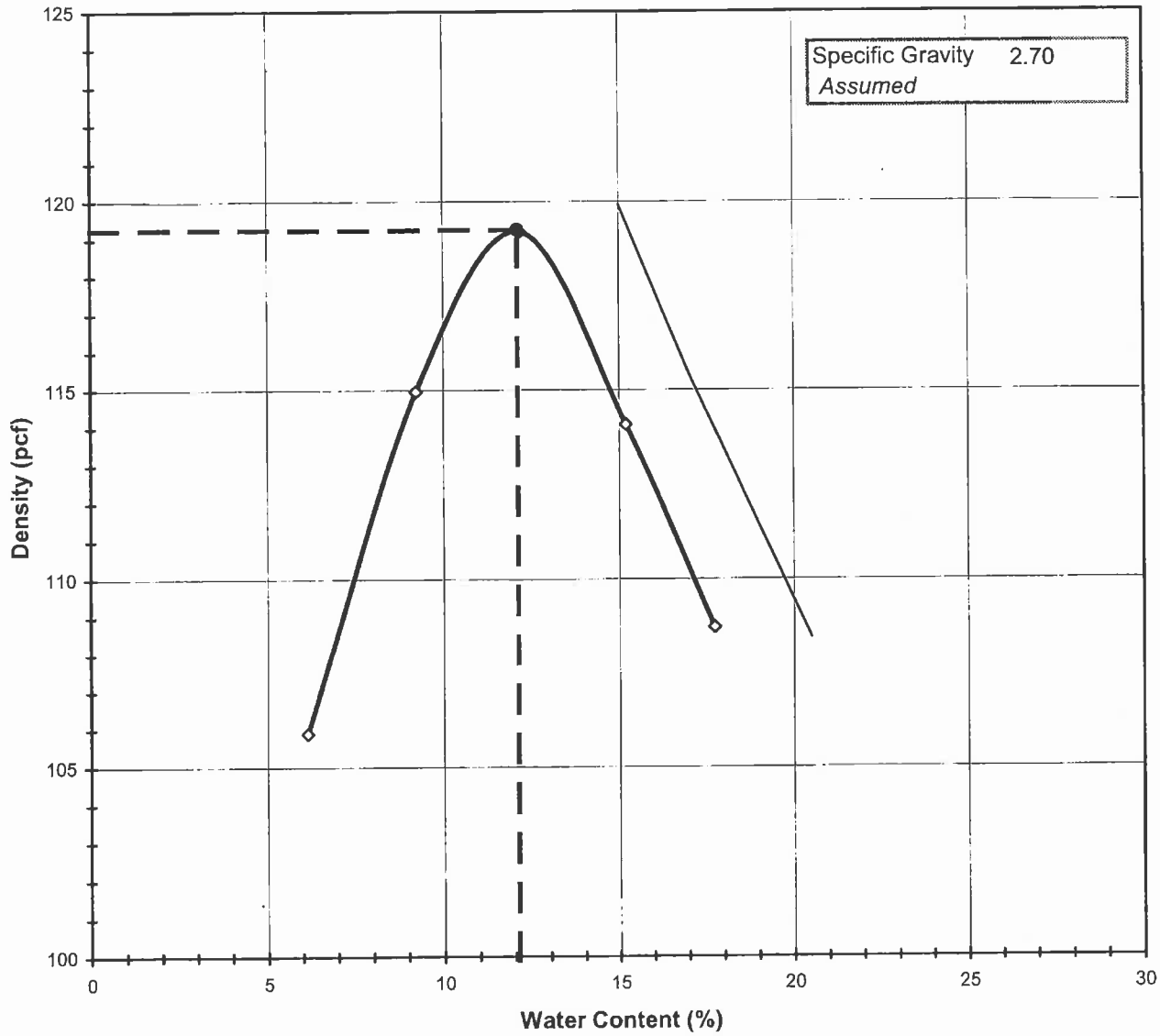
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-01
Client Reference	JOHNSTON CO. PH.4A CELL 3	Depth (ft)	NA
Project No.	2009-610-01	Sample No.	NA
Lab ID	2009-610-01-01	Test Method	**STANDARD**

Visual Description: ORANGE CLAYEY SAND

Optimum Water Content 12.1
Maximum Dry Density 119.3



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DCN:CT-S12 DATE:12/11/00 REVISION 5

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-01
Client Reference	JOHNSTON CO. PH.4A CELL 3	Depth (ft)	NA
Project No.	2009-610-01	Sample No.	NA
Lab ID	2009-610-01-01		

Visual Description: ORANGE CLAYEY SAND

Total Weight of the Sample (gm)	15093
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6009	6207	6329	6294	6243
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1688	1886	2008	1974	1923
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	398	308	312	301	300
Wt. of Tare & WS (gm)	490.00	540.50	496.40	410.50	643.20
Wt. of Tare & DS (gm)	466.57	504.24	451.71	367.48	563.01
Wt. of Tare (gm)	84.60	111.60	84.60	84.40	110.90
Wt. of Water (gm)	23.43	36.26	44.69	43.02	80.19
Wt. of DS (gm)	381.97	392.64	367.11	283.08	452.11
Wet Density (gm/cc)	1.80	2.01	2.14	2.11	2.05
Wet Density (pcf)	112.4	125.6	133.7	131.4	128.0
Moisture Content (%)	**6.1**	**9.2**	**12.2**	**15.2**	**17.7**
Dry Density (pcf)	**105.9**	**115.0**	**119.2**	**114.1**	**108.7**

Zero Air Voids

Moisture Content (%)	15.0	17.0	20.5
Dry Unit Weight (pcf)	119.9	115.5	108.5

Tested By SD *Date* 1/26/2009 *Checked By* GEM *Date* 1-28-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

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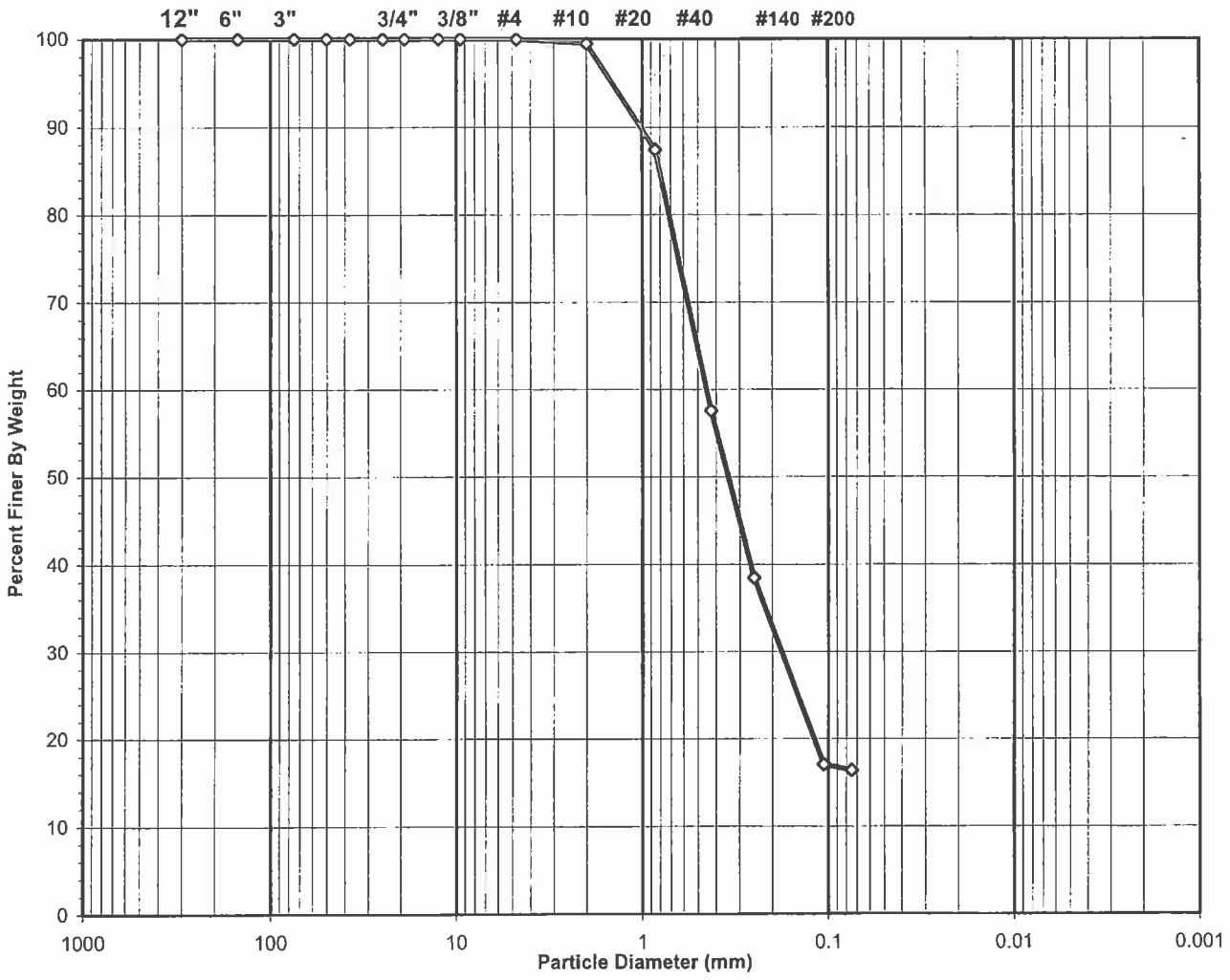
geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	SF-02
Client Reference	JOHNSTON CO. PH 4A CELL3	Depth (ft)	NA
Project No.	2009-610-02	Sample No.	NA
Lab ID	2009-610-02-01	Soil Color	**ORANGE**

	SIEVE ANALYSIS		HYDROMETER
USCS	gravel	sand	silt and clay



USCS Symbol ***SC-SM, TESTED***

USCS Classification ***SILTY, CLAYEY SAND***

Tested By SD Date 1/30/2009 Checked By Gem Date 2-3-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-02-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	SF-02
Client Reference	JOHNSTON CO. PH 4A CELL3	Depth (ft)	NA
Project No.	2009-610-02	Sample No.	NA
Lab ID	2009-610-02-01	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	216	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	698.67	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	643.72	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	170.76	Weight of Tare (gm)	NA
Weight of Water (gm)	54.95	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	472.96	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**11.6**	**Moisture Content (%)**	NA

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	472.96
Dry Weight - 3/4" Sample (gm)	395.5	Weight of minus #200 material (gm)	77.48
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	395.48
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	0.12	0.0	0.0	100.0	**100.0**
#10	2.00	2.41	0.5	0.5	99.5	**99.5**
#20	0.850	57.08	12.1	12.6	87.4	**87.4**
#40	0.425	141.14	29.8	42.4	57.6	**57.6**
#60	0.250	90.37	19.1	61.6	38.4	**38.4**
#140	0.106	101.16	21.4	82.9	17.1	**17.1**
#200	0.075	3.20	0.7	83.6	16.4	**16.4**
Pan	-	77.48	16.4	100.0	-	-

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	SF-02
Client Reference	JOHNSTON CO. PH 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-02	Sample No.	NA
Lab ID	2009-610-02-01	Soil Description	**ORANGE SILTY CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

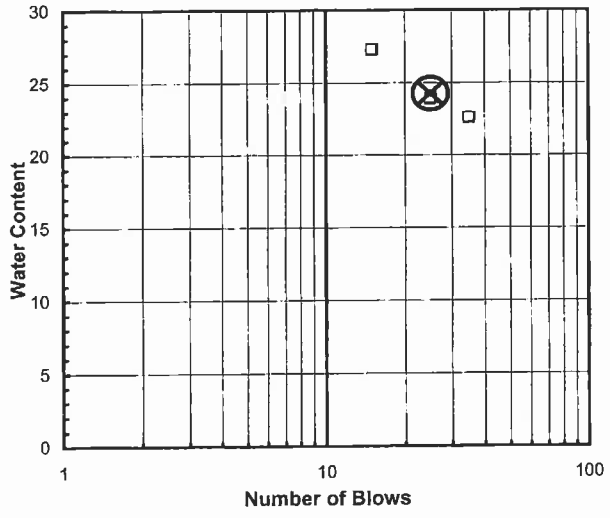
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	G	R	A	**U**
Wt. of Tare & WS (gm)	27.05	28.30	27.38	**L**
Wt. of Tare & DS (gm)	23.56	24.94	24.35	**T**
Wt. of Tare (gm)	10.76	10.88	10.94	**I**
Wt. of Water (gm)	3.5	3.4	3.0	**P**
Wt. of DS (gm)	12.8	14.1	13.4	**O**
				I
Moisture Content (%)	**27.3**	**23.9**	**22.6**	**N**
Number of Blows	**15**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-I	A-O	
Wt. of Tare & WS (gm)	22.72	21.91	
Wt. of Tare & DS (gm)	21.56	20.86	
Wt. of Tare (gm)	15.48	15.44	
Wt. of Water (gm)	1.2	1.1	
Wt. of DS (gm)	6.1	5.4	
Moisture Content (%)	**19.1**	**19.4**	**-0.3**

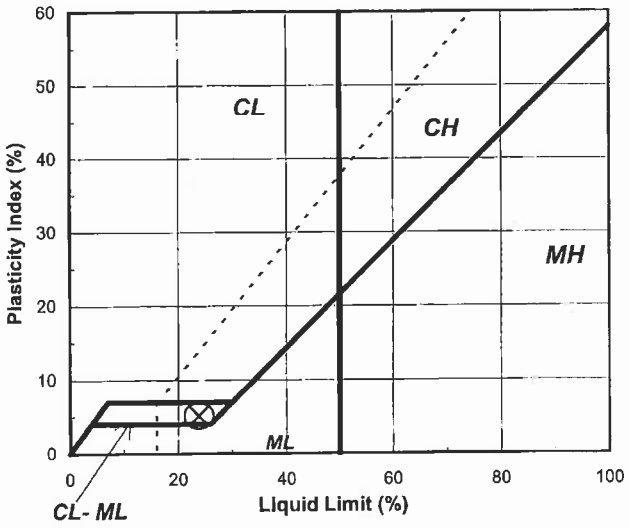
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**24**
Plastic Limit (%)	**19**
Plasticity Index (%)	**5**
USCS Symbol	**CL-ML**

Flow Curve



Plasticity Chart



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Geotechnics
INTEGRITY IN TESTING

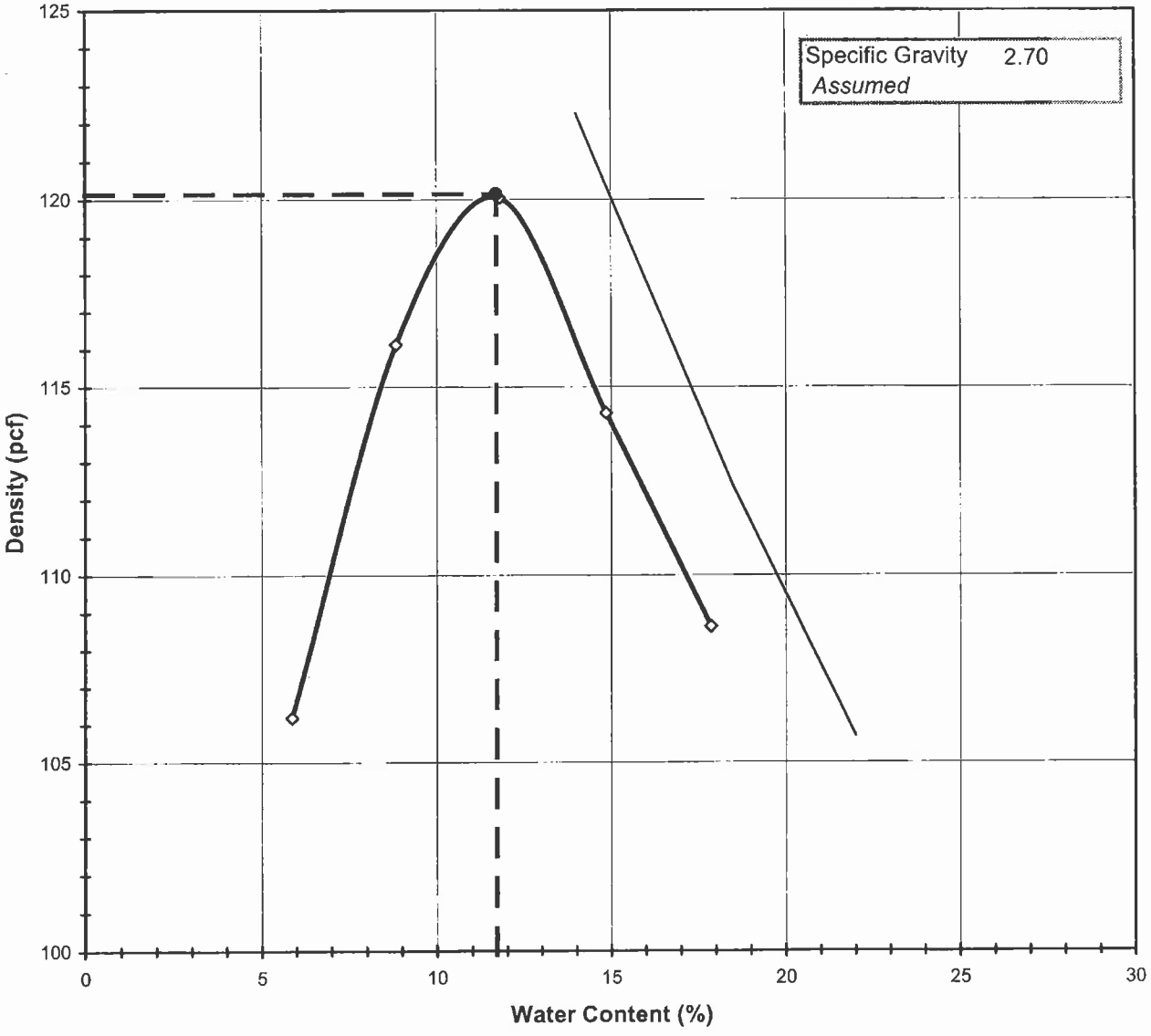
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-02
Client Reference	JOHNSTON CO. PH 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-02	Sample No.	NA
Lab ID	2009-610-02-01	Test Method	**STANDARD**

Visual Description ORANGE SILTY CLAYEY SAND

Optimum Water Content **11.7**
Maximum Dry Density **120.1**



Tested By SD *Date* 1/30/2009 *Checked By* GEM *Date* 2-3-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-02-01 Proctor.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-02
Client Reference	JOHNSTON CO. PH 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-02	Sample No.	NA
Lab ID	2009-610-02-01		

Visual Description: ORANGE SILTY CLAYEY SAND

Total Weight of the Sample (gm)	16553
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4321
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	6009	6219	6336	6293	6244
Wt.of Mold (gm)	4321	4321	4321	4321	4321
Wt. of WS	1689	1899	2016	1972	1923
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	311	301	399	315	303
Wt. of Tare & WS (gm)	484.00	461.20	559.70	593.80	606.50
Wt. of Tare & DS (gm)	461.83	430.57	509.80	531.18	531.45
Wt. of Tare (gm)	84.10	84.00	87.00	110.00	111.30
Wt. of Water (gm)	22.17	30.63	49.90	62.62	75.05
Wt. of DS (gm)	377.73	346.57	422.80	421.18	420.15

Wet Density (gm/cc)	1.80	2.03	2.15	2.10	2.05
Wet Density (pcf)	112.4	126.4	134.2	131.3	128.0
Moisture Content (%)	**5.9**	**8.8**	**11.8**	**14.9**	**17.9**
Dry Density (pcf)	**106.2**	**116.1**	**120.0**	**114.3**	**108.6**

Zero Air Voids

Moisture Content (%)	14.0	18.5	22.0
Dry Unit Weight (pcf)	122.3	112.4	105.7

Tested By SD *Date* 1/30/2009 *Checked By* GEM *Date* 2-3-09

DCN:CT-S12 DATE:12/11/00 REVISION 5

\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-02-01 Proctor.XLS]Sheet1

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Geotechnics
INTEGRITY IN TESTING

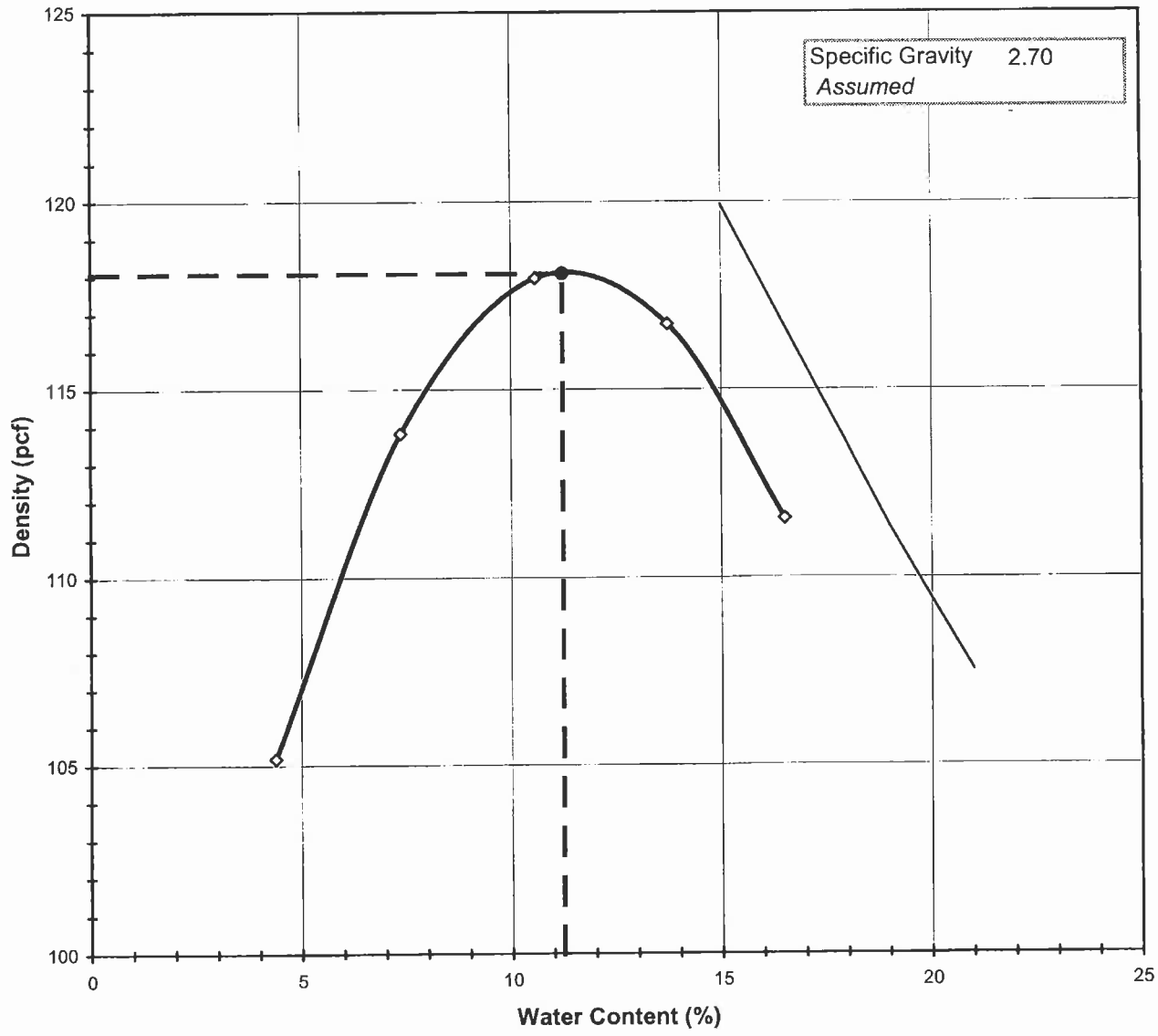
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	SF-03
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	LIFT 3
Project No.	6009-610-03	Sample No.	NA
Lab ID	2009-610-03-01	Test Method	**STANDARD**

Visual Description ORANGE SAND

Optimum Water Content **11.2**
Maximum Dry Density **118.1**



Tested By SD *Date* 2/6/2009 *Checked By* Gen *Date* 2-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-03-01 PROCTOR.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	SF-03
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	LIFT 3
Project No.	6009-610-03	Sample No.	NA
Lab ID	2009-610-03-01		

Visual Description: ORANGE SAND

Total Weight of the Sample (gm)	25523
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5969	6156	6280	6314	6273
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1649	1836	1959	1994	1953
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	310	314	303	399	301
Wt. of Tare & WS (gm)	459.20	526.90	551.10	641.60	735.50
Wt. of Tare & DS (gm)	444.55	496.57	508.99	574.72	643.19
Wt. of Tare (gm)	110.10	84.80	111.10	87.40	84.20
Wt. of Water (gm)	14.65	30.33	42.11	66.88	92.31
Wt. of DS (gm)	334.45	411.77	397.89	487.32	558.99
Wet Density (gm/cc)	1.76	1.96	2.09	2.13	2.08
Wet Density (pcf)	109.8	122.2	130.4	132.8	130.0
Moisture Content (%)	**4.4**	**7.4**	**10.6**	**13.7**	**16.5**
Dry Density (pcf)	**105.2**	**113.8**	**118.0**	**116.7**	**111.6**

Zero Air Voids

Moisture Content (%)	15.0	19.0	21.0
Dry Unit Weight (pcf)	119.9	111.4	107.5

Tested By SD *Date* 2/6/2009 *Checked By* GEM *Date* 2-9-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-03-01 PROCTOR.XLS]Sheet1*

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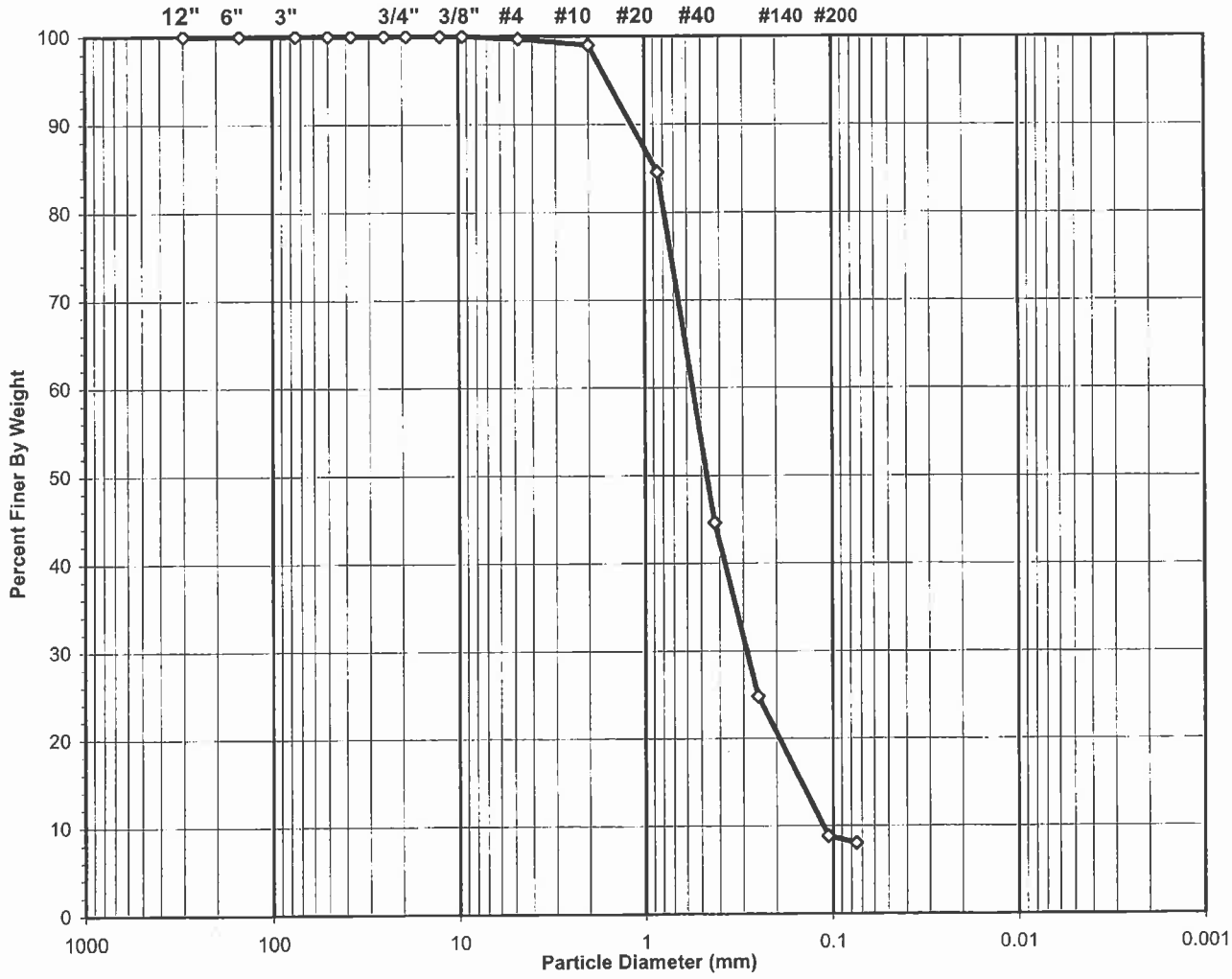
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	SF-04
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	BORROW
Lab ID	2009-610-04-01	Soil Color	**ORANGE TAN**

	SIEVE ANALYSIS		HYDROMETER
USCS	gravel	sand	silt and clay



USCS Symbol	*SP-SM, TESTED*	D60 =	0.6	CC =	1.3
USCS Classification	*POORLY GRADED SAND WITH SILT*	D30 =	0.3	CU =	4.9
		D10 =	0.1		

Tested By SD Date 2/13/2009 Checked By GZM Date 2-18-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	SF-04
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	BORROW
Lab ID	2009-610-04-01	Soil Color	**ORANGE TAN**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	216	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	646.93	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	616.51	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	170.91	Weight of Tare (gm)	NA
Weight of Water (gm)	30.42	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	445.60	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**6.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	445.60
Dry Weight - 3/4" Sample (gm)	409.8	Weight of minus #200 material (gm)	35.83
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	409.77
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.37	0.3	0.3	99.7	**99.7**
#10	2.00	3.11	0.7	1.0	99.0	**99.0**
#20	0.850	64.58	14.5	15.5	84.5	**84.5**
#40	0.425	177.64	39.9	55.4	44.6	**44.6**
#60	0.250	88.24	19.8	75.2	24.8	**24.8**
#140	0.106	71.33	16.0	91.2	8.8	**8.8**
#200	0.075	3.50	0.8	92.0	8.0	**8.0**
Pan	-	35.83	8.0	100.0	-	-

Tested By SD Date 2/13/2009 Checked By GEM Date 2-18-09

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	R.S.G & ASSOCIATES	Boring No.	SF-04
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	BORROW
Lab ID	2009-610-04-01	Soil Description	**ORANGE TAN SILT**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

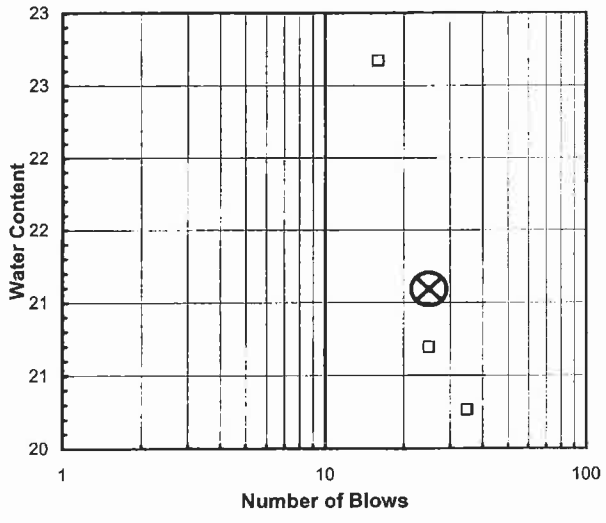
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	L	A-P	V	**U**
Wt. of Tare & WS (gm)	31.14	31.33	28.96	**L**
Wt. of Tare & DS (gm)	28.20	28.63	26.65	**T**
Wt. of Tare (gm)	15.23	15.58	15.25	**I**
Wt. of Water (gm)	2.9	2.7	2.3	**P**
Wt. of DS (gm)	13.0	13.1	11.4	**O**
				I
Moisture Content (%)	**22.7**	**20.7**	**20.3**	**N**
Number of Blows	**16**	**25**	**35**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-K	A-L	
Wt. of Tare & WS (gm)	23.16	22.03	
Wt. of Tare & DS (gm)	21.94	20.99	
Wt. of Tare (gm)	15.56	15.52	
Wt. of Water (gm)	1.2	1.0	
Wt. of DS (gm)	6.4	5.5	
Moisture Content (%)	**19.1**	**19.0**	**0.1**

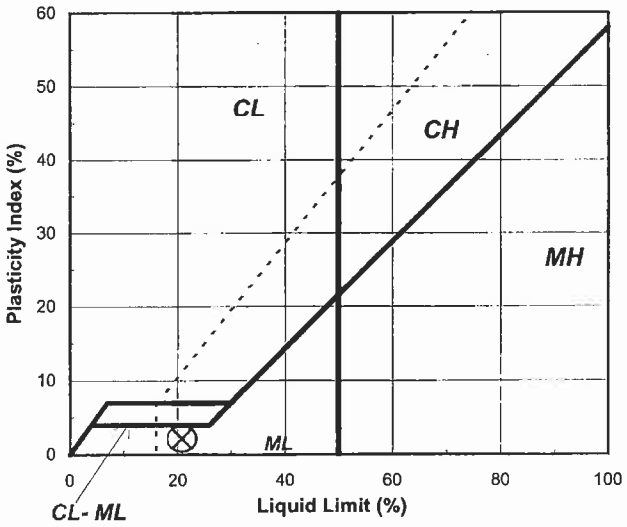
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**21**
Plastic Limit (%)	**19**
Plasticity Index (%)	**2**
USCS Symbol	**ML**

Flow Curve



Plasticity Chart



Tested By SD *Date* 2/13/2009 *Checked By* JBD *Date* 2-16-09

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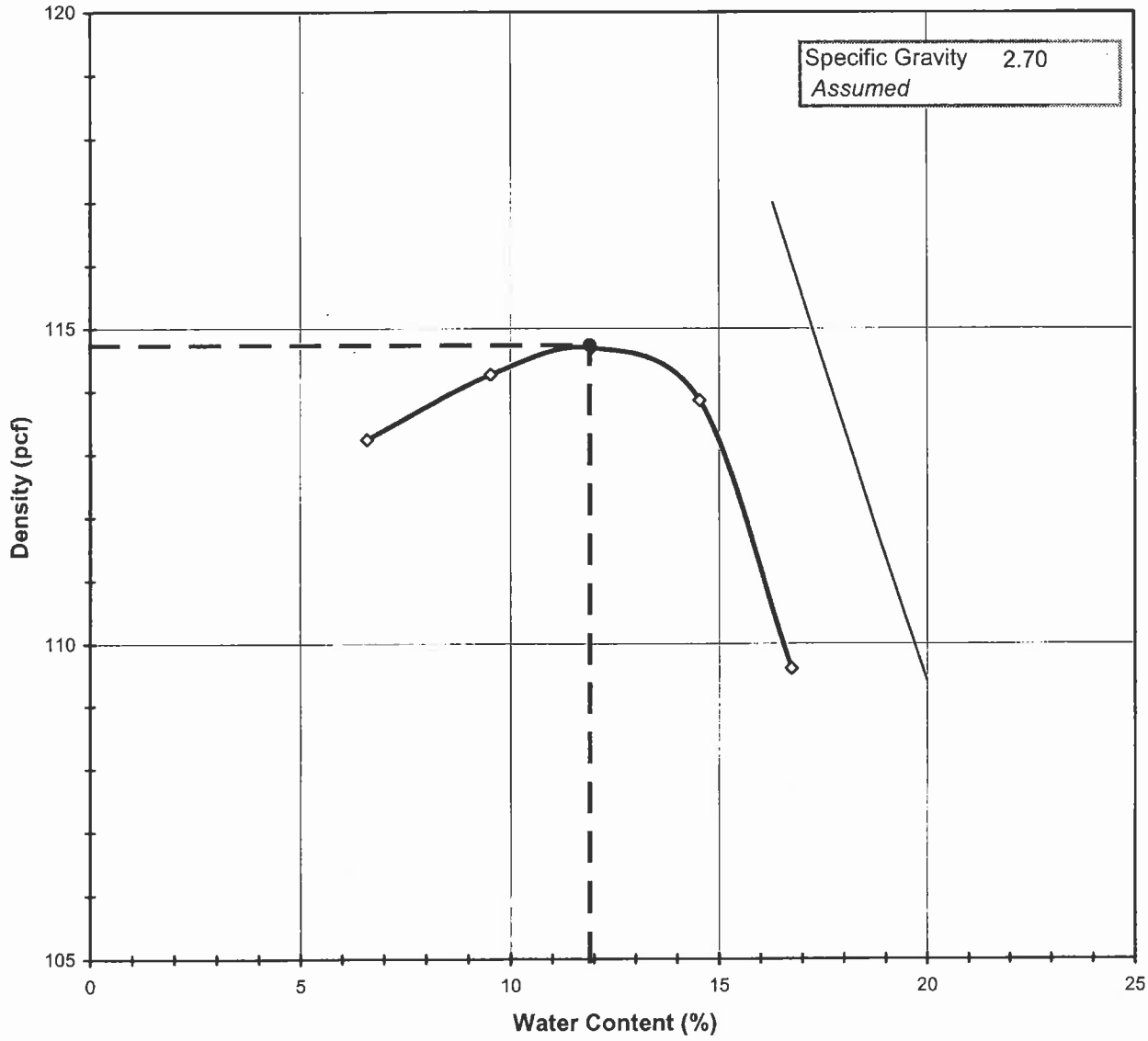
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	SF-04
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	BORROW
Lab ID	2009-610-04-01	Test Method	**STANDARD**

Visual Description ORANGE/TAN SAND

Optimum Water Content **11.9**
Maximum Dry Density **114.7**



Tested By SD *Date* 2/13/2009 *Checked By* GEM *Date* 2-17-09

DCN:CT-S12 DATE: 6-25-98 REVISION 3

#N/A

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	R.S.G. & ASSOCIATES	Boring No.	SF-04
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	BORROW
Lab ID	2009-610-04-01		

Visual Description: ORANGE/TAN SAND

Total Weight of the Sample (gm)	NA
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType	STANDARD
Rammer Weight (lbs)	5.5
Rammer Drop (in)	12
Rammer Type	MECH
Machine ID	R174
Mold ID	R172
Mold diameter	4"
Weight of the Mold	4320
Volume of the Mold(cc)	937

Mold / Specimen

Point No.	1	2	3	4	5
Wt. of Mold & WS (gm)	6133	6200	6249	6279	6242
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1813	1880	1929	1959	1922
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	306	315	310	318	303
Wt. of Tare & WS (gm)	485.30	557.00	496.00	541.70	756.70
Wt. of Tare & DS (gm)	460.74	518.15	454.82	483.94	664.10
Wt. of Tare (gm)	88.60	110.50	110.10	86.70	111.00
Wt. of Water (gm)	24.56	38.85	41.18	57.76	92.60
Wt. of DS (gm)	372.14	407.65	344.72	397.24	553.10
Wet Density (gm/cc)	1.93	2.01	2.06	2.09	2.05
Wet Density (pcf)	120.7	125.2	128.4	130.4	128.0
Moisture Content (%)	**6.6**	**9.5**	**11.9**	**14.5**	**16.7**
Dry Density (pcf)	**113.2**	**114.3**	**114.7**	**113.9**	**109.6**

Zero Air Voids

Moisture Content (%)	16.3	18.8	20.0
Dry Unit Weight (pcf)	117.0	111.8	109.4

Tested By SD *Date* 2/13/2009 *Checked By* GEM *Date* 2-17-09

DCN:CT-S12 DATE: 6-25-98 REVISION 3

#N/A

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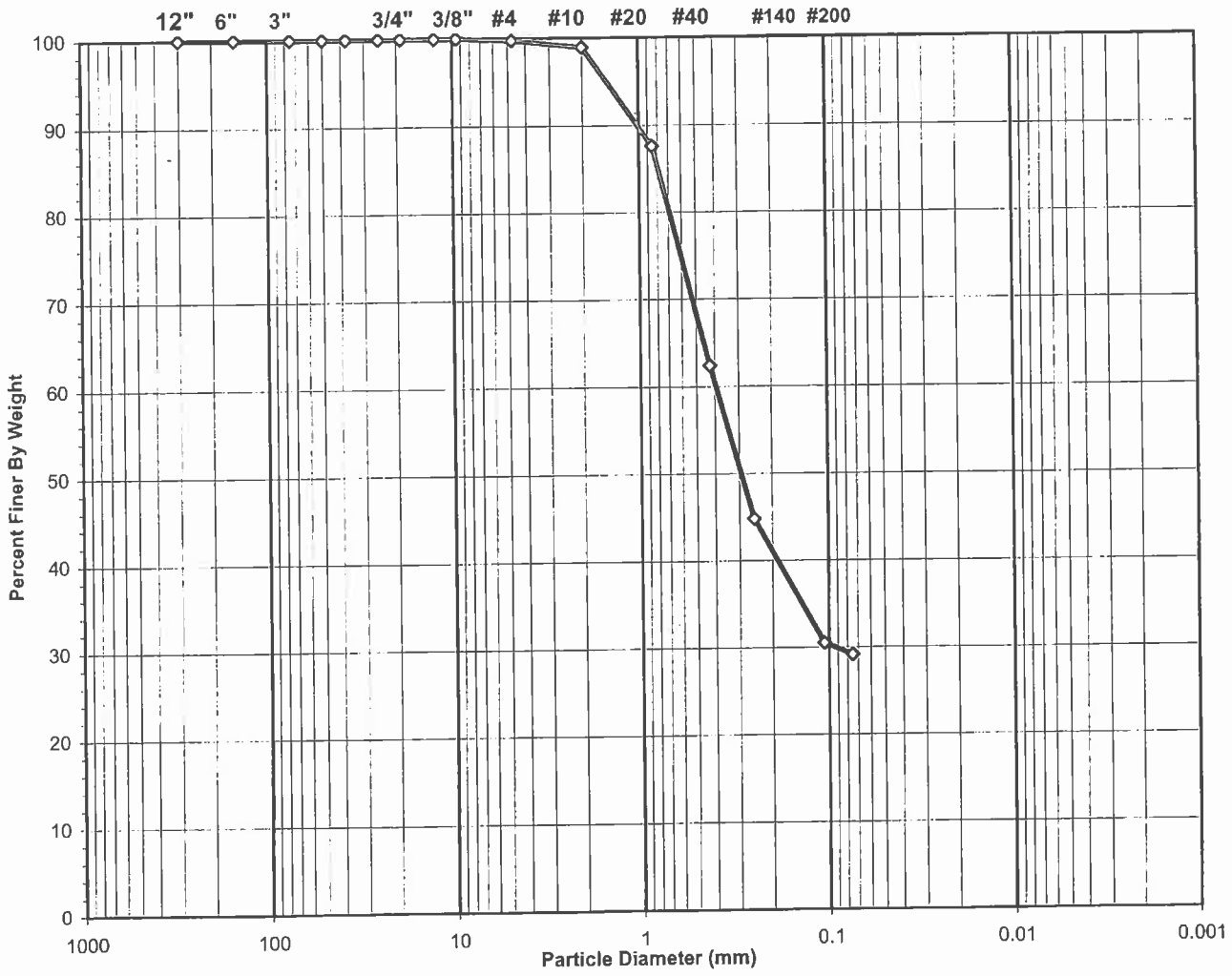
Geotechnics
INTEGRITY IN TESTING

SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	SF-05
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	INT. COVER
Lab ID	2009-610-04-02	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By SD Date 2/13/2009 Checked By GEM Date 2-17-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-02 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	SF-05
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	INT. COVER
Lab ID	2009-610-04-02	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	843	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	799.24	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	737.84	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	262.25	Weight of Tare (gm)	NA
Weight of Water (gm)	61.40	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	475.59	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**12.9**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	475.59
Dry Weight - 3/4" Sample (gm)	337.1	Weight of minus #200 material (gm)	138.53
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	337.06
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.13	0.2	0.2	99.8	**99.8**
#10	2.00	3.97	0.8	1.1	98.9	**98.9**
#20	0.850	53.82	11.3	12.4	87.6	**87.6**
#40	0.425	119.96	25.2	37.6	62.4	**62.4**
#60	0.250	83.56	17.6	55.2	44.8	**44.8**
#140	0.106	68.17	14.3	69.5	30.5	**30.5**
#200	0.075	6.45	1.4	70.9	29.1	**29.1**
Pan	-	138.53	29.1	100.0	-	-

Tested By SD Date 2/13/2009 Checked By GLM Date 2-17-09

DCN: CT-S3C DATE 6-25-98 REVISION: 2 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-02 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	R.S.G. & ASSOCIATES	Boring No.	SF-05
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-04	Sample No.	INT. COVER
Lab ID	2009-610-04-02	Soil Description	**ORANGE LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description. (Minus No. 40 sieve material, Airdried)

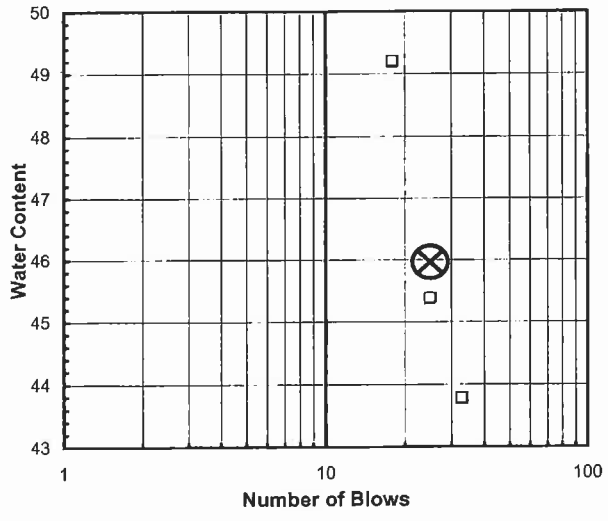
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	P	M	F	
Wt. of Tare & WS (gm)	27.21	27.57	29.07	
Wt. of Tare & DS (gm)	23.25	23.69	24.82	
Wt. of Tare (gm)	15.20	15.14	15.11	
Wt. of Water (gm)	4.0	3.9	4.3	
Wt. of DS (gm)	8.1	8.6	9.7	
Moisture Content (%)	**49.2**	**45.4**	**43.8**	
Number of Blows	**18**	**25**	**33**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	B	A-H	
Wt. of Tare & WS (gm)	22.18	21.89	
Wt. of Tare & DS (gm)	20.91	20.78	
Wt. of Tare (gm)	15.19	15.54	
Wt. of Water (gm)	1.3	1.1	
Wt. of DS (gm)	5.7	5.2	
Moisture Content (%)	**22.2**	**21.2**	**1.0**

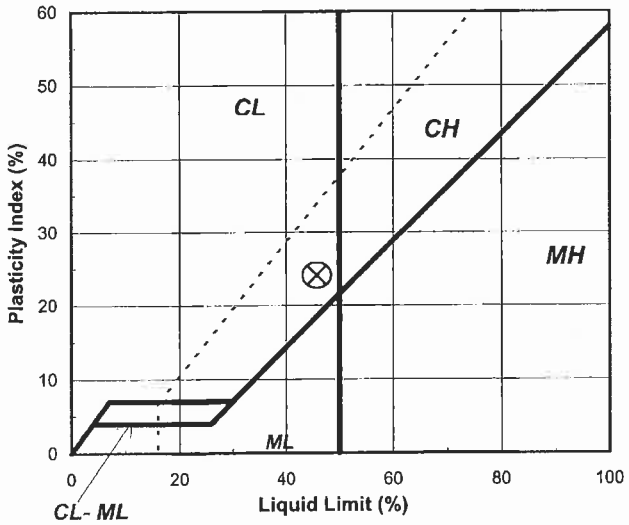
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**22**
Plasticity Index (%)	**24**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 2/12/2009 *Checked By* GBM *Date* 2-17-09

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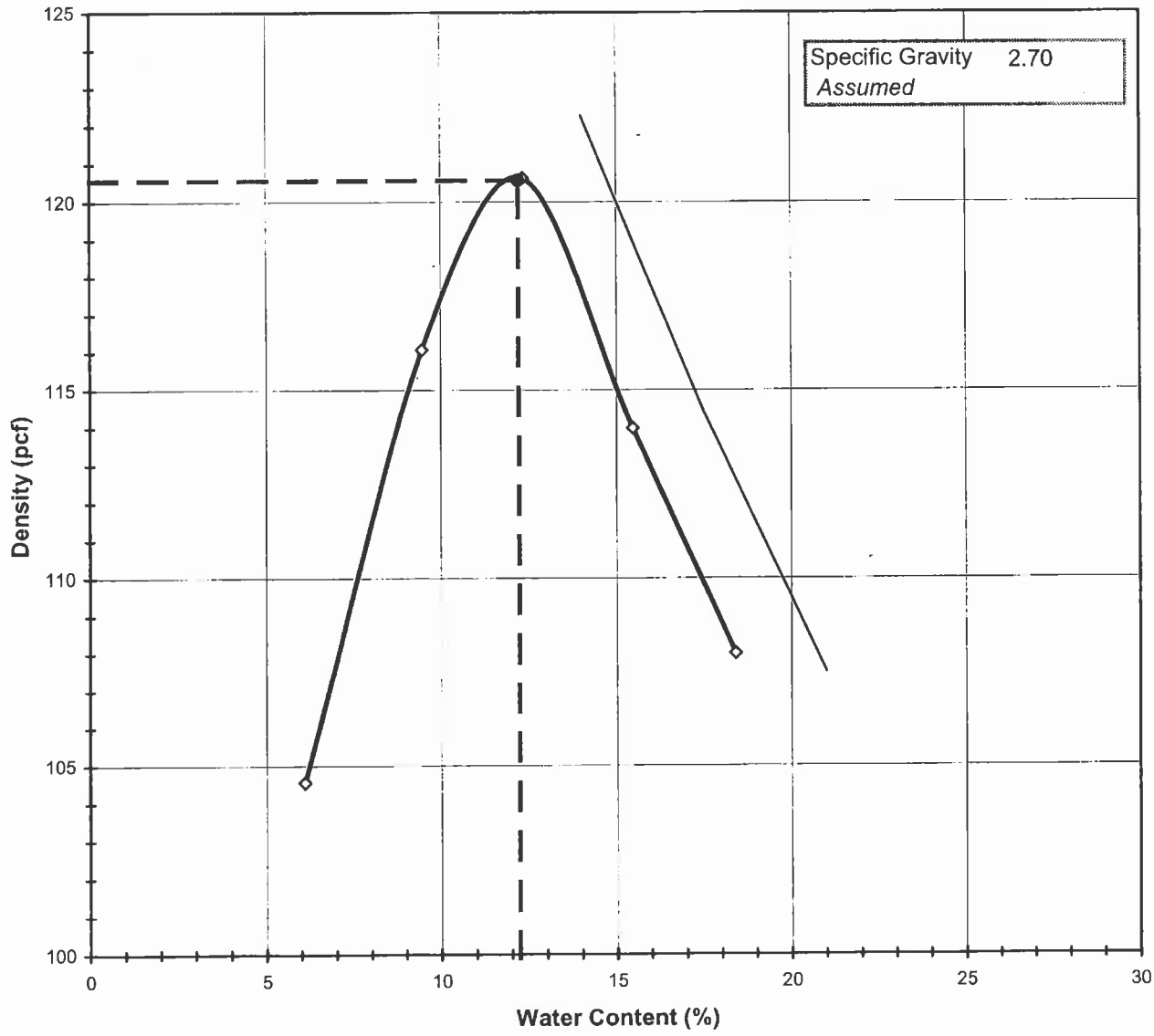
MOISTURE DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-05
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2008-610-04	Sample No.	INT. COVER
Lab ID	2008-610-04-02	Test Method	**STANDARD**

Visual Description ORANGE CLAYEY SAND

Optimum Water Content **12.2**
Maximum Dry Density **120.6**



Tested By SD *Date* 2/13/2009 *Checked By* GEM *Date* 2-17-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-02 Proctor.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

MOISTURE - DENSITY RELATIONSHIP

ASTM D698-91 SOP-S12

Client	RSG & ASSOCIATES	Boring No.	SF-05
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2008-610-04	Sample No.	INT. COVER
Lab ID	2008-610-04-02		

Visual Description: ORANGE CLAYEY SAND

Total Weight of the Sample (gm)	21883
As Received Water Content(%)	NA
Assumed Specific Gravity	2.70
Percent Retained on 3/4"	NA
Percent Retained on 3/8"	NA
Percent Retained on #4	NA
Oversize Material	Not included
Procedure Used	A

TestType		**STANDARD**
Rammer Weight (lbs)		5.5
Rammer Drop (in)		12
Rammer Type		MECHANICAL
Machine ID	R	174
Mold ID	R	172
Mold diameter		4"
Weight of the Mold		4320
Volume of the Mold(cc)		937

Mold / Specimen

Point No.	**1**	**2**	**3**	**4**	**5**
Wt. of Mold & WS (gm)	5986	6229	6355	6297	6241
Wt.of Mold (gm)	4320	4320	4320	4320	4320
Wt. of WS	1666	1909	2035	1977	1921
Mold Volume (cc)	937	937	937	937	937

Moisture Content / Density

Tare Number	314	301	399	309	304
Wt. of Tare & WS (gm)	556.90	544.20	593.20	502.90	618.70
Wt. of Tare & DS (gm)	529.78	504.41	537.48	450.24	539.76
Wt. of Tare (gm)	84.90	84.10	86.00	109.80	110.80
Wt. of Water (gm)	27.12	39.79	55.72	52.66	78.94
Wt. of DS (gm)	444.88	420.31	451.48	340.44	428.96
Wet Density (gm/cc)	1.78	2.04	2.17	2.11	2.05
Wet Density (pcf)	110.9	127.1	135.5	131.6	127.9
Moisture Content (%)	**6.1**	**9.5**	**12.3**	**15.5**	**18.4**
Dry Density (pcf)	**104.6**	**116.1**	**120.6**	**114.0**	**108.0**

Zero Air Voids

Moisture Content (%)	14.0	17.5	21.0
Dry Unit Weight (pcf)	122.3	114.4	107.5

Tested By SD *Date* 2/13/2009 *Checked By* GEM *Date* 2-17-09

DCN:CT-S12 DATE:12/11/00 REVISION 5 *\\Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-02 Proctor.XLS]Sheet1*

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STRUCTURAL FILL
RECORD TEST SUMMARY

Project Name: Johnston County MSWLF - Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J Enterprises

In-Place Moisture-Density Test Results:

Test Number	Date	Test Method*	In-Situ Values		Reference Values (ASTM D 698)		Compaction (%)	Difference From Optimum Moisture (%)	Pass/Fail	Location/Comment
			Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
1	1/28 - 2/5/09	N	116.2	12.8	119.3	12.1	97	0.7	PASS	See Sketch
2	1/28 - 2/5/09	N	116.0	13.1	119.3	12.1	97	1.0	PASS	See Sketch
DC-2	1/28 - 2/5/09	DC	120.3	11.9	119.3	12.1	101	-0.2	PASS	See Sketch
3	1/28 - 2/5/09	N	114.9	13.8	119.3	12.1	96	1.7	PASS	See Sketch
4	1/28 - 2/5/09	N	115.4	10.7	119.3	12.1	97	-1.4	PASS	See Sketch
DC-3	1/28 - 2/5/09	DC	119.0	10.3	119.3	12.1	100	-1.8	PASS	See Sketch
5	1/28 - 2/5/09	N	113.4	11.6	119.3	12.1	95	-0.5	PASS	See Sketch
6	1/28 - 2/5/09	N	115.3	12.5	119.3	12.1	97	0.4	PASS	See Sketch
7	1/28 - 2/5/09	N	114.0	13.2	119.3	12.1	96	1.1	PASS	See Sketch
8	1/28 - 2/5/09	N	113.9	14.3	119.3	12.1	95	2.2	PASS	See Sketch
9	1/28 - 2/5/09	N	113.3	13.4	119.3	12.1	95	1.3	PASS	See Sketch
10	1/28 - 2/5/09	N	113.7	12.7	119.3	12.1	95	0.6	PASS	See Sketch
11	1/28 - 2/5/09	N	114.4	13.4	119.3	12.1	96	1.3	PASS	See Sketch
12	1/28 - 2/5/09	N	113.8	12.3	119.3	12.1	95	0.2	PASS	See Sketch
13	1/28 - 2/5/09	N	114.7	12.8	119.3	12.1	96	0.7	PASS	See Sketch
DC-4	1/28 - 2/5/09	DC	114.8	11.9	119.3	12.1	96	-0.2	PASS	See Sketch
14	1/28 - 2/5/09	N	114.9	13.2	119.3	12.1	96	1.1	PASS	See Sketch
15	2/9 - 2/13/09	N	113.8	9.2	118.1	11.2	96	-2.0	PASS	See Sketch
16	2/9 - 2/13/09	N	112.9	12.9	118.1	11.2	96	1.7	PASS	See Sketch
17	2/9 - 2/13/09	N	118.9	8.7	118.1	11.2	101	-2.5	PASS	See Sketch
DC-5	2/9 - 2/13/09	DC	117.7	9.1	118.1	11.2	100	-2.1	PASS	See Sketch
18	2/9 - 2/13/09	N	111.7	12.4	118.1	11.2	95	1.2	PASS	See Sketch
19	2/9 - 2/13/09	N	112.9	11.7	118.1	11.2	96	0.5	PASS	See Sketch
20	2/9 - 2/13/09	N	117.5	8.4	118.1	11.2	99	-2.8	PASS	See Sketch
21	2/9 - 2/13/09	N	115.4	10.7	118.1	11.2	98	-0.5	PASS	See Sketch
22	2/9 - 2/13/09	N	114.4	13.2	118.1	11.2	97	2.0	PASS	See Sketch
23	2/9 - 2/13/09	N	112.2	14.0	118.1	11.2	95	2.8	PASS	See Sketch
24	2/9 - 2/13/09	N	116.7	14.1	118.1	11.2	99	2.9	PASS	See Sketch
25	2/9 - 2/13/09	N	112.2	10.7	118.1	11.2	95	-0.5	PASS	See Sketch

Test Number	Date	Test Method*	In-Situ Values		Reference Values (ASTM D 698)		Compaction (%)	Difference From Optimum Moisture (%)	Pass/Fail	Location/Comment
			Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
26	2/9 - 2/13/09	N	113.4	16.6	118.1	11.2	96	5.4	PASS	See Sketch
27	2/9 - 2/13/09	N	116.7	15.2	118.1	11.2	99	4.0	PASS	See Sketch
28	2/9 - 2/13/09	N	113.3	12.5	118.1	11.2	96	1.3	PASS	See Sketch
29	2/9 - 2/13/09	N	112.3	6.9	118.1	11.2	95	-4.3	PASS	See Sketch
30	2/9 - 2/13/09	N	111.6	9.0	118.1	11.2	95	-2.2	PASS	See Sketch
31	2/9 - 2/13/09	N	114.0	8.4	118.1	11.2	97	-2.8	PASS	See Sketch
32	2/9 - 2/13/09	N	117.5	10.7	118.1	11.2	99	-0.5	PASS	See Sketch
DC-6	2/9 - 2/13/09	DC	117.6	10.5	118.1	11.2	100	-0.7	PASS	See Sketch
33	2/9 - 2/13/09	N	112.0	11.1	118.1	11.2	95	-0.1	PASS	See Sketch
34	2/9 - 2/13/09	N	115.0	11.0	118.1	11.2	97	-0.2	PASS	See Sketch
35	2/16/09	N	112.6	9.4	118.1	11.2	95	-1.8	PASS	See Sketch
DC-7	2/16/09	DC	113.3	9.4	118.1	11.2	96	-1.8	PASS	See Sketch
36	2/16/09	N	113.2	7.4	118.1	11.2	96	-3.8	PASS	See Sketch
37	2/16/09	N	112.1	9.3	118.1	11.2	95	-1.9	PASS	See Sketch
38	2/16/09	N	112.8	13.9	118.1	11.2	96	2.7	PASS	See Sketch
39	2/16/09	N	112.5	9.2	118.1	11.2	95	-2.0	PASS	See Sketch
40	2/16/09	N	112.3	9.5	118.1	11.2	95	-1.7	PASS	See Sketch
41	2/16/09	N	117.6	10.4	118.1	11.2	100	-0.8	PASS	See Sketch
42	2/16/09	N	112.3	9.4	118.1	11.2	95	-1.8	PASS	See Sketch
43	2/16/09	N	118.7	12.2	118.1	11.2	101	1.0	PASS	See Sketch
44	2/26/09	N	112.4	12.0	118.1	11.2	95	0.8	PASS	See Sketch
45	2/26/09	N	112.5	8.2	118.1	11.2	95	-3.0	PASS	See Sketch
46	2/26/09	N	116.7	15.0	118.1	11.2	99	3.8	PASS	See Sketch
47	2/26/09	N	114.4	10.7	118.1	11.2	97	-0.5	PASS	See Sketch
48	2/26/09	N	111.8	13.3	118.1	11.2	95	2.1	PASS	See Sketch
49	2/26/09	N	111.8	11.2	118.1	11.2	95	0.0	PASS	See Sketch
50	2/26/09	N	112.8	11.3	118.1	11.2	96	0.1	PASS	See Sketch
51	2/26/09	N	113.7	9.6	118.1	11.2	96	-1.6	PASS	See Sketch
52	3/10/09	N	115.4	10.9	118.1	11.2	98	-0.3	PASS	See Sketch
DC-8	3/10/09	DC	117.9	9.8	118.1	11.2	100	-1.4	PASS	See Sketch
53	3/10/09	N	120.0	10.4	118.1	11.2	102	-0.8	PASS	See Sketch
54	3/10/09	N	118.4	10.0	118.1	11.2	100	-1.2	PASS	See Sketch
55	3/10/09	N	121.9	10.2	118.1	11.2	103	-1.0	PASS	See Sketch
56	3/10/09	N	116.3	10.9	118.1	11.2	98	-0.3	PASS	See Sketch
57	3/10/09	N	114.4	11.6	118.1	11.2	97	0.4	PASS	See Sketch
58	3/10/09	N	122.7	12.5	118.1	11.2	104	1.3	PASS	See Sketch
DC-9	3/10/09	DC	122.3	12.5	118.1	11.2	104	1.3	PASS	See Sketch
59	3/10/09	N	122.6	10.4	118.1	11.2	104	-0.8	PASS	See Sketch
60	3/10/09	N	113.3	10.2	118.1	11.2	96	-1.0	PASS	See Sketch

Test Number	Date	Test Method*	In-Situ Values		Reference Values (ASTM D 698)		Compaction (%)	Difference From Optimum Moisture (%)	Pass/Fail	Location/Comment
			Dry Density (pcf)	Moisture Content (%)	Maximum Dry Density (pcf)	Optimum Moisture Content (%)				
61	3/10/09	N	120.7	12.3	118.1	11.2	102	1.1	PASS	See Sketch
62	3/10/09	N	115.6	11.4	118.1	11.2	98	0.2	PASS	See Sketch
63	3/10/09	N	121.2	11.1	118.1	11.2	103	-0.1	PASS	See Sketch
64	3/10/09	N	121.7	12.0	118.1	11.2	103	0.8	PASS	See Sketch
65	3/10/09	N	119.7	10.2	118.1	11.2	101	-1.0	PASS	See Sketch
66	3/10/09	N	120.7	11.0	118.1	11.2	102	-0.2	PASS	See Sketch
67	3/10/09	N	122.3	11.2	118.1	11.2	104	0.0	PASS	See Sketch
68	3/10/09	N	122.4	10.5	118.1	11.2	104	-0.7	PASS	See Sketch
69	3/10/09	N	115.2	13.7	118.1	11.2	98	2.5	PASS	See Sketch
70	3/10/09	N	117.2	11.8	118.1	11.2	99	0.6	PASS	See Sketch
71	3/10/09	N	115.4	9.7	118.1	11.2	98	-1.5	PASS	See Sketch

*Note: N = Nuclear; SC = Sand Cone; DC = Drive Cylinder; RB = Rubber Balloon

Totals:

Number of Tests =	79		
Min. Percent Compaction =	95	Min. Moisture (% of Opt.) =	-4.3
Max. Percent Compaction =	104	Max. Moisture (% of Opt.) =	5.4
Avg. Percent Compaction =	98	Avg. Moisture (% of Opt.) =	0.0

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Geotechnics
INTEGRITY IN TESTING

STRUCTURAL FILL FIELD TESTING SUMMARY

Client: RSG & Associates
Client Reference: Johnston County Landfill
Project No.: 2009-610
Geotechnics Rep.: Jesse Patton

Location	Lift	Test No.	Proctor ID	% Compaction	Dry. Dens	% M
C9	LIFT 1	01	610-01-01	97.4%	116.2	12.8
B8	LIFT 1	02	610-01-01	97.2%	116.0	13.1
B8	LIFT 1	DC-02	610-01-01	100.0%	120.3	11.9
C7	LIFT 1	03	610-01-01	96.3%	114.9	13.8
B7	LIFT 1	04	610-01-01	96.8%	115.4	10.7
B7	LIFT 1	DC-03	610-01-01	99.0%	119.0	10.3
C5	LIFT 1	05	610-01-01	95.1%	113.4	11.6
B5	LIFT 1	06	610-01-01	96.6%	115.3	12.5
C8	LIFT 2	07	610-01-01	95.6%	114.0	13.2
B8	LIFT 2	08	610-01-01	95.5%	113.9	14.3
C6	LIFT 2	09	610-01-01	95.0%	113.3	13.4
B6	LIFT 2	10	610-01-01	95.3%	113.7	12.7
C7	LIFT 3	11	610-01-01	95.9%	114.4	13.4
B7	LIFT 3	12	610-01-01	95.4%	113.8	12.3
C4	LIFT 3	13	610-01-01	96.2%	114.7	12.8
C4	LIFT 3	DC-04	610-01-01	96.2%	114.8	11.9
B4	LIFT 3	14	610-01-01	96.3%	114.9	13.2
C6	LIFT 4	15	610-03-01	96.4%	113.8	9.2
B6	LIFT 4	16	610-03-01	95.6%	112.9	12.9
D4	LIFT 4	17	610-03-01	100.6%	118.9	8.7
D4	LIFT 4	DC-05	610-03-01	99.6%	117.7	9.1
C4	LIFT 4	18	610-03-01	95.0%	111.7	12.4
C7	LIFT 5	19	610-03-01	95.6%	112.9	11.7
D5	LIFT 5	20	610-03-01	99.5%	117.5	8.4
D6	LIFT 5	21	610-03-01	97.7%	115.4	10.7
B8	LIFT 5	22	610-03-01	96.9%	114.4	13.2
B7	LIFT 5	23	610-03-01	95.0%	112.2	14.0
B9	LIFT 5	24	610-03-01	98.8%	116.7	14.1
D3	LIFT 6	25	610-03-01	95.0%	112.2	10.7
D2	LIFT 7	26	610-03-01	96.0%	113.4	16.6
D2	LIFT 8	27	610-03-01	98.8%	116.7	15.2
A4	LIFT 1	28	610-03-01	96.0%	113.3	12.5
A6	LIFT 1	29	610-03-01	95.1%	112.3	6.9
A7	LIFT 1	30	610-03-01	94.5%	111.6	9.0
A9	LIFT 1	31	610-03-01	96.5%	114.0	8.4
B2	LIFT 1	32	610-03-01	99.5%	117.5	10.7
B2	LIFT 1	DC-06	610-03-01	99.6%	117.6	10.5
B2	LIFT 6	33	610-03-01	94.8%	112.0	11.1
C8	LIFT 6	34	610-03-01	97.4%	115.0	11.0
D9	FINAL	35	610-03-01	95.3%	112.6	9.4
D9	FINAL	DC-07	610-03-01	96.0%	113.3	9.4
D6	FINAL	36	610-03-01	95.8%	113.1	7.4
D3	FINAL	37	610-03-01	94.9%	112.1	9.3
C2	FINAL	38	610-03-01	95.5%	112.8	13.9

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Geotechnics
INTEGRITY IN TESTING

STRUCTURAL FILL FIELD TESTING SUMMARY

Client: RSG & Associates
Client Reference: Johnston County Landfill
Project No.: 2009-610
Geotechnics Rep.: Jesse Patton

Location	Lift	Test No.	Proctor ID	% Compaction	Dry. Dens	% M
C5	FINAL	39	610-03-01	95.1%	112.4	9.2
C8	FINAL	40	610-03-01	95.0%	112.2	9.5
B9	FINAL	41	610-03-01	99.5%	117.5	10.4
A5	FINAL	42	610-03-01	95.1%	112.3	9.4
B3	FINAL	43	610-03-01	100.4%	118.6	12.2
S. Berm B	L1	44	610-03-01	95.2%	112.4	12.0
S. Berm C	L2	45	610-03-01	95.2%	112.5	8.2
S. Berm D	L3	46	610-03-01	98.8%	116.7	15.0
S. Berm B	FINAL	47	610-03-01	96.8%	114.4	10.7
S. Berm C	FINAL	48	610-03-01	94.7%	111.8	13.3
S. Berm D	FINAL	49	610-03-01	94.6%	111.8	11.2
N. Berm C	FINAL	50	610-03-01	95.6%	112.8	11.3
N. Berm B	L1	51	610-03-01	96.3%	113.7	9.6
D6	FINAL	52	610-03-01	97.7%	115.4	10.9
D6	FINAL	DC-08	610-03-01	99.8%	117.9	9.8
D7	FINAL	53	610-03-01	101.6%	120.0	10.4
D8	FINAL	54	610-03-01	100.2%	118.4	10.0
D9	FINAL	55	610-03-01	103.2%	121.9	10.2
D10	FINAL	56	610-03-01	98.5%	116.3	10.9
D11	FINAL	57	610-03-01	96.9%	114.4	11.6
A5	FINAL	58	610-03-01	103.9%	122.7	12.5
A5	FINAL	DC-09	610-03-01	103.5%	122.3	12.5
A6	FINAL	59	610-03-01	103.8%	122.6	10.4
A7	FINAL	60	610-03-01	96.0%	113.3	10.2
A8	FINAL	61	610-03-01	102.2%	120.7	12.3
A9	FINAL	62	610-03-01	97.9%	115.6	11.4
A10	FINAL	63	610-03-01	102.6%	121.2	11.1
A11	FINAL	64	610-03-01	103.0%	121.7	12.0
A11	FINAL	65	610-03-01	101.3%	119.7	10.2
A12	FINAL	66	610-03-01	102.2%	120.7	11.0
A12	FINAL	67	610-03-01	103.6%	122.3	11.2
A13	FINAL	68	610-03-01	103.6%	122.4	10.5
B5	FINAL	69	610-03-01	97.6%	115.2	13.7
B4	FINAL	70	610-03-01	99.2%	117.2	11.8
B3	FINAL	71	610-03-01	97.7%	115.4	9.7

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Client: RS&G
Project Name : Johnston County Landfill
Project Number : 2009-610

Geotechnics
INTEGRITY IN TESTING

Field Density Test Report

Report Number : **SF FDR - 01**	Geotechnics Representative : Jesse Patton	Page : 1
Date (s) : **1/28/09 - 2/05/09**	Reviewed By : [signature]	Date : 2-12-09

Contractor : ES&J	Borrow Source : Onsite Borrow Source

Compaction Equipment : 3 John Deer Farm Tractors each towing two pans. 2 Catipillar D6 Dozers. 2 Catipillar trackhoes. One Catipillar Vibratory Smooth Drum Roller

Test Number	Test Location	Elevation / Lift	Rod Depth	Proctor I.D. No.	Proctor Data		Measured In Place			Compaction		Comments
					MDD pcf	Opt. %M	WD (pcf)	% M	DD (pcf)	% C	% Req.	
ND 01	C9	LIFT 1	6"	610-01-01	119.3	12.1	**131.1**	**12.8**	**116.2**	**97.4%**	**95.0%**	
ND 02	B8	LIFT 1	6"	610-01-01	119.3	12.1	**131.2**	**13.1**	**116.0**	**97.2%**	**95.0%**	DC-02
ND 03	B7	LIFT 1	6"	610-01-01	119.3	12.1	**130.7**	**13.8**	**114.9**	**96.3%**	**95.0%**	
ND 04	C7	LIFT 1	6"	610-01-01	119.3	12.1	**127.8**	**10.7**	**115.4**	**96.8%**	**95.0%**	DC-03
ND 05	C5	LIFT 1	6"	610-01-01	119.3	12.1	**126.6**	**11.6**	**113.4**	**95.1%**	**95.0%**	
ND 06	B5	LIFT 1	6"	610-01-01	119.3	12.1	**129.7**	**12.5**	**115.3**	**96.6%**	**95.0%**	
ND 07	C8	LIFT 2	6"	610-01-01	119.3	12.1	**129.1**	**13.2**	**114.0**	**95.6%**	**95.0%**	
ND 08	B8	LIFT 2	6"	610-01-01	119.3	12.1	**130.2**	**14.3**	**113.9**	**95.5%**	**95.0%**	
ND 09	C6	LIFT 2	6"	610-01-01	119.3	12.1	**128.5**	**13.4**	**113.3**	**95.0%**	**95.0%**	
ND 10	B6	LIFT 2	6"	610-01-01	119.3	12.1	**128.2**	**12.7**	**113.7**	**95.3%**	**95.0%**	
ND 11	C7	LIFT 3	6"	610-01-01	119.3	12.1	**129.8**	**13.4**	**114.4**	**95.9%**	**95.0%**	
ND 12	B7	LIFT 3	6"	610-01-01	119.3	12.1	**127.8**	**12.3**	**113.8**	**95.4%**	**95.0%**	
ND 13	C4	LIFT 3	6"	610-01-01	119.3	12.1	**129.4**	**12.8**	**114.7**	**96.2%**	**95.0%**	DC-04
ND 14	B4	LIFT 3	6"	610-01-01	119.3	12.1	**130.1**	**13.2**	**114.9**	**96.3%**	**95.0%**	

Gauge Number	Gauge Model	Density Count	Moisture Count
32387	3440	2555	700

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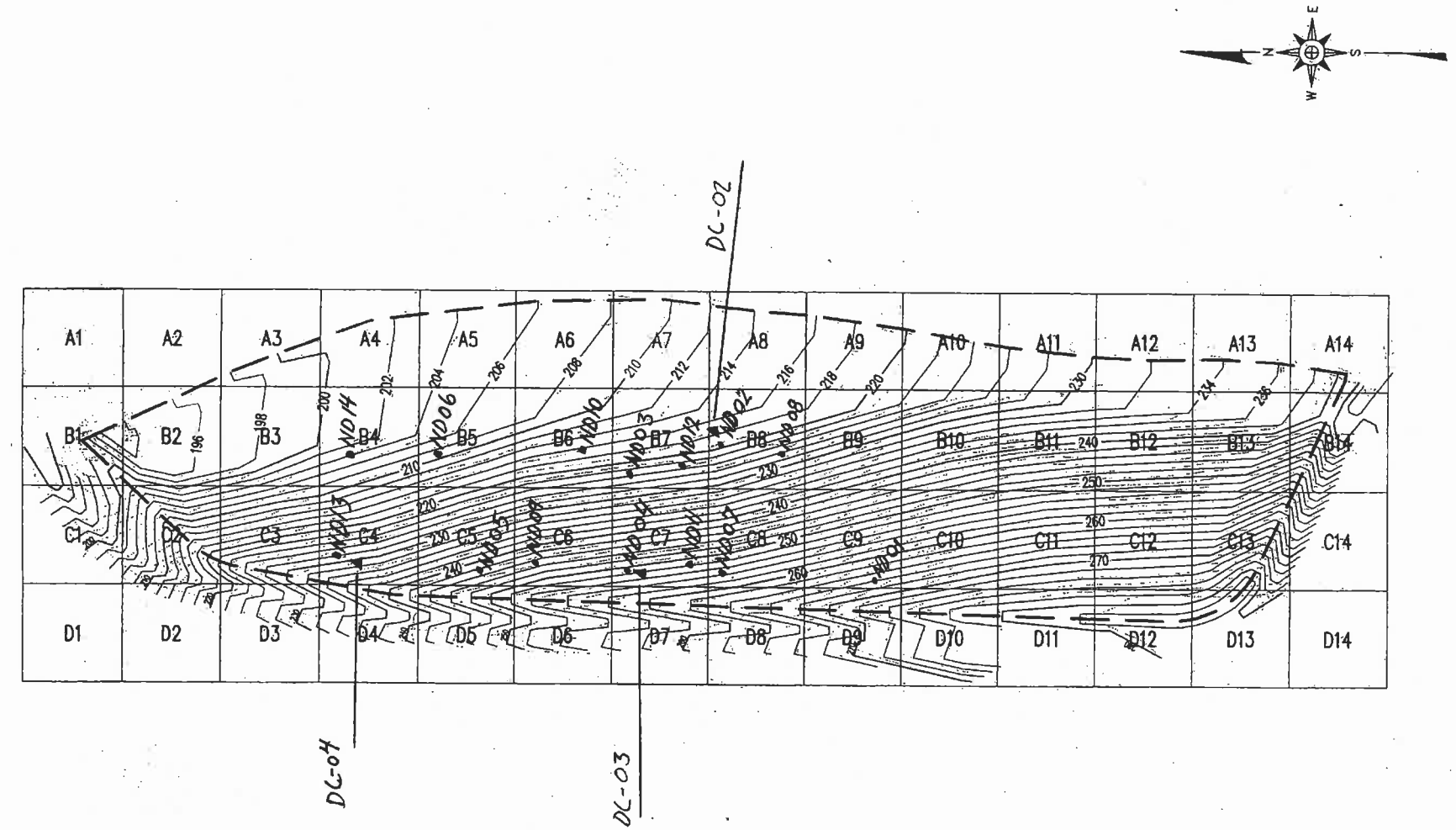

SFFDR-01

JOHNSTON COUNTY MSW LANDFILL PHASE 4A - CELL 3 WASTE PLACEMENT GRID	DRAWN BY: C.T.J.	CHECKED BY:	SCALE: AS SHOWN	FIGURE NO. 1
	DATE: Feb. 2009	PROJECT NO. JOHN 08-5	FILE NAME JOHN-B0574	

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Geotechnics
INTEGRITY IN TESTING

Client: RS&G
Project Name : JOHNSTON COUNTY LANDFILL
Project Number : 2009-610

Report Number : **SFFDR-01**
Date (s) : 1/28/09 - 2/05/09

Drive Cylinder - ASTM D 2937

Test Information				
Test Number :	DC-01	DC-02	DC-03	DC-04
Nuclear Test Number :	T1	SFND02	SFND04	SFND13
Location:	D8	B8	C7	C4
Depth (ft):	LIFT 1	LIFT 1	LIFT1	LIFT3
Date :	1/28/09	1/29/09	2/2/09	2/3/09
Mold				
Cylinder ID	JP-01	JP-01	JP-01	JP-01
Weight of Cylinder (lbs.)	1.41	1.41	1.41	1.41
Volume of Cylinder (ft^3)	0.033	0.033	0.033	0.033
Specimen				
Wt. of Cylinder & WS (lbs.)	5.64	5.85	5.74	5.65
Wt. of Cylinder (lbs.)	1.41	1.41	1.41	1.41
Wt. of WS	4.23	4.44	4.33	4.24
Cylinder Volume (ft^3)	0.033	0.033	0.033	0.033
Moisture / Density				
Tare Number	8010	Z14	820	G-1
Wt. of Tare & WS (gm)	569.44	666.80	561.40	80.60
Wt. of Tare & DS (gm)	513.27	606.70	521.70	73.70
Wt. of Tare (gm)	135.94	100.50	136.30	15.80
Wt. of Water (gm)	56.17	60.10	39.70	6.90
Wt. of DS (gm)	377.33	506.20	385.40	57.90
Wet Density (pcf):	128.2	134.5	131.2	128.5
Moisture Content (%):	**14.9**	**11.9**	**10.3**	**11.9**
Dry Density (pcf):	**111.6**	**120.3**	**119.0**	**114.8**

Geotechnics Representative : JESSE PATTON

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Client: RSG
Project Name : JCLF 4A CELL 3
Project Number : 2009-610

Geotechnics
INTEGRITY IN TESTING

Field Density Test Report

Report Number : **SFFDR-02**	Geotechnics Representative : Jesse Patton	Page : 1 0f 1
Date (s) : **2/9/09 - 2/13/09**	Reviewed By : MMS	Date : 2-19-09

Contractor : ES&J	Borrow Source : On Site Borrow red clayey sand
Compaction Equipment : 1 Cat smooth drum roller. 1 Sakai sheepsfoot roller.	

