CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

PRINCIPALS
STEVEN W. SMITH, P.E.
SUSAN K. FASNACHT, P.E.
MOSE D. BUONOCORE, P.E.
THOMAS NOVELLINO, C.P., P.P.S.
SENIOR ASSOCIATES
DAN E. BREWER, P.E.
C. ROSS MASSEY, P.E.
DAVID K. BRUBAKER, P.L.S.

Carmen Johnson
Fac/Perm/Co ID# 18-09 | Date 1/24/12 | Doc ID# | DIN

Received

VOLUME II – GEOSYNTHETICS CQA REPORT

DUKE ENERGY CORP.
MARSHALL STEAM STATION
FLUE GAS DESULFURIZATION (FGD)
GYPSUM LANDFILL, PHASE 1
CATAWBA COUNTY, NC

OCTOBER 2006

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 11-21-06 BY TJ
1809 PTO A2 DOC13

128 Overhill Drive • Suite 105 • Mooresville, NC 28117 • Tel: 704.662.0100 • Fax: 704.662.0101 • www.chashsells.com
AN EQUAL OPPORTUNITY EMPLOYER, M/F

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

PRINCIPALS
STEVEN W. SMITH, P.E.
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SENIOR ASSOCIATES
DAN E. BREWER, P.E.
C. ROSS MASSEY, P.E.
DAVID K. BRUBAKER, P.L.S.

October 16, 2006

NCDENR
Division of Waste Management
401 Oberlin Road
Suite 150
Raleigh, NC 27605

Attention: Mr. Ed Mussler, P.E.

Reference: **Volume II – Geosynthetics CQA Report**
Marshall FGD Gypsum Landfill
Catawba County, NC

Gentlemen:

Please find enclosed, Volume II – Geosynthetic CQA Report for the above referenced project. This report includes the following information:

Manufacturer's Material Data

Hallaton Field QC Data

Field QA Data

Laboratory Destructive Seam Tests

Site Photographs

As-Built Drawing

APPROVED
DIVISION OF WASTE MANAGEMENT
SOLID WASTE SECTION
DATE 11-21-06 BY TJ
1809 PTO A2 DOC13

Based upon our observations and review of the above test data, we find the geosynthetics to be constructed in accordance with the approved drawings and technical specifications. If you have any questions or require additional information, please contact us.

Sincerely,
Chas. H. Sells, Inc.

Dan E. Brewer, P.E.
Senior Associate

cc: Mr. Pat McCabe, Duke Energy Corp.

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1

SUBMITTAL LETTER

SUBMITTAL NO.: 0018
SUBMITTAL DATE: 08/12/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER:	3.0	SUBCONTRACTOR:	
SEQUENCE. NO.:	3	SUPPLIER:	
SUBMISSION TYPE:	A. Original Submission	MANUFACTURER:	

SUBMITTAL DESCRIPTION: Geosynthetic Clay Liner

ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
3.2	.5	SD	GCL QC Certification Claymax 200R (lds. dt. 7/25, 7/26, 7/27, 7/31, 8/4)	

Miscellaneous Info:

Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/12/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- [X] **No Exception Taken**
- [ ] **Make Corrections Noted**
- [ ] **Amend and Resubmit**
- [ ] **Rejected - See Remarks**

Dan E. Brewer, P.E.

Engineer: Chas. H. Sells, Inc. **Signed:** Dan E. Brewer **Date:** 8/18/06

*SD=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Date: 7/25/2006
Purchase Order: P6212
ORDER NUMBER: 021622802

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Lovell, Wyoming plant on 7/24/2006.

If you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall_LF
CUSTOMER P.O.: P6212
ORDER NUMBER: 021622802
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

PRODUCTION CERTIFICATION

PROJECT NAME: Marshall_LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 7/24/2006
Order Number: 021622802
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 CLAYMAX 200R

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 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	50 psf (2.4 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

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 CLAYMAX 200R

Raw Material	test method	mass per area	units
Claymax 200R 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).

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622802	LO-CLAYMAX200R	200630LO	00002847	150	15	2250	3019
021622802	LO-CLAYMAX200R	200630LO	00002849	150	15	2250	3016
021622802	LO-CLAYMAX200R	200630LO	00002886	150	15	2250	3015
021622802	LO-CLAYMAX200R	200630LO	00002887	150	15	2250	3019
021622802	LO-CLAYMAX200R	200630LO	00002939	150	15	2250	3021
021622802	LO-CLAYMAX200R	200630LO	00002947	150	15	2250	3024
021622802	LO-CLAYMAX200R	200630LO	00002948	150	15	2250	3025
021622802	LO-CLAYMAX200R	200630LO	00002954	150	15	2250	3020
021622802	LO-CLAYMAX200R	200630LO	00002956	150	15	2250	3023
021622802	LO-CLAYMAX200R	200630LO	00002958	150	15	2250	3024
021622802	LO-CLAYMAX200R	200630LO	00002959	150	15	2250	3022
021622802	LO-CLAYMAX200R	200630LO	00002960	150	15	2250	3021
021622802	LO-CLAYMAX200R	200630LO	00002970	150	15	2250	3022
021622802	LO-CLAYMAX200R	200630LO	00002971	150	15	2250	3023
021622802	LO-CLAYMAX200R	200630LO	00002972	150	15	2250	3024
			Totals:	**2250**	**225**	**33750**	**45318**

Total Number of Rolls Certified: **15**

CETCO
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800.527.9948 www.cetco.com

GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles				Clay
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7			LO-N/W-BLK-200R-2.7	LO-CG 50-200R
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200630LO	00002847	00002836	2006886390			2006886387	070906F
200630LO	00002849	00002836	2006886381			2006886387	070906F
200630LO	00002886	00002870	2006886361			2006880799	071006A
200630LO	00002887	00002887	2006886361			2006880799	071006A
200630LO	00002939	00002938	2006880838			2006890553	071006B
200630LO	00002947	00002938	2006886343			2006403571	071006B
200630LO	00002948	00002938	2006886343			2006403571	071006B
200630LO	00002954	00002938	2006886343			2006403571	071006B
200630LO	00002956	00002955	2006886336			2006880829	071006B
200630LO	00002958	00002955	2006886336			2006880829	071006B
200630LO	00002959	00002955	2006886336			2006880829	071006B
200630LO	00002960	00002955	2006886336			2006880829	071106A
200630LO	00002970	00002955	2006886336			2006880829	071106A
200630LO	00002971	00002955	2006886360			2006886359	071106A
200630LO	00002972	00002972	2006886360			2006886359	071106A

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
	Standard Test Method:		ASTM D 5993	ASTM D 4632
	Standard Specification:		0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200630LO	00002836	0.89	353.3
LO-CLAYMAX200R	200630LO	00002870	0.91	353.3
LO-CLAYMAX200R	200630LO	00002887	0.84	353.3
LO-CLAYMAX200R	200630LO	00002938	0.86	342.3
LO-CLAYMAX200R	200630LO	00002955	0.92	342.3
LO-CLAYMAX200R	200630LO	00002972	0.85	342.3

All 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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The bentonite clay used to produce certification package 000216228 has been tested by American Collo. following results.

Clay Type	Clay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
	Test Method:	ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
	Specification:	24ml/2g Min	18ml Max	12% Max	1% Max	0%
LO-CG 50-200R	070906F	26	18	10	0.4	0
LO-CG 50-200R	071006A	25	17.6	8.8	0.3	0
LO-CG 50-200R	071006B	25	17.6	9.6	0.4	0
LO-CG 50-200R	071106A	25	16.4	9.2	0.4	0

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006403571	3.9	85.1
SI 311	2006880799	3.4	89.8
SI 311	2006880829	3.5	91.2
SI 311	2006886359	3.4	91.6
SI 311	2006886387	3.7	72.6
SI 311	2006890553	3.6	96.4

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006886360	3.4	91.6
SI 311	2006886390	3.4	95.7
SI 311	2006880838	3.4	78.6
SI 311	2006886361	3.2	79.3
SI 311	2006886381	3.3	87.0
SI 311	2006886336	3.3	83.3
SI 311	2006886343	3.7	90.1

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

CETCO
LINING TECHNOLOGIES
)0.527.9948 www.cetco.com

7/26/2006

ıse Order: P6212

.R NUMBERS: 021622803, 021622804, 021622805

Brinkerhoff
ton
: 203
son, MD 21286
ıkerhoff@hallaton.com

Whom it May Concern:

ease find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to allaton. The shipments left our Lovell, Wyoming plant on 7/25/2006.

you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
ORDER NUMBERS: 021622803, 021622804, 021622805
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

LINING TECHNOLOGIES
800.527.9948 www.cetco.com

PRODUCTION CERTIFICATION

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

INDLOGIES
www.cetco.com

:5/2006
ers: 021622803, 021622804, 021622805
. Hallaton

v materials and GCL finished product manufactured for the above-referenced r(s) are hereby certified to achieve the properties listed in the tables below.

'ERTY SPECIFICATIONS FOR CLAYMAX 200R

Test Method Property	Test Frequency	Certified Value
Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
Bentonite Mass Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
Bentonite Swell Index	1 per 50 Tons	24 ml 2g Min
GCL Grab Strength	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
GCL Grab Strength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
GCL Hydrated Internal Shear Strength	Periodic	50 psf (2.4 kPa) typ @ 200 psf
GCL Hydraulic Conductivity	Weekly	5 x 10 -9 cm sec Max
GCL Index Flux	Weekly	1 x 10 -8 m 3 m 2 sec Max

ty tests are performed at a bentonite processing facility before shipment to CETCO's production facility.
g is in the machine direction.

SUPPLIER REQUIREMENTS FOR CLAYMAX 200R

Raw Material	test method	mass per area	units
00R Base Nonwoven Fabric	ASTM D 5261	2.7	oz/yd2

tions from our raw material suppliers are on file at our production facility.

IQA laboratory is GAI-accredited (www.geosynthetic-institute.org gai lab.html).

B. Wilkerson
y Assurance Coordinator
O Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622804	LO-CLAYMAX200R	200630LO	00002836	150	15	2250	3021
021622805	LO-CLAYMAX200R	200630LO	00002842	150	15	2250	3015
021622805	LO-CLAYMAX200R	200630LO	00002843	150	15	2250	3020
021622805	LO-CLAYMAX200R	200630LO	00002844	150	15	2250	3018
021622805	LO-CLAYMAX200R	200630LO	00002845	150	15	2250	3020
021622805	LO-CLAYMAX200R	200630LO	00002846	150	15	2250	3016
021622804	LO-CLAYMAX200R	200630LO	00002848	150	15	2250	3014
021622804	LO-CLAYMAX200R	200630LO	00002851	150	15	2250	3023
021622805	LO-CLAYMAX200R	200630LO	00002852	150	15	2250	3025
021622804	LO-CLAYMAX200R	200630LO	00002853	150	15	2250	3021
021622804	LO-CLAYMAX200R	200630LO	00002854	150	15	2250	3024
021622805	LO-CLAYMAX200R	200630LO	00002855	150	15	2250	3020
021622804	LO-CLAYMAX200R	200630LO	00002868	150	15	2250	3019
021622804	LO-CLAYMAX200R	200630LO	00002869	150	15	2250	3021
021622804	LO-CLAYMAX200R	200630LO	00002870	150	15	2250	3016
021622805	LO-CLAYMAX200R	200630LO	00002871	150	15	2250	3018
021622804	LO-CLAYMAX200R	200630LO	00002873	150	15	2250	3015
021622804	LO-CLAYMAX200R	200630LO	00002874	150	15	2250	3019
021622804	LO-CLAYMAX200R	200630LO	00002875	150	15	2250	3022
021622805	LO-CLAYMAX200R	200630LO	00002876	150	15	2250	3025
021622804	LO-CLAYMAX200R	200630LO	00002878	150	15	2250	3024
021622804	LO-CLAYMAX200R	200630LO	00002879	150	15	2250	3022
021622804	LO-CLAYMAX200R	200630LO	00002880	150	15	2250	3020
021622804	LO-CLAYMAX200R	200630LO	00002882	150	15	2250	3017
021622803	LO-CLAYMAX200R	200630LO	00002888	150	15	2250	3022
021622803	LO-CLAYMAX200R	200630LO	00002889	150	15	2250	3021
021622803	LO-CLAYMAX200R	200630LO	00002890	150	15	2250	3015

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622803	LO-CLAYMAX200R	200630LO	00002891	150	15	2250	3019
021622803	LO-CLAYMAX200R	200630LO	00002892	150	15	2250	3014
021622803	LO-CLAYMAX200R	200630LO	00002893	150	15	2250	3020
021622803	LO-CLAYMAX200R	200630LO	00002894	150	15	2250	3018
021622805	LO-CLAYMAX200R	200630LO	00002895	150	15	2250	3015
021622803	LO-CLAYMAX200R	200630LO	00002906	150	15	2250	3020
021622803	LO-CLAYMAX200R	200630LO	00002907	150	15	2250	3018
021622803	LO-CLAYMAX200R	200630LO	00002908	150	15	2250	3014
021622803	LO-CLAYMAX200R	200630LO	00002909	150	15	2250	3020
021622803	LO-CLAYMAX200R	200630LO	00002914	150	15	2250	3027
021622805	LO-CLAYMAX200R	200630LO	00002915	150	15	2250	3024
021622805	LO-CLAYMAX200R	200630LO	00002916	150	15	2250	3023
021622805	LO-CLAYMAX200R	200630LO	00002917	150	15	2250	3025
021622805	LO-CLAYMAX200R	200630LO	00002918	150	15	2250	3026
021622805	LO-CLAYMAX200R	200630LO	00002919	150	15	2250	3024
021622803	LO-CLAYMAX200R	200630LO	00002950	150	15	2250	3026
021622803	LO-CLAYMAX200R	200630LO	00002951	150	15	2250	3023
021622803	LO-CLAYMAX200R	200630LO	0002887A	150	15	2250	3019
			Totals:	**6750**	**675**	**101250**	**135908**

Total Number of Rolls Certified: **45**

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles			Clay	
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7			LO-N/W-BLK-200R-2.7	LO-CG 50-200R
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200630LO	00002836	00002836	2006880833			2006886357	070906F
200630LO	00002842	00002836	2006880833			2006886357	070906F
200630LO	00002843	00002836	2006880833			2006886357	070906F
200630LO	00002844	00002836	2006880833			2006886357	070906F
200630LO	00002845	00002836	2006880833			2006886357	070906F
200630LO	00002846	00002836	2006880833			2006886357	070906F
200630LO	00002848	00002836	2006886390			2006886387	070906F
200630LO	00002851	00002836	2006886381			2006886387	070906F
200630LO	00002852	00002836	2006886381			2006886387	070906F
200630LO	00002853	00002853	2006886381			2006886387	070906F
200630LO	00002854	00002853	2006886381			2006886387	070906F
200630LO	00002855	00002853	2006886381			2006886387	070906F
200630LO	00002868	00002853	2006880782			2006880812	070906F
200630LO	00002869	00002853	2006880782			2006880812	070906F
200630LO	00002870	00002870	2006880782			2006880812	070906F
200630LO	00002871	00002870	2006880782			2006880812	070906F
200630LO	00002873	00002870	2006880782			2006880812	070906F
200630LO	00002874	00002870	2006880782			2006880812	070906F
200630LO	00002875	00002870	2006880782			2006880812	070906F
200630LO	00002876	00002870	2006880782			2006880812	070906F
200630LO	00002878	00002870	2006880782			2006880812	070906F
200630LO	00002879	00002870	2006880782			2006880799	071006A
200630LO	00002880	00002870	2006886361			2006880799	071006A
200630LO	00002882	00002870	2006886361			2006880799	071006A
200630LO	00002888	00002887	2006886361			2006880799	071006A
200630LO	00002889	00002887	2006886361			2006880799	071006A
200630LO	00002890	00002887	2006886361			2006880799	071006A
200630LO	00002891	00002887	2006886361			2006880799	071006A
200630LO	00002892	00002887	2006886361			2006880799	071006A

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200630LO	00002893	00002887	2006886361			2006880799	071006A
200630LO	00002894	00002887	2006886361			2006880799	071006A
200630LO	00002895	00002887	2006886361			2006880819	071006A
200630LO	00002906	00002904	2006886320			2006880819	071006A
200630LO	00002907	00002904	2006886320			2006880819	071006A
200630LO	00002908	00002904	2006886320			2006880819	071006A
200630LO	00002909	00002904	2006886320			2006880819	071006A
200630LO	00002914	00002904	2006880838			2006880822	071006B
200630LO	00002915	00002904	2006880838			2006880822	071006B
200630LO	00002916	00002904	2006880838			2006880822	071006B
200630LO	00002917	00002904	2006880838			2006880822	071006B
200630LO	00002918	00002904	2006880838			2006880822	071006B
200630LO	00002919	00002904	2006880838			2006880822	071006B
200630LO	00002950	00002938	2006886343			2006403571	071006B
200630LO	00002951	00002938	2006886343			2006403571	071006B
200630LO	0002887A	00002972	2006886361			2006880799	071006A

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
Standard Test Method:			ASTM D 5993	ASTM D 4632
Standard Specification:			0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200630LO	00002836	0.89	353.3
LO-CLAYMAX200R	200630LO	00002853	0.87	353.3
LO-CLAYMAX200R	200630LO	00002870	0.91	353.3
LO-CLAYMAX200R	200630LO	00002887	0.84	353.3
LO-CLAYMAX200R	200630LO	00002904	0.87	342.3
LO-CLAYMAX200R	200630LO	00002938	0.86	342.3
LO-CLAYMAX200R	200630LO	00002972	0.85	342.3

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The bentonite clay used to produce certification package 000216228 has been tested by American Colloid Co. with the following results.