Test Number	Test Location	Elevation / Lift	Rod Depth	Proctor I.D. No.	Proctor Data		Measured In Place			Compaction		Comments
					MDD pcf	Opt. %M	WD (pcf)	% M	DD (pcf)	% C	% Req.	
ND 15	C6	LIFT 4	6"	610-03	118.1	11.2	**124.3**	**9.2**	**113.8**	**96.4%**	**95.0%**	
ND 16	D6	LIFT 4	6"	610-03	118.1	11.2	**127.5**	**12.9**	**112.9**	**95.6%**	**95.0%**	
ND 17	D4	LIFT 4	6"	610-03	118.1	11.2	**129.2**	**8.7**	**118.9**	**100.6%**	**95.0%**	DC-05
ND 18	C4	LIFT 4	6"	610-03	118.1	11.2	**125.6**	**12.4**	**111.7**	**95.0%**	**95.0%**	
ND 19	C7	LIFT 5	6"	610-03	118.1	11.2	**126.1**	**11.7**	**112.9**	**95.6%**	**95.0%**	
ND 20	D5	LIFT 5	6"	610-03	118.1	11.2	**127.4**	**8.4**	**117.5**	**99.5%**	**95.0%**	
ND 21	D6	LIFT 5	6"	610-03	118.1	11.2	**127.7**	**10.7**	**115.4**	**97.7%**	**95.0%**	
ND 22	B8	LIFT 5	6"	610-03	118.1	11.2	**129.5**	**13.2**	**114.4**	**96.9%**	**95.0%**	
ND 23	B7	LIFT 5	6"	610-03	118.1	11.2	**127.9**	**14.0**	**112.2**	**95.0%**	**95.0%**	
ND 24	B9	LIFT 5	6"	610-03	118.1	11.2	**133.1**	**14.1**	**116.7**	**98.8%**	**95.0%**	
ND 25	D3	LIFT 6	6"	610-03	118.1	11.2	**124.2**	**10.7**	**112.2**	**95.0%**	**95.0%**	
ND 26	D2	LIFT 7	6"	610-03	118.1	11.2	**132.2**	**16.6**	**113.4**	**96.0%**	**95.0%**	
ND 27	D2	LIFT 8	6"	610-03	118.1	11.2	**134.4**	**15.2**	**116.7**	**98.8%**	**95.0%**	
ND 28	A4	LIFT 1	6"	610-03	118.1	11.2	**127.5**	**12.5**	**113.3**	**96.0%**	**95.0%**	
ND 29	A6	LIFT 1	6"	610-03	118.1	11.2	**120.1**	**6.9**	**112.3**	**95.1%**	**95.0%**	
ND 30	A7	LIFT 1	6"	610-03	118.1	11.2	**121.6**	**9.0**	**111.6**	**94.5%**	**95.0%**	
ND 31	A9	LIFT 1	6"	610-03	118.1	11.2	**123.6**	**8.4**	**114.0**	**96.5%**	**95.0%**	
ND 32	B2	LIFT 1	6"	610-03	118.1	11.2	**130.1**	**10.7**	**117.5**	**99.5%**	**95.0%**	DC-06
ND 33	B2	LIFT 6	6"	610-03	118.1	11.2	**124.4**	**11.1**	**112.0**	**94.8%**	**95.0%**	
ND 34	C8	LIFT 6	6"	610-03	118.1	11.2	**127.7**	**11.0**	**115.0**	**97.4%**	**95.0%**	

Gauge Number	Gauge Model	Density Count	Moisture Count
32387	3440	2555	700

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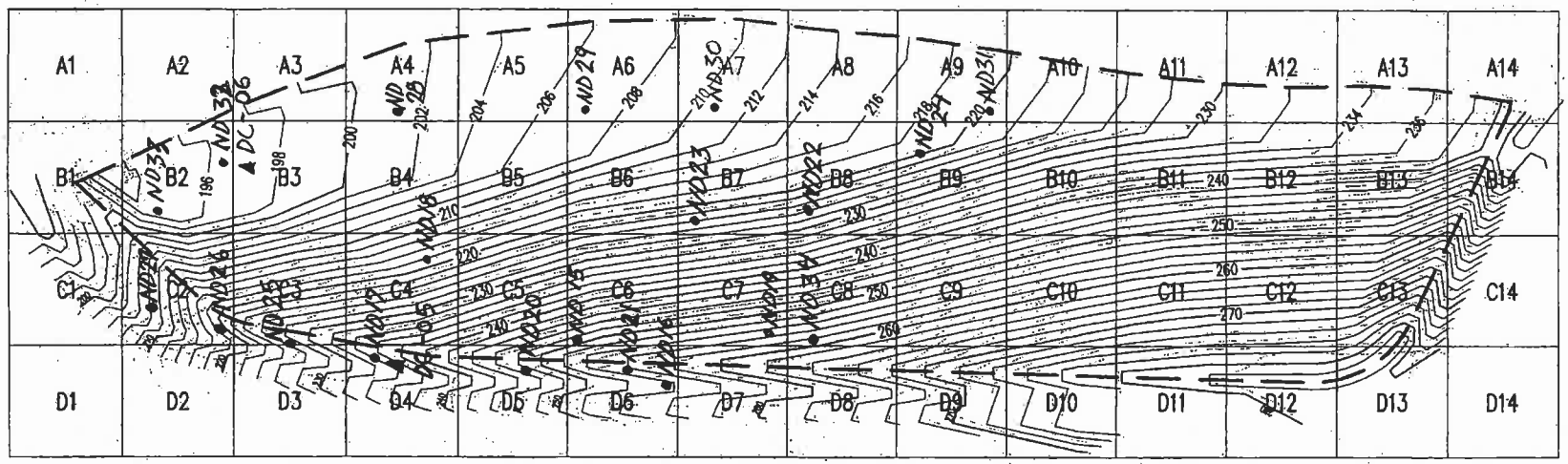

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SFFDR-02

JOHNSTON COUNTY MSW LANDFILL PHASE 4A - CELL 3 WASTE PLACEMENT GRID	DRAWN BY: C.T.J.	CHECKED BY:	SCALE: AS SHOWN	FIGURE NO. 1
	DATE: Feb. 2009	PROJECT NO. JOHN 08-5	FILE NAME JOHN-B0574	

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Geotechnics
INTEGRITY IN TESTING

Client: RSG
Project Name : Johnston County Landfill
Project Number : 2009-610

Report Number : **SFFDR-02**
Date (s) : 2/9/09 - 2/13/09

Drive Cylinder - ASTM D 2937

Test Information		
Test Number :	DC-05	DC-06
Nuclear Test Number :	ND-17	ND-32
Location:	D4	B2
Depth (ft):	Lift 4	Lift 1
Date :	2/9/09	2/13/09
Mold		
Cylinder ID	JP-02	JP-01
Weight of Cylinder (lbs.)	1.41	1.41
Volume of Cylinder (ft^3)	0.033	0.033
Specimen		
Wt. of Cylinder & WS (lbs.)	5.65	5.70
Wt. of Cylinder (lbs.)	1.41	1.41
Wt. of WS	4.24	4.29
Cylinder Volume (ft^3)	0.033	0.033
Moisture / Density		
Tare Number	G-1	G-1
Wt. of Tare & WS (gm)	82.80	102.00
Wt. of Tare & DS (gm)	77.20	93.80
Wt. of Tare (gm)	15.80	15.80
Wt. of Water (gm)	5.60	8.20
Wt. of DS (gm)	61.40	78.00
Wet Density (pcf):	128.5	130.0
Moisture Content (%):	**9.1**	**10.5**
Dry Density (pcf):	**117.7**	**117.6**

Geotechnics Representative : JESSE PATTON

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Client: RSG
Project Name : JCLF 4A CELL 3
Project Number : 2009-610

Geotechnics
INTEGRITY IN TESTING

Field Density Test Report

Report Number : **SFFDR-03**	Geotechnics Representative : Jesse Patton	Page : 1 of 1
Date (s) : **2/16/2009**	Reviewed By :	Date : 3-5-09

Contractor : ES&J	Borrow Source : On Site Borrow red clayey sand

Compaction Equipment : 1 Cat smooth drum roller. 1 Sakai sheepsfoot roller.

Test Number	Test Location	Elevation/ Lift	Rod Depth	Proctor I.D. No.	Proctor Data		Measured In Place			Compaction		Comments
					MDD pcf	Opt. %M	WD (pcf)	% M	DD (pcf)	% C	% Req.	
ND 35	D9	FINAL	6"	610-03-01	118.1	11.2	**123.3**	**9.4**	**112.6**	**95.3%**	**95.0%**	DC-07
ND 36	D6	FINAL	6"	610-03-01	118.1	11.2	**121.6**	**7.4**	**113.2**	**95.9%**	**95.0%**	
ND 37	D3	FINAL	6"	610-03-01	118.1	11.2	**122.5**	**9.3**	**112.1**	**94.9%**	**95.0%**	
ND 38	C2	FINAL	6"	610-03-01	118.1	11.2	**128.5**	**13.9**	**112.8**	**95.5%**	**95.0%**	
ND 39	C5	FINAL	6"	610-03-01	118.1	11.2	**122.8**	**9.2**	**112.5**	**95.2%**	**95.0%**	
ND 40	C8	FINAL	6"	610-03-01	118.1	11.2	**123.0**	**9.5**	**112.3**	**95.1%**	**95.0%**	
ND 41	B9	FINAL	6"	610-03-01	118.1	11.2	**129.8**	**10.4**	**117.6**	**99.6%**	**95.0%**	
ND 42	A5	FINAL	6"	610-03-01	118.1	11.2	**122.9**	**9.4**	**112.3**	**95.1%**	**95.0%**	
ND 43	B3	FINAL	6"	610-03-01	118.1	11.2	**133.2**	**12.2**	**118.7**	**100.5%**	**95.0%**	

Gauge Number	Gauge Model	Density Count	Moisture Count
13957	3401	2415	569

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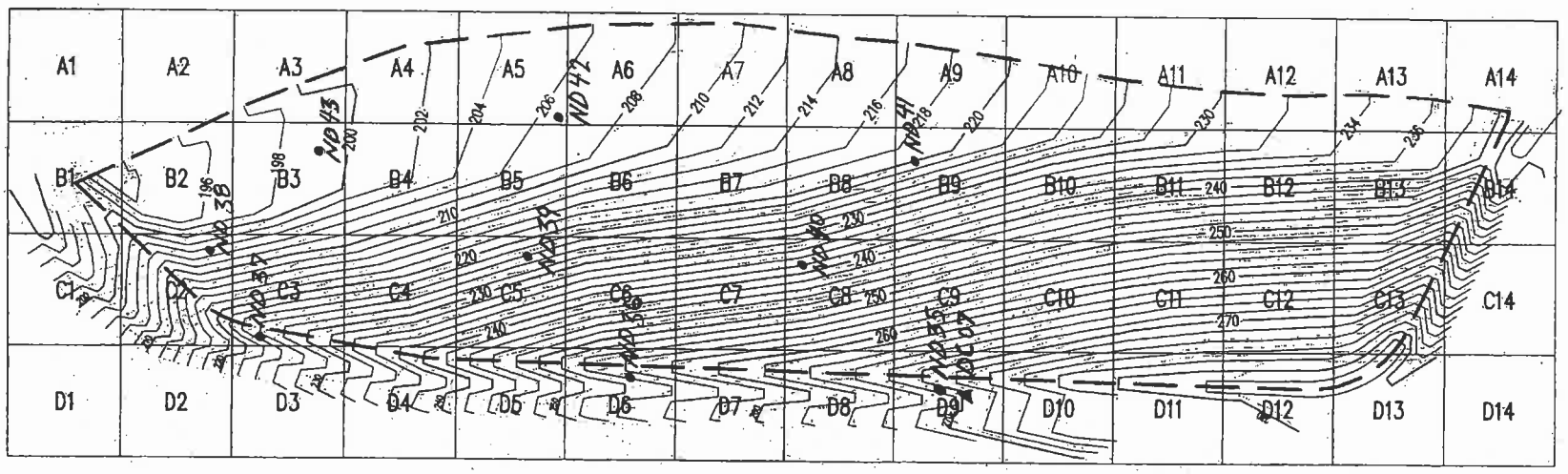

SFFDR-03

JOHNSTON COUNTY MSW LANDFILL PHASE 4A - CELL 3 WASTE PLACEMENT GRID	DRAWN BY: C.T.J.	CHECKED BY:	SCALE: AS SHOWN	FIGURE NO. 1
	DATE: Feb. 2009	PROJECT NO. JOHN 08-5	FILE NAME JOHN-B0574	

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Client:	RSG
Project Name :	JCLF 4A CELL 3
Project Number :	2009-610
Report Number :	**SFFDR 03**
Date (s) :	2/16/09

Geotechnics
INTEGRITY IN TESTING

Drive Cylinder - ASTM D 2937

Test Information

Test Number :	DC-07
Nuclear Test Number :	ND-35
Location:	D9
Depth (ft):	FINAL
Date :	2/16/09

Mold

Cylinder ID	JP-01
Weight of Cylinder (lbs.)	1.41
Volume of Cylinder (ft^3)	0.033

Specimen

Wt. of Cylinder & WS (lbs.)	5.50
Wt. of Cylinder (lbs.)	1.41
Wt. of WS	4.09
Cylinder Volume (ft^3)	0.033

Moisture / Density

Tare Number	G-1
Wt. of Tare & WS (gm)	74.00
Wt. of Tare & DS (gm)	69.00
Wt. of Tare (gm)	15.80
Wt. of Water (gm)	5.00
Wt. of DS (gm)	53.20
Wet Density (pcf):	123.9
Moisture Content (%):	**9.4**
Dry Density (pcf):	**113.3**

Geotechnics Representative : JESSE PATTON

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Client: RSG
Project Name : JCLF 4A CELL 3
Project Number : 2009-610

Geotechnics
INTEGRITY IN TESTING

Field Density Test Report

Report Number : **SFFDR-04**	Geotechnics Representative : Jesse Patton	Page : 1 of 1
Date (s) : **2/26/2009**	Reviewed By :	Date :

Contractor : ES&J	Borrow Source : On Site Borrow red clayey sand

Compaction Equipment : 1 Cat smooth drum roller. 1 Sakai sheepsfoot roller.

Test Number	Test Location	Elevation/ Lift	Rod Depth	Proctor I.D. No.	Proctor Data		Measured In Place			Compaction		Comments
					MDD pcf	Opt. %M	WD (pcf)	% M	DD (pcf)	% C	% Req.	
ND 44	S. Berm B	L1	6"	610-03-01	118.1	11.2	**125.9**	**12.0**	**112.4**	**95.2%**	**95.0%**	slope of berm
ND 45	S. Berm C	L2	6"	610-03-01	118.1	11.2	**121.7**	**8.2**	**112.5**	**95.2%**	**95.0%**	slope of berm
ND 46	S. Berm D	L3	6"	610-03-01	118.1	11.2	**134.2**	**15.0**	**116.7**	**98.8%**	**95.0%**	slope of berm
ND 47	S. Berm B	FINAL	6"	610-03-01	118.1	11.2	**126.6**	**10.7**	**114.4**	**96.8%**	**95.0%**	top of berm
ND 48	S. Berm C	FINAL	6"	610-03-01	118.1	11.2	**126.7**	**13.3**	**111.8**	**94.7%**	**95.0%**	top of berm
ND 49	S. Berm D	FINAL	6"	610-03-01	118.1	11.2	**124.3**	**11.2**	**111.8**	**94.6%**	**95.0%**	top of berm
ND 50	N. Berm C	FINAL	6"	610-03-01	118.1	11.2	**125.6**	**11.3**	**112.8**	**95.6%**	**95.0%**	top of berm
ND 51	N. Berm B	L1	6"	610-03-01	118.1	11.2	**124.6**	**9.6**	**113.7**	**96.3%**	**95.0%**	slope of berm

Gauge Number	Gauge Model	Density Count	Moisture Count
24656	3430	2203	594

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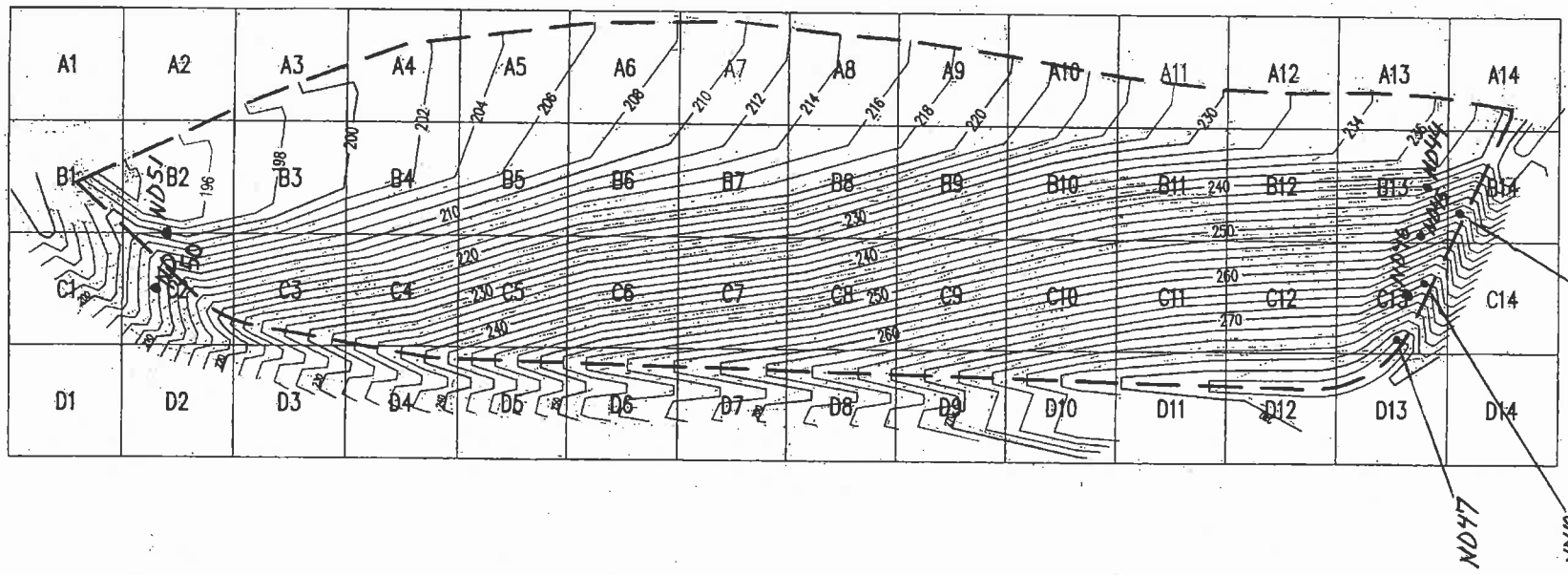

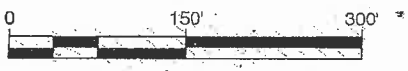

SFFDR-04

JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
WASTE PLACEMENT GRID

DRAWN BY:	CHECKED BY:	SCALE:	FIGURE NO.
C.T.J.		AS SHOWN	1

DATE:	PROJECT NO.	FILE NAME
Feb. 2009	JOHN 08-5	JOHN-B0574

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fax: 919-828-3899

Client: RSG
Project Name : JCLF 4A CELL 3
Project Number : 2009-610

Geotechnics
INTEGRITY IN TESTING

Field Density Test Report

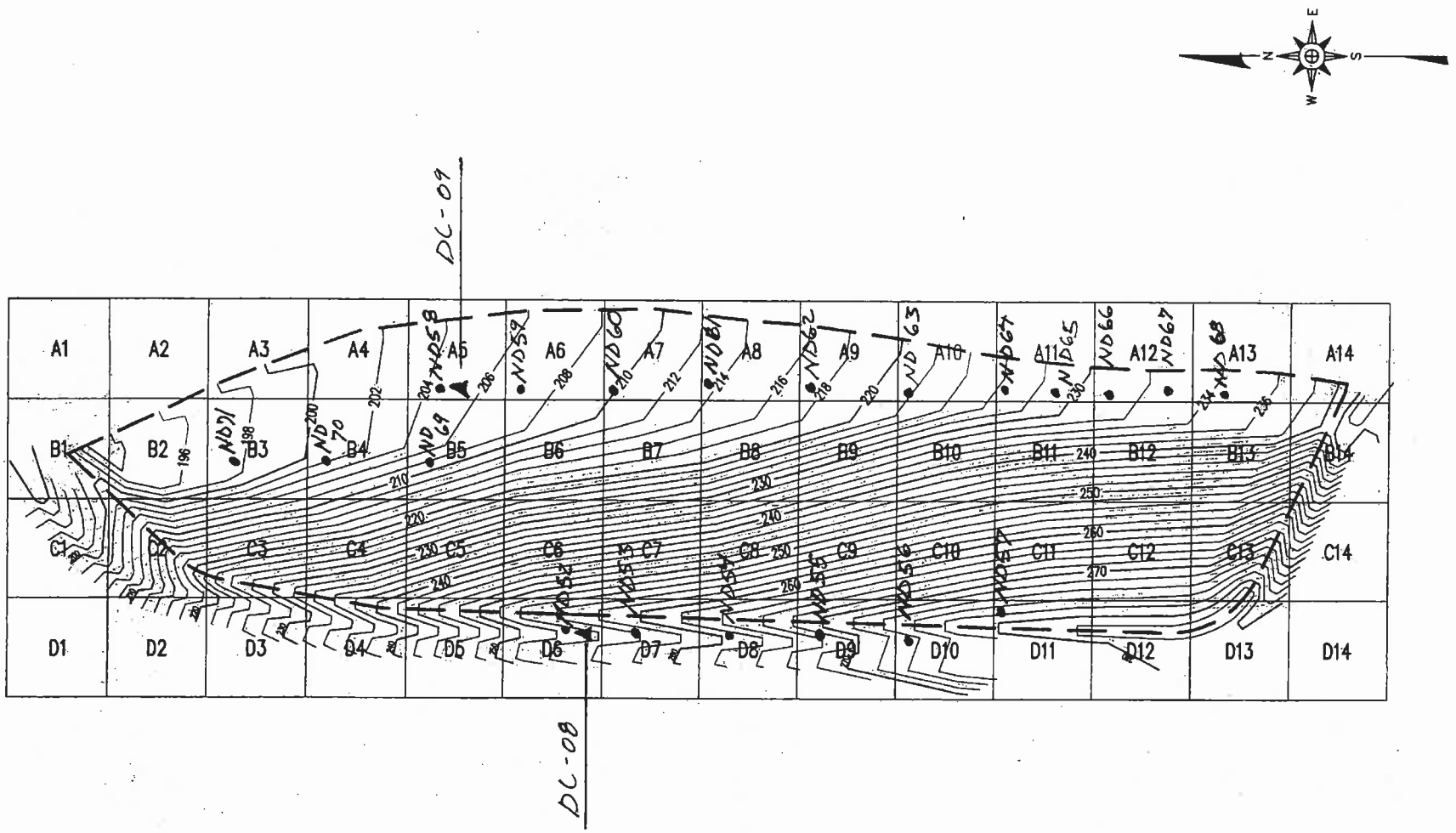
Report Number : **SFFDR-05**	Geotechnics Representative : Jesse Patton	Page : 1 of 1
Date (s) : **3/10/2009**	Reviewed By : MMK	Date : 3-16-09
Contractor : ES&J	Borrow Source : On Site Borrow red clayey sand	
Compaction Equipment : 1 Cat smooth drum roller. 1 Sakai sheepsfoot roller.		

Test Number	Test Location	Elevation/ Lift	Rod Depth	Proctor I.D. No.	Proctor Data		Measured In Place			Compaction		Comments
					MDD pcf	Opt. %M	WD (pcf)	% M	DD (pcf)	% C	% Req.	
ND 52	D6	FINAL	6"	610-03-01	118.1	11.2	**128.0**	**10.9**	**115.4**	**97.7%**	**95.0%**	DC-08
ND 53	D7	FINAL	6"	610-03-01	118.1	11.2	**132.5**	**10.4**	**120.0**	**101.6%**	**95.0%**	
ND 54	D8	FINAL	6"	610-03-01	118.1	11.2	**130.2**	**10.0**	**118.4**	**100.2%**	**95.0%**	
ND 55	D9	FINAL	6"	610-03-01	118.1	11.2	**134.3**	**10.2**	**121.9**	**103.2%**	**95.0%**	
ND 56	D10	FINAL	6"	610-03-01	118.1	11.2	**129.0**	**10.9**	**116.3**	**98.5%**	**95.0%**	
ND 57	D11	FINAL	6"	610-03-01	118.1	11.2	**127.7**	**11.6**	**114.4**	**96.9%**	**95.0%**	
ND 58	A5	FINAL	6"	610-03-01	118.1	11.2	**138.0**	**12.5**	**122.7**	**103.9%**	**95.0%**	DC-09
ND 59	A6	FINAL	6"	610-03-02	118.1	11.2	**135.3**	**10.4**	**122.6**	**103.8%**	**95.0%**	
ND 60	A7	FINAL	6"	610-03-03	118.1	11.2	**124.9**	**10.2**	**113.3**	**96.0%**	**95.0%**	
ND 61	A8	FINAL	6"	610-03-04	118.1	11.2	**135.5**	**12.3**	**120.7**	**102.2%**	**95.0%**	
ND 62	A9	FINAL	6"	610-03-05	118.1	11.2	**128.8**	**11.4**	**115.6**	**97.9%**	**95.0%**	
ND 63	A10	FINAL	6"	610-03-06	118.1	11.2	**134.6**	**11.1**	**121.2**	**102.6%**	**95.0%**	
ND 64	A11	FINAL	6"	610-03-07	118.1	11.2	**136.3**	**12.0**	**121.7**	**103.0%**	**95.0%**	
ND 65	A11	FINAL	6"	610-03-08	118.1	11.2	**131.9**	**10.2**	**119.7**	**101.3%**	**95.0%**	
ND 66	A12	FINAL	6"	610-03-09	118.1	11.2	**134.0**	**11.0**	**120.7**	**102.2%**	**95.0%**	
ND 67	A12	FINAL	6"	610-03-10	118.1	11.2	**136.0**	**11.2**	**122.3**	**103.6%**	**95.0%**	
ND 68	A13	FINAL	6"	610-03-11	118.1	11.2	**135.2**	**10.5**	**122.4**	**103.6%**	**95.0%**	
ND 69	B5	FINAL	6"	610-03-12	118.1	11.2	**131.0**	**13.7**	**115.2**	**97.6%**	**95.0%**	
ND 70	B4	FINAL	6"	610-03-13	118.1	11.2	**131.0**	**11.8**	**117.2**	**99.2%**	**95.0%**	
ND 71	B3	FINAL	6"	610-03-14	118.1	11.2	**126.6**	**9.7**	**115.4**	**97.7%**	**95.0%**	

Gauge Number	Gauge Model	Density Count	Moisture Count
24656	3430	2176	589

2200 Westinghouse Boulevard • Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460

G:\CAD\Johnston\John 08-5\sheets\JOHN-B0574.dwg - 2/4/2009 11:35 AM



SFFDR-05

JOHNSTON COUNTY MSW LANDFILL PHASE 4A - CELL 3 WASTE PLACEMENT GRID	DRAWN BY:	CHECKED BY:	SCALE:	FIGURE NO.
	C.T.J.		AS SHOWN	1
	DATE:	PROJECT NO.	FILE NAME	
	Feb. 2009	JOHN 08-5	JOHN-B0574	

RICHARDSON SMITH GARDNER & ASSOCIATES
14 N. Boylan Ave. Raleigh, N.C. 27603
www.rsgengineers.com
ph: 919-828-0577
fax: 919-828-3899

Client:	RSG
Project Name :	Johnston County Landfill
Project Number :	2009-610

Report Number : **SFFDR 05**
Date (s) : 3/10/09

Drive Cylinder - ASTM D 2937

Test Information		
Test Number :	DC-08	DC-09
Nuclear Test Number :	ND 52	ND 58
Location:	D 6	A5
Depth (ft):	FINAL	FINAL
Date :	3/10/09	3/10/09
Mold		
Cylinder ID	JP 01	JP 02
Weight of Cylinder (lbs.)	1.41	1.41
Volume of Cylinder (ft^3)	0.033	0.033
Specimen		
Wt. of Cylinder & WS (lbs.)	5.68	5.95
Wt. of Cylinder (lbs.)	1.41	1.41
Wt. of WS	4.27	4.54
Cylinder Volume (ft^3)	0.033	0.033
Moisture / Density		
Tare Number	821	813
Wt. of Tare & WS (gm)	378.70	451.60
Wt. of Tare & DS (gm)	357.11	416.74
Wt. of Tare (gm)	135.90	137.00
Wt. of Water (gm)	21.59	34.86
Wt. of DS (gm)	221.21	279.74
Wet Density (pcf):	129.4	137.6
Moisture Content (%):	**9.8**	**12.5**
Dry Density (pcf):	**117.9**	**122.3**

Geotechnics Representative : JESSE PATTON

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Appendix D

Interface Shear Strength Test Data

Construction Quality Assurance Report
Johnston County MSW Landfill - Phase 4A - Cell 3
Smithfield, North Carolina

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Table 1: Summary of Interface Shear Strength Test Data

Interface	Peak Shear Strength Envelope Determined by Direct Shear Testing[1]	Peak Shear Stress @ (Normal Load)	Required Shear Stress @ (Normal Load)	Comment
1. 40 mil TLLDPE vs. Existing Cover Soils	$\phi = 34.1$ a = 130 psf	236 psf (200 psf) 1,948 psf (2,500 psf) 3,380 psf (5,000 psf) 6,930 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement
2. Drainage Geocomposite vs. 40 mil TLLDPE	$\phi = 24.2$ a = 94 psf	141 psf (200 psf) 1,225 psf (2,500 psf) 2,420 psf (5,000 psf) 4,555 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement
3. GCL vs. Drainage Geocomposite (w/ 1 lb/SF sand)	$\phi = 28.4$ a = 147 psf	166 psf (200 psf) 1,559 psf (2,500 psf) 2,928 psf (5,000 psf) 5,490 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement
4. 60 mil THDPE vs. GCL	$\phi = 28.1$ a = 173 psf	183 psf (200 psf) 1,561 psf (2,500 psf) 2,881 psf (5,000 psf) 5,490 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement
5. Drainage Geocomposite vs. 60 mil THDPE	$\phi = 27.7$ a = 198 psf	167 psf (200 psf) 1,628 psf (2,500 psf) 2,914 psf (5,000 psf) 5,379 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement
6. Protective Cover vs. Drainage Geocomposite	$\phi = 33.8$ a = 323 psf	247 psf (200 psf) 2,270 psf (2,500 psf) 3,675 psf (5,000 psf) 6,955 psf (10,000 psf)	100 psf (200 psf) 1,000 psf (2,500 psf) 2,000 psf (5,000 psf) 4,000 psf (10,000 psf)	Exceeds Requirement Exceeds Requirement Exceeds Requirement Exceeds Requirement

Notes:

1. Tests performed by Geotechnics, East Pittsburgh, PA. Peak shear strength envelope based on best-fit line over the normal stresses evaluated.

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Appendix E

Geomembrane CQA Data

E1. Manufacturer's Product Data Submittals and Quality Control Certificates

E2. Geosynthetics Inventory

E3. CQA Test Results - Material Control Tests

E4. Pre-Weld (Trial Weld) Logs

E5. Panel Placement Logs

E6. Panel Seaming Logs (Includes Nondestructive Seam Testing Documentation (Air Pressure Tests))

E7. CQC Test Results - Destructive Seam Testing Report Forms (Field)

E8. CQA Test Results - Destructive Seam Testing (Laboratory)

E9. Repair Logs (Includes Nondestructive Testing Documentation (Vacuum Tests))

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GSE®

GSE STANDARD PRODUCTS

Product Data Sheet

GSE UltraFlex Textured Geomembranes

GSE UltraFlex Textured is the coextruded textured version of GSE UltraFlex. It is a high quality, linear low density polyethylene (LLDPE) geomembrane with one or two coextruded, textured surfaces, and consisting of approximately 97.5% polyethylene, 2.5% carbon black and trace amounts of antioxidants and heat stabilizers; no other additives, fillers or extenders are used. The resin used is a specially formulated, proprietary virgin polyethylene and is designed specifically for flexible geomembrane applications. GSE UltraFlex Textured has excellent resistance to UV radiation and is suitable for exposed conditions. This product allows projects with greater slopes to be designed since frictional characteristics are enhanced. *These product specifications meet or exceed GRI GM17.*

Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM VALUE		
Product Code			LUT040G000	LUT060G000	LUT080G000
Thickness, (minimum average) mil (mm) Lowest individual for 8 out of 10 values Lowest individual for any of the 10 values	ASTM D 5994	every roll	38 (0.96) 36 (0.91) 34 (0.86)	57 (1.45) 54 (1.40) 51 (1.30)	76 (1.93) 72 (1.80) 68 (1.73)
Density, g/cm³	ASTM D 1505	200,000 lb	0.92	0.92	0.92
Tensile Properties (each direction)[1] Strength at Break, lb/in-width (N/mm) Elongation at Break, %	ASTM D 6693, Type IV Dumbell, 2 ipm G.L. = 2.0 in (51 mm)	20,000 lb	 60 (11) 250	 90 (16) 250	 120 (21) 250
Tear Resistance, lb (N)	ASTM D 1004	45,000 lb	22 (98)	33 (147)	44 (200)
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	44 (200)	66 (300)	88 (400)
Carbon Black Content, %	ASTM D 1603*/4218	20,000 lb	2.0	2.0	2.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	+Note 1	+Note 1	+Note 1
Asperity Height	GRI GM 12	second roll	+Note 2	+Note 2	+Note 2
REFERENCE PROPERTY	**TEST METHOD**	**FREQUENCY**	**NOMINAL VALUE**		
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	>100	>100	>100
Roll Length[2] (approximate), ft (m)			700 (213)	520 (158)	400 (122)
Roll Width[2], ft (m)			22.5 (6.9)	22.5 (6.9)	22.5 (6.9)
Roll Area, ft² (m²)			15,750 (1,463)	11,700 (1,087)	9,000 (836)

NOTES:

- +Note 1: Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- +Note 2: 10 mil average. 8 of 10 readings ≥7 mils. Lowest individual ≥ 5 mils.
- GSE UltraFlex Textured is available in rolls weighing about 3,900 lb (1,769 kg).
- [1]The combination of stress concentrations due to coextrusion texture geometry and the small specimen size results in large variation of test results. Therefore, these tensile properties are average roll values.
- All GSE geomembranes have dimensional stability of ±2% when tested with ASTM D 1204 and LTB of <-77° C when tested with ASTM D 746.
- [2]Roll lengths and widths have a tolerance of ± 1%.
- Modified.

DS016 UflexText R01/07/08

This information is provided for reference purposes only and is not intended as a warranty or guarantee. GSE assumes no liability in connection with the use of this information. Please check with GSE for current, standard minimum quality assurance procedures and specifications.

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South America	GSE Lining Technology Chile S.A.	Santiago, Chile		56.2.595.4200	Fax: 56.2.595.4290
Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66.2.937.0091	Fax: 66.2.937.0097
Europe & Africa	GSE Lining Technology GmbH	Hamburg, Germany		49.40.767420	Fax: 49.40.7674234
Middle East	GSE Lining Technology-Egypt	The 6th of October City, Egypt		20.2.828.8888	Fax: 20.2.828.8889

www.gseworld.com

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GSE Roll Allocation

Order 56351
Customer Hallaton, Inc.
Site Johnston County Landfill-Phase 4A-Cell 3

Roll#	*Resin Lot*	*Product Code*	*Description*	*Mfg. Date*	*Length*
104144244	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144245	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144246	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144247	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144248	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144249	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144250	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144251	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144252	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144253	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144254	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144255	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144256	CYA810270	LUT040G000	LUT040G000	2/15/2009	700
104144257	CYA810400	LUT040G000	LUT040G000	2/15/2009	700
104144258	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144259	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144260	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144261	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144262	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144263	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144264	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144265	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144266	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144267	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144268	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144269	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144270	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144271	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144272	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144273	CYA810400	LUT040G000	LUT040G000	2/16/2009	700
104144274	CYA810400	LUT040G000	LUT040G000	2/17/2009	700
104144275	CYA810400	LUT040G000	LUT040G000	2/17/2009	700

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GSE *Lining Technology, Inc*

Roll Test Data Report

Sales Order No.	*Project Number*	*Customer Name*	*Project Location*	*Product Name*	*Report Date*
56351	526078	Hallaton, Inc.	Smithfield, MC	LUT040G000	2/17/2009

GSE QC APPROVED

	ASTM D 5994		*ASTM D638,Type IV / D6693*				*ASTM D 1004*		*ASTM D 4833*	*ASTM D 1505*	*ASTM D 4218/1603*	*ASTM D 5596*	*GRI GM 12*	
	Average Thickness	*Minimum Thickness*	*TD Strength @ Break*	*MD Strength @ Break*	*TD Elongation @ Break*	*MD Elongation @ Break*	*TD Tear Resistance*	*MD Tear Resistance*	*Puncture Resistance*	*Density*	*Carbon Black Content*	*Carbon Black Dispersion*	*Asperity Height Side A*	*Asperity Height Side B*
	(mils)	*(mils)*	*(ppi)*	*(ppi)*	*(%)*	*(%)*	*(lbs)*	*(lbs)*	*(lbs)*	*(g/cc)*	*(%)*	*View in Cat1 - Cat2*	*(mils)*	*(mils)*
Roll No.	*every roll*			*every 3rd*			*every 3rd*		*every 3rd*	*every 3rd*	*every 3rd*	*every 3rd*	*every 2nd*	
104144244	41	36	130	152	567	653	25	28	89	0.929	2.49	10	23	22
104144245	42	35	126	147	548	611	26	27	96	0.929	2.37	10	23	21
104144246	40	38	126	147	548	611	26	27	96	0.929	2.37	10	23	21
104144247	40	36	126	147	548	611	26	27	96	0.929	2.37	10	22	22
104144248	40	36	123	155	530	595	28	30	99	0.929	2.34	10	22	22
104144249	40	37	123	155	530	595	28	30	99	0.929	2.34	10	22	23
104144250	40	36	123	155	530	595	28	30	99	0.929	2.34	10	22	23
104144251	40	36	142	159	560	599	28	30	97	0.929	2.45	10	23	21
104144252	40	35	142	159	560	599	28	30	97	0.929	2.45	10	23	21
104144253	40	35	142	159	560	599	28	30	97	0.929	2.45	10	21	22
104144254	40	36	139	157	593	669	27	29	96	0.929	2.50	10	21	22
104144255	41	36	139	157	593	669	27	29	96	0.929	2.50	10	23	23
104144256	40	36	139	157	593	669	27	29	96	0.929	2.50	10	23	23
104144257	41	35	139	159	574	676	27	29	90	0.929	2.33	10	23	24
104144258	41	34	139	159	574	676	27	29	90	0.929	2.33	10	23	24
104144259	41	35	139	159	574	676	27	29	90	0.929	2.33	10	22	21
104144260	41	36	149	161	626	678	28	27	93	0.929	2.54	10	22	21
104144261	41	36	149	161	626	678	28	27	93	0.929	2.54	10	24	22
104144262	40	35	149	161	626	678	28	27	93	0.929	2.54	10	24	22
104144263	40	36	148	167	645	724	27	30	95	0.930	2.58	10	22	25
104144264	40	36	148	167	645	724	27	30	95	0.930	2.58	10	22	25
104144265	40	36	148	167	645	724	27	30	95	0.930	2.58	10	25	23
104144266	40	36	133	165	564	655	27	30	95	0.930	2.46	10	25	23
104144267	40	36	133	165	564	655	27	30	95	0.930	2.46	10	26	21
104144268	40	36	133	165	564	655	27	30	95	0.930	2.46	10	26	21
104144269	40	36	128	152	599	681	25	27	92	0.930	2.48	10	24	22
104144270	41	36	128	152	599	681	25	27	92	0.930	2.48	10	24	22
104144271	40	35	128	152	599	681	25	27	92	0.930	2.48	10	23	22
104144272	39	35	145	165	642	665	28	27	96	0.929	2.55	10	23	22
104144273	39	36	145	165	642	665	28	27	96	0.929	2.55	10	25	23

Roll Test Data Report

Lining Technology, Inc

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
56351	526078	Hallaton, Inc.	Smithfield, MC	LUT040G000	2/17/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693				ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness (mils)	Minimum Thickness (mils)	TD Strength @ Break (ppi)	MD Strength @ Break (ppi)	TD Elongation @ Break (%)	MD Elongation @ Break (%)	TD Tear Resistance (lbs)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion	Asperity Height Side A (mils)	Asperity Height Side B (mils)
Roll No.	every roll		every 3rd				every 3rd		every 3rd	every 3rd	every 3rd	every 3rd	every 2nd	
104144274	40	35	145	165	642	665	28	27	96	0.929	2.55	10	25	23
104144275	42	36	138	171	574	697	27	30	95	0.928	2.56	10	24	23

Laboratory Manager: Jane Allen

GSE-8.2.4-029 Rev -- 03/05

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19103 Gundle Road - Houston, Texas 77073

Chevron Phillips Chemical Company LP

CoA Date: 01/21/2009

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE 19103 GUNDLE ROAD WESTFIELD TX 77090 USA	CPC Delivery #: 87801832 PO #: 46823 Weight: 181350 LB Ship Date: 01/21/2009 Package: BULK
Recipient: UP TRACK 14732 Phouangsavanh Fax:	Mode: Hopper Car Car #: PSPX002612 Seal No: 484045

Product: PE 7104 BULK

Lot Number: CYA810400

Property	Test Method	Value	Unit
Melt Index	ST-103	0.37	g/10mi
Density	ST-292	0.918	g/cm3
Production date		20090114	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Kay F. Donaldson
Quality Control Supervisor

For CoA questions contact Customer Service Representative at 800-231-1212

Chevron Phillips Chemical Company LP

CoA Date: 01/21/2009

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: UP TRACK 14732 Phouangsavanh
Fax:

CPC Delivery #: 87801835
PO #: 46823
Weight: 180000 LB
Ship Date: 01/21/2009
Package: BULK
Mode: Hopper Car
Car #: GOCX058437
Seal No: 483788

Product: PE 7104 BULK

Lot Number: CYA810270

Property	Test Method	Value	Unit
Melt Index	ST-103	0.36	g/10mi
Density	ST-292	0.918	g/cm3
Production date		20090111	

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Kay F. Donaldson
Quality Control Supervisor

For CoA questions contact Customer Service Representative at 800-231-1212

GSE®

GSE STANDARD PRODUCTS

Product Data Sheet

GSE HD Textured Geomembranes

GSE HD Textured is the textured version of GSE HD. It is a high quality, high density polyethylene (HDPE) geomembrane with one or two coextruded, textured surfaces, and consisting of approximately 97.5% polyethylene, 2.5% carbon black and trace amounts of antioxidants and heat stabilizers; no other additives, fillers or extenders are used. The resin used is specially formulated, virgin polyethylene and is designed specifically for flexible geomembrane applications. GSE HD Textured has excellent resistance to UV radiation and is suitable for exposed conditions. This product allows projects with greater slopes to be designed since frictional characteristics are enhanced. *These product specifications meet or exceed GRI GM13.*

Product Specifications

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM VALUE				
Product Code			HDT 030G000	HDT 040G000	HDT 060G000	HDT 080G000	HDT 100G000
Thickness, (minimum average) mil (mm)	ASTM D 5994	every roll	29 (0.73)	38 (0.96)	57 (1.45)	76 (1.93)	95 (2.41)
Lowest individual for 8 out of 10 values			27 (0.69)	36 (0.91)	54 (1.40)	72 (1.80)	90 (2.30)
Lowest individual for any of the 10 values			26 (0.66)	34 (0.86)	51 (1.30)	68 (1.73)	85 (2.16)
Density, g/cm³	ASTM D 1505	200,000 lb	0.94	0.94	0.94	0.94	0.94
Tensile Properties (each direction)[1]	ASTM D 6693, Type IV	20,000 lb					
Strength at Break, lb/in-width (N/mm)	Dumbell, 2 ipm		45 (8)	60 (11)	90 (16)	120(21)	150 (27)
Strength at Yield, lb/in-width (N/mm)			63 (11)	84 (15)	126 (22)	168 (29)	210 (37)
Elongation at Break, %	G.L. = 2.0 in (51 mm)		100	100	100	100	100
Elongation at Yield, %	G.L. = 1.3 in (33 mm)		12	12	12	12	12
Tear Resistance, lb (N)	ASTM D 1004	45,000 lb	21 (93)	28 (125)	42 (187)	56 (249)	70 (311)
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	45 (200)	60 (267)	90 (400)	120 (534)	150 (667)
Carbon Black Content, %	ASTM D 1603*/4218	20,000 lb	2.0	2.0	2.0	2.0	2.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	+Note 1	+Note 1	+Note 1	+Note 1	+Note 1
Asperity Height	GRI GM 12	second roll	+Note 2	+Note 2	+Note 2	+Note 2	+Note 2
Notched Constant Tensile Load[2], hr	ASTM D 5397, Appendix	200,000 lb	300	300	300	300	300
REFERENCE PROPERTY	**TEST METHOD**	**FREQUENCY**	**NOMINAL VALUE**				
Oxidative Induction Time, min	ASTM D 3895, 200° C; O_2, 1 atm	200,000 lb	>100	>100	>100	>100	>100
Roll Length[3] (approximate), ft (m)	Standard Textured		830 (253)	700 (213)	520 (158)	400 (122)	330 (101)
Roll Width[3], ft (m)			22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)
Roll Area, ft² (m²)			18,674 (1,735)	15,750 (1,463)	11,700 (1,087)	9,000 (836)	7,425 (690)

NOTES:

- +Note 1: Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- +Note 2: 10 mil average. 8 of 10 readings ≥7 mils. Lowest individual ≥ 5 mils.
- GSE HD Standard Textured is available in rolls weighing about 4,000 lb (1,800 kg).
- [1]The combination of stress concentrations due to coextrusion texture geometry and the small specimen size results in large variation of test results. Therefore, these tensile properties are minimum average values.
- [2]NCTL for HD Textured is conducted on representative smooth membrane samples.
- All GSE geomembranes have dimensional stability of ±2% when tested with ASTM D 1204 and LTB of <-77° C when tested with ASTM D 746.
- [3]Roll lengths and widths have a tolerance of ± 1%.
- *Modified.

DS006 HDtext R01/08/08

This information is provided for reference purposes only and is not intended as a warranty or guarantee. GSE assumes no liability in connection with the use of this information. Please check with GSE for current, standard minimum quality assurance procedures and specifications

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South America	GSE Lining Technology Chile S.A.	Santiago, Chile		56.2.595.4200	Fax: 56.2.595.4290
Asia Pacific	GSE Lining Technology Company Limited	Bangkok, Thailand		66.2.937.0091	Fax: 66.2.937.0097
Europe & Africa	GSE Lining Technology GmbH	Hamburg, Germany		49.40.767420	Fax: 49.40.7674234
Middle East	GSE Lining Technology-Egypt	The 6th of October City, Egypt		20.2.828.8888	Fax: 20.2.828.8889

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GSE Roll Allocation

Order 56351
Customer Hallaton, Inc.
Site Johnston County Landfill-Phase 4A-Cell 3

Roll#	*Resin Lot*	*Product Code*	*Description*	*Mfg. Date*	*Length*
102136707	8281597	HDT060GW00	HDT060GW00	1/29/2009	520
102136708	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136709	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136710	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136711	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136712	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136713	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136714	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136715	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136716	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136717	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136718	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136719	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136720	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136721	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136722	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136723	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136724	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136725	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136726	8281597	HDT060GW00	HDT060GW00	1/30/2009	520
102136727	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136728	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136729	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136730	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136731	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136732	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136733	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136734	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136735	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136736	8281597	HDT060GW00	HDT060GW00	1/31/2009	520
102136737	8281597	HDT060GW00	HDT060GW00	1/31/2009	520

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Roll Test Data Report

Lining Technology, Inc

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
56351	526078	Hallaton, Inc.	Smithfield, MC	HDT060GW00	2/2/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693								ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness (mils)	Minimum Thickness (mils)	TD Strength @ Yield (ppi)	MD Strength @ Yield (ppi)	TD Strength @ Break (ppi)	MD Strength @ Break (ppi)	TD Elongation @ Yield (%)	MD Elongation @ Yield (%)	TD Elongation @ Break (%)	MD Elongation @ Break (%)	TD Tear Resistance (lbs)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion Views in Cat1 - Cat2	Asperity Height Side A (mils)	Asperity Height Side B (mils)
Roll No.	every roll		every 4th								every 4th		every 4th	every 4th	every 4th	every 4th	every 2nd	
102136707	62	59	183	170	186	187	15	16	408	422	54	54	153	0.948	2.53	10	27	26
102136708	62	58	183	170	186	187	15	16	408	422	54	54	153	0.948	2.53	10	27	26
102136709	58	54	178	178	174	205	15	17	444	512	53	55	153	0.947	2.42	10	26	24
102136710	59	53	178	178	174	205	15	17	444	512	53	55	153	0.947	2.42	10	26	24
102136711	58	53	178	178	174	205	15	17	444	512	53	55	153	0.947	2.42	10	25	24
102136712	58	53	178	178	174	205	15	17	444	512	53	55	153	0.947	2.42	10	25	24
102136713	59	55	169	167	167	200	15	17	487	561	50	53	148	0.946	2.35	10	24	23
102136714	58	54	169	167	167	200	15	17	487	561	50	53	148	0.946	2.35	10	24	23
102136715	57	53	169	167	167	200	15	17	487	561	50	53	148	0.946	2.35	10	25	23
102136716	58	53	169	167	167	200	15	17	487	561	50	53	148	0.946	2.35	10	25	23
102136717	58	53	170	166	176	192	15	18	453	522	51	53	150	0.946	2.11	10	26	23
102136718	58	52	170	166	176	192	15	18	453	522	51	53	150	0.946	2.11	10	26	23
102136719	58	51	170	166	176	192	15	18	453	522	51	53	150	0.946	2.11	10	26	23
102136720	57	52	170	166	176	192	15	18	453	522	51	53	150	0.946	2.11	10	26	23
102136721	58	52	163	161	183	178	16	17	522	462	50	55	145	0.946	2.42	10	27	24
102136722	57	52	163	161	183	178	16	17	522	462	50	55	145	0.946	2.42	10	27	24
102136723	58	55	163	161	183	178	16	17	522	462	50	55	145	0.946	2.42	10	25	23
102136724	58	54	163	161	183	178	16	17	522	462	50	55	145	0.946	2.42	10	25	23
102136725	59	55	164	159	170	195	16	17	335	532	51	52	145	0.946	2.59	10	24	24
102136726	59	53	164	159	170	195	16	17	335	532	51	52	145	0.946	2.59	10	24	24
102136727	58	52	164	159	170	195	16	17	335	532	51	52	145	0.946	2.59	10	25	24
102136728	58	53	164	159	170	195	16	17	335	532	51	52	145	0.946	2.59	10	25	24
102136729	58	52	172	157	176	190	15	17	455	505	51	55	153	0.946	2.45	10	25	24
102136730	59	54	172	157	176	190	15	17	455	505	51	55	153	0.946	2.45	10	25	24
102136731	58	52	172	157	176	190	15	17	455	505	51	55	153	0.946	2.45	10	23	22
102136732	58	53	172	157	176	190	15	17	455	505	51	55	153	0.946	2.45	10	23	22
102136733	59	54	174	165	175	206	16	17	453	537	51	55	154	0.946	2.38	10	23	22
102136734	58	54	174	165	175	206	16	17	453	537	51	55	154	0.946	2.38	10	23	22
102136735	58	54	174	165	175	206	16	17	453	537	51	55	154	0.946	2.38	10	23	23
102136736	58	53	174	165	175	206	16	17	453	537	51	55	154	0.946	2.38	10	23	23
102136737	58	53	170	166	177	191	16	18	463	482	53	54	152	0.946	2.39	10	26	23

Roll Test Data Report

Lining Technology, Inc

Sales Order No.	Project Number	Customer Name	Project Location	Product Name	Report Date
56351	526078	Hallaton, Inc.	Smithfield, MC	HDT060GW00	2/2/2009

GSE QC APPROVED

	ASTM D 5994		ASTM D638,Type IV / D6693								ASTM D 1004		ASTM D 4833	ASTM D 1505	ASTM D 4218/1603	ASTM D 5596	GRI GM 12	
	Average Thickness (mils)	Minimum Thickness (mils)	TD Strength @ Yield (ppi)	MD Strength @ Yield (ppi)	TD Strength @ Break (ppi)	MD Strength @ Break (ppi)	TD Elongation @ Yield (%)	MD Elongation @ Yield (%)	TD Elongation @ Break (%)	MD Elongation @ Break (%)	TD Tear Resistance (lbs)	MD Tear Resistance (lbs)	Puncture Resistance (lbs)	Density (g/cc)	Carbon Black Content (%)	Carbon Black Dispersion Views in Cat1 - Cat2	Asperity Height Side A (mils)	Asperity Height Side B (mils)
Roll No.	every roll		every 4th								every 4th		every 4th	every 4th	every 4th	every 4th	every 2nd	

Laboratory Manager: Jane Allen

GSE-8.2.4-029 Rev -- 03/05

This test report shall not be reproduced, except in full, without written approval of the laboratory.

19103 Gundle Road - Houston, Texas 77073

Chevron Phillips Chemical Company LP

CoA Date: 12/19/2008

Certificate of Analysis

Shipped To: CHEVRON PHILLIPS CHEM. CO LP: GSE
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: UP TRACK 14732 Phouangsavanh
Fax:

CPC Delivery #: 87788262
PO #: 44276
Weight: 194200 LB
Ship Date: 12/19/2008
Package: BULK
Mode: Hopper Car
Car #: PSPX006111
Seal No: 270360

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8281597

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.1	g/10mi
HLMI Flow Rate	ASTM D1238	12.4	g/10mi
Density	ASTM D1505	0.937	g/cm3
Production Date		12/02/2008	

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP.
However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.

Troy Griffin
Quality Systems Coordinator

For CoA questions contact Customer Service Representative at +1-832-813-4637

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GEOSYNTHETICS INVENTORY LOG
40 MIL LLDPE GEOMEMBRANE (TEXTURED)

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: 40-Mil LLDPE Geomembrane (Textured)
Geosynthetic Product Identification: GSE Ultraflex Textured

Material		Material Dimensions		Conformance	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)	Sample No.	
104144244	CYA810270	700	23	L0912-05-01	PASS
104144245	CYA810270	700	23		
104144246	CYA810270	700	23		
104144247	CYA810270	700	23		
104144248	CYA810270	700	23		
104144249	CYA810270	700	23		
104144250	CYA810270	700	23	L0912-05-02	PASS
104144251	CYA810270	700	23		
104144252	CYA810270	700	23		
104144253	CYA810270	700	23		
104144254	CYA810270	700	23		
104144255	CYA810270	700	23		
104144256	CYA810270	700	23	L0912-05-03	PASS
104144257	CYA810400	700	23		
104144258	CYA810400	700	23		
104144259	CYA810400	700	23		
104144260	CYA810400	700	23		
104144261	CYA810400	700	23		
104144262	CYA810400	700	23	L0912-05-04	PASS
104144263	CYA810400	700	23		
104144264	CYA810400	700	23		
104144265	CYA810400	700	23		
104144266	CYA810400	700	23		
104144267	CYA810400	700	23		
104144268	CYA810400	700	23	L0912-05-05	PASS
104144269	CYA810400	700	23		
104144270	CYA810400	700	23		
104144271	CYA810400	700	23		
104144272	CYA810400	700	23		
104144273	CYA810400	700	23		
104144274	CYA810400	700	23	L0912-05-06	
104144275	CYA810400	700	23		

Totals:

Total Rolls: 32
Total Lots: 2
Total SF: 515,200

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GEOSYNTHETICS INVENTORY LOG
60 MIL LLDPE GEOMEMBRANE (TEXTURED)

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton, Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: 60-Mil HDPE Geomembrane (Textured)
Geosynthetic Product Identification: GSE HD Textured

Material		Material Dimensions		Conformance	
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)	Sample No.	Remarks
102136707	8281597	520	23	L0912-01-01	PASS
102136708	8281597	520	23		
102136709	8281597	520	23		
102136710	8281597	520	23		
102136711	8281597	520	23		
102136712	8281597	520	23		
102136713	8281597	520	23		
102136714	8281597	520	23		
102136715	8281597	520	23	L0912-01-02	PASS
102136716	8281597	520	23		
102136717	8281597	520	23		
102136718	8281597	520	23		
102136719	8281597	520	23		
102136720	8281597	520	23		
102136721	8281597	520	23		
102136722	8281597	520	23		
102136723	8281597	520	23	L0912-01-03	PASS
102136724	8281597	520	23		
102136725	8281597	520	23		
102136726	8281597	520	23		
102136727	8281597	520	23		
102136728	8281597	520	23		
102136729	8281597	520	23		
102136730	8281597	520	23		
102136731	8281597	520	23	L0912-01-04	PASS
102136732	8281597	520	23		
102136733	8281597	520	23		
102136734	8281597	520	23		
102136735	8281597	520	23		
102136736	8281597	520	23		
102136737	8281597	520	23		

Totals:

Total Rolls: 31
Total Lots: 1
Total SF: 370,760

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CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-01
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144244

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	41	41	38	38	41		
			37	37	37	41	41	**39.2**	1.93
DENSITY	D 1505	g/cc	0.9332	0.9332	0.9329			**0.9331**	0.0002
CARBON BLACK CONTENT	D 1603	%	2.55	2.56				**2.55**	0.010
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	28.0	29.8	28.3	32.6	32.2		
			33.0	28.2	31.4	30.4	28.0	**30.2**	2.01
		CD-lbs	32.5	25.5	31.0	28.2	33.1		
			28.7	29.8	31.2	25.5	24.7	**29.0**	3.02
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	148	137	132	133	136	**137**	6.45
		CD-ppi	129	125	134	108	85	**116**	20.06
ELONGATION AT BREAK		MD%	632	586	545	569	600	**586**	32.72
Lo = 2.0"		CD%	575	585	624	482	421	**537**	83.36

CHECKED BY: BF DATE: 2-27-09

\\GEOSERVER\Data Drive\Synthetics\2009 SYNTHETICS\[L09012-05-01 LLDPE JOHN: L09012-05-01 2/27/2009

CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-02
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144250

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	38	41	41	42	44		
			41	43	40	43	39	**41.2**	1.87
DENSITY	D 1505	g/cc	0.9321	0.9324	0.9326			**0.9324**	0.0003
CARBON BLACK CONTENT	D 1603	%	2.51	2.44				**2.47**	0.053
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	2	1		
TEAR RESISTANCE	D 1004	MD-lbs	28.7	30.2	31.0	33.9	29.8		
			26.3	31.7	33.4	31.6	29.7	**30.6**	2.23
		CD-lbs	28.0	30.6	32.7	32.3	28.4		
			30.5	32.4	33.4	26.8	28.8	**30.4**	2.29
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	152	134	169	160	150	**153**	12.82
		CD-ppi	141	126	107	130	124	**126**	12.20
ELONGATION AT BREAK		MD%	611	529	677	642	601	**612**	55.08
Lo = 2.0"		CD%	628	535	476	513	520	**534**	56.65

CHECKED BY: BF DATE: 2-27-09

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2/27/2009

CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-03
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144256

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	45	40	39	42	44		
			38	37	44	41	41	**41.1**	2.69
DENSITY	D 1505	g/cc	0.9324	0.9324	0.9326			**0.9325**	0.0002
CARBON BLACK CONTENT	D 1603	%	2.51	2.60				**2.56**	0.068
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	33.0	31.8	30.1	31.4	28.6		
			31.1	31.5	32.1	32.1	32.4	**31.4**	1.26
		CD-lbs	28.0	28.7	29.6	26.9	29.0		
			32.6	29.5	26.4	27.5	33.7	**29.2**	2.35
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	156	143	166	148	165	**155**	9.95
		CD-ppi	102	148	144	134	142	**134**	18.40
ELONGATION AT BREAK		MD%	640	590	676	596	679	**636**	42.37
Lo = 2.0"		CD%	484	638	602	557	637	**584**	64.76

CHECKED BY: BF DATE: 2-27-09

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CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-04
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144262

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	41	44	42	43	39		
			42	44	42	40	42	**41.9**	1.60
DENSITY	D 1505	g/cc	0.9326	0.9329	0.9329			**0.9328**	0.0002
CARBON BLACK CONTENT	D 1603	%	2.54	2.52				**2.53**	0.007
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	31.9	28.7	34.6	30.9	28.4		
			30.6	31.4	30.1	33.4	29.8	**31.0**	1.95
		CD-lbs	27.3	31.4	30.0	29.4	25.0		
			28.7	31.1	28.7	29.5	31.4	**29.3**	1.99
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	161	150	156	142	169	**156**	10.36
		CD-ppi	99	134	140	116	143	**126**	18.36
ELONGATION AT BREAK		MD%	647	606	622	586	672	**627**	33.81
Lo = 2.0"		CD%	444	549	574	512	611	**538**	63.75

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2/27/2009

CONFORMANCE TEST RESULTS

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INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-05
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144268

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	39	42	41	39	42		
			41	37	46	41	42	**41.0**	2.40
DENSITY	D 1505	g/cc	0.9324	0.9326	0.9326			**0.9325**	0.0002
CARBON BLACK CONTENT	D 1603	%	2.58	2.61				**2.59**	0.023
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	2	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	32.3	32.0	28.9	28.5	29.0		
			29.2	28.9	26.9	28.2	30.0	**29.4**	1.66
		CD-lbs	31.0	28.2	26.0	29.9	30.6		
			26.6	29.3	29.4	30.1	30.2	**29.1**	1.68
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	153	146	137	164	144	**149**	10.01
		CD-ppi	129	133	138	130	151	**136**	8.87
ELONGATION AT BREAK		MD%	633	620	554	698	618	**625**	51.25
Lo = 2.0"		CD%	557	582	569	556	655	**584**	41.18

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CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-05
LAB ID NO.: L09012-05-06
MATERIAL: GSE 40 MIL TEXTURED LLDPE
ROLL NO: 104144274

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	43	44	43	42	40		
			40	46	43	43	44	**42.8**	1.81
DENSITY	D 1505	g/cc	0.9318	0.9318	0.9321			**0.9319**	0.0002
CARBON BLACK CONTENT	D 1603	%	2.60	2.51				**2.56**	0.065
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	30.7	32.8	34.9	34.6	29.9		
			31.4	27.0	29.3	33.9	32.2	**31.7**	2.52
		CD-lbs	29.8	31.6	28.8	28.3	33.3		
			33.7	29.8	29.6	32.5	30.5	**30.8**	1.88
TENSILE PROPERTIES	D 6693								
STRENGTH AT BREAK		MD-ppi	158	146	166	176	160	**161**	10.97
		CD-ppi	132	140	136	144	132	**137**	5.25
ELONGATION AT BREAK		MD%	615	581	646	700	667	**642**	45.97
Lo = 2.0"		CD%	549	573	561	570	576	**566**	10.94

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CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-01
LAB ID NO.: L09012-01-01
MATERIAL: GSE 60 MIL TEXTURED HDPE
ROLL NO: 102136707

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	61	60	64	63	65		
			61	60	66	62	63	**62.5**	2.07
DENSITY	D 1505	g/cc	0.9443	0.9443	0.9442			**0.9443**	0.0001
CARBON BLACK CONTENT	D 1603	%	2.54	2.55				**2.55**	0.006
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	55.4	55.5	52.4	52.0	57.2		
			57.1	58.5	59.1	59.8	52.8	**56.0**	2.84
		CD-lbs	54.4	58.6	53.7	55.9	54.5		
			54.6	53.8	52.1	51.2	51.9	**54.1**	2.15
TENSILE PROPERTIES	D 6693								
STRENGTH AT YIELD		MD-ppi	166	155	163	168	164	**163**	5.10
		CD-ppi	166	168	157	151	160	**161**	6.87
STRENGTH AT BREAK		MD-ppi	185	165	194	148	180	**175**	18.01
		CD-ppi	165	178	176	180	167	**173**	6.82
ELONGATION AT YIELD		MD%	16	17	16	17	17	**16.4**	0.44
Lo = 1.3"		CD%	15	16	16	15	16	**15.6**	0.44
ELONGATION AT BREAK		MD%	465	427	522	362	451	**445**	58.26
Lo = 2.0"		CD%	447	510	490	539	466	**490**	36.14

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CONFORMANCE TEST RESULTS

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INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-01
LAB ID NO.: L09012-01-02
MATERIAL: GSE 60 MIL TEXTURED HDPE
ROLL NO: 102136715

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	62	65	59	61	63		
			61	59	58	59	58	**60.5**	2.32
DENSITY	D 1505	g/cc	0.9438	0.9437	0.9437			**0.9438**	0.0001
CARBON BLACK CONTENT	D 1603	%	2.43	2.43				**2.43**	0.002
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			2	2	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	55.7	54.2	55.4	52.0	54.1		
			51.3	55.7	54.0	54.3	55.0	**54.2**	1.49
		CD-lbs	52.8	51.6	56.3	54.9	49.7		
			49.8	52.5	52.7	54.4	54.1	**52.9**	2.13
TENSILE PROPERTIES	D 6693								
STRENGTH AT YIELD		MD-ppi	156	160	161	165	167	**162**	4.37
		CD-ppi	158	163	154	160	166	**160**	4.50
STRENGTH AT BREAK		MD-ppi	204	178	172	170	178	**180**	13.82
		CD-ppi	147	166	176	182	185	**171**	15.19
ELONGATION AT YIELD		MD%	16	15	16	14	15	**15.0**	0.72
Lo = 1.3"		CD%	17	16	15	16	16	**15.9**	0.58
ELONGATION AT BREAK		MD%	586	508	496	467	487	**509**	45.68
Lo = 2.0"		CD%	335	410	476	483	485	**438**	65.33

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CONFORMANCE TEST RESULTS

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INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-01
LAB ID NO.: L09012-01-03
MATERIAL: GSE 60 MIL TEXTURED HDPE
ROLL NO: 102136723

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	60	63	61	66	64		
			63	60	62	64	58	**62.1**	2.38
DENSITY	D 1505	g/cc	0.9451	0.9452	0.9452			**0.9452**	0.0001
CARBON BLACK CONTENT	D 1603	%	2.53	2.53				**2.53**	0.003
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	54.9	55.9	56.1	57.0	52.7		
			54.3	52.0	51.8	57.6	54.4	**54.7**	2.03
		CD-lbs	53.3	51.1	57.9	55.6	53.4		
			53.9	51.1	50.9	52.5	53.2	**53.3**	2.18
TENSILE PROPERTIES	D 6693								
STRENGTH AT YIELD		MD-ppi	164	169	163	166	158	**164**	3.79
		CD-ppi	171	167	170	167	162	**167**	3.42
STRENGTH AT BREAK		MD-ppi	160	147	191	185	180	**173**	18.46
		CD-ppi	181	170	182	164	155	**170**	11.30
ELONGATION AT YIELD		MD%	17	16	16	16	16	**16.2**	0.17
Lo = 1.3"		CD%	15	15	15	15	15	**15.2**	0.34
ELONGATION AT BREAK		MD%	408	327	508	484	451	**436**	71.37
Lo = 2.0"		CD%	484	462	492	459	327	**445**	67.34

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CONFORMANCE TEST RESULTS

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-01
LAB ID NO.: L09012-01-04
MATERIAL: GSE 60 MIL TEXTURED HDPE
ROLL NO: 102136731

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
THICKNESS	D 5994	mils	63	65	62	61	63		
			64	66	64	58	61	**62.7**	2.31
DENSITY	D 1505	g/cc	0.9450	0.9450	0.9449			**0.9450**	0.0001
CARBON BLACK CONTENT	D 1603	%	2.53	2.55				**2.54**	0.015
CARBON BLACK DISPERSION	D 5596	CATEGORY	1	1	1	1	1		
			1	1	1	1	1		
TEAR RESISTANCE	D 1004	MD-lbs	59.0	55.3	56.0	58.3	55.7		
			54.5	59.8	55.5	52.5	53.8	**56.0**	2.33
		CD-lbs	53.0	53.5	52.7	51.4	54.3		
			53.0	54.0	52.6	52.8	53.2	**53.1**	0.80
TENSILE PROPERTIES	D 6693								
STRENGTH AT YIELD		MD-ppi	157	168	170	170	169	**167**	5.54
		CD-ppi	166	174	170	172	173	**171**	3.36
STRENGTH AT BREAK		MD-ppi	192	200	185	158	178	**182**	15.71
		CD-ppi	148	164	188	140	176	**163**	19.69
ELONGATION AT YIELD		MD%	14	16	16	15	17	**15.5**	0.93
Lo = 1.3"		CD%	15	15	15	15	15	**15.2**	0.21
ELONGATION AT BREAK		MD%	502	504	447	330	423	**441**	71.36
Lo = 2.0"		CD%	400	429	516	354	478	**435**	63.70

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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Field Trial Seam Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/11/2009
Project Location: Smithfield, NC
Page: 1 of 2

Material: LLDPE

40 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	50	Peel:	44
Shear:	60	Shear:	60

Sample #	Date	Time	Ambient Temp.	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
								Peel (ppi) IN / OUT					Shear (ppi)							
				Machine	Operator	Temp/ Speed °F/fpm (or %max)	Barrel/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
1	3/11/2009	8:40		19	GG	850/650		74	76	81	78		82	84	85	82		P	IF	TX/TX
								74	76	77	76									
2	3/11/2009	9:00		21	LG	850/650		79	76	74	71		75	74	75	73		P	IF	TX/TX
								74	75	72	74									
3	3/11/2009	1:28		21	LG	850/700		68	66	68	70		75	73	77	70		P	IF	TX/TX
								67	72	73	67									
4	3/1/2009	1:30		19	GG	850/700		66	71	69	70		69	70	68	73		P	IF	TX/TX
								67	67	69	67									
5	3/12/2009	8:25		10	GG		500/400	57	67	77	70		84	81	87	82		P	IF	TX/TX
6	3/12/2009	8:02		11	RO		550/500	76	80	84	81		89	88	84	81		P	IF	TX/TX
7	3/12/2009	1:15		10	GG		500/400	70	73	73	71		77	73	70	71		P	IF	TX/TX
8	3/12/2009	1:21		11	RO		500/400	73	73	77	75		75	72	77	76		P	IF	TX/TX
9	3/12/2009	3:50		14	LG	850/700		73	68	72	69		79	74	76	78		P	IF	TX/TX
								69	73	70	68									
10	3/12/2009	4:15		19	GG	850/700		75	71	72	73		73	76	78	72		P	IF	TX/TX
								74	73	70	69									
11	3/23/2009	8:55		14	LG	850/700		68	73	74	72		72	70	81	77		P	LG	TX/TX
								77	71	69	68									
12	3/23/2009	8:50		21	GG	850/680		75	75	73	75		78	77	76	78		P	GG	TX/TX
								74	72	71	73									
13	3/23/2009	1:30		14	LG	850/680		64	62	64	65		67	65	66	67		P	LG	TX/TX
								60	63	60	64									
14	3/23/2009	1:35		21	GG	850/680		67	61	65	65		68	67	70	68		P	GG	TX/TX
								65	64	66	64									

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Field Trial Seam Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/11/2009
Project Location: Smithfield, NC
Page: 2 of 2

Material: LLDPE

40 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	50	Peel:	44
Shear:	60	Shear:	60

Sample #	Date	Time	Ambient Temp.	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
								Peel (ppi) IN / OUT					Shear (ppi)							
				Machine	Operator	Temp/ Speed °F/fpm (or %max)	Barrel/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
15	3/24/2009	7:45		10	GG		500/400	77	65	63	82		79	78	80	86		P	GG	TX/TX
16	3/24/2009	1:30		14	LG	850/680		61	72	60	67		73	69	68	75		P	LG	TX/TX
								60	63	60	73									
17	3/24/2009	1:33		21	GG	850/680		68	64	61	66		71	69	76	74		P	GG	TX/TX
								64	60	66	64									
18	3/25/2009	7:50		10	GG		500/400	85	81	83	82		83	84	81	84		P	GG	TX/TX
19	3/25/2009	8:06		11	RO		550/550	75	81	79	81		80	81	83	80		P	RO	TX/TX
20	3/25/2009	5:48		14	LG	850/680		70	72	78	69		79	85	83	79		P	LG	TX/TX
								68	72	72	69									
21	3/25/2009	5:55		21	GG	850/650		72	76	73	67		90	85	91	94		P	GG	TX/TX
								73	73	74	74									
22	3/25/2009	6:00		14	LG	850/650		71	78	67	67		85	90	88	87		P	LG	TX/TX
								68	79	69	68									
23	3/28/2009	3:30		11	RO		550/550	78	77	70	74		83	79	80	86		P	RO	TX/TX
24	3/30/2009	7:40		11	RO		550/550	85	79	83	80		93	89	91	90		P	RO	TX/TX
25	3/31/2009	6:20		11	RO		550/550	82	84	80	85		89	92	90	89		P	IF	TX/TX
26	3/31/2009	5:40		21	GG	850/680		70	65	60	62		96	90	92	89		P	IF	TX/TX
								68	68	60	68									
27	4/1/2009	4:30		11	RO		550/550	82	84	80	85		89	92	90	89		P	IF	TX/TX

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Field Trial Seam Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/18/2009
Project Location: Smithfield, NC
Page: 1 of 3

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

Sample #	Date	Time	Ambient Temp.	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
								Peel (ppi) IN / OUT					Shear (ppi)							
				Machine	Operator	Temp/ Speed °F/fpm (or %max)	Barrel/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
1	3/18/2009	2:40		14	LG	850/550		139	140	135	134		148	152	145	155		P	IF	TX/TX
								143	146	136	142									
2	3/18/2009	2:40		19	GG	850/550		130	145	145	136		173	164	160	174		P	IF	TX/TX
								155	145	150	130									
3	3/19/2009	8:06		11	RO		550/550	151	166	155	135		186	190	180	184		P	IF	TX/TX
4	3/19/2009	1:05		14	LG	850/550		123	135	131	140		143	156	146	144		P	IF	TX/TX
								131	138	125	135									
5	3/19/2009	1:06		19	GG	850/550		131	134	137	128		150	157	149	155		P	IF	TX/TX
								130	132	137	131									
6	3/20/2009	7:36		10	GG		550/550	141	150	152	144		180	182	185	181		P	IF	TX/TX
7	3/20/2009	10:55		11	RO		550/550	145	144	145	150		186	183	180	183		P	IF	TX/TX
8	3/20/2009	12:58		11	RO		550/550	140	139	141	144		182	180	179	185		P	IF	TX/TX
9	3/20/2009	1:00		10	GG		550/550	150	149	144	147		181	185	184	180		P	IF	TX/TX
10	3/30/2009	7:32		14	LG	850/550		125	117	120	105		145	132	129	138		P	IF	TX/TX
								129	126	124	119									
11	3/30/2009	7:40		19	GG	850/550		125	128	130	120		160	155	148	150		P	GG	
								132	132	132	125									
12	3/30/2009	1:02		14	LG	850/550		130	128	132	130		149	150	156	150		P	LG	
								126	136	128	130									
13	3/30/2009	12:58		19	GG	850/550		145	128	132	136		150	148	152	158		P	GG	
								138	130	130	128									
14	3/31/2009	7:50		19	GG	850/550		142	122	128	136		160	158	172	160		P	GG	
								136	126	130	122									

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
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Geomembrane Field Trial Seam Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/18/2009
Project Location: Smithfield, NC
Page: 2 of

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

Sample #	Date	Time	Ambient Temp.	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
								Peel (ppi) IN / OUT					Shear (ppi)							
				Machine	Operator	Temp/ Speed °F/fpm (or %max)	Barrel/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
15	3/31/2009	7:58		14	LG	850/550		142	146	126	138		160	166	170	158		P	LG	
								140	138	136	142									
16	3/31/2009	1:40		19	GG	850/550		122	132	128	142		155	148	142	140		P	GG	
								119	116	136	125									
17	3/31/2009	1:48		14	LG	850/550		128	122	119	120		146	148	142	150		P	LG	
								130	126	125	130									
18	3/31/2009	7:20		11	RO		550/550	118	126	130	128		148	146	146	150		P	RO	
19	4/1/2019	10:48		14	LG	850/550		138	139	132	130		158	150	145	152		P	LG	
								132	140	138	136									
20	4/1/2009	11:00		19	GG	850/550		137	136	132	142		160	149	158	155		P	GG	
								138	137	138	148									
21	4/1/2009	2:48		14	LG	850/550		138	142	140	136		150	152	162	160		P	LG	
								130	136	140	134									
22	4/1/2009	3:00		19	GG	850/550		141	140	130	134		159	156	160	158		P	GG	
								143	149	136	142									
23	4/2/2009	8:00		19	GG	850/550		152	148	150	140		160	162	170	160		P	GG	
								141	150	150	146									
24	4/2/2009	7:50		14	LG	850/550		148	138	140	132		149	160	155	150		P	LG	
								132	130	140	146									
25	4/3/2009	1:27		11	RO		550/550	100	103	101	106		120	125	119	132		P	RO	
26	4/4/2009	7:25		11	RO		550/550	125	119	135	128		173	162	165	168		P	RO	
27	4/6/2009	8:15		14	LG	850/550		148	146	142	146		175	161	170	168		P	LG	
								152	130	144	141									
28	4/6/2009	8:27		19	GG	850/550		142	140	126	142		168	162	170	166		P	GG	
								145	148	143	140									

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Field Trial Seam Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/18/2009
Project Location: Smithfield, NC
Page: 3 of 3

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

Sample #	Date	Time	Ambient Temp.	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
								Peel (ppi) IN / OUT					Shear (ppi)							
				Machine	Operator	Temp/ Speed °F/fpm (or %max)	Barrel/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
29	4/7/2009	8:00		19	GG	850/550		154	175	151	172		190	197	191	189		P	GG	
								148	161	170	151									
30	4/7/2009	9:55		14	LG	850/550		123	156	146	161		180	192	190	179		P	LG	
								144	149	151	156									
31	4/7/2009	1:41		19	GG	850/550		130	137	138	136		173	168	165	170		P	GG	
								137	145	140	138									
32	4/7/2009	1:45		14	LG	850/550		134	128	137	148		163	171	160	165		P	LG	
								147	148	136	137									
33	4/8/2009	7:30		10	JV		550/500	104	105	135	130		185	173	182	175		P	JV	
34	4/8/2009	7:35		11	RO		550/550	124	108	114	112		192	182	188	179		P	RO	
35	4/7/2009	3:22		14	LG	850/550		123	145	144	143		194	193	189	190		P	LG	
								146	139	141	145									
36	4/7/2009	3:25		19	GG	850/550		142	129	137	140		193	190	189	194		P	GG	
								146	137	134	143									
37	4/9/2009	10:25		14	LG	850/550		128	130	122	134		163	164	158	162		P	LG	
								131	133	141	137									
38	4/9/2009	10:30		19	GG	850/550		145	129	128	135		164	165	162	163		P	GG	
								130	142	141	132									
39	4/9/2009	2:14		10	JV		550/500	140	143	142	143		147	145	147	146		P	JV	

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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
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Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/11/09
Project Location: Smithfield, NC
Page: 1 of 2

Material: LLDPE
Thickness: 40 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/11/2009	P-1	9:57	Slope	4245	22.5	278	6255
3/11/2009	P-2	10:04	Slope	4245	22.5	275	6187.5
3/11/2009	P-3	10:14	Slope	4245	22.5	128	2880
3/11/2009	P-4	10:19	Slope	4246	22.5	140	3150
3/11/2009	P-5	10:27	Slope	4246	22.5	256	5760
3/11/2009	P-6	10:32	Slope	4246	22.5	231	5197.5
3/11/2009	P-7	10:45	Slope	4257	22.5	191	4297.5
3/11/2009	P-8	10:52	Slope	4257	22.5	147	3307.5
3/11/2009	P-9	11:02	Slope	4257	22.5	102	2295
3/11/2009	P-10	11:10	Slope	4257	22.5	55	1237.5
3/11/2009	P-11	11:14	Slope	4257	13	20	260
3/11/2009	P-12	1:20	Slope	4257	22.5	121	2722.5
3/11/2009	P-13	1:34	Slope	4248	22.5	159	3577.5
3/11/2009	P-14	1:50	Slope	4248	22.5	275	6187.5
3/11/2009	P-15	2:15	Slope	4248	22.5	245	5512.5
3/11/2009	P-16	2:34	Slope	4251	22.5	33	742.5
3/11/2009	P-17	2:40	Slope	4251	22.5	279	6277.5
3/11/2009	P-18	2:52	Slope	4251	22.5	281	6322.5
3/11/2009	P-19	2:56	Slope	4251	22.5	78	1755
3/11/2009	P-20	3:33	Slope	4247	22.5	203	4567.5
3/11/2009	P-21	3:49	Slope	4247	22.5	289	6502.5
3/11/2009	P-22	3:55	Slope	4247	22.5	174	3915
3/11/2009	P-23	4:05	Slope	4262	22.5	117	2632.5
3/11/2009	P-24	4:18	Slope	4262	22.5	296	6660
3/11/2009	P-25	4:39	Slope	4262	22.5	265	5962.5
3/11/2009	P-26	5:19	Slope	4269	22.5	33	742.5
3/11/2009	P-27	5:21	Slope	4269	22.5	300	6750
3/11/2009	P-28	5:35	Slope	4269	22.5	303	6817.5
3/11/2009	P-29	5:46	Slope	4264	22.5	32	720
3/11/2009	P-30	5:50	Slope	4264	22.5	273	6142.5
3/11/2009	P-31	5:58	Slope	4264	22.5	507	11407.5
3/11/2009	P-32	6:15	Slope	4264	22.5	88	1980
3/11/2009	P-33	6:20	Slope	4272	22.5	223	5017.5
3/12/2009	P-34	4:27	Slope	4272	22.5	313	7042.5
3/12/2009	P-35	4:45	Slope	4272	22.5	142	3195
3/12/2009	P-36	4:49	Slope	4271	22.5	171	3847.5
3/12/2009	P-37	5:00	Slope	4271	22.5	315	7087.5
3/23/2009	P-38	9:33	Slope	4271	22.5	181	4072.5
3/23/2009	P-39	9:49	Floor	4270	22.5	136	3060
3/23/2009	P-40	10:20	Slope/Floor	4270	22.5	322	7245
3/23/2009	P-41	11:19	Slope	4270	22.5	224	5040
3/23/2009	P-42	11:41	Floor	4273	22.5	98	2205
3/23/2009	P-43	12:10	Slope/Floor	4273	22.5	322	7245
3/23/2009	P-44	1:44	Slope/Floor	4273	22.5	275	6187.5
3/23/2009	P-45	1:55	Floor	4275	22.5	47	1057.5
3/23/2009	P-46	2:12	Slope/Floor	4275	22.5	322	7245
3/23/2009	P-47	2:44	Slope/Floor	4275	22.5	321	7222.5
3/23/2009	P-48	3:15	Slope/Floor	4254	22.5	319	7177.5
					Total This Page		222672.5

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/11/09
Project Location: Smithfield, NC
Page: 2 of 2

Material: LLDPE
Thickness: 40 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/23/2009	P-49	3:30	Slope/Floor	4254	22.5	317	7132.5
3/23/2009	P-50	3:50	Slope/Floor	4255	22.5	315	7087.5
3/23/2009	P-51	4:18	Slope/Floor	4255	22.5	312	7020
3/23/2009	P-52	4:40	Slope/Floor	4256	22.5	310	6975
3/24/2009	P-53	1:59	Slope/Floor	4256	22.5	307	6907.5
3/24/2009	P-54	2:33	Slope/Floor	4258	22.5	304	6840
3/24/2009	P-55	2:55	Slope/Floor	4258	22.5	303	6817.5
3/24/2009	P-56	3:40	Slope/Floor	4258	22.5	80	1800
3/24/2009	P-57	3:49	Slope/Floor	4259	22.5	221	4972.5
3/24/2009	P-58	4:17	Slope/Floor	4259	22.5	301	6772.5
3/24/2009	P-59	4:22	Slope/Floor	4259	22.5	151	3397.5
3/24/2009	P-60	4:30	Slope/Floor	4260	22.5	141	3172.5
3/24/2009	P-61	5:02	Slope/Floor	4260	22.5	290	6525
3/24/2009	P-62	5:23	Slope/Floor	4260	22.5	237	5332.5
3/24/2009	P-63	5:29	Slope/Floor	42556	22.5	38	855
3/24/2009	P-64	5:47	Slope/Floor	4250	22.5	268	6030
3/24/2009	P-65	6:00	Slope/Floor	4250	22.5	255	5737.5
3/25/2009	P-66	6:10	Slope	4250	22.5	158	3555
3/25/2009	P-67	6:30	Floor	4263	22.5	82	1845
3/25/2009	P-68	6:36	Slope/Floor	4263	22.5	230	5175
3/25/2009	P-69	6:47	Slope/Floor	4263	22.5	220	4950
3/25/2009	P-70	6:53	Slope/Floor	4263	22.5	132	2970
3/25/2009	P-71	7:04	Floor	4268	22.5	73	1642.5
3/25/2009	P-72	7:06	Slope/Floor	4268	22.5	185	4162.5
3/25/2009	P-73	7:20	Slope/Floor	4268	22.5	160	3600
3/25/2009	P-74	7:28	Slope/Floor	4268	22.5	122	2745
3/25/2009	P-75	7:35	Slope/Floor	4268	22.5	90	2025
3/31/2009	P-76	6:00	Slope	4255	22.5	47	1057.5
3/31/2009	P-77	6:08	Slope	4255	22.5	13	292.5
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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
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Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/18/09
Project Location: Smithfield, NC
Page: 1 of 2

Material: HDPE
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/18/2009	P-1	2:56	Slope	6715	22.5	275	6187.5
3/18/2009	P-2	3:07	Slope	6715	22.5	244	5490
3/18/2009	P-3	3:23	Slope	6722	22.5	32	720
3/18/2009	P-4	3:28	Slope	6722	22.5	271	6097.5
3/18/2009	P-5	3:47	Slope	6722	22.5	211	4747.5
3/18/2009	P-6	3:55	Floor	6719	22.5	58	1305
3/18/2009	P-7	4:00	Slope	6719	22.5	260	5850
3/18/2009	P-8	4:20	Slope	6719	22.5	194	4365
3/18/2009	P-9	4:25	Floor	6714	22.5	53	1192.5
3/18/2009	P-10	4:50	Slope	6714	22.5	209	4702.5
3/18/2009	P-11	4:55	Slope	6714	22.5	162	3645
3/18/2009	P-12	4:58	Slope	6714	22.5	65	1462.5
3/18/2009	P-13	6:06	Floor	6728	22.5	54	1215
3/19/2009	P-14	1:20	Slope/Floor	6728	22.5	275	6187.5
3/19/2009	P-15	1:34	Slope/Floor	6728	22.5	172	3870
3/19/2009	P-16	1:40	Slope	6711	22.5	103	2317.5
3/19/2009	P-17	1:51	Slope	6711	22.5	277	6232.5
3/19/2009	P-18	1:59	Slope	6711	22.5	110	2475
3/19/2009	P-19	2:09	Slope	6727	22.5	170	3825
3/19/2009	P-20	2:22	Slope	6727	22.5	282	6345
3/19/2009	P-21	3:37	Slope	6727	22.5	51	1147.5
3/19/2009	P-22	3:00	Slope	6718	22.5	233	5242.5
3/19/2009	P-23	3:23	Slope	6718	22.5	286	6435
3/19/2009	P-24	3:30	Slope	6732	22.5	293	6592.5
3/19/2009	P-25	5:10	Slope	6732	22.5	228	5130
3/19/2009	P-26	5:25	Slope	6734	22.5	67	1507.5
3/19/2009	P-27	5:30	Slope	6734	22.5	304	6840
3/19/2009	P-28	5:15	Slope	6734	22.5	70	1575
3/19/2009	P-29	5:17	Slope	6734	22.5	30	675
3/30/2009	P-30	2:37	Slope/Floor	6733	22.5	304	6840
3/30/2009	P-31	3:20	Slope/Floor	6733	22.5	198	4455
3/30/2009	P-32	3:25	Slope/Floor	6729	22.5	105	2362.5
3/30/2009	P-33	4:00	Slope/Floor	6729	22.5	311	6997.5
3/30/2009	P-34	4:25	Slope/Floor	6729	22.5	90	2025
3/30/2009	P-35	4:33	Slope/Floor	6712	22.5	222	4995
3/30/2009	P-36	4:50	Slope/Floor	6712	22.5	290	6525
3/30/2009	P-37	4:58	Slope/Floor	6726	22.5	20	450
3/30/2009	P-38	5:25	Slope/Floor	6726	22.5	312	7020
3/30/2009	P-39	6:05	Slope/Floor	6726	22.5	150	3375
3/30/2009	P-40	6:28	Slope/Floor	6707	22.5	170	3825
3/31/2009	P-41	1:40	Slope/Floor	6707	22.5	320	7200
3/31/2009	P-42	2:10	Slope/Floor	6720	22.5	320	7200
3/31/2009	P-43	2:39	Slope/Floor	6720	22.5	180	4050
3/31/2009	P-44	2:50	Slope/Floor	6717	22.5	141	3172.5
3/31/2009	P-45	3:20	Slope/Floor	6717	22.5	319	7177.5
3/31/2009	P-46	4:50	Slope/Floor	6721	22.5	321	7222.5
4/1/2009	P-47	11:00	Slope/Floor	6721	22.5	179	4027.5
4/1/2009	P-48	11:13	Slope/Floor	6713	22.5	142	3195
					Total This Page		205492.5

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/18/09
Project Location: Smithfield, NC
Page: 2 of 2

Material: HDPE
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
4/1/2009	P-49	11:20	Slope/Floor	6713	22.5	322	7245
4/1/2009	P-50	3:58	Slope/Floor	6724	22.5	319	7177.5
4/1/2009	P-51	4:10	Slope/Floor	6724	22.5	196	4410
4/1/2009	P-52	4:47	Slope/Floor	6731	22.5	119	2677.5
4/1/2009	P-53	6:00	Slope/Floor	6731	22.5	319	7177.5
4/1/2009	P-54	6:10	Slope/Floor	6731	22.5	71	1597.5
4/1/2009	P-55	6:18	Slope/Floor	6723	22.5	243	5467.5
4/2/2009	P-56	9:30	Slope/Floor	6723	22.5	268	6030
4/2/2009	P-57	9:40	Slope/Floor	6713	22.5	37	832.5
4/2/2009	P-58	9:45	Slope/Floor	6717	22.5	11	247.5
4/6/2009	P-59	8:45	Slope/Floor	6730	22.5	311	6997.5
4/6/2009	P-60	9:25	Slope/Floor	6730	22.5	207	4657.5
4/6/2009	P-61	9:33	Slope/Floor	6725	22.5	101	2272.5
4/7/2009	P-62	10:15	Slope/Floor	6725	22.5	304	6840
4/7/2009	P-63	10:35	Slope/Floor	6725	22.5	105	2362.5
4/7/2009	P-64	10:47	Slope/Floor	6709	22.5	198	4455
4/7/2009	P-65	11:07	Slope/Floor	6709	22.5	298	6705
4/7/2009	P-66	11:34	Slope/Floor	6716	22.5	292	6570
4/7/2009	P-67	3:33	Slope/Floor	6716	22.5	220	4950
4/7/2009	P-68	3:36	Slope/Floor	6708	22.5	66	1485
4/7/2009	P-69	4:00	Slope/Floor	6708	22.5	278	6255
4/7/2009	P-70	4:25	Slope/Floor	6708	22.5	161	3622.5
4/7/2009	P-71	4:35	Slope/Floor	6710	22.5	103	2317.5
4/7/2009	P-72	4:45	Slope/Floor	6710	22.5	252	5670
4/9/2009	P-73	10:55	Slope/Floor	6710	22.5	143	3217.5
4/9/2009	P-74	11:05	Slope/Floor	6737	22.5	96	2160
4/9/2009	P-75	11:20	Slope/Floor	6737	22.5	225	5062.5
4/9/2009	P-76	11:32	Slope/Floor	6737	22.5	183	4117.5
4/9/2009	P-77	11:35	Slope/Floor	6736	22.5	28	630
4/9/2009	P-78	11:50	Slope/Floor	6736	22.5	195	4387.5
4/9/2009	P-79	12:55	Slope/Floor	6736	22.5	174	3915
4/9/2009	P-80	1:05	Slope/Floor	6736	22.5	90	2025
4/9/2009	P-81	1:16	Slope/Floor	6735	22.5	53	1192.5
4/9/2009	P-82	1:22	Slope/Floor	6735	22.5	108	2430
4/9/2009	P-83	1:25	Slope/Floor	6735	22.5	75	1687.5
4/9/2009	P-84	1:37	Slope/Floor	6735	22.5	35	787.5
4/9/2009	P-85	1:40	Slope/Floor	6735	22.5	15	337.5
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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/11/09
Project Location: Smithfield, NC
Page: 1 of 2

Material: LLDPE
Thickness: 40 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/11/2009	P-1	9:57	Slope	4245	22.5	278	6255
3/11/2009	P-2	10:04	Slope	4245	22.5	275	6187.5
3/11/2009	P-3	10:14	Slope	4245	22.5	128	2880
3/11/2009	P-4	10:19	Slope	4246	22.5	140	3150
3/11/2009	P-5	10:27	Slope	4246	22.5	256	5760
3/11/2009	P-6	10:32	Slope	4246	22.5	231	5197.5
3/11/2009	P-7	10:45	Slope	4257	22.5	191	4297.5
3/11/2009	P-8	10:52	Slope	4257	22.5	147	3307.5
3/11/2009	P-9	11:02	Slope	4257	22.5	102	2295
3/11/2009	P-10	11:10	Slope	4257	22.5	55	1237.5
3/11/2009	P-11	11:14	Slope	4257	13	20	260
3/11/2009	P-12	1:20	Slope	4257	22.5	121	2722.5
3/11/2009	P-13	1:34	Slope	4248	22.5	159	3577.5
3/11/2009	P-14	1:50	Slope	4248	22.5	275	6187.5
3/11/2009	P-15	2:15	Slope	4248	22.5	245	5512.5
3/11/2009	P-16	2:34	Slope	4251	22.5	33	742.5
3/11/2009	P-17	2:40	Slope	4251	22.5	279	6277.5
3/11/2009	P-18	2:52	Slope	4251	22.5	281	6322.5
3/11/2009	P-19	2:56	Slope	4251	22.5	78	1755
3/11/2009	P-20	3:33	Slope	4247	22.5	203	4567.5
3/11/2009	P-21	3:49	Slope	4247	22.5	289	6502.5
3/11/2009	P-22	3:55	Slope	4247	22.5	174	3915
3/11/2009	P-23	4:05	Slope	4262	22.5	117	2632.5
3/11/2009	P-24	4:18	Slope	4262	22.5	296	6660
3/11/2009	P-25	4:39	Slope	4262	22.5	265	5962.5
3/11/2009	P-26	5:19	Slope	4269	22.5	33	742.5
3/11/2009	P-27	5:21	Slope	4269	22.5	300	6750
3/11/2009	P-28	5:35	Slope	4269	22.5	303	6817.5
3/11/2009	P-29	5:46	Slope	4264	22.5	32	720
3/11/2009	P-30	5:50	Slope	4264	22.5	273	6142.5
3/11/2009	P-31	5:58	Slope	4264	22.5	507	11407.5
3/11/2009	P-32	6:15	Slope	4264	22.5	88	1980
3/11/2009	P-33	6:20	Slope	4272	22.5	223	5017.5
3/12/2009	P-34	4:27	Slope	4272	22.5	313	7042.5
3/12/2009	P-35	4:45	Slope	4272	22.5	142	3195
3/12/2009	P-36	4:49	Slope	4271	22.5	171	3847.5
3/12/2009	P-37	5:00	Slope	4271	22.5	315	7087.5
3/23/2009	P-38	9:33	Slope	4271	22.5	181	4072.5
3/23/2009	P-39	9:49	Floor	4270	22.5	136	3060
3/23/2009	P-40	10:20	Slope/Floor	4270	22.5	322	7245
3/23/2009	P-41	11:19	Slope	4270	22.5	224	5040
3/23/2009	P-42	11:41	Floor	4273	22.5	98	2205
3/23/2009	P-43	12:10	Slope/Floor	4273	22.5	322	7245
3/23/2009	P-44	1:44	Slope/Floor	4273	22.5	275	6187.5
3/23/2009	P-45	1:55	Floor	4275	22.5	47	1057.5
3/23/2009	P-46	2:12	Slope/Floor	4275	22.5	322	7245
3/23/2009	P-47	2:44	Slope/Floor	4275	22.5	321	7222.5
3/23/2009	P-48	3:15	Slope/Floor	4254	22.5	319	7177.5
					Total This Page		222672.5

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/11/09
Project Location: Smithfield, NC
Page: 2 of 2

Material: LLDPE
Thickness: 40 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/23/2009	P-49	3:30	Slope/Floor	4254	22.5	317	7132.5
3/23/2009	P-50	3:50	Slope/Floor	4255	22.5	315	7087.5
3/23/2009	P-51	4:18	Slope/Floor	4255	22.5	312	7020
3/23/2009	P-52	4:40	Slope/Floor	4256	22.5	310	6975
3/24/2009	P-53	1:59	Slope/Floor	4256	22.5	307	6907.5
3/24/2009	P-54	2:33	Slope/Floor	4258	22.5	304	6840
3/24/2009	P-55	2:55	Slope/Floor	4258	22.5	303	6817.5
3/24/2009	P-56	3:40	Slope/Floor	4258	22.5	80	1800
3/24/2009	P-57	3:49	Slope/Floor	4259	22.5	221	4972.5
3/24/2009	P-58	4:17	Slope/Floor	4259	22.5	301	6772.5
3/24/2009	P-59	4:22	Slope/Floor	4259	22.5	151	3397.5
3/24/2009	P-60	4:30	Slope/Floor	4260	22.5	141	3172.5
3/24/2009	P-61	5:02	Slope/Floor	4260	22.5	290	6525
3/24/2009	P-62	5:23	Slope/Floor	4260	22.5	237	5332.5
3/24/2009	P-63	5:29	Slope/Floor	42556	22.5	38	855
3/24/2009	P-64	5:47	Slope/Floor	4250	22.5	268	6030
3/24/2009	P-65	6:00	Slope/Floor	4250	22.5	255	5737.5
3/25/2009	P-66	6:10	Slope	4250	22.5	158	3555
3/25/2009	P-67	6:30	Floor	4263	22.5	82	1845
3/25/2009	P-68	6:36	Slope/Floor	4263	22.5	230	5175
3/25/2009	P-69	6:47	Slope/Floor	4263	22.5	220	4950
3/25/2009	P-70	6:53	Slope/Floor	4263	22.5	132	2970
3/25/2009	P-71	7:04	Floor	4268	22.5	73	1642.5
3/25/2009	P-72	7:06	Slope/Floor	4268	22.5	185	4162.5
3/25/2009	P-73	7:20	Slope/Floor	4268	22.5	160	3600
3/25/2009	P-74	7:28	Slope/Floor	4268	22.5	122	2745
3/25/2009	P-75	7:35	Slope/Floor	4268	22.5	90	2025
3/31/2009	P-76	6:00	Slope	4255	22.5	47	1057.5
3/31/2009	P-77	6:08	Slope	4255	22.5	13	292.5
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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/18/09
Project Location: Smithfield, NC
Page: 1 of 2

Material: HDPE
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
3/18/2009	P-1	2:56	Slope	6715	22.5	275	6187.5
3/18/2009	P-2	3:07	Slope	6715	22.5	244	5490
3/18/2009	P-3	3:23	Slope	6722	22.5	32	720
3/18/2009	P-4	3:28	Slope	6722	22.5	271	6097.5
3/18/2009	P-5	3:47	Slope	6722	22.5	211	4747.5
3/18/2009	P-6	3:55	Floor	6719	22.5	58	1305
3/18/2009	P-7	4:00	Slope	6719	22.5	260	5850
3/18/2009	P-8	4:20	Slope	6719	22.5	194	4365
3/18/2009	P-9	4:25	Floor	6714	22.5	53	1192.5
3/18/2009	P-10	4:50	Slope	6714	22.5	209	4702.5
3/18/2009	P-11	4:55	Slope	6714	22.5	162	3645
3/18/2009	P-12	4:58	Slope	6714	22.5	65	1462.5
3/18/2009	P-13	6:06	Floor	6728	22.5	54	1215
3/19/2009	P-14	1:20	Slope/Floor	6728	22.5	275	6187.5
3/19/2009	P-15	1:34	Slope/Floor	6728	22.5	172	3870
3/19/2009	P-16	1:40	Slope	6711	22.5	103	2317.5
3/19/2009	P-17	1:51	Slope	6711	22.5	277	6232.5
3/19/2009	P-18	1:59	Slope	6711	22.5	110	2475
3/19/2009	P-19	2:09	Slope	6727	22.5	170	3825
3/19/2009	P-20	2:22	Slope	6727	22.5	282	6345
3/19/2009	P-21	3:37	Slope	6727	22.5	51	1147.5
3/19/2009	P-22	3:00	Slope	6718	22.5	233	5242.5
3/19/2009	P-23	3:23	Slope	6718	22.5	286	6435
3/19/2009	P-24	3:30	Slope	6732	22.5	293	6592.5
3/19/2009	P-25	5:10	Slope	6732	22.5	228	5130
3/19/2009	P-26	5:25	Slope	6734	22.5	67	1507.5
3/19/2009	P-27	5:30	Slope	6734	22.5	304	6840
3/19/2009	P-28	5:15	Slope	6734	22.5	70	1575
3/19/2009	P-29	5:17	Slope	6734	22.5	30	675
3/30/2009	P-30	2:37	Slope/Floor	6733	22.5	304	6840
3/30/2009	P-31	3:20	Slope/Floor	6733	22.5	198	4455
3/30/2009	P-32	3:25	Slope/Floor	6729	22.5	105	2362.5
3/30/2009	P-33	4:00	Slope/Floor	6729	22.5	311	6997.5
3/30/2009	P-34	4:25	Slope/Floor	6729	22.5	90	2025
3/30/2009	P-35	4:33	Slope/Floor	6712	22.5	222	4995
3/30/2009	P-36	4:50	Slope/Floor	6712	22.5	290	6525
3/30/2009	P-37	4:58	Slope/Floor	6726	22.5	20	450
3/30/2009	P-38	5:25	Slope/Floor	6726	22.5	312	7020
3/30/2009	P-39	6:05	Slope/Floor	6726	22.5	150	3375
3/30/2009	P-40	6:28	Slope/Floor	6707	22.5	170	3825
3/31/2009	P-41	1:40	Slope/Floor	6707	22.5	320	7200
3/31/2009	P-42	2:10	Slope/Floor	6720	22.5	320	7200
3/31/2009	P-43	2:39	Slope/Floor	6720	22.5	180	4050
3/31/2009	P-44	2:50	Slope/Floor	6717	22.5	141	3172.5
3/31/2009	P-45	3:20	Slope/Floor	6717	22.5	319	7177.5
3/31/2009	P-46	4:50	Slope/Floor	6721	22.5	321	7222.5
4/1/2009	P-47	11:00	Slope/Floor	6721	22.5	179	4027.5
4/1/2009	P-48	11:13	Slope/Floor	6713	22.5	142	3195
					Total This Page		205492.5

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 03/18/09
Project Location: Smithfield, NC
Page: 2 of 2

Material: HDPE
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
4/1/2009	P-49	11:20	Slope/Floor	6713	22.5	322	7245
4/1/2009	P-50	3:58	Slope/Floor	6724	22.5	319	7177.5
4/1/2009	P-51	4:10	Slope/Floor	6724	22.5	196	4410
4/1/2009	P-52	4:47	Slope/Floor	6731	22.5	119	2677.5
4/1/2009	P-53	6:00	Slope/Floor	6731	22.5	319	7177.5
4/1/2009	P-54	6:10	Slope/Floor	6731	22.5	71	1597.5
4/1/2009	P-55	6:18	Slope/Floor	6723	22.5	243	5467.5
4/2/2009	P-56	9:30	Slope/Floor	6723	22.5	268	6030
4/2/2009	P-57	9:40	Slope/Floor	6713	22.5	37	832.5
4/2/2009	P-58	9:45	Slope/Floor	6717	22.5	11	247.5
4/6/2009	P-59	8:45	Slope/Floor	6730	22.5	311	6997.5
4/6/2009	P-60	9:25	Slope/Floor	6730	22.5	207	4657.5
4/6/2009	P-61	9:33	Slope/Floor	6725	22.5	101	2272.5
4/7/2009	P-62	10:15	Slope/Floor	6725	22.5	304	6840
4/7/2009	P-63	10:35	Slope/Floor	6725	22.5	105	2362.5
4/7/2009	P-64	10:47	Slope/Floor	6709	22.5	198	4455
4/7/2009	P-65	11:07	Slope/Floor	6709	22.5	298	6705
4/7/2009	P-66	11:34	Slope/Floor	6716	22.5	292	6570
4/7/2009	P-67	3:33	Slope/Floor	6716	22.5	220	4950
4/7/2009	P-68	3:36	Slope/Floor	6708	22.5	66	1485
4/7/2009	P-69	4:00	Slope/Floor	6708	22.5	278	6255
4/7/2009	P-70	4:25	Slope/Floor	6708	22.5	161	3622.5
4/7/2009	P-71	4:35	Slope/Floor	6710	22.5	103	2317.5
4/7/2009	P-72	4:45	Slope/Floor	6710	22.5	252	5670
4/9/2009	P-73	10:55	Slope/Floor	6710	22.5	143	3217.5
4/9/2009	P-74	11:05	Slope/Floor	6737	22.5	96	2160
4/9/2009	P-75	11:20	Slope/Floor	6737	22.5	225	5062.5
4/9/2009	P-76	11:32	Slope/Floor	6737	22.5	183	4117.5
4/9/2009	P-77	11:35	Slope/Floor	6736	22.5	28	630
4/9/2009	P-78	11:50	Slope/Floor	6736	22.5	195	4387.5
4/9/2009	P-79	12:55	Slope/Floor	6736	22.5	174	3915
4/9/2009	P-80	1:05	Slope/Floor	6736	22.5	90	2025
4/9/2009	P-81	1:16	Slope/Floor	6735	22.5	53	1192.5
4/9/2009	P-82	1:22	Slope/Floor	6735	22.5	108	2430
4/9/2009	P-83	1:25	Slope/Floor	6735	22.5	75	1687.5
4/9/2009	P-84	1:37	Slope/Floor	6735	22.5	35	787.5
4/9/2009	P-85	1:40	Slope/Floor	6735	22.5	15	337.5
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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/11/2009
Project Location: Smithfield, NC
Page: 1 of 2

LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-1/2	10:12	GG	19	850	65	BOS	EOS	278	20	20	9:11	9:16	EF		3/11/2009	P
P-2/4	10:37	LG	21	850	65	BOS	EOS	154	20	20	8:58	9:03	EF		3/11/2009	P
P-2/3	10:53	LG	21	850	65	BOS	EOS	108	20	20	8:50	8:55	EF		3/11/2009	P
P-3/4	10:15	LG	21	850	65	BOS	EOS	32	20	20	8:50	8:55	EF		3/11/2009	P
P-4/5	10:53	GG	19	850	65	BOS	EOS	130	20	20	8:57	9:02	EF		3/11/2009	P
P-3/5	11:08	GG	19	850	65	BOS	89'> BOS	89	20	20	8:50	8:55	EF		3/11/2009	P
P-3/5	11:21	GG	19	850	65	89'> BOS	EOS	55	20	20	8:43	8:48	EF		3/11/2009	P
P-5/6	11:12	LG	21	850	65	BOS	94'> BOS	94	20	20	9:01	9:06	EF		3/11/2009	P
P-5/6	11:27	LG	21	850	65	94'> BOS	EOS	157	20	20	8:41	8:46	EF		3/11/2009	P
P-6/7	11:26	GG	19	850	65	BOS	144'> BOS	144	20	20	8:37	8:42	EF		3/11/2009	P
P-6/7	11:43	GG	19	850	65	144'> BOS	EOS	63	20	20	8:31	8:36	EF		3/11/2009	P
P-7/8	11:40	LG	21	850	65	BOS	110'> BOS	110	20	20	8:36	8:41	EF		3/11/2009	P
P-7/8	11:56	LG	21	850	65	110'> BOS	EOS	50	20	20	8:28	8:33	EF		3/11/2009	P
P-8/9	12:05	GG	19	850	65	BOS	54'> BOS	54	20	20	8:24	8:29	EF		3/11/2009	P
P-8/9	12:18	GG	19	850	65	54'> BOS	EOS	63	20	20	8:03	8:08	EF		3/11/2009	P
P-9/10	12:02	LG	21	850	65	BOS	EOS	72	20	19	8:01	8:06	EF		3/11/2009	P
P-10/11	12:16	LG	21	850	65	BOS	EOS	26	20	20	7:58	8:03	EF		3/11/2009	P
P-1/13	1:55	LG	21	850	70	BOS	EOS	145	20	20	9:24	9:29	EF		3/11/2009	P
P-1/12	2:14	LG	21	850	70	BOS	10'> BOS	10	20	20	9:50	9:55	EF		3/11/2009	P
P-1/12	2:16	LG	21	850	70	10'> BOS	R-12	10	20	20	9:51	9:56	EF		3/11/2009	P
P-1/12	1:19	LG	21	850	700	20'> BOS	EOS	111	20	20	9:40	9:45	EF		3/11/2009	P
P-12/13	1:45	LG	21	850	70	BOS	EOS	32	20	19	9:39	9:44	EF		3/11/2009	P
P-13/14	1:55	GG	19	850	70	BOS	EOS	167	20	20	9:19	9:24	EF		3/11/2009	P
P-12/14	2:12	GG	19	850	70	BOS	66'> BOS	66	20	20	10:04	10:09	EF		3/11/2009	P
P-12/14	2:23	GG	19	850	70	66'> BOS	9'> EOS	40	20	20	9:12	9:17	EF		3/11/2009	P
P-12/14	2:31	GG	19	850	70	9'> EOS	EOS	9	20	20	9:58	10:03	EF		3/11/2009	P
P-14/15	2:26	LG	21	850	70	BOS	EOS	240	20	20	10:42	10:47	EF		3/11/2009	P
P-15/17	2:45	GG	19	850	70	BOS	EOS	240	20	20	10:30	10:35	EF		3/11/2009	P
P-15/16	0.316	GG	19	850	70	BOS	EOS	22.5	20	20	10:21	10:26	EF		3/11/2009	P
P-16/17	3:10	GG	19	850	70	BOS	11'> EOS	23	20	20	10:30	10:35	EF		3/11/2009	P
P-16/17	3:13	GG	19	850	70	11'> EOS	EOS	11	20	20	10:31	10:36	EF		3/11/2009	P
P-17/18	3:03	LG	21	850	70	BOS	EOS	278	20	20	10:43	10:48	EF		3/11/2009	P
P-18/20	3:53	GG	19	850	70	BOS	EOS	219	20	18	11:02	11:07	EF		3/11/2009	P
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HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/11/2009
Project Location: Smithfield, NC
Page: 2 of 2

LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-18/19	3:55	GG	19	850	70	BOS	EOS	63	20	20	10:50	10:55	EF		3/11/2009	P
P-19/20	3:40	LG	21	850	70	BOS	EOS	32	20	20	11:00	11:05	EF		3/11/2009	P
P-20/21	3:47	LG	21	850	70	BOS	EOS	197	20	18	11:10	11:15	EF		3/11/2009	P
P-19/21	4:10	LG	21	850	70	BOS	53'> BOS	53	20	20	11:13	11:18	EF		3/11/2009	P
P-19/21	4:18	LG	21	850	70	53'> BOS	EOS	34	20	19	11:12	11:17	EF		3/11/2009	P
P-21/23	4:25	GG	19	850	70	BOS	EOS	133	20	20	11:22	11:27	EF		3/11/2009	P
P-23/24	4:22	LG	21	850	70	BOS	EOS	102	20	19	11:38	11:43	EF		3/11/2009	P
P-22/23	4:12	GG	19	850	70	BOS	EOS	32	20	19	11:28	11:33	EF		3/11/2009	P
P-21/22	4:37	GG	19	850	70	BOS	EOS	155	20	20	11:26	11:31	EF		3/11/2009	P
P-22/24	4:27	LG	21	850	70	BOS	EOS	175	20	18	11:38	11:43	EF		3/11/2009	P
P-24/25	4:57	LG	21	850	70	BOS	EOS	265	20	20	11:46	11:51	EF		3/11/2009	P
P-25/27	5:25	GG	19	850	70	BOS	EOS	267	20	20	11:55	12:00	EF		3/11/2009	P
P-25/26	5:15	GG	19	850	70	BOS	EOS	22.5	20	19	11:53	11:58	EF		3/11/2009	P
P-26/24	5:22	LG	21	850	70	BOS	EOS	30	20	18	11:46	11:51	EF		3/11/2009	P
P-26/27	5:53	GG	19	850	70	BOS	EOS	38	20	20	11:55	12:00	EF		3/11/2009	P
P-27/28	5:33	LG	21	850	70	BOS	EOS	302	20	20	1:04	1:09	EF		3/11/2009	P
P-28/30	6:05	GG	19	850	70	BOS	EOS	274	20	20	1:19	1:24	EF		3/11/2009	P
P-30/31	6:18	LG	21	850	70	BOS	EOS	273	20	20	1:29	1:34	EF		3/11/2009	P
P-29/30	6:07	LG	21	850	70	BOS	EOS	22.5	20	20	1:19	1:24	EF		3/11/2009	P
P-28/29	6:33	GG	19	850	70	BOS	EOS	29	20	20	11:08	11:13	EF		3/11/2009	P
P-29/31	6:44	LG	21	850	70	BOS	EOS	34	20	20	1:29	1:34	EF		3/11/2009	P
P-31/33	6:45	GG	19	850	70	BOS	EOS	223	20	20	1:44	1:49	EF		3/11/2009	P
P-31/32	7:10	GG	19	850	70	BOS	EOS	89	20	20	1:52	1:57	EF		3/11/2009	P
P-32/33								22.5	EXTRUDATE							
								2867.5								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/12/2009
Project Location: Smithfield, NC
Page: 1 of 1

LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-33/34	4:30	LG	14	850	70	BOS	EOS	223	20	20	5:52	5:57	EF		3/12/2009	P
P-32/34	4:52	LG	14	850	70	BOS	EOS	90	20	20	5:40	5:45	EF		3/12/2009	P
P-34/36	4:50	GG	19	850	70	BOS	EOS	171	20	20	5:52	5:57	EF		3/12/2009	P
P-34/35	5:08	GG	19	850	70	BOS	EOS	156	20	19	5:45	5:50	EF		3/12/2009	P
P-35/36	5:07	LG	14	850	70	BOS	EOS	32	20	18	5:57	6:02	EF		3/12/2009	P
P-36/37	5:18	LG	14	850	70	BOS	EOS	170	20	20	5:53	5:58	EF		3/12/2009	P
P-35/37	5:28	GG	19	850	70	BOS	EOS	131	20	20	5:46	5:51	EF		3/12/2009	P
								973								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/23/2009
Project Location: Smithfield, NC
Page: 1 of 1

LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test PSI Start	Air Pressure Test PSI Finish	Air Pressure Test Time Start	Air Pressure Test Time Finish	Air Pressure Test Tech	Vac Test Tech	Test Date	Pass / Fail
P-37/38	9:40	LG	14	850	70	BOS	EOS	170	20	19	5:28	5:33	EF		3/23/2009	P
P-38/39	9:51	GG	21	850	68	BOS	EOS	20	20	19	5:52	5:57	EF		3/23/2009	P
P-37/39	10:01	LG	14	850	70	BOS	EOS	140	20	18	6:04	6:09	EF		3/23/2009	P
P-38/40	10:22	GG	21	850	68	BOS	121'> BOS	121	20	20	5:40	5:45	EF		3/23/2009	P
P-38/40	10:37	GG	21	850	68	121'> BOS	148'> BOS	27	20	18	5:37	5:42	EF		3/23/2009	P
P-38/40	10:40	GG	21	850	68	148'> BOS	EOS	42	20	18	5:33	5:38	EF		3/23/2009	P
P-39/40	10:45	GG	21	850	68	BOS	EOS	125	20	18	6:04	6:09	EF		3/23/2009	P
P-40/41	11:22	LG	14	850	70	BOS	EOS	222	20	20	5:51	5:56	EF		3/23/2009	P
P-41/43	11:55	LG	14	850	68	BOS	EOS	223	20	19	5:52	5:57	EF		3/23/2009	P
P-41/42	11:50	LG	14	850	70	BOS	EOS	22.5	20	20	5:54	5:59	EF		3/23/2009	P
P-40/42	11:56	LG	14	850	70	BOS	EOS	96	20	19	6:10	6:15	EF		3/23/2009	P
P-42/43	12:17	GG	21	850	68	BOS	EOS	96	20	20	6:12	6:17	EF		3/23/2009	P
P-43/44	1:50	LG	14	850	70	BOS	EOS	275	20	19	6:00	6:05	EF		3/23/2009	P
P-44/46	2:18	GG	21	850	68	BOS	EOS	274	20	20	6:01	6:06	EF		3/23/2009	P
P-44/45	1:58	GG	21	850	68	BOS	EOS	22.5	20	20	6:00	6:05	EF		3/23/2009	P
P-43/45	2:20	LG	14	850	70	BOS	EOS	44	20	20	6:13	6:18	EF		3/23/2009	P
P-45/46	2:40	GG	21	850	68	BOS	EOS	46	20	20	6:13	6:18	EF		3/23/2009	P
P-46/47	2:34	LG	14	850	70	BOS	EOS	320	20	20	6:22	6:27	EF		3/23/2009	P
P-47/48	3:20	GG	21	850	68	BOS	26'> EOS	296	20	18	6:21	6:26	EF		3/23/2009	P
P-47/48	3:47	GG	21	850	68	26'> EOS	EOS	26	20	20	6:59	7:04	EF		3/23/2009	P
P-48/49	3:32	LG	14	850	70	BOS	EOS	317	20	19	6:29	6:34	EF		3/23/2009	P
P-49/50	4:00	GG	21	850	68	BOS	82'> EOS	289	20	20	6:29	6:34	EF		3/23/2009	P
P-50/51	4:22	LG	14	850	70	BOS	95'> BOS	95	20	20	6:32	6:37	EF		3/23/2009	P
P-50/51	4:29	LG	14	850	70	95'> BOS	EOS	217	20	19	6:32	6:37	EF		3/23/2009	P
P-51/52	4:47	GG	21	850	68	BOS	EOS	310	20	20	6:42	6:47	EF		3/23/2009	P
P-49/50	4:21	GG	21	850	68	82'> EOS	EOS	82	20	19	7:10	7:15	EF		3/23/2009	P
								3918								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/24/2009
Project Location: Smithfield, NC
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LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-52/53	2:03	LG	14	850	68	BOS	EOS	309	20	20	6:18	6:23	EF		3/24/2009	P
P-53/54	2:44	GG	21	850	68	BOS	EOS	306	20	20	6:18	6:23	EF		3/24/2009	P
P-54/55	2:58	LG	14	850	68	BOS	EOS	305	20	20	6:18	6:23	EF		3/24/2009	P
P-55/57	3:50	GG	21	850	68	BOS	EOS	223	20	20	6:31	6:36	EF		3/24/2009	P
P-57/58	4:06	LG	14	850	68	BOS	118'> BOS	118	20	20	6:46	6:51	EF		3/24/2009	P
P-57/58	4:21	LG	14	850	68	118'> BOS	180'> BOS	62	20	20	6:39	6:44	EF		3/24/2009	P
P-57/58	4:30	LG	14	850	68	180'> BOS	EOS	39	20	20	6:34	6:39	EF		3/24/2009	P
P-56/57	3:55	LG	14	850	68	BOS	EOS	22.5	20	20	7:03	7:08	EF		3/24/2009	P
P-55/56	4:12	GG	21	850	68	BOS	EOS	79	20	20	6:54	6:59	EF		3/24/2009	P
P-56/58	4:34	LG	14	850	68	BOS	EOS	80	20	20	6:54	6:59	EF		3/24/2009	P
P-58/60	4:40	GG	21	850	68	BOS	EOS	130	20	18	6:40	6:45	EF		3/24/2009	P
P-58/59	4:52	GG	21	850	68	BOS	EOS	160	20	20	7:14	7:19	EF		3/24/2009	P
P-59/60	4:42	LG	14	850	68	BOS	EOS	28	20	20	7:13	7:18	EF		3/24/2009	P
P-60/61	5:04	LG	14	850	68	BOS	EOS	146	20	20	6:41	6:46	EF		3/24/2009	P
P-59/61	5:21	LG	14	850	68	BOS	EOS	139	20	20	7:12	7:17	EF		3/24/2009	P
P-61/62	5:27	GG	21	850	68	BOS	EOS	240	20	20	7:42	7:47	EF		3/24/2009	P
P-62/63	5:40	LG	14	850	68	BOS	13'> BOS	13	20	20	8:03	8:08	EF		3/24/2009	P
P-62/64	5:33	LG	14	850	68	BOS	EOS	235	20	20	7:40	7:45	EF		3/24/2009	P
P-64/65	6:08	GG	21	850	68	BOS	EOS	261	20	20	7:42	7:47	EF		3/24/2009	P
P-61/62	5:42	LG	14	850	68	13'> BOS	EOS	9	20	20	8:11	8:16	EF		3/24/2009	P
P-61/63	5:50	GG	21	850	68	BOS	EOS	41	20	19	7:55	8:00	EF		3/24/2009	P
P-63/64	6:20	LG	14	850	68	BOS	EOS	34	20	18	7:50	7:55	EF		3/24/2009	P
								2979.5								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/25/2009
Project Location: Smithfield, NC
Page: 1 of 1

LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-65/66	6:15	LG	14	850	65	BOS	EOS	161	20	20	8:05	8:10	EF		3/25/2009	P
P-66/68	6:35	GG	21	850	65	BOS	7'> BOS	7	20	20	7:58	8:03	EF		3/25/2009	P
P-66/68	6:36	GG	21	850	65	7'> BOS	EOS	147	20	20	7:58	8:03	EF		3/25/2009	P
P-66/67	6:28	LG	14	850	65	BOS	6'> BOS	6	20	20	8:11	8:16	EF		3/25/2009	P
P-66/67	6:29	LG	14	850	65	6'> BOS	EOS	15	20	20	8:05	8:10	EF		3/25/2009	P
P-65/67	6:37	LG	14	850	65	BOS	75'> BOS	75	20	20	3:26	3:31	EF		3/25/2009	P
P-65/67	6:41	LG	14	850	65	75'> BOS	EOS	10	20	20	3:32	3:37	EF		3/25/2009	P
P-67/68	6:50	GG	21	850	65	BOS	EOS	83	20	20	8:26	8:31	EF		3/25/2009	P
P-68/69	6:50	LG	14	850	65	BOS	EOS	224	20	20	5:10	5:15	EF		3/25/2009	P
P-69/70	7:07	GG	21	850	65	BOS	EOS	138	20	20	4:09	4:14	EF		3/25/2009	P
P-69/71	7:25	GG	21	850	65	BOS	10'> EOS	62	20	20	3:43	3:48	EF		3/25/2009	P
P-69/71	7:33	GG	21	850	65	10'> EOS	EOS	10	20	20	3:50	3:55	EF		3/25/2009	P
P-70/72	7:39	LG	14	850	65	BOS	50'> BOS	50	20	20	3:59	4:04	EF		3/25/2009	P
P-70/71	7:00	GG	21	850	65	BOS	EOS	22.5	20	20	3:53	3:58	EF		3/25/2009	P
P-70/72	7:44	LG	14	850	65	50'> BOS	EOS	75	20	20	3:53	3:58	EF		3/25/2009	P
P-71/72	7:52	LG	14	850	65	BOS	EOS	63	20	20	4:23	4:28	EF		3/25/2009	P
P-72/73	7:36	GG	21	850	65	BOS	EOS	172	20	20	4:10	4:15	EF		3/25/2009	P
P-73/74	7:55	LG	14	850		BOS	EOS	141	20	20	4:18	4:23	EF		3/25/2009	P
P-74/75	8:05	GG	21	850	65	BOS	72'> BOS	72	20	20	4:15	4:20	EF		3/25/2009	P
P-74/75	8:15	GG	21	850	65	72'> BOS	84'> BOS	12	20	20	4:10	4:15	EF		3/25/2009	P
P-74/75	8:18	GG	21	850	65	84'> BOS	EOS	23	20	20	4:15	4:20	EF		3/25/2009	P
								1568.5								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/31/2009
Project Location: Smithfield, NC
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LLDPE

40 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-75/76	6:00	GG	21	850	68	BOS	EOS	45	30	30	7:00	7:05	EF		3/31/2009	P
P-76/77	6:10	GG	21	850	68	BOS	EOS	20	30	30	7:05	7:10	EF		3/31/2009	P
								65								

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1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/18/2009
Project Location: Smithfield, NC
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HDPE

60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-1/2	3:11	LG	14	850	550	BOS	EOS	2:46	30	30	9:20	9:25	EF		3/18/2009	P
P-1/3	3:42	LG	14	850	550	BOS	EOS	31	30	30	10:13	10:18	EF		3/18/2009	P
P-2/3	4:05	GG	19	850	550	BOS	EOS	22.5	30	30	9:19	9:24	EF		3/18/2009	P
P-3/4	4:05	LG	14	850	550	BOS	EOS	32	30	30	10:17	10:22	EF		3/18/2009	P
P-2/4	3:43	GG	19	850	550	BOS	EOS	242	30	30	8:43	8:48	EF		3/18/2009	P
P-4/5	4:07	LG	14	850	550	BOS	EOS	214	30	30	8:41	8:46	EF		3/18/2009	P
P-4/6	4:33	LG	14	850	550	BOS	EOS	48	30	30	10:23	10:28	EF		3/18/2009	P
P-5/6	4:00	LG	14	850	550	BOS	EOS	22.5	30	30	10:23	10:28	EF		3/18/2009	P
P-5/7	4:26	GG	19	850	550	BOS	EOS	206	30	30	8:41	8:46	EF		3/18/2009	P
P-6/7	4:54	GG	19	850	550	BOS	EOS	57	30	30	10:24	10:29	EF		3/18/2009	P
P-7/8	4:54	LG	14	850	550	BOS	EOS	198	30	30	10:19	10:24	EF		3/18/2009	P
P-7/9	5:20	LG	14	850	550	BOS	EOS	52	30	30	8:20	8:25	EF		3/18/2009	P
P-8/9	4:44	LG	14	850	550	BOS	EOS	22.5	30	30	10:19	10:24	EF		3/18/2009	P
P-8/10	5:15	GG	19	850	550	BOS	EOS	229	30	30	8:20	8:25	EF		3/18/2009	P
P-9/10	5:36	GG	19	850	550	BOS	EOS	52	30	30	8:13	8:18	EF		3/18/2009	P
P-10/11	5:40	LG	14	850	550	BOS	EOS	184	30	30	8:13	8:18	EF		3/18/2009	P
P-11/12	6:05	GG	19	850	550	BOS	EOS	86	30	30	8:02	8:07	EF		3/18/2009	P
P-11/13	6:17	GG	19	850	550	BOS	EOS	54	30	30	7:55	8:00	EF		3/18/2009	P
P-12/13	6:10	LG	14	850	550	BOS	EOS	22.5	30	30	7:48	7:53	EF		3/18/2009	P
								1775.1								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/19/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE

60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-12/28	6:20	GG	19	850	550	BOS	EOS	45	30	30	7:57	8:02	EF		3/19/2009	P
P-13/28	6:25	GG	19	850	550	BOS	EOS	53	30	30	7:33	7:38	EF		3/19/2009	P
P-28/29	6:35	GG	19	850	550	BOS	EOS	52	30	30	7:33	7:38	EF		3/19/2009	P
P-14/16	1:54	GG	19	850	550	BOS	EOS	90	30	30	10:10	10:15	EF		3/19/2009	P
P-14/15	2:12	GG	19	850	550	BOS	EOS	184	30	30	9:25	9:30	EF		3/19/2009	P
P-15/16	1:47	GG	19	850	550	BOS	EOS	32	30	30	9:54	9:59	EF		3/19/2009	P
P-15/17	2:23	LG	14	850	550	BOS	EOS	168	30	30	9:35	9:40	EF		3/19/2009	P
P-16/17	2:08	LG	14	850	550	BOS	EOS	111	30	30	9:53	9:58	EF		3/19/2009	P
P-17/19	2:47	GG	19	850	550	BOS	EOS	160	30	30	10:35	10:40	EF		3/19/2009	P
P-17/18	3:05	GG	19	850	550	BOS	EOS	120	30	30	10:42	10:47	EF		3/19/2009	P
P-18/19	2:50	LG	14	850	550	BOS	EOS	32	30	30	10:35	10:40	EF		3/19/2009	P
P-19/20	3:00	LG	14	850	550	BOS	EOS	178	30	30	10:35	10:40	EF		3/19/2009	P
P-18/20	3:23	LG	14	850	550	BOS	EOS	104	30	30	10:41	10:46	EF		3/19/2009	P
P-20/22	3:48	GG	19	850	550	BOS	EOS	234	30	30	10:50	10:55	EF		3/19/2009	P
P-20/21	4:18	GG	19	850	550	BOS	EOS	50	30	30	11:35	11:40	EF		3/19/2009	P
P-21/22	3:33	GG	19	850	550	BOS	EOS	22.5	30	30	10:30	10:35	EF		3/19/2009	P
P-22/23	3:47	LG	14	850	550	BOS	EOS	231	30	30	10:50	10:55	EF		3/19/2009	P
P-21/23	4:16	LG	14	850	550	BOS	EOS	49	30	30	10:30	10:35	EF		3/19/2009	P
P-23/24	4:30	LG	14	850	550	BOS	EOS	285	30	28	10:50	10:55	EF		3/19/2009	P
P-1/14	1:24	LG	14	850	550	BOS	EOS	275	30	30	9:28	9:33	EF		3/19/2009	P
P-24/25	5:14	GG	19	850	550	BOS	EOS	227	30	30	11:06	11:11	EF		3/19/2009	P
P-24/26	5:43	GG	19	850	550	BOS	EOS	64	30	30	10:19	10:24	EF		3/19/2009	P
P-25/27	5:36	LG	14	850	550	BOS	EOS	228	30	30	11:08	11:13	EF		3/19/2009	P
P-26/27	6:07	LG	14	850	550	BOS	EOS	68	30	30	10:19	10:24	EF		3/19/2009	P
P-25/26	5:27	LG	14	850	550	BOS	EOS	22.5	30	29	11:12	11:17	EF		3/19/2009	P
								3085								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/30/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE
60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-29/30	3:00	LG	14	850	550	BOS	EOS	306	30	30	9:36	9:41	EF		3/30/2009	P
P-30/31	3:50	GG	19	850	550	BOS	EOS	205	30	30	9:36	9:41	EF		3/30/2009	P
P-30/32	3:38	GG	19	850	550	BOS	EOS	98	30	30	9:43	9:48	EF		3/30/2009	P
P-31/32	3:32	GG	19	850	550	BOS	EOS	29	30	30	9:45	9:50	EF		3/30/2009	P
P-32/33	3:56	LG	14	850	550	BOS	EOS	113	30	30	9:50	9:55	EF		3/30/2009	P
P-33/35	4:35	GG	19	850	550	BOS	EOS	227	30	30	8:04	8:09	EF		3/30/2009	P
P-33/34	5:05	GG	19	850	550	BOS	88'> BOS	80	30	30	9:11	9:16	EF		3/30/2009	P
P-33/34	5:21	GG	19	850	550	88'> BOS	EOS	7	30	30	9:25	9:30	EF		3/30/2009	P
P-34/35	4:43	LG	14	850	550	BOS	EOS	22.5	30	30	9:01	9:06	EF		3/30/2009	P
P-35/37	5:09	LG	14	850	550	BOS	EOS	13	30	30	9:58	10:03	EF		3/30/2009	P
P-35/36	5:12	LG	14	850	550	BOS	EOS	211	30	30	8:19	8:24	EF		3/30/2009	P
P-34/36	5:41	LG	14	850	550	BOS	EOS	90	30	30	9:00	9:05	EF		3/30/2009	P
P-36/37	5:00	LG	14	850	550	BOS	EOS	29	30	30	9:55	10:00	EF		3/30/2009	P
P-36/38	5:31	GG	19	850	550	BOS	EOS	282	30	30	8:21	8:26	EF		3/30/2009	P
P-37/38	5:28	GG	19	850	550	BOS	EOS	29	30	30	9:59	10:04	EF		3/30/2009	P
P-38/39	6:47	LG	14	850	550	BOS	EOS	159	30	30	8:35	8:40	EF		3/30/2009	P
P-38/40	6:24	LG	14	850	550	BOS	EOS	162	30	30	8:42	8:47	EF		3/30/2009	P
P-39/40	6:30	GG	19	850	550	BOS	EOS	29	30	30	8:43	8:48	EF		3/30/2009	P
								2091.5								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 3/31/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE
60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-40/41	2:00	LG	14	850	55	BOS	EOS	176	30	30	8:37	8:42	EF		3/31/2009	P
P-41/42	2:14	GG	19	850	55	BOS	EOS	320	30	30	8:42	8:47	EF		3/31/2009	P
P-42/43	3:21	LG	14	850	55	BOS	EOS	187	30	30	9:46	9:51	EF		3/31/2009	P
P-42/44	3:03	LG	14	850	55	BOS	EOS	133	30	30	8:49	8:54	EF		3/31/2009	P
P-43/44	3:28	LG	14	850	55	BOS	EOS	28	30	30	7:44	7:49	EF		3/31/2009	P
P-43/45	3:42	GG	19	850	55	BOS	EOS	173	30	30	9:50	9:55	EF		3/31/2009	P
P-44/45	3:22	GG	19	850	55	BOS	EOS	148	30	30	8:50	8:55	EF		3/31/2009	P
P-39/41	2:18	LG	14	850	55	BOS	EOS	142	30	30	8:38	8:43	EF		3/31/2009	P
P-45/46	4:55	LG	14	850	55	BOS	EOS	320	30	30	9:09	9:14	EF		3/31/2009	P
								1627								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 4/1/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE

60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-46/47	11:27	LG	14	850	55	BOS	EOS	186	30	30	9:55	10:00	EF		4/1/2009	P
P-46/48	11:08	LG	14	850	55	BOS	EOS	139	30	30	8:57	9:02	EF		4/1/2009	P
P-47/48	11:01	LG	14	850	55	BOS	EOS	28	30	30	9:55	10:00	EF		4/1/2009	P
P-47/49	11:35	GG	19	850	55	BOS	EOS	172	30	30	9:55	10:00	EF		4/1/2009	P
P-48/49	11:15	GG	19	850	55	BOS	EOS	149	30	30	8:13	8:18	EF		4/1/2009	P
P-49/50	4:00	LG	14	850	55	BOS	EOS	320	30	30	9:20	9:25	EF		4/1/2009	P
P-50/52	4:45	GG	19	850	55	BOS	EOS	118	30	30	10:04	10:09	EF		4/1/2009	P
P-50/51	4:20	GG	19	850	55	BOS	EOS	198	30	30	9:27	9:32	EF		4/1/2009	P
P-51/52	4:50	LG	14	850	55	BOS	EOS	22.5	30	30	10:04	10:09	EF		4/1/2009	P
P-51/53	6:05	LG	14	850	55	BOS	EOS	194	30	30	9:36	9:41	EF		4/1/2009	P
P-53/54	6:55	GG	19	850	55	BOS	EOS	70	30	30	10:12	10:17	EF		4/1/2009	P
P-53/55	6:25	GG	19	850	55	BOS	EOS	245	30	30	9:37	9:42	EF		4/1/2009	P
P-54/55	6:48	LG	14	850	55	BOS	EOS	22.5	30	30	10:12	10:17	EF		4/1/2009	P
								1864								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 4/2/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE
60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-55/56	9:35	LG	14	850	55	BOS	EOS	269	30	30	10:32	10:37	EF		4/2/2009	P
P-54/56	10:10	LG	14	850	55	BOS	EOS	25	30	30	10:25	10:30	EF		4/2/2009	P
P-54/57	10:13	LG	14	850	55	BOS	EOS	37	30	30	10:27	10:32	EF		4/2/2009	P
P-56/57	9:55	GG	19	850	55	BOS	EOS	22.5	30	30	8:30	8:35	EF		4/2/2009	P
P-54/58	10:17	LG	14	850	55	BOS	EOS	9	30	30	8:20	8:25	EF		4/2/2009	P
P-57/58	10:07	GG	19	850	55	BOS	EOS	22.5	30	30	8:22	8:27	EF		4/2/2009	P
								385								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 4/6/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE

60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-56/59	8:49	LG	14	850	55	BOS	EOS	268	30	30	4:02	4:07	EF		4/7/2009	P
P-57/59	9:27	LG	14	850	55	BOS	EOS	37	30	30	4:25	4:30	EF		4/7/2009	P
P-58/59	9:31	LG	14	850	55	BOS	EOS	11	30	30	4:25	4:30	EF		4/7/2009	P
								316								

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1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 4/7/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE

60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-59/60	9:28	GG	19	850	55	BOS	51'> BOS	51	30	29	3:56	4:01	EF		4/7/2009	P
P-59/60	9:50	GG	19	850	55	51'> BOS	96'>BOS	45	30	30	3:56	4:01	EF		4/7/2009	P
P-59/60	8:22	GG	19	850	55	96'> BOS	104'>BOS	8	30	30	4:14	4:19	EF		4/7/2009	P
P-59/60	8:23	GG	19	850	55	104'> BOS	EOS	100	30	30	4:07	4:12	EF		4/7/2009	P
P-60/61	9:41	LG	14	850	55	BOS	EOS	22.5	30	30	4:15	4:20	EF		4/7/2009	P
P-59/61	8:37	GG	19	850	55	BOS	EOS	101	30	30	4:17	4:22	EF		4/7/2009	P
P-60/62	10:18	LG	14	850	55	BOS	EOS	202	30	30	4:32	4:37	EF		4/7/2009	P
P-61/62	10:48	LG	14	850	55	BOS	EOS	101	30	30	4:32	4:37	EF		4/7/2009	P
P-62/64	10:47	GG	19	850	55	BOS	EOS	195	30	30	4:35	4:40	EF		4/7/2009	P
P-63/64	11:05	LG	14	850	55	BOS	EOS	22.5	30	30	5:21	5:26	EF		4/7/2009	P
P-62/63	11:13	GG	19	850	55	BOS	EOS	102	30	30	4:35	4:40	EF		4/7/2009	P
P-64/65	11:17	LG	14	850	55	BOS	EOS	192	30	30	5:18	5:23	EF		4/7/2009	P
P-63/65	11:43	LG	14	850	55	BOS	EOS	103	30	30	4:58	5:03	EF		4/7/2009	P
P-65/66	11:36	GG	19	850	55	BOS	EOS	297	30	30	5:22	5:27	EF		4/7/2009	P
P-66/67	3:50	LG	14	850	55	BOS	EOS	220	30	30	5:33	5:38	EF		4/7/2009	P
P-67/68	3:40	LG	14	850	55	BOS	EOS	22.5	30	30	5:32	5:37	EF		4/7/2009	P
P-66/68	4:16	LG	14	850	55	BOS	EOS	66	30	28	5:26	5:31	EF		4/7/2009	P
P-67/69	4:07	GG	19	850	55	BOS	EOS	219	30	28	5:37	5:42	EF		4/7/2009	P
P-68/69	4:37	GG	19	850	55	BOS	EOS	66	30	30	5:26	5:31	EF		4/7/2009	P
P-69/70	4:40	LG	14	850	55	BOS	EOS	161	30	30	5:41	5:46	EF		4/7/2009	P
P-70/71	4:48	GG	19	850	55	BOS	EOS	22.5	30	30	5:49	5:54	EF		4/7/2009	P
P-69/71	5:02	LG	14	850	55	BOS	EOS	102	30	30	5:20	5:25	EF		4/7/2009	P
P-70/72	5:03	GG	19	850	55	BOS	EOS	160	30	30	5:45	5:50	EF		4/7/2009	P
P-71/72	5:25	GG	19	850	55	BOS	EOS	101	30	30	5:52	5:57	EF		4/7/2009	P
								2586								

HALLATON, INC.

1206 SPARKS RD., SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Weld Date: 4/9/2009
Project Location: Smithfield, NC
Page: 1 of 1

HDPE
60 mil.