Clay Type	Clay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
Test Method:		ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
Specification:		24ml/2g Min	18ml Max	12% Max	1% Max	0%
LO-CG 50-200R	070906F	26	18	10	0.4	0
LO-CG 50-200R	071006A	25	17.6	8.8	0.3	0
LO-CG 50-200R	071006B	25	17.6	9.6	0.4	0

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006403571	3.9	85.1
SI 311	2006880799	3.4	89.8
SI 311	2006880812	3.7	91.6
SI 311	2006880819	2.7	69.9
SI 311	2006880822	3.7	93.8
SI 311	2006886357	3.3	89.1
SI 311	2006886387	3.7	72.6

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006880833	3.3	84.7
SI 311	2006886320	3.4	96.2
SI 311	2006886361	3.2	79.3
SI 311	2006886381	3.3	87.0
SI 311	2006880782	3.4	82.3
SI 311	2006886343	3.7	90.1
SI 311	2006886390	3.4	95.7
SI 311	2006880838	3.4	78.6

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

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Date: 7/27/2006
Purchase Order: P6212
ORDER NUMBERS: 021622801, 021622806, 021622807, 021622808, 021622810

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Lovell, Wyoming plant on 7/26/2006.

If you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

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GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
ORDER NUMBERS: 021622801, 021622806, 021622807, 021622808, 021622810
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

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PRODUCTION CERTIFICATION

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

!801, 021622806, 021622807, 021622808, 021622810

; and GCL finished product manufactured for the above-referenced
reby certified to achieve the properties listed in the tables below.

?ECIFICATIONS FOR CLAYMAX 200R

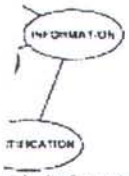
hod Property	Test Frequency	Certified Value
Loss	1 per 50 Tons	18 ml Max
Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
l Index	1 per 50 Tons	24 ml 2g Min
:ngth	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
ength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
d Internal Shear Strength	Periodic	50 psf (2.4 kPa) typ @ 200 psf
ic Conductivity	Weekly	5 x 10 -9 cm sec Max
lux	Weekly	1 x 10 -8 m 3 m 2 sec Max

formed at a bentonite processing facility before shipment to CETCO's production facility.
ine direction.

ER REQUIREMENTS FOR CLAYMAX 200R

erial	test method	mass per area	units
Jonwoven Fabric	ASTM D 5261	2.7	oz/yd2

raw material suppliers are on file at our production facility.



ry is GAI-accredited (www.geosynthetic-institute.org gai lab.html).

erson
ınce Coordinator
ll Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622806	LO-CLAYMAX200R	200626LO	00002242	150	15	2250	3021
021622807	LO-CLAYMAX200R	200627LO	00002557	150	15	2250	3010
021622807	LO-CLAYMAX200R	200627LO	00002575	150	15	2250	3007
021622807	LO-CLAYMAX200R	200627LO	00002576	150	15	2250	3009
021622807	LO-CLAYMAX200R	200627LO	00002579	150	15	2250	3004
021622807	LO-CLAYMAX200R	200627LO	00002580	150	15	2250	3001
021622801	LO-CLAYMAX200R	200627LO	00002588	150	15	2250	3018
021622801	LO-CLAYMAX200R	200627LO	00002589	150	15	2250	3014
021622807	LO-CLAYMAX200R	200627LO	00002592	150	15	2250	3001
021622807	LO-CLAYMAX200R	200627LO	00002593	150	15	2250	3007
021622806	LO-CLAYMAX200R	200627LO	00002594	150	15	2250	3010
021622806	LO-CLAYMAX200R	200627LO	00002595	150	15	2250	3012
021622806	LO-CLAYMAX200R	200627LO	00002596	150	15	2250	3008
021622806	LO-CLAYMAX200R	200627LO	00002597	150	15	2250	3006
021622801	LO-CLAYMAX200R	200627LO	00002620	150	15	2250	3017
021622807	LO-CLAYMAX200R	200628LO	00002701	150	15	2250	3008
021622807	LO-CLAYMAX200R	200628LO	00002702	150	15	2250	3005
021622807	LO-CLAYMAX200R	200628LO	00002703	150	15	2250	3009
021622807	LO-CLAYMAX200R	200628LO	00002704	150	15	2250	3010
021622807	LO-CLAYMAX200R	200628LO	00002705	150	15	2250	3012
021622807	LO-CLAYMAX200R	200628LO	00002706	150	15	2250	3011
021622807	LO-CLAYMAX200R	200628LO	00002707	150	15	2250	3014
021622807	LO-CLAYMAX200R	200628LO	00002708	150	15	2250	3010
021622801	LO-CLAYMAX200R	200628LO	00002709	150	15	2250	3012
021622801	LO-CLAYMAX200R	200628LO	00002710	150	15	2250	3015
021622801	LO-CLAYMAX200R	200628LO	00002711	150	15	2250	3011
021622801	LO-CLAYMAX200R	200628LO	00002712	150	15	2250	3014

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622801	LO-CLAYMAX200R	200628LO	00002713	150	15	2250	3016
021622810	LO-CLAYMAX200R	200628LO	00002714	150	15	2250	3013
021622810	LO-CLAYMAX200R	200628LO	00002715	150	15	2250	3010
021622810	LO-CLAYMAX200R	200628LO	00002716	150	15	2250	3014
021622810	LO-CLAYMAX200R	200628LO	00002717	150	15	2250	3017
021622810	LO-CLAYMAX200R	200628LO	00002718	150	15	2250	3015
021622810	LO-CLAYMAX200R	200628LO	00002719	150	15	2250	3018
021622801	LO-CLAYMAX200R	200628LO	00002720	150	15	2250	3012
021622801	LO-CLAYMAX200R	200628LO	00002721	150	15	2250	3012
021622801	LO-CLAYMAX200R	200628LO	00002722	150	15	2250	3014
021622808	LO-CLAYMAX200R	200628LO	00002723	150	15	2250	3014
021622808	LO-CLAYMAX200R	200628LO	00002724	150	15	2250	3011
021622810	LO-CLAYMAX200R	200628LO	00002729	150	15	2250	3007
021622810	LO-CLAYMAX200R	200628LO	00002730	150	15	2250	3009
021622810	LO-CLAYMAX200R	200628LO	00002731	150	15	2250	3012
021622806	LO-CLAYMAX200R	200628LO	00002776	150	15	2250	3010
021622801	LO-CLAYMAX200R	200630LO	00002819	150	15	2250	3020
021622801	LO-CLAYMAX200R	200630LO	00002820	150	15	2250	3021
021622808	LO-CLAYMAX200R	200630LO	00002821	150	15	2250	3023
021622808	LO-CLAYMAX200R	200630LO	00002822	150	15	2250	3022
021622810	LO-CLAYMAX200R	200630LO	00002827	150	15	2250	3023
021622810	LO-CLAYMAX200R	200630LO	00002828	150	15	2250	3021
021622810	LO-CLAYMAX200R	200630LO	00002829	150	15	2250	3024
021622801	LO-CLAYMAX200R	200630LO	00002830	150	15	2250	3022
021622808	LO-CLAYMAX200R	200630LO	00002831	150	15	2250	3023
021622808	LO-CLAYMAX200R	200630LO	00002832	150	15	2250	3020
021622810	LO-CLAYMAX200R	200630LO	00002837	150	15	2250	3020
021622810	LO-CLAYMAX200R	200630LO	00002838	150	15	2250	3022
021622810	LO-CLAYMAX200R	200630LO	00002839	150	15	2250	3019
021622808	LO-CLAYMAX200R	200630LO	00002840	150	15	2250	3015
021622808	LO-CLAYMAX200R	200630LO	00002841	150	15	2250	3018
021622801	LO-CLAYMAX200R	200630LO	00002856	150	15	2250	3016

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622806	LO-CLAYMAX200R	200630LO	00002857	150	15	2250	3019
021622806	LO-CLAYMAX200R	200630LO	00002858	150	15	2250	3015
021622806	LO-CLAYMAX200R	200630LO	00002859	150	15	2250	3018
021622806	LO-CLAYMAX200R	200630LO	00002860	150	15	2250	3020
021622806	LO-CLAYMAX200R	200630LO	00002861	150	15	2250	3014
021622808	LO-CLAYMAX200R	200630LO	00002862	150	15	2250	3019
021622806	LO-CLAYMAX200R	200630LO	00002863	150	15	2250	3021
021622806	LO-CLAYMAX200R	200630LO	00002864	150	15	2250	3019
021622806	LO-CLAYMAX200R	200630LO	00002865	150	15	2250	3015
021622806	LO-CLAYMAX200R	200630LO	00002866	150	15	2250	3020
021622808	LO-CLAYMAX200R	200630LO	00002867	150	15	2250	3018
021622808	LO-CLAYMAX200R	200630LO	00002872	150	15	2250	3020
021622808	LO-CLAYMAX200R	200630LO	00002877	150	15	2250	3021
021622808	LO-CLAYMAX200R	200630LO	00002881	150	15	2250	3018
021622808	LO-CLAYMAX200R	200630LO	00002883	150	15	2250	3019
021622808	LO-CLAYMAX200R	200630LO	00002885	150	15	2250	3018
			Totals:	**11250**	**1125**	**168750**	**226103**

Total Number of Rolls Certified: **75**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles				Clay
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7			LO-N/W-BLK-200R-2.7	LO-CG 50-200R
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200626LO	00002242	00002230	2006880780			2006879794	061406A
200627LO	00002557	00002547	2006880837			2006880787	061906E
200627LO	00002575	00002564	2006886319			2006886218	061906F
200627LO	00002576	00002564	2006886319			2006886218	061906F
200627LO	00002579	00002564	2006886319			2006886218	061906F
200627LO	00002580	00002564	2006886319			2006886218	061906F
200627LO	00002588	00002581	2006886215			2006880828	061906F
200627LO	00002589	00002581	2006886215			2006880828	061906F
200627LO	00002592	00002581	2006886215			2006880828	061906F
200627LO	00002593	00002581	2006886215			2006880828	061906F
200627LO	00002594	00002581	2006886215			2006880828	061906F
200627LO	00002595	00002581	2006886215			2006880828	061906F
200627LO	00002596	00002581	2006886215			2006880828	061906F
200627LO	00002597	00002581	2006886215			2006880809	061906F
200627LO	00002620	00002615	2006880827			2006886206	062006A
200628LO	00002701	00002695	2006880840			2006880821	062206B
200628LO	00002702	00002695	2006880840			2006880821	062206B
200628LO	00002703	00002695	2006880840			2006880821	062206B
200628LO	00002704	00002695	2006880840			2006880821	062206B
200628LO	00002705	00002695	2006880840			2006880821	062206B
200628LO	00002706	00002695	2006880840			2006880826	062206B
200628LO	00002707	00002695	2006880840			2006880826	062206B
200628LO	00002708	00002695	2006880840			2006880826	062206B
200628LO	00002709	00002695	2006880840			2006880826	062206B
200628LO	00002710	00002695	2006880840			2006880826	062206B
200628LO	00002711	00002695	2006880826			2006880826	062206B
200628LO	00002712	00002712	2006880826			2006880826	062206B
200628LO	00002713	00002712	2006880826			2006880826	062206B
200628LO	00002714	00002712	2006880826			2006880826	062206B

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200628LO	00002715	00002712	2006880826			2006880826	062206B
200628LO	00002716	00002712	2006880826			2006880826	062206B
200628LO	00002717	00002712	2006880826			2006880826	062206B
200628LO	00002718	00002712	2006880826			2006880826	062206B
200628LO	00002719	00002712	2006880826			2006880826	062206C
200628LO	00002720	00002712	2006880826			2006880826	062206C
200628LO	00002721	00002712	2006880826			2006880826	062206C
200628LO	00002722	00002712	2006880826			2006880836	062206C
200628LO	00002723	00002712	2006880826			2006880836	062206C
200628LO	00002724	00002712	2006880826			2006880836	062206C
200628LO	00002729	00002729	2006886406			2006880836	062206C
200628LO	00002730	00002729	2006886406			2006880836	062206C
200628LO	00002731	00002729	2006886406			2006880836	062206C
200628LO	00002776	00002763	2006890550			2006890554	062906A
200630LO	00002819	00002819	2006880833			2006886356	070906E
200630LO	00002820	00002819	2006880833			2006886356	070906E
200630LO	00002821	00002819	2006880833			2006886356	070906E
200630LO	00002822	00002819	2006880833			2006886356	070906E
200630LO	00002827	00002819	2006880833			2006886356	070906E
200630LO	00002828	00002819	2006880833			2006886356	070906E
200630LO	00002829	00002819	2006880833			2006886356	070906E
200630LO	00002830	00002819	2006880833			2006886356	070906E
200630LO	00002831	00002819	2006880833			2006886357	070906E
200630LO	00002832	00002819	2006880833			2006886357	070906E
200630LO	00002837	00002836	2006880833			2006886357	070906F
200630LO	00002838	00002836	2006880833			2006886357	070906F
200630LO	00002839	00002836	2006880833			2006886357	070906F
200630LO	00002840	00002836	2006880833			2006886357	070906F
200630LO	00002841	00002836	2006880833			2006886357	070906F
200630LO	00002856	00002853	2006886381			2006886387	070906F
200630LO	00002857	00002853	2006886381			2006886387	070906F
200630LO	00002858	00002853	2006886381			2006886387	070906F
200630LO	00002859	00002853	2006886381			2006886387	070906F
200630LO	00002860	00002853	2006886381			2006886387	070906F
200630LO	00002861	00002853	2006886381			2006886387	070906F

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200630LO	00002862	00002853	2006886381			2006886387	070906F
200630LO	00002863	00002853	2006886381			2006880812	070906F
200630LO	00002864	00002853	2006880782			2006880812	070906F
200630LO	00002865	00002853	2006880782			2006880812	070906F
200630LO	00002866	00002853	2006880782			2006880812	070906F
200630LO	00002867	00002853	2006880782			2006880812	070906F
200630LO	00002872	00002870	2006880782			2006880812	070906F
200630LO	00002877	00002870	2006880782			2006880812	070906F
200630LO	00002881	00002870	2006886361			2006880799	071006A
200630LO	00002883	00002870	2006886361			2006880799	071006A
200630LO	00002885	00002870	2006886361			2006880799	071006A

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
Standard Test Method:			ASTM D 5993	ASTM D 4632
Standard Specification:			0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200626LO	00002230	0.86	326.1
LO-CLAYMAX200R	200627LO	00002547	0.89	322.1
LO-CLAYMAX200R	200627LO	00002564	0.88	322.1
LO-CLAYMAX200R	200627LO	00002581	0.86	322.1
LO-CLAYMAX200R	200627LO	00002615	0.85	362.3
LO-CLAYMAX200R	200628LO	00002695	0.92	332.5
LO-CLAYMAX200R	200628LO	00002712	0.92	332.5
LO-CLAYMAX200R	200628LO	00002729	0.88	332.5
LO-CLAYMAX200R	200628LO	00002763	0.83	332.5
LO-CLAYMAX200R	200630LO	00002819	0.89	353.3
LO-CLAYMAX200R	200630LO	00002836	0.89	353.3
LO-CLAYMAX200R	200630LO	00002853	0.87	353.3
LO-CLAYMAX200R	200630LO	00002870	0.91	353.3

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.

:OLLOID COMPANY

LAY CERTIFICATION

y used to produce certification package 000216228 has been tested by American Colloid Co. with the

lay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
Method:	ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
:ification:	24ml/2g Min	18ml Max	12% Max	1% Max	0%
)61406A	24	16.4	8	0.4	0
061906E	25	16.4	9.2	0.4	0
061906F	25	16.4	8.8	0.4	0
062006A	24	16.6	8.8	0.4	0
062206B	25	16.4	8.4	0.3	0
062206C	25	16.4	8.8	0.4	0
062906A	25	16.4	10.4	0.4	0
070906E	26	18	10	0.4	0
070906F	26	18	10	0.4	0
071006A	25	17.6	8.8	0.3	0

by

oid Company
nce Coordinator

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006879794	3.3	85.0
SI 311	2006880787	3.3	90.6
SI 311	2006880799	3.4	89.8
SI 311	2006880809	3.3	97.0
SI 311	2006880812	3.7	91.6
SI 311	2006880821	3.7	93.8
SI 311	2006880826	3.5	91.2
SI 311	2006880828	3.5	91.2
SI 311	2006880836	3.4	78.6
SI 311	2006886206	3.9	85.4
SI 311	2006886218	3.5	89.6
SI 311	2006886356	3.3	89.1
SI 311	2006886357	3.3	89.1
SI 311	2006886387	3.7	72.6
SI 311	2006890554	3.6	96.4

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006880840	3.3	81.5
SI 311	2006880826	3.5	91.2
SI 311	2006880833	3.3	84.7
SI 311	2006886406	3.5	96.4
SI 311	2006880782	3.4	82.3
SI 311	2006886319	3.5	89.6
SI 311	2006880827	3.5	91.2
SI 311	2006886361	3.2	79.3
SI 311	2006886381	3.3	87.0
SI 311	2006880780	3.4	82.3
SI 311	2006890550	3.5	100.7
SI 311	2006880837	3.4	78.6
SI 311	2006886215	3.2	80.7

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

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Date: 7/31/2006
Purchase Order: P6212
ORDER NUMBERS: 021622809, 021622811, 021622812

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Lovell, Wyoming plant on 7/29/2006.

If you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
ORDER NUMBERS: 021622809, 021622811, 021622812
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

PRODUCTION CERTIFICATION

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 7/29/2006
Order Numbers: 021622809, 021622811, 021622812
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 CLAYMAX 200R

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 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	50 psf (2.4 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

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 CLAYMAX 200R

Raw Material	test method	mass per area	units
Claymax 200R 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).