SEAM # (P#/P#)	WELD TIME	TECH ID	Machine ID	Machine Temp	Machine Speed or Preheat	Start Point	End Point	Seam Length (Feet)	Air Pressure Test					Vac Test Tech	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
P-72/73	11:00	LG	14	850	55	BOS	EOS	144	30	30	1:06	1:11	RO		4/9/2009	P
P-72/74	11:20	LG	14	850	55	BOS	EOS	97	30	30	12:45	12:50	RO		4/9/2009	P
P-73/74	11:08	GG	19	850	55	BOS	EOS	22.5	30	30	1:01	1:06	RO		4/9/2009	P
P-73/75	11:23	GG	19	850	55	BOS	EOS	142	30	30	1:06	1:11	RO		4/9/2009	P
P-74/75	11:31	GG	19	850	55	BOS	EOS	95	30	30	2:45	2:50	RO		4/9/2009	P
P-75/76	11:44	LG	14	850	55	BOS	EOS	185	30	30	1:15	1:20	RO		4/9/2009	P
P-76/77	11:55	GG	19	850	55	BOS	EOS	22.5	30	30	1:20	1:25	RO		4/9/2009	P
P-75/77	12:07	LG	14	850	55	BOS	EOS	30	30	30	1:25	1:30	RO		4/9/2009	P
P-76/78	12:00	GG	19	850	55	BOS	7'>BOS	7	30	30	1:35	1:40	RO		4/9/2009	P
P-76/78	12:02	GG	19	850	55	7'> BOS	EOS	175	30	30	1:15	1:20	RO		4/9/2009	P
P-77/78	12:24	GG	19	850	55	BOS	EOS	26	30	30	1:25	1:30	RO		4/9/2009	P
P-78/79	1:00	LG	14	850	55	BOS	EOS	191	30	30	1:40	1:45	RO		4/9/2009	P
P-79/80	1:17	GG	19	850	55	BOS	EOS	95	30	30	1:45	1:50	RO		4/9/2009	P
P-80/81	1:35	GG	19	850	55	BOS	EOS	22.5	30	30	1:50	1:55	RO		4/9/2009	P
P-81/79	1:40	GG	19	850	55	BOS	EOS	55	30	30	1:45	1:50	RO		4/9/2009	P
P-80/82	1:30	LG	14	850	55	BOS	EOS	85	30	30	1:45	1:50	RO		4/9/2009	P
P-81/82	1:42	LG	14	850	55	BOS	EOS	51	30	30	1:50	1:55	RO		4/9/2009	P
P-82/83	1:57	LG	14	850	55	BOS	EOS	98	30	30	2:15	2:20	RO		4/9/2009	P
P-83/84	2:05	GG	19	850	55	BOS	EOS	33	30	30	2:15	2:20	RO		4/9/2009	P
P-83/84	2:09	GG	19	850	55	BOS	EOS	13	30	30	2:20	2:25	RO		4/9/2009	P
P-84/85	2:20	GG	19	850	55	BOS	EOS	15	30	30	2:25	2:30	RO		4/9/2009	P
								1604.5								

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1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/12/2009
Project Location: Smithfield, NC
Page: 1 of 3

Material: LLDPE

40 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	50	Peel:	44
Shear:	60	Shear:	60

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
1	P-9/10	3/12/2009	21	LG	850/650		74	75	80	75	77	76	73	75	76	74	P	IF	TX/TX
							70	71	70	77	74								
2	P-6/7	3/12/2009	19	GG	850/650		69	77	73	79	77	77	80	76	75	78	P	IF	TX/TX
							78	75	74	75	73								
3	P-5/6	3/12/2009	21	LG	850/650		77	76	76	74	77	77	81	82	80	79	P	IF	TX/TX
							71	78	79	77	71								
4	P-2/1	3/12/2009	19	GG	850/650		67	65	67	70	73	81	79	82	82	77	P	IF	TX/TX
							71	67	69	79	72								
5	P-12/13	3/12/2009	21	LG	850/700		69	69	76	71	78	79	84	76	80	82	P	IF	TX/TX
							77	75	73	74	70								
6	P-15/17	3/12/2009	19	GG	850/700		72	77	74	73	71	78	79	79	80	77	P	IF	TX/TX
							74	75	74	70	75								
7	P-17/18	3/12/2009	21	LG	850/700		75	72	72	76	75	83	82	78	81	79	P	IF	TX/TX
							71	71	73	71	73								
8	P-20/21	3/12/2009	21	LG	850/700		73	69	77	77	71	80	81	78	75	80	P	IF	TX/TX
							75	73	69	68	73								
9	P-21/23	3/12/2009	19	GG	850/700		72	75	73	69	71	73	75	78	81	76	P	IF	TX/TX
							67	75	76	70	74								
10	P-30/31	3/12/2009	21	LG	850/700		69	71	70	75	74	85	79	81	80	78	P	IF	TX/TX
							70	69	73	71	69								
11	P-31/33	3/12/2009	19	GG	850/700		73	68	68	77	70	74	77	76	75	77	P	IF	TX/TX
							74	71	68	72	69								
12	P-37/38	3/24/2009	14	LG	850/680		76	76	84	71	75	77	72	78	74	76	P	IF	TX/TX
							78	78	84	75	72								
13	P-39/40	3/24/2009	21	GG	850/680		72	79	69	70	74	75	74	76	72	76	P	IF	TX/TX
							72	80	78	74	77								

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1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/12/2009
Project Location: Smithfield, NC
Page: 2 of 3

Material: LLDPE

40 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	50	Peel:	44
Shear:	60	Shear:	60

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
14	P-43/44	3/24/2009	14	LG	850/700		68	73	70	69	70	70	73	66	69	70	P	IF	TX/TX
							72	74	68	69	75								
15	P-44/46	3/24/2009	21	GG	850/680		69	66	63	72	64	71	70	69	76	74	P	IF	TX/TX
							72	69	78	70	64								
16	P-46/47	3/24/2009	14	LG	850/700		64	65	65	64	66	72	70	68	73	70	P	IF	TX/TX
							66	66	68	66	63								
17	P-49/50	3/24/2009	21	GG	850/680		62	61	68	60	61	72	76	74	81	73	P	IF	TX/TX
							60	64	74	60	68								
18	P-50/51	3/24/2009	14	LG	850/700		61	63	64	69	67	69	74	70	73	79	P	IF	TX/TX
							64	68	68	68	66								
19	Tie In/48	3/24/2009	14	LG	850/700		63	60	67	65	65	74	79	73	75	76	P	IF	TX/TX
							60	61	63	66	62								
20	P-51/52	3/24/2009	21	GG	850/680		67	60	61	63	61	68	73	66	72	71	P	IF	TX/TX
							60	66	64	62	66								
21	P-52/53	3/25/2009	14	LG	850/680		76	82	77	74	73	82	80	85	85	80	P	EF	TX/TX
							74	73	75	75	69								
22	P-53/54	3/25/2009	21	GG	850/680		72	76	69	74	69	78	81	87	89	84	P	EF	TX/TX
							73	80	77	72	69								
23	P-57/58	3/25/2009	14	LG	850/680		75	75	76	75	70	75	73	78	74	74	P	EF	TX/TX
							77	75	77	80	72								
24	P-61/69	3/25/2009	21	GG	850/680		80	75	74	70	78	82	78	76	80	77	P	EF	TX/TX
							82	77	74	81	78								
25	P-62/64	3/25/2009	14	LG	850/680		71	77	67	72	77	77	77	79	75	71	P	EF	TX/TX
							77	83	73	74	73								
26	P-64/65	3/25/2009	21	GG	850/680		74	75	69	74	69	73	71	78	74	75	P	EF	TX/TX
							73	72	75	75	76								

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
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Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/12/2009
Project Location: Smithfield, NC
Page: 3 of 3

Material: LLDPE

40 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	50	Peel:	44
Shear:	60	Shear:	60

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
							Peel (ppi) IN / OUT					Shear (ppi)							
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
27	P-63/Tie In	3/25/2009	11	RO		550/550	80	71	76	75	80	82	85	83	80	80	P	EF	TX/TX
28	P-65/66	3/25/2009	14	LG	850/650		75	72	69	68	71	70	78	76	76	74	P	EF	TX/TX
							70	67	69	71	73								
29	P-67/68	3/25/2009	21	GG	850/650		69	69	71	72	72	76	69	72	74	72	P	EF	TX/TX
							75	70	72	72	68								
30	P-70/72	3/25/2009	14	LG	850/650		68	66	69	71	69	70	71	69	75	72	P	EF	TX/TX
							66	64	63	70	70								
31	P-72/Tie In	3/30/2009	11	RO		550/550	72	68	58	63	72	76	74	82	68	80	P	RO	TX/TX
32	P-72/73	3/27/2009	21	GG	850/650		77	71	64	70	71	75	69	67	73	70	P	GG	TX/TX
							70	68	63	73	70								

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1206 SPARKS ROAD, SPARKS, MD 21152
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Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/20/2009
Project Location: Smithfield, NC
Page: 1 of 3

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
							Peel (ppi) IN / OUT					Shear (ppi)							
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	1	2	3	4	5	1	2	3	4	5			
1	P-1/2	3/20/2009	14	LG	850/550		142	126	147	106	99	180	181	185	180	183	P	IF	TX/TX
							129	142	125	105	100								
2	P-2/4	3/20/2009	19	GG	850/550		145	142	152	148	151	183	181	190	185	181	P	IF	TX/TX
							135	139	138	138	131								
3	P-7/8	3/20/2009	14	LG	850/550		142	143	124	124	150	184	183	178	176	180	P	IF	TX/TX
							145	126	129	140	120								
4	P-11/12	3/20/2009	19	GG	850/550		143	147	143	144	140	175	168	175	177	179	P	IF	TX/TX
							132	125	139	146	136								
5	P-1/14	3/20/2009	14	LG	850/550		141	122	125	125	124	180	177	179	175	192	P	IF	TX/TX
							137	134	136	119	115								
6	P-15/17	3/20/2009	14	LG	850/550		146	125	135	115	125	183	180	181	179	185	P	IF	TX/TX
							125	127	133	138	137								
7	P-17/19	3/20/2009	19	GG	850/550		135	131	143	135	148	178	180	179	181	184	P	IF	TX/TX
							134	135	139	146	138								
8	P-20/22	3/20/2009	19	GG	850/550		147	142	132	139	150	189	187	180	196	181	P	IF	TX/TX
							129	121	140	127	147								
9	P-23/24	3/20/2009	14	LG	850/550		130	131	130	129	125	179	180	179	178	182	P	IF	TX/TX
							124	125	127	127	125								
10	P-24/25	3/20/2009	19	GG	850/550		137	135	131	136	132	187	185	181	187	186	P	IF	TX/TX
							132	136	130	137	131								
11	P-26/27	3/20/2009	14	LG	850/550		144	140	139	135	138	181	179	180	185	182	P	IF	TX/TX
							141	137	135	138	136								
12	P-24/TI	3/20/2009	10	GG		550/550	113	115	119	120	117	140	135	136	145	141	P	IF	TX/TX
13	P-27/30	3/31/2009	14	LG	850/550		114	111	122	117	112	163	151	158	160	162	P	IF	TX/TX
							117	108	138	143	117								

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
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Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/20/2009
Project Location: Smithfield, NC
Page: 2 of 3

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
14	P-30/31	3/31/2009	19	GG	850/550		115	125	115	130	134	174	167	170	172	168	P	IF	TX/TX
							127	131	115	126	137								
15	P-35/36	3/31/2009	14	LG	850/550		118	123	116	116	123	145	156	175	168	160	P	IF	TX/TX
							133	128	124	114	124								
16	P-36/38	3/31/2009	19	GG	850/550		118	123	122	120	126	148	146	158	150	148	P	IF	TX/TX
							136	134	120	120	121								
17	P-38/39	3/31/2009	14	LG	850/550		130	127	132	118	118	157	160	158	165	170	P	IF	TX/TX
							130	122	118	122	134								
18	P-41/42	3/31/2009	19	GG	850/550		128	113	118	115	117	147	152	168	160	165	P	IF	TX/TX
							132	131	125	131	111								
19	P-42/43	3/31/2009	14	LG	850/550		140	123	115	116	118	157	168	159	162	160	P	IF	TX/TX
							118	118	123	121	125								
20	P-45/46	3/31/2009	14	LG	850/550		121	123	110	118	110	150	152	148	142	150	P	IF	TX/TX
							123	111	115	120	121								
21	P-47/46	3/31/2009	14	LG	850/550		116	117	110	119	114	154	160	149	148	140	P	IF	TX/TX
							134	114	117	113	118								
22	P-48/49	3/31/2009	19	GG	850/550		110	128	107	117	107	138	142	150	140	136	P	IF	TX/TX
							114	115	108	116	120								
23	P-51/53	3/31/2009	14	LG	850/550		111	110	106	112	106	145	158	160	152	155	P	IF	TX/TX
							116	111	108	116	118								
24	P-53/53	3/31/2009	19	GG	850/550		117	119	119	125	115	140	138	142	140	146	P	IF	TX/TX
							123	129	126	127	118								
25	P-56/57	4/8/2009	19	GG	850/550		151	157	145	139	130	184	190	193	189	197	P		
							150	167	159	156	143								
26	P-56/59	4/8/2009	14	LG	850/550		139	136	133	130	133	190	187	189	196	184	P		
							141	144	142	132	128								

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1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Geomembrane Seam Destructive Test Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Start Date: 3/20/2009
Project Location: Smithfield, NC
Page: 3 of 3

Material: HDPE

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:	91	Peel:	78
Shear:	120	Shear:	120

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed °F/fpm	Temp/ Preheat °F/°F	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
27	P-59/60	4/8/2009	19	GG	850/550		135	136	132	150	135	186	183	188	189	196	P		
							133	137	136	134	128								
28	P-62/64	4/8/2009	19	GG	850/550		131	139	140	139	136	182	193	185	189	187	P		
							144	136	138	144	135								
29	P-65/66	4/8/2009	19	GG	850/550		139	138	139	139	133	180	179	189	183	189	P		
							137	140	137	138	135								
30	P-68/69	4/8/2009	19	GG	850/550		140	139	126	134	134	179	176	178	177	180	P		
							136	140	131	128	140								
31	P-69/70	4/8/2009	14	LG	850/550		122	127	136	121	128	177	178	176	180	183	P		
							127	121	133	127	133								
32	P-72/TI	4/8/2009	10	JV		550/500	134	108	130	135	132	163	169	168	170	169	P		
33	P-72/73	4/9/2009	14	LG	850/550		122	123	136	125	131	157	164	161	165	165	P		
							128	130	138	127	128								
34	P-75/76	4/9/2009	14	LG	850/550		127	128	134	123	129	151	162	156	157	153	P		
							138	131	139	137	138								
35	P-79/80	4/9/2009	19	GG	850/550		124	127	118	121	121	148	151	164	154	163	P		
							136	129	130	131	130								
36	P-82/83	4/9/2009	14	LG	850/550		124	126	122	124	128	159	147	151	158	154	P		
							139	135	134	123	140								

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-01
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-1

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.4	SE1	<10
2	69.5	SE1	<10
3	69.7	SE1	<10
4	68.3	SE1	<10
5	67.1	SE1	<10
AVERAGE	**68.2**		
STD. DEV.	1.45		
INSIDE TRACK (WELD "B")			
1	66.3	SE1	<10
2	67.9	SE1	<10
3	67.6	SE1	<10
4	66.1	SE1	<10
5	66.9	SE1	<10
AVERAGE	**67.0**		
STD. DEV.	0.79		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	66.8	SE1
2	65.0	SE1
3	66.9	SE1
4	71.3	SE1
5	71.1	SE1
AVERAGE	**68.2**	
STD. DEV.	2.82	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-02
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-2

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	70.9	SE1	<10
2	68.1	SE1	<10
3	67.2	SE1	<10
4	66.8	SE1	<10
5	67.9	SE1	<10
AVERAGE	**68.2**		
STD. DEV.	1.61		
INSIDE TRACK (WELD "B")			
1	69.4	SE1	<10
2	66.3	SE1	<10
3	68.6	SE1	<10
4	66.9	SE1	<10
5	67.5	SE1	<10
AVERAGE	**67.7**		
STD. DEV.	1.26		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	66.3	SE1
2	66.9	SE1
3	69.6	SE1
4	67.4	SE1
5	68.8	SE1
AVERAGE	**67.8**	
STD. DEV.	1.37	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-03
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-3

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	63.6	SE1	<10
2	66.4	SE1	<10
3	65.7	SE1	<10
4	65.2	SE1	<10
5	69.9	SE1	<10
AVERAGE	**66.2**		
STD. DEV.	2.33		
INSIDE TRACK (WELD "B")			
1	63.6	SE1	<10
2	65.6	SE1	<10
3	63.9	SE1	<10
4	66.3	SE1	<10
5	69.0	SE1	<10
AVERAGE	**65.7**		
STD. DEV.	2.17		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.9	SE1
2	65.1	SE1
3	66.9	SE1
4	68.2	SE1
5	67.3	SE1
AVERAGE	**67.3**	
STD. DEV.	1.45	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-04
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-4

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.0	SE1	<10
2	67.0	SE1	<10
3	69.6	SE1	<10
4	68.3	SE1	<10
5	65.9	SE1	<10
AVERAGE	**67.8**		
STD. DEV.	1.39		
INSIDE TRACK (WELD "B")			
1	69.2	SE1	<10
2	65.9	SE1	<10
3	63.0	SE1	<10
4	63.6	SE1	<10
5	62.1	SE1	<10
AVERAGE	**64.8**		
STD. DEV.	2.85		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	70.3	SE1
2	68.2	SE1
3	71.5	SE1
4	72.9	SE1
5	68.9	SE1
AVERAGE	**70.4**	
STD. DEV.	1.91	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-05
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-5

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	69.1	SE1	<10
2	67.3	SE1	<10
3	68.2	SE1	<10
4	65.9	SE1	<10
5	67.2	SE1	<10
AVERAGE	**67.5**		
STD. DEV.	1.20		
INSIDE TRACK (WELD "B")			
1	67.6	SE1	<10
2	64.6	SE1	<10
3	66.1	SE1	<10
4	68.1	SE1	<10
5	69.1	SE1	<10
AVERAGE	**67.1**		
STD. DEV.	1.77		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.2	SE1
2	70.7	SE1
3	67.3	SE1
4	67.3	SE1
5	71.0	SE1
AVERAGE	**69.1**	
STD. DEV.	1.78	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-06
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-6

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	65.9	SE1	<10
2	67.7	SE1	<10
3	67.6	SE1	<10
4	65.0	SE1	<10
5	66.1	SE1	<10
AVERAGE	**66.5**		
STD. DEV.	1.16		
INSIDE TRACK (WELD "B")			
1	62.3	SE1	<10
2	64.3	SE1	<10
3	67.3	SE1	<10
4	63.7	SE1	<10
5	66.6	SE1	<10
AVERAGE	**64.8**		
STD. DEV.	2.07		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.0	SE1
2	67.6	SE1
3	67.9	SE1
4	65.1	SE1
5	68.0	SE1
AVERAGE	**67.3**	
STD. DEV.	1.25	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-07
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-7

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	67.3	SE1	<10
2	68.6	SE1	<10
3	71.1	SE1	<10
4	66.1	SE1	<10
5	67.9	SE1	<10
AVERAGE	**68.2**		
STD. DEV.	1.86		
INSIDE TRACK (WELD "B")			
1	66.4	SE1	<10
2	67.9	SE1	<10
3	66.9	SE1	<10
4	69.4	SE1	<10
5	70.6	SE1	<10
AVERAGE	**68.2**		
STD. DEV.	1.75		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.0	SE1
2	70.5	SE1
3	68.0	SE1
4	67.5	SE1
5	69.2	SE1
AVERAGE	**68.6**	
STD. DEV.	1.21	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-08
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-8

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.1	SE1	<10
2	70.9	SE1	<10
3	66.9	SE1	<10
4	69.7	SE1	<10
5	70.2	SE1	<10
AVERAGE	**68.8**		
STD. DEV.	2.13		
INSIDE TRACK (WELD "B")			
1	66.0	SE1	<10
2	64.9	SE1	<10
3	64.7	SE1	<10
4	68.2	SE1	<10
5	63.6	SE1	<10
AVERAGE	**65.5**		
STD. DEV.	1.74		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.2	SE1
2	69.0	SE1
3	74.3	SE1
4	68.7	SE1
5	66.9	SE1
AVERAGE	**69.4**	
STD. DEV.	2.84	

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PEEL AND SHEAR TEST RESULTS
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ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-09
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-9

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	72.2	SE1	<10
2	66.2	SE1	<10
3	66.1	SE1	<10
4	65.3	SE1	<10
5	68.4	SE1	<10
AVERAGE	**67.6**		
STD. DEV.	2.80		
INSIDE TRACK (WELD "B")			
1	65.8	SE1	<10
2	67.2	SE1	<10
3	68.9	SE1	<10
4	68.3	SE1	<10
5	67.6	SE1	<10
AVERAGE	**67.6**		
STD. DEV.	1.18		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	65.9	SE1
2	69.7	SE1
3	66.6	SE1
4	67.3	SE1
5	71.3	SE1
AVERAGE	**68.2**	
STD. DEV.	2.26	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-10
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-10

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.2	SE1	<10
2	66.0	SE1	<10
3	64.2	SE1	<10
4	64.9	SE1	<10
5	63.1	SE1	<10
AVERAGE	**65.3**		
STD. DEV.	1.94		
INSIDE TRACK (WELD "B")			
1	65.9	SE1	<10
2	62.4	SE1	<10
3	62.9	SE1	<10
4	64.4	SE1	<10
5	62.9	SE1	<10
AVERAGE	**63.7**		
STD. DEV.	1.44		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	67.3	SE1
2	63.5	SE1
3	63.7	SE1
4	64.7	SE1
5	66.9	SE1
AVERAGE	**65.2**	
STD. DEV.	1.78	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-07
LAB ID NO.: L09012-07-11
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-11

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.0	SE1	<10
2	67.4	SE1	<10
3	63.1	SE1	<10
4	64.7	SE1	<10
5	65.6	SE1	<10
AVERAGE	**65.4**		
STD. DEV.	1.59		
INSIDE TRACK (WELD "B")			
1	67.4	SE1	<10
2	67.6	SE1	<10
3	64.0	SE1	<10
4	64.2	SE1	<10
5	66.1	SE1	<10
AVERAGE	**65.9**		
STD. DEV.	1.71		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	65.6	SE1
2	68.0	SE1
3	65.8	SE1
4	65.5	SE1
5	63.9	SE1
AVERAGE	**65.8**	
STD. DEV.	1.46	

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PEEL AND SHEAR TEST RESULTS
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ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-01
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-12

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	69.3	SE1	<10
2	69.6	SE1	<10
3	70.5	SE1	<10
4	68.5	SE1	<10
5	67.9	SE1	<10
AVERAGE	**69.2**		
STD. DEV.	1.00		
INSIDE TRACK (WELD "B")			
1	68.0	SE1	<10
2	65.9	SE1	<10
3	69.7	SE1	<10
4	68.9	SE1	<10
5	66.1	SE1	<10
AVERAGE	**67.7**		
STD. DEV.	1.68		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	84.9	SE1
2	66.0	SE1
3	72.0	SE1
4	67.6	SE1
5	67.1	SE1
AVERAGE	**71.5**	
STD. DEV.	7.82	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-02
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-13

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.9	SE1	<10
2	70.0	SE1	<10
3	71.1	SE1	<10
4	71.0	SE1	<10
5	74.2	SE1	<10
AVERAGE	**71.0**		
STD. DEV.	1.98		
INSIDE TRACK (WELD "B")			
1	67.7	SE1	<10
2	68.6	SE1	<10
3	73.2	SE1	<10
4	68.7	SE1	<10
5	74.6	SE1	<10
AVERAGE	**70.6**		
STD. DEV.	3.11		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	76.6	SE1
2	68.1	SE1
3	70.1	SE1
4	68.3	SE1
5	70.1	SE1
AVERAGE	**70.6**	
STD. DEV.	3.47	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-03
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-14

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.7	SE1	<10
2	65.4	SE1	<10
3	68.4	SE1	<10
4	68.4	SE1	<10
5	64.3	SE1	<10
AVERAGE	**67.0**		
STD. DEV.	2.04		
INSIDE TRACK (WELD "B")			
1	63.9	SE1	<10
2	66.1	SE1	<10
3	65.9	SE1	<10
4	66.3	SE1	<10
5	64.9	SE1	<10
AVERAGE	**65.4**		
STD. DEV.	1.01		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	65.9	SE1
2	74.2	SE1
3	65.1	SE1
4	64.6	SE1
5	66.1	SE1
AVERAGE	**67.2**	
STD. DEV.	3.97	

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PEEL AND SHEAR TEST RESULTS
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ASTM D 6392 & 4437 w/NSF 54

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-04
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-15

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.0	SE1	<10
2	69.7	SE1	<10
3	69.7	SE1	<10
4	67.8	SE1	<10
5	69.2	SE1	<10
AVERAGE	**68.9**		
STD. DEV.	0.92		
INSIDE TRACK (WELD "B")			
1	70.5	SE1	<10
2	67.3	SE1	<10
3	69.0	SE1	<10
4	64.9	SE1	<10
5	68.3	SE1	<10
AVERAGE	**68.0**		
STD. DEV.	2.09		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.0	SE1
2	67.9	SE1
3	70.4	SE1
4	69.2	SE1
5	67.9	SE1
AVERAGE	**68.7**	
STD. DEV.	1.11	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-05
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-16

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	67.5	SE1	<10
2	69.1	SE1	<10
3	68.6	SE1	<10
4	67.1	SE1	<10
5	70.4	SE1	<10
AVERAGE	**68.5**		
STD. DEV.	1.32		
INSIDE TRACK (WELD "B")			
1	68.1	SE1	<10
2	69.6	SE1	<10
3	68.3	SE1	<10
4	70.2	SE1	<10
5	71.5	SE1	<10
AVERAGE	**69.5**		
STD. DEV.	1.40		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.1	SE1
2	72.6	SE1
3	70.7	SE1
4	75.7	SE1
5	67.9	SE1
AVERAGE	**71.0**	
STD. DEV.	3.27	

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PEEL AND SHEAR TEST RESULTS
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ASTM D 6392 & 4437 w/NSF 54

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-06
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-17

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	69.1	SE1	<10
2	67.5	SE1	<10
3	68.3	SE1	<10
4	67.1	SE1	<10
5	68.7	SE1	<10
AVERAGE	**68.1**		
STD. DEV.	0.83		
INSIDE TRACK (WELD "B")			
1	69.9	SE1	<10
2	67.6	SE1	<10
3	66.2	SE1	<10
4	67.7	SE1	<10
5	65.2	SE1	<10
AVERAGE	**67.3**		
STD. DEV.	1.78		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.2	SE1
2	66.6	SE1
3	72.1	SE1
4	69.9	SE1
5	66.8	SE1
AVERAGE	**68.7**	
STD. DEV.	2.31	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-07
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-18

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	71.2	SE1	<10
2	68.7	SE1	<10
3	67.4	SE1	<10
4	68.3	SE1	<10
5	70.1	SE1	<10
AVERAGE	**69.1**		
STD. DEV.	1.51		
INSIDE TRACK (WELD "B")			
1	68.9	SE1	<10
2	67.1	SE1	<10
3	66.3	SE1	<10
4	68.6	SE1	<10
5	65.8	SE1	<10
AVERAGE	**67.3**		
STD. DEV.	1.37		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.2	SE1
2	69.4	SE1
3	67.6	SE1
4	69.6	SE1
5	68.1	SE1
AVERAGE	**68.6**	
STD. DEV.	0.87	

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PEEL AND SHEAR TEST RESULTS
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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-08
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-19

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	69.6	SE1	<10
2	71.7	SE1	<10
3	67.7	SE1	<10
4	68.7	SE1	<10
5	70.0	SE1	<10
AVERAGE	**69.5**		
STD. DEV.	1.50		
INSIDE TRACK (WELD "B")			
1	68.0	SE1	<10
2	66.5	SE1	<10
3	69.0	SE1	<10
4	68.2	SE1	<10
5	68.4	SE1	<10
AVERAGE	**68.0**		
STD. DEV.	0.93		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.0	SE1
2	70.2	SE1
3	71.8	SE1
4	68.4	SE1
5	69.2	SE1
AVERAGE	**69.7**	
STD. DEV.	1.33	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-09
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-20

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	70.2	SE1	<10
2	69.4	SE1	<10
3	68.9	SE1	<10
4	68.7	SE1	<10
5	71.6	SE1	<10
AVERAGE	**69.8**		
STD. DEV.	1.18		
INSIDE TRACK (WELD "B")			
1	68.1	SE1	<10
2	66.3	SE1	<10
3	67.9	SE1	<10
4	70.2	SE1	<10
5	69.7	SE1	<10
AVERAGE	**68.4**		
STD. DEV.	1.55		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.9	SE1
2	72.9	SE1
3	71.9	SE1
4	72.1	SE1
5	70.9	SE1
AVERAGE	**71.3**	
STD. DEV.	1.54	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-10
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-21

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.6	SE1	<10
2	69.7	SE1	<10
3	74.3	SE1	<10
4	67.1	SE1	<10
5	70.2	SE1	<10
AVERAGE	**70.0**		
STD. DEV.	2.69		
INSIDE TRACK (WELD "B")			
1	66.4	SE1	<10
2	70.1	SE1	<10
3	69.6	SE1	<10
4	68.4	SE1	<10
5	66.6	SE1	<10
AVERAGE	**68.2**		
STD. DEV.	1.69		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.7	SE1
2	72.2	SE1
3	70.6	SE1
4	70.0	SE1
5	73.1	SE1
AVERAGE	**71.1**	
STD. DEV.	1.47	

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PEEL AND SHEAR TEST RESULTS
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INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-11
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-22

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	65.5	SE1	<10
2	66.0	SE1	<10
3	72.1	SE1	<10
4	69.5	SE1	<10
5	70.6	SE1	<10
AVERAGE	**68.7**		
STD. DEV.	2.89		
INSIDE TRACK (WELD "B")			
1	68.7	SE1	<10
2	65.9	SE1	<10
3	72.1	SE1	<10
4	64.8	SE1	<10
5	70.1	SE1	<10
AVERAGE	**68.3**		
STD. DEV.	2.99		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	74.8	SE1
2	73.1	SE1
3	67.2	SE1
4	67.5	SE1
5	67.0	SE1
AVERAGE	**69.9**	
STD. DEV.	3.73	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-12
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-23

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	63.9	SE1	<10
2	73.0	SE1	<10
3	68.5	SE1	<10
4	64.9	SE1	<10
5	68.2	SE1	<10
AVERAGE	**67.7**		
STD. DEV.	3.58		
INSIDE TRACK (WELD "B")			
1	68.6	SE1	<10
2	70.8	SE1	<10
3	69.7	SE1	<10
4	66.4	SE1	<10
5	67.4	SE1	<10
AVERAGE	**68.6**		
STD. DEV.	1.76		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	70.2	SE1
2	73.3	SE1
3	71.9	SE1
4	73.6	SE1
5	70.5	SE1
AVERAGE	**71.9**	
STD. DEV.	1.56	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-13
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-24

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.0	SE1	<10
2	65.9	SE1	<10
3	68.0	SE1	<10
4	68.3	SE1	<10
5	70.5	SE1	<10
AVERAGE	**67.7**		
STD. DEV.	1.90		
INSIDE TRACK (WELD "B")			
1	65.9	SE1	<10
2	68.6	SE1	<10
3	69.1	SE1	<10
4	68.5	SE1	<10
5	67.9	SE1	<10
AVERAGE	**68.0**		
STD. DEV.	1.25		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	68.5	SE1
2	69.2	SE1
3	68.8	SE1
4	72.0	SE1
5	67.1	SE1
AVERAGE	**69.1**	
STD. DEV.	1.79	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-14
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-25

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	68.6	SE1	<10
2	67.2	SE1	<10
3	69.7	SE1	<10
4	66.8	SE1	<10
5	69.8	SE1	<10
AVERAGE	**68.4**		
STD. DEV.	1.39		
INSIDE TRACK (WELD "B")			
1	66.4	SE1	<10
2	67.3	SE1	<10
3	65.7	SE1	<10
4	66.8	SE1	<10
5	68.0	SE1	<10
AVERAGE	**66.8**		
STD. DEV.	0.87		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.0	SE1
2	70.1	SE1
3	68.9	SE1
4	69.1	SE1
5	71.4	SE1
AVERAGE	**69.7**	
STD. DEV.	1.07	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-15
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-26

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	65.5	SE1	<10
2	64.9	SE1	<10
3	66.0	SE1	<10
4	68.5	SE1	<10
5	68.9	SE1	<10
AVERAGE	**66.8**		
STD. DEV.	1.82		
INSIDE TRACK (WELD "B")			
1	66.7	SE1	<10
2	65.2	SE1	<10
3	67.0	SE1	<10
4	68.5	SE1	<10
5	68.9	SE1	<10
AVERAGE	**67.3**		
STD. DEV.	1.49		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	70.0	SE1
2	67.0	SE1
3	68.5	SE1
4	69.5	SE1
5	65.9	SE1
AVERAGE	**68.2**	
STD. DEV.	1.71	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-09
LAB ID NO.: L09012-09-16
MATERIAL: 40 MIL LLDPE
SEAM TYPE: EXTRUSION

SAMPLE I.D.: DS-27

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
1	69.4	SE3	<10
2	73.1	SE3	<10
3	73.4	SE3	<10
4	70.9	SE3	<10
5	69.6	SE3	<10
AVERAGE	**71.3**		
STD. DEV.	1.89		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	75.0	SE1
2	76.2	SE1
3	75.9	SE1
4	75.7	SE1
5	76.7	SE1
AVERAGE	**75.9**	
STD. DEV.	0.63	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-10
LAB ID NO.: L09012-10-01
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-28

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.0	SE1	<10
2	64.6	SE1	<10
3	67.0	SE1	<10
4	66.3	SE1	<10
5	67.2	SE1	<10
AVERAGE	**66.2**		
STD. DEV.	1.03		
INSIDE TRACK (WELD "B")			
1	68.7	SE1	<10
2	67.1	SE1	<10
3	67.9	SE1	<10
4	61.9	SE1	<10
5	69.9	SE1	<10
AVERAGE	**67.1**		
STD. DEV.	3.09		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.6	SE1
2	71.0	SE1
3	69.3	SE1
4	66.8	SE1
5	74.6	SE1
AVERAGE	**70.3**	
STD. DEV.	2.86	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-10
LAB ID NO.: L09012-10-02
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-29

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	62.1	SE1	<10
2	67.7	SE1	<10
3	69.8	SE1	<10
4	70.7	SE1	<10
5	66.9	SE1	<10
AVERAGE	**67.4**		
STD. DEV.	3.36		
INSIDE TRACK (WELD "B")			
1	69.2	SE1	<10
2	65.5	SE1	<10
3	67.8	SE1	<10
4	67.8	SE1	<10
5	64.7	SE1	<10
AVERAGE	**67.0**		
STD. DEV.	1.85		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	65.6	SE1
2	70.2	SE1
3	68.5	SE1
4	71.7	SE1
5	66.3	SE1
AVERAGE	**68.5**	
STD. DEV.	2.57	

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PEEL AND SHEAR TEST RESULTS
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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-10
LAB ID NO.: L09012-10-03
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-30

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.9	SE1	<10
2	64.4	SE1	<10
3	68.8	SE1	<10
4	70.2	SE1	<10
5	70.2	SE1	<10
AVERAGE	**68.1**		
STD. DEV.	2.47		
INSIDE TRACK (WELD "B")			
1	63.6	SE1	<10
2	63.3	SE1	<10
3	64.6	SE1	<10
4	67.6	SE1	<10
5	64.9	SE1	<10
AVERAGE	**64.8**		
STD. DEV.	1.70		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	65.1	SE1
2	72.6	SE1
3	73.2	SE1
4	70.5	SE1
5	71.0	SE1
AVERAGE	**70.5**	
STD. DEV.	3.21	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-10
LAB ID NO.: L09012-10-04
MATERIAL: 40 MIL LLDPE
SEAM TYPE: EXTRUSION

SAMPLE I.D.: DS-31

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	64.0	SE3	<10
2	62.9	SE3	<10
3	63.2	SE3	<10
4	67.7	SE3	<10
5	66.3	SE3	<10
AVERAGE	**64.8**		
STD. DEV.	2.09		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	71.7	SE1
2	70.7	SE1
3	72.2	SE1
4	71.9	SE1
5	70.7	SE1
AVERAGE	**71.4**	
STD. DEV.	0.70	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-10
LAB ID NO.: L09012-10-05
MATERIAL: 40 MIL LLDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-32

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	66.1	SE1	<10
2	64.5	SE1	<10
3	68.9	SE1	<10
4	68.8	SE1	<10
5	67.3	SE1	<10
AVERAGE	**67.1**		
STD. DEV.	1.87		
INSIDE TRACK (WELD "B")			
1	63.1	SE1	<10
2	67.3	SE1	<10
3	67.9	SE1	<10
4	67.9	SE1	<10
5	63.0	SE1	<10
AVERAGE	**65.8**		
STD. DEV.	2.56		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	69.0	SE1
2	69.2	SE1
3	68.2	SE1
4	67.1	SE1
5	71.9	SE1
AVERAGE	**69.1**	
STD. DEV.	1.78	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-01
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-1

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	137.4	SE1	<10
2	137.9	SE1	<10
3	142.8	SE1	<10
4	144.6	SE1	<10
5	139.4	SE1	<10
AVERAGE	**140.4**		
STD. DEV.	3.15		
INSIDE TRACK (WELD "B")			
1	157.1	SE1	<10
2	148.1	SE1	<10
3	150.8	SE1	<10
4	153.5	SE1	<10
5	148.8	SE1	<10
AVERAGE	**151.7**		
STD. DEV.	3.69		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.4	SE1
2	175.0	SE1
3	174.6	SE1
4	174.1	SE1
5	175.4	SE1
AVERAGE	**175.1**	
STD. DEV.	0.87	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-02
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-2

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	142.2	SE1	<10
2	136.8	SE1	<10
3	138.4	SE1	<10
4	139.6	SE1	<10
5	138.4	SE1	<10
AVERAGE	**139.1**		
STD. DEV.	2.01		
INSIDE TRACK (WELD "B")			
1	151.1	SE1	<10
2	154.7	SE1	<10
3	153.7	SE1	<10
4	149.2	SE1	<10
5	149.0	SE1	<10
AVERAGE	**151.5**		
STD. DEV.	2.59		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.3	SE1
2	175.1	SE1
3	176.1	SE1
4	174.3	SE1
5	175.0	SE1
AVERAGE	**175.6**	
STD. DEV.	1.17	

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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-03
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-3

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	135.5	SE1	<10
2	124.9	SE1	<10
3	142.9	SE1	<10
4	138.2	SE1	<10
5	135.6	SE1	<10
AVERAGE	**135.4**		
STD. DEV.	6.60		
INSIDE TRACK (WELD "B")			
1	148.2	SE1	<10
2	137.4	SE1	<10
3	142.9	SE1	<10
4	137.2	SE1	<10
5	141.4	SE1	<10
AVERAGE	**141.4**		
STD. DEV.	4.53		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.8	SE1
2	176.9	SE1
3	176.5	SE1
4	177.6	SE1
5	176.4	SE1
AVERAGE	**177.0**	
STD. DEV.	0.63	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-04
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-4

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	136.4	SE1	<10
2	139.0	SE1	<10
3	131.7	SE1	<10
4	116.6	SE1	<10
5	131.7	SE1	<10
AVERAGE	**131.1**		
STD. DEV.	8.68		
INSIDE TRACK (WELD "B")			
1	147.6	SE1	<10
2	142.1	SE1	<10
3	144.8	SE1	<10
4	143.5	SE1	<10
5	142.7	SE1	<10
AVERAGE	**144.1**		
STD. DEV.	2.18		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	172.5	SE1
2	174.6	SE1
3	173.8	SE1
4	173.2	SE1
5	173.4	SE1
AVERAGE	**173.5**	
STD. DEV.	0.77	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-05
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-5

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	129.1	SE1	<10
2	128.3	SE1	<10
3	128.8	SE1	<10
4	127.7	SE1	<10
5	131.8	SE1	<10
AVERAGE	**129.1**		
STD. DEV.	1.58		
INSIDE TRACK (WELD "B")			
1	136.7	SE1	<10
2	123.3	SE1	<10
3	132.8	SE1	<10
4	133.7	SE1	<10
5	131.1	SE1	<10
AVERAGE	**131.5**		
STD. DEV.	5.02		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	173.9	SE1
2	174.1	SE1
3	172.3	SE1
4	174.4	SE1
5	173.2	SE1
AVERAGE	**173.6**	
STD. DEV.	0.84	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-06
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-6

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	147.7	SE1	<10
2	134.2	SE1	<10
3	121.0	SE1	<10
4	124.6	SE1	<10
5	131.0	SE1	<10
AVERAGE	**131.7**		
STD. DEV.	10.34		
INSIDE TRACK (WELD "B")			
1	143.2	SE1	<10
2	144.3	SE1	<10
3	145.2	SE1	<10
4	147.5	SE1	<10
5	146.9	SE1	<10
AVERAGE	**145.4**		
STD. DEV.	1.79		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	173.0	SE1
2	172.4	SE1
3	172.2	SE1
4	172.9	SE1
5	172.9	SE1
AVERAGE	**172.7**	
STD. DEV.	0.36	

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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-07
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-7

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	135.2	SE1	<10
2	132.7	SE1	<10
3	140.3	SE1	<10
4	134.8	SE1	<10
5	136.8	SE1	<10
AVERAGE	**136.0**		
STD. DEV.	2.83		
INSIDE TRACK (WELD "B")			
1	138.8	SE1	<10
2	134.5	SE1	<10
3	130.8	SE1	<10
4	149.3	SE1	<10
5	141.9	SE1	<10
AVERAGE	**139.1**		
STD. DEV.	7.11		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.2	SE1
2	174.4	SE1
3	172.6	SE1
4	175.8	SE1
5	174.9	SE1
AVERAGE	**175.0**	
STD. DEV.	1.70	

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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-08
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-8

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	133.2	SE1	<10
2	126.9	SE1	<10
3	135.0	SE1	<10
4	131.0	SE1	<10
5	130.0	SE1	<10
AVERAGE	**131.2**		
STD. DEV.	3.10		
INSIDE TRACK (WELD "B")			
1	145.9	SE1	<10
2	144.8	SE1	<10
3	144.9	SE1	<10
4	143.5	SE1	<10
5	121.0	SE1	<10
AVERAGE	**140.0**		
STD. DEV.	10.67		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	171.8	SE1
2	171.6	SE1
3	172.0	SE1
4	173.9	SE1
5	174.9	SE1
AVERAGE	**172.8**	
STD. DEV.	1.47	

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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-09
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-9

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	135.8	SE1	<10
2	121.9	SE1	<10
3	126.5	SE1	<10
4	111.4	SE1	<10
5	137.0	SE1	<10
AVERAGE	**126.5**		
STD. DEV.	10.56		
INSIDE TRACK (WELD "B")			
1	144.2	SE1	<10
2	134.2	SE1	<10
3	139.2	SE1	<10
4	140.4	SE1	<10
5	141.6	SE1	<10
AVERAGE	**139.9**		
STD. DEV.	3.69		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	175.7	SE1
2	172.8	SE1
3	173.2	SE1
4	172.9	SE1
5	173.6	SE1
AVERAGE	**173.6**	
STD. DEV.	1.19	

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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-10
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-10

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.4	SE1	<10
2	143.2	SE1	<10
3	144.3	SE1	<10
4	142.5	SE1	<10
5	139.1	SE1	<10
AVERAGE	**141.9**		
STD. DEV.	2.12		
INSIDE TRACK (WELD "B")			
1	139.5	SE1	<10
2	142.7	SE1	<10
3	138.6	SE1	<10
4	143.2	SE1	<10
5	139.7	SE1	<10
AVERAGE	**140.7**		
STD. DEV.	2.07		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	175.4	SE1
2	174.9	SE1
3	175.1	SE1
4	175.4	SE1
5	174.2	SE1
AVERAGE	**175.0**	
STD. DEV.	0.49	

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CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-11
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-11

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	131.3	SE1	<10
2	134.2	SE1	<10
3	140.6	SE1	<10
4	135.8	SE1	<10
5	132.9	SE1	<10
AVERAGE	**135.0**		
STD. DEV.	3.56		
INSIDE TRACK (WELD "B")			
1	139.5	SE1	<10
2	138.8	SE1	<10
3	138.9	SE1	<10
4	142.1	SE1	<10
5	139.6	SE1	<10
AVERAGE	**139.8**		
STD. DEV.	1.34		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	174.8	SE1
2	175.2	SE1
3	175.9	SE1
4	174.4	SE1
5	176.2	SE1
AVERAGE	**175.3**	
STD. DEV.	0.75	

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PEEL AND SHEAR TEST RESULTS
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CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES,INC.
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-08
LAB ID NO.: L09012-08-12
MATERIAL: 60 MIL HDPE
SEAM TYPE: EXTRUSION

SAMPLE I.D.: DS-12

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
1	108.0	SE3	<10
2	104.9	SE3	<10
3	113.5	SE3	<10
4	103.2	SE3	<10
5	102.6	SE3	<10
AVERAGE	**106.4**		
STD. DEV.	4.47		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	166.3	SE2
2	170.2	SE2
3	167.2	SE2
4	169.9	SE2
5	167.2	SE2
AVERAGE	**168.2**	
STD. DEV.	1.77	

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CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-11
LAB ID NO.: L09012-11-01
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-13

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	137.8	SE1	<10
2	131.2	SE1	<10
3	139.0	SE1	<10
4	134.3	SE1	<10
5	135.9	SE1	<10
AVERAGE	**135.6**		
STD. DEV.	3.06		
INSIDE TRACK (WELD "B")			
1	130.2	SE1	<10
2	135.5	SE1	<10
3	137.7	SE1	<10
4	141.6	SE1	<10
5	136.8	SE1	<10
AVERAGE	**136.4**		
STD. DEV.	4.13		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	179.7	SE1
2	176.5	SE1
3	177.4	SE1
4	178.3	SE1
5	174.8	SE1
AVERAGE	**177.3**	
STD. DEV.	1.85	

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PEEL AND SHEAR TEST RESULTS
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CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-11
LAB ID NO.: L09012-11-02
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-14

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	146.8	SE1	<10
2	135.1	SE1	<10
3	143.5	SE1	<10
4	141.1	SE1	<10
5	147.7	SE1	<10
AVERAGE	**142.8**		
STD. DEV.	5.07		
INSIDE TRACK (WELD "B")			
1	130.7	SE1	<10
2	143.6	SE1	<10
3	141.6	SE1	<10
4	133.0	SE1	<10
5	124.5	SE1	<10
AVERAGE	**134.7**		
STD. DEV.	7.90		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.8	SE1
2	177.9	SE1
3	177.4	SE1
4	177.8	SE1
5	176.5	SE1
AVERAGE	**177.3**	
STD. DEV.	0.61	

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CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-11
LAB ID NO.: L09012-11-03
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-15

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	137.9	SE1	<10
2	124.9	SE1	<10
3	133.2	SE1	<10
4	137.4	SE1	<10
5	137.0	SE1	<10
AVERAGE	**134.1**		
STD. DEV.	5.46		
INSIDE TRACK (WELD "B")			
1	145.2	SE1	<10
2	143.7	SE1	<10
3	143.3	SE1	<10
4	140.3	SE1	<10
5	144.2	SE1	<10
AVERAGE	**143.3**		
STD. DEV.	1.84		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	175.7	SE1
2	174.6	SE1
3	175.6	SE1
4	175.6	SE1
5	177.3	SE1
AVERAGE	**175.8**	
STD. DEV.	0.97	

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CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-11
LAB ID NO.: L09012-11-04
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-16

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	139.8	SE1	<10
2	140.5	SE1	<10
3	141.6	SE1	<10
4	139.3	SE1	<10
5	141.7	SE1	<10
AVERAGE	**140.6**		
STD. DEV.	1.07		
INSIDE TRACK (WELD "B")			
1	138.7	SE1	<10
2	136.7	SE1	<10
3	142.3	SE1	<10
4	143.3	SE1	<10
5	142.1	SE1	<10
AVERAGE	**140.6**		
STD. DEV.	2.79		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	174.1	SE1
2	172.2	SE1
3	170.7	SE1
4	171.2	SE1
5	175.0	SE1
AVERAGE	**172.6**	
STD. DEV.	1.85	

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CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-11
LAB ID NO.: L09012-11-05
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-17

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.1	SE1	<10
2	137.3	SE1	<10
3	134.6	SE1	<10
4	134.6	SE1	<10
5	133.6	SE1	<10
AVERAGE	**136.0**		
STD. DEV.	2.65		
INSIDE TRACK (WELD "B")			
1	141.6	SE1	<10
2	147.0	SE1	<10
3	141.4	SE1	<10
4	144.9	SE1	<10
5	146.1	SE1	<10
AVERAGE	**144.2**		
STD. DEV.	2.58		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.6	SE1
2	180.2	SE1
3	180.7	SE1
4	178.0	SE1
5	181.5	SE1
AVERAGE	**179.4**	
STD. DEV.	2.03	

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4/2/2009

PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-01
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-18

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	137.7	SE1	<10
2	139.0	SE1	<10
3	135.6	SE1	<10
4	132.9	SE1	<10
5	135.1	SE1	<10
AVERAGE	**136.1**		
STD. DEV.	2.37		
INSIDE TRACK (WELD "B")			
1	137.5	SE1	<10
2	127.5	SE1	<10
3	130.4	SE1	<10
4	127.8	SE1	<10
5	132.6	SE1	<10
AVERAGE	**131.2**		
STD. DEV.	4.11		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.0	BRK
2	180.4	BRK
3	176.9	BRK
4	182.4	BRK
5	181.3	BRK
AVERAGE	**179.6**	
STD. DEV.	2.52	

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4/6/2009

PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING
ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-02
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-19

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	138.2	SE1	<10
2	138.8	SE1	<10
3	135.6	SE1	<10
4	140.1	SE1	<10
5	137.8	SE1	<10
AVERAGE	**138.1**		
STD. DEV.	1.65		
INSIDE TRACK (WELD "B")			
1	131.1	SE1	<10
2	125.8	SE1	<10
3	127.8	SE1	<10
4	132.6	SE1	<10
5	130.7	SE1	<10
AVERAGE	**129.6**		
STD. DEV.	2.74		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	189.2	BRK
2	176.5	BRK
3	188.8	BRK
4	190.0	BRK
5	184.3	BRK
AVERAGE	**185.8**	
STD. DEV.	5.63	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

Geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-03
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-20

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	125.9	SE1	<10
2	132.7	SE1	<10
3	135.1	SE1	<10
4	134.2	SE1	<10
5	130.9	SE1	<10
AVERAGE	**131.8**		
STD. DEV.	3.64		
INSIDE TRACK (WELD "B")			
1	133.3	SE1	<10
2	127.6	SE1	<10
3	129.3	SE1	<10
4	130.0	SE1	<10
5	128.1	SE1	<10
AVERAGE	**129.7**		
STD. DEV.	2.25		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.6	BRK
2	175.4	BRK
3	182.7	BRK
4	177.2	BRK
5	180.5	BRK
AVERAGE	**178.5**	
STD. DEV.	3.02	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-04
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-21

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	132.5	SE1	<10
2	128.9	SE1	<10
3	138.6	SE1	<10
4	133.8	SE1	<10
5	132.4	SE1	<10
AVERAGE	**133.2**		
STD. DEV.	3.50		
INSIDE TRACK (WELD "B")			
1	127.1	SE1	<10
2	128.0	SE1	<10
3	132.3	SE1	<10
4	130.1	SE1	<10
5	126.5	SE1	<10
AVERAGE	**128.8**		
STD. DEV.	2.39		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	185.1	BRK
2	178.8	BRK
3	182.7	BRK
4	185.3	BRK
5	180.4	BRK
AVERAGE	**182.5**	
STD. DEV.	2.86	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

Geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-05
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-22

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.2	SE1	<10
2	138.9	SE1	<10
3	130.8	SE1	<10
4	126.9	SE1	<10
5	131.3	SE1	<10
AVERAGE	**133.6**		
STD. DEV.	5.69		
INSIDE TRACK (WELD "B")			
1	125.7	SE1	<10
2	130.2	SE1	<10
3	127.4	SE1	<10
4	132.5	SE1	<10
5	128.4	SE1	<10
AVERAGE	**128.8**		
STD. DEV.	2.62		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	189.1	BRK
2	178.3	BRK
3	180.2	BRK
4	177.9	BRK
5	176.4	BRK
AVERAGE	**180.4**	
STD. DEV.	5.06	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING
ASTM D 6392 & 4437 w/NSF 54

Geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-06
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-23

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.1	SE1	<10
2	137.6	SE1	<10
3	133.1	SE1	<10
4	135.0	SE1	<10
5	139.8	SE1	<10
AVERAGE	**137.1**		
STD. DEV.	3.04		
INSIDE TRACK (WELD "B")			
1	126.4	SE1	<10
2	127.8	SE1	<10
3	130.1	SE1	<10
4	128.1	SE1	<10
5	131.2	SE1	<10
AVERAGE	**128.7**		
STD. DEV.	1.91		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	175.5	BRK
2	182.7	BRK
3	179.7	BRK
4	176.0	BRK
5	188.0	BRK
AVERAGE	**180.4**	
STD. DEV.	5.17	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-06
LAB ID NO.: 2009-610-06-07
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-24

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	137.6	SE1	<10
2	132.8	SE1	<10
3	134.7	SE1	<10
4	135.1	SE1	<10
5	130.7	SE1	<10
AVERAGE	**134.2**		
STD. DEV.	2.59		
INSIDE TRACK (WELD "B")			
1	127.9	SE1	<10
2	124.3	SE1	<10
3	133.4	SE1	<10
4	128.1	SE1	<10
5	129.6	SE1	<10
AVERAGE	**128.7**		
STD. DEV.	3.29		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	180.0	BRK
2	183.7	BRK
3	182.8	BRK
4	179.8	BRK
5	180.3	BRK
AVERAGE	**181.3**	
STD. DEV.	1.80	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING
ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-01
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-25

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.5	SE1	<10
2	132.2	SE1	<10
3	126.9	SE1	<10
4	98.9	AD	100%
5	133.1	SE1	<10
AVERAGE	**126.3**		
STD. DEV.	16.08		
INSIDE TRACK (WELD "B")			
1	149.6	SE1	<10
2	139.3	SE1	<10
3	139.1	SE1	<10
4	134.5	SE1	<10
5	131.9	SE1	<10
AVERAGE	**138.9**		
STD. DEV.	6.76		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	180.5	BRK
2	173.3	BRK
3	176.3	BRK
4	176.7	BRK
5	174.4	BRK
AVERAGE	**176.2**	
STD. DEV.	2.76	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

Geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-02
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-26

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	132.0	SE1	<10
2	133.5	SE1	<10
3	129.5	SE1	<10
4	132.6	SE1	<10
5	124.3	SE1	<10
AVERAGE	**130.4**		
STD. DEV.	3.71		
INSIDE TRACK (WELD "B")			
1	132.9	SE1	<10
2	127.3	SE1	<10
3	127.3	SE1	<10
4	135.9	SE1	<10
5	140.3	SE1	<10
AVERAGE	**132.7**		
STD. DEV.	5.62		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	171.0	BRK
2	174.6	BRK
3	170.9	BRK
4	173.7	BRK
5	174.0	BRK
AVERAGE	**172.8**	
STD. DEV.	1.76	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-03
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-27

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	128.6	SE1	<10
2	143.0	SE1	<10
3	136.1	SE1	<10
4	132.6	SE1	<10
5	142.0	SE1	<10
AVERAGE	**136.5**		
STD. DEV.	6.13		
INSIDE TRACK (WELD "B")			
1	127.3	SE1	<10
2	128.2	SE1	<10
3	142.6	SE1	<10
4	125.5	SE1	<10
5	119.8	SE1	<10
AVERAGE	**128.7**		
STD. DEV.	8.44		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.7	BRK
2	174.7	BRK
3	174.5	BRK
4	176.4	BRK
5	174.7	BRK
AVERAGE	**175.6**	
STD. DEV.	1.40	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-04
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-28

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	139.4	SE1	<10
2	134.7	SE1	<10
3	138.1	SE1	<10
4	135.9	SE1	<10
5	134.7	SE1	<10
AVERAGE	**136.6**		
STD. DEV.	2.11		
INSIDE TRACK (WELD "B")			
1	132.9	SE1	<10
2	137.6	SE1	<10
3	133.2	SE1	<10
4	132.1	SE1	<10
5	128.7	SE1	<10
AVERAGE	**132.9**		
STD. DEV.	3.18		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	185.1	BRK
2	188.7	BRK
3	186.2	BRK
4	187.6	BRK
5	187.1	BRK
AVERAGE	**186.9**	
STD. DEV.	1.37	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-05
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-29

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	139.6	SE1	<10
2	139.4	SE1	<10
3	139.3	SE1	<10
4	136.5	SE1	<10
5	132.4	SE1	<10
AVERAGE	**137.4**		
STD. DEV.	3.09		
INSIDE TRACK (WELD "B")			
1	132.1	SE1	<10
2	143.7	SE1	<10
3	132.5	SE1	<10
4	124.3	SE1	<10
5	127.7	SE1	<10
AVERAGE	**132.1**		
STD. DEV.	7.33		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	182.2	BRK
2	183.9	BRK
3	185.4	BRK
4	186.1	BRK
5	184.7	BRK
AVERAGE	**184.5**	
STD. DEV.	1.50	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-06
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-30

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	140.5	SE1	<10
2	137.6	SE1	<10
3	139.1	SE1	<10
4	141.1	SE1	<10
5	142.5	SE1	<10
AVERAGE	**140.2**		
STD. DEV.	1.88		
INSIDE TRACK (WELD "B")			
1	135.0	SE1	<10
2	141.6	SE1	<10
3	127.6	SE1	<10
4	132.9	SE1	<10
5	133.0	SE1	<10
AVERAGE	**134.0**		
STD. DEV.	5.05		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	181.8	BRK
2	185.8	BRK
3	186.8	BRK
4	183.7	BRK
5	184.1	BRK
AVERAGE	**184.4**	
STD. DEV.	1.94	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-07
MATERIAL: 60 MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-31

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	125.3	SE1	<10
2	125.1	SE1	<10
3	135.3	SE1	<10
4	135.8	SE1	<10
5	132.9	SE1	<10
AVERAGE	**130.9**		
STD. DEV.	5.30		
INSIDE TRACK (WELD "B")			
1	131.6	SE1	<10
2	131.4	SE1	<10
3	131.3	SE1	<10
4	132.1	SE1	<10
5	130.6	SE1	<10
AVERAGE	**131.4**		
STD. DEV.	0.54		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.1	BRK
2	185.6	BRK
3	182.3	BRK
4	186.6	BRK
5	181.6	BRK
AVERAGE	**182.6**	
STD. DEV.	3.75	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC.
CLIENT PROJECT: JOHNSTON CO. PH 4A CELL 3
CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-07
LAB ID NO.: 2009-610-07-08
MATERIAL: 60 MIL HDPE
SEAM TYPE: EXTRUSION

SAMPLE I.D.: DS-32

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
1	148.3	SE3	<10
2	161.4	SE3	<10
3	133.7	SE3	<10
4	158.1	SE3	<10
5	143.0	SE3	<10
AVERAGE	**148.9**		
STD. DEV.	11.26		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	173.9	SE2
2	170.3	SE2
3	168.7	SE2
4	167.5	SE2
5	171.4	SE2
AVERAGE	**170.4**	
STD. DEV.	2.48	

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4/9/2009

PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING
ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: R.S.G & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO. PH. 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-09
LAB ID NO.: 2009-610-09-01
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-33

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	125.7	SE-1	<10
2	129.8	SE-1	<10
3	135.4	SE-1	<10
4	129.4	SE-1	<10
5	131.6	SE-1	<10
AVERAGE	**130.4**		
STD. DEV.	3.53		
INSIDE TRACK (WELD "B")			
1	137.9	SE-1	<10
2	132.3	SE-1	<10
3	140.8	SE-1	<10
4	132.1	SE-1	<10
5	130.3	SE-1	<10
AVERAGE	**134.7**		
STD. DEV.	4.45		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.5	BRK
2	173.2	BRK
3	172.4	BRK
4	173.0	BRK
5	171.5	BRK
AVERAGE	**173.3**	
STD. DEV.	1.90	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: R.S.G & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO. PH. 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-09
LAB ID NO.: 2009-610-09-02
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-34

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	132.0	SE-1	<10
2	133.2	SE-1	<10
3	130.1	SE-1	<10
4	132.6	SE-1	<10
5	131.2	SE-1	<10
AVERAGE	**131.8**		
STD. DEV.	1.21		
INSIDE TRACK (WELD "B")			
1	137.3	SE-1	<10
2	133.2	SE-1	<10
3	142.9	SE-1	<10
4	135.1	SE-1	<10
5	132.6	SE-1	<10
AVERAGE	**136.2**		
STD. DEV.	4.16		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	177.5	BRK
2	170.9	BRK
3	173.3	BRK
4	174.6	BRK
5	177.3	BRK
AVERAGE	**174.7**	
STD. DEV.	2.78	

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PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

Geotechnics
INTEGRITY IN TESTING

CLIENT: R.S.G & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO. PH. 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-09
LAB ID NO.: 2009-610-09-03
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-35

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	124.4	SE-1	<10
2	123.6	SE-1	<10
3	124.2	SE-1	<10
4	121.3	SE-1	<10
5	122.9	SE-1	<10
AVERAGE	**123.3**		
STD. DEV.	1.25		
INSIDE TRACK (WELD "B")			
1	127.0	SE-1	<10
2	119.2	SE-1	<10
3	124.2	SE-1	<10
4	122.9	SE-1	<10
5	127.5	SE-1	<10
AVERAGE	**124.2**		
STD. DEV.	3.37		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	176.0	BRK
2	172.0	BRK
3	172.8	BRK
4	169.7	BRK
5	173.1	BRK
AVERAGE	**172.7**	
STD. DEV.	2.27	

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4/10/2009

PEEL AND SHEAR TEST RESULTS
DESTRUCTIVE SEAM TESTING

ASTM D 6392 & 4437 w/NSF 54

geotechnics
INTEGRITY IN TESTING

CLIENT: R.S.G & ASSOCIATES
CLIENT PROJECT: JOHNSTON CO. PH. 4A CELL 3

CLIENT PROJ. NO.: NA
PROJECT NO.: 2009-610-09
LAB ID NO.: 2009-610-09-04
MATERIAL: 60-MIL HDPE
SEAM TYPE: DOUBLE FUSION

SAMPLE I.D.: DS-36

PEEL ADHESION

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE	PEEL INCURSION (%)
OUTSIDE TRACK (WELD "A")			
1	124.1	SE-1	<10
2	124.4	SE-1	<10
3	120.5	SE-1	<10
4	125.1	SE-1	<10
5	122.3	SE-1	<10
AVERAGE	**123.3**		
STD. DEV.	1.87		
INSIDE TRACK (WELD "B")			
1	139.0	SE-1	<10
2	134.6	SE-1	<10
3	131.3	SE-1	<10
4	133.7	SE-1	<10
5	135.6	SE-1	<10
AVERAGE	**134.8**		
STD. DEV.	2.82		

BONDED SEAM (SHEAR) STRENGTH

REPLICATE No.	PEAK LOAD (lbs/in)	EPA BREAK CLASSIFICATION CODE
1	175.3	BRK
2	175.2	BRK
3	175.2	BRK
4	175.0	BRK
5	174.0	BRK
AVERAGE	**174.9**	
STD. DEV.	0.54	

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HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008 Material: LLDPE
Project Name: Johnston Co LF
Project Start Date: 3/12/2009 Thickness: 40 mil
Project Location: Smithfield, NC
Page: 1 of 4

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
1	WR	P-10	3/12/2009	9:06	P	2X3	11	RO	P	3/13/09
2	AT	P-9/10/TI	3/12/2009	9:15	P	2X6	11	RO	P	3/13/09
3	WS	P-9/10 3'> BOS	3/12/2009	9:25	P	3X5	10	GG	P	3/13/09
4	BO	P-8/9 54'> BOS	3/12/2009	9:31	P	2X7	10	GG	P	3/13/09
5	WS	P-8/9 10'> BOS	3/12/2009	10:21	P	2X2	10	GG	P	3/13/09
6	BO	P-7/8 110'> BOS	3/12/2009	9:20	P	2X8	10	GG	P	3/13/09
7	BO	P-6/7 144'> BOS	3/12/2009	9:05	P	2X2	10	GG	P	3/13/09
8	BO	P-5/6 94'> BOS	3/12/2009	10:17	P	2X2	10	GG	P	3/13/09
9	AT	P-3/4/5	3/12/2009	10:43	P	2X2	10	GG	P	3/13/09
10	AT	P-2/3/4	3/12/2009	10:41	P	2X6	10	GG	P	3/13/09
11	BO	P-3/5 89'> BOS	3/12/2009	10:15	P	2X3	10	GG	P	3/13/09
12	BO	P-1/12 18'> BOS	3/12/2009	10:57	P	2X2	10	GG	P	3/13/09
13	BO	P-1/12 9'> BOS	3/12/2009	2:40	P	2X2	10	GG	P	3/13/09
14	MD	P-13	3/12/2009	11:06	P	2X2	10	GG	P	3/13/09
15	MD	P-13	3/12/2009	11:23	P	2X2	10	GG	P	3/13/09
16	AT	P-1/12/13	3/12/2009	11:12	P	2X2	10	GG	P	3/13/09
17	AT	P-12/13/14	3/12/2009	11:03	P	2X2	10	GG	P	3/13/09
18	MD	P-13	3/12/2009	11:26	P	2X2	10	GG	P	3/13/09
19	MD	P-13	3/12/2009	11:31	P	2X2	10	GG	P	3/13/09
20	MD	P-13	3/12/2009	2:51	P	2X2	10	GG	P	3/13/09
21	MD	P-13	3/12/2009	2:35	P	2X2	10	GG	P	3/13/09
22	BO	P-12/14 39'> BOS	3/12/2009	2:16	P	2X5	10	GG	P	3/13/09
23	BO	P-12/14 12'> EOS	3/12/2009	11:35	P	2X3	11	RO	P	3/13/09
24	AT	P-14/15/16	3/12/2009	2:20	P	2X2	10	GG	P	3/13/09
25	AT	P-15/16/17	3/12/2009	2:26	P	2X2	10	GG	P	3/13/09
26	BO	P-16/17 21'> BOS	3/12/2009	1:34	P	2X3	11	RO	P	3/13/09
27	AT	P-18/19/TI	3/12/2009	1:23	P	2X2	11	RO	P	3/13/09
28	MD	P-19	3/12/2009	1:26	B	6	11	RO	P	3/13/09
29	AT	P-18/19/20	3/12/2009	2:05	P	2X3	10	GG	P	3/13/09
30	BO	P-19/21 34'> EOS	3/12/2009	3:00	P	2X2	10	GG	P	3/13/09
31	AT	P-19/20/21	3/12/2009	1:54	P	2X3	10	GG	P	3/13/09
32	WS	P-31/32/33/34	3/12/2009	3:27	P	2X23	10	GG	P	3/13/09
33	AT	P-21/22/23	3/12/2009	1:52	P	2X2	10	GG	P	3/13/09
34	AT	P-22/23/24	3/12/2009	1:45	C	2X2	10	GG	P	3/13/09
35	AT	P-29/30/31	3/12/2009	3:17	P	2X2	11	RO	P	3/13/09
36	AT	P-28/29/30	3/12/2009	3:25	P	2X2	11	RO	P	3/13/09
37	MD	P-30	3/12/2009	3:24	B	6	11	RO	P	3/13/09
38	AT	P-25/26/27	3/12/2009	3:10	P	2X2	10	GG	P	3/13/09
39	AT	P-24/25/26	3/12/2009	3:06	P	2X2	10	GG	P	3/13/09
40	AT	P-26/27/TI	3/12/2009	3:31	P	2X2	11	RO	P	3/13/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ --to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008 Material: LLDPE
Project Name: Johnston Co LF
Project Start Date: 3/12/2009 Thickness: 40 mil
Project Location: Smithfield, NC
Page: 2 of 4

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
41	B	P-8	3/12/2009	9:18	P	6	10	GG	P	3/13/09
42	DT-1	P-9/10 27'> BOS	3/12/2009	9:39	P	2X6	10	GG	P	3/13/09
43	DT-2	P-6/7 82'> BOS	3/12/2009	10:00	P	2X7	10	GG	P	3/13/09
44	DT-3	P-5/6 67'> BOS	3/12/2009	10:25	P	2X7	10	GG	P	3/13/09
45	DT-4	P-1/2 45'> BOS	3/12/2009	11:40	P	2X6	10	GG	P	3/13/09
46	DT-5	P-12/13 13'> BOS	3/12/2009	11:12	P	2X6	10	GG	P	3/13/09
47	DT-6	P-15/17 61'> BOS	3/12/2009	11:54	P	2X6	10	GG	P	3/13/09
48	DT-7	P-17/18 34'> BOS	3/12/2009	11:59	P	2X6	10	GG	P	3/13/09
49	WS	P-15/17 4'> BOS	3/12/2009	3:40	P	2X2	11	RO	P	3/13/09
50	DT-8	P-20/21 69'> BOS	3/12/2009	1:40	P	2X6	10	GG	P	3/13/09
51	DT-9	P-21/23 26'> BOS	3/12/2009	1:32	P	2X6	10	GG	P	3/13/09
52	DT-10	P-30/31 31'> BOS	3/12/2009	3:45	P	2X6	10	GG	P	3/13/09
53	DT-11	P-31/33 189'> BOS	3/12/2009	3:36	P	2X6	10	GG	P	3/13/09
54	AT	P-34/35/36	3/12/2009	6:25	P	3X3	10	GG	P	3/13/09
55	AT	P-35/36/37	3/12/2009	6:33	P	3X3	10	GG	P	3/13/09
56	WR	P-34/TI	3/12/2009	6:45	P	2X4	11	RO	P	3/13/09
57	DD	P-27	3/19/2009	8:35	P	2X2	11	RO	P	3/19/09
58	DD	P-22	3/19/2009	8:50	P	2X4	11	RO	P	3/19/09
59	DT-12	P-37/38 119'> BOS	3/24/2009	9:25	P	2X6	10	GG	P	3/25/09
60	BO	P-38/40 121'> BOS	3/24/2009	9:13	P	2X4	10	GG	P	3/25/09
61	BO	P-38/40 150'> BOS	3/24/2009	9:09	P	2X6	10	GG	P	3/25/09
62	AT	P-37/38/39	3/24/2009	8:47	P	2X2	10	GG	P	3/25/09
63	AT	P-38/39/40	3/24/2009	8:50	P	2X2	10	GG	P	3/25/09
64	DT-13	P-39/40 53'> BOS	3/24/2009	11:08	P	2X6	10	GG	P	3/25/09
65	AT	P-40/41/42	3/24/2009	11:00	P	2X2	10	GG	P	3/25/09
66	AT	P-41/42/43	3/24/2009	10:55	P	2X3	10	GG	P	3/25/09
67	CR	P-40/41/42	3/24/2009	10:58	B	6	10	GG	P	3/25/09
68	DT-15	P-44/46 150'> BOS	3/24/2009	10:48	P	2X6	10	GG	P	3/25/09
69	AT	P-43/44/45	3/24/2009	11:14	P	2X2	10	GG	P	3/25/09
70	AT	P-44/45/46	3/24/2009	11:19	P	2X2	10	GG	P	3/25/09
71	BO	P-47/48 30'> EOS	3/24/2009	11:24	P	2X2	10	GG	P	3/25/09
72	AT	P-47/48/TI	3/25/2009	9:55	P	2X2	10	GG	P	3/25/09
73	AT	P-48/49/TI	3/25/2009	10:15	P	2X2	10	GG	P	3/25/09
74	DT-20	P-51/52 67'> EOS	3/24/2009	11:34	P	2X5	10	GG	P	3/25/09
75	BO	P-49/50 82'> EOS	3/24/2009	11:28	P	2X2	10	GG	P	3/25/09
76	WS	P-44/46 121'> BOS	3/24/2009	10:42	P	2X2	10	GG	P	3/25/09
77	DT-16	P-46/47 109'> BOS	3/24/2009	10:38	P	2X5	10	GG	P	3/25/09
78	WS	P-48/49 62'> BOS	3/24/2009	10:16	P	2X2	10	GG	P	3/25/09
79	DT-17	P-49/50 74'> BOS	3/24/2009	10:28	P	2X6	10	GG	P	3/25/09
80	BO	P-50/51 95'> BOS	3/24/2009	10:33	P	2X2	10	GG	P	3/25/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ --to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008 Material: LLDPE
Project Name: Johnston Co LF
Project Start Date: 3/12/2009 Thickness: 40 mil
Project Location: Smithfield, NC
Page: 3 of 4

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
81	DT-18	P-50/51 31'> BOS	3/24/2009	10:21	P	2X5	10	GG	P	3/25/09
82	DT-14	P-43/44 25'> BOS	3/24/2009	10:03	P	2X6	10	GG	P	3/25/09
83	DT-19	P-48/TI 7'> BOS	3/25/2009	10:12	P	2X6	10	GG	P	3/25/09
84	WS	P-37/38 5'> BOS	3/24/2009	9:35	P	2X5	10	GG	P	3/25/09
85	WS	P-38/40 5'> BOS	3/24/2009	9:55	P	2X2	10	GG	P	3/25/09
86	WS	P-44/46 5'> BOS	3/24/2009	10:12	P	2X2	10	GG	P	3/25/09
87	DT-21	P-52/59 77'> BOS	3/25/2009	9:10	P	2X5	11	RO	P	3/25/09
88	DT-22	P-53/54 118'> BOS	3/25/2009	8:55	P	2X5	11	RO	P	3/25/09
89	BO	P-57/58 118'> BOS	3/25/2009	8:45	P	2X2	11	RO	P	3/25/09
90	DT-23	P-57/58 134'> BOS	3/25/2009	8:50	P	2X5	11	RO	P	3/25/09
91	AT	P-58/59/60	3/25/2009	9:55	P	2X2	11	RO	P	3/25/09
92	AT	P-59/60/61	3/25/2009	9:59	P	2X2	11	RO	P	3/25/09
93	DT-24	P-61/62 124'> BOS	3/25/2009	9:47	P	2X6	11	RO	P	3/25/09
94	DT-26	P-64/65 105'> BOS	3/25/2009	9:34	P	2X6	11	RO	P	3/25/09
95	DT-25	P-62/64 11'> BOS	3/25/2009	9:23	P	2X6	11	RO	P	3/25/09
96	AT	P-61/62/63	3/25/2009	10:00	P	2X2	11	RO	P	3/25/09
97	BO	P-62/63 15'> BOS	3/25/2009	10:10	P	2X2	11	RO	P	3/25/09
98	AT	P-62/63/64	3/25/2009	10:15	P	2X2	11	RO	P	3/25/09
99	DT-27	P-63/TI 5'> BOS	3/25/2009	12:02	P	2X6	11	RO	P	3/25/09
100	AT	P-56/57/58	3/25/2009	11:48	P	2X2	11	RO	P	3/25/09
101	WS	P-56/57 10'> BOS	3/25/2009	8:33	C	2X12	11	RO	P	3/25/09
102	DD	P-45	3/25/2009	8:31	B	6	10	GG	P	3/25/09
103	WR	P-53/54 118'> BOS	3/25/2009	11:17	P	2X3	10	GG	P	3/25/09
104	DD	P-54	3/25/2009	11:27	P	2X2	10	GG	P	3/25/09
105	WS	P-57/58 148'> BOS	3/25/2009	12:08	P	2X7	11	RO	P	3/25/09
106	DD	P-64/TI	3/25/2009	11:04	P	2X2	11	RO	P	3/25/09
107	WR	P-64/TI	4/1/2009	4:30	GB	15	11	RO	P	4/2/09
108	AT	P-65/67/TI	4/1/2009	4:25	P	2X4	11	RO	P	4/2/09
109	WS	P-65/67 12'> EOS	3/30/2009	3:00	P	2X8	11	RO	P	4/2/09
110	AT	P-65/66/67	3/30/2009	3:07	P	2X2	11	RO	P	4/2/09
111	BO	P-66/67 5'> BOS	3/30/2009	8:05	P	2X2	11	RO	P	4/2/09
112	AT	P-66/67/68	3/30/2009	8:05	P	2X2	11	RO	P	4/2/09
113	DT-29	P-67/68 11'> BOS	3/30/2009	8:11	P	2X6	11	RO	P	4/2/09
114	WS	P-65/67 97'> BOS	3/30/2009	9:00	P	2X2	11	RO	P	4/2/09
115	DT-28	P-65/66 16'> BOS	3/30/2009	9:46	P	2X6	11	RO	P	4/2/09
116	WS	P-66/68 6'> BOS	3/30/2009	9:37	P	2X2	11	RO	P	4/2/09
117	WS	P-68/69 151'> BOS	3/30/2009	8:15	P	2X2	11	RO	P	4/2/09
118	WS	P-69/70 24'> EOS	3/30/2009	8:44	P	2X2	11	RO	P	4/2/09
119	AT	P-69/70/71	3/30/2009	8:32	P	2X6	11	RO	P	4/2/09
120	AT	P-70/71/72	3/30/2009	8:38	P	2X2	11	RO	P	4/2/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ --to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 3/12/2009
Project Location: Smithfield, NC
Page: 4 of 4

Material: LLDPE
Thickness: 40 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
121	BO	P-69/71 5'> EOS	3/30/2009	11:50	P	2X6	11	RO	P	4/2/09
122	WS	P-71/71 3'> EOS	4/1/2009	3:02	P	2X5	11	RO	P	4/2/09
123	DT-31	P-72/TI	4/1/2009	2:57	P	2X6	11	RO	P	4/2/09
124	BO	P-70/72 50'> BOS	3/30/2009	9:24	P	2X5	11	RO	P	4/2/09
125	DT-30	P-70/72 27'> BOS	3/30/2009	9:32	P	2X6	11	RO	P	4/2/09
126	DT-32	P-72/73 72'> BOS	3/30/2009	9:12	P	2X6	11	RO	P	4/2/09
127	WS	P-73/74 36'> BOS	3/30/2009	4:17	P	2X2	11	RO	P	4/2/09
128	BO	P-74/75 72'> BOS	3/30/2009	8:55	P	2X2	11	RO	P	4/2/09
129	BO	P-74/75 84'> BOS	3/30/2009	8:49	P	2X2	11	RO	P	4/2/09
130	AT	P-74/75/TI	4/1/2009	2:15	P	2X2	11	RO	P	4/2/09
131	Pipe	P-75/76 15'> EOS	4/1/2009	10:00	P	5X13	11	RO	P	4/2/09
132	MD	P-76/TI	4/1/2009	11:30	P	2X2	11	RO	P	4/2/09
133	AT	P-76/77/TI	4/1/2009	11:03	P	4X4	11	RO	P	4/2/09

Defect Code:

BO - Burn Out
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DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ –to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 3/20/2009
Project Location: Smithfield, NC
Page: 1 of 3

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
1	AT	P-12/13/28	3/20/2009	3:47	P	2X2	11	RO	P	4/2/09
2	AT	P-11/12/13	3/20/2009	3:43	P	2X2	11	RO	P	4/2/09
3	DT-4	P-11/12 39'> BOS	3/20/2009	3:51	P	2X6	11	RO	P	4/2/09
4	AT	P-8/9/10	3/20/2009	3:15	P	2X2	11	RO	P	4/2/09
5	AT	P-7/8/9	3/20/2009	3:09	P	2X2	11	RO	P	4/2/09
6	AT	P-5/6/7	3/20/2009	3:04	P	2X2	11	RO	P	4/2/09
7	AT	P-4/5/6	3/20/2009	3:00	P	2X2	11	RO	P	4/2/09
8	AT	P-2/3/4	3/20/2009	2:55	P	2X2	11	RO	P	4/2/09
9	AT	P-1/2/3	3/20/2009	2:49	P	2X2	11	RO	P	4/2/09
10	AT	P-20/21/22	3/20/2009	2:19	P	2X2	11	RO	P	4/2/09
11	AT	P-21/22/23	3/20/2009	2:24	P	2X2	11	RO	P	4/2/09
12	AT	P-24/25/26	3/20/2009	2:28	P	2X2	11	RO	P	4/2/09
13	AT	P-25/26/27	3/20/2009	2:21	P	2X2	11	RO	P	4/2/09
14	DT-11	P-25/27 129'> BOS	3/20/2009	2:03	P	2X6	11	RO	P	4/2/09
15	DT-9	P-23/24 130'> BOS	3/20/2009	2:16	P	2X5	11	RO	P	4/2/09
16	DT-8	P-20/22 168'> BOS	3/20/2009	1:32	P	2X5	11	RO	P	4/2/09
17	AT	P-18/19/20	3/20/2009	1:25	P	2X5	11	RO	P	4/2/09
18	AT	P-17/18/19	3/20/2009	1:17	P	2X2	11	RO	P	4/2/09
19	DT-6	P-15/17	3/20/2009	1:34	P	2X5	11	RO	P	4/2/09
20	AT	P-15/16/17	3/20/2009	1:03	P	2X2	11	RO	P	4/2/09
21	AT	P-14/15/16	3/20/2009	12:56	P	2X2	11	RO	P	4/2/09
22	DT-5	P-1/14 67'> BOS	3/20/2009	11:15	P	2X5	11	RO	P	4/2/09
23	DT-7	P-17/19 48'> BOS	3/20/2009	1:47	P	2X6	11	RO	P	4/2/09
24	DT-10	P-24/25 21'> BOS	3/20/2009	1:54	P	2X6	11	RO	P	4/2/09
25	DT-2	P-2/4 34'> BOS	3/20/2009	4:06	P	2X6	11	RO	P	4/2/09
26	DT-3	P-7/8 39'> BOS	3/20/2009	11:34	P	2X6	11	RO	P	4/2/09
27	DT-1	P-1/2 129'> BOS	3/20/2009	11:59	P	2X5	11	RO	P	4/2/09
28	DD	P-7	3/20/2009	3:21	B	6	11	RO	P	4/2/09
29	DD	P-15	3/20/2009	3:30	B	6	11	RO	P	4/2/09
30	DD	P-17	3/20/2009	3:32	B	6	11	RO	P	4/2/09
31	Short Panel	P-23/24/TI	3/20/2009	3:00	C	2X10	10	GG	P	4/2/09
32	DT-12	P-24/TI	3/20/2009	3:56	P	2X6	11	RO	P	4/2/09
33	DT-13	P-27/30 49'> BOS	3/31/2009	1:37	P	2X6	11	RO	P	4/3/09
34	AT	P-30/31/32	3/31/2009	11:09	P	2X2	11	RO	P	4/3/09
35	AT	P-31/32/33	3/31/2009	11:17	P	2X2	11	RO	P	4/3/09
36	DT-14	P-30/31 45'> BOS	3/31/2009	1:54	P	2X6	11	RO	P	4/3/09
37	MD	P-39	3/31/2009	10:57	P	2X4	11	RO	P	4/3/09
38	AT	P-33/34/35	3/31/2009	10:06	P	2X2	11	RO	P	4/3/09
39	AT	P-34/35/36	3/31/2009	10:00	P	2X2	11	RO	P	4/3/09
40	DD	P-33/34 7'> EOS	3/31/2009	10:40	P	4X4	11	RO	P	4/3/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ --to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008 Material: HDPE
Project Name: Johnston Co LF
Project Start Date: 3/20/2009 Thickness: 60 mil
Project Location: Smithfield, NC
Page: 2 of 3

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
41	DD	P-34	3/31/2009	10:32	P	2X2	11	RO	P	4/3/09
42	DD	P-36	3/31/2009	10:27	P	4X4	11	RO	P	4/3/09
43	DD	P-38	3/31/2009	10:20	P	2X2	11	RO	P	4/3/09
44	AT	P-38/39/40	3/31/2009	10:15	P	2X2	11	RO	P	4/3/09
45	DT-16	P-36/38 103'> BOS	3/31/2009	2:15	P	2X6	11	RO	P	4/3/09
46	DT-17	P-38/40 98'> BOS	3/31/2009	2:00	P	2X6	11	RO	P	4/3/09
47	DT-15	P-35/36 12'> BOS	3/31/2009	1:29	P	2X6	11	RO	P	4/3/09
48	AT	P-36/37/38	3/31/2009	11:30	P	2X2	11	RO	P	4/3/09
49	AT	P-35/36/37	3/31/2009	11:35	P	2X2	11	RO	P	4/3/09
50	DT-18	P-41/42 32'> BOS	4/3/2009	2:04	P	2X6	11	RO	P	4/3/09
51	AT	P-39/40/41	4/3/2009	1:36	P	2X2	11	RO	P	4/4/09
52	DT-19	P-42/43 11'> BOS	4/3/2009	1:44	P	2X6	11	RO	P	4/4/09
53	AT	P-42/43/44	4/3/2009	1:55	P	2X2	11	RO	P	4/4/09
54	AT	P-43/44/45	4/3/2009	1:49	P	2X2	11	RO	P	4/4/09
55	DT-20	P-45/46 50'> BOS	4/3/2009	2:10	P	2X6	11	RO	P	4/4/09
56	AT	P-46/47/48	4/3/2009	2:42	P	2X2	11	RO	P	4/4/09
57	AT	P-47/48/49	4/3/2009	2:51	P	2X2	11	RO	P	4/4/09
58	DD	P-39/40/41	3/31/2009	5:39	P	2X2	11	RO	P	4/4/09
59	MD	P-42/TI	4/3/2009	4:42	P	2X2	11	RO	P	4/4/09
60	AT	P-45/46/TI	4/3/2009	4:53	P	2X2	11	RO	P	4/4/09
61	DT-21	P-46/47 42'> BOS	4/3/2009	3:02	P	2X6	11	RO	P	4/4/09
62	DT-22	P-48/49 79'> BOS	4/3/2009	2:17	P	2X6	11	RO	P	4/4/09
63	DT-23	P-51/53 58'> BOS	4/3/2009	2:27	P	2X6	11	RO	P	4/4/09
64	DT-24	P-53/55 57'> BOS	4/3/2009	2:38	P	2X6	11	RO	P	4/4/09
65	AT	P-50/51/52	4/3/2009	3:13	P	2X2	11	RO	P	4/4/09
66	AT	P-51/52/53	4/3/2009	3:18	P	2X2	11	RO	P	4/4/09
67	AT	P-53/54/55	4/3/2009	3:24	P	2X2	11	RO	P	4/4/09
68	AT	P-54/55/56	4/3/2009	3:30	P	2X2	11	RO	P	4/4/09
69	AT	P-54/56/57	4/3/2009	3:38	P	2X2	11	RO	P	4/4/09
70	AT	P-54/57/58	4/3/2009	3:35	P	2X2	11	RO	P	4/4/09
71	AT	P-57/58/59	4/8/2009	8:00	P	2X2	10	JV	P	4/8/09
72	AT	P-56/57/59	4/8/2009	7:55	P	2X2	10	JV	P	4/8/09
73	BO	P-59/60 51'> BOS	4/8/2009	8:32	P	2X2	11	RO	P	4/8/09
74	AT	P-59/60/61	4/8/2009	7:59	P	2X2	11	RO	P	4/8/09
75	AT	P-60/61/62	4/8/2009	7:55	P	2X2	11	RO	P	4/8/09
76	DT-25	P-56/57 4'> BOS	4/8/2009	7:50	P	2X6	10	JV	P	4/8/09
77	BO	P-59/60 100'> EOS	4/8/2009	8:22	P	2X2	11	RO	P	4/8/09
78	BO	P-59/60 108'> EOS	4/8/2009	8:25	P	2X2	11	RO	P	4/8/09
79	DT-27	P-59/60 62'> BOS	4/8/2009	8:28	P	2X6	11	RO	P	4/8/09
80	WS	P-59/60 3'> BOS	4/8/2009	8:56	P	2X4	11	RO	P	4/8/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
MD - Material Damage
WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ –to an area/ >from an area/ NOAT-No AT

HALLATON, INC.

1206 SPARKS ROAD, SPARKS, MD 21152
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0901-20008
Project Name: Johnston Co LF
Project Start Date: 3/20/2009
Project Location: Smithfield, NC
Page: 3 of 3

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Time	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
									P/F	Date
81	DD	P-59	4/8/2009	8:21	P	2X2	10	JV	P	4/8/09
82	AT	P-62/63/64	4/8/2009	8:08	P	2X2	11	RO	P	4/8/09
83	AT	P-63/64/65	4/8/2009	8:13	P	2X2	11	RO	P	4/8/09
84	DT-28	P-62/64 35'> EOS	4/8/2009	8:18	P	2X6	11	RO	P	4/8/09
85	WS	P-64/65 3'> BOS	4/8/2009	9:11	P	2X3	11	RO	P	4/8/09
86	DT-26	P-56/59 11'> BOS	4/8/2009	8:50	P	2X6	11	RO	P	4/8/09
87	DT-29	P-65/66 33'> BOS	4/8/2009	9:19	P	2X6	11	RO	P	4/8/09
88	DD	P-66	4/8/2009	9:25	P	2X4	10	JV	P	4/8/09
89	AT	P-66/67/68	4/8/2009	10:37	P	2X2	10	JV	P	4/8/09
90	AT	P-67/68/69	4/8/2009	10:34	P	2X2	10	JV	P	4/8/09
91	DT-30	P-68/69 27'> BOS	4/8/2009	10:29	P	2X6	10	JV	P	4/8/09
92	AT	P-69/70/71	4/8/2009	10:26	C	2X19	11	RO	P	4/8/09
93	AT	P-70/71/72	4/8/2009	10:32	P	2X2	11	RO	P	4/8/09
94	DT-32	P-72/TI	4/8/2009	10:24	P	2X6	10	JV	P	4/8/09
95	DT-31	P-69/70 10'> BOS	4/8/2009	9:55	P	2X6	11	RO	P	4/8/09
96	WS	P-69/70 3'> BOS	4/8/2009	10:02	P	2X3	11	RO	P	4/8/09
97	DD	P-68/69 27'> BOS	4/8/2009	9:32	P	2X2	10	JV	P	4/8/09
98	DD	P-60	4/8/2009	8:03	P	2X2	11	RO	P	4/8/09
99	AT	P-72/73/74	4/9/2009	4:43	P	2X2	10	JV	P	4/9/09
100	AT	P-73/74/75	4/9/2009	4:48	P	2X2	10	JV	P	4/9/09
101	AT	P-75/76/77	4/9/2009	4:42	P	2X2	10	JV	P	4/9/09
102	AT	P-76/77/78	4/9/2009	4:37	P	2X2	10	JV	P	4/9/09
103	AT	P-79/80/81	4/9/2009	4:25	P	2X3	10	JV	P	4/9/09
104	AT	P-80/81/82	4/9/2009	4:21	P	2X2	10	JV	P	4/9/09
105	BO	P-83/84 33'> BOS	4/9/2009	4:11	P	2X3	10	JV	P	4/9/09
106	DT-33	P-72/73 21'> BOS	4/9/2009	5:00	P	2X5	10	JV	P	4/9/09
107	BO	P-76/77 7'> BOS	4/9/2009	5:05	P	2X4	10	JV	P	4/9/09
108	DT-34	P-75/76 36'> BOS	4/9/2009	4:55	P	2X6	10	JV	P	4/9/09
109	DD	P-79/TI	4/9/2009	4:33	P	2X2	10	JV	P	4/9/09
110	DT-35	P-79/80 39'> BOS	4/9/2009	4:31	P	2X6	10	JV	P	4/9/09
111	DT-36	P-82/83 10'> BOS	4/9/2009	4:17	P	2X6	10	JV	P	4/9/09

Defect Code:

BO - Burn Out
CR - Crease
DT - Destructive Test Number
EE - Earthwork Equipment Damage
FM – Fishmouth
FT – Pressure Test Cut
T – Joint
SI - Soil Surface Irregularity
DD - Deployment Damage
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WR - Wrinkle
WS - Welder restart
FD - Factory Defect
AT - Air Test

Repair Type: C-Cap Strip, P- Patch, B-Extrudate Bead, GB-Grind & Bead, BT-Boot

Test Result: P-Pass, F-Fail

Notations: BOS or 0-Beginning of Seam/ EOS-End of Seam/ --to an area/ >from an area/ NOAT-No AT

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Appendix F

GCL CQA Data

F1. Manufacturer's Product Data Submittals and Quality Control Certificates

F2. Geosynthetics Inventory - GCL

F3. CQA Test Results - Material Control Tests

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CETCO®

LINING TECHNOLOGIES
Certified Properties

BENTOMAT® SDN CERTIFIED PROPERTIES

MATERIAL PROPERTY	TEST METHOD	TEST FREQUENCY $ft^2(m^2)$	REQUIRED VALUES
Bentonite Swell Index[1]	ASTM D 5890	1 per 50 tonnes	24 mL/2g min.
Bentonite Fluid Loss[1]	ASTM D 5891	1 per 50 tonnes	18 mL max.
Bentonite Mass/Area[2]	ASTM D 5993	40,000 ft^2 (4,000 m^2)	0.75 lb/ft^2 (3.6 kg/m^2) min
GCL Grab Strength[3]	ASTM D 6768	200,000 ft^2 (20,000 m^2)	30 lbs/in (53 N/cm) MARV
GCL Peel Strength[3]	ASTM D 6496	40,000 ft^2 (4,000 m^2)	2.5 lbs/in (4.4 N/cm) min
GCL Index Flux[4]	ASTM D 5887	Weekly	1×10^{-8} m^3/m^2/sec max
GCL Hydraulic Conductivity[4]	ASTM D 5887	Weekly	5×10^{-9} cm/sec max
GCL Hydrated Internal Shear Strength[5]	ASTM D 5321 ASTM D 6243	Periodic	500 psf (24 kPa) typ @ 200 psf

Bentomat SDN is a reinforced GCL consisting of a layer of sodium bentonite between two nonwoven geotextiles, which are needlepunched together.

Notes

[1] Bentonite property tests performed at a bentonite processing facility before shipment to CETCO's GCL production facilities.

[2] Bentonite mass/area reported at 0 percent moisture content.

[3] All tensile strength testing is performed in the machine direction using ASTM D 6768. All peel strength testing is performed using ASTM D 6496. Upon request, tensile and peel results can be reported per modified ASTM D 4632 using 4 inch grips.

[4] Index flux and permeability testing with deaired distilled/deionized water at 80 psi (551kPa) cell pressure, 77 psi (531 kPa) headwater pressure and 75 psi (517 kPa) tailwater pressure. Reported value is equivalent to 925 gal/acre/day. This flux value is equivalent to a permeability of 5×10^{-9} cm/sec for typical GCL thickness. Actual flux values vary with field condition pressures. The last 20 weekly values prior the end of the production date of the supplied GCL may be provided.

[5] Peak values measured at 200 psf (10 kPa) normal stress for a specimen hydrated for 48 hours. Site-specific materials, GCL products, and test conditions must be used to verify internal and interface strength of the proposed design.

CETCO has developed an edge enhancement system that eliminates the need to use additional granular sodium bentonite within the overlap area of the seams. We call this edge enhancement, SuperGroove™, and it comes standard on both longitudinal edges of Bentomat® SDN. It should be noted that SuperGroove™ does not appear on the end-of-roll overlaps and recommend the continued use of supplemental bentonite for all end-of-roll seams.

800.527.9948 Fax 847.577.5566

For the most up-to-date product information, please visit our website, www.cetco.com.
A wholly owned subsidiary of AMCOL International Corporation. The information and data contained herein are believed to be accurate and reliable, CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

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Date: 2/26/2009
Purchase Order: P6782
ORDER NUMBERS: 024802801, 024802802, 024802803, 024802804

Kennedy Garber
Hallaton

Sparks, MD 21152
kgarber@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Johnston County LF
CUSTOMER P.O.: P6782
ORDER NUMBERS: 024802801, 024802802, 024802803, 024802804
PREPARED FOR: Hallaton

CONTENTS:

- Daily production and needle detection certification
- GCL property specifications
- Order packing list
- GCL MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121

Telephone: (770) 387-7773
Fax:
E-Mail: melanie.king@cetco.com

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PRODUCTION CERTIFICATION

PROJECT NAME: Johnston County LF
CUSTOMER P.O.: P6782
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

NEEDLE REMOVAL AND DETECTION PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

Melanie King

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

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Ship Date: 02/25/2009
Order Numbers: 024802801, 024802802, 024802803, 024802804
Prepared For: Hallaton

The GCL raw materials and GCL finished product manufactured for the above-referenced order number(s) are hereby certified to achieve the properties listed in the tables below.

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT SDN

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft (3.6 kg/sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf (48 kPa) typ @ 200 psf
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5 x 10^-9 cm/ sec Max
ASTM D 5887	GCL Index Flux	Weekly	1 x 10^-8 m^3/m^2/sec Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	2.5 lbs/in Min
ASTM D4632*	Grab Strength*modified with 4-inch grips	200,000 sq ft (20,000 sq m)	90 lbs (400 N) MARV
ASTM D4632*	Peel Strength*modified with 4-inch grips	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT SDN

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D4632*	Peel Strength*modified with 4-inch grips	1/40,000sf	30 lbs	Standard
ASTM D 6496	GCL Peel Strength	1/40,000sf	5.3 lbs	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction.

FABRIC SUPPLIER REQUIREMENTS FOR BENTOMAT SDN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd2
Bentomat SDN Base Nonwoven Fabric	ASTM D 5261	2.7	oz/yd2

Fabric certifications from our raw material suppliers are on file at our production facility.

CETCO's MQA laboratory is GAI-accredited (www.geosynthetic-institute.org/gai/lab.html).

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 024802801

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802801	CV-BENTOMAT SDN	200909CV	00000700	150	14.5	2175	2898
024802802	CV-BENTOMAT SDN	200909CV	00000726	150	14.5	2175	2760
024802804	CV-BENTOMAT SDN	200909CV	00000729	150	14.5	2175	2742
024802804	CV-BENTOMAT SDN	200909CV	00000730	150	14.5	2175	2770
024802804	CV-BENTOMAT SDN	200909CV	00000731	150	14.5	2175	2728
024802801	CV-BENTOMAT SDN	200909CV	00000744	150	14.5	2175	2732
024802802	CV-BENTOMAT SDN	200909CV	00000746	150	14.5	2175	2732
024802802	CV-BENTOMAT SDN	200909CV	00000752	150	14.5	2175	2498
024802801	CV-BENTOMAT SDN	200909CV	00000760	150	14.5	2175	2682
024802804	CV-BENTOMAT SDN	200909CV	00000761	150	14.5	2175	2664
024802804	CV-BENTOMAT SDN	200909CV	00000764	150	14.5	2175	2696
024802804	CV-BENTOMAT SDN	200909CV	00000769	150	14.5	2175	2708
024802802	CV-BENTOMAT SDN	200909CV	00000770	150	14.5	2175	2706
024802802	CV-BENTOMAT SDN	200909CV	00000772	150	14.5	2175	2716
024802804	CV-BENTOMAT SDN	200909CV	00000777	150	14.5	2175	2684
024802804	CV-BENTOMAT SDN	200909CV	00000778	150	14.5	2175	2646
024802802	CV-BENTOMAT SDN	200909CV	00000783	150	14.5	2175	2720
024802804	CV-BENTOMAT SDN	200909CV	00000790	150	14.5	2175	2686
024802802	CV-BENTOMAT SDN	200909CV	00000791	150	14.5	2175	2676
024802802	CV-BENTOMAT SDN	200909CV	00000793	150	14.5	2175	2686
024802802	CV-BENTOMAT SDN	200909CV	00000794	150	14.5	2175	2690
024802802	CV-BENTOMAT SDN	200909CV	00000798	150	14.5	2175	2686
024802802	CV-BENTOMAT SDN	200909CV	00000799	150	14.5	2175	2708
024802801	CV-BENTOMAT SDN	200909CV	00000800	150	14.5	2175	2688
024802801	CV-BENTOMAT SDN	200909CV	00000801	150	14.5	2175	2682
024802801	CV-BENTOMAT SDN	200909CV	00000802	150	14.5	2175	2690
024802804	CV-BENTOMAT SDN	200909CV	00000803	150	14.5	2175	2744

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802801	CV-BENTOMAT SDN	200909CV	00000804	150	14.5	2175	2718
024802801	CV-BENTOMAT SDN	200909CV	00000805	150	14.5	2175	2704
024802801	CV-BENTOMAT SDN	200909CV	00000806	150	14.5	2175	2690
024802801	CV-BENTOMAT SDN	200909CV	00000807	150	14.5	2175	2734
024802801	CV-BENTOMAT SDN	200909CV	00000808	150	14.5	2175	2676
024802801	CV-BENTOMAT SDN	200909CV	00000809	150	14.5	2175	2708
024802801	CV-BENTOMAT SDN	200909CV	00000810	150	14.5	2175	2690
024802801	CV-BENTOMAT SDN	200909CV	00000811	150	14.5	2175	2712
024802801	CV-BENTOMAT SDN	200909CV	00000812	150	14.5	2175	2738
024802801	CV-BENTOMAT SDN	200909CV	00000813	150	14.5	2175	2718
024802804	CV-BENTOMAT SDN	200909CV	00000815	150	14.5	2175	2696
024802804	CV-BENTOMAT SDN	200909CV	00000817	150	14.5	2175	2714
024802804	CV-BENTOMAT SDN	200909CV	00000818	150	14.5	2175	2718
024802804	CV-BENTOMAT SDN	200909CV	00000819	150	14.5	2175	2724
024802804	CV-BENTOMAT SDN	200909CV	00000821	150	14.5	2175	2708
024802803	CV-BENTOMAT SDN	200909CV	00000822	150	14.5	2175	2740
024802804	CV-BENTOMAT SDN	200909CV	00000823	150	14.5	2175	2716
024802803	CV-BENTOMAT SDN	200909CV	00000824	150	14.5	2175	2692
024802803	CV-BENTOMAT SDN	200909CV	00000825	150	14.5	2175	2688
024802803	CV-BENTOMAT SDN	200909CV	00000826	150	14.5	2175	2708
024802803	CV-BENTOMAT SDN	200909CV	00000827	150	14.5	2175	2726
024802803	CV-BENTOMAT SDN	200909CV	00000829	150	14.5	2175	2732
024802802	CV-BENTOMAT SDN	200909CV	00000831	150	14.5	2175	2730
024802803	CV-BENTOMAT SDN	200909CV	00000832	150	14.5	2175	2718
024802803	CV-BENTOMAT SDN	200909CV	00000833	150	14.5	2175	2722
024802803	CV-BENTOMAT SDN	200909CV	00000834	150	14.5	2175	2722
024802803	CV-BENTOMAT SDN	200909CV	00000835	150	14.5	2175	2718
024802803	CV-BENTOMAT SDN	200909CV	00000836	150	14.5	2175	2712
024802803	CV-BENTOMAT SDN	200909CV	00000838	150	14.5	2175	2718
024802803	CV-BENTOMAT SDN	200909CV	00000839	150	14.5	2175	2730
024802803	CV-BENTOMAT SDN	200909CV	00000840	150	14.5	2175	2736
024802802	CV-BENTOMAT SDN	200909CV	00000841	150	14.5	2175	2718

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802802	CV-BENTOMAT SDN	200909CV	00000842	150	14.5	2175	2714
024802803	CV-BENTOMAT SDN	200909CV	00000843	150	14.5	2175	2722
024802802	CV-BENTOMAT SDN	200909CV	00000844	150	14.5	2175	2712
024802803	CV-BENTOMAT SDN	200909CV	00000845	150	14.5	2175	2714
024802802	CV-BENTOMAT SDN	200909CV	00000846	150	14.5	2175	2716
			Totals:	**9600**	**928**	**139200**	**173470**

Total Number of Rolls Certified: **64**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 024802801

GCL			Geotextiles				Clay
CV-BENTOMAT SDN			CV-N/W-WHITE-DN LW			CV-N/W-BLK-DNLW-2.7	CV-CG 50-DN LWNW
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200909CV	00000700	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000726	00000715	200906CV	00000157	00000153	2011107903	901074A
200909CV	00000729	00000715	200906CV	00000157	00000153	2011107903	901074A
200909CV	00000730	00000730	200906CV	00000157	00000153	2011107903	901074A
200909CV	00000731	00000730	200906CV	00000157	00000153	2011104373	901074A
200909CV	00000744	00000730	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000746	00000745	200907CV	00000182	00000177	2011104373	901074B
200909CV	00000752	00000752	200905CV	00000141	00000138	2011104381	901074B
200909CV	00000760	00000752	200907CV	00000237	00000233	2011104381	901074B
200909CV	00000761	00000752	200907CV	00000237	00000233	2011104366	901074B
200909CV	00000764	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000769	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000770	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000772	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000777	00000777	200907CV	00000260	00000259	2011104395	901074B
200909CV	00000778	00000777	200907CV	00000260	00000259	2011104395	901074B
200909CV	00000783	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000790	00000777	200907CV	00000259	00000259	2011104395	901074B
200909CV	00000791	00000777	200907CV	00000259	00000259	2011104395	901074B
200909CV	00000793	00000792	200907CV	00000259	00000259	2011104396	901074B
200909CV	00000794	00000792	200907CV	00000259	00000259	2011104396	901074B
200909CV	00000798	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000799	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000800	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000801	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000802	00000792	200907CV	00000264	00000264	2011104396	902912A
200909CV	00000803	00000792	200907CV	00000264	00000264	2011104396	902912A
200909CV	00000804	00000792	200907CV	00000264	00000264	2011104396	902912A
200909CV	00000805	00000792	200907CV	00000264	00000264	2011104396	902912A

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200909CV	00000806	00000792	200907CV	00000264	00000264	2011104396	902912A
200909CV	00000807	00000807	200907CV	00000264	00000264	2011104396	902912A
200909CV	00000808	00000807	200907CV	00000264	00000264	2011104375	902912A
200909CV	00000809	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000810	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000811	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000812	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000813	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000815	00000807	200907CV	00000251	00000248	2011104375	902912A
200909CV	00000817	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000818	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000819	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000821	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000822	00000822	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000823	00000822	200909CV	00000387	00000383	2011104375	902912A
200909CV	00000824	00000822	200909CV	00000387	00000383	2011104375	902912A
200909CV	00000825	00000822	200909CV	00000387	00000383	2011107327	902912A
200909CV	00000826	00000822	200909CV	00000387	00000383	2011107327	902912A
200909CV	00000827	00000822	200909CV	00000387	00000383	2011107327	902912A
200909CV	00000829	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000831	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000832	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000833	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000834	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000835	00000822	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000836	00000822	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000838	00000837	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000839	00000837	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000840	00000837	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000841	00000837	200907CV	00000227	00000225	2011107902	902912A
200909CV	00000842	00000837	200907CV	00000227	00000225	2011107902	902912A
200909CV	00000843	00000837	200907CV	00000227	00000225	2011107902	902912A
200909CV	00000844	00000837	200907CV	00000227	00000225	2011107902	902912A
200909CV	00000845	00000837	200907CV	00000227	00000225	2011107902	902912A
200909CV	00000846	00000837	200907CV	00000227	00000225	2011107902	902912B

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 024802801 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength
		Standard Test Method:	ASTM D 5993	ASTM D 6768	ASTM D 6496
		Standard Specification:	0.75 lb/sq ft MARV	30lbs/in MARV	2.5lbs/in Min
Non-standard specifications were requested for this order as indicated on the attatched property sheet					
CV-BENTOMAT SDN	200909CV	00000700	0.97	30.9	9.1
CV-BENTOMAT SDN	200909CV	00000715	0.88	30.9	9.2
CV-BENTOMAT SDN	200909CV	00000730	0.98	30.9	6
CV-BENTOMAT SDN	200909CV	00000745	0.93	30.9	6.5
CV-BENTOMAT SDN	200909CV	00000752	0.86	30.9	7.1
CV-BENTOMAT SDN	200909CV	00000762	0.93	30.9	5.7
CV-BENTOMAT SDN	200909CV	00000777	0.93	30.9	6.8
CV-BENTOMAT SDN	200909CV	00000792	0.87	30.8	10.1
CV-BENTOMAT SDN	200909CV	00000807	0.95	30.8	8.7
CV-BENTOMAT SDN	200909CV	00000822	0.92	30.8	7.5
CV-BENTOMAT SDN	200909CV	00000837	0.94	30.8	8.7

Product	Lot # Tested	Roll # Tested	PEEL 4632
CV-BENTOMAT SDN	200909CV	00000700	46.4
CV-BENTOMAT SDN	200909CV	00000715	45.3
CV-BENTOMAT SDN	200909CV	00000730	33.0
CV-BENTOMAT SDN	200909CV	00000745	32.2
CV-BENTOMAT SDN	200909CV	00000752	36.4
CV-BENTOMAT SDN	200909CV	00000762	32.0
CV-BENTOMAT SDN	200909CV	00000777	33.5
CV-BENTOMAT SDN	200909CV	00000792	47.2
CV-BENTOMAT SDN	200909CV	00000807	42.9
CV-BENTOMAT SDN	200909CV	00000822	39.9
CV-BENTOMAT SDN	200909CV	00000837	50.8

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 024802801 has been tested by American Colloid Company and yeilded the following test results.

Reference	Moist	Swell	Fluid Loss
Test Method:	ASTM D 2216	ASTM D 5890	ASTM D 5891
Specification:	12% Max	24 ml/2g Min	18 ml Max
901074A	9.3	25.0	16.4
901074B	9.2	26.0	16.8
902912A	9.1	25.0	16.5
902912B	8.7	26.0	16.0

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GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 024802801 was manufactured using these geotextiles:

Material	Lot #	Roll #	Mass Area	Grab Strength
CV-NON-WOVEN	200905CV	00000138	7.1	53.3
CV-NON-WOVEN	200906CV	00000153	6.5	39.5
CV-NON-WOVEN	200907CV	00000177	7.1	39.4
CV-NON-WOVEN	200907CV	00000225	6.6	35.2
CV-NON-WOVEN	200907CV	00000233	6.4	40.1
CV-NON-WOVEN	200907CV	00000248	6.3	37.7
CV-NON-WOVEN	200907CV	00000259	6.8	55.2
CV-NON-WOVEN	200907CV	00000264	6.8	58.8
CV-NON-WOVEN	200907CV	00000312	6.6	53.9
CV-NON-WOVEN	200909CV	00000373	6.7	53.1
CV-NON-WOVEN	200909CV	00000383	6.3	50.1

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 024802801 was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 311C	2011104366	3.7	91.4
PPX 311C	2011104373	3.7	92.5
PPX 311C	2011104375	3.4	82.1
PPX 311C	2011104381	4.0	107.9
PPX 311C	2011104395	3.6	88.7
PPX 311C	2011104396	3.3	87.1
PPX 311C	2011107327	3.2	75.0
PPX 311C	2011107630	3.4	81.8
PPX 311C	2011107902	3.4	81.8
PPX 311C	2011107903	3.6	80.7

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Date: 2/27/2009
Purchase Order: P6782
ORDER NUMBERS: 024802805, 024802806, 024802807, 024802808

Kennedy Garber
Hallaton

Sparks, MD 21152
kgarber@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Johnson County LF
CUSTOMER P.O.: P6782
ORDER NUMBERS: 024802805, 024802806, 024802807, 024802808
PREPARED FOR: Hallaton

CONTENTS:

- Daily production and needle detection certification
- GCL property specifications
- Order packing list
- GCL MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121

Telephone: (770) 387-7773
Fax:
E-Mail: melanie.king@cetco.com

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PRODUCTION CERTIFICATION

PROJECT NAME: Johnson County LF
CUSTOMER P.O.: P6782
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

NEEDLE REMOVAL AND DETECTION PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO
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Ship Date: 02/26/2009
Order Numbers: 024802805, 024802806, 024802807, 024802808
Prepared For: Hallaton

The GCL raw materials and GCL finished product manufactured for the above-referenced order number(s) are hereby certified to achieve the properties listed in the tables below.

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT SDN

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft (3.6 kg/sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf (48 kPa) typ @ 200 psf
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5 x 10^-9 cm/ sec Max
ASTM D 5887	GCL Index Flux	Weekly	1 x 10^-8 m^3/m^2/sec Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	2.5 lbs/in Min
ASTM D4632*	Grab Strength*modified with 4-inch grips	200,000 sq ft (20,000 sq m)	90 lbs (400 N) MARV
ASTM D4632*	Peel Strength*modified with 4-inch grips	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT SDN

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D4632*	Peel Strength*modified with 4-inch grips	1/40,000sf	30 lbs	Standard
ASTM D 6496	GCL Peel Strength	1/40,000sf	5.3 lbs	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction.

FABRIC SUPPLIER REQUIREMENTS FOR BENTOMAT SDN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd2
Bentomat SDN Base Nonwoven Fabric	ASTM D 5261	2.7	oz/yd2

Fabric certifications from our raw material suppliers are on file at our production facility.

CETCO's MQA laboratory is GAI-accredited (www.geosynthetic-institute.org/gai/lab.html).

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 024802805

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802805	CV-BENTOMAT SDN	200909CV	00000701	150	14.5	2175	2822
024802805	CV-BENTOMAT SDN	200909CV	00000703	150	14.5	2175	2856
024802806	CV-BENTOMAT SDN	200909CV	00000704	150	14.5	2175	2824
024802806	CV-BENTOMAT SDN	200909CV	00000707	150	14.5	2175	2804
024802806	CV-BENTOMAT SDN	200909CV	00000709	150	14.5	2175	2828
024802806	CV-BENTOMAT SDN	200909CV	00000710	150	14.5	2175	2812
024802805	CV-BENTOMAT SDN	200909CV	00000712	150	14.5	2175	2818
024802805	CV-BENTOMAT SDN	200909CV	00000713	150	14.5	2175	2766
024802806	CV-BENTOMAT SDN	200909CV	00000716	150	14.5	2175	2750
024802806	CV-BENTOMAT SDN	200909CV	00000719	150	14.5	2175	2752
024802807	CV-BENTOMAT SDN	200909CV	00000721	150	14.5	2175	2748
024802806	CV-BENTOMAT SDN	200909CV	00000722	150	14.5	2175	2744
024802806	CV-BENTOMAT SDN	200909CV	00000724	150	14.5	2175	2736
024802807	CV-BENTOMAT SDN	200909CV	00000728	150	14.5	2175	2778
024802808	CV-BENTOMAT SDN	200909CV	00000732	150	14.5	2175	2752
024802808	CV-BENTOMAT SDN	200909CV	00000742	150	14.5	2175	2718
024802808	CV-BENTOMAT SDN	200909CV	00000743	150	14.5	2175	2738
024802808	CV-BENTOMAT SDN	200909CV	00000747	150	14.5	2175	2718
024802807	CV-BENTOMAT SDN	200909CV	00000756	150	14.5	2175	2686
024802808	CV-BENTOMAT SDN	200909CV	00000763	150	14.5	2175	2688
024802808	CV-BENTOMAT SDN	200909CV	00000771	150	14.5	2175	2694
024802806	CV-BENTOMAT SDN	200909CV	00000774	150	14.5	2175	2706
024802808	CV-BENTOMAT SDN	200909CV	00000781	150	14.5	2175	2716
024802808	CV-BENTOMAT SDN	200909CV	00000784	150	14.5	2175	2720
024802808	CV-BENTOMAT SDN	200909CV	00000785	150	14.5	2175	2700
024802808	CV-BENTOMAT SDN	200909CV	00000786	150	14.5	2175	2700
024802808	CV-BENTOMAT SDN	200909CV	00000787	150	14.5	2175	2708

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802807	CV-BENTOMAT SDN	200909CV	00000788	150	14.5	2175	2698
024802808	CV-BENTOMAT SDN	200909CV	00000789	150	14.5	2175	2684
024802808	CV-BENTOMAT SDN	200909CV	00000792	150	14.5	2175	2688
024802808	CV-BENTOMAT SDN	200909CV	00000795	150	14.5	2175	2720
024802808	CV-BENTOMAT SDN	200909CV	00000796	150	14.5	2175	2706
024802808	CV-BENTOMAT SDN	200909CV	00000797	150	14.5	2175	2686
024802805	CV-BENTOMAT SDN	200909CV	00000816	150	14.5	2175	2814
024802807	CV-BENTOMAT SDN	200909CV	00000820	150	14.5	2175	2702
024802805	CV-BENTOMAT SDN	200909CV	00000828	150	14.5	2175	2734
024802805	CV-BENTOMAT SDN	200909CV	00000830	150	14.5	2175	2760
024802805	CV-BENTOMAT SDN	200909CV	00000837	150	14.5	2175	2736
024802805	CV-BENTOMAT SDN	200909CV	00000847	150	14.5	2175	2740
024802805	CV-BENTOMAT SDN	200909CV	00000848	150	14.5	2175	2722
024802805	CV-BENTOMAT SDN	200909CV	00000849	150	14.5	2175	2728
024802805	CV-BENTOMAT SDN	200909CV	00000850	150	14.5	2175	2718
024802805	CV-BENTOMAT SDN	200909CV	00000851	150	14.5	2175	2726
024802807	CV-BENTOMAT SDN	200909CV	00000852	150	14.5	2175	2762
024802807	CV-BENTOMAT SDN	200909CV	00000853	150	14.5	2175	2700
024802805	CV-BENTOMAT SDN	200909CV	00000854	150	14.5	2175	2724
024802807	CV-BENTOMAT SDN	200909CV	00000855	150	14.5	2175	2716
024802807	CV-BENTOMAT SDN	200909CV	00000856	150	14.5	2175	2728
024802807	CV-BENTOMAT SDN	200909CV	00000857	150	14.5	2175	2724
024802807	CV-BENTOMAT SDN	200909CV	00000858	150	14.5	2175	2724
024802807	CV-BENTOMAT SDN	200909CV	00000859	150	14.5	2175	2732
024802807	CV-BENTOMAT SDN	200909CV	00000860	150	14.5	2175	2730
024802805	CV-BENTOMAT SDN	200909CV	00000861	150	14.5	2175	2734
024802807	CV-BENTOMAT SDN	200909CV	00000862	150	14.5	2175	2720
024802807	CV-BENTOMAT SDN	200909CV	00000863	150	14.5	2175	2740
024802807	CV-BENTOMAT SDN	200909CV	00000864	150	14.5	2175	2724
024802806	CV-BENTOMAT SDN	200909CV	00000865	150	14.5	2175	2734
024802805	CV-BENTOMAT SDN	200909CV	00000866	150	14.5	2175	2730
024802806	CV-BENTOMAT SDN	200909CV	00000867	150	14.5	2175	2750

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802806	CV-BENTOMAT SDN	200909CV	00000868	150	14.5	2175	2728
024802806	CV-BENTOMAT SDN	200909CV	00000869	150	14.5	2175	2714
024802806	CV-BENTOMAT SDN	200909CV	00000870	150	14.5	2175	2740
024802806	CV-BENTOMAT SDN	200909CV	00000871	150	14.5	2175	2734
024802806	CV-BENTOMAT SDN	200909CV	00000872	150	14.5	2175	2722
			Totals:	**9600**	**928**	**139200**	**175154**

Total Number of Rolls Certified: **64**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 024802805

GCL			Geotextiles				Clay
CV-BENTOMAT SDN			CV-N/W-WHITE-DN LW			CV-N/W-BLK-DNLW-2.7	CV-CG 50-DN LWNW
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200909CV	00000701	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000703	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000704	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000707	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000709	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000710	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000712	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000713	00000700	200907CV	00000312	00000312	2011107630	901074A
200909CV	00000716	00000715	200907CV	00000312	00000312	2011107903	901074A
200909CV	00000719	00000715	200907CV	00000312	00000312	2011107903	901074A
200909CV	00000721	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000722	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000724	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000728	00000715	200906CV	00000157	00000153	2011107903	901074A
200909CV	00000732	00000730	200906CV	00000157	00000153	2011104373	901074A
200909CV	00000742	00000730	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000743	00000730	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000747	00000745	200905CV	00000141	00000138	2011104381	901074B
200909CV	00000756	00000752	200907CV	00000237	00000233	2011104381	901074B
200909CV	00000763	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000771	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000774	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000781	00000777	200907CV	00000260	00000259	2011104395	901074B
200909CV	00000784	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000785	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000786	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000787	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000788	00000777	200907CV	00000226	00000225	2011104395	901074B
200909CV	00000789	00000777	200907CV	00000259	00000259	2011104395	901074B

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200909CV	00000792	00000792	200907CV	00000259	00000259	2011104395	901074B
200909CV	00000795	00000792	200907CV	00000259	00000259	2011104396	901074B
200909CV	00000796	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000797	00000792	200907CV	00000225	00000225	2011104396	902912A
200909CV	00000816	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000820	00000807	200907CV	00000250	00000248	2011104375	902912A
200909CV	00000828	00000822	200909CV	00000387	00000383	2011107327	902912A
200909CV	00000830	00000822	200907CV	00000249	00000248	2011107327	902912A
200909CV	00000837	00000837	200907CV	00000248	00000248	2011107327	902912A
200909CV	00000847	00000837	200907CV	00000227	00000225	2011107902	902912B
200909CV	00000848	00000837	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000849	00000837	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000850	00000837	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000851	00000837	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000852	00000852	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000853	00000852	200907CV	00000261	00000259	2011107902	902912B
200909CV	00000854	00000852	200907CV	00000261	00000259	2011108667	902912B
200909CV	00000855	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000856	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000857	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000858	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000859	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000860	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000861	00000852	200907CV	00000242	00000233	2011108667	902912B
200909CV	00000862	00000852	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000863	00000852	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000864	00000852	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000865	00000852	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000866	00000852	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000867	00000867	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000868	00000867	200907CV	00000241	00000233	2011108667	902912B
200909CV	00000869	00000867	200907CV	00000240	00000233	2011108667	902912B
200909CV	00000870	00000867	200907CV	00000240	00000233	2011108667	902912B
200909CV	00000871	00000867	200907CV	00000240	00000233	2011108667	902912B
200909CV	00000872	00000867	200907CV	00000240	00000233	2011108667	902912B

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 024802805 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength
		Standard Test Method:	ASTM D 5993	ASTM D 6768	ASTM D 6496
		Standard Specification:	0.75 lb/sq ft MARV	30lbs/in MARV	2.5lbs/in Min
Non-standard specifications were requested for this order as indicated on the attatched property sheet					
CV-BENTOMAT SDN	200909CV	00000700	0.97	30.9	9.1
CV-BENTOMAT SDN	200909CV	00000715	0.88	30.9	9.2
CV-BENTOMAT SDN	200909CV	00000730	0.98	30.9	6
CV-BENTOMAT SDN	200909CV	00000745	0.93	30.9	6.5
CV-BENTOMAT SDN	200909CV	00000752	0.86	30.9	7.1
CV-BENTOMAT SDN	200909CV	00000762	0.93	30.9	5.7
CV-BENTOMAT SDN	200909CV	00000777	0.93	30.9	6.8
CV-BENTOMAT SDN	200909CV	00000792	0.87	30.8	10.1
CV-BENTOMAT SDN	200909CV	00000807	0.95	30.8	8.7
CV-BENTOMAT SDN	200909CV	00000822	0.92	30.8	7.5
CV-BENTOMAT SDN	200909CV	00000837	0.94	30.8	8.7
CV-BENTOMAT SDN	200909CV	00000852	0.94	30.8	10.2
CV-BENTOMAT SDN	200909CV	00000867	0.96	30.8	10.7

Product	Lot # Tested	Roll # Tested	PEEL 4632
CV-BENTOMAT SDN	200909CV	00000700	46.4
CV-BENTOMAT SDN	200909CV	00000715	45.3
CV-BENTOMAT SDN	200909CV	00000730	33.0
CV-BENTOMAT SDN	200909CV	00000745	32.2
CV-BENTOMAT SDN	200909CV	00000752	36.4
CV-BENTOMAT SDN	200909CV	00000762	32.0
CV-BENTOMAT SDN	200909CV	00000777	33.5
CV-BENTOMAT SDN	200909CV	00000792	47.2
CV-BENTOMAT SDN	200909CV	00000807	42.9
CV-BENTOMAT SDN	200909CV	00000822	39.9
CV-BENTOMAT SDN	200909CV	00000837	50.8
CV-BENTOMAT SDN	200909CV	00000852	51.6
CV-BENTOMAT SDN	200909CV	00000867	52.2

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 024802805 has been tested by American Colloid Company and yeilded the following test results.

Reference	Moist	Swell	Fluid Loss
Test Method:	ASTM D 2216	ASTM D 5890	ASTM D 5891
Specification:	12% Max	24 ml/2g Min	18 ml Max
901074A	9.3	25.0	16.4
901074B	9.2	26.0	16.8
902912A	9.1	25.0	16.5
902912B	8.7	26.0	16.0

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GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 024802805 was manufactured using these geotextiles:

Material	Lot #	Roll #	Mass Area	Grab Strength
CV-NON-WOVEN	200905CV	00000138	7.1	53.3
CV-NON-WOVEN	200906CV	00000153	6.5	39.5
CV-NON-WOVEN	200907CV	00000177	7.1	39.4
CV-NON-WOVEN	200907CV	00000225	6.6	35.2
CV-NON-WOVEN	200907CV	00000233	6.4	40.1
CV-NON-WOVEN	200907CV	00000248	6.3	37.7
CV-NON-WOVEN	200907CV	00000259	6.8	55.2
CV-NON-WOVEN	200907CV	00000312	6.6	53.9
CV-NON-WOVEN	200909CV	00000373	6.7	53.1
CV-NON-WOVEN	200909CV	00000383	6.3	50.1

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 024802805 was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 311C	2011104366	3.7	91.4
PPX 311C	2011104373	3.7	92.5
PPX 311C	2011104375	3.4	82.1
PPX 311C	2011104381	4.0	107.9
PPX 311C	2011104395	3.6	88.7
PPX 311C	2011104396	3.3	87.1
PPX 311C	2011107327	3.2	75.0
PPX 311C	2011107630	3.4	81.8
PPX 311C	2011107902	3.4	81.8
PPX 311C	2011107903	3.6	80.7
PPX 311C	2011108667	3.4	81.8

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Date: 3/2/2009
Purchase Order: P6782
ORDER NUMBERS: 024802809, 024802810, 024802811

Kennedy Garber
Hallaton

Sparks, MD 21152
kgarber@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton.

The enclosed data package includes results of all the MQC tests required by ASTM D5889, with the exception of index flux/hydraulic conductivity. This test, which is run according to ASTM D5887, is normally performed once per production lot (once per week), unless a higher frequency is required by the project specifications. Because of the GCL's low permeability, this test can take several weeks to complete. The index flux/hydraulic conductivity results associated with this lot of material will be provided under separate cover as soon as they are available.

Although the index flux/hydraulic conductivity test results are not yet available, CETCO accepts responsibility for our GCL should the index flux/hydraulic conductivity tests produce unacceptable results. If, upon delivery and prior to installation, individual rolls of GCL are found to be nonconforming to accepted project specifications, CETCO will replace the nonconforming material at no charge.

Questions regarding this information should be directed to Chris Athanassopoulos, Technical Support Engineer, at (847) 851-1831.

Sincerely,

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Johnston County LF
CUSTOMER P.O.: P6782
ORDER NUMBERS: 024802809, 024802810, 024802811
PREPARED FOR: Hallaton

CONTENTS:

- Daily production and needle detection certification
- GCL property specifications
- Order packing list
- GCL MQA tracking form
- GCL manufacturing quality control test data
- Bentonite clay certification
- Raw material test results

PREPARED BY: Melanie King
Quality Assurance Coordinator
CETCO
218 Industrial Park

Cartersville, GA 30121

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Fax:
E-Mail: melanie.king@cetco.com

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PRODUCTION CERTIFICATION

PROJECT NAME: Johnston County LF
CUSTOMER P.O.: P6782
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

NEEDLE REMOVAL AND DETECTION PROCEDURE

CETCO hereby affirms that all Bentomat® geosynthetic clay liner material manufactured for this project is continually passed under a magnet for needle removal and then screened with a metal detection device. CETCO certifies Bentomat® to be essentially free of broken needles and fragments of needles that would negatively effect the performance of the final product.

Melanie King

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

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Ship Date: 02/27/2009
Order Numbers: 024802809, 024802810, 024802811
Prepared For: Hallaton

The GCL raw materials and GCL finished product manufactured for the above-referenced order number(s) are hereby certified to achieve the properties listed in the tables below.

GCL PROPERTY SPECIFICATIONS FOR BENTOMAT SDN

Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass/Area	40,000 sq ft (4000 sq m)	0.75 lb /sq ft (3.6 kg/sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml/2g Min
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	30 lbs/in MARV
ASTM D 6243	GCL Hydrated Internal Shear Strength	Periodic	500 psf (48 kPa) typ @ 200 psf
ASTM D 5887	GCL Hydraulic Conductivity	Weekly	5 x 10^-9 cm/ sec Max
ASTM D 5887	GCL Index Flux	Weekly	1 x 10^-8 m^3/m^2/sec Max
ASTM D 6496	GCL Peel Strength	40,000 sq ft (4000 sq m)	2.5 lbs/in Min
ASTM D4632*	Grab Strength*modified with 4-inch grips	200,000 sq ft (20,000 sq m)	90 lbs (400 N) MARV
ASTM D4632*	Peel Strength*modified with 4-inch grips	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

SPECIALLY REQUESTED CERTIFIED PROPERTIES FOR THIS ORDER OF BENTOMAT SDN

Test Method	Test Method Property	Requested Frequency	Requested Value	Requested Conditions
ASTM D4632*	Peel Strength*modified with 4-inch grips	1/40,000sf	30 lbs	Standard
ASTM D 6496	GCL Peel Strength	1/40,000sf	5.3 lbs	Standard

Bentonite property tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
All tensile testing is in the machine direction.

FABRIC SUPPLIER REQUIREMENTS FOR BENTOMAT SDN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd2
Bentomat SDN Base Nonwoven Fabric	ASTM D 5261	2.7	oz/yd2

Fabric certifications from our raw material suppliers are on file at our production facility.

CETCO's MQA laboratory is GAI-accredited (www.geosynthetic-institute.org/gai/lab.html).

Melanie King

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 024802809

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802811	CV-BENTOMAT SDN	200909CV	00000702	150	14.5	2175	2846
024802811	CV-BENTOMAT SDN	200909CV	00000705	150	14.5	2175	2818
024802811	CV-BENTOMAT SDN	200909CV	00000706	150	14.5	2175	2814
024802811	CV-BENTOMAT SDN	200909CV	00000708	150	14.5	2175	2814
024802810	CV-BENTOMAT SDN	200909CV	00000711	150	14.5	2175	2788
024802810	CV-BENTOMAT SDN	200909CV	00000714	150	14.5	2175	2734
024802811	CV-BENTOMAT SDN	200909CV	00000715	150	14.5	2175	2766
024802810	CV-BENTOMAT SDN	200909CV	00000717	150	14.5	2175	2730
024802810	CV-BENTOMAT SDN	200909CV	00000718	150	14.5	2175	2760
024802811	CV-BENTOMAT SDN	200909CV	00000720	150	14.5	2175	2746
024802811	CV-BENTOMAT SDN	200909CV	00000723	150	14.5	2175	2738
024802811	CV-BENTOMAT SDN	200909CV	00000725	150	14.5	2175	2728
024802809	CV-BENTOMAT SDN	200909CV	00000733	150	14.5	2175	2774
024802809	CV-BENTOMAT SDN	200909CV	00000734	150	14.5	2175	2754
024802809	CV-BENTOMAT SDN	200909CV	00000735	150	14.5	2175	2764
024802809	CV-BENTOMAT SDN	200909CV	00000736	150	14.5	2175	2776
024802810	CV-BENTOMAT SDN	200909CV	00000737	150	14.5	2175	2690
024802810	CV-BENTOMAT SDN	200909CV	00000738	150	14.5	2175	2698
024802810	CV-BENTOMAT SDN	200909CV	00000739	150	14.5	2175	2700
024802810	CV-BENTOMAT SDN	200909CV	00000740	150	14.5	2175	2715
024802810	CV-BENTOMAT SDN	200909CV	00000741	150	14.5	2175	2716
024802809	CV-BENTOMAT SDN	200909CV	00000745	150	14.5	2175	2762
024802809	CV-BENTOMAT SDN	200909CV	00000748	150	14.5	2175	2728
024802809	CV-BENTOMAT SDN	200909CV	00000749	150	14.5	2175	2722
024802809	CV-BENTOMAT SDN	200909CV	00000750	150	14.5	2175	2728
024802809	CV-BENTOMAT SDN	200909CV	00000755	150	14.5	2175	2734
024802810	CV-BENTOMAT SDN	200909CV	00000757	150	14.5	2175	2686

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
024802810	CV-BENTOMAT SDN	200909CV	00000758	150	14.5	2175	2667
024802810	CV-BENTOMAT SDN	200909CV	00000759	150	14.5	2175	2692
024802809	CV-BENTOMAT SDN	200909CV	00000762	150	14.5	2175	2698
024802809	CV-BENTOMAT SDN	200909CV	00000765	150	14.5	2175	2688
024802809	CV-BENTOMAT SDN	200909CV	00000766	150	14.5	2175	2686
024802810	CV-BENTOMAT SDN	200909CV	00000767	150	14.5	2175	2690
024802810	CV-BENTOMAT SDN	200909CV	00000768	150	14.5	2175	2694
024802809	CV-BENTOMAT SDN	200909CV	00000773	150	14.5	2175	2716
024802809	CV-BENTOMAT SDN	200909CV	00000775	150	14.5	2175	2704
024802809	CV-BENTOMAT SDN	200909CV	00000776	150	14.5	2175	2664
024802809	CV-BENTOMAT SDN	200909CV	00000779	150	14.5	2175	2702
024802810	CV-BENTOMAT SDN	200909CV	00000780	150	14.5	2175	2722
024802810	CV-BENTOMAT SDN	200909CV	00000782	150	14.5	2175	2720
			Totals:	**6000**	**580**	**87000**	**109272**

Total Number of Rolls Certified: **40**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 024802809

GCL			Geotextiles				Clay
CV-BENTOMAT SDN			CV-N/W-WHITE-DN LW			CV-N/W-BLK-DNLW-2.7	CV-CG 50-DN LWNW
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200909CV	00000702	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000705	00000700	200907CV	00000315	00000312	2011107630	901074A
200909CV	00000706	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000708	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000711	00000700	200906CV	00000155	00000153	2011107630	901074A
200909CV	00000714	00000700	200907CV	00000312	00000312	2011107630	901074A
200909CV	00000715	00000715	200907CV	00000312	00000312	2011107903	901074A
200909CV	00000717	00000715	200907CV	00000312	00000312	2011107903	901074A
200909CV	00000718	00000715	200907CV	00000312	00000312	2011107903	901074A
200909CV	00000720	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000723	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000725	00000715	200906CV	00000153	00000153	2011107903	901074A
200909CV	00000733	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000734	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000735	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000736	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000737	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000738	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000739	00000730	200906CV	00000158	00000153	2011104373	901074A
200909CV	00000740	00000730	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000741	00000730	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000745	00000745	200907CV	00000182	00000177	2011104373	901074A
200909CV	00000748	00000745	200905CV	00000141	00000138	2011104381	901074B
200909CV	00000749	00000745	200905CV	00000141	00000138	2011104381	901074B
200909CV	00000750	00000745	200905CV	00000141	00000138	2011104381	901074B
200909CV	00000755	00000752	200907CV	00000237	00000233	2011104381	901074B
200909CV	00000757	00000752	200907CV	00000237	00000233	2011104381	901074B
200909CV	00000758	00000752	200907CV	00000237	00000233	2011104381	901074B
200909CV	00000759	00000752	200907CV	00000237	00000233	2011104381	901074B

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200909CV	00000762	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000765	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000766	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000767	00000762	200909CV	00000373	00000373	2011104366	901074B
200909CV	00000768	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000773	00000762	200907CV	00000257	00000248	2011104366	901074B
200909CV	00000775	00000762	200907CV	00000260	00000259	2011104366	901074B
200909CV	00000776	00000762	200907CV	00000260	00000259	2011104366	901074B
200909CV	00000779	00000777	200907CV	00000260	00000259	2011104395	901074B
200909CV	00000780	00000777	200907CV	00000260	00000259	2011104395	901074B
200909CV	00000782	00000777	200907CV	00000226	00000225	2011104395	901074B

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 024802809 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength	Peel Strength
		Standard Test Method:	ASTM D 5993	ASTM D 6768	ASTM D 6496
		Standard Specification:	0.75 lb/sq ft MARV	30lbs/in MARV	2.5lbs/in Min
Non-standard specifications were requested for this order as indicated on the attatched property sheet					
CV-BENTOMAT SDN	200909CV	00000700	0.97	30.9	9.1
CV-BENTOMAT SDN	200909CV	00000715	0.88	30.9	9.2
CV-BENTOMAT SDN	200909CV	00000730	0.98	30.9	6
CV-BENTOMAT SDN	200909CV	00000745	0.93	30.9	6.5
CV-BENTOMAT SDN	200909CV	00000752	0.86	30.9	7.1
CV-BENTOMAT SDN	200909CV	00000762	0.93	30.9	5.7
CV-BENTOMAT SDN	200909CV	00000777	0.93	30.9	6.8

Product	Lot # Tested	Roll # Tested	PEEL 4632
CV-BENTOMAT SDN	200909CV	00000700	46.4
CV-BENTOMAT SDN	200909CV	00000715	45.3
CV-BENTOMAT SDN	200909CV	00000730	33.0
CV-BENTOMAT SDN	200909CV	00000745	32.2
CV-BENTOMAT SDN	200909CV	00000752	36.4
CV-BENTOMAT SDN	200909CV	00000762	32.0
CV-BENTOMAT SDN	200909CV	00000777	33.5

ASTM test methods and property specifications per CETCO standard unless non-standard specifications were requested.
Any non-standard property specifications requested for this order are noted on the attached GCL property specifications sheet.

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BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce package 024802809 has been tested by American Colloid Company and yeilded the following test results.

Reference	Moist	Swell	Fluid Loss
Test Method:	ASTM D 2216	ASTM D 5890	ASTM D 5891
Specification:	12% Max	24 ml/2g Min	18 ml Max
901074A	9.3	25.0	16.4
901074B	9.2	26.0	16.8

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GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 024802809 was manufactured using these geotextiles:

Material	Lot #	Roll #	Mass Area	Grab Strength
CV-NON-WOVEN	200905CV	00000138	7.1	53.3
CV-NON-WOVEN	200906CV	00000153	6.5	39.5
CV-NON-WOVEN	200907CV	00000177	7.1	39.4
CV-NON-WOVEN	200907CV	00000225	6.6	35.2
CV-NON-WOVEN	200907CV	00000233	6.4	40.1
CV-NON-WOVEN	200907CV	00000248	6.3	37.7
CV-NON-WOVEN	200907CV	00000259	6.8	55.2
CV-NON-WOVEN	200907CV	00000312	6.6	53.9
CV-NON-WOVEN	200909CV	00000373	6.7	53.1

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 024802809 was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
PPX 311C	2011104366	3.7	91.4
PPX 311C	2011104373	3.7	92.5
PPX 311C	2011104381	4.0	107.9
PPX 311C	2011104395	3.6	88.7
PPX 311C	2011107630	3.4	81.8
PPX 311C	2011107903	3.6	80.7

INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

JLT

Client	: CETCO		Date	:	03/07/2009
Project Location	: Johnston County Landfill		Job No.	:	09LG1855.01
Sample Number	: Roll 700		Tested By	:	RL
Description	: Bentomat SDN	Lot: ' 909CV	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.20	Final Height of Clay (in)	:	0.23
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	52.40	Final Wet Weight(Clay) (g)	:	82.30
Wet Density (pcf)	:	79.36	Wet Density (pcf)	:	108.38
Moisture Content %	:	25.10	Moisture Content %	:	96.40
Dry Density (pcf)	:	63.43	Dry Density (pcf)	:	55.18

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	240.00
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

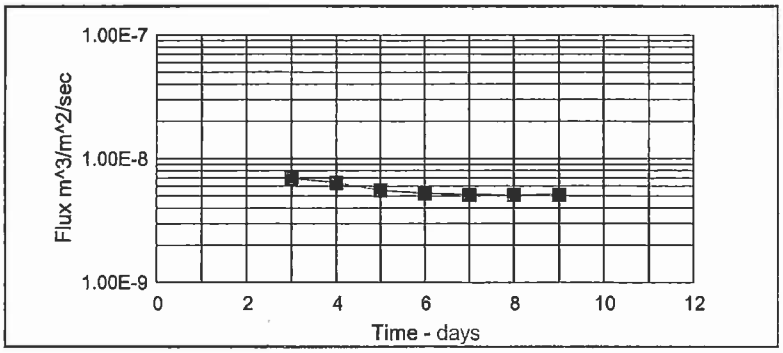
Flux and Permeability Input Data

Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.23 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	02/26/2009	48 hours of hydration per ASTM				
2	02/27/2009					
3	02/28/2009	4.90	1441	86460	6.99E-009	2.91E-009
4	03/01/2009	4.50	1440	86400	6.42E-009	2.68E-009
5	03/02/2009	3.90	1441	86460	5.56E-009	2.32E-009
6	03/03/2009	3.70	1439	86340	5.29E-009	2.20E-009
7	03/04/2009	3.60	1438	86280	5.15E-009	2.14E-009
8	03/05/2009	3.60	1442	86520	5.13E-009	2.14E-009
9	03/06/2009	3.60	1440	86400	5.14E-009	2.14E-009

Average of Last 3 Test Readings : 5.14E-009 2.14E-009



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INDEX FLUX AND PERMEABILITY OF GCL's
TEST RESULTS
ASTM D-5887 / D-5084

JLT

Client	: CETCO		Date	:	03/07/2009
Project Location	: Johnston County Landfill		Job No.	:	09LG1855.01
Sample Number	: Roll 807		Tested By	:	RL
Description	: Bentomat SDN	Lot: ' 909CV	Checked By	:	JB
Permeant Fluid	: De-Aired Water				

Physical Property Data

		Total Sample			Total Sample
Initial Clay Height (in)	:	0.19	Final Height of Clay (in)	:	0.22
Initial Diameter (in)	:	4.00	Final Diameter of Clay (in)	:	4.00
Initial Wet Weight (g)	:	45.80	Final Wet Weight(Clay) (g)	:	72.90
Wet Density (pcf)	:	73.01	Wet Density (pcf)	:	100.37
Moisture Content %	:	33.10	Moisture Content %	:	111.90
Dry Density (pcf)	:	54.85	Dry Density (pcf)	:	47.36

Test Parameters

Fluid	:	De-Aired Water	**Average Effective**		
Cell Pressure (psi)	:	80.00	**Confining Pressure (psi)**	:	**4**
Head Water (psi)	:	77.00	Gradient	:	250.91
Tail Water (psi)	:	75.00	Effective Stress at Base	:	5

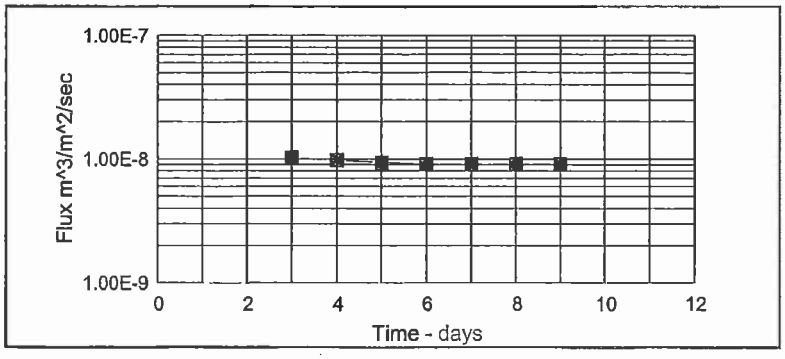
Flux and Permeability Input Data

Minimum Saturation Time is 48 hours

Area, A = 0.00811 m^2
Thickness, t = 0.22 in

Days	Date	Flow	Time	Elapsed	Flux	k
		cc	min	Time (sec)	(m^3/m^2)/sec	cm/sec
1	02/26/2009	48 hours of hydration per ASTM				
2	02/27/2009					
3	02/28/2009	7.20	1441	86460	1.03E-008	4.09E-009
4	03/01/2009	6.90	1440	86400	9.85E-009	3.93E-009
5	03/02/2009	6.60	1441	86460	9.42E-009	3.75E-009
6	03/03/2009	6.40	1439	86340	9.14E-009	3.64E-009
7	03/04/2009	6.40	1439	86340	9.14E-009	3.64E-009
8	03/05/2009	6.40	1442	86520	9.12E-009	3.64E-009
9	03/06/2009	6.40	1440	86400	9.14E-009	3.64E-009

Average of Last 3 Test Readings : 9.14E-009 3.64E-009



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GEOSYNTHETICS INVENTORY LOG
GEOSYNTHETIC CLAY LINER

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton, Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: GCL
Geosynthetic Product Identification: CETCO Bentomat SDN

Material		Material Dimensions		Conformance	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)	Sample No.	
00000700	200909CV	150	14.5	L09012-06-01	PASS
00000701	200909CV	150	14.5		
00000702	200909CV	150	14.5		
00000703	200909CV	150	14.5		
00000704	200909CV	150	14.5		
00000705	200909CV	150	14.5		
00000706	200909CV	150	14.5		
00000707	200909CV	150	14.5		
00000708	200909CV	150	14.5		
00000709	200909CV	150	14.5		
00000710	200909CV	150	14.5		
00000711	200909CV	150	14.5		
00000712	200909CV	150	14.5		
00000713	200909CV	150	14.5		
00000714	200909CV	150	14.5		
00000715	200909CV	150	14.5		
00000716	200909CV	150	14.5		
00000717	200909CV	150	14.5		
00000718	200909CV	150	14.5		
00000719	200909CV	150	14.5		
00000720	200909CV	150	14.5		
00000721	200909CV	150	14.5		
00000722	200909CV	150	14.5		
00000723	200909CV	150	14.5		
00000724	200909CV	150	14.5		
00000725	200909CV	150	14.5		
00000726	200909CV	150	14.5		
00000728	200909CV	150	14.5		
00000729	200909CV	150	14.5		
00000730	200909CV	150	14.5		
00000731	200909CV	150	14.5		
00000732	200909CV	150	14.5		
00000733	200909CV	150	14.5		
00000734	200909CV	150	14.5		
00000735	200909CV	150	14.5		
00000736	200909CV	150	14.5		
00000737	200909CV	150	14.5		
00000738	200909CV	150	14.5		
00000739	200909CV	150	14.5		
00000740	200909CV	150	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
00000741	200909CV	150	14.5		
00000742	200909CV	150	14.5		
00000743	200909CV	150	14.5		
00000744	200909CV	150	14.5		
00000745	200909CV	150	14.5	L09012-06-02	PASS
00000746	200909CV	150	14.5		
00000747	200909CV	150	14.5		
00000748	200909CV	150	14.5		
00000749	200909CV	150	14.5		
00000750	200909CV	150	14.5		
00000752	200909CV	150	14.5		
00000755	200909CV	150	14.5		
00000756	200909CV	150	14.5		
00000757	200909CV	150	14.5		
00000758	200909CV	150	14.5		
00000759	200909CV	150	14.5		
00000760	200909CV	150	14.5		
00000761	200909CV	150	14.5		
00000762	200909CV	150	14.5		
00000763	200909CV	150	14.5		
00000764	200909CV	150	14.5		
00000765	200909CV	150	14.5		
00000766	200909CV	150	14.5		
00000767	200909CV	150	14.5		
00000768	200909CV	150	14.5		
00000769	200909CV	150	14.5		
00000770	200909CV	150	14.5		
00000771	200909CV	150	14.5		
00000772	200909CV	150	14.5		
00000773	200909CV	150	14.5		
00000774	200909CV	150	14.5		
00000775	200909CV	150	14.5		
00000776	200909CV	150	14.5		
00000777	200909CV	150	14.5		
00000778	200909CV	150	14.5		
00000779	200909CV	150	14.5		
00000780	200909CV	150	14.5		
00000781	200909CV	150	14.5		
00000782	200909CV	150	14.5		
00000783	200909CV	150	14.5		
00000784	200909CV	150	14.5		
00000785	200909CV	150	14.5		
00000786	200909CV	150	14.5		
00000787	200909CV	150	14.5		
00000788	200909CV	150	14.5		
00000789	200909CV	150	14.5		
00000790	200909CV	150	14.5		
00000791	200909CV	150	14.5		
00000792	200909CV	150	14.5	L09012-06-03	PASS
00000793	200909CV	150	14.5		
00000794	200909CV	150	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
00000795	200909CV	150	14.5		
00000796	200909CV	150	14.5		
00000797	200909CV	150	14.5		
00000798	200909CV	150	14.5		
00000799	200909CV	150	14.5		
00000800	200909CV	150	14.5		
00000801	200909CV	150	14.5		
00000802	200909CV	150	14.5		
00000803	200909CV	150	14.5		
00000804	200909CV	150	14.5		
00000805	200909CV	150	14.5		
00000806	200909CV	150	14.5		
00000807	200909CV	150	14.5		
00000808	200909CV	150	14.5		
00000809	200909CV	150	14.5		
00000810	200909CV	150	14.5		
00000811	200909CV	150	14.5		
00000812	200909CV	150	14.5		
00000813	200909CV	150	14.5		
00000815	200909CV	150	14.5		
00000816	200909CV	150	14.5		
00000817	200909CV	150	14.5		
00000818	200909CV	150	14.5		
00000819	200909CV	150	14.5		
00000820	200909CV	150	14.5		
00000821	200909CV	150	14.5		
00000822	200909CV	150	14.5		
00000823	200909CV	150	14.5		
00000824	200909CV	150	14.5		
00000825	200909CV	150	14.5		
00000826	200909CV	150	14.5		
00000827	200909CV	150	14.5		
00000828	200909CV	150	14.5		
00000829	200909CV	150	14.5		
00000830	200909CV	150	14.5		
00000831	200909CV	150	14.5		
00000832	200909CV	150	14.5		
00000833	200909CV	150	14.5		
00000834	200909CV	150	14.5		
00000835	200909CV	150	14.5		
00000836	200909CV	150	14.5		
00000837	200909CV	150	14.5	L09012-06-04	PASS
00000838	200909CV	150	14.5		
00000839	200909CV	150	14.5		
00000840	200909CV	150	14.5		
00000841	200909CV	150	14.5		
00000842	200909CV	150	14.5		
00000843	200909CV	150	14.5		
00000844	200909CV	150	14.5		
00000845	200909CV	150	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
00000846	200909CV	150	14.5		
00000847	200909CV	150	14.5		
00000848	200909CV	150	14.5		
00000849	200909CV	150	14.5		
00000850	200909CV	150	14.5		
00000851	200909CV	150	14.5		
00000852	200909CV	150	14.5		
00000853	200909CV	150	14.5		
00000854	200909CV	150	14.5		
00000855	200909CV	150	14.5		
00000856	200909CV	150	14.5		
00000857	200909CV	150	14.5		
00000858	200909CV	150	14.5		
00000859	200909CV	150	14.5		
00000860	200909CV	150	14.5		
00000861	200909CV	150	14.5		
00000862	200909CV	150	14.5		
00000863	200909CV	150	14.5		
00000864	200909CV	150	14.5		
00000865	200909CV	150	14.5		
00000866	200909CV	150	14.5		
00000867	200909CV	150	14.5		
00000868	200909CV	150	14.5		
00000869	200909CV	150	14.5		
00000870	200909CV	150	14.5		
00000871	200909CV	150	14.5		
00000872	200909CV	150	14.5		

Totals:

Total Rolls:	168
Total Lots:	1
Total SF:	365,400

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-06
LAB ID NO.: L09012-06-01
MATERIAL: CETCO BENTOMAT SDN GCL
ROLL NO.: 700
LOT NO.: 200909CV

	SPECIMEN	TOTAL WT. AS REC'D grams	TOTAL WT. DRY grams	TOTAL WT. AS REC'D psf	TOTAL WT. DRY psf	WT. BACKING psf (1)	AS REC'D Bent Cont psf	DRY Bent Cont psf	MOISTURE CONTENT %	Bent Cont 12% m.c. psf
BENTONITE CONTENT ASTM D3776 & ASTM D5993	1	59.0	46.2	1.17	0.92	0.070	1.10	0.846	30.0	0.948
	2	72.2	57.0	1.43	1.13	0.070	1.36	1.059	28.6	1.186
	3	65.1	51.1	1.29	1.01	0.070	1.22	0.943	29.5	1.056
	4	61.8	48.5	1.23	0.96	0.070	1.16	0.892	29.5	0.999
	5	59.7	47.1	1.18	0.93	0.070	1.11	0.863	28.9	0.967
							AVERAGE:	**0.921**	**29.3**	**1.031**

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVG	STD
PEEL STRENGTH	D 6496	MD-lbs/in	9.1	7.6	10.4	9.9	10.6	**9.5**	1.21

* NOTES:1) Weight of carrier (geotextile) provided by CETCO spec. info: .

CHECKED BY: BF DATE: 3-3-09

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

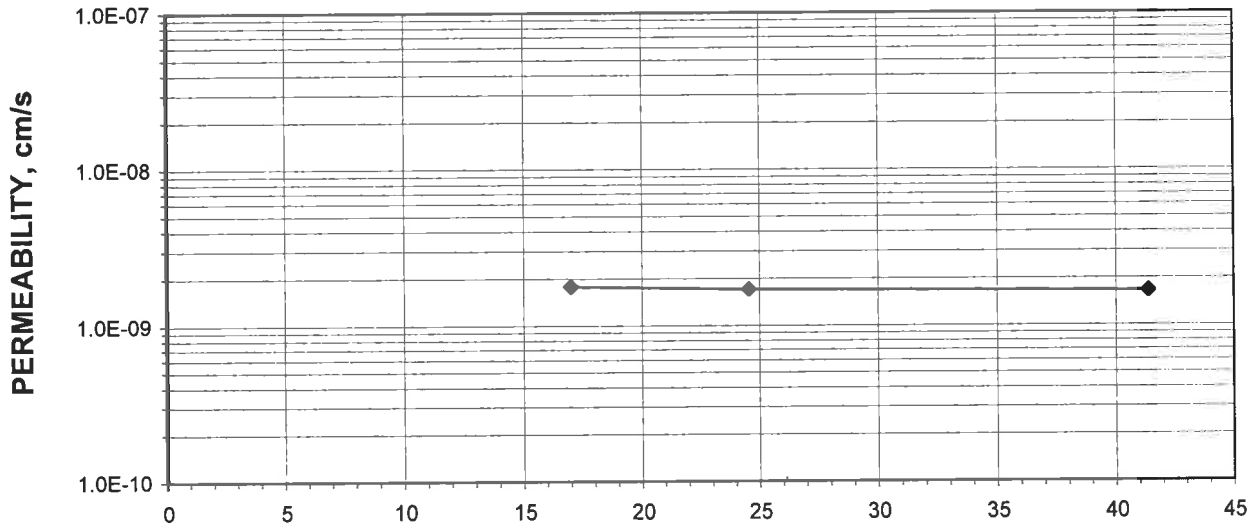
geotechnics
INTEGRITY IN TESTING

Lab ID No.	01	Material	BENTOMAT SDN
Client	RSGA	Roll I.D.:	700
Client Project	JOHNSTON CO.MSW LF PH. 4A	Lot No.:	NA
Project No.	L09012-06	Sample No.	NA

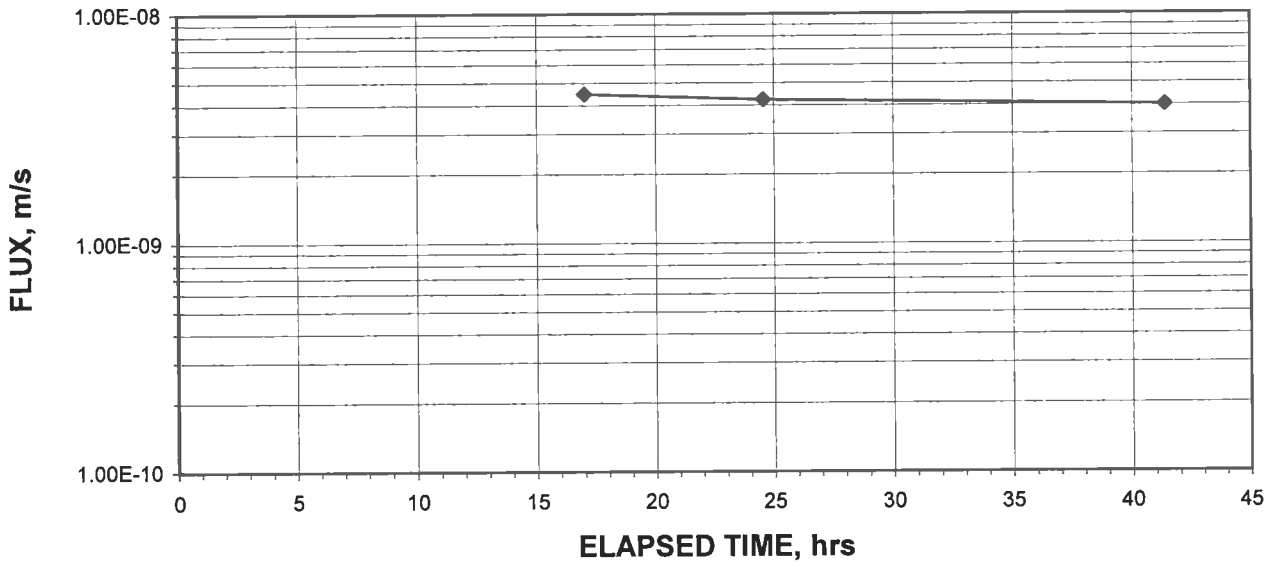
AVERAGE FLUX = 4.23E-09 m/s

AVERAGE PERMEABILITY = 1.71E-09 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



Checked By: DB Date: 3-12-09

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

geotechnics
INTEGRITY IN TESTING

Lab ID No.	01	Tested by: JB	Date: 3/10/2009
Client	RSGA		
Client Project	JOHNSTON CO.MSW LF PH. 4A	Checked by: JB	Date: 3/12/05
Project No.	L09012-06		
Material	BENTOMAT SDN		
Roll I.D.:	700		
Lot No.:	NA		
Sample No.	NA		

Permeant: DEAIRED, DEIONIZED WATER

MOISTURE CONTENT:	**BEFORE TEST**	**AFTER TEST**
Tare Number	64	55
Wt. of Tare & GCL[2] (gm.)	89.50	97.35
Wt. of Tare & Dry GCL [2] (gm.)	73.18	55.16
Wt. of Tare (gm.)	10.94	10.96
Wt. of Water (gm.)	16.32	42.19
Wt. of Dry GCL (gm.) [2]	62.24	44.20
Moisture Content (%)	**26.2**	**95.5**

SPECIMEN:	**BEFORE TEST**	**AFTER TEST**
Wt. of GCL (gm.) [2]	59.80	92.60 (Calculated)
Clay Component Thickness 1 (in.) [1]	0.138	0.260
Clay Component Thickness 2 (in.) [1]	0.140	0.270
Clay Component Thickness 3 (in.) [1]	0.135	0.266
Average Clay Component Thickness (in.)	na	0.265
Average Clay Component Thickness (mm)	na	**6.739**
Specimen Dia. (in)	4.000	4.000
Specimen Area (in.^{2})	12.57	12.57
Specimen Area (m^2)	0.00811	0.00811
Mass/Unit Area of GCL(gm./m^2) [2]	7,374	11,418
Mass/Unit Area of GCL(psf) [2]	1.51	2.34
Mass/Unit Area of Dry GCL(gm./m^2) [2]	5,842	
Mass/Unit Area of Dry GCL(psf) [2]	1.20	

NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

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INTEGRITY IN TESTING

ID No.	01
Client	RSGA
Client Project	JOHNSTON CO.MSW LF PH. 4A
Project No.	L09012-06
Material	BENTOMAT SDN
Roll I.D.:	700
Sample No.	NA

Pressure Heads (Constant)

Top Cap (psi)	75.0
Bottom Cap (psi)	77.0
Cell (psi)	80.0
Total Head (cm)	140.6

Final Sample Dimensions

Sample Length (cm), L	0.674
Sample Diameter (cm)	10.16
Sample Area (cm^2), A	**78.50**
Inflow Burette Area (cm^2), a-in	0.863
Outflow Burette Area (cm^2), a-out	0.825

AVERAGE FLUX = 4.23E-09 m/s
AVERAGE PERMEABILITY = 1.71E-09 cm/s @ 20oC

DATE	ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	RATIO ΔIN / ΔOUT	TOTAL HEAD h	TEMP.	INCREMENTAL FLUX @ 20°C	INCREMENTAL PERMEABILITY @ 20°C
(m-d-y)	(hr)	(cm^3)	(cm^3)	(3 readings)	(cm)	(°C)	(m/sec)	(cm/sec)
3/3/2009	0.0	0.0	0.0	NA	164.1	22.0	NA	NA
3/4/2009	17.0	2.4	1.9	NA	159.1	21.2	4.48E-09	1.78E-09
3/4/2009	24.6	3.4	2.7	1.26	157.0	21.4	4.22E-09	1.70E-09
3/5/2009	41.4	5.4	4.5	1.15	152.6	21.2	3.99E-09	1.66E-09

Checked By: JB Date: 3/12/09

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-06
LAB ID NO.: L09012-06-02
MATERIAL: CETCO BENTOMAT SDN GCL
ROLL NO.: 745
LOT NO.: 200909CV

	SPECIMEN	TOTAL WT. AS REC'D grams	TOTAL WT. DRY grams	TOTAL WT. AS REC'D psf	TOTAL WT. DRY psf	WT. BACKING psf (1)	AS REC'D Bent Cont psf	DRY Bent Cont psf	MOISTURE CONTENT %	Bent Cont 12% m.c. psf
BENTONITE CONTENT ASTM D3776 & ASTM D5993	1	67.9	53.9	1.35	1.07	0.070	1.28	0.999	27.8	1.119
	2	68.0	53.3	1.35	1.06	0.070	1.28	0.987	29.5	1.106
	3	55.1	43.7	1.09	0.87	0.070	1.02	0.796	28.3	0.892
	4	55.9	43.8	1.11	0.87	0.070	1.04	0.799	29.9	0.895
	5	77.7	61.5	1.54	1.22	0.070	1.47	1.149	28.0	1.287
							AVERAGE:	**0.946**	**28.7**	**1.060**

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVG	STD
PEEL STRENGTH	D 6496	MD-lbs/in	4.0	8.0	7.7	2.9	6.1	**5.7**	2.23

* NOTES:1) Weight of carrier (geotextile) provided by CETCO spec. info: .