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622811	LO-CLAYMAX200R	200631LO	00003186	150	15	2250	3034
021622811	LO-CLAYMAX200R	200631LO	00003201	150	15	2250	3031
021622812	LO-CLAYMAX200R	200631LO	00003213	150	15	2250	3030
021622812	LO-CLAYMAX200R	200631LO	00003214	150	15	2250	3026
021622812	LO-CLAYMAX200R	200631LO	00003215	150	15	2250	3029
021622812	LO-CLAYMAX200R	200631LO	00003216	150	15	2250	3032
021622812	LO-CLAYMAX200R	200631LO	00003217	150	15	2250	3028
021622812	LO-CLAYMAX200R	200631LO	00003225	150	15	2250	3028
021622812	LO-CLAYMAX200R	200631LO	00003226	150	15	2250	3025
021622812	LO-CLAYMAX200R	200631LO	00003227	150	15	2250	3029
021622812	LO-CLAYMAX200R	200631LO	00003228	150	15	2250	3034
021622812	LO-CLAYMAX200R	200631LO	00003229	150	15	2250	3035
021622812	LO-CLAYMAX200R	200631LO	00003235	150	15	2250	3029
021622812	LO-CLAYMAX200R	200631LO	00003236	150	15	2250	3032
021622812	LO-CLAYMAX200R	200631LO	00003237	150	15	2250	3035
021622812	LO-CLAYMAX200R	200631LO	00003238	150	15	2250	3037
021622811	LO-CLAYMAX200R	200631LO	00003240	150	15	2250	3030
021622811	LO-CLAYMAX200R	200631LO	00003241	150	15	2250	3032
021622811	LO-CLAYMAX200R	200631LO	00003243	150	15	2250	3032
021622811	LO-CLAYMAX200R	200631LO	00003244	150	15	2250	3030
021622811	LO-CLAYMAX200R	200631LO	00003245	150	15	2250	3028
021622811	LO-CLAYMAX200R	200631LO	00003246	150	15	2250	3031
021622811	LO-CLAYMAX200R	200631LO	00003247	150	15	2250	3027
021622811	LO-CLAYMAX200R	200631LO	00003248	150	15	2250	3030
021622811	LO-CLAYMAX200R	200631LO	00003249	150	15	2250	3028
021622812	LO-CLAYMAX200R	200631LO	00003250	150	15	2250	3031
021622809	LO-CLAYMAX200R	200631LO	00003257	150	15	2250	3032

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622809	LO-CLAYMAX200R	200631LO	00003258	150	15	2250	3031
021622809	LO-CLAYMAX200R	200631LO	00003261	150	15	2250	3029
021622809	LO-CLAYMAX200R	200631LO	00003262	150	15	2250	3031
021622809	LO-CLAYMAX200R	200631LO	00003263	150	15	2250	3028
021622809	LO-CLAYMAX200R	200631LO	00003264	150	15	2250	3032
021622809	LO-CLAYMAX200R	200631LO	00003265	150	15	2250	3030
021622811	LO-CLAYMAX200R	200631LO	00003267	150	15	2250	3031
021622811	LO-CLAYMAX200R	200631LO	00003268	150	15	2250	3025
021622811	LO-CLAYMAX200R	200631LO	00003269	150	15	2250	3027
021622811	LO-CLAYMAX200R	200631LO	00003273	150	15	2250	3027
021622809	LO-CLAYMAX200R	200631LO	00003274	150	15	2250	3031
021622809	LO-CLAYMAX200R	200631LO	00003275	150	15	2250	3034
021622809	LO-CLAYMAX200R	200631LO	00003277	150	15	2250	3039
021622809	LO-CLAYMAX200R	200631LO	00003298	150	15	2250	3038
021622809	LO-CLAYMAX200R	200631LO	00003299	150	15	2250	3035
021622809	LO-CLAYMAX200R	200631LO	00003307	150	15	2250	3041
021622809	LO-CLAYMAX200R	200631LO	00003308	150	15	2250	3039
021622809	LO-CLAYMAX200R	200631LO	00003315	150	15	2250	3042
			Totals:	**6750**	**675**	**101250**	**136415**

Total Number of Rolls Certified: **45**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles			Clay	
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7			LO-N/W-BLK-200R-2.7	LO-CG 50-200R
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200631LO	00003186	00003171	2006425110			2006683083	071606B
200631LO	00003201	00003188	2006886382			2006808520	071606B
200631LO	00003213	00003205	2006886349			2006890680	071606B
200631LO	00003214	00003205	2006886349			2006890680	071606B
200631LO	00003215	00003205	2006886349			2006890680	071606B
200631LO	00003216	00003205	2006886349			2006890680	071606B
200631LO	00003217	00003205	2006886349			2006890680	071606B
200631LO	00003225	00003222	2006886339			2006890690	071606B
200631LO	00003226	00003222	2006886339			2006890690	071606B
200631LO	00003227	00003222	2006886339			2006890690	071606B
200631LO	00003228	00003222	2006886339			2006890690	071606B
200631LO	00003229	00003222	2006886339			2006890690	071606B
200631LO	00003235	00003222	2006880842			2006890690	071606C
200631LO	00003236	00003222	2006880842			2006890690	071606C
200631LO	00003237	00003222	2006880842			2006890690	071606C
200631LO	00003238	00003222	2006880842			2006890690	071606C
200631LO	00003240	00003239	2006880842			2006879797	071606C
200631LO	00003241	00003239	2006880842			2006879797	071606C
200631LO	00003243	00003239	2006880842			2006879797	071606C
200631LO	00003244	00003239	2006880842			2006879797	071606C
200631LO	00003245	00003239	2006880842			2006879797	071606C
200631LO	00003246	00003239	2006880842			2006879797	071606C
200631LO	00003247	00003239	2006880842			2006879797	071606C
200631LO	00003248	00003239	2006880842			2006879797	071606C
200631LO	00003249	00003239	2006880842			2006879797	071606C
200631LO	00003250	00003239	2006886352			2006879797	071606C
200631LO	00003257	00003256	2006886352			2006879795	071606C
200631LO	00003258	00003256	2006886352			2006879795	071606C
200631LO	00003261	00003256	2006886352			2006879795	071606C

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200631LO	00003262	00003256	2006886352			2006879795	071606C
200631LO	00003263	00003256	2006886352			2006879795	071606C
200631LO	00003264	00003256	2006886352			2006879795	071606C
200631LO	00003265	00003256	2006886351			2006879795	071606C
200631LO	00003267	00003256	2006886351			2006879795	071606C
200631LO	00003268	00003256	2006886351			2006879795	071606C
200631LO	00003269	00003256	2006886351			2006879795	071606C
200631LO	00003273	00003273	2006886351			2006879786	071606C
200631LO	00003274	00003273	2006886351			2006879786	071606C
200631LO	00003275	00003273	2006886351			2006879786	071606D
200631LO	00003277	00003273	2006886351			2006879786	071606D
200631LO	00003298	00003290	2006886347			2006683111	071606D
200631LO	00003299	00003290	2006886347			2006683111	071606D
200631LO	00003307	00003307	2006886347			2006879777	071606D
200631LO	00003308	00003307	2006886347			2006879777	071606D
200631LO	00003315	00003307	2006886345			2006879777	071606D

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
		Standard Test Method:	ASTM D 5993	ASTM D 4632
		Standard Specification:	0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200631LO	00003171	0.84	285.0
LO-CLAYMAX200R	200631LO	00003188	0.84	285.0
LO-CLAYMAX200R	200631LO	00003205	0.83	285.0
LO-CLAYMAX200R	200631LO	00003222	0.82	285.0
LO-CLAYMAX200R	200631LO	00003239	0.84	318.0
LO-CLAYMAX200R	200631LO	00003256	0.84	318.0
LO-CLAYMAX200R	200631LO	00003273	0.84	318.0
LO-CLAYMAX200R	200631LO	00003290	0.89	318.0
LO-CLAYMAX200R	200631LO	00003307	0.85	318.0

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The bentonite clay used to produce certification package 000216228 has been tested by American Colloid Co. with the following results.

Clay Type	Clay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
Test Method:		ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
Specification:		24ml/2g Min	18ml Max	12% Max	1% Max	0%
LO-CG 50-200R	071606B	25	15.4	7.6	0.3	0
LO-CG 50-200R	071606C	25	15.4	10	0.4	0
LO-CG 50-200R	071606D	25	16.4	8.4	0.4	0

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006683083	3.6	85.3
SI 311	2006683111	3.6	84.1
SI 311	2006808520	3.6	93.6
SI 311	2006879777	3.8	94.8
SI 311	2006879786	3.0	74.6
SI 311	2006879795	3.3	85.0
SI 311	2006879797	3.3	85.0
SI 311	2006890680	3.3	83.9
SI 311	2006890690	3.4	89.9

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006886352	3.5	96.3
SI 311	2006880842	3.6	84.6
SI 311	2006886345	3.2	88.3
SI 311	2006886382	3.4	81.9
SI 311	2006425110	3.5	84.5
SI 311	2006886339	3.2	91.3
SI 311	2006886347	3.8	102.9
SI 311	2006886349	3.8	102.9
SI 311	2006886351	3.5	96.3

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

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Date: 8/4/2006
Purchase Order: P6212
ORDER NUMBER: 021622813

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Lovell, Wyoming plant on 8/3/2006.

If you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
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GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
ORDER NUMBER: 021622813
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

PRODUCTION CERTIFICATION

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 8/3/2006
Order Number: 021622813
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 CLAYMAX 200R

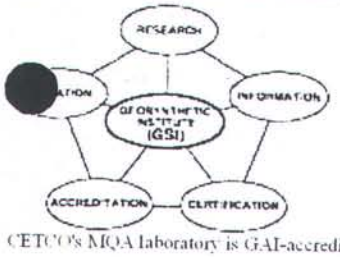
Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml 2g Min
ASTM D 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	50 psf (2.4 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

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 CLAYMAX 200R

Raw Material	test method	mass per area	units
Claymax 200R 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).

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
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GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622813	LO-CLAYMAX200R	200631LO	00003141	150	15	2250	3028
021622813	LO-CLAYMAX200R	200631LO	00003151	150	15	2250	3028
021622813	LO-CLAYMAX200R	200631LO	00003152	150	15	2250	3031
021622813	LO-CLAYMAX200R	200632LO	00003351	150	15	2250	3040
021622813	LO-CLAYMAX200R	200632LO	00003352	150	15	2250	3042
021622813	LO-CLAYMAX200R	200632LO	00003353	150	15	2250	3046
021622813	LO-CLAYMAX200R	200632LO	00003354	150	15	2250	3049
021622813	LO-CLAYMAX200R	200632LO	00003355	150	15	2250	3055
021622813	LO-CLAYMAX200R	200632LO	00003356	150	15	2250	3050
021622813	LO-CLAYMAX200R	200632LO	00003357	150	15	2250	3049
021622813	LO-CLAYMAX200R	200632LO	00003358	150	15	2250	3045
021622813	LO-CLAYMAX200R	200632LO	00003359	150	15	2250	3043
021622813	LO-CLAYMAX200R	200632LO	00003360	150	15	2250	3047
021622813	LO-CLAYMAX200R	200632LO	00003361	150	15	2250	3041
021622813	LO-CLAYMAX200R	200632LO	00003362	150	15	2250	3045
			Totals:	**2250**	**225**	**33750**	**45639**

Total Number of Rolls Certified: **15**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles			Clay	
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7			LO-N/W-BLK-200R-2.7	LO-CG 50-200R
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200631LO	00003141	00003137	2006886407			2006890686	071B06A
200631LO	00003151	00003137	2006886407			2006668984	071B06A
200631LO	00003152	00003137	2006886407			2006668984	071B06A
200632LO	00003351	00003351	2006425052			2006683078	072506B
200632LO	00003352	00003351	2006425052			2006683078	072506B
200632LO	00003353	00003351	2006425052			2006683078	072506B
200632LO	00003354	00003351	2006425052			2006683078	072506B
200632LO	00003355	00003351	2006425052			2006683078	072506B
200632LO	00003356	00003351	2006425052			2006683078	072506B
200632LO	00003357	00003351	2006425052			2006683078	072506B
200632LO	00003358	00003351	2006425052			2006683078	072506B
200632LO	00003359	00003351	2006425052			2006683078	072506B
200632LO	00003360	00003351	2006425052			2006683078	072506B
200632LO	00003361	00003351	2006425052			2006683078	072506B
200632LO	00003362	00003351	2006886346			2006683078	072506B

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
		Standard Test Method:	ASTM D 5993	ASTM D 4632
		Standard Specification:	0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200631LO	00003137	0.81	281.4
LO-CLAYMAX200R	200632LO	00003351	0.88	269.5

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The bentonite clay used to produce certification package 000216228 has been tested by American Colloid Co. with the following results.

Clay Type	Clay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
	Test Method:	ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
	Specification:	24ml/2g Min	18ml Max	12% Max	1% Max	0%
LO-CG 50-200R	072506B	24	16.8	10	0.3	0

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

CETCO
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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006668984	3.5	78.2
SI 311	2006683078	3.6	83.6
SI 311	2006890686	3.7	85.5

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006425052	3.3	74.7
SI 311	2006886346	3.2	88.3
SI 311	2006886407	3.5	96.4

ifications from our suppliers are on file at our production facility.
" or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

SUBMITTAL LETTER

SUBMITTAL NO.: 0017
SUBMITTAL DATE: 08/12/2006

PROJECT SUMMARY

PROJECT NAME: Marshall FGD Gypsum Landfill
OWNERS PROJECT NO.:
INTERNAL PROJECT NO.: 200603
OWNER: Duke Energy
A/E NAME: Chas. H. Sells, Inc.
CONTRACTOR: Phillips and Jordan, Inc.
OWNERS REP: Harold Backman
A/E REP: Dan Brewer PE
CONTRACTORS REP: Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER: 3.0
SEQUENCE. NO.: 2
SUBMISSION TYPE: A. Original Submission
SUBCONTRACTOR: Hallaton, Inc.
SUPPLIER:
MANUFACTURER:

SUBMITTAL DESCRIPTION: Geosynthetic Clay Liner
ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
3.2	.5	SD	GCL QC Certification Bentomat DN (lds. dt. 7/26, 7/27, 8/1)	

Miscellaneous Info:
Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:
By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/12/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- [X] No Exception Taken
- [ ] Make Corrections Noted
- [ ] Amend and Resubmit
- [ ] Rejected - See Remarks

Dan E. Brewer, P.E.
Engineer: Chas. H. Sells, Inc. **Signed:** Dan E. Brewer **Date:** 8/18/06

=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

CETCO
LINING TECHNOLOGIES
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Date: 7/26/2006
Purchase Order: P6212
ORDER NUMBERS: 021623001, 021623002, 021623003

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Cartersville, Georgia plant on 7/25/2006.

If you have any questions regarding this information, please contact me at (770) 387-7773.

Sincerely,

Melanie King
Quality Assurance Coordinator
CETCO Cartersville Plant

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GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall_LF
CUSTOMER P.O.: P6212
ORDER NUMBERS: 021623001, 021623002, 021623003
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: Marshall_LF
CUSTOMER P.O.: P6212
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. Any detected needles, which can be identified without damaging the GCL, are removed from the product.

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 7/25/2006
Order Numbers: 021623001, 021623002, 021623003
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 DN

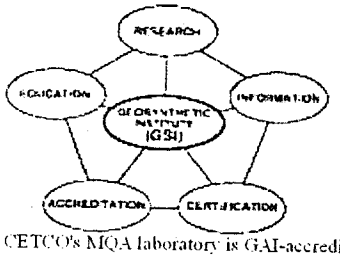
Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml 2g Min
ASTM D 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	150 lbs (660 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	37.5 lbs in (66 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	500 psf (24 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 (4.4 N cm) Min
ASTM D 4632	GCL Peel Strength	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

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 DN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd2
Bentomat DN Base Nonwoven Fabric	ASTM D 5261	6.0	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
Quality Assurance Coordinator
CETCO Cartersville Plant

CETCO
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GCL ORDER PACKING LIST

GCL shipped for certification package number 021623001

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021623003	CV-BENTOMAT DN	200614CV	00000063	150	14.5	2175	2734
021623003	CV-BENTOMAT DN	200614CV	00000130	150	14.5	2175	2671
021623003	CV-BENTOMAT DN	200617CV	00000168	150	14.5	2175	2402
021623002	CV-BENTOMAT DN	200624CV	00000183	150	14.5	2175	2820
021623001	CV-BENTOMAT DN	200624CV	00000403	150	14.5	2175	2825
021623001	CV-BENTOMAT DN	200624CV	00000410	150	14.5	2175	2742
021623001	CV-BENTOMAT DN	200624CV	00000411	150	14.5	2175	2734
021623001	CV-BENTOMAT DN	200624CV	00000413	150	14.5	2175	2722
021623002	CV-BENTOMAT DN	200624CV	00000417	150	14.5	2175	2723
021623001	CV-BENTOMAT DN	200624CV	00000420	150	14.5	2175	2709
021623001	CV-BENTOMAT DN	200624CV	00000422	150	14.5	2175	2754
021623001	CV-BENTOMAT DN	200624CV	00000442	150	14.5	2175	2743
021623001	CV-BENTOMAT DN	200624CV	00000460	150	14.5	2175	2750
021623003	CV-BENTOMAT DN	200624CV	00000461	150	14.5	2175	2739
021623003	CV-BENTOMAT DN	200624CV	00000473	150	14.5	2175	2782
021623001	CV-BENTOMAT DN	200629CV	00000596	150	14.5	2175	2862
021623002	CV-BENTOMAT DN	200629CV	00000598	150	14.5	2175	2866
021623001	CV-BENTOMAT DN	200629CV	00000636	150	14.5	2175	2796
021623003	CV-BENTOMAT DN	200629CV	00000638	150	14.5	2175	2796
021623003	CV-BENTOMAT DN	200629CV	00000643	150	14.5	2175	2806
021623003	CV-BENTOMAT DN	200629CV	00000644	150	14.5	2175	2804
021623002	CV-BENTOMAT DN	200629CV	00000646	150	14.5	2175	2794
021623003	CV-BENTOMAT DN	200629CV	00000650	150	14.5	2175	2804
021623002	CV-BENTOMAT DN	200629CV	00000653	150	14.5	2175	2798
021623002	CV-BENTOMAT DN	200629CV	00000661	150	14.5	2175	2792
021623003	CV-BENTOMAT DN	200629CV	00000665	150	14.5	2175	2794
021623002	CV-BENTOMAT DN	200629CV	00000666	150	14.5	2175	2788

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021623001	CV-BENTOMAT DN	200629CV	00000667	150	14.5	2175	2796
021623002	CV-BENTOMAT DN	200629CV	00000669	150	14.5	2175	2798
021623001	CV-BENTOMAT DN	200629CV	00000670	150	14.5	2175	2804
021623002	CV-BENTOMAT DN	200629CV	00000671	150	14.5	2175	2804
021623001	CV-BENTOMAT DN	200629CV	00000676	150	14.5	2175	2778
021623001	CV-BENTOMAT DN	200629CV	00000685	150	14.5	2175	2768
021623002	CV-BENTOMAT DN	200629CV	00000686	150	14.5	2175	2778
021623002	CV-BENTOMAT DN	200629CV	00000687	150	14.5	2175	2794
021623002	CV-BENTOMAT DN	200629CV	00000688	150	14.5	2175	2784
021623002	CV-BENTOMAT DN	200629CV	00000690	150	14.5	2175	2764
021623003	CV-BENTOMAT DN	200629CV	00000691	150	14.5	2175	2764
021623003	CV-BENTOMAT DN	200629CV	00000692	150	14.5	2175	2778
021623001	CV-BENTOMAT DN	200629CV	00000697	150	14.5	2175	2812
021623002	CV-BENTOMAT DN	200629CV	00000698	150	14.5	2175	2784
021623002	CV-BENTOMAT DN	200629CV	00000699	150	14.5	2175	2786
021623003	CV-BENTOMAT DN	200629CV	00000702	150	14.5	2175	2770
021623003	CV-BENTOMAT DN	200629CV	00000703	150	14.5	2175	2778
021623002	CV-BENTOMAT DN	200629CV	00000721	150	14.5	2175	2736
021623003	CV-BENTOMAT DN	200629CV	00000722	150	14.5	2175	2762
021623003	CV-BENTOMAT DN	200629CV	00000723	150	14.5	2175	2780
021623001	CV-BENTOMAT DN	200629CV	00000724	150	14.5	2175	2792
			Totals:	**7200**	**696**	**104400**	**132960**
						Total Number of Rolls Certified: **48**	

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 021623001

GCL			Geotextiles				Clay
CV-BENTOMAT DN			CV-N/W-WHITE-DN			CV-N/W-BLACK-DN-6 OZ	CV-CG 50-D
GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200614CV	00000063	00000063	200612CV	00001255	00001238	2006453613	696892
200614CV	00000130	00000120	200611CV	00001151	00001148	2006449202	695129
200617CV	00000168	00000164	200546CV	00002113	00002097	2006723597	718248
200624CV	00000183	00000170	200624CV	00001931	00000649	2006825655	723668
200624CV	00000403	00000403	200624CV	00001979	00001977	2006723417	720831
200624CV	00000410	00000403	200624CV	00001952	00001948	2006723598	720831
200624CV	00000411	00000403	200624CV	00001952	00001948	2006723598	720831
200624CV	00000413	00000403	200624CV	00001954	00001953	2006723598	720831
200624CV	00000417	00000403	200624CV	00001954	00001953	2006723598	720831
200624CV	00000420	00000403	200624CV	00002041	00002035	2006723598	720831
200624CV	00000422	00000421	200624CV	00002041	00002035	2006725338	720831
200624CV	00000442	00000421	200624CV	00002042	00002035	2006723397	720831
200624CV	00000460	00000457	200624CV	00002043	00002035	2006723410	723667
200624CV	00000461	00000457	200624CV	00002043	00002035	2006723410	723667
200624CV	00000473	00000457	200624CV	00002039	00002035	2006723594	723667
200629CV	00000596	00000595	2006936840			2006909711	731705
200629CV	00000598	00000595	2006936821			2006909711	731705
200629CV	00000636	00000631	2006936845			2006723595	731705
200629CV	00000638	00000631	2006936845			2006723595	731705
200629CV	00000643	00000631	2006936845			2006723592	731705
200629CV	00000644	00000631	2006936845			2006723592	731705
200629CV	00000646	00000631	2006936887			2006723592	731705
200629CV	00000650	00000649	2006936887			2006723592	731705
200629CV	00000653	00000649	2006936887			2006723592	731705
200629CV	00000661	00000649	2006936858			2006723592	731705
200629CV	00000665	00000649	2006936857			2006723592	731705
200629CV	00000666	00000649	2006936857			2006723592	731705
200629CV	00000667	00000667	2006936857			2006723592	731706
200629CV	00000669	00000667	2006936857			2006723593	731706

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200629CV	00000670	00000667	2006936857			2006723593	731706
200629CV	00000671	00000667	2006936857			2006723593	731706
200629CV	00000676	00000667	2006936863			2006723593	731706
200629CV	00000685	00000667	2006936816			2006723413	731706
200629CV	00000686	00000667	2006936816			2006723413	731706
200629CV	00000687	00000667	2006936816			2006723413	731706
200629CV	00000688	00000667	2006936816			2006723413	731706
200629CV	00000690	00000690	2006936816			2006723413	731706
200629CV	00000691	00000690	2006936816			2006723413	730438
200629CV	00000692	00000690	2006936859			2006723413	730438
200629CV	00000697	00000690	2006936859			2006910365	730438
200629CV	00000698	00000690	2006936859			2006910365	730438
200629CV	00000699	00000690	2006936859			2006910365	730438
200629CV	00000702	00000690	2006936865			2006910365	730438
200629CV	00000703	00000690	2006936865			2006910365	730438
200629CV	00000721	00000709	2006936844			2006723399	730438
200629CV	00000722	00000709	2006936844			2006872696	730438
200629CV	00000723	00000709	2006936844			2006872696	730438
200629CV	00000724	00000709	2006936844			2006872696	730438

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 021623001 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 4632	ASTM D 4632
		Standard Specification:	0.75 lb/sq ft MARV	150lbs MARV	15lbs MARV
CV-BENTOMAT DN	200614CV	00000063	0.99	324.3	34
CV-BENTOMAT DN	200614CV	00000120	0.80	198.4	35.9
CV-BENTOMAT DN	200617CV	00000164	0.80	286.6	35.5
CV-BENTOMAT DN	200624CV	00000170	0.97	317.0	37.7
CV-BENTOMAT DN	200624CV	00000403	1.01	316.5	40.8
CV-BENTOMAT DN	200624CV	00000421	0.86	316.5	40.7
CV-BENTOMAT DN	200624CV	00000457	0.85	316.5	41.8
CV-BENTOMAT DN	200629CV	00000595	0.88	322.5	30.8
CV-BENTOMAT DN	200629CV	00000631	0.86	322.5	37.2
CV-BENTOMAT DN	200629CV	00000649	0.89	322.5	35.9
CV-BENTOMAT DN	200629CV	00000667	0.94	347.8	35.4
CV-BENTOMAT DN	200629CV	00000690	0.99	333.7	35.4
CV-BENTOMAT DN	200629CV	00000709	0.93	333.7	37.3

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce Order 021623001
has been certified by American Colloid with the following test results

ACC Order Num	Moist	Swell	Fluid Loss	Retained 8m	Passing 200m
Test Method:	ASTM D 2216	ASTM D 5890	ASTM D 5891	ASTM C 136	ASTM C 136
Specification:	12.0% Max	24 Min	18.0% Max	0%	1.0% Max
696892	10.0	28.0	16.4	0.0	0.5
695129	11.2	25.0	16.4	0.0	0.4
718248	10.4	26.0	16.4	0.0	0.5
720831	10.0	29.0	15.8	0.0	0.7
723667	9.6	29.0	16.4	0.0	0.2
723668	9.6	25.0	16.4	0.0	0.5
730438	9.2	27.0	16.2	0.0	1.0
731705	8.6	31.0	17.2	0.0	0.8
731706	7.4	34.0	17.6	0.0	0.5

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

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GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 021623001 was manufactured using these geotextiles:

Material	Lot #	Roll #	Mass Area	Grab Strenth
CV-NON-WOVEN	200546CV	00002097	6.6	31.4
CV-NON-WOVEN	200611CV	00001148	6.2	36.2
CV-NON-WOVEN	200612CV	00001238	6.2	41.5
CV-NON-WOVEN	200624CV	00001948	7.1	41.7
CV-NON-WOVEN	200624CV	00001953	6.0	33.9
CV-NON-WOVEN	200624CV	00001977	6.4	28.0
CV-NON-WOVEN	200624CV	00002035	6.8	35.0

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 021623001was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strenth lbs
SI HH65L	2006449202	7.1	163.7
SI HH65L	2006453613	7.0	199.5
SI HH65L	2006723397	6.8	176.3
SI HH65L	2006723399	6.8	176.3
SI HH65L	2006723410	6.9	171.6
SIHH65L	2006723412	6.1	167.3
SI HH65L	2006723417	7.0	167.1
SI HH65L	2006723592	6.5	163.2
SI HH65L	2006723593	6.5	163.2
SI HH65L	2006723594	6.5	163.2
SI HH65L	2006723595	6.9	181.5
SI HH65L	2006723597	6.9	181.5
SI HH65L	2006723598	8.0	208.6
SI HH65L	2006725338	6.8	177.8
SI HH65L	2006825655	6.5	186.9
SI HH65L	2006872696	7.2	196.8
SI HH65L	2006909711	6.9	216.2
SI HH65L	2006910365	6.9	216.2

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strenth lbs
PPX 650	2006936840	7.1	75.1
PPX 650	2006936845	7.3	64.7
PPX 650	2006936887	7.3	69.1
PPX 650	2006936844	7.3	64.7
PPX 650	2006936863	6.6	60.4
PPX 650	2006936865	6.6	60.4
PPX 650	2006936816	7.0	67.6
PPX 650	2006936858	6.9	72.3

PPX 650	2006936859	6.6	63.4
PPX 650	2006936821	7.0	67.6
PPX 650	2006936857	6.9	72.3

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

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Date: 7/27/2006
Purchase Order: P6212
ORDER NUMBERS: 021623004, 021623005, 021623006, 021623007, 021623008

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Cartersville, Georgia plant on 7/26/2006.

If you have any questions regarding this information, please contact me at (770) 387-7773.

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: Marshall_LF
CUSTOMER P.O.: P6212
ORDER NUMBERS: 021623004, 021623005, 021623006, 021623007, 021623008
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: Marshall_LF
CUSTOMER P.O.: P6212
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. Any detected needles, which can be identified without damaging the GCL, are removed from the product.

Melanie King
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO LINING TECHNOLOGIES
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Ship Date: 7/26/2006
Order Numbers: 021623004, 021623005, 021623006, 021623007, 021623008
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 DN

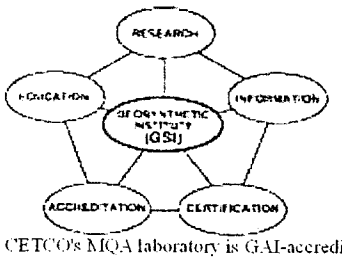
Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml 2g Min
ASTM D 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	150 lbs (660 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	37.5 lbs in (66 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	500 psf (24 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 (4.4 N cm) Min
ASTM D 4632	GCL Peel Strength	40,000 sq ft (4000 sq m)	15 lbs (65 N) Min

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 DN

Raw Material	test method	mass per area	units
Nonwoven Cover Fabric	ASTM D 5261	6.0	oz/yd2
Bentomat DN Base Nonwoven Fabric	ASTM D 5261	6.0	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
Quality Assurance Coordinator
CETCO Cartersville Plant

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GCL ORDER PACKING LIST

GCL shipped for certification package number 021623004

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021623007	CV-BENTOMAT DN	200614CV	00000065	150	14.5	2175	2770
021623007	CV-BENTOMAT DN	200614CV	00000119	150	14.5	2175	2724
021623005	CV-BENTOMAT DN	200614CV	00000121	150	14.5	2175	2723
021623004	CV-BENTOMAT DN	200614CV	00000131	150	14.5	2175	2663
021623004	CV-BENTOMAT DN	200617CV	00000165	150	14.5	2175	2190
021623004	CV-BENTOMAT DN	200624CV	00000181	150	14.5	2175	2844
021623005	CV-BENTOMAT DN	200624CV	00000437	150	14.5	2175	2757
021623005	CV-BENTOMAT DN	200624CV	00000438	150	14.5	2175	2753
021623007	CV-BENTOMAT DN	200624CV	00000440	150	14.5	2175	2743
021623007	CV-BENTOMAT DN	200624CV	00000446	150	14.5	2175	2752
021623004	CV-BENTOMAT DN	200624CV	00000456	150	14.5	2175	2756
021623004	CV-BENTOMAT DN	200624CV	00000458	150	14.5	2175	2733
021623007	CV-BENTOMAT DN	200629CV	00000589	150	14.5	2175	2942
021623008	CV-BENTOMAT DN	200629CV	00000597	150	14.5	2175	2864
021623008	CV-BENTOMAT DN	200629CV	00000604	150	14.5	2175	2844
021623008	CV-BENTOMAT DN	200629CV	00000607	150	14.5	2175	2842
021623008	CV-BENTOMAT DN	200629CV	00000610	150	14.5	2175	2832
021623008	CV-BENTOMAT DN	200629CV	00000611	150	14.5	2175	2830
021623008	CV-BENTOMAT DN	200629CV	00000612	150	14.5	2175	2840
021623008	CV-BENTOMAT DN	200629CV	00000613	150	14.5	2175	2836
021623008	CV-BENTOMAT DN	200629CV	00000616	150	14.5	2175	2830
021623008	CV-BENTOMAT DN	200629CV	00000617	150	14.5	2175	2826
021623005	CV-BENTOMAT DN	200629CV	00000619	150	14.5	2175	2810
021623005	CV-BENTOMAT DN	200629CV	00000621	150	14.5	2175	2822
021623008	CV-BENTOMAT DN	200629CV	00000622	150	14.5	2175	2830
021623008	CV-BENTOMAT DN	200629CV	00000623	150	14.5	2175	2818
021623008	CV-BENTOMAT DN	200629CV	00000624	150	14.5	2175	2816

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021623006	CV-BENTOMAT DN	200629CV	00000626	150	14.5	2175	2796
021623006	CV-BENTOMAT DN	200629CV	00000628	150	14.5	2175	2816
021623006	CV-BENTOMAT DN	200629CV	00000629	150	14.5	2175	2818
021623008	CV-BENTOMAT DN	200629CV	00000630	150	14.5	2175	2812
021623006	CV-BENTOMAT DN	200629CV	00000631	150	14.5	2175	2794
021623006	CV-BENTOMAT DN	200629CV	00000632	150	14.5	2175	2812
021623006	CV-BENTOMAT DN	200629CV	00000633	150	14.5	2175	2810
021623005	CV-BENTOMAT DN	200629CV	00000634	150	14.5	2175	2812
021623005	CV-BENTOMAT DN	200629CV	00000635	150	14.5	2175	2802
021623007	CV-BENTOMAT DN	200629CV	00000637	150	14.5	2175	2792
021623004	CV-BENTOMAT DN	200629CV	00000639	150	14.5	2175	2800
021623004	CV-BENTOMAT DN	200629CV	00000640	150	14.5	2175	2794
021623008	CV-BENTOMAT DN	200629CV	00000641	150	14.5	2175	2818
021623008	CV-BENTOMAT DN	200629CV	00000642	150	14.5	2175	2806
021623005	CV-BENTOMAT DN	200629CV	00000645	150	14.5	2175	2796
021623008	CV-BENTOMAT DN	200629CV	00000647	150	14.5	2175	2804
021623004	CV-BENTOMAT DN	200629CV	00000648	150	14.5	2175	2802
021623006	CV-BENTOMAT DN	200629CV	00000649	150	14.5	2175	2850
021623006	CV-BENTOMAT DN	200629CV	00000651	150	14.5	2175	2802
021623006	CV-BENTOMAT DN	200629CV	00000652	150	14.5	2175	2806
021623006	CV-BENTOMAT DN	200629CV	00000654	150	14.5	2175	2812
021623004	CV-BENTOMAT DN	200629CV	00000655	150	14.5	2175	2802
021623006	CV-BENTOMAT DN	200629CV	00000656	150	14.5	2175	2810
021623005	CV-BENTOMAT DN	200629CV	00000657	150	14.5	2175	2804
021623005	CV-BENTOMAT DN	200629CV	00000658	150	14.5	2175	2800
021623007	CV-BENTOMAT DN	200629CV	00000659	150	14.5	2175	2794
021623007	CV-BENTOMAT DN	200629CV	00000660	150	14.5	2175	2796
021623004	CV-BENTOMAT DN	200629CV	00000662	150	14.5	2175	2790
021623006	CV-BENTOMAT DN	200629CV	00000664	150	14.5	2175	2786
021623005	CV-BENTOMAT DN	200629CV	00000668	150	14.5	2175	2812
021623006	CV-BENTOMAT DN	200629CV	00000672	150	14.5	2175	2806
021623007	CV-BENTOMAT DN	200629CV	00000673	150	14.5	2175	2792