CHECKED BY: BF DATE: 3-3-09

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GCL INDEX FLUX & PERMEABILITY TEST

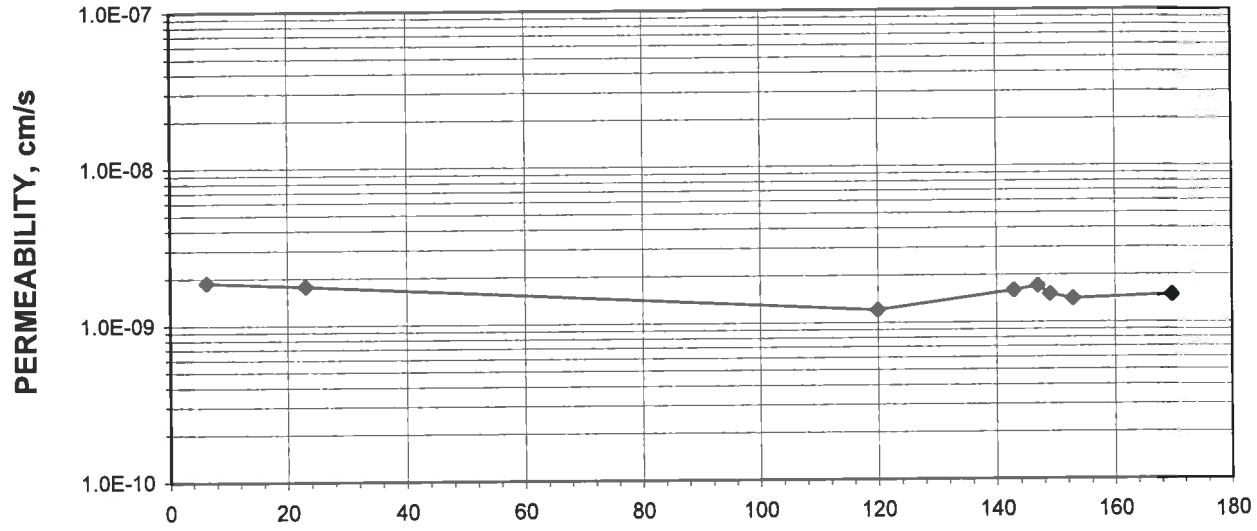
ASTM D 5887
(SOP-G52)

Lab ID No.	02	Material	BENTOMAT SDN
Client	RSGA	Roll I.D.:	745
Client Project	JOHNSTON CO.MSW LF PH. 4A	Lot No.:	NA
Project No.	L09012-06	Sample No.	NA

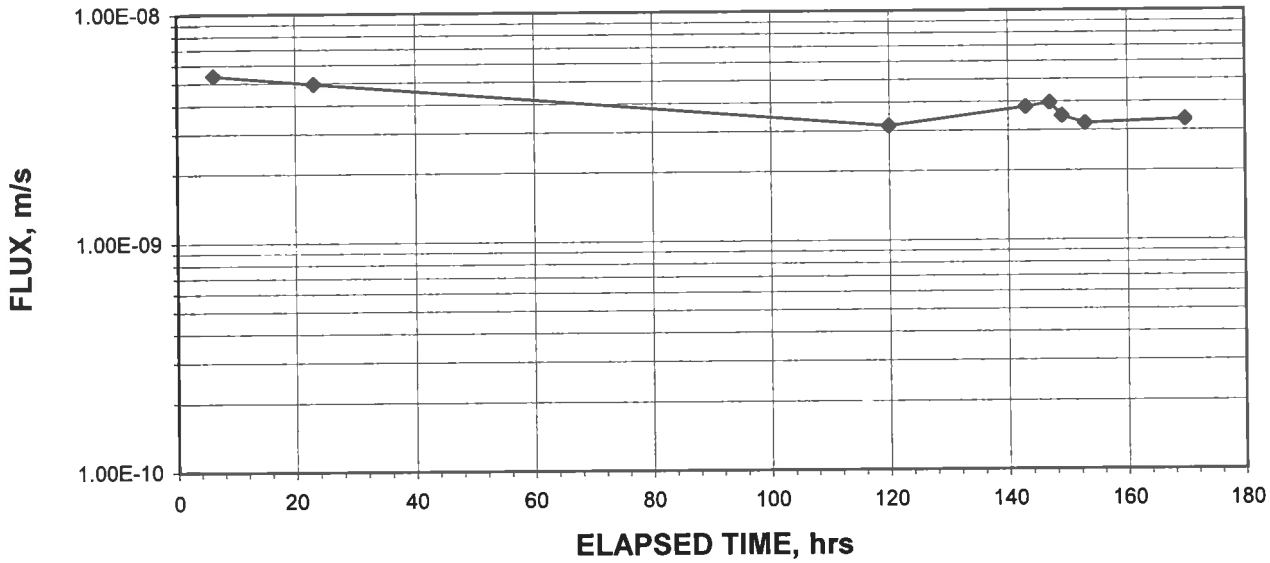
AVERAGE FLUX = 3.33E-09 m/s

AVERAGE PERMEABILITY = 1.46E-09 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



Checked By: QB Date: 3/13/09

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

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INTEGRITY IN TESTING

Lab ID No.	02	Tested by: JB	Date: 3/10/2009
Client	RSGA		
Client Project	JOHNSTON CO.MSW LF PH. 4A	Checked by: JB	Date: 3/13/09
Project No.	L09012-06		
Material	BENTOMAT SDN		
Roll I.D.:	745		
Lot No.:	NA		
Sample No.	NA		

Permeant: DEAIRED, DEIONIZED WATER

MOISTURE CONTENT:	**BEFORE TEST**	**AFTER TEST**
Tare Number	55	64
Wt. of Tare & GCL[2] (gm.)	89.83	97.25
Wt. of Tare & Dry GCL [2] (gm.)	73.61	54.88
Wt. of Tare (gm.)	10.94	10.92
Wt. of Water (gm.)	16.22	42.37
Wt. of Dry GCL (gm.) [2]	62.67	43.96
Moisture Content (%)	**25.9**	**96.4**

SPECIMEN:	**BEFORE TEST**	**AFTER TEST**
Wt. of GCL (gm.) [2]	58.04	90.55 (Calculated)
Clay Component Thickness 1 (in.) [1]	0.138	0.236
Clay Component Thickness 2 (in.) [1]	0.146	0.232
Clay Component Thickness 3 (in.) [1]	0.134	0.230
Average Clay Component Thickness (in.)	na	0.233
Average Clay Component Thickness (mm)	na	**5.910**
Specimen Dia. (in)	4.000	4.000
Specimen Area ($in.^2$)	12.57	12.57
Specimen Area (m^2)	0.00811	0.00811
Mass/Unit Area of GCL($gm./m^2$) [2]	7,157	11,165
Mass/Unit Area of GCL(psf) [2]	1.46	2.29
Mass/Unit Area of Dry GCL($gm./m^2$) [2]	5,685	
Mass/Unit Area of Dry GCL(psf) [2]	1.16	

NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

Geotechnics
INTEGRITY IN TESTING

L D No.	02
Client	RSGA
Client Project	JOHNSTON CO.MSW LF PH. 4A
Project No.	L09012-06
Material	BENTOMAT SDN
Roll I.D.:	745
Sample No.	NA

Pressure Heads (Constant)

Top Cap (psi)	75.0
Bottom Cap (psi)	77.0
Cell (psi)	80.0
Total Head (cm)	140.6

Final Sample Dimensions

Sample Length (cm), L	0.591
Sample Diameter (cm)	10.16
Sample Area (cm^2), A	**78.50**
Inflow Burette Area (cm^2), a-in	0.856
Outflow Burette Area (cm^2), a-out	0.855

AVERAGE FLUX = 3.33E-09 m/s
AVERAGE PERMEABILITY = 1.46E-09 cm/s @ 20oC

DATE	ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	RATIO ΔIN / ΔOUT	TOTAL HEAD h	TEMP.	INCREMENTAL FLUX @ 20°C	INCREMENTAL PERMEABILITY @ 20°C
(m-d-y)	(hr)	(cm^3)	(cm^3)	(3 readings)	(cm)	(°C)	(m/sec)	(cm/sec)
3/4/2009	0.0	0.0	0.0	NA	164.7	21.2	NA	NA
3/4/2009	6.3	0.8	1.1	NA	162.4	21.4	5.38E-09	1.87E-09
3/5/2009	23.1	3.0	3.6	0.83	157.0	21.2	4.94E-09	1.77E-09
3/9/2009	120.0	11.6	12.2	0.97	136.9	22.0	3.14E-09	1.20E-09
3/10/2009	142.9	14.0	14.7	0.99	131.2	22.0	3.78E-09	1.58E-09
3/10/2009	146.9	14.5	15.1	1.00	130.2	22.0	3.95E-09	1.70E-09
3/11/2009	146.9	14.5	15.1	1.25	129.4	22.0	NA	NA
3/11/2009	149.0	14.7	15.3	1.00	128.9	22.0	3.45E-09	1.50E-09
3/11/2009	152.8	15.1	15.6	1.20	128.1	22.0	3.20E-09	1.40E-09
3/12/2009	169.8	16.7	17.2	1.05	124.4	22.0	3.34E-09	1.48E-09

Checked By: JB Date: 3/13/09

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-06
LAB ID NO.: L09012-06-03
MATERIAL: CETCO BENTOMAT SDN GCL
ROLL NO.: 792
LOT NO.: 200909CV

	SPECIMEN	TOTAL WT. AS REC'D grams	TOTAL WT. DRY grams	TOTAL WT. AS REC'D psf	TOTAL WT. DRY psf	WT. BACKING psf (1)	AS REC'D Bent Cont psf	DRY Bent Cont psf	MOISTURE CONTENT %	Bent Cont 12% m.c. psf
BENTONITE CONTENT ASTM D3776 & ASTM D5993	1	66.3	53.2	1.31	1.05	0.070	1.24	0.984	26.5	1.102
	2	69.7	54.9	1.38	1.09	0.070	1.31	1.018	28.9	1.140
	3	53.8	42.7	1.07	0.85	0.070	1.00	0.776	28.5	0.869
	4	64.3	50.9	1.27	1.01	0.070	1.20	0.938	28.3	1.051
	5	61.8	48.7	1.22	0.97	0.070	1.15	0.896	28.8	1.004
							AVERAGE:	**0.923**	**28.2**	**1.033**

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVG	STD
PEEL STRENGTH	D 6496	MD-lbs/in	8.8	12.6	13.0	7.2	11.7	**10.7**	2.53

* NOTES:1) Weight of carrier (geotextile) provided by CETCO spec. info: .

CHECKED BY: BF DATE: 3-3-09

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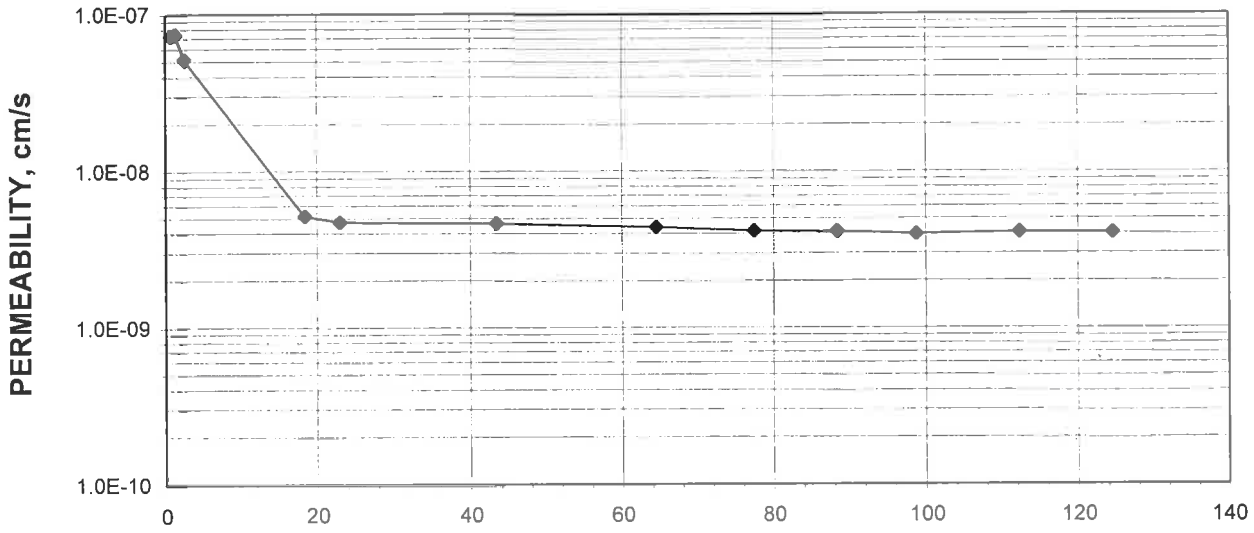
GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

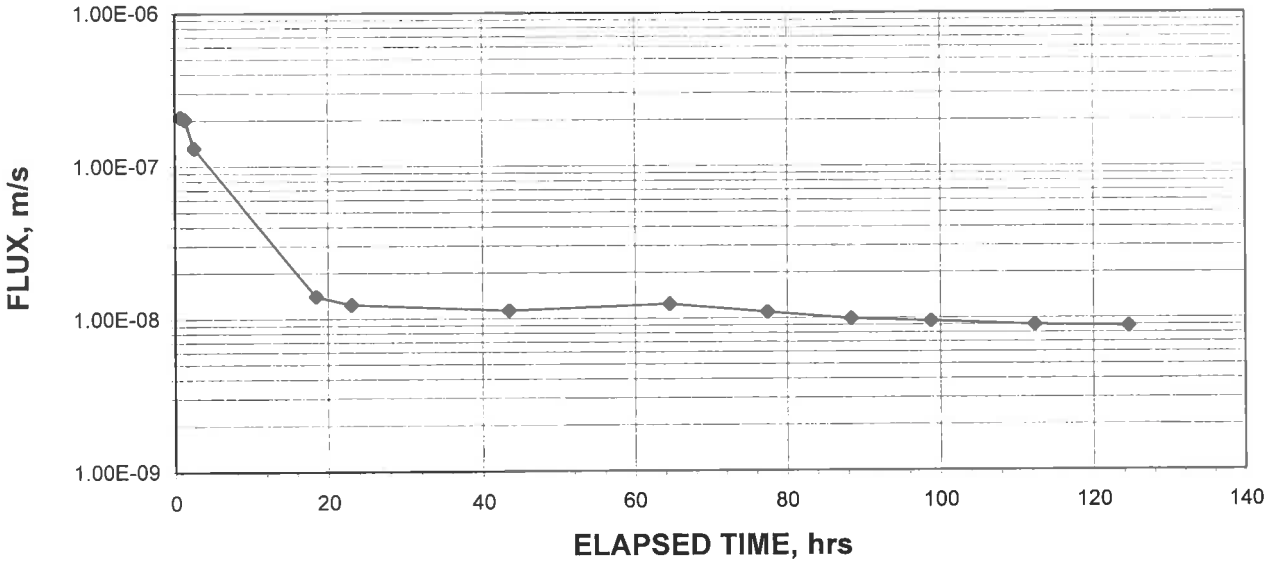
Lab ID No.	L09012-06-03	Material	BENTOMAT SDN
Client	RSGA	Roll I.D.:	792
Client Project	Johnston Co. MSW LF. Phase 4A	Lot No.:	NA
Project No.	L09012-06	Sample No.	NA

AVERAGE FLUX = 9.10E-09 m/s
AVERAGE PERMEABILITY = 4.04E-09 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



Checked By: KB Date: 3-12-09

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

Lab ID No.	L09012-06-03	Tested by: JCM	Date: 3/3/2009
Client	RSGA		
Client Project	Johnston Co. MSW LF. Phase 4A	Checked by: KB	Date: 3-12-09
Project No.	L09012-06		
Material	BENTOMAT SDN		
Roll I.D.:	792		
Lot No.:	NA		
Sample No.	NA		

Permeant: DEAIRED, DEIONIZED WATER

MOISTURE CONTENT:	**BEFORE TEST**	**AFTER TEST**
Tare Number	598	882
Wt. of Tare & GCL [2] (gm.)	214.62	200.18
Wt. of Tare & Dry GCL [2] (gm.)	187.35	151.09
Wt. of Tare (gm.)	84.74	110.35
Wt. of Water (gm.)	27.27	49.09
Wt. of Dry GCL (gm.) [2]	102.61	40.74
C Moisture Content (%)	**26.6**	**120.5**

SPECIMEN:	**BEFORE TEST**	**AFTER TEST**
Wt. of GCL (gm.) [2]	61.18	106.58 (Calculated)
Clay Component Thickness 1 (in.) [1]	0.128	0.201
Clay Component Thickness 2 (in.) [1]	0.156	0.216
Clay Component Thickness 3 (in.) [1]	0.015	0.241
Average Clay Component Thickness (in.)	na	0.219
Average Clay Component Thickness (mm)	na	**5.571**
Specimen Dia. (in)	4.000	4.000
Specimen Area (in.^{2})	12.57	12.57
Specimen Area (m^2)	0.00811	0.00811
Mass/Unit Area of GCL(gm./m^2) [2]	7,544	13,141
Mass/Unit Area of GCL(psf) [2]	1.54	2.69
Mass/Unit Area of Dry GCL(gm./m^2) [2]	5,960	
Mass/Unit Area of Dry GCL(psf) [2]	1.22	

NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

geotechnics
INTEGRITY IN TESTING

L D No.	L09012-06-03
Client	RSGA
Client Project	Johnston Co. MSW LF. Phase 4A
Project No.	L09012-06
Material	BENTOMAT SDN
Roll I.D.:	792
Sample No.	NA

Pressure Heads (Constant)

Top Cap (psi)	75.0
Bottom Cap (psi)	77.0
Cell (psi)	80.0
Total Head (cm)	140.6

Final Sample Dimensions

Sample Length (cm), L	0.557
Sample Diameter (cm)	10.16
Sample Area (cm^2), A	**78.50**
Inflow Burette Area (cm^2), a-in	0.907
Outflow Burette Area (cm^2), a-out	0.915

AVERAGE FLUX = 9.10E-09 m/s
AVERAGE PERMEABILITY = 4.04E-09 cm/s @ 20oC

DATE	ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	RATIO ΔIN/ΔOUT	TOTAL HEAD h	TEMP.	INCREMENTAL FLUX @ 20°C	INCREMENTAL PERMEABILITY @ 20°C
(m-d-y)	(hr)	(cm^3)	(cm^3)	(3 readings)	(cm)	(°C)	(m/sec)	(cm/sec)
3/6/2009	0.0	0.0	0.0	NA	165.1	20.0	NA	NA
3/6/2009	0.7	4.1	4.0	NA	156.2	20.0	2.10E-07	7.29E-08
3/6/2009	1.3	7.5	7.3	1.03	148.8	20.0	2.03E-07	7.44E-08
3/6/2009	2.5	12.2	11.8	1.04	138.7	20.0	1.32E-07	5.12E-08
3/6/2009	2.5	12.2	11.8	1.04	161.7	20.0	NA	NA
3/7/2009	18.4	18.9	17.7	1.14	147.8	19.0	1.40E-08	5.18E-09
3/7/2009	23.0	20.6	19.2	1.14	144.3	20.0	1.24E-08	4.72E-09
3/8/2009	43.4	27.2	25.6	1.05	130.0	19.5	1.13E-08	4.64E-09
3/8/2009	43.4	27.2	25.6	1.03	166.0	19.5	NA	NA
3/9/2009	64.5	34.7	32.9	1.03	149.7	20.0	1.24E-08	4.39E-09
3/9/2009	77.4	38.7	36.9	1.02	140.9	20.5	1.10E-08	4.16E-09
3/10/2009	88.3	41.8	39.9	1.01	134.2	18.8	9.89E-09	4.13E-09
3/10/2009	98.8	44.6	42.7	1.02	128.0	20.8	9.51E-09	3.97E-09
3/11/2009	112.3	48.1	46.1	1.02	120.5	19.5	8.99E-09	4.09E-09
3/11/2009	124.6	51.2	49.1	1.03	113.7	21.5	8.81E-09	4.05E-09

Checked By: KB Date: 3-12-09

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-06
LAB ID NO.: L09012-06-04
MATERIAL: CETCO BENTOMAT SDN GCL
ROLL NO.: 837
LOT NO.: 200909CV

	SPECIMEN	TOTAL WT. AS REC'D grams	TOTAL WT. DRY grams	TOTAL WT. AS REC'D psf	TOTAL WT. DRY psf	WT. BACKING psf (1)	AS REC'D Bent Cont psf	DRY Bent Cont psf	MOISTURE CONTENT %	Bent Cont 12% m.c. psf
BENTONITE CONTENT ASTM D3776 & ASTM D5993	1	58.9	45.6	1.17	0.90	0.070	1.10	0.835	31.5	0.935
	2	67.3	52.6	1.33	1.04	0.070	1.26	0.972	30.1	1.088
	3	76.3	59.0	1.51	1.17	0.070	1.44	1.100	31.2	1.232
	4	63.9	49.4	1.27	0.98	0.070	1.20	0.910	31.6	1.019
	5	68.2	53.0	1.35	1.05	0.070	1.28	0.980	30.7	1.098
							AVERAGE:	**0.959**	**31.0**	**1.074**

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVG	STD
PEEL STRENGTH	D 6496	MD-lbs/in	7.3	11.1	7.3	10.0	9.6	**9.1**	1.69

* NOTES:1) Weight of carrier (geotextile) provided by CETCO spec. info: .

CHECKED BY: BF DATE: 3-3-09

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

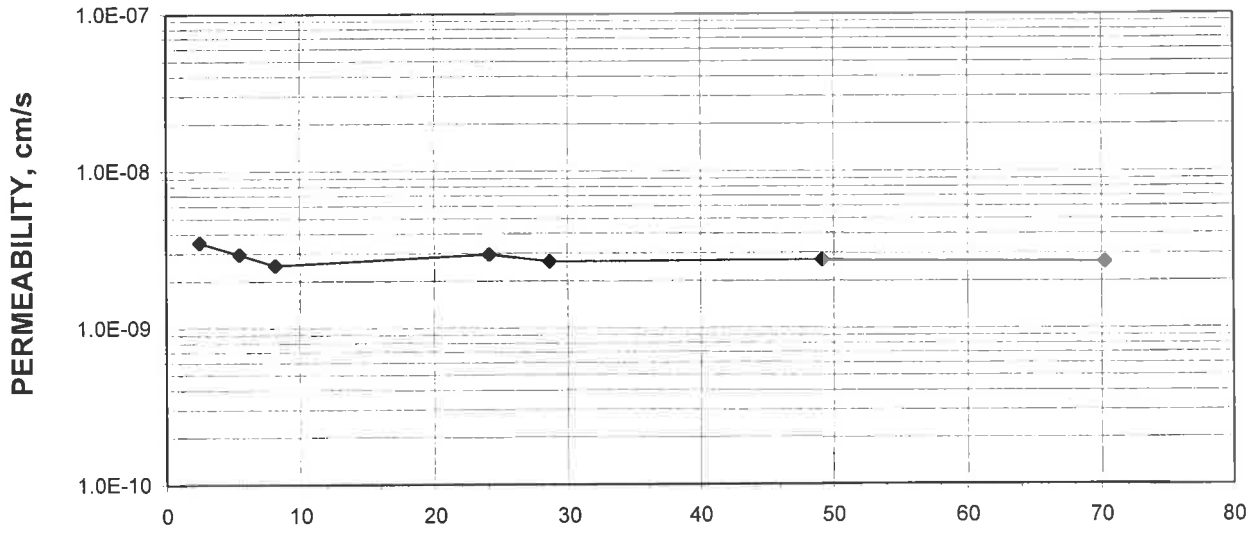
Geotechnics
INTEGRITY IN TESTING

Lab ID No.	L09012-06-04	Material	BENTOMAT SDN
Client	RSGA	Roll I.D.:	837
Client Project	Johnston Co. MSW LF. Phase 4A	Lot No.:	NA
Project No.	L09012-06	Sample No.	NA

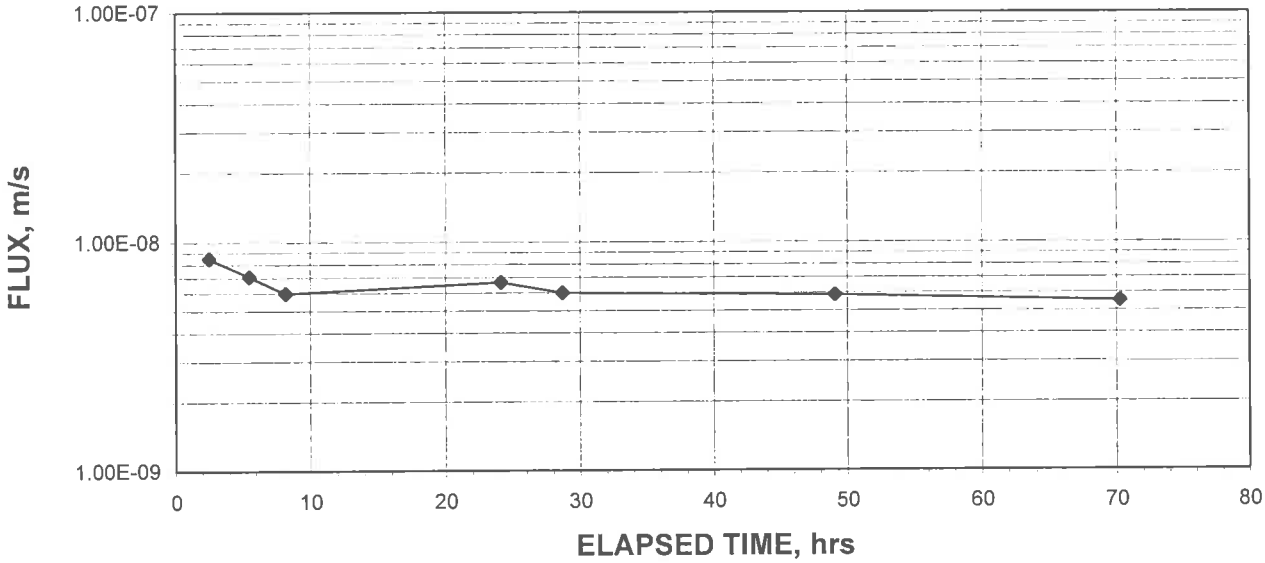
AVERAGE FLUX = 5.78E-09 m/s

AVERAGE PERMEABILITY = 2.67E-09 cm/s @ 20°C

PERMEABILITY VS. ELAPSED TIME



FLUX VS. ELAPSED TIME



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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

geotechnics
INTEGRITY IN TESTING

Lab ID No.	L09012-06-04	Tested by: JCM	Date: 3/3/2009
Client	RSGA		
Client Project	Johnston Co. MSW LF. Phase 4A	Checked by: KB	Date: 3-10-09
Project No.	L09012-06		
Material	BENTOMAT SDN		
Roll I.D.:	837		
Lot No.:	NA		
Sample No.	NA		

Permeant: DEAIRED, DEIONIZED WATER

MOISTURE CONTENT:	**BEFORE TEST**	**AFTER TEST**
Tare Number	Z	591
Wt. of Tare & GCL[2] (gm.)	186.06	187.34
Wt. of Tare & Dry GCL [2] (gm.)	162.32	133.76
Wt. of Tare (gm.)	73.64	87.35
Wt. of Water (gm.)	23.74	53.58
Wt. of Dry GCL (gm.) [2]	88.68	46.41
C Moisture Content (%)	**26.8**	**115.4**

SPECIMEN:	**BEFORE TEST**	**AFTER TEST**
Wt. of GCL (gm.) [2]	64.36	109.38 (Calculated)
Clay Component Thickness 1 (in.) [1]	0.141	0.258
Clay Component Thickness 2 (in.) [1]	0.142	0.291
Clay Component Thickness 3 (in.) [1]	0.135	0.265
Average Clay Component Thickness (in.)	na	0.271
Average Clay Component Thickness (mm)	na	**6.892**
Specimen Dia. (in)	4.000	4.000
Specimen Area (in.^{2})	12.57	12.57
Specimen Area (m^2)	0.00811	0.00811
Mass/Unit Area of GCL(gm./m^2) [2]	7,936	13,487
Mass/Unit Area of GCL(psf) [2]	1.62	2.76
Mass/Unit Area of Dry GCL(gm./m^2) [2]	6,260	
Mass/Unit Area of Dry GCL(psf) [2]	1.28	

NOTES: 1) Direct visual measurement of exposed clay at specimen perimeter.
2) Includes weight of the textile carriers.

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GCL INDEX FLUX & PERMEABILITY TEST

ASTM D 5887
(SOP-G52)

geotechnics
INTEGRITY IN TESTING

L D No.	L09012-06-04
Client	RSGA
Client Project	Johnston Co. MSW LF. Phase 4A
Project No.	L09012-06
Material	BENTOMAT SDN
Roll I.D.:	837
Sample No.	NA

Pressure Heads (Constant)	
Top Cap (psi)	75.0
Bottom Cap (psi)	77.0
Cell (psi)	80.0
Total Head (cm)	140.6

Final Sample Dimensions	
Sample Length (cm), L	0.689
Sample Diameter (cm)	10.16
Sample Area (cm^2), A	**78.50**
Inflow Burette Area (cm^2), a-in	0.912
Outflow Burette Area (cm^2), a-out	0.902

AVERAGE FLUX = 5.78E-09 m/s
AVERAGE PERMEABILITY = 2.67E-09 cm/s @ 20oC

DATE	ELAPSED TIME t	TOTAL INFLOW	TOTAL OUTFLOW	RATIO ΔIN/ΔOUT	TOTAL HEAD h	TEMP.	INCREMENTAL FLUX @ 20°C	INCREMENTAL PERMEABILITY @ 20°C
(m-d-y)	(hr)	(cm^3)	(cm^3)	(3 readings)	(cm)	(°C)	(m/sec)	(cm/sec)
3/6/2009	0.0	0.0	0.0	NA	166.1	20.0	NA	NA
3/6/2009	2.5	0.8	0.4	NA	164.8	20.0	8.49E-09	3.53E-09
3/6/2009	5.5	1.6	0.8	2.00	163.5	20.0	7.08E-09	2.96E-09
3/6/2009	8.2	2.2	1.1	2.00	162.5	20.0	5.97E-09	2.52E-09
3/7/2009	24.1	5.7	3.6	1.46	155.9	19.0	6.67E-09	2.95E-09
3/7/2009	28.7	6.6	4.3	1.36	154.2	20.0	5.98E-09	2.66E-09
3/8/2009	49.1	10.2	7.4	1.18	146.8	19.5	5.85E-09	2.71E-09
3/8/2009	49.1	10.2	7.4	1.18	146.8	19.5	NA	NA
3/9/2009	70.3	13.7	10.5	1.13	139.5	20.0	5.52E-09	2.65E-09

Checked By: KB Date: 3-10-09

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Appendix G

Leachate Management System CQA Data

G1. Manufacturer's Product Data Submittals and Quality Control Certificates

G2. CQA Test Results - Drainage Aggregate

G3. CQA Test Results - Protective Cover

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Martin Marietta Aggregates

Raleigh District
2700 Wycliff Rd Ste 104
Raleigh NC, 27607
Telephone 919/787-9504
Fax 919/787-9577

July 6, 2009

Attn: Rick Williams

RE: Spec on Materials
Johnston County Landfill

Dear Customer:

This letter will certify that the granite #57 stone at our **Benson Quarry** meets the specifications of the North Carolina Department of Transportation's Standard Specifications for Roads and Structures.

Thank you for the opportunity to furnish your crushed stone requirements.

Sincerely,

Jason E Phillips
Sales Representative

NORTH CAROLINA
WAKE COUNTY

Sworn to and subscribed before me
This 6th day of July 2009.

CYNTHIA ANN BENTKOWSKI
NOTARY PUBLIC
WAKE COUNTY, NC
My Commission Expires 7-24-2012

Cynthia Ann Bentkowski Notary Public

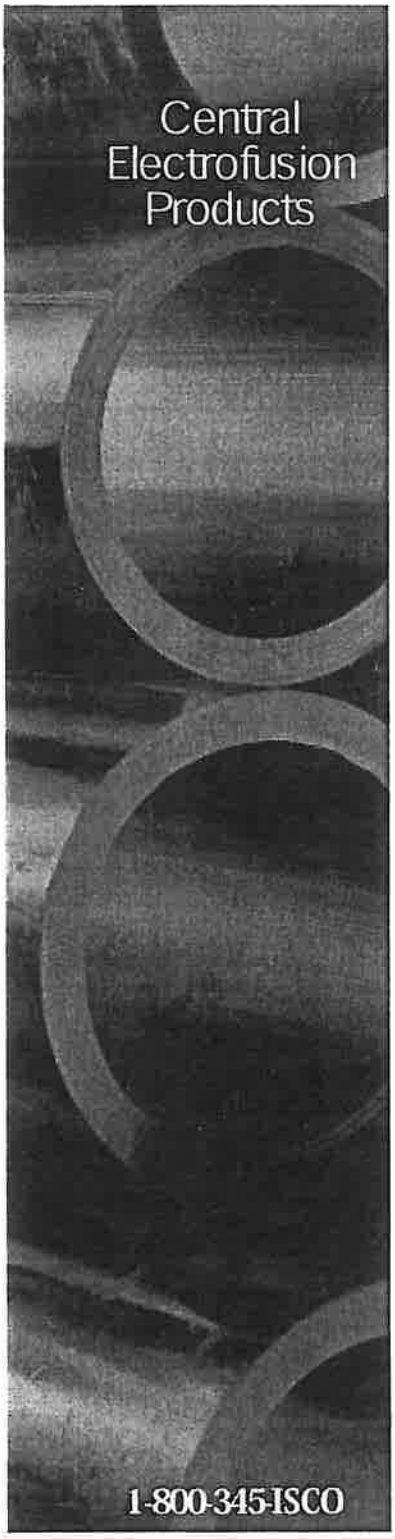
My commission expires 7/24/20012.

Martin Marietta Materials

Basic Quality Statistical Summary Report

Plant 44206-Benson
Product 0570-#57
Specification #57

Sieve/Test	Tests	Average	St Dev	Target	Specification
1 1/2" (37.5mm)	37	100.0	0.0		100
1" (25mm)	37	100.0	0.1		95-100
3/4" (19mm)	37	90.2	2.8		
1/2" (12.5mm)	37	39.8	8.3		25-60
3/8" (9.5mm)	37	16.9	6.6		
#4 (4.75mm)	37	2.9	1.4		0-10
#8 (2.36mm)	37	1.7	0.5		0-5
PAN (0um)	37	0.00	0.00		



Central Electrofusion Products

A pioneer in electrofusion technology, Central Plastics continues to break new ground in the field. Today, Central is a leading manufacturer of electrofusion fittings and equipment. Central offers a large assortment of sizes and fitting types to meet many applications and a variety of electrofusion processors designed for different customer requirements. Central also offers a line of complimentary accessories.

Central is committed to customer satisfaction, offering extensive field services and technical support to end-users. Working hand-in-hand with the industry has made Central a leader in solving PE piping problems.

To assure the highest quality product, Central is vertically integrated, with most manufacturing processes in-house. Much of their manufacturing equipment is of proprietary design. Their in-house, state-of-the-art tool and die designs provide consistent precision through all production stages.

Worldwide standards and testing requirements are met on all products, and Central is ISO 9001 certified. Central Electrofusion Fittings meet worldwide standards including ASTM, AWWA, J.I.S., K.S., B.G. and ISO. Strict and precise quality control tests are performed on all molded fittings throughout production runs.

Central maintains a complete testing laboratory on-site. They utilize state-of-the-art equipment and highly trained personnel. Hot bath testing allows Central to test fittings and connections in accordance with industry standards. Tensile pull and quick burst are other common tests performed on PE products.

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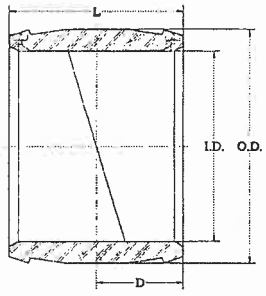
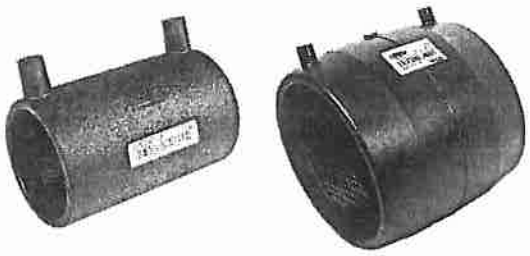
3408 Electrofusion Couplings - 1/2" to 12" IPS/DIPS





Part Number	Nominal Size	Pin	Fusion Time Setting	Weight Lbs.	I.D. Max.	I.D. Min.	O.D Nom.	Stab Depth Nom.	Height Nom.	Length Nom.
5760019	1/2" CTS	4.7mmR	A	0.12	0.633	0.615	1.13	1.36	2.01	3.15
5757546	1/2" IPS AWWA	4.7mmR	A	0.138	0.854	0.834	1.38	1.42	2.15	2.98
5757515	3/4" CTS AWWA	4.7mmR	A	0.15	0.89	0.87	1.38	1.42	2.15	2.98
5760022	3/4" IPS AWWA	4.7mmR	A	0.18	1.073	1.065	1.72	1.36	2.48	3.46
5760023	1" CTS AWWA	4.7mmR	A	0.2	1.142	1.132	1.72	1.36	2.52	3.46
5750639	1" IPS AWWA	4.7mmR	A	0.2	1.331	1.321	1.88	1.57	2.63	3.46
5760026	1 1/4" IPS AWWA	4.7mmR	A	0.3	1.69	1.675	2.27	1.82	3.04	3.86
5754049	1 1/4" SIDR	3.0mm	A	0.331	1.595	1.62	2.27	1.82	3.0	3.7
5754075	1 1/4 " Duct	3.0mm	A	0.324	1.520	1.490	2.27	1.82	3.0	3.7
5760028	1 1/2 IPS AWWA	4.7mmR	A	0.395	1.917	1.907	2.6	1.89	3.36	4.33
5756611*	2" CTS AWWA	Solid/4.7	M	0.305	2.145	2.13	2.80	2.125	3.59	4.37
5760030	2" IPS AWWA	4.7mmR	A	0.582	2.42	2.395	3.16	2.09	3.78	4.72
5756062	2" IPS Conduit	3.0mm	A	0.305	2.42	2.4	2.82	2.09	3.55	4.31
5754047	2 1/2" Conduit	3.0mm	A	0.552	2.956	2.894	3.5	2.06	4.17	4.25
10000358	3" IPS AWWA	4.7mmR	A	1.263	3.56	3.545	4.54	2.72	5.18	5.59
10000360	4" IPS FM (CL 200) AWWA	4.7mmR	A	2.547	4.545	4.51	5.57	3.0	6.51	6.14
5751970	4 DIPS AWWA	Solid/4.7	M	2.673	4.846	4.810	6.06	3.46	6.06	6.03
5750661*	5" IPS (140 mm)	Solid/4.7	A	3.08	5.547	5.524	6.93	3.54	7.56	7.17
10000359	6" IPS FM (CL 200) AWWA	4.7mmR	A	4.94	6.69	6.655	8.17	4.1	8.7	8.35
5751071*	6" DIPS AWWA	Solid/4.7	M	6.513	6.94	6.91	8.74	4.09	8.74	8.19
5750867	7" IPS	3.0mm	A	4.85	7.145	7.105	8.74	4.09	8.04	7.19
10000361	8" IPS FM (CL 200) AWWA	4.7mmR	A	7.125	8.7	8.67	10.63	4.7	11.2	9.48
5751972*	8" DIPS AWWA	Solid/4.7	M	11.875	9.105	9.075	11.14	5.08	11.14	10.16
5757544	10 IPS FM (CL 150) AWWA	4.7mmR	A	16.8	10.801	10.766	13.25	5.0	13.41	10.5
10000362	10 IPS FM (CL 200) AWWA	Solid/4.7	M	16.8	10.801	10.766	13.25	5.0	13.41	10.5
5751973*	10" DIPS AWWA	Solid/4.7	M	19	11.071	11.031	13.7	5.5	13.7	11.0
5757545	12" IPS FM (CL 150) AWWA	4.7mmR	A	25.2	12.795	12.74	15.7	5.5	15.84	11.5
10000363	12" IPS FM (CL 200) AWWA	Solid/4.7	M	25.5	12.795	12.74	15.7	5.5	15.84	11.5
5751974*	12 DIPS AWWA	Solid/4.7	M	31.5	13.162	13.122	16.2	6.5	16.2	13.1

A=Automatic Identification for Fusion Time. M=Manual Setting or Bar Code Setting.
* Special Lead Requirements.

Central Electrofusion Products

1-800-345-ISCO

www.isco-pipe.com

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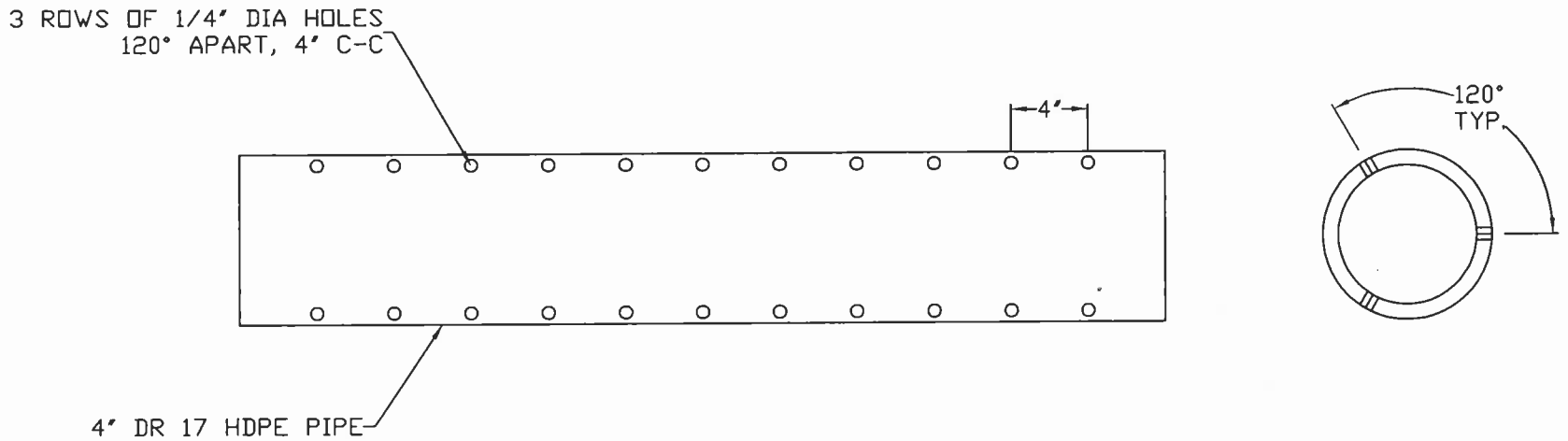
4" DR 17 PERFORATION PATTERN

LEACHATE DETECTION PIPING



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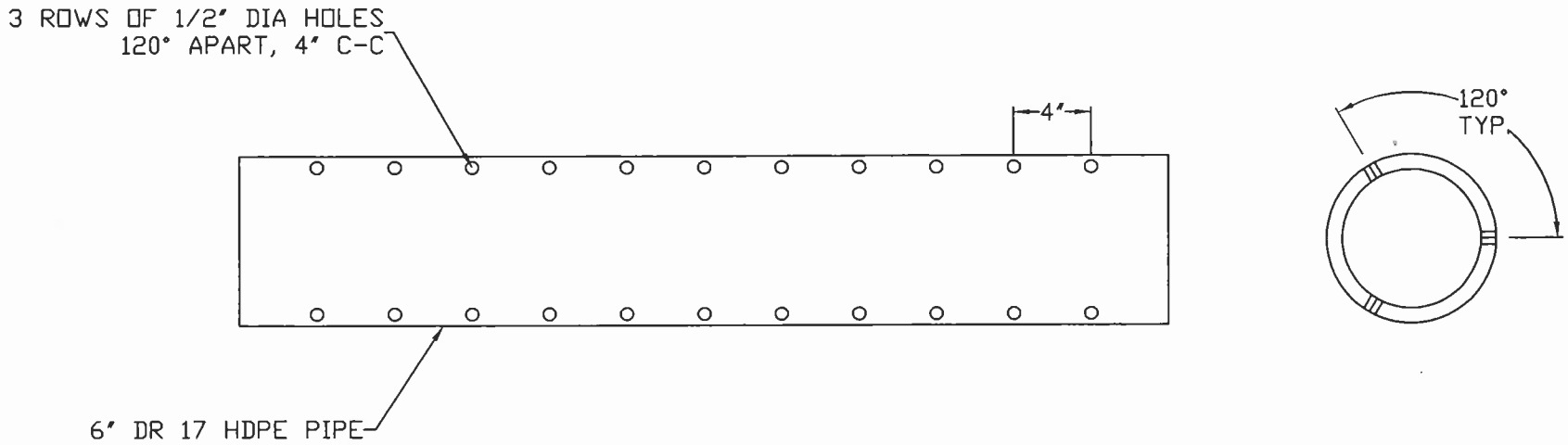
NLA	11/21/08	NO.	DESCRIPTION	DATE

6" DR 17 PERFORATION PATTERN 1

LEACHATE COLLECTION PIPING



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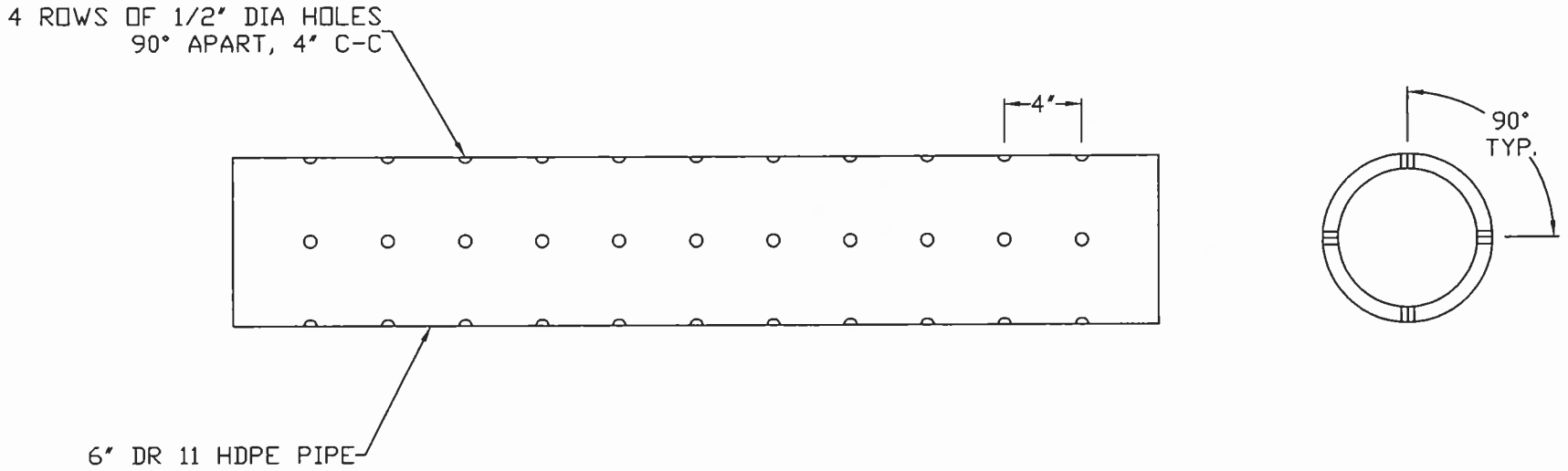
6" DR 17 PERFORATION PATTERN 2

GAS COLLECTION PIPING



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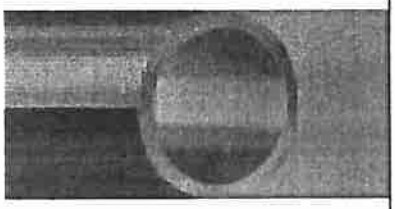
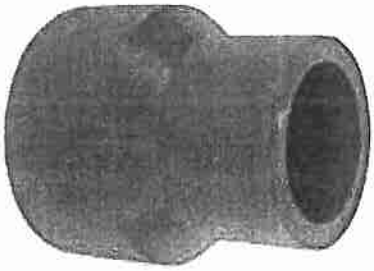
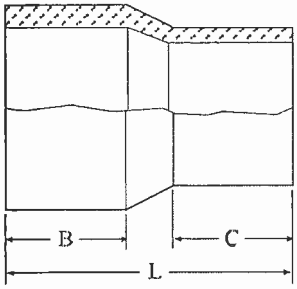


IPS
HDPE
Fittings

IPS Fittings Concentric Reducer





IPS Fittings Concentric Reducer

Nominal Size(in)	Pipe OD(in)	DR	Pressure Rating	Part #	Dimensions L (in)	B (in)	C (in)	Weight Lbs.	Shipping Method
1 x 3/4	1.315 x 1.05	09	200	ISMFCR01X3/49.3	4.5	1.5	2.5	0.1	UPS
		11	160	ISMFCR01X3/411	"	"	"	"	"
1-1/4 x 1	1.66 x 1.315	11	160	ISMFCR01 25X111	4.3	1.8	1.25	0.1	UPS
1-1/2 x 3/4	1.9 x 1.05	09	200	ISMFCR01 5X3/49I	5.688	2.5	2.5	0.2	UPS
		11	160	ISMFCR01 5X3/411	"	"	"	"	"
1-1/2 x 1	1.9 x 1.315	09	200	ISMFCR01 5X01 93I	6	3.25	1.25	0.2	UPS
		11	160	ISMFCR01 5X0111	"	"	"	"	"
1-1/2 x 1-1/4	1.9 x 1.66	11	160	ISFFCR01.5X1.25	4	1.88	2	0.2	UPS
2 x 3/4	2.375 x 1.05	11	160	ISMFCR02X07511I	6.25	3.25	1.25	0.3	UPS
2 x 1	2.375 x 1.315	11	160	ISMFCR02X0111IP	6.25	3.25	1.25	0.3	UPS
2 x 1-1/4	2.375 x 1.66	11	160	ISMFCR02X01 2511	6.25	3.25	2.25	0.3	UPS
2 x 1-1/2	2.375 x 1.9	09	200	ISMFCR02X01 509I	7	3	2.5	0.3	UPS
		11	160	ISMFCR02X01 511I	"	"	"	"	"
3 x 2	3.5 x 2.375	09	200	ISMFCR03X0209IP	6.75	3	2.5	0.7	UPS
		11	160	ISMFCR03X0211IP	"	"	"	"	"
4 x 2	4.5 x 2.375	11	160	ISMFCR04X0211IP	7.5	3	2.5	1.2	UPS
		17	100	ISMFCR04X021 7IP	"	"	"	0.8	"
4 x 3	4.5 x 3.5	09	200	ISMFCR04X0309IP	7.25	2.75	2.75	4	UPS
		11	160	ISMFCR04X0311IP	"	"	"	3	"
		17	100	ISMFCR04X031 7IP	"	"	"	2	"
5 x 4	5.563 x 4.5	11	160	ISMFCR05X0411IP	3.75	1.75	1.25	2.5	UPS
6 x 3	6.625 x 3.5	11	160	ISMFCR06X0311IP	11.42	5.12	3.94	3	UPS
		17	100	ISMFCR06X031 7IP	"	"	"	2	"
6 x 4	6.625 x 4.5	09	200	ISMFCR06X0409IP	11	4.5	3.5	4	UPS
		11	160	ISMFCR06X0411IP	"	"	"	3.5	"
		17	100	ISMFCR06X041 7IP	"	"	"	2.4	"
6 x 5	6.625 x 5.563	11	160	ISMFCR06X0511IP	3.75	1.75	1.25	2.5	UPS
8 x 6	8.625 x 6.625	09	200	ISFFCR08X0609IP	12	4.5	4	9	UPS
		11	160	ISMFCR08X0611IP	"	"	"	7.3	"
		17	100	ISMFCR08X061 7IP	"	"	"	5	"
10 x 8	10.75 x 8.625	09	200	ISFFCR10X0809IP	16	6	6	16	UPS
		11	160	ISFFCR10X0811IP	"	"	"	13	"
		17	100	ISFFCR10X081 7IP	"	"	"	9	"
12 x 8	12.75 x 8.625	11	160	ISFFCR12X0811IP	16	6	6	19	UPS
		17	100	ISFFCR12X081 7IP	"	"	"	13	"
12 x 10	12.75 x 10.75	09	200	ISFFCR12X1009IP	16	6	6	25	UPS
		11	160	ISFFCR12X1011IP	"	"	"	21	"
		17	100	ISFFCR12X101 7IP	"	"	"	14	"
14 x 12	14.0 x 12.75	09	200	ISFFCR14X1209IP	18	7	7	34	UPS
		11	160	ISFFCR14X1211IP	"	"	"	28	"
		17	100	ISFFCR14X121 7IP	"	"	"	19	"
16 x 14	16.0 x 14.0	09	200	ISFFCR16X1409IP	18	7	7	43	UPS
		11	160	ISFFCR16X1411IP	"	"	"	36	"

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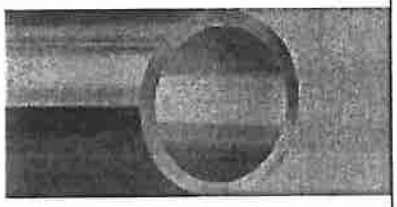
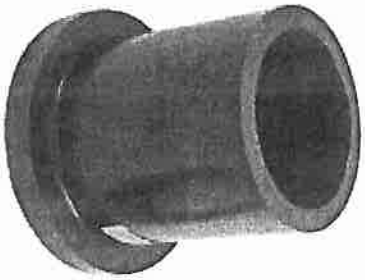
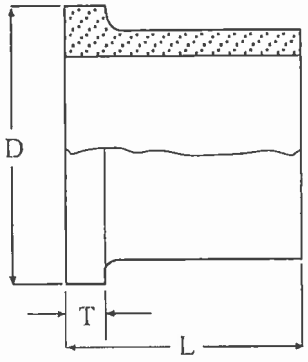


IPS
HDPE
Fittings

IPS Fittings Flange Adapter





IPS Fittings Flange Adapter

Nominal Size(in)	Pipe OD(in)	DR	Pressure Rating	Part #	Dimensions D (in)	T (in)	L (in)	Weight Lbs.	Shipping Method
3/4	1.05	11	160	ISMFFA07511IPS	1.85	0.39	4	0.05	UPS
1	1.315	11	160	ISMFFA0111IPS	2.4	0.39	4	0.08	UPS
1-1/4	1.66	11	160	ISMFFA01251IPS	2.75	0.39	4	0.14	UPS
1-1/2	1.9	11	160	ISMFFA0151IPS	3.125	0.39	4	0.21	UPS
2	2.375	09	200	ISMFFA0209IPS	3.9	0.45	6	0.5	UPS
		11	160	ISMFFA0211IPS	"	"	"	0.4	"
3	3.5	09	200	ISMFFA0309IPS	5	0.6	6	1	UPS
		11	160	ISMFFA0311IPS	"	"	"	1	"
		17	100	ISMFFA0317IPS	"	"	"	1	"
4	4.5	09	200	ISMFFA0409IPS	6.6	1	6	2	UPS
		11	160	ISMFFA0411IPS	"	"	"	2	"
		17	100	ISMFFA0417IPS	"	"	"	2	"
6	6.625	09	200	ISMFFA0609IPS	8.5	1.1	8	5	UPS
		11	160	ISMFFA0611IPS	"	"	"	5	"
		17	100	ISMFFA0617IPS	"	"	"	4	"
		26	64	ISMFFA0626IPS	"	"	"	3	"
8	8.625	09	200	ISMFFA0809IPS	10.6	1.5	9	10	UPS
		11	160	ISMFFA0811IPS	"	"	"	9	"
		17	100	ISMFFA0817IPS	"	"	"	7	"
		26	64	ISMFFA0826IPS	"	"	"	5	"
10	10.75	09	200	ISMFFA1009IPS	12.75	1.35	12	20	UPS
		11	160	ISMFFA1011IPS	"	"	"	18	"
		17	100	ISMFFA1017IPS	"	"	"	14	"
		26	64	ISMFFA1026IPS	"	"	"	12	"
12	12.75	09	200	ISMFFA1209IPS	15.5	1.55	12	25	UPS
		11	160	ISMFFA1211IPS	"	"	"	24	"
		17	100	ISMFFA1217IPS	"	"	"	19	"
		26	64	ISMFFA1226IPS	"	"	"	14	"
14	14	09	200	ISMFFA1409IPS	17.5	1.5	12	30	UPS
		11	160	ISMFFA1411IPS	"	"	"	27	"
		17	100	ISMFFA1417IPS	"	"	"	19	"
16	16	09	200	ISMFFA1609IPS	20	1.75	12	35	UPS
		11	160	ISMFFA1611IPS	"	"	"	31	"
		17	100	ISMFFA1617IPS	"	"	"	23	"
		26	64	ISMFFA1626IPS	"	"	"	17	"
18	18	09	200	ISMFFA1809IPS	21.1	2	12	42	UPS
		11	160	ISMFFA1811IPS	"	1.82	"	36	"
		17	100	ISMFFA1817IPS	"	"	"	26	"
		26	64	ISMFFA1826IPS	"	"	"	19	"

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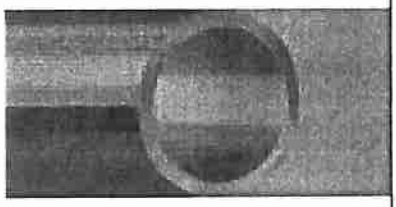
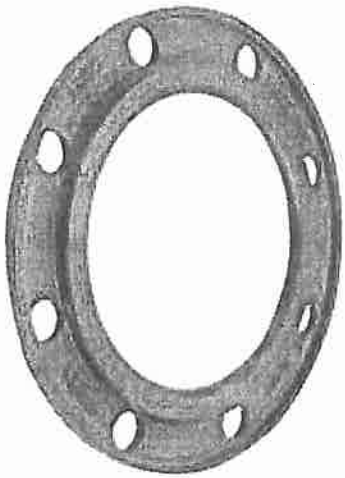
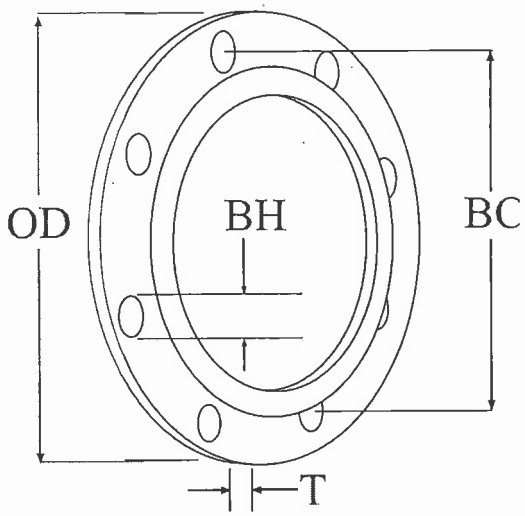


IPS
HDPE
Fittings

IPS Fittings Back Up Rings (For use with the Flange Adapter)





IPS Fittings Back Up Ring

Nominal Size(in)	Pipe OD(in)	Material	Part #	Dimensions OD (in)	T(in)	Bolts(#)	BH(in)	BC(in)	Weight Lbs.	Shipping Method
3/4	1.0	Ductile Iron	BU003/4DI	3.875	0.5	4	0.625	2.75	1	UPS
		Stainless Steel	BU003/4SS	"	0.5	"	"	"	1	"
1	1.315	Ductile Iron	BU01DI	4.25	0.56	4	0.625	3.125	1	UPS
		Stainless Steel	BU01SS	"	0.56	"	"	"	2	"
1 1/4	1.66	Ductile Iron	BU011/4DI	4.625	0.63	4	0.625	3.5	2	UPS
		Stainless Steel	BU011/4SS	"	0.6	"	"	"	2	"
1 1/2	1.9	Ductile Iron	BU011/2DI	5	0.69	4	0.625	3.875	2	UPS
		Stainless Steel	BU011/2SS	"	0.69	"	"	"	2	"
2	2.375	Ductile Iron	BU02IPS	6	0.5	4	0.75	4.75	1.5	UPS
		PP Coated DI	BU02IPSPP	"	0.71	"	"	"	1.6	"
		Stainless Steel	BU02SS316	"	0.4	"	"	"	2	"
3	3.5	Ductile Iron	BU03IPS	7.5	0.53	4	0.75	6	2.5	UPS
		PP Coated DI	BU03IPSPP	"	0.71	"	"	"	2.2	"
		Stainless Steel	BU03SS316	"	0.94	"	"	"	5	"
4	4.5	Ductile Iron	BU04IPS	9	0.55	8	0.75	7.5	3.5	UPS
		PP Coated DI	BU04IPSPP	"	0.71	"	"	"	2.8	"
		Stainless Steel	BU04SS	"	0.94	"	"	"	6	"
6	6.625	Ductile Iron	BU06IPS	11	0.63	8	0.875	9.5	4.5	UPS
		PP Coated DI	BU06IPSPP	"	0.79	"	"	"	4.1	"
		Stainless Steel	BU06SS316	"	1	"	"	"	8.5	"
8	8.625	Ductile Iron	BU08IPS	13.5	0.85	8	0.875	11.75	8	UPS
		PP Coated DI	BU08IPSPP	"	1.1	"	"	"	8.2	"
		Stainless Steel	BU08SS316	"	1.12	"	"	"	12	"
10	10.75	Ductile Iron	BU10IPS	16	0.98	12	1	14.25	12	UPS
		PP Coated DI	BU10IPSPP	"	1.22	"	"	"	11.3	"
		Stainless Steel	BU10SS	"	1.19	"	"	"	20.1	"
12	12.75	Ductile Iron	BU12IPS	19	1.25	12	1	17	20	UPS
		PP Coated DI	BU12IPSPP	"	1.61	"	"	"	19.3	"
		Stainless Steel	BU12SS316	"	1.25	"	"	"	24	"

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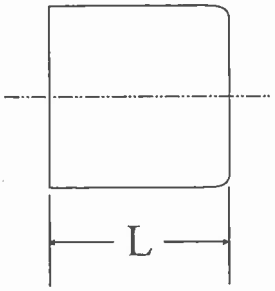
IPS Fittings Cap



IPS Fittings Cap

Nominal Pipe Size(in)	OD(in)	DR	Pressure Rating	Part #	Dimensions L (in)	Weight Lbs	Shipping Method
3/4	1.05	11	160	ISMFCP0751IIPS	2.375	0.05	UPS
1	1.315	11	160	ISMFCP0111IIPS	2.375	0.1	UPS
1 1/4	1.66	11	160	ISMFCP01251IIPS	2.25	0.1	UPS
1 1/2	1.9	11	160	ISMFCP0151IIPS	2.83	0.25	UPS
2	2.375	09	200	ISMFCP0209IPS	3.25	0.3	UPS
		11	160	ISMFCP0211IPS	"	"	"
3	3.5	09	200	ISMFCP0309IPS	3.25	0.8	UPS
		11	160	ISMFCP0311IPS	"	"	"
4	4.5	09	200	ISMFCP0409IPS	5.5	2	UPS
		11	160	ISMFCP0411IPS	"	"	"
6	6.625	09	200	ISMFCP0609IPS	4.5	3	UPS
		11	160	SMFCP0611IPS	"	"	"
8	8.625	11	160	ISMFCP0811IPS	4.75	4.4	UPS
10	10.75	11	160	ISMFCP1011IPS	4	13	UPS
12	12.75	11	160	ISMFCP1211IPS	4	18	UPS
14	14.00	7	267	ISFFCP1407IPS	4	21	UPS
		11	160	ISFFCP1411IPS	"	21	"
		7	267	ISFFCP1407IPSLG	16	53	UPS
		11	160	ISFFCP1411IPSLG	"	44	"
16	16.00	7	267	ISFFCP1607IPS	5	35	UPS
		11	160	ISFFCP1611IPS	4	28	"
		7	267	ISFFCP1607IPSLG	16	76	UPS
		11	160	ISFFCP1611IPSLG	"	57	"
18	18.00	7	267	ISFFCP1807IPS	5	44	UPS
		11	160	ISFFCP1811IPS	5	44	"
		7	267	ISFFCP1807IPSLG	16	96	UPS
		11	160	ISFFCP1811IPSLG	"	81	"
20	20.00	7	267	ISFFCP2007IPS	6	65	UPS
		11	160	ISFFCP2011IPS	5	55	"
		7	267	ISFFCP2007IPSLG	16	130	LTL
		11	160	ISFFCP2011IPSLG	"	100	"
22	22.00	7	267	ISFFCP2207IPS	6	79	UPS
		11	160	ISFFCP2211IPS	5	66	"
		7	267	ISFFCP2207IPSLG	16	157	LTL
		11	160	ISFFCP2211IPSLG	"	121	"
24	24.00	11	160	ISFFCP2411IPS	6	94	UPS
		11	160	ISFFCP2411IPSLG	16	159	LTL

IPS
HDPE
Fittings

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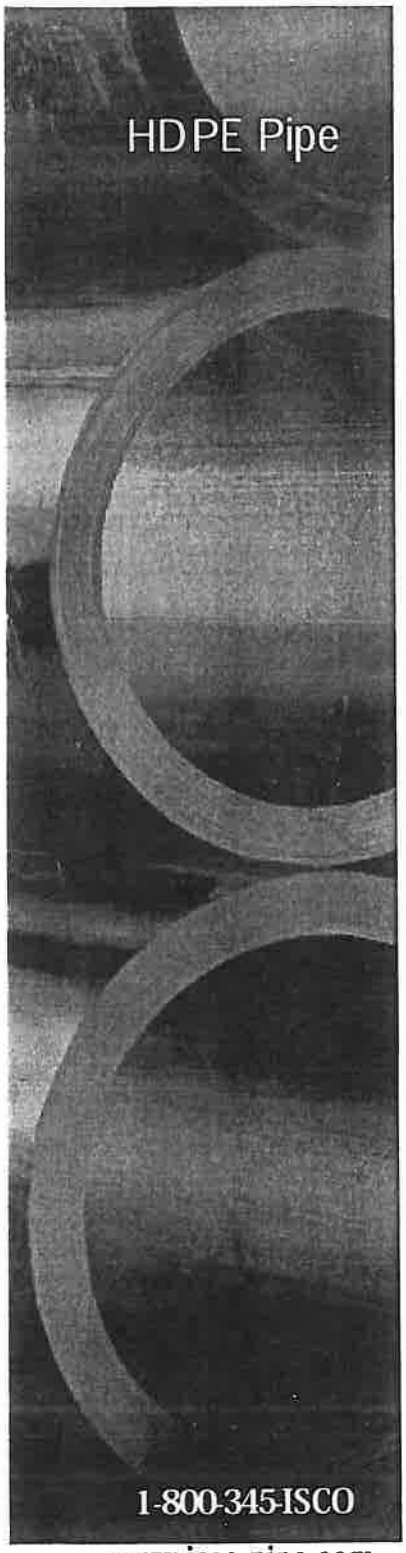

High-Density Polyethylene Pipe

Introduction

ISCO Industries, LLC is the largest high-density polyethylene pipe distributor in North America. ISCO can serve your needs anywhere in the USA and internationally. ISCO offers a complete package of HDPE piping products. Butt fusion machines are offered for sale or rental. Fusion technicians are available to provide on-site training or assistance to your project. Please call 1-800-345-ISCO for all your HDPE piping needs.

Some of The Characteristics of HDPE Pipe are:

- Economical
- Corrosion Resistant
- Zero Leak-Rate
- Hydraulically Smooth
- Fatigue and Surge Resistant
- Long Design Life
- Tappable
- Chemically Resistant
- Easily Installed
- Small to Large Diameters
- Non-Toxic, Non-Tasting
- Lightweight
- Reliable
- Flexible and Coilable
- Heat Fused
- Mechanically Joined (As Needed)
- Strong and Ductile
- Weather Resistant
- Impact Resistant
- Freeze Resistant
- Durable
- Abrasion Resistant
- Inert
- Self Restrained Pipe (Monolithic)
- Listed and Approved

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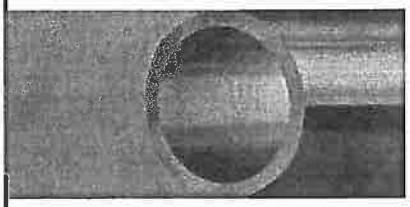
Markets and Standards for High-Density Polyethylene Pipe

User	Applications	Special Requirements
Landfills	Gas Collection Systems	ASTM D 2513
	Leachate Collection Systems	ASTM F 714
	Perforated Pipe	
	Dual Containment Piping	State requirements
		EPA listed chemicals
Industrial	Underground Fire Protection Piping	Factory Mutual
	Pulp & Paper/Wood Products	ASTM D 3350 & F 714
	Acid Sewers	ASTM D 3350 & F 714
	Slurry Piping	ASTM D 3350 & F 714
	Power Plant	ASTM D 3350 & F 714
	Caustic Sewers	ASTM D 3350 & F 714
	Potable Water	NSF 61, ASTM D 3350
	Raw Water	ASTM D 3350
	Dual Containment Piping	EPA & State requirements
Irrigation	Golf Course	ASTM D 3350
	Industrial	ASTM D 3350
Municipal	Drinking Water	NSF 61, AWWA C 906 & ASTM D 3350
	Sanitary Sewers	ASTM D 3350
	Reclaimed Water	ASTM D 3350
	Spray Fields	ASTM D 3350
	Gas Distribution Piping	ASTM D 2513 & DOT
	Ocean Outfalls	ASTM D 3350
Trenchless Installations		
	Pipe Bursting	ASTM D 3350
	Directional Drilling	ASTM F 1962
	Sliplining	ASTM F 585
Highway Drainage		
	Culvert Rehabilitation	ASTM D 3350, State DOT
Geothermal	Heating and Cooling Systems	IGSHPA
Oil & Gas Gathering		
	Gas Gathering	ASTM D 2513
	Salt Water	ASTM D 3350
Electrical/Telecommunications		
	Conduit	ASTM D 3350, UL
	Telecommunications	ASTM D 3350
Fittings	Molded	ASTM D 3261-97
	Fabricated	ASTM F 2206
	Electrofusion	ASTM F 1055



HDPE Pipe

1-800-345-ISCO

www.isco-pipe.com

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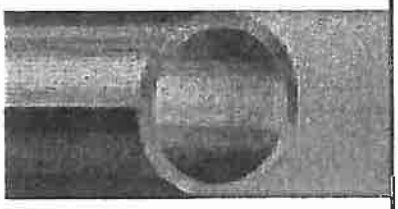

HDPE Pipe

Specifications for HDPE Pipe

The properties of high-density polyethylene pipe are described using ASTM D 3350-02, "Standard Specification for Polyethylene Plastic Pipe and Fittings Materials". This ASTM Standard provides cell classifications that define the physical properties of the resin used to make the HDPE pipe.

Most HDPE pipe is made with a cell classification of PE 345464C. The meaning of this cell classification is provided in the table below:

ISCO Standard HDPE Resin Specifications

PROPERTY VALUE		SPECIFICATION	UNIT	NOMINAL
Material Designation		PPI / ASTM		PE3408
Material Classification		ASTM D 1248		III C 5 P34
Cell Classification		ASTM D 3350-02		345464C
Density	(3)	ASTM D 1505	g/cm³	.955 to .957
Melt Index	(4)	ASTM D 1238	gm/ 10 min	.10 to .15
Flexural Modulus	(5)	ASTM D 790	psi	110 to 140,000
Tensile Strength	(4)	ASTM D 638	psi	3,200 min.
Slow Crack Growth				
ESCR		ASTM D 1693	hours in 100% igepal	> 5,000
PENT	(6)	ASTM F 1473	hours	> 100
HDB @ 73 deg F	(4)	ASTM D 2837	psi	1,600
UV Stabilizer	C	ASTM D 1603	%C	2 to 2.5%

Types of Polyethylene Pipe

All polyethylene pipe is not the same. The Plastic Pipe Institute's "Engineering Properties of Polyethylene" shows that polyethylene with a density of greater than 0.941 (with no additives) is high-density. Materials with a density of 0.926 to .94 are medium density and those with a density of between .90 and .925 are low density.

Density influences key properties in polyethylene materials. As the density increases, the tensile strength increases. Also the chemical resistance increases.

Traditionally, medium density polyethylene resin has been used to make pipe for gas distribution. When medium density was selected for gas pipe, it had better stress crack resistance than other resins.

As new resins and manufacturing processes have been developed, high and medium density polyethylene resins have improved in their ability to handle stress and stress cracking agents.

The current test to determine stress crack resistance is the PENT test. The PENT Test is run in accordance with ASTM F 1473-97, " Standard Test Method for Notch Tensile Test to Measure the Resistance to Slow Crack Growth of Polyethylene Pipes and Resins". This test requires that slow crack growth test be run on samples of extruded pipe.

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The first Environmental Stress Crack (ESCR) testing was conducted on compression molded tensile bars. As resin manufacturing techniques have improved, samples no longer failed using the ESCR test methods. ESCR testing uses strong detergents at elevated temperatures to evaluate resins.

The PENT test is a good test of resistance to slow crack growth and related failures induced by the presence of stressing agents. Since this test is conducted using HDPE pipe, it is a better test to determine the best resins to use for piping applications.

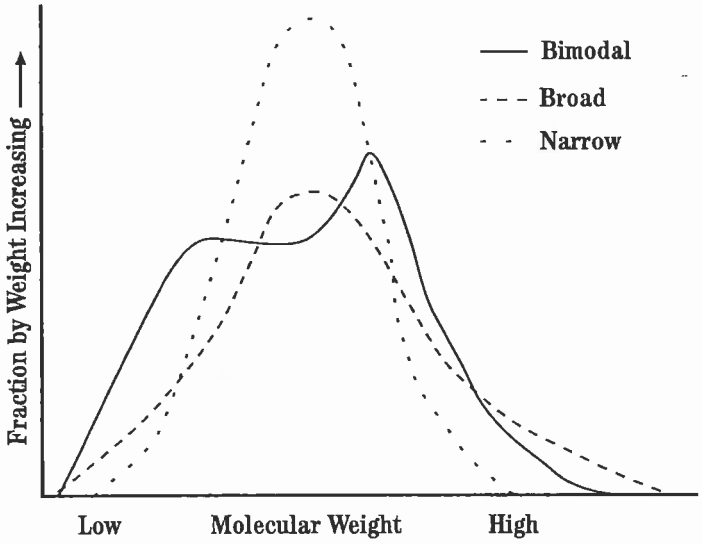
Traditional broad molecular weight resins are used to produce most high-density polyethylene pipe. Typical PENT Test values for these HDPE pipes are 100 to 600 hours.

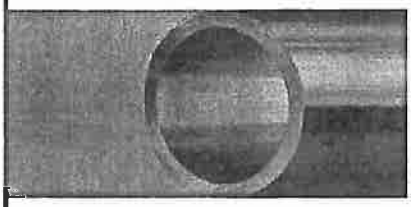
The Chart below shows the modular weight distribution for Bimodal, Broad and Narrow molecular weight resins.

Molecular Weight Distribution

The dotted line shows a typical molecular weight distribution for a narrow molecular weight HDPE resin. The dashes show just the distribution for a broad molecular weight HDPE. The solid line shows the distribution of a bimodal HDPE resin.

The properties of the HDPE resin can be changed because of the molecular distribution. Density and melt index also are important in tailoring the properties of the HDPE resin.





HDPE Pipe

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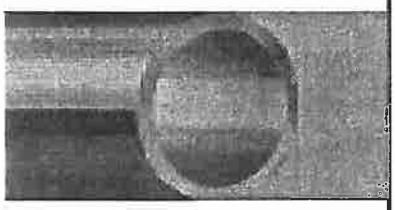

HDPE Pipe

*Blue Bold indicates standard/more readily available items.