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021623007	CV-BENTOMAT DN	200629CV	00000674	150	14.5	2175	2780
021623005	CV-BENTOMAT DN	200629CV	00000675	150	14.5	2175	2786
021623006	CV-BENTOMAT DN	200629CV	00000689	150	14.5	2175	2770
021623004	CV-BENTOMAT DN	200629CV	00000693	150	14.5	2175	2772
021623004	CV-BENTOMAT DN	200629CV	00000694	150	14.5	2175	2794
021623005	CV-BENTOMAT DN	200629CV	00000695	150	14.5	2175	2818
021623005	CV-BENTOMAT DN	200629CV	00000700	150	14.5	2175	2862
021623004	CV-BENTOMAT DN	200629CV	00000701	150	14.5	2175	2756
021623004	CV-BENTOMAT DN	200629CV	00000704	150	14.5	2175	2780
021623004	CV-BENTOMAT DN	200629CV	00000706	150	14.5	2175	2768
021623004	CV-BENTOMAT DN	200629CV	00000707	150	14.5	2175	2782
021623007	CV-BENTOMAT DN	200629CV	00000708	150	14.5	2175	2778
021623007	CV-BENTOMAT DN	200629CV	00000709	150	14.5	2175	2794
021623007	CV-BENTOMAT DN	200629CV	00000710	150	14.5	2175	2780
021623007	CV-BENTOMAT DN	200629CV	00000711	150	14.5	2175	2850
021623007	CV-BENTOMAT DN	200629CV	00000712	150	14.5	2175	2782
021623005	CV-BENTOMAT DN	200629CV	00000713	150	14.5	2175	2778
021623005	CV-BENTOMAT DN	200629CV	00000714	150	14.5	2175	2778
021623006	CV-BENTOMAT DN	200629CV	00000715	150	14.5	2175	2794
021623006	CV-BENTOMAT DN	200629CV	00000716	150	14.5	2175	2790
021623007	CV-BENTOMAT DN	200629CV	00000720	150	14.5	2175	2826
			Totals:	**12000**	**1160**	**174000**	**223354**
						Total Number of Rolls Certified: **80**	

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 021623004

GCL			Geotextiles				Clay
CV-BENTOMAT DN			CV-N/W-WHITE-DN			CV-N/W-BLACK-DN-6 OZ	CV-CG 50-D
GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200614CV	00000065	00000063	200612CV	00001255	00001238	2006453613	696892
200614CV	00000119	00000103	200610CV	00001043	00001040	2006453610	695127
200614CV	00000121	00000120	200610CV	00001042	00001040	2006453610	695129
200614CV	00000131	00000120	200611CV	00001151	00001148	2006449202	695129
200617CV	00000165	00000164	200546CV	00002113	00002097	2006723401	718248
200624CV	00000181	00000170	200624CV	00001931	00000649	2006825654	723668
200624CV	00000437	00000421	200624CV	00002042	00002035	2006723397	720831
200624CV	00000438	00000421	200624CV	00002042	00002035	2006723397	720831
200624CV	00000440	00000421	200624CV	00002042	00002035	2006723397	720831
200624CV	00000446	00000421	200624CV	00002032	00002030	2006723397	723667
200624CV	00000456	00000421	200624CV	00002044	00002035	2006723410	723667
200624CV	00000458	00000457	200624CV	00002044	00002035	2006723410	723667
200629CV	00000589	00000576	2006936840			2006909711	731705
200629CV	00000597	00000595	2006936840			2006909711	731705
200629CV	00000604	00000595	2006936821			2006909711	731705
200629CV	00000607	00000595	2006936820			2006909711	731705
200629CV	00000610	00000595	2006936820			2006909711	731705
200629CV	00000611	00000595	2006936820			2006909711	731705
200629CV	00000612	00000595	2006936820			2006909711	731705
200629CV	00000613	00000613	2006936820			2006909711	731705
200629CV	00000616	00000613	2006936820			2006909711	731705
200629CV	00000617	00000613	2006938761			2006909711	731705
200629CV	00000619	00000613	2006938761			2006909711	731705
200629CV	00000621	00000613	2006938761			2006723595	731705
200629CV	00000622	00000613	2006938761			2006723595	731705
200629CV	00000623	00000613	2006938761			2006723595	731705
200629CV	00000624	00000613	2006938761			2006723595	731705
200629CV	00000626	00000613	2006936848			2006723595	731705
200629CV	00000628	00000613	2006936848			2006723595	731705

GCL Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
200629CV	00000629	00000613	2006936848			2006723595	731705
200629CV	00000630	00000613	2006936848			2006723595	731705
200629CV	00000631	00000631	2006936848			2006723595	731705
200629CV	00000632	00000631	2006936848			2006723595	731705
200629CV	00000633	00000631	2006936848			2006723595	731705
200629CV	00000634	00000631	2006936848			2006723595	731705
200629CV	00000635	00000631	2006936848			2006723595	731705
200629CV	00000637	00000631	2006936845			2006723595	731705
200629CV	00000639	00000631	2006936845			2006723595	731705
200629CV	00000640	00000631	2006936845			2006723595	731705
200629CV	00000641	00000631	2006936845			2006723592	731705
200629CV	00000642	00000631	2006936845			2006723592	731705
200629CV	00000645	00000631	2006936887			2006723592	731705
200629CV	00000647	00000631	2006936887			2006723592	731705
200629CV	00000648	00000631	2006936887			2006723592	731705
200629CV	00000649	00000649	2006936887			2006723592	731705
200629CV	00000651	00000649	2006936887			2006723592	731705
200629CV	00000652	00000649	2006936887			2006723592	731705
200629CV	00000654	00000649	2006936887			2006723592	731705
200629CV	00000655	00000649	2006936858			2006723592	731705
200629CV	00000656	00000649	2006936858			2006723592	731705
200629CV	00000657	00000649	2006936858			2006723592	731705
200629CV	00000658	00000649	2006936858			2006723592	731705
200629CV	00000659	00000649	2006936858			2006723592	731705
200629CV	00000660	00000649	2006936858			2006723592	731705
200629CV	00000662	00000649	2006936858			2006723592	731705
200629CV	00000664	00000649	2006936857			2006723592	731705
200629CV	00000668	00000667	2006936857			2006723593	731706
200629CV	00000672	00000667	2006936857			2006723593	731706
200629CV	00000673	00000667	2006936857			2006723593	731706
200629CV	00000674	00000667	2006936863			2006723593	731706
200629CV	00000675	00000667	2006936863			2006723593	731706
200629CV	00000689	00000667	2006936816			2006723413	731706
200629CV	00000693	00000690	2006936859			2006723413	730438
200629CV	00000694	00000690	2006936859			2006723413	730438

L Lot #	GCL Roll #	Roll # Tested	Cap Lot #	Cap Roll #	Roll # Tested	Base Roll #	Clay Lot #
629CV	00000695	00000690	2006936859			2006910365	730438
629CV	00000700	00000690	2006936859			2006910365	730438
)629CV	00000701	00000690	2006936865			2006910365	730438
)629CV	00000704	00000690	2006936865			2006910365	730438
0629CV	00000706	00000690	2006936865			2006910365	730438
)0629CV	00000707	00000690	2006936865			2006910365	730438
)0629CV	00000708	00000690	2006936865			2006723399	730438
00629CV	00000709	00000709	2006936865			2006723399	730438
,00629CV	00000710	00000709	2006936865			2006723399	730438
200629CV	00000711	00000709	2006931372			2006723399	730438
200629CV	00000712	00000709	2006931372			2006723399	730438
200629CV	00000713	00000709	2006931372			2006723399	730438
200629CV	00000714	00000709	2006931372			2006723399	730438
200629CV	00000715	00000709	2006931372			2006723399	730438
200629CV	00000716	00000709	2006931372			2006723399	730438
200629CV	00000720	00000709	2006931372			2006723399	730438

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 021623004 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 4632	ASTM D 4632
		Standard Specification:	0.75 lb/sq ft MARV	150lbs MARV	15lbs MARV
CV-BENTOMAT DN	200614CV	00000063	0.99	324.3	34
CV-BENTOMAT DN	200614CV	00000103	0.94	198.4	38.2
CV-BENTOMAT DN	200614CV	00000120	0.80	198.4	35.9
CV-BENTOMAT DN	200617CV	00000164	0.80	286.6	35.5
CV-BENTOMAT DN	200624CV	00000170	0.97	317.0	37.7
CV-BENTOMAT DN	200624CV	00000421	0.86	316.5	40.7
CV-BENTOMAT DN	200624CV	00000457	0.85	316.5	41.8
CV-BENTOMAT DN	200629CV	00000576	0.99	322.5	29.4
CV-BENTOMAT DN	200629CV	00000595	0.88	322.5	30.8
CV-BENTOMAT DN	200629CV	00000613	1.00	322.5	23.4
CV-BENTOMAT DN	200629CV	00000631	0.86	322.5	37.2
CV-BENTOMAT DN	200629CV	00000649	0.89	322.5	35.9
CV-BENTOMAT DN	200629CV	00000667	0.94	347.8	35.4
CV-BENTOMAT DN	200629CV	00000690	0.99	333.7	35.4
CV-BENTOMAT DN	200629CV	00000709	0.93	333.7	37.3

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The Bentonite Clay used to produce Order 021623004
has been certified by American Colloid with the following test results

ACC Order Num	Moist	Swell	Fluid Loss	Retained 8m	Passing 200m
Test Method:	ASTM D 2216	ASTM D 5890	ASTM D 5891	ASTM C 136	ASTM C 136
Specification:	12.0% Max	24 Min	18.0% Max	0%	1.0% Max
696892	10.0	28.0	16.4	0.0	0.5
695129	11.2	25.0	16.4	0.0	0.4
695127	8.8	25.0	16.4	0.0	0.4
718248	10.4	26.0	16.4	0.0	0.5
720831	10.0	29.0	15.8	0.0	0.7
723667	9.6	29.0	16.4	0.0	0.2
723668	9.6	25.0	16.4	0.0	0.5
730438	9.2	27.0	16.2	0.0	1.0
731705	8.6	31.0	17.2	0.0	0.8
731706	7.4	34.0	17.6	0.0	0.5

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOTEXTILE TEST RESULTS FOR RAW MATERIAL SUPPLIED BY A CETCO FACILITY

The GCL in certification package number 021623004 was manufactured using these geotextiles:

Material	Lot #	Roll #	Mass Area	Grab Strenth
CV-NON-WOVEN	200546CV	00002097	6.6	31.4
CV-NON-WOVEN	200610CV	00001040	6.2	39.0
CV-NON-WOVEN	200611CV	00001148	6.2	36.2
CV-NON-WOVEN	200612CV	00001238	6.2	41.5
CV-NON-WOVEN	200624CV	00002030	6.6	33.7
CV-NON-WOVEN	200624CV	00002035	6.8	35.0

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GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 021623004was manufactured with geotextiles which were tested with the following results.

BASE			
Material	**Roll Number**	**Mass Area oz/yd2**	**Grab Strenth lbs**
SI HH65L	2006449202	7.1	163.7
SI HH65L	2006453610	7.0	199.5
SI HH65L	2006453613	7.0	199.5
SI HH65L	2006723397	6.8	176.3
SI HH65L	2006723399	6.8	176.3
SI HH65L	2006723400	6.9	162.2
SI HH65L	2006723410	6.9	171.6
SIHH65L	2006723412	6.1	167.3
SI HH65L	2006723592	6.5	163.2
SI HH65L	2006723593	6.5	163.2
SI HH65L	2006723595	6.9	181.5
SI HH65L	2006825654	6.5	186.9
SI HH65L	2006909711	6.9	216.2
SI HH65L	2006910365	6.9	216.2

CAP			
Material	**Roll Number**	**Mass Area oz/yd2**	**Grab Strenth lbs**
PPX 650	2006936820	7.0	67.6
PPX 650	2006931372	7.7	114.6
PPX 650	2006936863	6.6	60.4
PPX 650	2006936816	7.0	67.6
PPX 650	2006936858	6.9	72.3
PPX 650	2006936859	6.6	63.4
PPX 650	2006936821	7.0	67.6
PPX 650	2006936857	6.9	72.3
PPX 650	2006936848	7.0	55.7
PPX 650	2006936865	6.6	60.4
PPX 650	2006936840	7.1	75.1
PPX 650	2006936845	7.3	64.7

PPX 650	2006936887	7.3	69.1
PPX 650	2006938761	7.0	71.3

Certifications from our suppliers are on file at our production facility. An '*' or 'PT' indicates supplier certifications were unavailable prior to shipping so testing was performed at a CETCO lab.

CETCO
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Date: 8/1/2006
Purchase Order: P6212
ORDER NUMBER: 021622814

Scott Brinkerhoff
Hallaton
Suite 203
Towson, MD 21286
sbrinkerhoff@hallaton.com

To Whom it May Concern:

Please find enclosed the MQA/MQC test data package for Geosynthetic Clay Liner shipments to Hallaton. The shipments left our Lovell, Wyoming plant on 7/31/2006.

If you have any questions regarding this information, please contact me at 800-322-1149 ext. 423.

Sincerely,

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOSYNTHETIC CLAY LINER
MANUFACTURING QUALITY ASSURANCE DATA PACKAGE

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
ORDER NUMBER: 021622814
PREPARED FOR: Hallaton

CONTENTS:

- Daily GCL production 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: Roger B. Wilkerson
Quality Assurance Coordinator
CETCO
P.O. Box 428
92 Hwy. 37
Lovell, WY 82431

Telephone: 800-322-1149 ext. 423
Fax: (307)548-6927
E-Mail: rwilke@cetco.com

LINING TECHNOLOGIES
800.527.9948 www.cetco.com

PRODUCTION CERTIFICATION

PROJECT NAME: Marshall LF
CUSTOMER P.O.: P6212
PREPARED FOR: Hallaton

CETCO affirms that these products meet the physical and chemical criteria listed on the attached GCL property specification sheet.

Roger B. Wilkerson
Quality Assurance Coordinator
Colloid Environmental Technologies Co. (CETCO)

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

Ship Date: 7/31/2006
Order Number: 021622814
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 CLAYMAX 200R

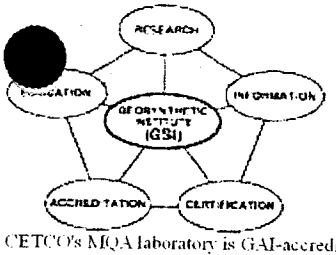
Test Method	Test Method Property	Test Frequency	Certified Value
ASTM D 5891	Bentonite Fluid Loss	1 per 50 Tons	18 ml Max
ASTM D 5993	Bentonite Mass Area	40,000 sq ft (4000 sq m)	0.75 lb sq ft (3.6 kg sq m) Min
ASTM D 5890	Bentonite Swell Index	1 per 50 Tons	24 ml 2g Min
ASTM D 4632	GCL Grab Strength	200,000 sq ft (20,000 sq m)	100 lbs (445 N) MARV
ASTM D 6768	GCL Grab Strength	200,000 sq ft (20,000 sq m)	25 lbs in (44 N cm) MARV
ASTM D 5321	GCL Hydrated Internal Shear Strength	Periodic	50 psf (2.4 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

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 CLAYMAX 200R

Raw Material	test method	mass per area	units
Claymax 200R 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).

Roger B. Wilkerson
Quality Assurance Coordinator
CETCO Lovell Plant

CETCO
LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GCL ORDER PACKING LIST

GCL shipped for certification package number 000216228

Order #	Product	Lot Number	Roll Number	Length (ft)	Width (ft)	Square Ft	Weight (lbs)
021622814	LO-CLAYMAX200R	200631LO	00003321	150	15	2250	3045
021622814	LO-CLAYMAX200R	200631LO	00003322	150	15	2250	3043
021622814	LO-CLAYMAX200R	200631LO	00003323	150	15	2250	3040
021622814	LO-CLAYMAX200R	200631LO	00003324	150	15	2250	3038
021622814	LO-CLAYMAX200R	200631LO	00003325	150	15	2250	3035
021622814	LO-CLAYMAX200R	200631LO	00003326	150	15	2250	3033
021622814	LO-CLAYMAX200R	200631LO	00003327	150	15	2250	3036
021622814	LO-CLAYMAX200R	200631LO	00003328	150	15	2250	3037
021622814	LO-CLAYMAX200R	200631LO	00003329	150	15	2250	3039
021622814	LO-CLAYMAX200R	200631LO	00003330	150	15	2250	3041
021622814	LO-CLAYMAX200R	200631LO	00003331	150	15	2250	3043
021622814	LO-CLAYMAX200R	200631LO	00003332	150	15	2250	3044
021622814	LO-CLAYMAX200R	200631LO	00003337	150	15	2250	3038
021622814	LO-CLAYMAX200R	200631LO	00003341	150	15	2250	3033
021622814	LO-CLAYMAX200R	200631LO	00003343	150	15	2250	3032
			Totals:	**2250**	**225**	**33750**	**45577**

Total Number of Rolls Certified: **15**

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GCL MQA TRACKING FORM

Listing of finished and raw materials used to produce certification package number 000216228

GCL			Geotextiles			Clay	
LO-CLAYMAX200R			LO-N/W-BLK-200R-2.7		LO-N/W-BLK-200R-2.7	LO-CG 50-200R	
GCL Lot #	**GCL Roll #**	**Roll # Tested**	**Cap Lot #**	**Cap Roll #**	**Roll # Tested**	**Base Roll #**	**Clay Lot #**
200631LO	00003321	00003307	2006886345			2006808166	071606D
200631LO	00003322	00003307	2006886345			2006808166	071606D
200631LO	00003323	00003307	2006886345			2006808166	071606D
200631LO	00003324	00003324	2006886345			2006808166	071706A
200631LO	00003325	00003324	2006886345			2006808166	071706A
200631LO	00003326	00003324	2006886345			2006808166	071706A
200631LO	00003327	00003324	2006886328			2006808166	071706A
200631LO	00003328	00003324	2006886328			2006808166	071706A
200631LO	00003329	00003324	2006886328			2006808166	071706A
200631LO	00003330	00003324	2006886328			2006808166	071706A
200631LO	00003331	00003324	2006886328			2006808166	071706A
200631LO	00003332	00003324	2006886328			2006879801	071706A
200631LO	00003337	00003324	2006886328			2006879801	071706A
200631LO	00003341	00003341	2006886328			2006879801	071706A
200631LO	00003343	00003341	2006425052			2006879801	071706A

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GCL MANUFACTURING QUALITY CONTROL TEST DATA

The following rolls in GCL certification package number 000216228 have been tested in our production facility lab.