Typical IPS HDPE Pipe Sizes

Most high-density polyethylene pipe is made to the following dimensions. At present PE 3408 is the resin used for most applications

Pipe Size Nominal	Actual OD	Dimension Ratio	Pressure rating, psi @ 73°F	Minimum Wall	Average ID	Weight lbs./ft
3/4"	1.050"	DR 11	160	0.095"	0.86"	0.12
1"	1.315"	DR 11	160	0.12"	1.075"	0.19
1.25"	1.660"	DR 11	160	0.151"	1.358"	0.31
1.5"	1.900"	DR 11	160	0.173"	1.55"	0.41
2"	2.375"	DR 7	267	0.339"	1.670"	0.943
2"	2.375"	DR 9	200	0.264"	1.826"	0.762
2"	2.375"	DR 11	160	0.216"	1.926"	0.639
2"	2.375"	DR 13.5	128	0.176"	2.009"	0.531
2"	2.375"	DR 15.5	110	0.153"	2.057"	0.467
2"	2.375"	DR 17	100	0.140"	2.084"	0.429
3"	3.500"	DR 7	267	0.500"	2.460"	2.047
3"	3.500"	DR 9	200	0.389"	2.691"	1.656
3"	3.500"	DR 11	160	0.318"	2.839"	1.387
3"	3.500"	DR 13.5	128	0.259"	2.961"	1.153
3"	3.500"	DR 15.5	110	0.226"	3.048"	1.020
3"	3.500"	DR 17	100	0.206"	3.088"	0.932
4"	4.500"	DR 7	267	0.643"	3.163"	3.384
4"	4.500"	DR 9	200	0.500"	3.460"	2.737
4"	4.500"	DR 11	160	0.409"	3.649"	2.294
4"	4.500"	DR 13.5	128	0.333"	3.807"	1.906
4"	4.500"	DR 15.5	110	0.290"	3.897"	1.678
4"	4.500"	DR 17	100	0.265"	3.949"	1.54
4"	4.500"	DR 21	80	0.214"	4.055"	1.262
4"	4.500"	DR 26	64	0.173"	4.140"	1.03
4"	4.500"	DR 32.5	51	0.138"	4.213"	0.831
5"	5.375"	DR 11	160	0.489"	4.358"	3.272
5"	5.375"	DR 17	100	0.316"	4.718"	2.197
5"	5.375"	DR 21	80	0.256"	4.843"	1.801
5"	5.375"	DR 26	64	0.207"	4.944"	1.186

Pipe Lengths

Straight lengths: Pipe 2" to 24" stocked in 40 foot lengths. Sizes 28" to 63" in 50 ft. lengths.

Coil: Standard for 3/4" to 6". Coils for 8" available on special order.

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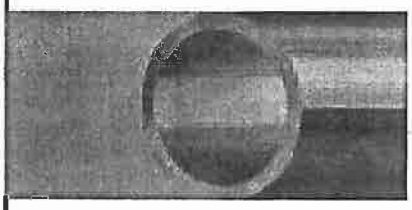
Typical IPS HDPE Pipe Sizes

Pipe Size Nominal	Actual OD	Dimension Ratio	Pressure rating, psi @73°F	Minimum Wall	Average ID	Weight lbs./ft
5"	5.563"	DR 7	267	0.795"	3.909"	5.172
5"	5.563"	DR 9	200	0.618"	4.278"	4.182
5"	5.563"	DR 11	160	0.506"	4.511"	3.505
5"	5.563"	DR 13.5	128	0.412"	4.706"	2.912
5"	5.563"	DR 15.5	110	0.359"	4.816"	2.564
5"	5.563"	DR 17	100	0.327"	4.883"	2.353
5"	5.563"	DR 21	80	0.265"	5.012"	1.929
5"	5.563"	DR 26	64	0.214"	5.118"	1.574
5"	5.563"	DR 32.5	51	0.171"	5.207"	1.27
6"	6.625"	DR 7	267	0.946"	4.657"	7.336
6"	6.625"	DR 9	200	0.736"	5.094"	5.932
6"	**6.625"**	**DR 11**	**160**	**0.602"**	**5.373"**	**4.971**
6"	6.625"	DR 13.5	128	0.491"	5.604"	4.13
6"	6.625"	DR 15.5	110	0.427"	5.737"	3.637
→ **6"**	**6.625"**	**DR 17**	**100**	**0.390"**	**5.814"**	**3.338**
6"	6.625"	DR 19	89	0.349"	5.900"	3.007
6"	6.625"	DR 21	80	0.315"	5.970"	2.736
6"	6.625"	DR 26	64	0.255"	6.095"	2.233
6"	6.625"	DR 32.5	51	0.204"	6.201"	1.801
7"	7.125"	DR 11	160	0.648"	5.777"	5.75
7"	7.125"	DR 17	100	0.419"	6.253"	3.86
7"	7.125"	DR 19	89	0.375"	6.350"	3.478
7"	7.125"	DR 21	80	0.339"	6.420"	3.165
7"	7.125"	DR 26	64	0.274"	6.555"	2.582
7"	7.125"	DR 32.5	51	0.219"	6.669"	2.083
8"	8.625"	DR 7	267	1.232"	6.062"	12.433
8"	8.625"	DR 9	200	0.958"	6.632"	10.054
8"	**8.625"**	**DR 11**	**160**	**0.784"**	**6.994"**	**8.425**
8"	8.625"	DR 13.5	128	0.639"	7.296"	7.001
8"	8.625"	DR 15.5	110	0.556"	7.469"	6.164
→ **8"**	**8.625"**	**DR 17**	**100**	**0.507"**	**7.570"**	**5.657**
8"	8.625"	DR 19	89	0.454"	7.680"	5.097
8"	8.625"	DR 21	80	0.411"	7.770"	4.637
8"	8.625"	DR 26	64	0.332"	7.934"	3.784
8"	8.625"	DR 32.5	51	0.265"	8.074"	3.053



HDPE Pipe

*Blue Bold indicates standard/more readily available items.

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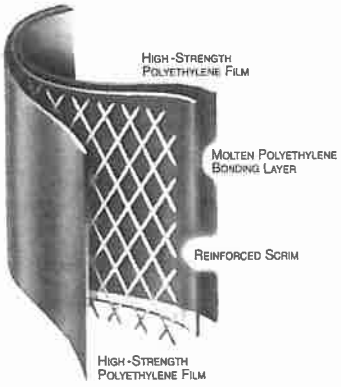
DURA•SKRIM®

8BV & 12BV

PRODUCT DESCRIPTION

DURA•SKRIM 8BV and **12BV** consist of two sheets of high-strength virgin polyethylene film laminated together with a third layer of molten polyethylene. The black outer layers contain carbon black to enhance outdoor life. A heavy scrim reinforcement placed between these plies greatly enhances tear resistance and increases service life. DURA•SKRIM's heavy-duty diamond reinforcement responds to tears immediately by surrounding and stopping the tear.



PRODUCT USE

DURA•SKRIM 8BV and **12BV** are used in more demanding applications requiring high tear resistance. They are designed to withstand longer term outdoor applications requiring up to 5 years of exposure or more depending upon geographical location.

DURA•SKRIM 8BV and **12BV** are designed to meet the requirements of the Geosynthetics Research Institute; GRI-GM22 Standard Specification.

SIZE & PACKAGING

DURA•SKRIM 8BV and **12BV** are available in a variety of widths and panels up to 85,000 square feet. All panels are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time-saving installation.

Temporary Rain Shed Cover

PRODUCT	PART NUMBER
DURA•SKRIM	R8BV
DURA•SKRIM	R12BV

COMMON APPLICATIONS

- Daily Landfill Covers
- Interim Landfill Covers
- Temporary Rainshed Covers
- Remediation Covers or Liners
- Cargo Coverings

DURA-SKRIM®

RAVEN INDUSTRIES
Engineered Films Division

DURA•SKRIM®

8BV & 12BV

PROPERTIES	TEST METHOD	DURA•SKRIM 8BV		DURA•SKRIM 12BV	
		English	Metric	English	Metric
Appearance		Black/Black		Black/Black	
Thickness, Nominal		8 mil	0.20 mm	12 mil	0.30 mm
Weight		38 lbs/MSF 5.5 oz./yd²	185 g/m²	58 lbs/MSF 8.4 oz./yd²	283 g/m²
Construction		Extrusion laminated with scrim reinforcement			
Tensile Strength @ Break 1" (2.54 cm)	ASTM D7003	52 lbf.	231 N	59 lbf.	263 N
Elongation @ Break	ASTM D7003	600%	600%	650%	650%
Grab Tensile	ASTM D7004	70 lbf	312 N	90 lbf	400 N
***Trapezoid Tear**	ASTM D4533	55 lbf	245 N	72 lbf	320 N
Hydrostatic Resistance	ASTM D751	70 psi	482 kPa	100 psi	689 kPa
Maximum Use Temperature		180°F	82°C	180°F	82°C
Minimum Use Temperature		-70°F	-57°C	-70°F	-57°C
Permeability					
WVTR	ASTM E96 Method A	0.030 g/100in²/day	0.46 g/m²/day	0.023 g/100in²/day	0.35 g/m²/day
Perm Rating	ASTM E96 Method A	0.066 U.S. Perms	0.044 Metric Perms	0.051 U.S. Perms	0.034 Metric Perms

*Tests are an average of diagonal directions.

DURA•SKRIM 8BV and 12BV are both four layer reinforced extrusion laminates. The outer layers consist of a high-strength polyethylene film containing carbon black and UV and thermal stabilizers.

DURA•SKRIM 8BV and 12BV are reinforced with a minimum of a 1000 denier scrim laid in a diagonal pattern spaced 3/8" apart with an additional machine direction scrim every 3" across the width.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.

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P.O. Box 5107 • Sioux Falls, SD 57117-5107
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Toll Free: 800-635-3456

ISO 9001:2000 CERTIFIED MANAGEMENT SYSTEM

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS OF AGGREGATES
ASTM C117-04 / C136-06

Client	RSG & ASSOCIATES	Boring No.	DRAINAGE STONE #5
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth(ft.)	NA
Project No.	2009-610-04	Sample No.	NA
Lab ID	2009-610-04-03		

Color **DARK GRAY**

USCS Symbol: ***gp, ASSUMED***

Fineness Modulus: ***7.10***

D60 = 16.53

D30 = 13.77 CC = 1.01

D10 = 11.31 CU = 1.46

USCS Classification: ***POORLY GRADED GRAVEL***

Tested By SD Date 2/17/2009 Checked By GEM Date 2-18-09

DCN: CT-S42A DATE 10/18/06 REVISION 0 Server\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-03 C136pan1.xls]Sheet1

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ASTM C117-04 / C136-06

Client	RSG & ASSOCIATES	Boring No.	DRAINAGE STONE #5
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth(ft.)	NA
Project No.	2009-610-04	Sample No.	NA
Lab ID	2009-610-04-03		
		Color	**DARK GRAY**

Tare No.	T-3	Wt. of Dry Specimen (gm)	5106.50
Wt. Tare + DS.(Pre-Wash)	5289.10	Wt. of +#200 Specimen(gm)	5076.50
Wt.Tare + Dry,Washed specimen	5273.80	Wt. of -#200 Specimen(gm)	24.30
Wt Tare	182.60		
Wt. Dry,Washed specimen	5091.20		

Total Wt. Retained After Sieving 5085.50

% Difference Wt. Dry,Washed specimen vs Total Wt. Retained After Sieving 0.1

Note: % Difference must not be more than 0.3

Sieve	Sieve Opening (mm)	Weight Retained (gm.)	Percent Retained	Accumulated Percent Retained	**Percent Finer**
3"	75	0.00	0	0	100
2 1/2"	63	0.00	0	0	100
2"	50	0.00	0	0	100
1 1/2"	37.50	0.00	0	0	100
1"	25.00	0.00	0	0	100
3/4"	19.00	877.70	17	17	83
1/2"	12.50	3504.60	69	86	14
3/8"	9.50	583.50	11	97	3
#4	4.75	92.80	2	99	1
#8	2.36	3.20	0	99	1
#16	1.18	3.40	0	99	1
#30	0.60	2.60	0	99	1
#50	0.30	2.40	0	99	1
#100	0.15	2.90	0	99	1
#200	0.075	3.40	0	99	1
Pan	-	9.00	0	100	-

Tested By SD Date 2/17/2009 Checked By GEM Date 2-18-09

DCN: CT-S42A DATE 10/18/06 REVISION 0 Ver\c\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-04-03 C136pan1.xls]Sheet1

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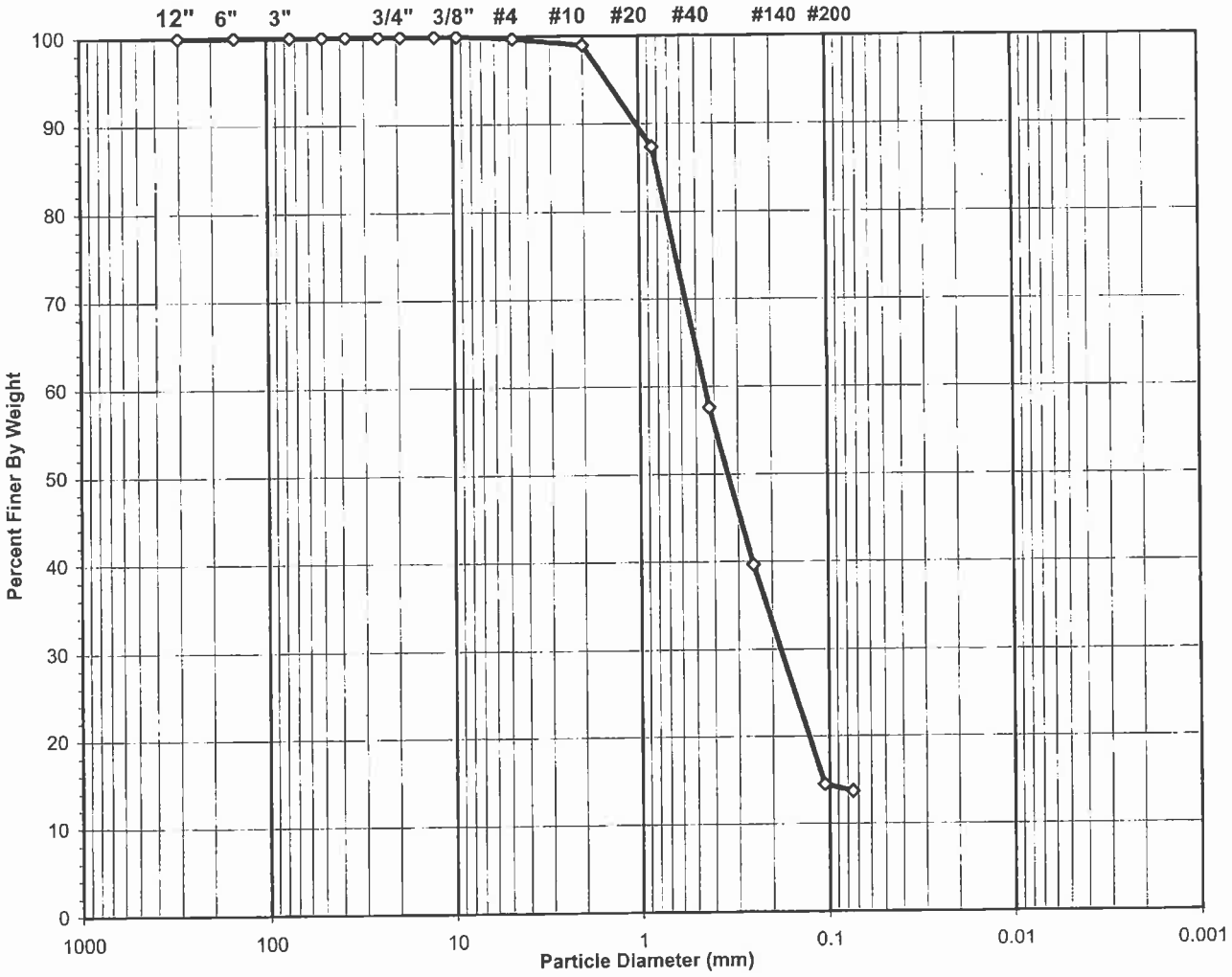
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	JOHNSTON CO. PH. 4A CELL3	Depth (ft)	NA
Project No.	2009-610-05	Sample No.	PC-4.1.09
Lab ID	2009-610-05-01	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SC, TESTED***

USCS Classification ***CLAYEY SAND***

Tested By JBD Date 4/7/2009 Checked By GSM Date 4-7-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *J:\Data Drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-05-01 SIEVON REV 4.XLS]Sheet1*

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Geotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	JOHNSTON CO. PH. 4A CELL3	Depth (ft)	NA
Project No.	2009-610-05	Sample No.	PC-4.1.09
Lab ID	2009-610-05-01	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	842	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	745.94	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	701.52	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	255.90	Weight of Tare (gm)	NA
Weight of Water (gm)	44.42	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	445.62	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**10.0**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	445.62
Dry Weight - 3/4" Sample (gm)	384.5	Weight of minus #200 material (gm)	61.10
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	384.52
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.26	0.3	0.3	99.7	**99.7**
#10	2.00	3.41	0.8	1.0	99.0	**99.0**
#20	0.850	51.97	11.7	12.7	87.3	**87.3**
#40	0.425	132.33	29.7	42.4	57.6	**57.6**
#60	0.250	80.05	18.0	60.4	39.6	**39.6**
#140	0.106	112.04	25.1	85.5	14.5	**14.5**
#200	0.075	3.46	0.8	86.3	13.7	**13.7**
Pan	-	61.10	13.7	100.0	-	-

Tested By JBD Date 4/7/2009 Checked By GEM Date 4-7-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *G:\Data Drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-05-01 SIEVON REV 4.XLS]Sheet1*

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	NA
Client Reference	JOHNSTON CO. PH. 4A CELL3	Depth (ft)	NA
Project No.	2009-610-05	Sample No.	PC-4.1.09
Lab ID	2009-610-05-01	Soil Description	**ORANGE LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

(Minus No. 40 sieve material, Airdried)

Liquid Limit Test	**1**	**2**	**3**
Tare Number	B	L	Q
Wt. of Tare & WS (gm)	26.49	28.75	26.96
Wt. of Tare & DS (gm)	23.33	25.11	23.98
Wt. of Tare (gm)	15.20	15.22	15.17
Wt. of Water (gm)	3.2	3.6	3.0
Wt. of DS (gm)	8.1	9.9	8.8
Moisture Content (%)	**38.9**	**36.8**	**33.8**
Number of Blows	**16**	**25**	**35**

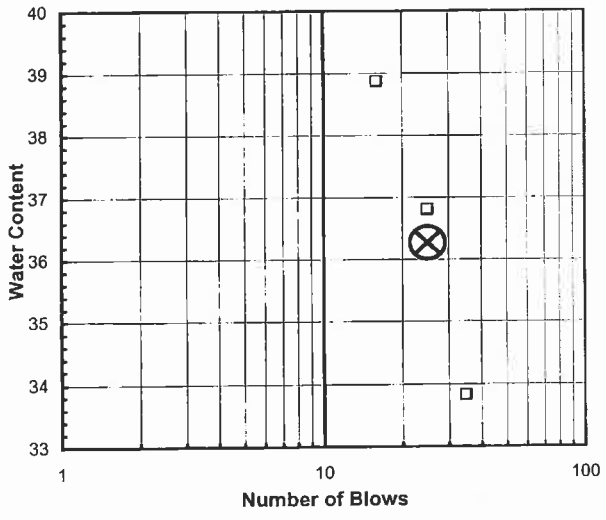
MULTIPOINT

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-K	A-B	
Wt. of Tare & WS (gm)	22.04	22.02	
Wt. of Tare & DS (gm)	21.00	20.99	
Wt. of Tare (gm)	15.52	15.55	
Wt. of Water (gm)	1.0	1.0	
Wt. of DS (gm)	5.5	5.4	
Moisture Content (%)	**19.0**	**18.9**	**0.0**

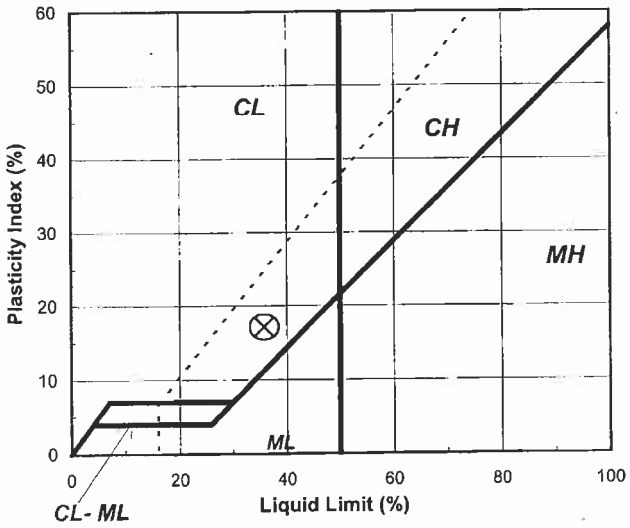
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**36**
Plastic Limit (%)	**19**
Plasticity Index (%)	**17**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 4/6/2009 *Checked By* GM *Date* 4-7-09

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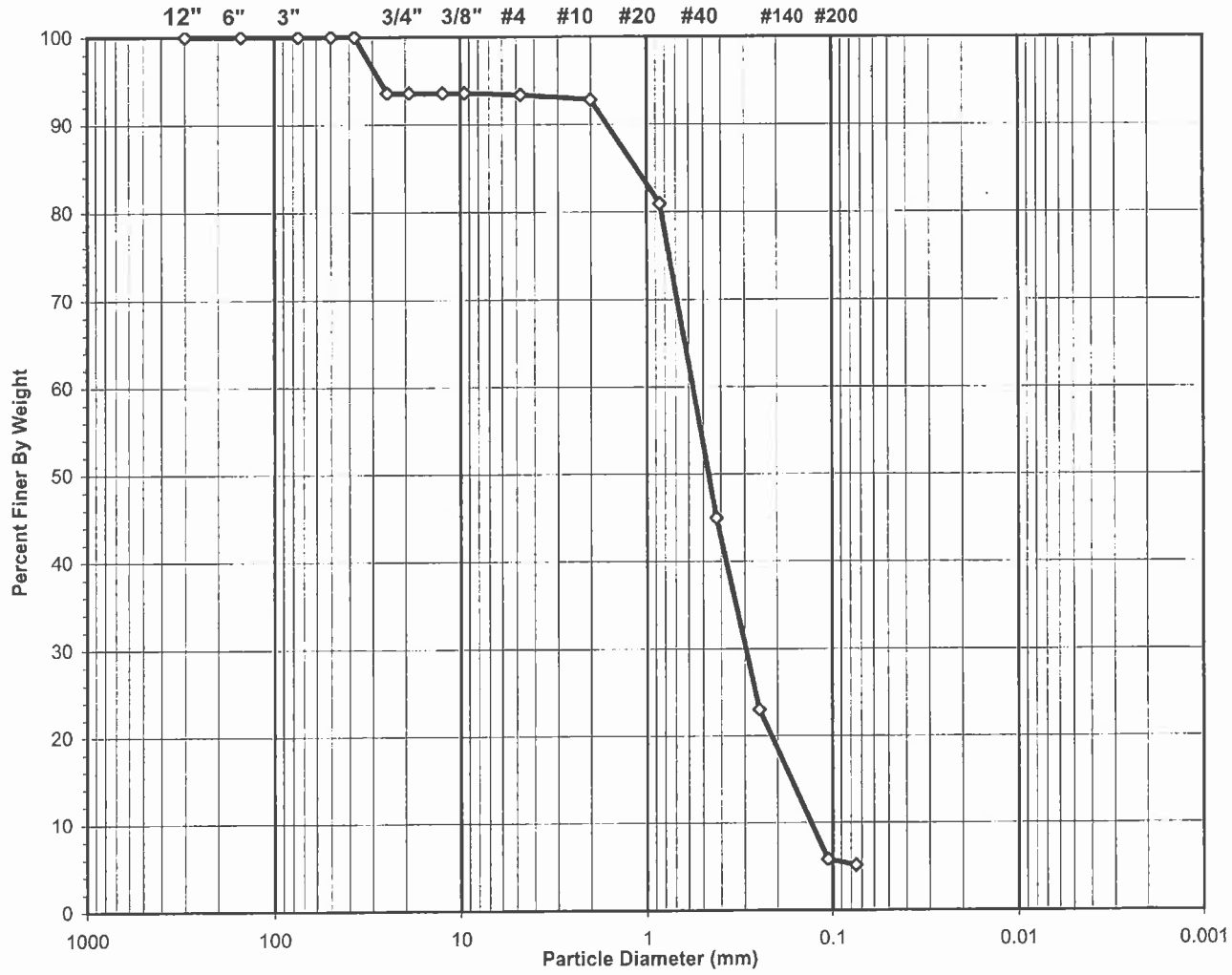
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	4/6/09
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	BORROW
Project No.	2009-610-08	Sample No.	SAMPLE 2
Lab ID	2009-610-08-01	Soil Color	**ORANGE LEAN CLAY**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol	***SP-SC, TESTED***	**D60 =**	**0.6**	**CC =**	**1.2**
USCS Classification	***POORLY GRADED SAND WITH CLAY***	**D30 =**	**0.3**	**CU =**	**4.3**
		D10 =	**0.1**		

Tested By SD Date 4/15/2009 Checked By JMS Date 4-16-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *Server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-08-01 SIEVON REV 4.XLS]Sheet1*

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Gotechnics
INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	4/6/09
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	BORROW
Project No.	2009-610-08	Sample No.	SAMPLE 2
Lab ID	2009-610-08-01	Soil Color	**ORANGE LEAN CLAY**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	213	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	681.40	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	662.72	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	173.29	Weight of Tare (gm)	NA
Weight of Water (gm)	18.68	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	489.43	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**3.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	489.43
Dry Weight - 3/4" Sample (gm)	433.0	Weight of minus #200 material (gm)	24.97
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	464.46
Dry Weight + 3/4" Sample (gm)	31.50		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	31.50	6.4	6.4	93.6	**93.6**
3/4"	19.0	0.00	0.0	6.4	93.6	**93.6**
1/2"	12.50	0.00	0.0	6.4	93.6	**93.6**
3/8"	9.50	0.00	0.0	6.4	93.6	**93.6**
#4	4.75	0.97	0.2	6.6	93.4	**93.4**
#10	2.00	2.70	0.6	7.2	92.8	**92.8**
#20	0.850	58.33	11.9	19.1	80.9	**80.9**
#40	0.425	175.95	35.9	55.1	44.9	**44.9**
#60	0.250	107.11	21.9	76.9	23.1	**23.1**
#140	0.106	84.56	17.3	94.2	5.8	**5.8**
#200	0.075	3.34	0.7	94.9	5.1	**5.1**
Pan	-	24.97	5.1	100.0	-	-

Tested By SD Date 4/15/2009 Checked By _____ Date 4/16/09

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INTEGRITY IN TESTING

ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	R.S.G. & ASSOCIATES	Boring No.	4/6/09
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	BORROW
Project No.	2009-610-08	Sample No.	SAMPLE 2
Lab ID	2009-610-08-01	Soil Description	**ORANGE LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

(Minus No. 40 sieve material, Airdried)

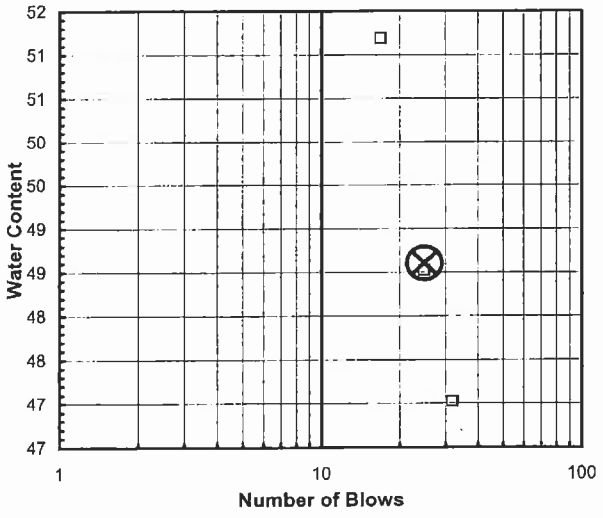
Liquid Limit Test	**1**	**2**	**3**	
				M
Tare Number	A-O	I	N	**U**
Wt. of Tare & WS (gm)	26.94	27.78	22.58	**L**
Wt. of Tare & DS (gm)	23.04	23.68	18.87	**T**
Wt. of Tare (gm)	15.42	15.23	10.98	**I**
Wt. of Water (gm)	3.9	4.1	3.7	**P**
Wt. of DS (gm)	7.6	8.5	7.9	**O**
				I
Moisture Content (%)	**51.2**	**48.5**	**47.0**	**N**
Number of Blows	**17**	**25**	**32**	**T**

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-I	A-C	
Wt. of Tare & WS (gm)	22.70	21.89	
Wt. of Tare & DS (gm)	21.56	20.91	
Wt. of Tare (gm)	15.47	15.61	
Wt. of Water (gm)	1.1	1.0	
Wt. of DS (gm)	6.1	5.3	
Moisture Content (%)	**18.7**	**18.5**	**0.2**

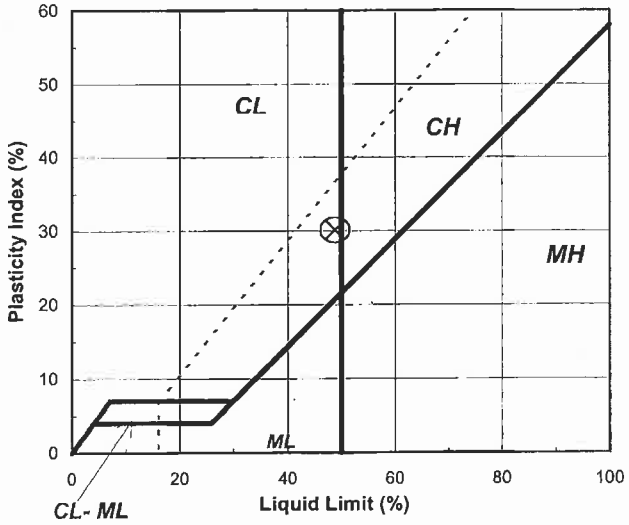
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**49**
Plastic Limit (%)	**19**
Plasticity Index (%)	**30**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



Tested By SD *Date* 4/14/2009 *Checked By* [illegible] *Date* 4/16/09

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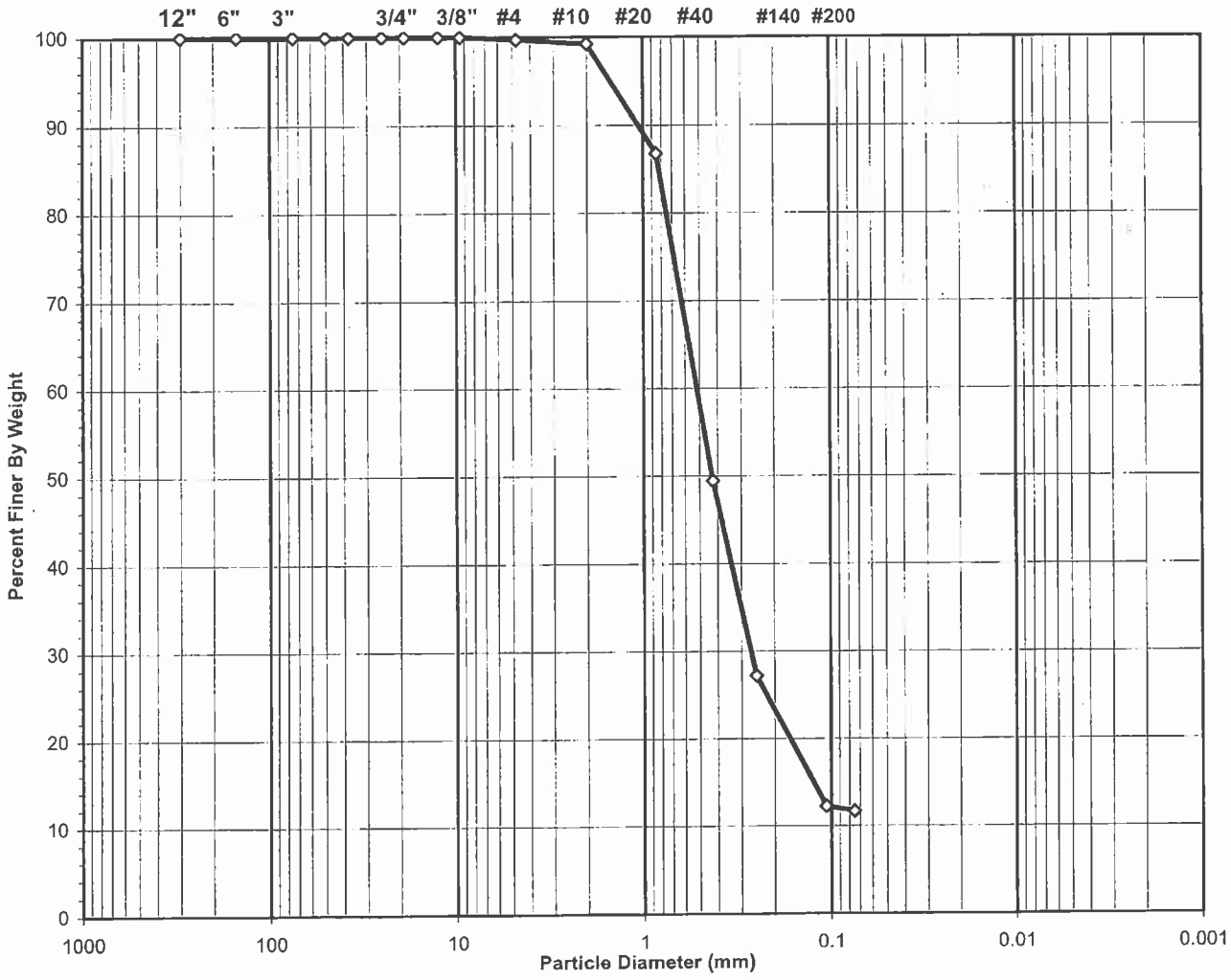
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	4/9/09
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	SITE
Project No.	2009-610-08	Sample No.	SAMPLE 3
Lab ID	2009-610-08-02	Soil Color	**ORANGE LEAN CLAY**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***SP-SC, TESTED***

USCS Classification ***POORLY GRADED SAND WITH CLAY***

Tested By SD Date 4/15/2009 Checked By TMS Date 4-16-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *N:\server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-08-02 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G. & ASSOCIATES	Boring No.	4/9/09
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	SITE
Project No.	2009-610-08	Sample No.	SAMPLE 3
Lab ID	2009-610-08-02	Soil Color	**ORANGE LEAN CLAY**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	211	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	623.18	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	602.47	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	171.22	Weight of Tare (gm)	NA
Weight of Water (gm)	20.71	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	431.25	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**4.8**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	431.25
Dry Weight - 3/4" Sample (gm)	380.9	Weight of minus #200 material (gm)	50.40
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	380.85
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	Accumulated **Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.25	0.3	0.3	99.7	**99.7**
#10	2.00	2.09	0.5	0.8	99.2	**99.2**
#20	0.850	53.76	12.5	13.2	86.8	**86.8**
#40	0.425	160.94	37.3	50.6	49.4	**49.4**
#60	0.250	95.89	22.2	72.8	27.2	**27.2**
#140	0.106	64.42	14.9	87.7	12.3	**12.3**
#200	0.075	2.50	0.6	88.3	11.7	**11.7**
Pan	-	50.40	11.7	100.0	-	-

Tested By SD Date 4/15/2009 Checked By TMS Date 4/16/09

DCN: CT-S3C DATE 6-25-98 REVISION 2 S:\server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-08-02 SIEVON REV 4.XLS]Sheet1

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ATTERBERG LIMITS

ASTM D 4318-05 / AASHTO T89 (SOP - S4A)

Client	RSG & ASSOCIATES	Boring No.	4.9.09
Client Reference	JOHNSTON CO. PH 4A CELL 3	Depth (ft)	SITE
Project No.	2009-610-08	Sample No.	SAMPLE 3
Lab ID	2009-610-08-02	Soil Description	**ORANGE LEAN CLAY**

Note: The USCS symbol used with this test refers only to the minus No. 40 sieve material. See the "Sieve and Hydrometer Analysis" graph page for the complete material description.

(Minus No. 40 sieve material, Airdried)

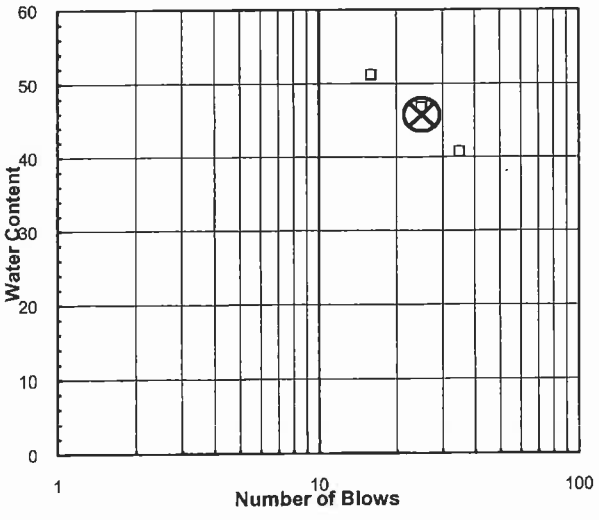
Liquid Limit Test	**1**	**2**	**3**	MULTIPOINT
Tare Number	M	G	A-H	
Wt. of Tare & WS (gm)	28.22	27.47	25.61	
Wt. of Tare & DS (gm)	23.79	23.51	22.70	
Wt. of Tare (gm)	15.13	15.04	15.54	
Wt. of Water (gm)	4.4	4.0	2.9	
Wt. of DS (gm)	8.7	8.5	7.2	
Moisture Content (%)	**51.2**	**46.8**	**40.6**	
Number of Blows	**16**	**25**	**35**	

Plastic Limit Test	**1**	**2**	**Range**
Tare Number	A-P	H	
Wt. of Tare & WS (gm)	21.92	21.33	
Wt. of Tare & DS (gm)	20.96	20.41	
Wt. of Tare (gm)	15.57	15.13	
Wt. of Water (gm)	1.0	0.9	
Wt. of DS (gm)	5.4	5.3	
Moisture Content (%)	**17.8**	**17.4**	**0.4**

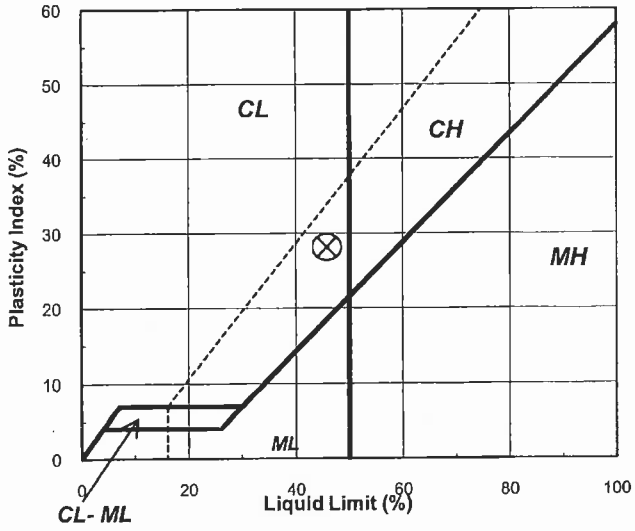
Note: The acceptable range of the two Moisture contents is ± 2.6

Test Results	
Liquid Limit (%)	**46**
Plastic Limit (%)	**18**
Plasticity Index (%)	**28**
USCS Symbol	**CL**

Flow Curve



Plasticity Chart



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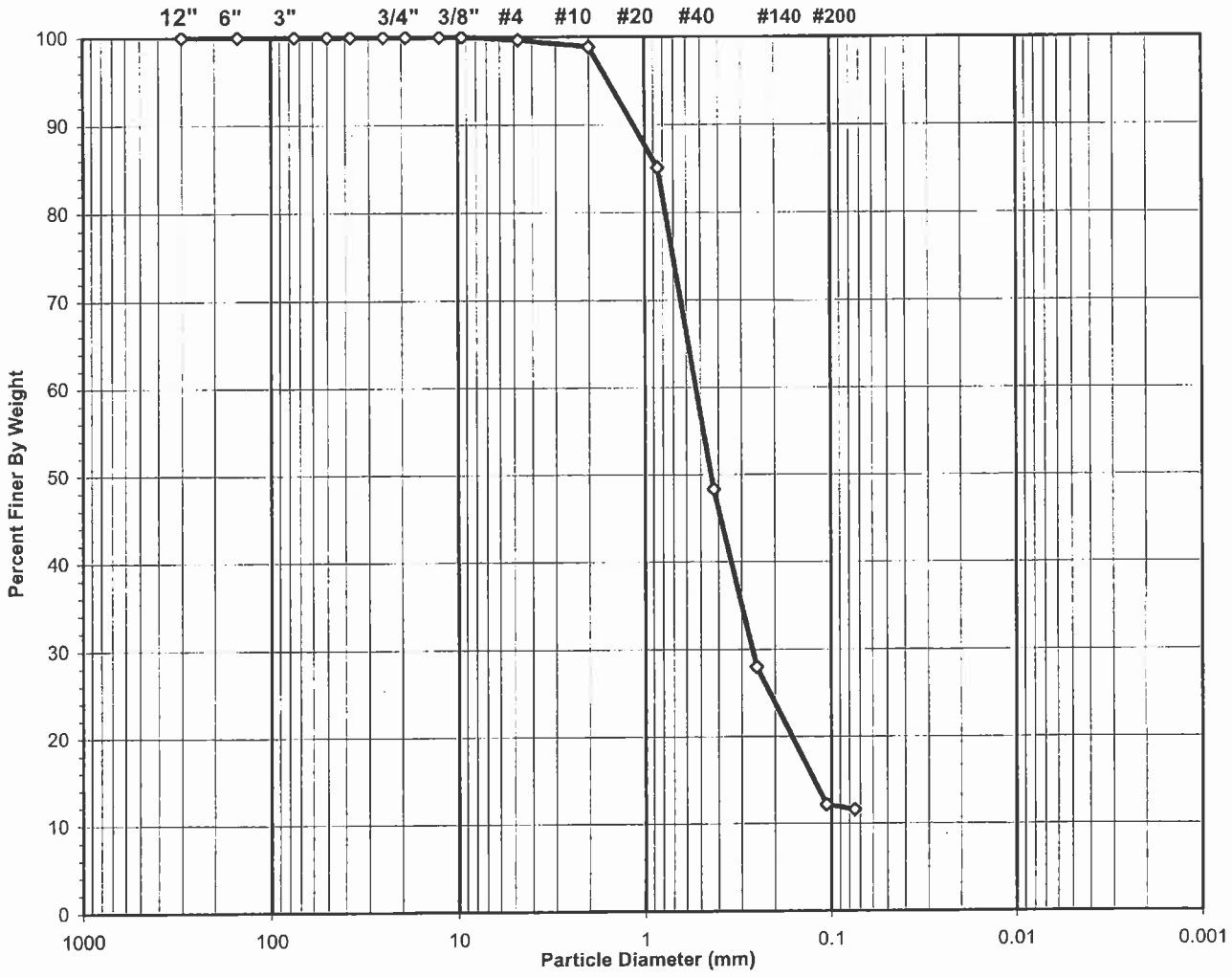
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	PROTECTIVE COVER
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-10	Sample No.	4/13 A
Lab ID	2009-610-10-01	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***sp-sm, ASSUMED***

USCS Classification ***POORLY GRADED SAND WITH SILT***

Tested By SD Date 4/17/2009 Checked By GBM Date 4-17-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *Server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-10-01 SIEVON REV 4.XLS]Sheet1*

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INTEGRITY IN TESTING

WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	PROTECTIVE COVER
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-10	Sample No.	4/13 A
Lab ID	2009-610-10-01	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	202	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	675.22	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	646.94	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	197.38	Weight of Tare (gm)	NA
Weight of Water (gm)	28.28	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	449.56	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**6.3**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	449.56
Dry Weight - 3/4" Sample (gm)	397.6	Weight of minus #200 material (gm)	51.96
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	397.60
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.52	0.3	0.3	99.7	**99.7**
#10	2.00	3.63	0.8	1.1	98.9	**98.9**
#20	0.850	61.95	13.8	14.9	85.1	**85.1**
#40	0.425	165.37	36.8	51.7	48.3	**48.3**
#60	0.250	91.24	20.3	72.0	28.0	**28.0**
#140	0.106	71.32	15.9	87.9	12.1	**12.1**
#200	0.075	2.57	0.6	88.4	11.6	**11.6**
Pan	-	51.96	11.6	100.0	-	-

Tested By SD Date 4/17/2009 Checked By GDM Date 4-17-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 Server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-10-01 SIEVON REV 4.XLS]Sheet1

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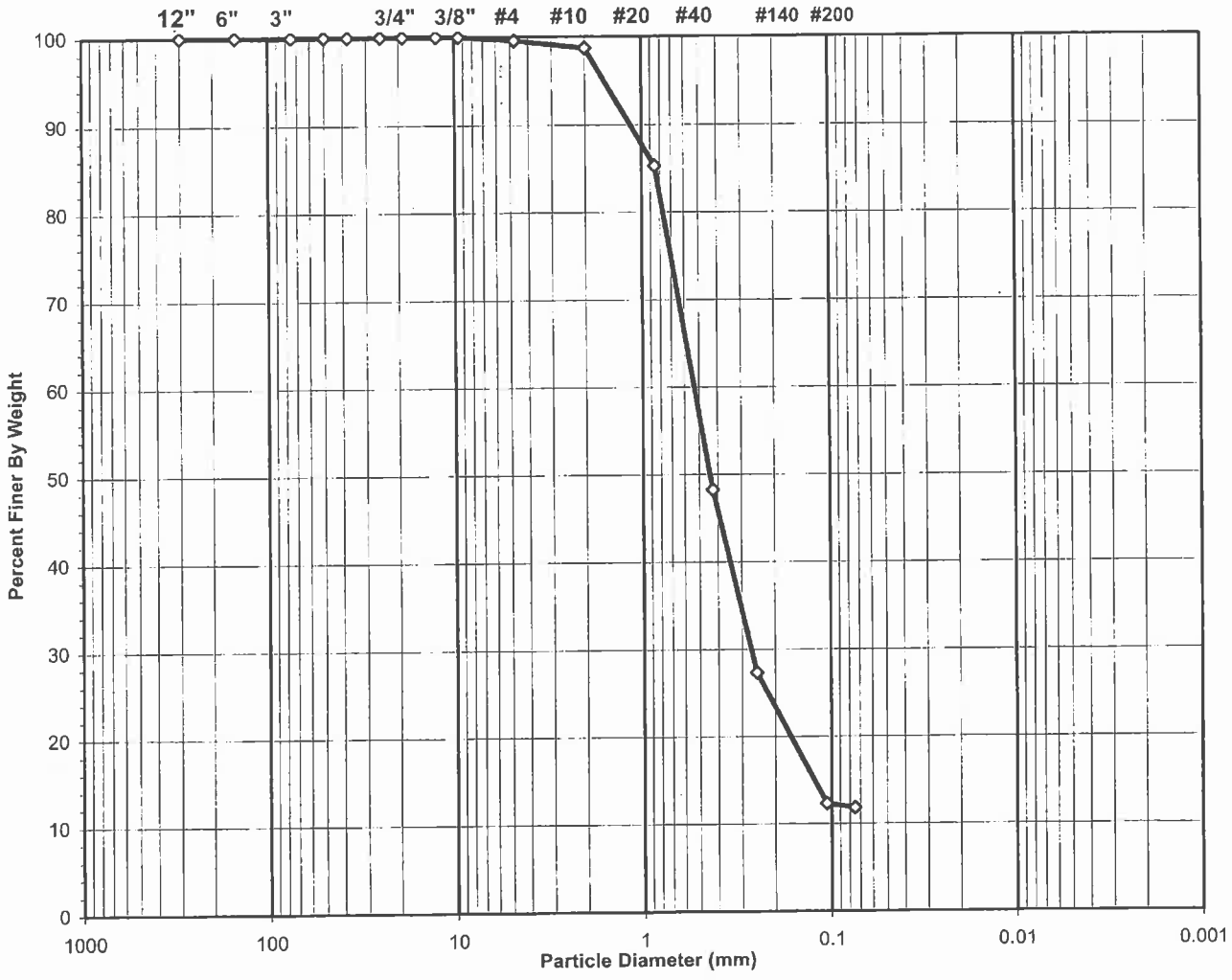
SIEVE ANALYSIS
ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	PROTECTIVE COVER
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-10	Sample No.	4/13 B
Lab ID	2009-610-10-02	Soil Color	**ORANGE**

USCS	SIEVE ANALYSIS		HYDROMETER
	gravel	sand	silt and clay



USCS Symbol ***sp-sm, ASSUMED***

USCS Classification ***POORLY GRADED SAND WITH SILT***

Tested By SD Date 4/17/2009 Checked By GBM Date 4-17-09

DCN: CT-S3C DATE 6-25-98 REVISION 2 *S:\server\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-10-02 SIEVON REV 4.XLS]Sheet1*

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WASH SIEVE ANALYSIS

ASTM D 422-63 (SOP-S3)

Client	R.S.G & ASSOCIATES	Boring No.	PROTECTIVE COVER
Client Reference	JOHNSTON CO. PH. 4A CELL 3	Depth (ft)	NA
Project No.	2009-610-10	Sample No.	4/13 B
Lab ID	2009-610-10-02	Soil Color	**ORANGE**

Moisture Content of Passing 3/4" Material		Water Content of Retained 3/4" Material	
Tare No.	841	Tare No.	NA
Wgt.Tare + Wet Specimen (gm)	642.85	Wgt.Tare + Wet Specimen (gm)	NA
Wgt.Tare + Dry Specimen (gm)	615.92	Wgt.Tare + Dry Specimen (gm)	NA
Weight of Tare (gm)	258.82	Weight of Tare (gm)	NA
Weight of Water (gm)	26.93	Weight of Water (gm)	NA
Weight of Dry Soil (gm)	357.10	Weight of Dry Soil (gm)	NA
Moisture Content (%)	**7.5**	**Moisture Content (%)**	**NA**

Wet Weight -3/4" Sample (gm)	NA	Weight of the Dry Specimen (gm)	357.10
Dry Weight - 3/4" Sample (gm)	314.9	Weight of minus #200 material (gm)	42.17
Wet Weight +3/4" Sample (gm)	NA	Weight of plus #200 material (gm)	314.93
Dry Weight + 3/4" Sample (gm)	0.00		
Total Dry Weight Sample (gm)	NA		

Sieve Size	Sieve Opening (mm)	Wgt.of Soil Retained (gm)	Percent Retained (%)	Accumulated Percent Retained (%)	Percent Finer (%)	**Accumulated Percent Finer (%)**
12"	300	0.00	0.0	0.0	100.0	**100.0**
6"	150	0.00	0.0	0.0	100.0	**100.0**
3"	75	0.00	0.0	0.0	100.0	**100.0**
2"	50	0.00	0.0	0.0	100.0	**100.0**
1 1/2"	37.5	0.00	0.0	0.0	100.0	**100.0**
1"	25.0	0.00	0.0	0.0	100.0	**100.0**
3/4"	19.0	0.00	0.0	0.0	100.0	**100.0**
1/2"	12.50	0.00	0.0	0.0	100.0	**100.0**
3/8"	9.50	0.00	0.0	0.0	100.0	**100.0**
#4	4.75	1.52	0.4	0.4	99.6	**99.6**
#10	2.00	3.00	0.8	1.3	98.7	**98.7**
#20	0.850	48.14	13.5	14.7	85.3	**85.3**
#40	0.425	132.24	37.0	51.8	48.2	**48.2**
#60	0.250	74.61	20.9	72.7	27.3	**27.3**
#140	0.106	53.60	15.0	87.7	12.3	**12.3**
#200	0.075	1.82	0.5	88.2	11.8	**11.8**
Pan	-	42.17	11.8	100.0	-	-

Tested By SD Date 4/17/2009 Checked By GEM Date 4-17-09

DCN: CT-S3C DATE 8-25-98 REVISION 2 *Z:\data drive\2009 PROJECTS\2009-610 RSGA (JOHNSTON)\[2009-610-10-02 SIEVON REV 4.XLS]Sheet1*

2200 Westinghouse Boulevard • Suite 103 • Raleigh, NC 27604 • Phone (919) 876-0405 • Fax (919) 876-0460

Appendix H

Geotextile CQA Data

H1. Manufacturer's Product Data Submittals and Quality Control Certificates

H2. Geosynthetics Inventory - Geotextiles

H3. CQA Test Results - Material Control Tests

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SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: info@skaps.com

Sales Office:
Engineered Synthetic Product Inc.
Phone: (770)564-1857
Fax: (770)564-1818

May 27, 2009
Hallaton, Inc.
1206 Sparks Rd.
Sparks, MD 21152
Ref : Johnston County Landfill

Dear Sir/Madam:

This is to certify that SKAPS GE112 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GE112 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GE112 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Weight	ASTM D 5261	oz/sy (g/m^2)	12.00 (407)
Thickness*	ASTM D 5199	mils (mm)	120 (3.05)
Grab Tensile	ASTM D 4632	lbs (kN)	330 (1.47)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	125 (0.56)
Puncture Resistance	ASTM D 4833	lbs (kN)	190 (0.85)
Mullen Burst Strength	ASTM D 3786	psi (kPa)	625 (4309)
Permittivity*	ASTM D 4491	sec^{-1}	0.90
Permeability*	ASTM D 4491	cm/sec	0.30
Water Flow*	ASTM D 4491	gpm/ft^2(l/min/m^2)	70 (2852)
AOS*	ASTM D 4751	US Sieve (mm)	100 (0.15)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

ANURAG SHAH
QUALITY CONTROL MANAGER

Product : GE112-15

ROLL #	WEIGHT	THICKNESS	MD TENSILE	MD ELONG	XMD TENSILE	XMD ELONG	MD TRAP	XMD TRAP	PUNCTURE	MULLEN	AOS	WATER FLOW	PERMEABILITY	PERMITTIVITY
ASTM METHOD	D5261	D5199	D4632	D4632	D4632	D4632	D4533	D4533	D4833	D3786	D4751	D4491	D4491	D4491
UNITS	oz/sq yd	(mils)	lbs.	%	lbs	%	lbs.	lbs	lbs.	psi	US Sieve	gpm/ft^2	cm/sec	sec^{-1}
TARGET	12.00	120	330	50	330	50	125	125	190	625	100	70	0.30	0.90
11110.01	12.27	133	343	74	357	87	135	148	197	631	100	74	0.33	0.99
11110.02	12.27	133	343	74	357	87	135	148	197	631	100	74	0.33	0.99
11110.03	12.27	133	343	74	357	87	135	148	197	631	100	74	0.33	0.99
11110.04	12.27	133	343	74	357	87	135	148	197	631	100	74	0.33	0.99
11110.05	12.27	133	343	74	357	87	135	148	197	631	100	74	0.33	0.99

*All values are MARV.

FROM THE DESK OF:
WENDEY SMITH
(919) 781-1760
(919) 781-1773 - Fax

February 5, 2009

To: David
E.S. & J.

Fax #: (910) 567-2891

# of Pages: 2 (including cover sheet)

Following please find the Certifications for the GTF-150EX delivered to the Johnston Count Landfill job.

If there is anything else we can do for you, please let us know. We appreciate your business.

Sincerely,

Wendey Smith
Asst. Branch Manager
#258 - Raleigh, NC
wendeysmith@whitecap.net
(919) 781-1760
(919) 781-1773 - Fax

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Thrace-LINQ
MEMBER THRACE GROUP

Geosynthetic QA Line: 1-800-543-9966
Fax: 1-843-875-8276
Website: www.thracelinq.com
E-Mail: qa@thracelinq.com

February 5, 2009

HD Supply White Cap Construction Supply
8909 Midway West Road
Raleigh, NC 27617

Re: Order # 10027024

Dear Sir or Madam:

This letter is to certify that Style 150EX, a nonwoven polypropylene fabric supplied by Thrace-LINQ, Inc., meets the fabric properties listed below:

PROPERTY	*TEST PROCEDURE*	*METRIC*		*ENGLISH*	
		MARV		MARV	
Grab Tensile Strength	ASTM D-4632	734	N	165	lbs
Grab Elongation	ASTM D-4632	50	%	50	%
Trapezoid Tear	ASTM D-4533	289	N	65	lbs
Puncture	ASTM D-4833	401	N	90	lbs
Puncture (CBR)	ASTM D-6241	1780	N	400	lbs
Mullen Burst	ASTM D-3786	2137	kPa	310	psi
Permittivity	ASTM D-4491	1.5	sec^{-1}	1.5	sec^{-1}
A.O.S.	ASTM D-4751	0.180	mm	80	U.S. Sieve
UV Stability (500 hrs)	ASTM D-4355	70	%	70	%
Water Flow Rate	ASTM D-4491	4482	lpm/m^2	110	gpm/ft^2

MARV: Minimum Average Roll Value
Apparent Opening Size (AOS) properties are Maximum Average Roll Values

Sworn to and subscribed before me this 5th day of February, 2009

Sincerely,

Daniel A. Selander
Technical Services

pdated on September 6, 2007

Carol L. Miller
Notary Public for South Carolina

My commission Expires 2-28-2018

NON WOVEN ACTUAL ROLL DATA

Date 2/5/09 **Style** 150ex **Order Number** 10027024

ROLL NUMBER	Tensile Machine Direction D4632 (lbs)	Tensile Cross Direction D4632 (lbs)	Elongation Machine Direction D4632 (%)	Elongation Cross Direction D4632 (%)	Tensile Tear Machine Direction (lbs)	Tensile Tear Cross Direction D4533 (lbs)	Mullen Burst D3786 (psi)	Puncture D4833 (lbs)	AOS D4751 U.S. sieve	Water Flow Rate D4491 gpm/ft2	Permeability D4491 cm/sec	Permittivity D4491 (sec-1)
TX10407	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10408	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10409	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10413	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10415	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10419	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10422	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10424	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10428	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10429	255	195	58	`69`	65	66	310	111	80	110	0.25	1.5
TX10430	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10431	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10432	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10433	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10435	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10436	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10437	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10438	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10439	271	221	61	76	65	65	310	106	80	110	0.25	1.5
TX10440	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10441	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10442	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10443	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10444	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10445	230	225	61	68	65	68	310	103	80	110	0.25	1.5
TX10446	230	225	61	68	65	68	310	103	80	110	0.25	1.5

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GEOSYNTHETICS INVENTORY LOG
TYPE GT-C GEOTEXTILE

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton, Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: Type GT-C Geotextile
Geosynthetic Product Identification: SKAPS GE112

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
11110.01	-----	480	15		
11110.02	-----	480	15	L09012-02-01	PASS
11110.03	-----	480	15		
11110.04	-----	480	15		
11110.05	-----	480	15	L09012-14-01	PASS

Totals:

Total Rolls: 5
Total Lots: 1
Total SF: 36,000

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GEOSYNTHETICS INVENTORY LOG
TYPE GT-S GEOTEXTILE

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton, Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: Type GT-S Geotextile
Geosynthetic Product Identification: Thrace-Linq GTF-150EX

Material		Material Dimensions		Conformance	
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)	Sample No.	Remarks
TX10407	-----	300	15		
TX10408	-----	300	15		
TX10409	-----	300	15		
TX10413	-----	300	15		
TX10415	-----	300	15		
TX10419	-----	300	15		
TX10422	-----	300	15		
TX10424	-----	300	15		
TX10428	-----	300	15		
TX10429	-----	300	15		
TX10430	-----	300	15		
TX10431	-----	300	15	L0912-04-01	PASS
TX10432	-----	300	15		
TX10433	-----	300	15		
TX10435	-----	300	15		
TX10436	-----	300	15		
TX10437	-----	300	15		
TX10438	-----	300	15		
TX10439	-----	300	15		
TX10440	-----	300	15		
TX10441	-----	300	15		
TX10442	-----	300	15		
TX10443	-----	300	15		
TX10444	-----	300	15		
TX10445	-----	300	15		
TX10446	-----	300	15		

Totals:

Total Rolls: 26
Total Lots: 1
Total SF: 117,000

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-02
LAB ID NO.: L09012-02-01
MATERIAL: SKAPS GE-112 NONWOVEN GEOTEXTILE
ROLL NO: 11110.02

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	6	7	8	9	10	AVG	STD
GRAB STRENGTH	D 4632	MD-lbs	497.8	448.2	410.3	444.2	406.1	376.6	382.9	357.0	366.4	440.7	**413.0**	**44.43**
		CD-lbs	416.4	462.8	462.7	509.7	500.0	517.7	460.3	452.7	391.6	386.5	**456.0**	**46.30**
GRAB ELONGATION	D 4632	MD-%	106.7	106.7	110.0	116.7	113.3	103.3	106.7	103.3	103.3	100.0	**107.0**	**5.08**
		CD-%	123.3	113.3	110.0	106.7	110.0	106.7	113.3	126.7	123.3	120.0	**115.3**	**7.40**
TRAPEZOIDAL TEAR	D 4533	MD-lbs	225.4	174.2	173.7	175.3	186.9	200.9	195.1	175.0	176.6	179.2	**186.2**	**16.73**
		CD-lbs	307.3	304.5	302.0	277.0	245.0	280.6	243.5	286.3	261.5	268.5	**277.6**	**23.22**
PUNCTURE	D 4833	lbs	245.9	252.2	232.6	262.1	236.3	213.0	264.6	197.5	227.0	260.5		
		lbs	190.8	262.6	240.0	263.2	224.6						**238.2**	**24.10**

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L09012-02-01

2/13/2009

Geotechnics
INTEGRITY IN TESTING

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LANDFILL
PHASE 4A - CELL 3
PROJECT NO.: L09012-14
LAB ID NO.: L09012-14-01
MATERIAL: SKAPS GE-112 NONWOVEN GEOTEXTILE
ROLL NO: 11110.05

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	6	7	8	9	10	AVG	STD
GRAB STRENGTH	D 4632	MD-lbs	437.9	429.1	393.9	407.0	406.9	392.8	388.2	367.7	432.4	439.1	**409.5**	**24.33**
		CD-lbs	489.5	468.4	459.9	484.5	500.9	493.0	505.4	450.0	480.3	446.9	**477.9**	**20.68**
GRAB ELONGATION	D 4632	MD-%	96.7	106.7	93.3	106.7	106.7	106.7	106.7	103.3	106.7	96.7	**103.0**	**5.32**
		CD-%	123.3	113.3	106.7	103.3	110.0	110.0	110.0	106.7	113.3	123.3	**112.0**	**6.70**
TRAPEZOIDAL TEAR	D 4533	MD-lbs	211.1	163.2	205.9	174.2	164.1	176.9	168.1	178.6	208.1	192.7	**184.3**	**18.64**
		CD-lbs	238.7	211.1	230.3	235.0	212.5	213.7	189.4	209.4	181.7	207.1	**212.9**	**18.36**
PUNCTURE	D 4833	lbs	210.5	221.9	214.7	187.7	193.6	200.8	221.2	187.2	168.2	202.5		
		lbs	203.7	216.1	236.1	199.4	206.3						**204.7**	**16.73**

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L09012-14-01

6/2/2009

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LF
PHASE 4A - CELL 3
PROJECT NO.: L09012-04
LAB ID NO.: L09012-04-01
MATERIAL: LINQ GT-S 6 OZ NW GEOTEXTILE
ROLL NO: TX10431

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	6	7	8	9	10	AVG	STD
GRAB STRENGTH	D 4632	MD-lbs	266.7	244.8	243.3	211.4	254.2	206.5	255.7	273.9	213.9	262.2	**243.3**	**24.39**
		CD-lbs	194.2	197.7	243.9	247.5	238.2	253.5	226.3	212.3	240.8	205.9	**226.0**	**21.89**
GRAB ELONGATION	D 4632	MD-%	66.7	63.3	66.7	66.7	70.0	63.3	70.0	73.3	70.0	66.7	**67.7**	**3.16**
		CD-%	80.0	86.7	80.0	76.7	83.3	80.0	76.7	73.3	80.0	86.7	**80.3**	**4.29**
TRAPEZOIDAL TEAR	D 4533	MD-lbs	92.9	92.8	89.6	92.9	75.6	88.7	88.6	80.4	76.8	95.3	**87.4**	**7.15**
		CD-lbs	110.1	77.5	107.6	103.8	89.6	108.2	83.9	101.3	97.7	104.0	**98.4**	**11.11**
PUNCTURE	D 4833	lbs	108.2	108.8	109.1	112.6	116.5	123.9	127.3	170.3	112.5	113.2		
		lbs	92.6	152.1	144.3	132.2	127.6						**123.4**	**19.92**

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CHECKED BY: BF DATE: 2-19-09

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L09012-04-01

2/19/2009

544 Braddock Avenue • East Pittsburgh, PA 15112 • Phone (412) 823-7600 • Fax (412) 823-8999

APPARENT OPENING SIZE
ASTM D 4751(MODIFIED*)

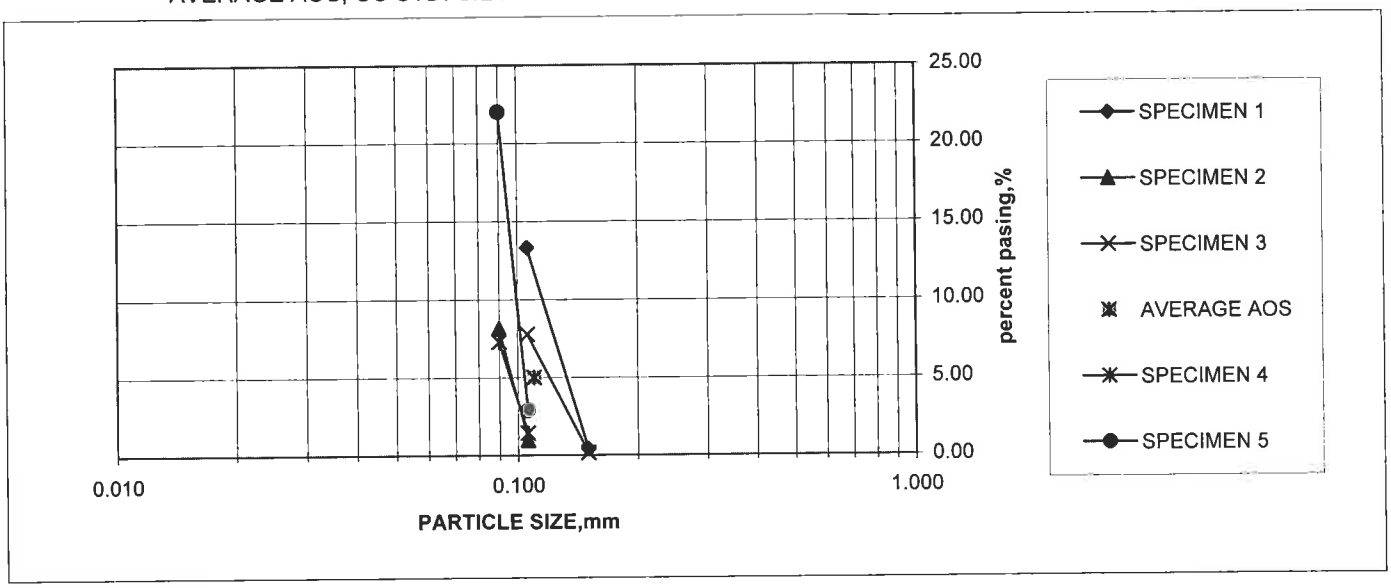
geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC
CLIENT PROJECT: JOHNSTON COUNTY MSW LF
PHASE 4A - CELL 3
MATERIAL: LINQ GT-S 6 OZ NW GEOTEXTILE

PROJECT NO.: [illegible]12-04
LAB ID NO.: L09012-04-01
ROLL NO: TX10431

US STD. SIEVE SIZE	SIEVE OPENING (mm)	WT. FRAME & GEOTEXTILE & BEADS (gm)	WT. FRAME & GEOTEXTILE (gm)	WT. BEADS (gm)	WT. PAN & BEADS (gm)	WT. PAN (gm)	WT. BEADS PASSING (gm)	PERCENT PASSING (%)	AOS @ 5% PASSING (mm)
SPECIMEN 1									
#140	0.106	1149.92	1099.92	50.00	393.18	386.53	6.65	13.30	
#100	0.150	1149.90	1099.90	50.00	386.72	386.53	0.19	0.38	**0.132**
SPECIMEN 2									
#170	0.090	817.76	767.76	50.00	536.52	532.45	4.07	8.14	
#140	0.106	817.66	767.66	50.00	532.93	532.45	0.48	0.96	**0.097**
SPECIMEN 3									
#140	0.106	822.20	772.20	50.00	531.09	527.21	3.88	7.76	
#100	0.150	822.18	772.18	50.00	527.28	527.21	0.07	0.14	**0.120**
SPECIMEN 4									
#170	0.090	816.12	766.12	50.00	528.91	525.27	3.64	7.28	
#140	0.106	815.96	765.96	50.00	525.98	525.27	0.71	1.42	**0.096**
SPECIMEN 5									
#170	0.090	821.54	771.54	50.00	538.48	527.48	11.00	22.00	
#140	0.106	821.46	771.46	50.00	528.91	527.48	1.43	2.86	**0.104**

AVERAGE AOS @ 5% PASSING, mm 0.110
AVERAGE AOS, US STD. SIEVE SIZE **#120**



* NOTE: Larger bead size was run first through each specimen followed by the smaller bead size(s).

Checked By: BF DATE: 2-19-09

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2/19/2009

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH, GARDNER & ASSOCIATES, INC.
CLIENT PROJECT: JOHNSTON COUNTY MSW LF
PHASE 4A - CELL 3
PROJECT NO.: L09012-13
LAB ID NO.: L09012-13-01
MATERIAL: LINQ GT-S 6 OZ NW GEOTEXTILE
ROLL NO: 7575925

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	6	7	8	9	10	AVG	STD
GRAB STRENGTH	D 4632	MD-lbs	216.4	180.8	217.8	184.0	174.4	193.5	204.3	196.7	189.4	228.6	**198.6**	**17.79**
		CD-lbs	220.4	191.1	213.8	224.3	251.4	242.5	228.4	262.3	236.4	234.5	**230.5**	**20.05**
GRAB ELONGATION	D 4632	MD-%	90.0	86.7	90.0	86.7	80.0	86.7	90.0	93.3	90.0	86.7	**88.0**	**3.58**
		CD-%	93.3	93.3	86.7	93.3	93.3	90.0	86.7	93.3	93.3	93.3	**91.7**	**2.83**
TRAPEZOIDAL TEAR	D 4533	MD-lbs	105.4	71.1	74.7	66.1	73.4	78.0	79.3	76.2	66.6	69.8	**76.1**	**11.24**
		CD-lbs	100.6	105.3	90.6	88.8	85.7	99.8	89.9	74.2	113.2	91.9	**94.0**	**11.03**
PUNCTURE	D 4833	lbs	86.6	105.2	87.0	99.9	88.4	90.4	90.0	104.7	93.7	87.3	**95.9**	**8.35**
		lbs	96.2	97.4	94.9	101.4	115.8							

C:\My Documents\EXCEL\Templates\[HDConf-1.xls]Sheet1

CHECKED BY: BF DATE: 4-30-09

\\GEOSERVER\Data Drive\Synthetics\2009 SYNTHETICS\[L09012-13-01 TEXT JOHNSTON.xls]TEXT

L09012-13-01

4/30/2009

APPARENT OPENING SIZE
ASTM D 4751(MODIFIED*)

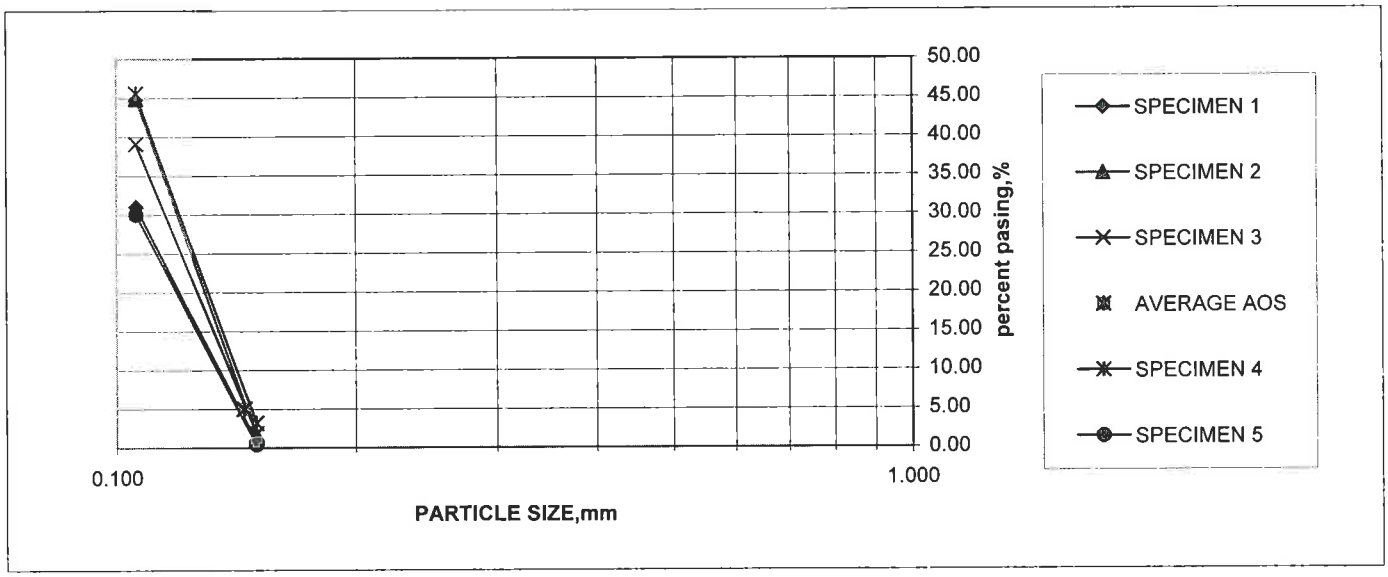
geotechnics
INTEGRITY IN TESTING

CLIENT: RICHARDSON SMITH GARDNER & ASSOC
CLIENT PROJECT: JOHNSTON COUNTY MSW LF
PHASE 4A - CELL 3
MATERIAL: LINQ GT-S 6 OZ NW GEOTEXTILE

PROJECT NO.: L09012-13
LAB ID NO.: L09012-13-01
ROLL NO: 7575925

US STD. SIEVE SIZE	SIEVE OPENING (mm)	WT. FRAME & GEOTEXTILE & BEADS (gm)	WT. FRAME & GEOTEXTILE (gm)	WT. BEADS (gm)	WT. PAN & BEADS (gm)	WT. PAN (gm)	WT. BEADS PASSING (gm)	PERCENT PASSING (%)	AOS @ 5% PASSING (mm)
SPECIMEN 1									
#140	0.106	1154.12	1104.12	50.00	401.93	386.45	15.48	30.96	
#100	0.150	1154.08	1104.08	50.00	386.79	386.45	0.34	0.68	**0.143**
SPECIMEN 2									
#140	0.106	818.60	768.60	50.00	554.90	532.44	22.46	44.92	
#100	0.150	818.54	768.54	50.00	533.24	532.44	0.80	1.60	**0.146**
SPECIMEN 3									
#140	0.106	823.56	773.56	50.00	546.75	527.20	19.55	39.10	
#100	0.150	823.50	773.50	50.00	528.12	527.20	0.92	1.84	**0.146**
SPECIMEN 4									
#140	0.106	816.60	766.60	50.00	548.09	525.31	22.78	45.56	
#100	0.150	816.54	766.54	50.00	526.90	525.31	1.59	3.18	**0.148**
SPECIMEN 5									
#140	0.106	823.52	773.52	50.00	542.46	527.46	15.00	30.00	
#100	0.150	823.44	773.44	50.00	527.67	527.46	0.21	0.42	**0.142**

AVERAGE AOS @ 5% PASSING, mm 0.145
AVERAGE AOS, US STD. SIEVE SIZE **#100**



* NOTE: Larger bead size was run first through each specimen followed by the smaller bead size(s).

Checked By: BF DATE: 4-30-09

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Appendix I

Drainage Geocomposite CQA Data

I1. Manufacturer's Product Data Submittals and Quality Control Certificates

I2. Geosynthetics Inventory - Drainage Geocomposite

I3. CQA Test Results - Material Control Tests

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SKAPS Industries

Engineered Synthetic Products, Inc.

February 18, 2009
Hallaton, Inc.
1206 Sparks Road
Sparks, Maryland 21152

Ref. : Johnston County Landfill, NC
Customer P.O. # P6783
Transnet 270-2-6

We certify that the Transnet 270-2-6 drainage composite, meets the project requirements as stated in the specifications. The properties listed in this section are:

Property	Test Method	Unit	Required Value	Qualifier
Geonet[3]				
Mass per Unit Area	ASTM D 5261	lbs/ft^2	0.197	Minimum
Thickness	ASTM D 5199	mil	270 ± 20	Range
Carbon Black	ASTM D 4218	%	2 - 3	Range
Tensile Strength	ASTM D 5035	lbs/in	75	Minimum
Melt Flow	ASTM D 1238[3]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.94	Minimum
Composite				
Ply Adhesion (Min)	GRI GC7	lb/in	1.0	MARV[5]
Ply Adhesion (Avg)	GRI GC7	lb/in	2.0	MARV
Transmissivity[1]	ASTM D 4716	m^2/sec	5.0 x 10^{-4}	MARV
Geotextile[3 & 4]				
Fabric Weight	ASTM D 5261	oz/yd^2	6.0	MARV
Grab Strength	ASTM D 4632	lbs	150	MARV
Grab Elongation	ASTM D 4632	%	50	MARV
Puncture Resistance	ASTM D 4833	lbs	55	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.0	MARV
AOS	ASTM D 4751	US Sieve	70	MARV
UV Resistance	ASTM D 4355	%/hrs	70/500	MARV

Notes:

1 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.1 and a confining pressure of 10000 psf between sand & liner after 100 hours.