Product	Lot # Tested	Roll # Tested	Mass Area	Grab Strength
Standard Test Method:			ASTM D 5993	ASTM D 4632
Standard Specification:			0.75 lb/sq ft MARV	100lbs MARV
LO-CLAYMAX200R	200631LO	00003307	0.85	318.0
LO-CLAYMAX200R	200631LO	00003324	0.83	324.1
LO-CLAYMAX200R	200631LO	00003341	0.89	324.1

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.

AMERICAN COLLOID COMPANY

BENTONITE CLAY CERTIFICATION

The bentonite clay used to produce certification package 000216228 has been tested by American Colloid Co. with the following results.

Clay Type	Clay Lot #	Swell	Fluid Loss	Moisture	% Passing 200m	% Retained 8m
Test Method:		ASTM D 5890	ASTM D 5891	ASTM D 2216	ASTM C 136	ASTM C 136
Specification:		24ml/2g Min	18ml Max	12% Max	1% Max	0%
LO-CG 50-200R	071606D	25	16.4	8.4	0.4	0
LO-CG 50-200R	071706A	25	16	10.4	0.4	0

Tests approved by
Moses Briseno
American Colloid Company
Quality Assurance Coordinator

LINING TECHNOLOGIES
800.527.9948 www.cetco.com

GEOTEXTILE TEST RESULTS FROM MATERIAL SUPPLIERS

The GCL in certification package number 000216228was manufactured with geotextiles which were tested with the following results.

BASE

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006808166	3.0	74.6
SI 311	2006879801	3.1	81.8

CAP

Material	Roll Number	Mass Area oz/yd2	Grab Strength lbs
SI 311	2006425052	3.3	74.7
SI 311	2006886328	3.4	86.1
SI 311	2006886345	3.2	88.3

ations from our suppliers are on file at our production facility.
'PT indicates supplier certifications were unavailable prior to shi so testing was performed at a CETCO lab.

2

SUBMITTAL LETTER

SUBMITTAL NO.: 0014
SUBMITTAL DATE: 08/11/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER: 4.0
SEQUENCE. NO.: 5
SUBMISSION TYPE: A. Original Submission
SUBCONTRACTOR: Hallaton, Inc.
SUPPLIER:
MANUFACTURER:

SUBMITTAL DESCRIPTION: Geomembrane Liner
ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
4.2		SD	Manufacturer's QC Certification-HDPE Liner-Micro Spike	

Miscellaneous Info:

Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/11/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- [X] **No Exception Taken**
- [ ] **Make Corrections Noted**
- [ ] **Amend and Resubmit**
- [ ] **Rejected - See Remarks**

Dan E. Brewer, P.E.

Engineer: Chas. H. Sells, Inc. **Signed:** Dan E. Brewer **Date:** 8/18/06

D=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

microspike liner

HDPE

60 mil

Hallaton Duke Power Marshall Steam doc 7995

Terrell, NC

31 LONG rolls 60 HD micro	31	left
54 rolls 60 HD smooth	54	left
160 rolls 200mil geonet		
9 spools 5mm HD PETROMONT WELD ROD		

		METRIC DIMENSIONS										
roll #		width	length	area								
(P)429114	.06	7	131.07	917.49	60HD	micro	31tot	1	3496	3 ft.	MM195247
(P)429115	.06	7	131.07	917.49	60HD	micro	31tot	2	3492		MM195247
(P)429116	.06	7	131.07	917.49	60HD	micro	31tot	3	3300		MM195247
(P)429117	.06	7	131.07	917.49	60HD	micro	31tot	4	3300		MM195247
(P)429118	.06	7	131.07	917.49	60HD	micro	31tot	5	3300		MM195247
(P)429119	.06	7	131.07	917.49	60HD	micro	31tot	6	3304		MM195247
(P)429120	.06	7	131.07	917.49	60HD	micro	31tot	7	3304		MM195247
(P)429221	.06	7	131.07	917.49	60HD	micro	31tot	8	3308		MM195247
(P)429222	.06	7	131.07	917.49	60HD	micro	31tot	9	3304	3 ft.	MM195247
(P)429223	.06	7	131.07	917.49	60HD	micro	31tot	10	3270		MM195247
(P)429224	.06	7	131.07	917.49	60HD	micro	31tot	11	3304		MM195247
(P)429225	.06	7	131.07	917.49	60HD	micro	31tot	12	3304		MM195247
(P)429226	.06	7	131.07	917.49	60HD	micro	31tot	13	3307		MM195247
(P)429227	.06	7	131.07	917.49	60HD	micro	31tot	14	3304		MM195247
(P)429228	.06	7	131.07	917.49	60HD	micro	31tot	15	3301		MM195247
(P)429229	.06	7	131.07	917.49	60HD	micro	31tot	16	3297		MM195247
(P)429230	.06	7	131.07	917.49	60HD	micro	31tot	17	3295		MM195247
(P)429231	.06	7	131.07	917.49	60HD	micro	31tot	18	3290		MM195247
(P)429232	.06	7	131.07	917.49	60HD	micro	31tot	19	3295	3 ft.	MM195247
(P)429233	.06	7	131.07	917.49	60HD	micro	31tot	20	3290		MM195247
(P)429234	.06	7	131.07	917.49	60HD	micro	31tot	21	3292		MM195247
(P)429235	.06	7	131.07	917.49	60HD	micro	31tot	22	3290		MM195247
(P)429236	.06	7	131.07	917.49	60HD	micro	31tot	23	3294		MM195247
(P)429237	.06	7	131.07	917.49	60HD	micro	31tot	24	3292		MM195247
(P)429238	.06	7	131.07	917.49	60HD	micro	31tot	25	3296		MM195247
(P)429239	.06	7	131.07	917.49	60HD	micro	31tot	26	3298		MM195247
(P)429340	.06	7	131.07	917.49	60HD	micro	31tot	27	3297		MM195247
(P)429341	.06	7	131.07	917.49	60HD	micro	31tot	28	3295		MM195247
(P)429342	.06	7	131.07	917.49	60HD	micro	31tot	29	3290	3 ft.	MM195247
(P)429343	.06	7	131.07	917.49	60HD	micro	31tot	30	3295		MM195247
(P)429344	.06	7	131.07	917.49	60HD	micro	31tot	31	3298		MM195247

agru

quality certificate

ROLL # **429114-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.75	mm	69	mil
	AVE:	1.59	mm	63	mil

Thickness..... 1.5 mm 60 mil
Length..... 131.07 m 430.0 feet
Width..... 7.00 m; 23.0 feet

Asperity GRI GM12: 36 mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes 160

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.33	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	25	N/mm	145 ppi	2,315	psi
	Average Strength @ Break	35	N/mm	202 ppi	3,230	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.73	
Lo = 2.0" Break	Average Elongation @ Break	%			538.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	226.1	N		50.825	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	425.2	N		95.600	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	562.3	N		126.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs		ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: 7-17-06

Signature.....
Quality Control Department

60HDmic.FRM
REV 03
12/23/05

agru

quality certificate

ROLL # **429115-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH			
	MIN:	1.53 mm	60 mil	Thickness.....	1.5 mm	60 mil
	MAX:	1.78 mm	70 mil	Length.....	131.07 m	430.0 feet
				Width.....	7.00 m;	23.0 feet
Asperity GRI GM12: 29 mil	AVE:	1.65 mm	65 mil			

ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.33	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm	150 ppi		2,315	psi
	Average Strength @ Break	37 N/mm	210 ppi		3,230	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			19.73	
Lo = 2.0" Break	Average Elongation @ Break	%			538.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	226.1 N			50.825	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	425.2 N			95.600	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	562.3 N			126.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: 7-17-06

Signature [signature]
Quality Control Department

60HDmic.FRM
REV 03
12/23/05

agru

quality certificate

ROLL # **429116-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.50	mm	59	mil
	MAX:	1.68	mm	66	mil
	AVE:	1.59	mm	63	mil

Thickness.....	1.5	mm	60 mil
Length.....	131.07	m	430.0 feet
Width.....	7.00	m;	23.0 feet

Asperity GRI GM12: **38** mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.33	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	25	N/mm	145 ppi	2,315	psi
	Average Strength @ Break	35	N/mm	202 ppi	3,230	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.73	
	Average Elongation @ Break	%			538.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	226.1	N		50.825	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	425.2	N		95.600	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	562.3	N		126.42	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-17-06**

Signature.....

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ROLL # **429117-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.49**	mm	**59**	mil
	MAX:	**1.68**	mm	**66**	mil
Asperity GRI GM12: **31** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.59**	mm	**63**	mil

Thickness.....	**1.5**	mm	**60 mil**
Length.....	**131.07**	m	**430.0** feet
Width.....	**7.00**	m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g		g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range		%			**2.33**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**145**	ppi	**2,315**	psi
	Average Strength @ Break	**35**	N/mm	**202**	ppi	**3,230**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			**19.73**	
	Average Elongation @ Break		%			**538.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1**	N			**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2**	N			**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3**	N			**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

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ROLL # **429118-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.47** mm	**58** mil
	MAX:	**1.81** mm	**71** mil
Asperity GRI GM12: **38** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.61** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**160**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g		g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range		%		**2.33**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**147** ppi	**2,315**	psi
	Average Strength @ Break	**36**	N/mm	**205** ppi	**3,230**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%		**19.73**	
	Average Elongation @ Break		%		**538.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2**	N		**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3**	N		**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-17-06**

Signature: [signature]

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ROLL # **429119-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.50** mm	**59** mil
	MAX:	**1.74** mm	**69** mil
Asperity GRI GM12: **32** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.61** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.21**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**147** ppi		**2,319**	psi
	Average Strength @ Break	**36** N/mm	**204** ppi		**3,220**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**18.94**	
Lo = 2.0" Break	Average Elongation @ Break	%			**538.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1** N			**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2** N			**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3** N			**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-17-06**

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ROLL # **429120-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.49**	mm	**59**	mil
	MAX:	**1.78**	mm	**70**	mil
	AVE:	**1.60**	mm	**63**	mil

Asperity GRI GM12: **32** mil
ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5**	mm	**60** mil
Length.....	**131.07**	m	**430.0** feet
Width.....	**7.00**	m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g		g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range		%		**2.21**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**146** ppi	**2,319**	psi
	Average Strength @ Break	**36**	N/mm	**203** ppi	**3,220**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield		%		**18.94**	
Lo = 2.0" Break	Average Elongation @ Break		%		**538.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%		**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2**	N		**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3**	N		**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-17-06**

Signature: [signature]
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ROLL # **429221-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.52**	mm	**60**	mil
	MAX:	**1.69**	mm	**67**	mil
Asperity GRI GM12: **29** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.61**	mm	**63**	mil

Thickness.....	**1.5**	mm	**60**	mil
Length.....	**131.07**	m	**430.0**	feet
Width.....	**7.00**	m;	**23.0**	feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.21**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**147** ppi	**2,319**	psi
	Average Strength @ Break	**36**	N/mm	**204** ppi	**3,220**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.94**	
	Average Elongation @ Break	%			**538.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2**	N		**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3**	N		**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: [signature]

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ROLL # **429222-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.47	mm	58	mil
	MAX:	1.68	mm	66	mil
	AVE:	1.60	mm	63	mil

Asperity GRI GM12: **34** mil
ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5**	**mm**	**60 mil**
Length.....	**131.07**	m	**430.0** feet
Width.....	**7.00**	m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.21**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**146** ppi	**2,319**	psi
	Average Strength @ Break	**36**	N/mm	**203** ppi	**3,220**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.94**	
	Average Elongation @ Break	%			**538.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2**	N		**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3**	N		**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: [signature]

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ROLL # **429223-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.52** mm	**60** mil
	MAX:	**1.76** mm	**69** mil
Asperity GRI GM12: **29** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.63** mm	**64** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**160**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.21**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**149** ppi		**2,319**	psi
	Average Strength @ Break	**36** N/mm	**207** ppi		**3,220**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**18.94**	
Lo = 2.0" Break	Average Elongation @ Break	%			**538.4**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**226.1** N			**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**425.2** N			**95.600**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**562.3** N			**126.42**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

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ROLL # **429224-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.47** mm	**58** mil
	MAX:	**1.65** mm	**65** mil
Asperity GRI GM12: **35** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.54** mm	**61** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**160**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.31**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25** N/mm	**143** ppi		**2,351**	psi
	Average Strength @ Break	**34** N/mm	**196** ppi		**3,241**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**19.56**	
	Average Elongation @ Break	%			**523.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**221.5** N			**49.792**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**400.6** N			**90.060**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**576.3** N			**129.56**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date:..... **7-18-06**

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ROLL # **429225-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.74	mm	69	mil
	AVE:	1.60	mm	63	mil

Thickness.....	1.5	mm	60	mil
Length.....	131.07	m	430.0	feet
Width.....	7.00	m;	23.0	feet

Asperity GRI GM12: **30** mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **160**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.31	
Carbon Black Dispersion ASTM D5596	Category					1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm	148	ppi	2,351	psi
	Average Strength @ Break	36	N/mm	204	ppi	3,241	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				19.56	
Lo = 2.0" Break	Average Elongation @ Break	%				523.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	221.5	N			49.792	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.6	N			90.060	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	576.3	N			129.56	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

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ROLL # **429226-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.48** mm	**58** mil
	MAX:	**1.78** mm	**70** mil
Asperity GRI GM12: **34** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.60** mm	**63** mil

Thickness..... **1.5 mm** **60 mil**
Length..... **131.07** m **430.0** feet
Width..... **7.00** m; **23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS
Specific Gravity ASTM D792	Density	g/cc			**.946**
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**
Carbon Black Content ASTM D4218	Range	%			**2.31**
Carbon Black Dispersion ASTM D5596	Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**148** ppi	**2,351**	psi
	Average Strength @ Break	**36** N/mm	**204** ppi	**3,241**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%		**19.56**	
Lo = 2.0" Break	Average Elongation @ Break	%		**523.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**221.5** N		**49.792**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**400.6** N		**90.060**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**576.3** N		**129.56**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date:..... **7-18-06**

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ROLL # **429227-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.78	mm	70	mil
	AVE:	1.58	mm	62	mil

Thickness.....	1.5	mm	60	mil
Length.....	131.07	m	430.0	feet
Width.....	7.00	m;	23.0	feet

Asperity GRI GM12: **26** mil
ODD # : TOP EVEN #: BOTTOM

OIT(Standard) ASTM D3895 minutes **160**

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min				.26	
Carbon Black Content ASTM D4218	Range	%				2.31	
Carbon Black Dispersion ASTM D5596	Category					1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26	N/mm	146	ppi	2,351	psi
	Average Strength @ Break	35	N/mm	202	ppi	3,241	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				19.56	
Lo = 2.0" Break	Average Elongation @ Break	%				523.0	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	221.5	N			49.792	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.6	N			90.060	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	576.3	N			129.56	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature [signature]
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ROLL # **429228-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.46** mm	**57** mil
	MAX:	**1.80** mm	**71** mil
Asperity GRI GM12: **37** mil	AVE:	**1.61** mm	**63** mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

				TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc		**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range	%		**2.31**	
Carbon Black Dispersion ASTM D5596	Category			**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**149** ppi	**2,351**	psi
	Average Strength @ Break	**36** N/mm	**205** ppi	**3,241**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%		**19.56**	
	Average Elongation @ Break	%		**523.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%		**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**221.5** N		**49.792**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**400.6** N		**90.060**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**576.3** N		**129.56**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date:..... **7-18-06**

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ROLL # **429229-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.48	mm	58	mil
	MAX:	1.78	mm	70	mil
Asperity GRI GM12: 27 mil	AVE:	1.60	mm	63	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	1.5 mm	60 mil	
Length.....	131.07 m	430.0	feet
Width.....	7.00 m;	23.0	feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm	154 ppi	2,441	psi
	Average Strength @ Break	36	N/mm	206 ppi	3,263	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			17.81	
Lo = 2.0" Break	Average Elongation @ Break	%			544.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	221.5	N		49.792	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.6	N		90.060	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	576.3	N		129.56	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: 7-18-06

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ROLL # **429230-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.47** mm	**58** mil
	MAX:	**1.75** mm	**69** mil
Asperity GRI GM12: **36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.60** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**160**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.29**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27** N/mm	**154** ppi		**2,441**	psi
	Average Strength @ Break	**36** N/mm	**206** ppi		**3,263**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.81**	
	Average Elongation @ Break	%			**544.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**221.5** N			**49.792**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**400.6** N			**90.060**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**576.3** N			**129.56**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

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ROLL # **429231-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	1.52	mm	60	mil
	MAX:	1.71	mm	67	mil
Asperity GRI GM12: 28 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.60	mm	63	mil

Thickness.....	1.5 mm		60 mil
Length.....	131.07 m		430.0 feet
Width.....	7.00 m;		23.0 feet
OIT(Standard) ASTM D3895	minutes	160	

						TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g		g/10 min			.26	
Carbon Black Content ASTM D4218	Range		%			2.29	
Carbon Black Dispersion ASTM D5596	Category					1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27	N/mm	154	ppi	2,441	psi
	Average Strength @ Break	36	N/mm	206	ppi	3,263	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			17.81	
	Average Elongation @ Break		%			544.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	221.5	N			49.792	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.6	N			90.060	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	576.3	N			129.56	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

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ROLL # **429232-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.49 mm	59 mil
	MAX:	1.78 mm	70 mil
Asperity GRI GM12: 37 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.65 mm	65 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet
OIT(Standard) ASTM D3895 minutes	160	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	28 N/mm	159 ppi		2,441	psi
	Average Strength @ Break	37 N/mm	212 ppi		3,263	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			17.81	
	Average Elongation @ Break	%			544.8	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	221.5 N			49.792	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	400.6 N			90.060	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	576.3 N			129.56	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: 7-18-06

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ROLL # **429233-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.47**	mm	**58**	mil
	MAX:	**1.80**	mm	**71**	mil
Asperity GRI GM12: **26** mil	AVE:	**1.60**	mm	**63**	mil

ODD # : TOP EVEN #: BOTTOM

Thickness.....	**1.5**	**mm**	**60 mil**
Length.....	**131.07**	m	**430.0** feet
Width.....	**7.00**	m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.29**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27**	N/mm	**154** ppi	**2,441**	psi
	Average Strength @ Break	**36**	N/mm	**206** ppi	**3,263**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%			**17.81**	
Lo = 2.0" Break	Average Elongation @ Break	%			**544.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**221.5**	N		**49.792**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**400.6**	N		**90.060**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**576.3**	N		**129.56**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date:..... **7-18-06**

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ROLL # **429234-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.47 mm	58 mil
	MAX:	1.73 mm	68 mil
Asperity GRI GM12: 36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.34	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	25 N/mm	144 ppi		2,313	psi
	Average Strength @ Break	36 N/mm	204 ppi		3,287	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.46	
	Average Elongation @ Break	%			556.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	216.9 N			48.755	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	460.5 N			103.52	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	530.6 N			119.30	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: [signature]

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ROLL # **429235-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.50 mm	59 mil
	MAX:	1.69 mm	67 mil
Asperity GRI GM12: 28 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.59 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.34	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	25 N/mm	145 ppi		2,313	psi
	Average Strength @ Break	36 N/mm	206 ppi		3,287	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.46	
	Average Elongation @ Break	%			556.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	216.9 N			48.755	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	460.5 N			103.52	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	530.6 N			119.30	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: [signature]
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ROLL # **429236-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.48 mm	58 mil
	MAX:	1.75 mm	69 mil
Asperity GRI GM12: 30 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: 7002	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.34	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	25 N/mm	144 ppi		2,313	psi
	Average Strength @ Break	36 N/mm	204 ppi		3,287	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			19.46	
	Average Elongation @ Break	%			556.2	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	216.9 N			48.755	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	460.5 N			103.52	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	530.6 N			119.30	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: H Holmes

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ROLL # **429237-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.47** mm	**58** mil
	MAX:	**1.74** mm	**69** mil
Asperity GRI GM12: **27** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.59** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.34**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25** N/mm	**145** ppi		**2,313**	psi
	Average Strength @ Break	**36** N/mm	**206** ppi		**3,287**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**19.46**	
	Average Elongation @ Break	%			**556.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**216.9** N			**48.755**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**460.5** N			**103.52**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**530.6** N			**119.30**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-18-06**

Signature: _____

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ROLL # **429238-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.45** mm	**57** mil
	MAX:	**1.75** mm	**69** mil
Asperity GRI GM12: **35** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.59** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.34**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25** N/mm	**145** ppi		**2,313**	psi
	Average Strength @ Break	**36** N/mm	**206** ppi		**3,287**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**19.46**	
	Average Elongation @ Break	%			**556.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**216.9** N			**48.755**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**460.5** N			**103.52**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**530.6** N			**119.30**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature: [signature]

Quality Control Department

60HDmic.FRM
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12/23/05

agru

quality certificate

ROLL # **429239-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.44** mm	**57** mil
	MAX:	**1.69** mm	**67** mil
Asperity GRI GM12: **31** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.58** mm	**62** mil

Thickness..... **1.5 mm** **60 mil**
Length..... **131.07** m **430.0** feet
Width..... **7.00** m; **23.0** feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc		**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g		g/10 min		**.26**	
Carbon Black Content ASTM D4218	Range		%		**2.29**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm		**150** ppi	**2,409**	psi
	Average Strength @ Break	**34** N/mm		**193** ppi	**3,109**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.59**	
	Average Elongation @ Break	%			**508.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**216.9** N			**48.755**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**460.5** N			**103.52**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**530.6** N			**119.30**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date:..... **7-19-06**

Signature.....

Quality Control Department

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ROLL # **429340-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.50**	mm	**59**	mil
	MAX:	**1.68**	mm	**66**	mil
Asperity GRI GM12: **39** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.59**	mm	**63**	mil

Thickness.....	**1.5**	**mm**	**60 mil**
Length.....	**131.07**	m	**430.0** feet
Width.....	**7.00**	m;	**23.0** feet
OIT(Standard) ASTM D3895	minutes	**160**	

							TEST RESULTS	
Specific Gravity ASTM D792	Density		g/cc				**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g		g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range		%				**2.29**	
Carbon Black Dispersion ASTM D5596	Category						**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**151**	ppi		**2,409**	psi
	Average Strength @ Break	**34**	N/mm	**195**	ppi		**3,109**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%				**18.59**	
	Average Elongation @ Break		%				**508.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change		%				**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**216.9**	N				**48.755**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**460.5**	N				**103.52**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**530.6**	N				**119.30**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500	hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300	hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature: _____

Quality Control Department

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quality certificate

ROLL # **429341-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.74 mm	69 mil
Asperity GRI GM12: 33 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.61 mm	63 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	27 N/mm	153 ppi		2,409	psi
	Average Strength @ Break	35 N/mm	197 ppi		3,109	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.59	
	Average Elongation @ Break	%			508.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	216.9 N			48.755	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	460.5 N			103.52	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	530.6 N			119.30	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature: [signature]

Quality Control Department

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12/23/05

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quality certificate

ROLL # **429342-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	1.46 mm	57 mil
	MAX:	1.76 mm	69 mil
Asperity GRI GM12: 36 mil ODD # : TOP EVEN #: BOTTOM	AVE:	1.58 mm	62 mil

Thickness.....	1.5 mm	60 mil
Length.....	131.07 m	430.0 feet
Width.....	7.00 m;	23.0 feet

OIT(Standard) ASTM D3895 minutes **160**

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			.946	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			.26	
Carbon Black Content ASTM D4218	Range	%			2.29	
Carbon Black Dispersion ASTM D5596	Category				1	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	26 N/mm	150 ppi		2,409	psi
	Average Strength @ Break	34 N/mm	193 ppi		3,109	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			18.59	
	Average Elongation @ Break	%			508.3	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			-0.51	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	216.9 N			48.755	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	460.5 N			103.52	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	530.6 N			119.30	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			CERTIFIED	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature: H Holmes

Quality Control Department

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quality certificate

ROLL # **429343-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC		ENGLISH	
	MIN:	**1.48**	mm	**58**	mil
	MAX:	**1.72**	mm	**68**	mil
Asperity GRI GM12: **31** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.61**	mm	**63**	mil

Thickness.....	**1.5** mm	**60** mil	
Length.....	**131.07** m	**430.0** feet	
Width.....	**7.00** m;	**23.0** feet	
OIT(Standard) ASTM D3895 minutes	**160**		

						TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc				**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min				**.26**	
Carbon Black Content ASTM D4218	Range	%				**2.29**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**27**	N/mm	**153**	ppi	**2,409**	psi
	Average Strength @ Break	**35**	N/mm	**197**	ppi	**3,109**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield	Average Elongation @ Yield	%				**18.59**	
Lo = 2.0" Break	Average Elongation @ Break	%				**508.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%				**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**216.9**	N			**48.755**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**460.5**	N			**103.52**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**530.6**	N			**119.30**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature:

Quality Control Department

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ROLL # **429344-06** Lot #: **MM195247** **Liner Type: MICROSPIKE™ HDPE**

Measurement ASTM D5994 (Modified)		METRIC	ENGLISH
	MIN:	**1.52** mm	**60** mil
	MAX:	**1.73** mm	**68** mil
Asperity GRI GM12: **36** mil ODD # : TOP EVEN #: BOTTOM	AVE:	**1.60** mm	**63** mil

Thickness.....	**1.5 mm**	**60 mil**
Length.....	**131.07** m	**430.0** feet
Width.....	**7.00** m;	**23.0** feet
OIT(Standard) ASTM D3895 minutes	**160**	

					TEST RESULTS	
Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	g/10 min			**.26**	
Carbon Black Content ASTM D4218	Range	%			**2.29**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**147** ppi		**2,338**	psi
	Average Strength @ Break	**33** N/mm	**189** ppi		**3,005**	psi
Elongation ASTM D6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**19.13**	
	Average Elongation @ Break	%			**490.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional change	%			**-0.51**	
Tear Resistance ASTM D-1004 (Modified)	Average Tear Resistance	**231.0** N			**51.931**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**448.8** N			**100.90**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**596.0** N			**134.00**	lbs
ESCR ASTM D1693	Minimum Hrs w/o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Marshall Steam Station**
Destination **Terrell, NC.**

Date: **7-19-06**

Signature: M. Holmes

Quality Control Department

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PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04345

Your material number

Quality certificate

Repeat printout

Date
2006/05/24 16:39:01

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80099328 000010

Order number and item
26962 000010

Vehicule
CGLX 10308

Material : S-7002 PETROMONT HDPE-7002
Batch MM 195247 / Qty 88,180 KG 194,404 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.260	0.170	
Flow Index 190C 21.6kg	g/10mi	25.8	21.0	27.0
Density Annealed 15C/min	g/cc	0.9370	0.9365	0.9385
Pellet Count	#/g	27	20	35
Oxydative Induction Time	min	164	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

SUBMITTAL LETTER

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

SUBMITTAL NO.: 0015
SUBMITTAL DATE: 08/11/2006

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER:	4.0	SUBCONTRACTOR:	Hallaton, Inc.
SEQUENCE. NO.:	6	SUPPLIER:	
SUBMISSION TYPE:	A. Original Submission	MANUFACTURER:	

SUBMITTAL DESCRIPTION: Geomembrane Liner

ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
4.2		SD	Manufacturer's QC Certification-HDPE Liner-Smooth	

Miscellaneous Info:

Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/11/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- ☐ No Exception Taken
- ☒ Make Corrections Noted
- ☐ Amend and Resubmit
- ☐ Rejected - See Remarks

Roll Nos. 232240-06 and 232239-06
Do Not Meet Specifications - Delete Rolls from Shipment

Dan E. Brewer, P.E.
Engineer: Chas. H. Sells, Inc. Signed: Dan C Brewer Date: 8/18/06

SD=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

SUBMITTAL LETTER

SUBMITTAL NO.: 0015
SUBMITTAL DATE: 08/11/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER:	4.0	SUBCONTRACTOR:	Hallaton, Inc.
SEQUENCE. NO.:	6	SUPPLIER:	
SUBMISSION TYPE:	A. Original Submission	MANUFACTURER:	

SUBMITTAL DESCRIPTION: Geomembrane Liner

ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
4.2		SD	Manufacturer's QC Certification-HDPE Liner-Smooth	

Miscellaneous Info:

Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/11/2006

By: B. Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- ☐ **No Exception Taken**
- ☐ **Make Corrections Noted**
- ☐ **Amend and Resubmit**
- ☐ **Rejected - See Remarks**

Engineer: _____ **Signed:** _____ **Date:** _____

SD=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

microspike liner

HDPE

60 mil

Hallaton Duke Power Marshall Steam doc 7995

Terrell, NC

31 LONG rolls 60 HD micro	5	left
54 rolls 60 HD smooth	54	left
160 rolls 200mil geonet		
9 spools 5mm HD PETROMONT WELD ROD		

		METRIC DIMENSIONS							
roll #		width	length	area					
(P)231246	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	1	3019	MM195365
(P)231247	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	2	3019	MM195365
(P)231248	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	3	3030	MM195365
(P)231249	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	4	3024	MM195365
(P)231250	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	5	3027	MM195365
(P)231351	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	6		MM195365
(P)231352	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	7		MM195365
(P)231353	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	8		MM195365
(P)231354	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	9		MM195365
(P)231355	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	10		MM195365
(P)231356	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	11		MM195365
(P)231357	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	12		MM195365
(P)231358	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	13		MM195365
(P)231359	.06	6.86	133.5	915.8	Hallaton Duke Marshall	54tot	14		MM195365

agru america quality control dept

quality certificate

ROLL # **231246-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH		Thickness	1.5mm	60mil		
Thickness Measurement ASTM D5199 (Modified)	MIN:	1.473 mm	58	mil	Length	133.5	m	438	feet
	MAX:	1.741 mm	69	mil	Width	6.86	m	22.5	feet
	AVE:	1.569 mm	62	mil	OIT(Standard) ASTM D3895		minutes	143	

Specific Gravity ASTM D792		Density	g/cc			.946
MFI ASTM D1238 COND. E GRADE:	7002	Melt Flow Index 190°C /2160 g	- g /10 min			.22
Carbon Black Content ASTM D4218		Range	%			2.40
Carbon Black Dispersion ASTM D5596		Category				1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	26 N/mm	149 ppi	2,487	psi
		Average Strength @ Break	43 N/mm	247 ppi	4,119	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%		17.98	
		Average Elongation @ Break	%		773.8	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%		-0.20	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	220 N		49.522	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	448 N		100.66	lbs
Puncture Resistance ASTM D4833 (Modified)		Load	554 N		124.58	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		CERTIFIED	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		ONGOING	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-2-06**

Signature: _____

Quality Control Department

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REV 06
12/23/05

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quality certificate

ROLL # **231247-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.448** mm	**57** mil
	MAX:	**1.725** mm	**68** mil
	AVE:	**1.545** mm	**61** mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **143**

Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min				**.22**	
Carbon Black Content ASTM D4218	Range	%			**2.40**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26** N/mm	**149** ppi	**2,487** psi		
	Average Strength @ Break	**43** N/mm	**247** ppi	**4,119** psi		
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.98**	
	Average Elongation @ Break	%			**773.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.20**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**220** N		**49.522** lbs		
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**448** N		**100.66** lbs		
Puncture Resistance ASTM D4833 (Modified)	Load	**554** N		**124.58** lbs		
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**		

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-2-06**

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ROLL # **231248-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.478**	mm	**58**	mil
	MAX:	**1.788**	mm	**70**	mil
	AVE:	**1.543**	mm	**61**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 *minutes* **143**

Specific Gravity ASTM D792		Density		g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.22**	
Carbon Black Content ASTM D4218		Range		%			**2.40**	
Carbon Black Dispersion ASTM D5596		Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**149**	ppi	**2,487**	psi
		Average Strength @ Break	**43**	N/mm	**247**	ppi	**4,119**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.98**	
		Average Elongation @ Break		%			**773.8**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.20**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**220** N			**49.522**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**448** N			**100.66**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**554** N			**124.58**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231249-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.448**	mm	**57**	mil
	MAX:	**1.824**	mm	**72**	mil
	AVE:	**1.572**	mm	**62**	mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **143**

Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.22**	
Carbon Black Content ASTM D4218	Range	%			**2.40**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**149** ppi	**2,487**	psi
	Average Strength @ Break	**43**	N/mm	**247** ppi	**4,119**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.98**	
	Average Elongation @ Break	%			**773.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.20**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**220**	N		**49.522**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**448**	N		**100.66**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**554**	N		**124.58**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
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ROLL # **231250-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH	Thickness	**1.5mm**	**60mil**		
	MIN:	**1.473** mm	**58** mil	Length	**133.5**	m	**438**	feet
	MAX:	**1.767** mm	**70** mil	Width	**6.86**	m	**22.5**	feet
	AVE:	**1.547** mm	**61** mil	OIT(Standard) ASTM D3895		minutes	**143**	

Specific Gravity ASTM D792		Density	g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.22**
Carbon Black Content ASTM D4218		Range	%			**2.40**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25** N/mm	**144** ppi	**2,401**	psi
		Average Strength @ Break	**44** N/mm	**249** ppi	**4,144**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%		**17.63**	
		Average Elongation @ Break	%		**805.8**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%		**-0.20**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**220** N		**49.522**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**448** N		**100.66**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**554** N		**124.58**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231351-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH		Thickness	1.5mm	60mil	
	MIN:	1.447 mm	57 mil		Length	133.5 m	438	feet
	MAX:	1.695 mm	67 mil		Width	6.86 m	22.5	feet
	AVE:	1.54 mm	61 mil		OIT(Standard) ASTM D3895		minutes	143

Specific Gravity ASTM D792		Density	g/cc		.946
MFI ASTM D1238 COND. E GRADE:	7002	Melt Flow Index 190°C /2160 g	- g /10 min		.22
Carbon Black Content ASTM D4218		Range	%		2.40
Carbon Black Dispersion ASTM D5596		Category			1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	25 N/mm	144 ppi	2,401 psi
		Average Strength @ Break	44 N/mm	249 ppi	4,144 psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%		17.63
		Average Elongation @ Break	%		805.8
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%		-0.20
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	220 N		49.522 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	448 N		100.66 lbs
Puncture Resistance ASTM D4833 (Modified)		Load	554 N		124.58 lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		CERTIFIED
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		ONGOING

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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Date: **8-2-06**

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ROLL # **231352-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.457** mm	**57**	mil
	MAX:	**1.778** mm	**70**	mil
	AVE:	**1.573** mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**143**	

Specific Gravity ASTM D792		Density		g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.22**
Carbon Black Content ASTM D4218		Range		%			**2.40**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**144**	ppi	**2,401** psi
		Average Strength @ Break	**44**	N/mm	**249**	ppi	**4,144** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.63**
		Average Elongation @ Break		%			**805.8**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.20**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**220**	N			**49.522** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**448**	N			**100.66** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**554**	N			**124.58** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
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ROLL # **231353-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.462**	mm	**58**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.808**	mm	**71**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.597**	mm	**63**	mil	OIT(Standard) ASTM D3895	minutes	**143**