2 Condition 190/2.16

3 Geotextile and Geonet properties are prior to lamination.

4 Geotextile data is provided by the supplier.

5 MARV is statistically defined as mean minus two standard deviations and it is the value which is exceeded by 97.5% of all the test data.

Sincerely,

Nilay Patel

Nilay Patel
QA Manager

571 Industrial Parkway, Commerce, GA 30529 **Phone**: 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910001	307910001 - N	3079.03	3079.22	2.21	3.05	
2	307910002	307910002 - N	3079.03	3079.22			
3	307910003	307910003 - N	3079.03	3079.22			
4	307910004	307910004 - N	3079.03	3079.22			
5	307910005	307910005 - N	3079.03	3079.22			
6	307910006	307910006 - N	3079.03	3079.22			
7	307910007	307910007 - N	3079.03	3079.22			
8	307910008	307910008 - N	3079.18	3079.01			
9	307910009	307910009 - N	3079.18	3079.01			
10	307910010	307910010 - N	3079.18	3079.01	2.33	3.68	
11	307910011	307910011 - N	3079.18	3079.01			
12	307910012	307910012 - N	3079.18	3079.01			
13	307910013	307910013 - N	3079.18	3079.01			
14	307910014	307910014 - N	3079.18	3079.01			
15	307910015	307910015 - N	3079.07	3079.20			
16	307910016	307910016 - N	3079.07	3079.20			
17	307910017	307910017 - N	3079.07	3079.20			
18	307910018	307910018 - N	3079.07	3079.20			
19	307910019	307910019 - N	3079.07	3079.20			
20	307910020	307910020 - N	3079.07	3079.20	2.27	3.20	
21	307910021	307910021 - N	3079.07	3079.20			
22	307910022	307910022 - N	3079.24	3079.05			
23	307910023	307910023 - N	3079.24	3079.05			
24	307910024	307910024 - N	3079.24	3079.05			
25	307910025	307910025 - N	3079.24	3079.05			
26	307910026	307910026 - N	3079.24	3079.05			
27	307910027	307910027 - N	3079.24	3079.05			

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910001 - N	ECUX882478	0.9538	0.266	275	2.47	91	
307910002 - N	ECUX882478	0.9538					
307910003 - N	ECUX882478	0.9538					
307910004 - N	ECUX882478	0.9538					
307910005 - N	ECUX882478	0.9538					
307910006 - N	ECUX882478	0.9538					
307910007 - N	ECUX882478	0.9538					
307910008 - N	ECUX882478	0.9538					
307910009 - N	ECUX882478	0.9538					
307910010 - N	ECUX882478	0.9540	0.278	283	2.61	95	
307910011 - N	ECUX882478	0.9540					
307910012 - N	ECUX882478	0.9540					
307910013 - N	ECUX882478	0.9540					
307910014 - N	ECUX882478	0.9540					
307910015 - N	ECUX882478	0.9540					
307910016 - N	ECUX882478	0.9540					
307910017 - N	ECUX882478	0.9540					
307910018 - N	ECUX882478	0.9540					
307910019 - N	ECUX882478	0.9540					
307910020 - N	ECUX882478	0.9536	0.262	273	2.28	93	
307910021 - N	ECUX882478	0.9536					
307910022 - N	ECUX882478	0.9536					
307910023 - N	ECUX882478	0.9536					
307910024 - N	ECUX882478	0.9536					
307910025 - N	ECUX882478	0.9536					
307910026 - N	ECUX882478	0.9536					
307910027 - N	ECUX882478	0.9536					

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SKAPS Industries

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Product : **TN270-2-6**
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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910028	307910028 - N	3079.24	3079.05			
2	307910029	307910029 - N	3079.09	3079.17			
3	307910030	307910030 - N	3079.09	3079.17	2.39	3.54	
4	307910031	307910031 - N	3079.09	3079.17			
5	307910032	307910032 - N	3079.09	3079.17			
6	307910033	307910033 - N	3079.09	3079.17			
7	307910034	307910034 - N	3079.09	3079.17			
8	307910035	307910035 - N	3079.09	3079.17			
9	307910036	307910036 - N	3079.26	3079.11			
10	307910037	307910037 - N	3079.26	3079.11			
11	307910038	307910038 - N	3079.26	3079.11			
12	307910039	307910039 - N	3079.26	3079.11			
13	307910040	307910040 - N	3079.26	3079.11	2.25	3.07	
14	307910041	307910041 - N	3079.26	3079.11			
15	307910042	307910042 - N	3079.26	3079.11			
16	307910043	307910043 - N	3079.04	3079.23			
17	307910044	307910044 - N	3079.04	3079.23			
18	307910045	307910045 - N	3079.04	3079.23			
19	307910046	307910046 - N	3079.04	3079.23			
20	307910047	307910047 - N	3079.04	3079.23			
21	307910048	307910048 - N	3079.04	3079.23			
22	307910049	307910049 - N	3079.04	3079.23			
23	307910050	307910050 - N	3079.19	3079.02	2.31	3.71	
24	307910051	307910051 - N	3079.19	3079.02			
25	307910052	307910052 - N	3079.19	3079.02			
26	307910053	307910053 - N	3079.19	3079.02			
27	307910054	307910054 - N	3079.19	3079.02			

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Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910028 - N	ECUX882478	0.9536					
307910029 - N	ECUX882478	0.9536					
307910030 - N	ECUX882478	0.9542	0.272	287	2.53	96	
307910031 - N	ECUX882478	0.9542					
307910032 - N	ECUX882478	0.9542					
307910033 - N	ECUX882478	0.9542					
307910034 - N	ECUX882478	0.9542					
307910035 - N	ECUX882478	0.9542					
307910036 - N	ECUX882478	0.9542					
307910037 - N	ECUX882478	0.9542					
307910038 - N	ECUX882478	0.9542					
307910039 - N	ECUX882478	0.9542					
307910040 - N	ECUX882478	0.9539	0.268	280	2.36	90	
307910041 - N	ECUX882478	0.9539					
307910042 - N	ECUX882478	0.9539					
307910043 - N	ECUX882478	0.9539					
307910044 - N	ECUX882478	0.9539					
307910045 - N	ECUX882478	0.9539					
307910046 - N	ECUX882478	0.9539					
307910047 - N	ECUX882478	0.9539					
307910048 - N	ECUX882478	0.9539					
307910049 - N	ECUX882478	0.9539					
307910050 - N	ECUX882478	0.9541	0.280	281	2.64	94	
307910051 - N	ECUX882478	0.9541					
307910052 - N	ECUX882478	0.9541					
307910053 - N	ECUX882478	0.9541					
307910054 - N	ECUX882478	0.9541					

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We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910055	307910055 - N	3079.19	3079.02			
2	307910056	307910056 - N	3079.19	3079.02			
3	307910057	307910057 - N	3079.10	3079.25			
4	307910058	307910058 - N	3079.10	3079.25			
5	307910059	307910059 - N	3079.10	3079.25			
6	307910060	307910060 - N	3079.10	3079.25	2.22	3.13	
7	307910061	307910061 - N	3079.10	3079.25			
8	307910062	307910062 - N	3079.10	3079.25			
9	307910063	307910063 - N	3079.10	3079.25			
10	307910064	307910064 - N	3079.15	3079.06			
11	307910065	307910065 - N	3079.15	3079.06			
12	307910066	307910066 - N	3079.15	3079.06			
13	307910067	307910067 - N	3079.15	3079.06			
14	307910068	307910068 - N	3079.15	3079.06			
15	307910069	307910069 - N	3079.15	3079.06			
16	307910070	307910070 - N	3079.15	3079.06	2.37	3.77	
17	307910071	307910071 - N	3079.12	3079.27			
18	307910072	307910072 - N	3079.12	3079.27			
19	307910073	307910073 - N	3079.12	3079.27			
20	307910074	307910074 - N	3079.12	3079.27			
21	307910075	307910075 - N	3079.12	3079.27			
22	307910076	307910076 - N	3079.12	3079.27			
23	307910077	307910077 - N	3079.12	3079.27			
24	307910078	307910078 - N	3079.21	3079.08			
25	307910079	307910079 - N	3079.21	3079.08			
26	307910080	307910080 - N	3079.21	3079.08	2.18	3.02	
27	307910081	307910081 - N	3079.21	3079.08			

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Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910055 - N	ECUX882478	0.9541					
307910056 - N	ECUX882478	0.9541					
307910057 - N	ECUX882478	0.9541					
307910058 - N	ECUX882478	0.9541					
307910059 - N	ECUX882478	0.9541					
307910060 - N	ECUX882478	0.9537	0.264	277	2.41	92	
307910061 - N	ECUX882478	0.9537					
307910062 - N	ECUX882478	0.9537					
307910063 - N	ECUX882478	0.9537					
307910064 - N	ECUX882478	0.9537					
307910065 - N	ECUX882478	0.9537					
307910066 - N	ECUX882478	0.9537					
307910067 - N	ECUX882478	0.9537					
307910068 - N	ECUX882478	0.9537					
307910069 - N	ECUX882478	0.9537					
307910070 - N	ECUX882478	0.9540	0.275	285	2.56	96	
307910071 - N	ECUX882478	0.9540					
307910072 - N	ECUX882478	0.9540					
307910073 - N	ECUX882478	0.9540					
307910074 - N	ECUX882478	0.9540					
307910075 - N	ECUX882478	0.9540					
307910076 - N	ECUX882478	0.9540					
307910077 - N	ECUX882478	0.9540					
307910078 - N	ECUX882478	0.9540					
307910079 - N	ECUX882478	0.9540					
307910080 - N	ECUX882478	0.9538	0.260	274	2.29	90	
307910081 - N	ECUX882478	0.9538					

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Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910082	307910082 - N	3079.21	3079.08			
2	307910083	307910083 - N	3079.21	3079.08			
3	307910084	307910084 - N	3079.21	3079.08			
4	307910085	307910085 - N	3079.14	3079.28			
5	307910086	307910086 - N	3079.14	3079.28			
6	307910087	307910087 - N	3079.14	3079.28			
7	307910088	307910088 - N	3079.14	3079.28			
8	307910089	307910089 - N	3079.14	3079.28			
9	307910090	307910090 - N	3079.14	3079.28	2.32	3.64	
10	307910091	307910091 - N	3079.14	3079.28			
11	307910092	307910092 - N	3079.40	3079.13			
12	307910093	307910093 - N	3079.40	3079.13			
13	307910094	307910094 - N	3079.40	3079.13			
14	307910095	307910095 - N	3079.40	3079.13			
15	307910096	307910096 - N	3079.40	3079.13			
16	307910097	307910097 - N	3079.40	3079.13			
17	307910098	307910098 - N	3079.40	3079.13			
18	307910099	307910099 - N	3079.16	3079.42			
19	307910100	307910100 - N	3079.16	3079.42	2.24	3.26	
20	307910101	307910101 - N	3079.16	3079.42			
21	307910102	307910102 - N	3079.16	3079.42			
22	307910103	307910103 - N	3079.16	3079.42			
23	307910104	307910104 - N	3079.16	3079.42			
24	307910105	307910105 - N	3079.16	3079.42			
25	307910106	307910106 - N	3079.43	3079.30			
26	307910107	307910107 - N	3079.43	3079.30			
27	307910108	307910108 - N	3079.43	3079.30			

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910082 - N	ECUX882478	0.9538					
307910083 - N	ECUX882478	0.9538					
307910084 - N	ECUX882478	0.9538					
307910085 - N	ECUX882478	0.9538					
307910086 - N	ECUX882478	0.9538					
307910087 - N	ECUX882478	0.9538					
307910088 - N	ECUX882478	0.9538					
307910089 - N	ECUX882478	0.9538					
307910090 - N	ECUX882478	0.9542	0.277	286	2.50	94	
307910091 - N	ECUX882478	0.9542					
307910092 - N	ECUX882478	0.9542					
307910093 - N	ECUX882478	0.9542					
307910094 - N	ECUX882478	0.9542					
307910095 - N	ECUX882478	0.9542					
307910096 - N	ECUX882478	0.9542					
307910097 - N	ECUX882478	0.9542					
307910098 - N	ECUX882478	0.9542					
307910099 - N	ECUX882478	0.9542					
307910100 - N	ECUX882478	0.9536	0.270	278	2.48	92	
307910101 - N	ECUX882478	0.9536					
307910102 - N	ECUX882478	0.9536					
307910103 - N	ECUX882478	0.9536					
307910104 - N	ECUX882478	0.9536					
307910105 - N	ECUX882478	0.9536					
307910106 - N	ECUX882478	0.9536					
307910107 - N	ECUX882478	0.9536					
307910108 - N	ECUX882478	0.9536					

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910109	307910109 - N	3079.43	3079.30			
2	307910110	307910110 - N	3079.43	3079.30	2.30	3.51	
3	307910111	307910111 - N	3079.43	3079.30			
4	307910112	307910112 - N	3079.43	3079.30			
5	307910113	307910113 - N	3079.33	3079.45			
6	307910114	307910114 - N	3079.33	3079.45			
7	307910115	307910115 - N	3079.33	3079.45			
8	307910116	307910116 - N	3079.33	3079.45			
9	307910117	307910117 - N	3079.33	3079.45			
10	307910118	307910118 - N	3079.33	3079.45			
11	307910119	307910119 - N	3079.33	3079.45			
12	307910120	307910120 - N	3079.49	3079.35	2.20	3.04	
13	307910121	307910121 - N	3079.49	3079.35			
14	307910122	307910122 - N	3079.49	3079.35			
15	307910123	307910123 - N	3079.49	3079.35			
16	307910124	307910124 - N	3079.49	3079.35			
17	307910125	307910125 - N	3079.49	3079.35			
18	307910126	307910126 - N	3079.49	3079.35			
19	307910127	307910127 - N	3079.37	3079.51			
20	307910128	307910128 - N	3079.37	3079.51			
21	307910129	307910129 - N	3079.37	3079.51			
22	307910130	307910130 - N	3079.37	3079.51	2.34	3.73	
23	307910131	307910131 - N	3079.37	3079.51			
24	307910132	307910132 - N	3079.37	3079.51			
25	307910133	307910133 - N	3079.37	3079.51			
26	307910134	307910134 - N	3079.47	3079.32			
27	307910135	307910135 - N	3079.47	3079.32			

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910109 - N	ECUX882478	0.9536					
307910110 - N	ECUX882478	0.9540	0.279	288	2.58	96	
307910111 - N	ECUX882478	0.9540					
307910112 - N	ECUX882478	0.9540					
307910113 - N	ECUX882478	0.9540					
307910114 - N	ECUX882478	0.9540					
307910115 - N	ECUX882478	0.9540					
307910116 - N	ECUX882478	0.9540					
307910117 - N	ECUX882478	0.9540					
307910118 - N	ECUX882478	0.9540					
307910119 - N	ECUX882478	0.9540					
307910120 - N	ECUX882478	0.9538	0.261	279	2.32	91	
307910121 - N	ECUX882478	0.9538					
307910122 - N	ECUX882478	0.9538					
307910123 - N	ECUX882478	0.9538					
307910124 - N	ECUX882478	0.9538					
307910125 - N	ECUX882478	0.9538					
307910126 - N	ECUX882478	0.9538					
307910127 - N	ECUX882478	0.9538					
307910128 - N	ECUX882478	0.9538					
307910129 - N	ECUX882478	0.9538					
307910130 - N	ECUX882478	0.9542	0.276	282	2.62	95	
307910131 - N	ECUX882478	0.9542					
307910132 - N	ECUX882478	0.9542					
307910133 - N	ECUX882478	0.9542					
307910134 - N	ECUX882478	0.9542					
307910135 - N	ECUX882478	0.9542					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910136	307910136 - N	3079.47	3079.32			
2	307910137	307910137 - N	3079.47	3079.32			
3	307910138	307910138 - N	3079.47	3079.32			
4	307910139	307910139 - N	3079.47	3079.32			
5	307910140	307910140 - N	3079.47	3079.32	2.26	3.10	
6	307910141	307910141 - N	3079.34	3079.54			
7	307910142	307910142 - N	3079.34	3079.54			
8	307910143	307910143 - N	3079.34	3079.54			
9	307910144	307910144 - N	3079.34	3079.54			
10	307910145	307910145 - N	3079.34	3079.54			
11	307910146	307910146 - N	3079.34	3079.54			
12	307910147	307910147 - N	3079.34	3079.54			
13	307910148	307910148 - N	3079.41	3079.39			
14	307910149	307910149 - N	3079.41	3079.39			
15	307910150	307910150 - N	3079.41	3079.39	2.38	3.56	
16	307910151	307910151 - N	3079.41	3079.39			
17	307910152	307910152 - N	3079.41	3079.39			
18	307910153	307910153 - N	3079.41	3079.39			
19	307910154	307910154 - N	3079.41	3079.39			
20	307910155	307910155 - N	3079.29	3079.46			
21	307910156	307910156 - N	3079.29	3079.46			
22	307910157	307910157 - N	3079.29	3079.46			
23	307910158	307910158 - N	3079.29	3079.46			
24	307910159	307910159 - N	3079.29	3079.46			
25	307910160	307910160 - N	3079.29	3079.46	2.17	3.06	
26	307910161	307910161 - N	3079.29	3079.46			
27	307910162	307910162 - N	3079.44	3079.31			

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910136 - N	ECUX882478	0.9542					
307910137 - N	ECUX882478	0.9542					
307910138 - N	ECUX882478	0.9542					
307910139 - N	ECUX882478	0.9542					
307910140 - N	ECUX882478	0.9539	0.267	276	2.27	93	
307910141 - N	ECUX882478	0.9539					
307910142 - N	ECUX882478	0.9539					
307910143 - N	ECUX882478	0.9539					
307910144 - N	ECUX882478	0.9539					
307910145 - N	ECUX882478	0.9539					
307910146 - N	ECUX882478	0.9539					
307910147 - N	ECUX882478	0.9539					
307910148 - N	ECUX882478	0.9539					
307910149 - N	ECUX882478	0.9539					
307910150 - N	ECUX882478	0.9541	0.273	287	2.54	96	
307910151 - N	ECUX882478	0.9541					
307910152 - N	ECUX882478	0.9541					
307910153 - N	ECUX882478	0.9541					
307910154 - N	ECUX882478	0.9541					
307910155 - N	ECUX882478	0.9541					
307910156 - N	ECUX882478	0.9541					
307910157 - N	ECUX882478	0.9541					
307910158 - N	ECUX882478	0.9541					
307910159 - N	ECUX882478	0.9541					
307910160 - N	ECUX882478	0.9537	0.263	273	2.34	90	
307910161 - N	ECUX882478	0.9537					
307910162 - N	ECUX882478	0.9537					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910163	307910163 - N	3079.44	3079.31			
2	307910164	307910164 - N	3079.44	3079.31			
3	307910165	307910165 - N	3079.44	3079.31			
4	307910166	307910166 - N	3079.44	3079.31			
5	307910167	307910167 - N	3079.44	3079.31			
6	307910168	307910168 - N	3079.44	3079.31			
7	307910169	307910169 - N	3079.38	3079.52			
8	307910170	307910170 - N	3079.38	3079.52	2.35	3.69	
9	307910171	307910171 - N	3079.38	3079.52			
10	307910172	307910172 - N	3079.38	3079.52			
11	307910173	307910173 - N	3079.38	3079.52			
12	307910174	307910174 - N	3079.38	3079.52			
13	307910175	307910175 - N	3079.38	3079.52			
14	307910176	307910176 - N	3079.48	3079.50			
15	307910177	307910177 - N	3079.48	3079.50			
16	307910178	307910178 - N	3079.48	3079.50			
17	307910179	307910179 - N	3079.48	3079.50			
18	307910180	307910180 - N	3079.48	3079.50	2.23	3.21	
19	307910181	307910181 - N	3079.48	3079.50			
20	307910182	307910182 - N	3079.48	3079.50			
21	307910183	307910183 - N	3079.36	3079.71			
22	307910184	307910184 - N	3079.36	3079.71			
23	307910185	307910185 - N	3079.36	3079.71			
24	307910186	307910186 - N	3079.36	3079.71			
25	307910187	307910187 - N	3079.36	3079.71			
26	307910188	307910188 - N	3079.36	3079.71			
27	307910189	307910189 - N	3079.36	3079.71			

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910163 - N	ECUX882478	0.9537					
307910164 - N	ECUX882478	0.9537					
307910165 - N	ECUX882478	0.9537					
307910166 - N	ECUX882478	0.9537					
307910167 - N	ECUX882478	0.9537					
307910168 - N	ECUX882478	0.9537					
307910169 - N	ECUX882478	0.9537					
307910170 - N	ECUX882478	0.9540	0.280	284	2.59	94	
307910171 - N	ECUX882478	0.9540					
307910172 - N	ECUX882478	0.9540					
307910173 - N	ECUX882478	0.9540					
307910174 - N	ECUX882478	0.9540					
307910175 - N	ECUX882478	0.9540					
307910176 - N	ECUX882478	0.9540					
307910177 - N	ECUX882478	0.9540					
307910178 - N	ECUX882478	0.9540					
307910179 - N	ECUX882478	0.9540					
307910180 - N	ECUX882478	0.9536	0.265	278	2.36	92	
307910181 - N	ECUX882478	0.9536					
307910182 - N	ECUX882478	0.9536					
307910183 - N	ECUX882478	0.9536					
307910184 - N	ECUX882478	0.9536					
307910185 - N	ECUX882478	0.9536					
307910186 - N	ECUX882478	0.9536					
307910187 - N	ECUX882478	0.9536					
307910188 - N	ECUX882478	0.9536					
307910189 - N	ECUX882478	0.9536					

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910190	307910190 - N	3079.69	3079.53	2.33	3.75	
2	307910191	307910191 - N	3079.69	3079.53			
3	307910192	307910192 - N	3079.69	3079.53			
4	307910193	307910193 - N	3079.69	3079.53			
5	307910194	307910194 - N	3079.69	3079.53			
6	307910195	307910195 - N	3079.69	3079.53			
7	307910196	307910196 - N	3079.69	3079.53			
8	307910197	307910197 - N	3079.55	3079.75			
9	307910198	307910198 - N	3079.55	3079.75			
10	307910199	307910199 - N	3079.55	3079.75			
11	307910200	307910200 - N	3079.55	3079.75	2.19	3.12	
12	307910201	307910201 - N	3079.55	3079.75			
13	307910202	307910202 - N	3079.55	3079.75			
14	307910203	307910203 - N	3079.55	3079.75			
15	307910204	307910204 - N	3079.72	3079.57			
16	307910205	307910205 - N	3079.72	3079.57			
17	307910206	307910206 - N	3079.72	3079.57			
18	307910207	307910207 - N	3079.72	3079.57			
19	307910208	307910208 - N	3079.72	3079.57			
20	307910209	307910209 - N	3079.72	3079.57			
21	307910210	307910210 - N	3079.72	3079.57	2.36	3.67	
22	307910211	307910211 - N	3079.59	3079.78			
23	307910212	307910212 - N	3079.59	3079.78			
24	307910213	307910213 - N	3079.59	3079.78			
25	307910214	307910214 - N	3079.59	3079.78			
26	307910215	307910215 - N	3079.59	3079.78			
27	307910216	307910216 - N	3079.59	3079.78			

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910190 - N	ECUX882478	0.9542	0.272	288	2.63	96	
307910191 - N	ECUX882478	0.9542					
307910192 - N	ECUX882478	0.9542					
307910193 - N	ECUX882478	0.9542					
307910194 - N	ECUX882478	0.9542					
307910195 - N	ECUX882478	0.9542					
307910196 - N	ECUX882478	0.9542					
307910197 - N	ECUX882478	0.9542					
307910198 - N	ECUX882478	0.9542					
307910199 - N	ECUX882478	0.9542					
307910200 - N	ECUX882478	0.9539	0.262	279	2.44	91	
307910201 - N	ECUX882478	0.9539					
307910202 - N	ECUX882478	0.9539					
307910203 - N	ECUX882478	0.9539					
307910204 - N	ECUX882478	0.9539					
307910205 - N	ECUX882478	0.9539					
307910206 - N	ECUX882478	0.9539					
307910207 - N	ECUX882478	0.9539					
307910208 - N	ECUX882478	0.9539					
307910209 - N	ECUX882478	0.9539					
307910210 - N	ECUX882478	0.9541	0.274	283	2.57	95	
307910211 - N	ECUX882478	0.9541					
307910212 - N	ECUX882478	0.9541					
307910213 - N	ECUX882478	0.9541					
307910214 - N	ECUX882478	0.9541					
307910215 - N	ECUX882478	0.9541					
307910216 - N	ECUX882478	0.9541					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910217	307910217 - N	3079.59	3079.78			
2	307910218	307910218 - N	3079.80	3079.60			
3	307910219	307910219 - N	3079.80	3079.60			
4	307910220	307910220 - N	3079.80	3079.60	2.16	3.08	
5	307910221	307910221 - N	3079.80	3079.60			
6	307910222	307910222 - N	3079.80	3079.60			
7	307910223	307910223 - N	3079.80	3079.60			
8	307910224	307910224 - N	3079.80	3079.60			
9	307910225	307910225 - N	3079.63	3079.73			
10	307910226	307910226 - N	3079.63	3079.73			
11	307910227	307910227 - N	3079.63	3079.73			
12	307910228	307910228 - N	3079.63	3079.73			
13	307910229	307910229 - N	3079.63	3079.73			
14	307910230	307910230 - N	3079.63	3079.73	2.28	3.59	
15	307910231	307910231 - N	3079.63	3079.73			
16	307910232	307910232 - N	3079.70	3079.62			
17	307910233	307910233 - N	3079.70	3079.62			
18	307910234	307910234 - N	3079.70	3079.62			
19	307910235	307910235 - N	3079.70	3079.62			
20	307910236	307910236 - N	3079.70	3079.62			
21	307910237	307910237 - N	3079.70	3079.62			
22	307910238	307910238 - N	3079.70	3079.62			
23	307910239	307910239 - N	3079.56	3079.76			
24	307910240	307910240 - N	3079.56	3079.76	2.25	3.17	
25	307910241	307910241 - N	3079.56	3079.76			
26	307910242	307910242 - N	3079.56	3079.76			
27	307910243	307910243 - N	3079.56	3079.76			

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910217 - N	ECUX882478	0.9541					
307910218 - N	ECUX882478	0.9541					
307910219 - N	ECUX882478	0.9541					
307910220 - N	CHVX890138	0.9551	0.269	275	2.46	93	
307910221 - N	CHVX890138	0.9551					
307910222 - N	CHVX890138	0.9551					
307910223 - N	CHVX890138	0.9551					
307910224 - N	CHVX890138	0.9551					
307910225 - N	CHVX890138	0.9551					
307910226 - N	CHVX890138	0.9551					
307910227 - N	CHVX890138	0.9551					
307910228 - N	CHVX890138	0.9551					
307910229 - N	CHVX890138	0.9551					
307910230 - N	CHVX890138	0.9553	0.277	287	2.60	96	
307910231 - N	CHVX890138	0.9553					
307910232 - N	CHVX890138	0.9553					
307910233 - N	CHVX890138	0.9553					
307910234 - N	CHVX890138	0.9553					
307910235 - N	CHVX890138	0.9553					
307910236 - N	CHVX890138	0.9553					
307910237 - N	CHVX890138	0.9553					
307910238 - N	CHVX890138	0.9553					
307910239 - N	CHVX890138	0.9553					
307910240 - N	CHVX890138	0.9550	0.264	277	2.35	90	
307910241 - N	CHVX890138	0.9550					
307910242 - N	CHVX890138	0.9550					
307910243 - N	CHVX890138	0.9550					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910244	307910244 - N	3079.56	3079.76			
2	307910245	307910245 - N	3079.56	3079.76			
3	307910246	307910246 - N	3079.74	3079.66			
4	307910247	307910247 - N	3079.74	3079.66			
5	307910248	307910248 - N	3079.74	3079.66			
6	307910249	307910249 - N	3079.74	3079.66			
7	307910250	307910250 - N	3079.74	3079.66	2.37	3.72	
8	307910251	307910251 - N	3079.74	3079.66			
9	307910252	307910252 - N	3079.74	3079.66			
10	307910253	307910253 - N	3079.58	3079.82			
11	307910254	307910254 - N	3079.58	3079.82			
12	307910255	307910255 - N	3079.58	3079.82			
13	307910256	307910256 - N	3079.58	3079.82			
14	307910257	307910257 - N	3079.58	3079.82			
15	307910258	307910258 - N	3079.58	3079.82			
16	307910259	307910259 - N	3079.58	3079.82			
17	307910260	307910260 - N	3079.68	3079.61	2.18	3.14	
18	307910261	307910261 - N	3079.68	3079.61			
19	307910262	307910262 - N	3079.68	3079.61			
20	307910263	307910263 - N	3079.68	3079.61			
21	307910264	307910264 - N	3079.68	3079.61			
22	307910265	307910265 - N	3079.68	3079.61			
23	307910266	307910266 - N	3079.68	3079.61			
24	307910267	307910267 - N	3079.64	3079.85			
25	307910268	307910268 - N	3079.64	3079.85			
26	307910269	307910269 - N	3079.64	3079.85			
27	307910270	307910270 - N	3079.64	3079.85	2.29	3.79	

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910244 - N	CHVX890138	0.9550					
307910245 - N	CHVX890138	0.9550					
307910246 - N	CHVX890138	0.9550					
307910247 - N	CHVX890138	0.9550					
307910248 - N	CHVX890138	0.9550					
307910249 - N	CHVX890138	0.9550					
307910250 - N	CHVX890138	0.9554	0.273	285	2.55	94	
307910251 - N	CHVX890138	0.9554					
307910252 - N	CHVX890138	0.9554					
307910253 - N	CHVX890138	0.9554					
307910254 - N	CHVX890138	0.9554					
307910255 - N	CHVX890138	0.9554					
307910256 - N	CHVX890138	0.9554					
307910257 - N	CHVX890138	0.9554					
307910258 - N	CHVX890138	0.9554					
307910259 - N	CHVX890138	0.9554					
307910260 - N	CHVX890138	0.9549	0.267	280	2.26	92	
307910261 - N	CHVX890138	0.9549					
307910262 - N	CHVX890138	0.9549					
307910263 - N	CHVX890138	0.9549					
307910264 - N	CHVX890138	0.9549					
307910265 - N	CHVX890138	0.9549					
307910266 - N	CHVX890138	0.9549					
307910267 - N	CHVX890138	0.9549					
307910268 - N	CHVX890138	0.9549					
307910269 - N	CHVX890138	0.9549					
307910270 - N	CHVX890138	0.9552	0.279	284	2.52	96	

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910271	307910271 - N	3079.64	3079.85			
2	307910272	307910272 - N	3079.64	3079.85			
3	307910273	307910273 - N	3079.64	3079.85			
4	307910274	307910274 - N	3079.77	3079.81			
5	307910275	307910275 - N	3079.77	3079.81			
6	307910276	307910276 - N	3079.77	3079.81			
7	307910277	307910277 - N	3079.77	3079.81			
8	307910278	307910278 - N	3079.77	3079.81			
9	307910279	307910279 - N	3079.77	3079.81			
10	307910280	307910280 - N	3079.77	3079.81	2.23	3.03	
11	307910281	307910281 - N	3079.67	3079.83			
12	307910282	307910282 - N	3079.67	3079.83			
13	307910283	307910283 - N	3079.67	3079.83			
14	307910284	307910284 - N	3079.67	3079.83			
15	307910285	307910285 - N	3079.67	3079.83			
16	307910286	307910286 - N	3079.67	3079.83			
17	307910287	307910287 - N	3079.67	3079.83			
18	307910288	307910288 - N	3079.84	3079.79			
19	307910289	307910289 - N	3079.84	3079.79			
20	307910290	307910290 - N	3079.84	3079.79	2.31	3.68	
21	307910291	307910291 - N	3079.84	3079.79			
22	307910292	307910292 - N	3079.84	3079.79			
23	307910293	307910293 - N	3079.84	3079.79			
24	307910294	307910294 - N	3079.84	3079.79			
25	307910295	307910295 - N	3079.65	3079.86			
26	307910296	307910296 - N	3079.65	3079.86			
27	307910297	307910297 - N	3079.65	3079.86			

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910271 - N	CHVX890138	0.9552					
307910272 - N	CHVX890138	0.9552					
307910273 - N	CHVX890138	0.9552					
307910274 - N	CHVX890138	0.9552					
307910275 - N	CHVX890138	0.9552					
307910276 - N	CHVX890138	0.9552					
307910277 - N	CHVX890138	0.9552					
307910278 - N	CHVX890138	0.9552					
307910279 - N	CHVX890138	0.9552					
307910280 - N	CHVX890138	0.9550	0.266	276	2.37	91	
307910281 - N	CHVX890138	0.9550					
307910282 - N	CHVX890138	0.9550					
307910283 - N	CHVX890138	0.9550					
307910284 - N	CHVX890138	0.9550					
307910285 - N	CHVX890138	0.9550					
307910286 - N	CHVX890138	0.9550					
307910287 - N	CHVX890138	0.9550					
307910288 - N	CHVX890138	0.9550					
307910289 - N	CHVX890138	0.9550					
307910290 - N	CHVX890138	0.9554	0.276	282	2.49	95	
307910291 - N	CHVX890138	0.9554					
307910292 - N	CHVX890138	0.9554					
307910293 - N	CHVX890138	0.9554					
307910294 - N	CHVX890138	0.9554					
307910295 - N	CHVX890138	0.9554					
307910296 - N	CHVX890138	0.9554					
307910297 - N	CHVX890138	0.9554					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geocomposite manufacturer, hereby certify the following for the material delievered to the above referenced project :

Roll	Geocomposite Roll Number	Geonet Roll Number	Geotextile Roll Number		Ply Adhesion (lb/in)		Geocomposite Transmissivity (m^2/sec)
			Top	Bottom	Minimum	Average	
1	307910298	307910298 - N	3079.65	3079.86			
2	307910299	307910299 - N	3079.65	3079.86			
3	307910300	307910300 - N	3079.65	3079.86	2.18	3.01	
4	307910301	307910301 - N	3079.65	3079.86			
5	307910302	307910302 - N	3079.87	3079.90			
6	307910303	307910303 - N	3079.87	3079.90			
7	307910304	307910304 - N	3079.87	3079.90			
8	307910305	307910305 - N	3079.87	3079.90			
9	307910306	307910306 - N	3079.87	3079.90			
10	307910307	307910307 - N	3079.87	3079.90			
11	307910308	307910308 - N	3079.87	3079.90			
12	307910309	307910309 - N	3079.89	3079.88			
13	307910310	307910310 - N	3079.89	3079.88	2.39	3.78	

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN270-2-6**
Project : **Johnston County Landfill, NC**

We, the Geonet Manufacturer, hereby ceritify the following for the material sent to the above referenced project :

Geonet Roll Number	Resin Lot Number	Geonet Density (gm/cc)	Mass Per Unit Area (lb/ft^2)	Thickness (mils)	Carbon Black (%)	Tensile Strength (MD) (lb/in)	Transmissivity (m^2/sec)
307910298 - N	CHVX890138	0.9554					
307910299 - N	CHVX890138	0.9554					
307910300 - N	CHVX890138	0.9549	0.262	286	2.30	90	
307910301 - N	CHVX890138	0.9549					
307910302 - N	CHVX890138	0.9549					
307910303 - N	CHVX890138	0.9549					
307910304 - N	CHVX890138	0.9549					
307910305 - N	CHVX890138	0.9549					
307910306 - N	CHVX890138	0.9549					
307910307 - N	CHVX890138	0.9549					
307910308 - N	CHVX890138	0.9549					
307910309 - N	CHVX890138	0.9549					
307910310 - N	CHVX890138	0.9553	0.278	274	2.51	93	

APPROVED 5 QA

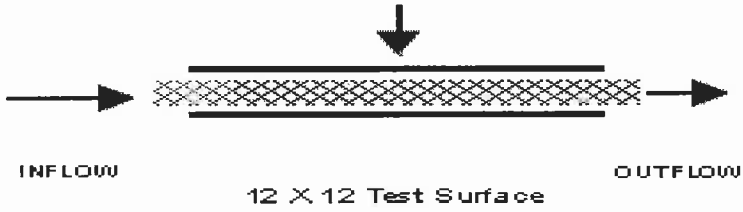
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Hallaton, Inc.	**Job #**	3079
Project:	Johnston County Landfill, NC		
Product:	TN270-2-6		

Test Configuration:



Test Information:

Boundary Conditions:	Sand Geocomposite Liner	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.1 ft 100 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec 100 hours
307910001	10000	0.1	5.71×10^{-4}
307910025			5.89×10^{-4}
307910050			5.68×10^{-4}
307910075			5.85×10^{-4}
307910100			5.73×10^{-4}
307910125			5.90×10^{-4}
307910150			5.81×10^{-4}
307910175			5.83×10^{-4}
307910200			5.77×10^{-4}
307910225			5.88×10^{-4}
307910250			5.67×10^{-4}
307910275			5.86×10^{-4}
307910300			5.69×10^{-4}

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

POLYETHYLENE RESIN CERTIFICATION

Customer Name : Hallaton, Inc.
Project Name : Johnston County Landfill, NC
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN270-2-6

We, the Geonet Manufacturer, hereby certify the following for the material delivered to the above referenced project:

Resin Supplier	Resin Production Plant	Resin Brand Name	Resin Lot Number	Property	Test Method	Units	Resin Supplier Value	Tested Value*
I Resin LLC	Chevron, TX	HDPE	ECUX882478	Density	ASTM D 1505	gm/cc	0.948	0.949
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.06	0.09
			CHVX890138	Density	ASTM D 1505	gm/cc	0.954	0.950
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.055	0.08

(a) Condition 190/2.16
* Data from SKAPS Quality Control

APPROVED 5 QA

571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 **Fax:** 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : TN270-2-6
Project : Johnston County Landfill, NC

We, the Geocomposite Manufacturer, hereby certify the following for the material delivered to the above referenced project :

GEOCOMP ROLL#	FABRIC ROLL#	WEIGHT oz/sq yd	MD TENSILE lbs.	MD ELONG %	XMD TENSILE lbs.	XMD ELONG %	PUNCTURE lbs.	AOS us sieve	PERM-ITY sec^{-1}
307910001	3079.03	6.69	160	68	175	80	95	70	1.82
	3079.22	6.67	165	71	173	79	100	70	1.82
307910035	3079.09	6.22	164	70	172	77	95	70	1.82
	3079.17	6.31	162	66	177	81	98	70	1.82
307910070	3079.15	6.31	162	66	177	81	98	70	1.82
	3079.06	6.22	164	70	172	77	95	70	1.82
307910105	3079.16	6.31	162	66	177	81	98	70	1.82
	3079.42	6.62	161	72	174	78	99	70	1.82
307910140	3079.47	6.45	166	70	170	82	99	70	1.82
	3079.32	6.59	168	74	179	76	96	70	1.82
307910175	3079.38	6.20	163	67	176	85	96	70	1.82
	3079.52	6.28	169	65	177	80	97	70	1.75
307910210	3079.72	6.64	164	71	178	75	98	70	1.75
	3079.57	6.53	162	75	175	77	97	70	1.75
307910245	3079.56	6.53	162	75	175	77	97	70	1.75
	3079.76	6.70	161	66	173	81	98	70	1.75
307910280	3079.77	6.70	161	66	173	81	98	70	1.75
	3079.81	6.26	166	74	171	78	100	70	1.75

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GEOSYNTHETICS INVENTORY LOG
DRAINAGE GEOCOMPOSITE

Project Name: Johnston County MSWLF Phase 4A - Cell 3
Project Number: JOHNSTON-08-5
Contractor: ES&J **Storage Area:** Top of Phases 1&2
Geosynthetics Installer: Hallaton, Inc. **Inventory Monitor(s):** BSH

Geosynthetic Material Type: Drainage Geocomposite
Geosynthetic Product Identification: SKAPS Transnet 270-2-6

Material		Material Dimensions		Conformance	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)	Sample No.	
307910001	ECUX882478	200	14.5		
307910002	ECUX882478	200	14.5		
307910003	ECUX882478	200	14.5		
307910004	ECUX882478	200	14.5		
307910005	ECUX882478	200	14.5		
307910006	ECUX882478	200	14.5		
307910007	ECUX882478	200	14.5		
307910008	ECUX882478	200	14.5		
307910009	ECUX882478	200	14.5		
307910010	ECUX882478	200	14.5		
307910011	ECUX882478	200	14.5		
307910012	ECUX882478	200	14.5		
307910013	ECUX882478	200	14.5		
307910014	ECUX882478	200	14.5		
307910015	ECUX882478	200	14.5		
307910016	ECUX882478	200	14.5		
307910017	ECUX882478	200	14.5		
307910018	ECUX882478	200	14.5		
307910019	ECUX882478	200	14.5		
307910020	ECUX882478	200	14.5	L09012-03-01	PASS
307910021	ECUX882478	200	14.5		
307910022	ECUX882478	200	14.5		
307910023	ECUX882478	200	14.5		
307910024	ECUX882478	200	14.5		
307910025	ECUX882478	200	14.5		
307910026	ECUX882478	200	14.5		
307910027	ECUX882478	200	14.5		
307910028	ECUX882478	200	14.5		
307910029	ECUX882478	200	14.5		
307910030	ECUX882478	200	14.5		
307910031	ECUX882478	200	14.5		
307910032	ECUX882478	200	14.5		
307910033	ECUX882478	200	14.5		
307910034	ECUX882478	200	14.5		
307910035	ECUX882478	200	14.5		
307910036	ECUX882478	200	14.5		
307910037	ECUX882478	200	14.5		
307910038	ECUX882478	200	14.5		
307910039	ECUX882478	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910040	ECUX882478	200	14.5		
307910041	ECUX882478	200	14.5		
307910042	ECUX882478	200	14.5		
307910043	ECUX882478	200	14.5		
307910044	ECUX882478	200	14.5		
307910045	ECUX882478	200	14.5		
307910046	ECUX882478	200	14.5		
307910047	ECUX882478	200	14.5		
307910048	ECUX882478	200	14.5		
307910049	ECUX882478	200	14.5		
307910050	ECUX882478	200	14.5	L09012-03-02	PASS
307910051	ECUX882478	200	14.5		
307910052	ECUX882478	200	14.5		
307910053	ECUX882478	200	14.5		
307910054	ECUX882478	200	14.5		
307910055	ECUX882478	200	14.5		
307910056	ECUX882478	200	14.5		
307910057	ECUX882478	200	14.5		
307910058	ECUX882478	200	14.5		
307910059	ECUX882478	200	14.5		
307910060	ECUX882478	200	14.5		
307910061	ECUX882478	200	14.5		
307910062	ECUX882478	200	14.5		
307910063	ECUX882478	200	14.5		
307910064	ECUX882478	200	14.5		
307910065	ECUX882478	200	14.5		
307910066	ECUX882478	200	14.5		
307910067	ECUX882478	200	14.5		
307910068	ECUX882478	200	14.5		
307910069	ECUX882478	200	14.5		
307910070	ECUX882478	200	14.5		
307910071	ECUX882478	200	14.5		
307910072	ECUX882478	200	14.5		
307910073	ECUX882478	200	14.5		
307910074	ECUX882478	200	14.5		
307910075	ECUX882478	200	14.5		
307910076	ECUX882478	200	14.5		
307910077	ECUX882478	200	14.5		
307910078	ECUX882478	200	14.5		
307910079	ECUX882478	200	14.5		
307910080	ECUX882478	200	14.5	L09012-03-03	PASS
307910081	ECUX882478	200	14.5		
307910082	ECUX882478	200	14.5		
307910083	ECUX882478	200	14.5		
307910084	ECUX882478	200	14.5		
307910085	ECUX882478	200	14.5		
307910086	ECUX882478	200	14.5		
307910087	ECUX882478	200	14.5		
307910088	ECUX882478	200	14.5		
307910089	ECUX882478	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910090	ECUX882478	200	14.5		
307910091	ECUX882478	200	14.5		
307910092	ECUX882478	200	14.5		
307910093	ECUX882478	200	14.5		
307910094	ECUX882478	200	14.5		
307910095	ECUX882478	200	14.5		
307910096	ECUX882478	200	14.5		
307910097	ECUX882478	200	14.5		
307910098	ECUX882478	200	14.5		
307910099	ECUX882478	200	14.5		
307910100	ECUX882478	200	14.5		
307910101	ECUX882478	200	14.5		
307910102	ECUX882478	200	14.5		
307910103	ECUX882478	200	14.5		
307910104	ECUX882478	200	14.5		
307910105	ECUX882478	200	14.5		
307910106	ECUX882478	200	14.5		
307910107	ECUX882478	200	14.5		
307910108	ECUX882478	200	14.5		
307910109	ECUX882478	200	14.5		
307910110	ECUX882478	200	14.5	L09012-03-04	PASS
307910111	ECUX882478	200	14.5		
307910112	ECUX882478	200	14.5		
307910113	ECUX882478	200	14.5		
307910114	ECUX882478	200	14.5		
307910115	ECUX882478	200	14.5		
307910116	ECUX882478	200	14.5		
307910117	ECUX882478	200	14.5		
307910118	ECUX882478	200	14.5		
307910119	ECUX882478	200	14.5		
307910120	ECUX882478	200	14.5		
307910121	ECUX882478	200	14.5		
307910122	ECUX882478	200	14.5		
307910123	ECUX882478	200	14.5		
307910124	ECUX882478	200	14.5		
307910125	ECUX882478	200	14.5		
307910126	ECUX882478	200	14.5		
307910127	ECUX882478	200	14.5		
307910128	ECUX882478	200	14.5		
307910129	ECUX882478	200	14.5		
307910130	ECUX882478	200	14.5		
307910131	ECUX882478	200	14.5		
307910132	ECUX882478	200	14.5		
307910133	ECUX882478	200	14.5		
307910134	ECUX882478	200	14.5		
307910135	ECUX882478	200	14.5		
307910136	ECUX882478	200	14.5		
307910137	ECUX882478	200	14.5		
307910138	ECUX882478	200	14.5		
307910139	ECUX882478	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910140	ECUX882478	200	14.5	L09012-03-05	PASS
307910141	ECUX882478	200	14.5		
307910142	ECUX882478	200	14.5		
307910143	ECUX882478	200	14.5		
307910144	ECUX882478	200	14.5		
307910145	ECUX882478	200	14.5		
307910146	ECUX882478	200	14.5		
307910147	ECUX882478	200	14.5		
307910148	ECUX882478	200	14.5		
307910149	ECUX882478	200	14.5		
307910150	ECUX882478	200	14.5		
307910151	ECUX882478	200	14.5		
307910152	ECUX882478	200	14.5		
307910153	ECUX882478	200	14.5		
307910154	ECUX882478	200	14.5		
307910155	ECUX882478	200	14.5		
307910156	ECUX882478	200	14.5		
307910157	ECUX882478	200	14.5		
307910158	ECUX882478	200	14.5		
307910159	ECUX882478	200	14.5		
307910160	ECUX882478	200	14.5		
307910161	ECUX882478	200	14.5		
307910162	ECUX882478	200	14.5		
307910163	ECUX882478	200	14.5		
307910164	ECUX882478	200	14.5		
307910165	ECUX882478	200	14.5		
307910166	ECUX882478	200	14.5		
307910167	ECUX882478	200	14.5		
307910168	ECUX882478	200	14.5		
307910169	ECUX882478	200	14.5		
307910170	ECUX882478	200	14.5	L09012-03-06	PASS
307910171	ECUX882478	200	14.5		
307910172	ECUX882478	200	14.5		
307910173	ECUX882478	200	14.5		
307910174	ECUX882478	200	14.5		
307910175	ECUX882478	200	14.5		
307910176	ECUX882478	200	14.5		
307910177	ECUX882478	200	14.5		
307910178	ECUX882478	200	14.5		
307910179	ECUX882478	200	14.5		
307910180	ECUX882478	200	14.5		
307910181	ECUX882478	200	14.5		
307910182	ECUX882478	200	14.5		
307910183	ECUX882478	200	14.5		
307910184	ECUX882478	200	14.5		
307910185	ECUX882478	200	14.5		
307910186	ECUX882478	200	14.5		
307910187	ECUX882478	200	14.5		
307910188	ECUX882478	200	14.5		
307910189	ECUX882478	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910190	ECUX882478	200	14.5		
307910191	ECUX882478	200	14.5		
307910192	ECUX882478	200	14.5		
307910193	ECUX882478	200	14.5		
307910194	ECUX882478	200	14.5		
307910195	ECUX882478	200	14.5		
307910196	ECUX882478	200	14.5		
307910197	ECUX882478	200	14.5		
307910198	ECUX882478	200	14.5		
307910199	ECUX882478	200	14.5		
307910200	ECUX882478	200	14.5	L09012-03-07	PASS
307910201	ECUX882478	200	14.5		
307910202	ECUX882478	200	14.5		
307910203	ECUX882478	200	14.5		
307910204	ECUX882478	200	14.5		
307910205	ECUX882478	200	14.5		
307910206	ECUX882478	200	14.5		
307910207	ECUX882478	200	14.5		
307910208	ECUX882478	200	14.5		
307910209	ECUX882478	200	14.5		
307910210	ECUX882478	200	14.5		
307910211	ECUX882478	200	14.5		
307910212	ECUX882478	200	14.5		
307910213	ECUX882478	200	14.5		
307910214	ECUX882478	200	14.5		
307910215	ECUX882478	200	14.5		
307910216	ECUX882478	200	14.5		
307910217	ECUX882478	200	14.5		
307910218	ECUX882478	200	14.5		
307910219	CHVX890138	200	14.5		
307910220	CHVX890138	200	14.5		
307910221	CHVX890138	200	14.5		
307910222	CHVX890138	200	14.5		
307910223	CHVX890138	200	14.5		
307910224	CHVX890138	200	14.5		
307910225	CHVX890138	200	14.5		
307910226	CHVX890138	200	14.5		
307910227	CHVX890138	200	14.5		
307910228	CHVX890138	200	14.5		
307910229	CHVX890138	200	14.5		
307910230	CHVX890138	200	14.5	L09012-03-08	PASS
307910231	CHVX890138	200	14.5		
307910232	CHVX890138	200	14.5		
307910233	CHVX890138	200	14.5		
307910234	CHVX890138	200	14.5		
307910235	CHVX890138	200	14.5		
307910236	CHVX890138	200	14.5		
307910237	CHVX890138	200	14.5		
307910238	CHVX890138	200	14.5		
307910239	CHVX890138	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910240	CHVX890138	200	14.5		
307910241	CHVX890138	200	14.5		
307910242	CHVX890138	200	14.5		
307910243	CHVX890138	200	14.5		
307910244	CHVX890138	200	14.5		
307910245	CHVX890138	200	14.5		
307910246	CHVX890138	200	14.5		
307910247	CHVX890138	200	14.5		
307910248	CHVX890138	200	14.5		
307910249	CHVX890138	200	14.5		
307910250	CHVX890138	200	14.5		
307910251	CHVX890138	200	14.5		
307910252	CHVX890138	200	14.5		
307910253	CHVX890138	200	14.5		
307910254	CHVX890138	200	14.5		
307910255	CHVX890138	200	14.5		
307910256	CHVX890138	200	14.5		
307910257	CHVX890138	200	14.5		
307910258	CHVX890138	200	14.5		
307910259	CHVX890138	200	14.5		
307910260	CHVX890138	200	14.5	L09012-03-09	PASS
307910261	CHVX890138	200	14.5		
307910262	CHVX890138	200	14.5		
307910263	CHVX890138	200	14.5		
307910264	CHVX890138	200	14.5		
307910265	CHVX890138	200	14.5		
307910266	CHVX890138	200	14.5		
307910267	CHVX890138	200	14.5		
307910268	CHVX890138	200	14.5		
307910269	CHVX890138	200	14.5		
307910270	CHVX890138	200	14.5		
307910271	CHVX890138	200	14.5		
307910272	CHVX890138	200	14.5		
307910273	CHVX890138	200	14.5		
307910274	CHVX890138	200	14.5		
307910275	CHVX890138	200	14.5		
307910276	CHVX890138	200	14.5		
307910277	CHVX890138	200	14.5		
307910278	CHVX890138	200	14.5		
307910279	CHVX890138	200	14.5		
307910280	CHVX890138	200	14.5		
307910281	CHVX890138	200	14.5		
307910282	CHVX890138	200	14.5		
307910283	CHVX890138	200	14.5		
307910284	CHVX890138	200	14.5		
307910285	CHVX890138	200	14.5		
307910286	CHVX890138	200	14.5		
307910287	CHVX890138	200	14.5		
307910288	CHVX890138	200	14.5		
307910289	CHVX890138	200	14.5		

Material		Material Dimensions		Conformance Sample No.	Remarks
Roll No.	Batch/Lot No.	Length (Feet)	Width (Feet)		
307910290	CHVX890138	200	14.5	L09012-03-10	PASS
307910291	CHVX890138	200	14.5		
307910292	CHVX890138	200	14.5		
307910293	CHVX890138	200	14.5		
307910294	CHVX890138	200	14.5		
307910295	CHVX890138	200	14.5		
307910296	CHVX890138	200	14.5		
307910297	CHVX890138	200	14.5		
307910298	CHVX890138	200	14.5		
307910299	CHVX890138	200	14.5		
307910300	CHVX890138	200	14.5		
307910301	CHVX890138	200	14.5		
307910302	CHVX890138	200	14.5		
307910303	CHVX890138	200	14.5		
307910304	CHVX890138	200	14.5		
307910305	CHVX890138	200	14.5		
307910306	CHVX890138	200	14.5		
307910307	CHVX890138	200	14.5		
307910308	CHVX890138	200	14.5		
307910309	CHVX890138	200	14.5		
307910310	CHVX890138	200	14.5		

Totals:

Total Rolls:	310
Total Lots:	2
Total SF:	899,000

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-01
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910020

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3362	0.3385	0.3438	0.3483	0.3352		
			0.3379	0.3325	0.3476	0.3472	0.3348	**0.3402**	0.0060
DENSITY	D 1505	g/cc	0.9548	0.9545	0.9545			**0.9546**	0.0002
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	3.1	3.3	6.1	5.7	3.1	**4.26**	1.505
	SIDE"B"	MD-lb/in	4.7	4.2	5.1	5.5	3.3	**4.53**	0.832

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-02
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910050

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3282	0.3452	0.3424	0.3419	0.3421		
			0.3362	0.3372	0.3392	0.3355	0.3364	**0.3384**	0.0048
DENSITY	D 1505	g/cc	0.9542	0.9542	0.9541			**0.9542**	0.0001
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	2.4	1.8	5.7	5.0	2.3	**3.43**	1.789
	SIDE"B"	MD-lb/in	2.9	2.7	5.9	6.1	2.0	**3.94**	1.935

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CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-03
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910080

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3415	0.3417	0.3446	0.3434	0.3342		
			0.3330	0.3414	0.3532	0.3502	0.3495	**0.3433**	0.0065
DENSITY	D 1505	g/cc	0.9548	0.9548	0.9545			**0.9547**	0.0002
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	1.6	2.4	6.4	5.4	1.5	**3.45**	2.282
	SIDE"B"	MD-lb/in	2.6	3.4	5.4	4.5	2.4	**3.65**	1.294

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CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-04
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910110

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3321 0.3318	0.3394 0.3289	0.3249 0.3289	0.3368 0.3417	0.3336 0.3412	**0.3339**	0.0057
DENSITY	D 1505	g/cc	0.9545	0.9545	0.9542			**0.9544**	0.0002
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	2.1	2.6	5.8	5.7	4.4	**4.11**	1.697
	SIDE"B"	MD-lb/in	2.7	3.0	5.8	6.8	4.3	**4.53**	1.787

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-05
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910140

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3189 0.3251	0.3192 0.3309	0.3122 0.3263	0.3159 0.3246	0.3197 0.3274	**0.3220**	0.0058
DENSITY	D 1505	g/cc	0.9542	0.9542	0.9548			**0.9544**	0.0004
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	4.2	4.1	2.1	1.9	2.8	**3.02**	1.065
	SIDE"B"	MD-lb/in	4.3	3.7	2.2	1.9	4.4	**3.27**	1.187

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-06
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910170

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3342	0.3301	0.3302	0.3313	0.3272		
			0.3308	0.3282	0.3270	0.3262	0.3296	**0.3295**	0.0024
DENSITY	D 1505	g/cc	0.9542	0.9542	0.9542			**0.9542**	0.0000
Geocomposite									
PLY **ADHESION**	GDI GC7								
	SIDE "A"	MD-lb/in	3.4	2.3	5.7	3.6	6.4	**4.26**	1.728
	SIDE"B"	MD-lb/in	3.2	3.1	5.9	4.3	4.8	**4.28**	1.162

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CONFORMANCE TEST RESULTS

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INTEGRITY IN TESTING

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-07
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910200

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3244	0.3209	0.3252	0.3295	0.3292		
			0.3325	0.3304	0.3347	0.3325	0.3334	**0.3293**	0.0045
DENSITY	D 1505	g/cc	0.9545	0.9545	0.9545			**0.9545**	0.0000
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	5.5	4.9	3.8	3.4	3.7	**4.25**	0.897
	SIDE"B"	MD-lb/in	3.8	5.0	3.9	3.5	3.5	**3.94**	0.630

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\\GEOSERVER\Data Drive\Synthetics\2009 SYNTHETICS\[L09012-03-07COMP-JHONSTON L09012-03-07

2/16/2009

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-08
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910230

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3303	0.3379	0.3344	0.3375	0.3364		
			0.3348	0.3215	0.3221	0.3292	0.3345	**0.3319**	0.0060
DENSITY	D 1505	g/cc	0.9548	0.9545	0.9545			**0.9546**	0.0002
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	5.9	3.4	4.7	5.9	2.5	**4.47**	1.487
	SIDE"B"	MD-lb/in	5.5	4.9	4.6	6.3	3.9	**5.02**	0.946

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2/16/2009

CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-09
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910260

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3287	0.3222	0.3262	0.3241	0.3204		
			0.3264	0.3176	0.3263	0.3334	0.3234	**0.3249**	0.0044
DENSITY	D 1505	g/cc	0.9545	0.9545	0.9548			**0.9546**	0.0002
Geocomposite									
PLY ADHESION	GDI GC7								
	SIDE "A"	MD-lb/in	2.5	1.9	4.7	5.0	3.4	**3.50**	1.344
	SIDE"B"	MD-lb/in	3.8	3.1	5.9	5.9	2.7	**4.27**	1.516

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2/16/2009

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CONFORMANCE TEST RESULTS

CLIENT: RICHARDSON, SMITH,GARDNER & ASSOCIATES, INC
CLIENT PROJECT: JOHNSTON CO.MSW LANDFILL-PHASE 4A
PROJECT NO.: L09012-03
LAB ID NO.: L09012-03-10
MATERIAL: SKAPS TN 270-2-6 GEOCOMPOSITE
ROLL NO: 307910290

TEST	ASTM METHOD	UNITS	SPECIMEN NO. 1	2	3	4	5	AVE	STD
Geonet									
THICKNESS	D 5199	inches	0.3194	0.3262	0.3312	0.3254	0.3285		
			0.3246	0.3262	0.3265	0.3189	0.3209	**0.3248**	0.0040
DENSITY	D 1505	g/cc	0.9545	0.9548	0.9548			**0.9547**	0.0002
Geocomposite									
PLY **ADHESION**	GDI GC7								
	SIDE "A"	MD-lb/in	4.2	2.9	4.7	4.4	3.5	**3.94**	0.764
	SIDE"B"	MD-lb/in	4.6	3.3	5.4	6.7	3.5	**4.69**	1.398

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2/16/2009

TRANSMISSIVITY TEST RESULTS

ASTM D 4716-00

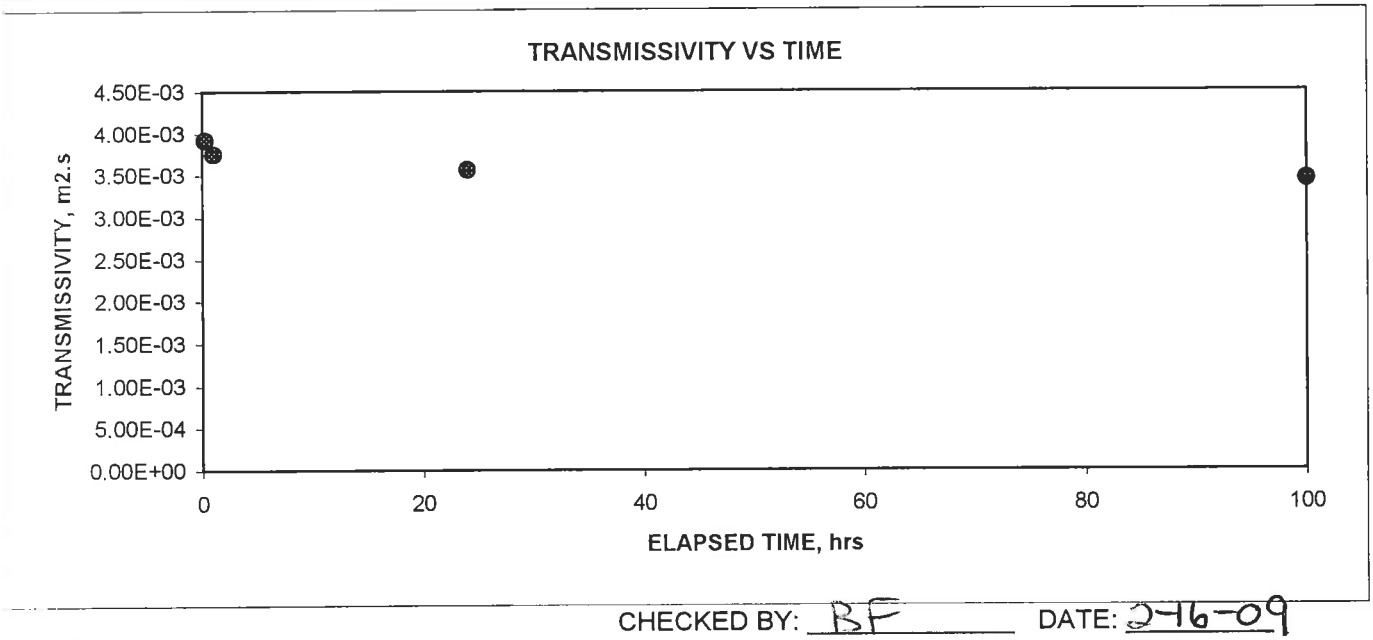
CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
PROJECT: JOHNSTON CO. MSW LANDFILL
PHASE 4A - CELL 3
MATERIAL: SKAPS TN270-2-6 GEOCOMPOSITE

PROJECT NO.: L09012-03
LAB I.D. NO.: L09012-03-01
ROLL NO.: 307910020

TEST SECTION: OTTOWA SAND
SKAPS TN270-2-6 GEOCOMPOSITE - MD
60-MIL TEXTURED HDPE LINER

10,000 psf NORMAL COMPRESSIVE STRESS

ELAPSED TIME (hrs)	MANOMETERS RES. (in)	MANOMETERS WEIR (in)	HYDR. GRAD.	COLLECTION DATA VOLUME (ml)	COLLECTION DATA TIME (sec.)	WATER TEMP °C	AVERAGE FLOW RATE (l/s-m)	AVERAGE FLOW RATE (gpm/ft)	CALCULATED TRANSMISSIVITY (m2/sec)
0.25	1.55	0.35	0.10	1200 1200 1195	10 10 10	19.0	3.92E-01	1.893	3.92E-03
1	1.55	0.35	0.10	1150 1150 1150	10 10 10	19.1	3.75E-01	1.813	3.75E-03
24	1.55	0.35	0.10	1130 1130 1130	10 10 10	20.5	3.56E-01	1.722	3.56E-03
100	1.55	0.35	0.10	1110 1110 1110	10 10 10	21.2	3.44E-01	1.663	3.44E-03



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2/16/2009

TRANSMISSIVITY TEST RESULTS

ASTM D 4716-00

geotechnics
INTEGRITY IN TESTING

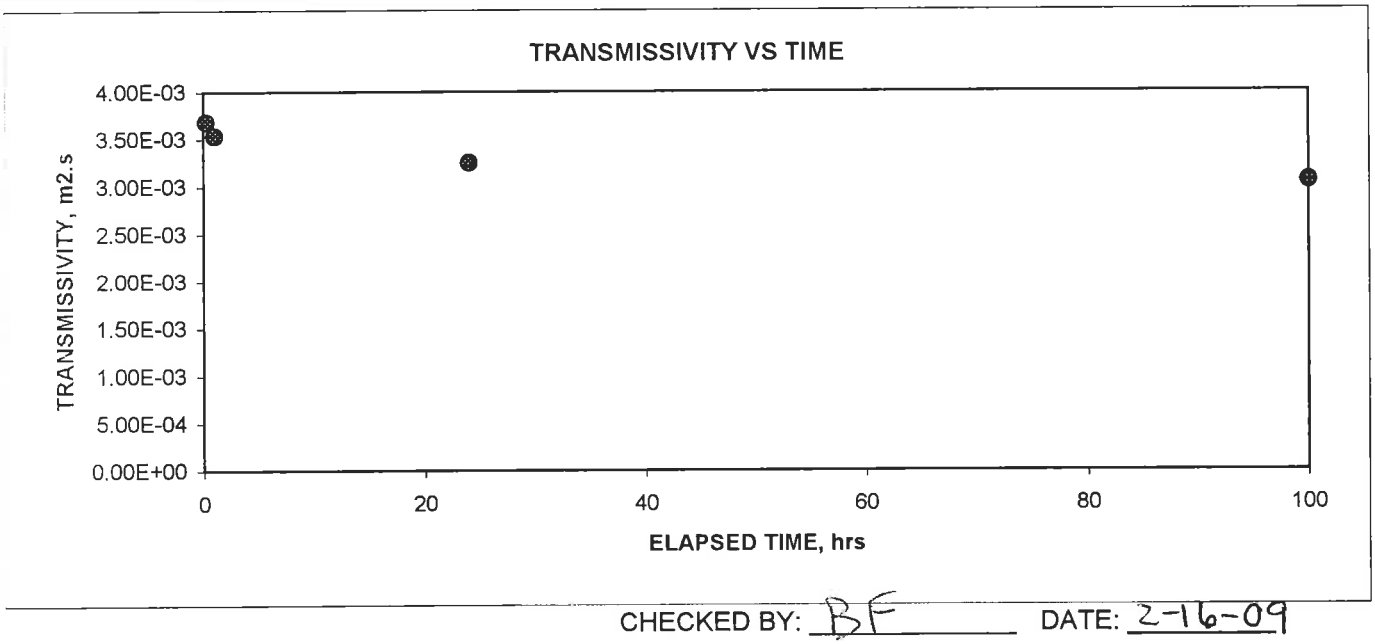
CLIENT: RICHARDSON SMITH GARDNER & ASSOCIATES
PROJECT: JOHNSTON CO. MSW LANDFILL
PHASE 4A - CELL 3
MATERIAL: SKAPS TN270-2-6 GEOCOMPOSITE

PROJECT NO.: L09012-03
LAB I.D. NO.: L09012-03-08
ROLL NO.: 307910230

TEST SECTION: OTTOWA SAND
SKAPS TN270-2-6 GEOCOMPOSITE - MD
60-MIL TEXTURED HDPE LINER

10,000 psf NORMAL COMPRESSIVE STRESS

ELAPSED TIME (hrs)	MANOMETERS RES. (in)	MANOMETERS WEIR (in)	HYDR. GRAD.	COLLECTION DATA VOLUME (ml)	COLLECTION DATA TIME (sec.)	WATER TEMP °C	AVERAGE FLOW RATE (l/s-m)	AVERAGE FLOW RATE (gpm/ft)	CALCULATED TRANSMISSIVITY (m2/sec)
0.25	1.70	0.50	0.10	1130 1125 1125	10 10 10	19.0	3.68E-01	1.780	3.68E-03
1	1.70	0.50	0.10	1080 1080 1080	10 10 10	19.0	3.53E-01	1.706	3.53E-03
24	1.70	0.50	0.10	1010 1010 1010	10 10 10	19.7	3.25E-01	1.569	3.25E-03
100	1.70	0.50	0.10	980 980 980	10 10 10	21.0	3.05E-01	1.475	3.05E-03



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2/16/2009

Appendix J

Record Drawings

1. As-Built Subgrade and Top of Protective Cover (prepared by 4D Site Solutions)

2. 40 Mil LLDPE Geomembrane As-Built Drawing with Destructive Test and Repair Locations (prepared by Hallaton)

3. 60 Mil HDPE Geomembrane As-Built Drawing with Destructive Test and Repair Locations (prepared by Hallaton)

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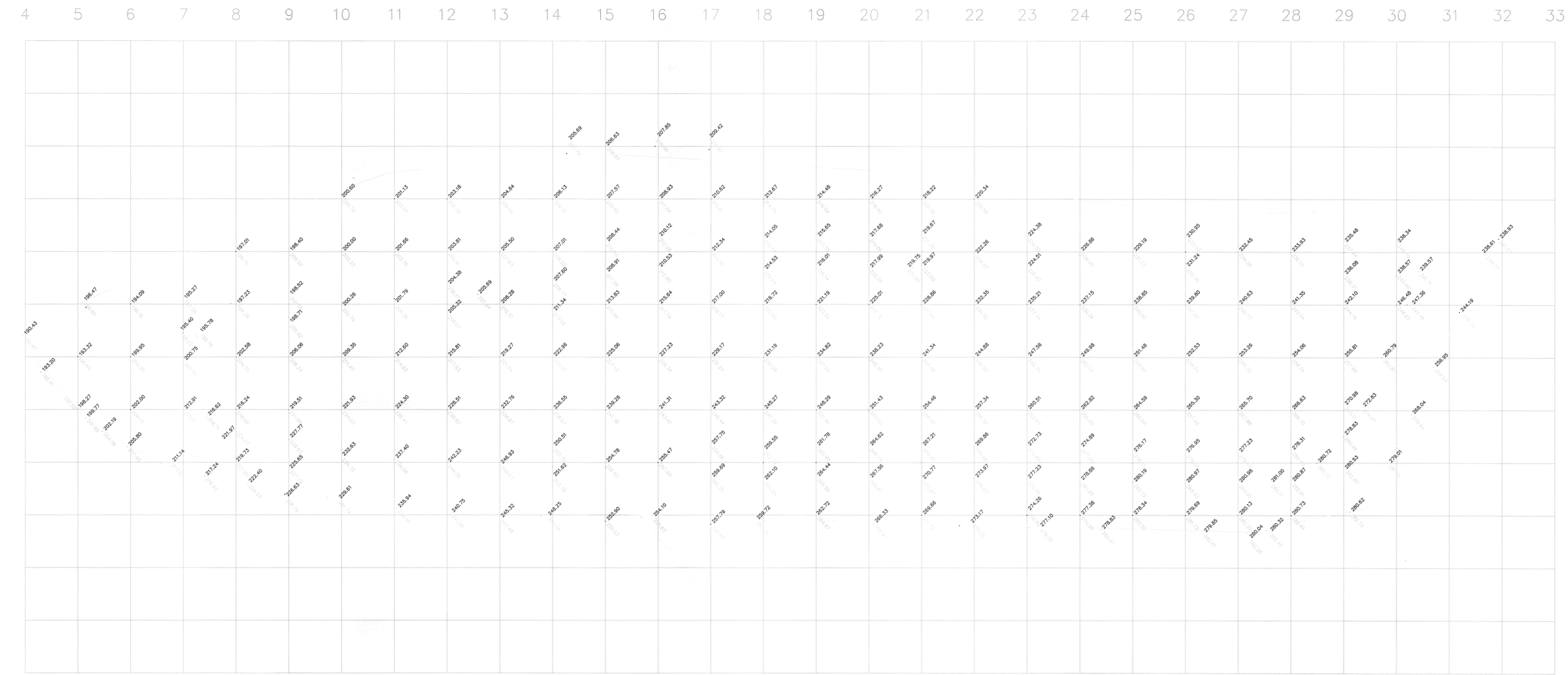
SITE DATUM

I, JIMMY HOLLAND JR., CERTIFY THAT THIS SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXCEPTION TO THE DEFINITION OF SUBDIVISION.

PROFESSIONAL LAND SURVEYOR - L-3908

I, JIMMY HOLLAND JR., CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION. WITNESS MY HAND AND SEAL THIS 26 DAY OF AUGUST, A.D., 2009.

PROFESSIONAL LAND SURVEYOR - L-3908



LEGEND

216.53 PROTECTIVE COVER ELEVATION
214.24 SUBGRADE ELEVATION
DESIGNED LINER LIMITS

NOTES:
1) ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES MEASUREMENTS
2) THIS SKETCH WAS DRAWN FROM AN ACTUAL GPS SURVEY MADE UNDER MY DIRECT SUPERVISION. I USED REALTIME KINEMATIC GPS FIELD PROCEDURES WITH NO ADJUSTMENTS. THE SURVEY WAS PERFORMED WITH A TRIMBLE GLOBAL POSITIONING SYSTEM USING (2) RECEIVERS. ALL COORDINATES AND ELEVATIONS ARE BASED ON CONTROL POINTS ESTABLISHED BY DENNIS LEE, PLS PRIOR TO CONSTRUCTION
3) LOCATIONS OF ALL UNDERGROUND UTILITIES LYING WITHIN THIS MAPPED AREA MAY NOT BE SHOWN ON THIS SKETCH. DEVELOPERS OR CONTRACTORS SHOULD NOT ONLY MAKE SUBSURFACE INVESTIGATIONS BUT SHOULD ALSO ALLOW FOR CONTINGENCIES WHICH MIGHT ARISE BY REASON OF ENCOUNTERING UNRECORDED LINES OR OF LINES BEING IN DIFFERENT LOCATIONS THAN INDICATED ON THE PLANS.
4) THIS SKETCH IS ONLY INTENDED TO BE USED TO ILLUSTRATE THE AS-BUILT ELEVATIONS OF THE SUBGRADE AND PROTECTIVE COVER MATERIALS.

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

4D SITE SOLUTIONS, INC.

NORTH CAROLINA PROFESSIONAL SEAL L-3908 JIMMY L. HOLLAND, JR. SURVEYOR

8-26-09

REVISIONS

PROJECT NAME

JOHNSTON COUNTY MSW LANDFILL PHASE 4A-CELL 3 AS-BUILT

JOHNSTON COUNTY
NORTH CAROLINA

CLIENT

ES&J ENTERPRISES, INC.

1555 HOLLAND ROAD
AUTRYVILLE, NORTH CAROLINA, 28318
PHONE: 910-567-6138
FAX: 910-567-2891

PROJECT INFORMATION

SURVEYED BY:	BOBBY
DRAWN BY:	JUSTIN
CHECKED BY:	JH
PROJECT NUMBER:	417

DRAWING SCALE
HORIZONTAL: 1"=50'

DATE SURVEYED
JUNE 17, 2009

SHEET NUMBER
C-1

= Limit of Liner

= Liner Panel Seams

P-00 = Liner Panel Numbers

= Destructive Test Location

= Liner Repair Location

N

*This is not a Surveyed As-Built Drawing is for Reference Only

NO.	Date.	By.	Description.

REVISIONS

JOHNSTON CO. LANDFILL
PHASE 4A CELL 3 CONSTRUCTION
SMITHFIELD, NC

40 mil LLDPE Geomembrane As-Built Drawing

Hallaton, Inc.
Containment Linings
1206 Sparks Road - Sparks, MD 21152
(410) 583-7700 - (410) 583-7720 Fax

Drawn by:	KHG
Date:	4/28/09
Scale:	1" = 60'
Job Number:	0901-20008
Drawing Number:	003

= Limit of Liner
= Liner Panel Seams
P-00 = Liner Panel Numbers
= Destructive Test Location
= Liner Repair Location

*This is not a Surveyed As-Built Drawing is for Reference Only

N

NO.	Date.	By.	Description.

REVISIONS

JOHNSTON CO. LANDFILL
PHASE 4A CELL 3 CONSTRUCTION
SMITHFIELD, NC

60 mil HDPE Geomembrane As-Built Drawing

Hallaton, Inc.
Containment Linings
1206 Sparks Road - Sparks, MD 21152
(410) 583-7700 - (410) 583-7720 Fax

Drawn by:	KHG
Date:	4/28/09
Scale:	1" = 60'
Job Number:	0901-20008
Drawing Number:	002