Specific Gravity ASTM D792	Density	g/cc				**.946**
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.22**
Carbon Black Content ASTM D4218	Range	%				**2.40**
Carbon Black Dispersion ASTM D5596	Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield		**25**	N/mm	**144** ppi	**2,401** psi
	Average Strength @ Break		**44**	N/mm	**249** ppi	**4,144** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.63**
	Average Elongation @ Break	%				**805.8**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.20**
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**220**	N		**49.522** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**448**	N		**100.66** lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**554**	N		**124.58** lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231354-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH			
	MIN:	**1.477**	mm	**58**	mil		
	MAX:	**1.757**	mm	**69**	mil		
	AVE:	**1.573**	mm	**62**	mil		

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **143**

Specific Gravity ASTM D792	Density	g/cc				**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min					**.22**	
Carbon Black Content ASTM D4218	Range	%				**2.40**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield		**25**	N/mm	**144** ppi	**2,401**	psi
	Average Strength @ Break		**44**	N/mm	**249** ppi	**4,144**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.63**	
	Average Elongation @ Break	%				**805.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.20**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**220**	N		**49.522**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**448**	N		**100.66**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**554**	N		**124.58**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231355-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.455** mm	**57** mil
	MAX:	**1.729** mm	**68** mil
	AVE:	**1.557** mm	**61** mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **143**

Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.22**	
Carbon Black Content ASTM D4218	Range	%			**2.19**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25** N/mm	**141** ppi		**2,357**	psi
	Average Strength @ Break	**46** N/mm	**265** ppi		**4,418**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.27**	
	Average Elongation @ Break	%			**851.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.20**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**221** N			**49.724**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**416** N			**93.48**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**571** N			**128.46**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231356-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.447** mm	**57** mil
	MAX:	**1.717** mm	**68** mil
	AVE:	**1.573** mm	**62** mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 *minutes* **143**

Specific Gravity ASTM D792	Density	g/cc			**.946**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.22**	
Carbon Black Content ASTM D4218	Range	%			**2.19**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25** N/mm	**141** ppi	**2,357** psi		
	Average Strength @ Break	**46** N/mm	**265** ppi	**4,418** psi		
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.27**	
	Average Elongation @ Break	%			**851.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.20**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**221** N		**49.724** lbs		
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**416** N		**93.48** lbs		
Puncture Resistance ASTM D4833 (Modified)	Load	**571** N		**128.46** lbs		
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**		
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs		**ONGOING**		

Customer: **Hallaton, inc.**
PO: **P6209 Duke Power Marshall Steam Station**
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ROLL # **231357-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.45**	mm	**57**	mil
	MAX:	**1.701**	mm	**67**	mil
	AVE:	**1.549**	mm	**61**	mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**143**	

Specific Gravity ASTM D792		Density		g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.22**
Carbon Black Content ASTM D4218		Range		%			**2.19**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,357** psi
		Average Strength @ Break	**46**	N/mm	**265**	ppi	**4,418** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.27**
		Average Elongation @ Break		%			**851.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.20**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**221** N			**49.724** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**416** N			**93.48** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**571** N			**128.46** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-2-06**

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ROLL # **231358-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.459**	mm	**57**	mil
	MAX:	**1.755**	mm	**69**	mil
	AVE:	**1.569**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **143**

Specific Gravity ASTM D792		Density		g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.22**
Carbon Black Content ASTM D4218		Range		%			**2.19**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,357** psi
		Average Strength @ Break	**46**	N/mm	**265**	ppi	**4,418** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.27**
		Average Elongation @ Break		%			**851.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.20**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**221**	N			**49.724** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**416**	N			**93.48** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**571**	N			**128.46** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-2-06**

Signature: .....

Quality Control Department

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ROLL # **231359-06** Lot # **MM195365** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.448**	mm	**57**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.803**	mm	**71**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.583**	mm	**62**	mil	OIT(Standard) ASTM D3895	minutes	**143**

Specific Gravity ASTM D792		Density		g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.22**
Carbon Black Content ASTM D4218		Range		%			**2.19**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,357** psi
		Average Strength @ Break	**46**	N/mm	**265**	ppi	**4,418** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.27**
		Average Elongation @ Break		%			**851.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.20**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**221** N			**49.724** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**416** N			**93.48** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**571** N			**128.46** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-2-06**

Signature: [signature]

Quality Control Department

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PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04373

Your material number

Quality certificate

Repeat printout

Date
2006/06/22 16:13:22

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80100555 000010

Order number and item
27402 000010

Vehicule
UNPX 122628

Material : S-7002 PETROMONT HDPE-7002
Batch MM 195365 / Qty 85,820 KG 189,201 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.220	0.170	
Flow Index 190C 21.6kg	g/10mi	23.9	21.0	27.0
Density Annealed 15C/min	g/cc	0.9365	0.9365	0.9385
Pellet Count	#/g	28	20	35
Oxydative Induction Time	min	162	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

microspike liner

HDPE

60 mil

Hallaton Duke Power Marshall Steam doc 7995

Terrell, NC

31 LONG rolls 60 HD micro	5	left
54 rolls 60 HD smooth	54	left
160 rolls 200mil geonet		
9 spools 5mm HD PETROMONT WELD ROD		

roll #		METRIC DIMENSIONS width	length	area							
(P)232101	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	15	3085	MM195368
(P)232102	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	16	3090	2 ft MM195368
(P)232103	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	17	3093	MM195368
(P)232104	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	18	3090	MM195368
(P)232105	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	19	3093	MM195368
(P)232106	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	20	3090	MM195368
(P)232107	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	21	3113	MM195368
(P)232108	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	22	3111	MM195368
(P)232109	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	23	3106	MM195368
(P)232110	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	24	3103	MM195368
(P)232111	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	25	3106	MM195368
(P)232112	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	26	3106	MM195368
(P)232113	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	27	3106	MM195368
(P)232114	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	28	3105	MM195368
(P)232115	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	29	3111	MM195368
(P)232116	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	30	3110	MM195368
(P)232117	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	31	3109	2FT MM195368
(P)232118	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	32	3112	MM195368
(P)232119	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	33	3109	MM195368
(P)232120	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	34	3112	MM195368
(P)232121	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	35	3107	MM195368
(P)232122	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	36	3107	MM195368
(P)232123	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	37	3116	MM195368
(P)232224	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	38		MM195368
(P)232225	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	39		MM195368
(P)232226	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	40		MM195368
(P)232227	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	41		MM195368
(P)232228	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	42		MM195368

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04373

Your material number

Quality certificate

Repeat printout

Date
2006/06/29 10:46:18

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80100846 000010

Order number and item
27404 000010

Vehicule
UNPX 123962

Material : S-7002 PETROMONT HDPE-7002
Batch MM 195368 / Qty 88,320 KG 194,712 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.238	0.170	
Flow Index 190C 21.6kg	g/10mi	24.5	21.0	27.0
Density Annealed 15C/min	g/cc	0.9371	0.9365	0.9385
Pellet Count	#/g	26	20	35
Oxydative Induction Time	min	162	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

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Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

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ROLL # **232101-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.468**	mm	**58**	mil
	MAX:	**1.672**	mm	**66**	mil
	AVE:	**1.569**	mm	**62**	mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc				**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%				**2.30**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**142**	ppi	**2,374**	psi
	Average Strength @ Break	**44**	N/mm	**251**	ppi	**4,191**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.23**	
	Average Elongation @ Break	%				**811.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**218**	N			**49.059**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**413**	N			**92.786**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**591**	N			**132.84**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: _____

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ROLL # **232102-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.484**	mm	**58**	mil
	MAX:	**1.756**	mm	**69**	mil
	AVE:	**1.602**	mm	**63**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.30**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**142**	ppi	**2,374** psi
		Average Strength @ Break	**44**	N/mm	**251**	ppi	**4,191** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.23**
		Average Elongation @ Break		%			**811.7**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**218**	N			**49.059** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**413**	N			**92.786** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**591**	N			**132.84** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: _____

Quality Control Department

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ROLL # **232103-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.5**	mm	**59**	mil
	MAX:	**1.737**	mm	**68**	mil
	AVE:	**1.597**	mm	**63**	mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc				**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%				**2.30**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**142**	ppi	**2,374**	psi
	Average Strength @ Break	**44**	N/mm	**251**	ppi	**4,191**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.23**	
	Average Elongation @ Break	%				**811.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**218**	N			**49.059**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**413**	N			**92.786**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**591**	N			**132.84**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: .....

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ROLL # **232104-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.475**	mm	**58**	mil
	MAX:	**1.71**	mm	**67**	mil
	AVE:	**1.574**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range		%			**2.26**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**147**	ppi	**2,443**	psi
	Average Strength @ Break	**44**	N/mm	**252**	ppi	**4,195**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			**17.40**	
	Average Elongation @ Break		%			**806.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**218**	N		**49.059**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**413**	N		**92.786**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**591**	N		**132.84**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: .....

Quality Control Department

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ROLL # **232105-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.45**	mm	**57**	mil
	MAX:	**1.724**	mm	**68**	mil
	AVE:	**1.555**	mm	**61**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.26**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**147** ppi	**2,443**	psi
	Average Strength @ Break	**44**	N/mm	**252** ppi	**4,195**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.40**	
	Average Elongation @ Break	%			**806.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**218**	N		**49.059**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**413**	N		**92.786**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**591**	N		**132.84**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: .....

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ROLL # **232106-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.45**	mm	**57**	mil
	MAX:	**1.81**	mm	**71**	mil
	AVE:	**1.608**	mm	**63**	mil

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.26**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**147**	ppi	**2,443** psi
		Average Strength @ Break	**44**	N/mm	**252**	ppi	**4,195** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.40**
		Average Elongation @ Break		%			**806.9**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**218** N			**49.059** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**413** N			**92.786** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**591** N			**132.84** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: _____

Quality Control Department

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ROLL # **232107-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.485**	mm	**58**	mil
	MAX:	**1.77**	mm	**70**	mil
	AVE:	**1.589**	mm	**63**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.26**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**147**	ppi	**2,443** psi
		Average Strength @ Break	**44**	N/mm	**252**	ppi	**4,195** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.40**
		Average Elongation @ Break		%			**806.9**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**218** N			**49.059** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**413** N			**92.786** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**591** N			**132.84** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: _____

Quality Control Department

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ROLL # **232108-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.479**	mm	**58**	mil
	MAX:	**1.738**	mm	**68**	mil
	AVE:	**1.593**	mm	**63**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range		%			**2.26**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**147**	ppi	**2,443**	psi
	Average Strength @ Break	**44**	N/mm	**252**	ppi	**4,195**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			**17.40**	
	Average Elongation @ Break		%			**806.9**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**218**	N		**49.059**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**413**	N		**92.786**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**591**	N		**132.84**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: .....

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ROLL # **232109-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.489** mm	**59** mil
	MAX:	**1.714** mm	**67** mil
	AVE:	**1.577** mm	**62** mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218	Range		%			**2.27**
Carbon Black Dispersion ASTM D5596	Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,354** psi
	Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,209** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			**17.37**
	Average Elongation @ Break		%			**843.5**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**230**	N			**51.752** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**401**	N			**90.176** lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**610**	N			**137.16** lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: M. Holmes

Quality Control Department

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ROLL # **232110-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.457**	mm	**57**	mil
	MAX:	**1.789**	mm	**70**	mil
	AVE:	**1.589**	mm	**63**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.27**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,354** psi
		Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,209** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.37**
		Average Elongation @ Break		%			**843.5**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**230**	N			**51.752** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**401**	N			**90.176** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**610**	N			**137.16** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: _____

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ROLL # **232111-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.464**	mm	**58**	mil
	MAX:	**1.719**	mm	**68**	mil
	AVE:	**1.577**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**		
Length	**133.5**	m	**438**	feet	
Width	**6.86**	m	**22.5**	feet	

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc				**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%				**2.27**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,354**	psi
	Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,209**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.37**	
	Average Elongation @ Break	%				**843.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**230**	N			**51.752**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**401**	N			**90.176**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**610**	N			**137.16**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-7-06**

Signature: D. Palmer

Quality Control Department

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ROLL # **232112-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.505**	mm	**59**	mil
	MAX:	**1.74**	mm	**69**	mil
	AVE:	**1.578**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.27**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**141**	ppi	**2,354** psi
		Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,209** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.37**
		Average Elongation @ Break		%			**843.5**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**230** N			**51.752** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**401** N			**90.176** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**610** N			**137.16** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232113-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.47**	mm	**58**	mil
	MAX:	**1.74**	mm	**69**	mil
	AVE:	**1.58**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.27**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**141** ppi	**2,354**	psi
	Average Strength @ Break	**44**	N/mm	**253** ppi	**4,209**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.37**	
	Average Elongation @ Break	%			**843.5**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**230** N		**51.752**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**401** N		**90.176**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**610** N		**137.16**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232114-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH				
	MIN:	**1.508** mm	**59** mil	Thickness	**1.5mm**	**60mil**	
	MAX:	**1.718** mm	**68** mil	Length	**133.5** m	**438** feet	
	AVE:	**1.589** mm	**63** mil	Width	**6.86** m	**22.5** feet	
				OIT(Standard) ASTM D3895	minutes	**125**	

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.28**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25** N/mm	**144** ppi		**2,394** psi
		Average Strength @ Break	**46** N/mm	**261** ppi		**4,350** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**18.06**
		Average Elongation @ Break	%			**848.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**230** N		**51.752** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**401** N		**90.176** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**610** N		**137.16** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs			**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232115-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH			
	MIN:	**1.491**	mm	**59**	mil		
	MAX:	**1.73**	mm	**68**	mil		
	AVE:	**1.568**	mm	**62**	mil		

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.28**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield		**25** N/mm	**144** ppi	**2,394**	psi
		Average Strength @ Break		**46** N/mm	**261** ppi	**4,350**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.06**
		Average Elongation @ Break		%			**848.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**230** N		**51.752**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**401** N		**90.176**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**610** N		**137.16**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232116-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH		Thickness	**1.5mm**	**60mil**	
	MIN:	**1.504** mm	**59** mil		Length	**133.5** m	**438** feet	
	MAX:	**1.744** mm	**69** mil		Width	**6.86** m	**22.5** feet	
	AVE:	**1.585** mm	**62** mil		OIT(Standard) ASTM D3895	minutes	**125**	
Specific Gravity ASTM D792		Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.24**	
Carbon Black Content ASTM D4218		Range		%			**2.28**	
Carbon Black Dispersion ASTM D5596		Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**144**	ppi	**2,394**	psi
		Average Strength @ Break	**46**	N/mm	**261**	ppi	**4,350**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.06**	
		Average Elongation @ Break		%			**848.2**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**230** N			**51.752**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**401** N			**90.176**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**610** N			**137.16**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232117-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.455**	mm	**57**	mil
	MAX:	**1.797**	mm	**71**	mil
	AVE:	**1.581**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.28**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**144** ppi	**2,394**	psi
	Average Strength @ Break	**46**	N/mm	**261** ppi	**4,350**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**18.06**	
	Average Elongation @ Break	%			**848.2**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**230**	N		**51.752**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**401**	N		**90.176**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**610**	N		**137.16**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232118-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC	ENGLISH
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.474** mm	**58** mil
	MAX:	**1.815** mm	**71** mil
	AVE:	**1.607** mm	**63** mil

Thickness	**1.5mm**		**60mil**
Length	**133.5**	m	**438** feet
Width	**6.86**	m	**22.5** feet
OIT(Standard) ASTM D3895		minutes	**125**

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.28**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**144**	ppi	**2,394** psi
		Average Strength @ Break	**46**	N/mm	**261**	ppi	**4,350** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**18.06**
		Average Elongation @ Break		%			**848.2**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**230** N			**51.752** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**401** N			**90.176** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**610** N			**137.16** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: .....

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ROLL # **232119-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.49**	mm	**59**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.8**	mm	**71**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.618**	mm	**64**	mil	OIT(Standard) ASTM D3895	minutes	**125**

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.32**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26** N/mm	**148** ppi	**2,473** psi	
		Average Strength @ Break	**44** N/mm	**253** ppi	**4,213** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.75**
		Average Elongation @ Break	%			**796.7**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**226** N		**50.825** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**459** N		**103.16** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**578** N		**130.01** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: .....

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ROLL # **232120-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.505**	mm	**59**	mil
	MAX:	**1.73**	mm	**68**	mil
	AVE:	**1.6**	mm	**63**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.32**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**148** ppi	**2,473**	psi
	Average Strength @ Break	**44**	N/mm	**253** ppi	**4,213**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.75**	
	Average Elongation @ Break	%			**796.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**226**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**459**	N		**103.16**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**578**	N		**130.01**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: M. Holmes

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ROLL # **232121-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.468**	mm	**58**	mil
	MAX:	**1.72**	mm	**68**	mil
	AVE:	**1.578**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.32**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**148** ppi	**2,473**	psi
	Average Strength @ Break	**44**	N/mm	**253** ppi	**4,213**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.75**	
	Average Elongation @ Break	%			**796.7**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**226**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**459**	N		**103.16**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**578**	N		**130.01**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

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ROLL # **232122-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.475**	mm	**58**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.74**	mm	**69**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.595**	mm	**63**	mil	OIT(Standard) ASTM D3895	minutes	**125**

Specific Gravity ASTM D792		Density	g/cc				**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g - g /10 min					**.24**
Carbon Black Content ASTM D4218		Range	%				**2.32**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**148**	ppi	**2,473** psi
		Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,213** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%				**17.75**
		Average Elongation @ Break	%				**796.7**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%				**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**226**	N			**50.825** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**459**	N			**103.16** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**578**	N			**130.01** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232123-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.466**	mm	**58**	mil
	MAX:	**1.696**	mm	**67**	mil
	AVE:	**1.574**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.32**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**148**	ppi	**2,473** psi
		Average Strength @ Break	**44**	N/mm	**253**	ppi	**4,213** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.75**
		Average Elongation @ Break		%			**796.7**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**226** N			**50.825** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**459** N			**103.16** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**578** N			**130.01** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232224-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.46**	mm	**57**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.808**	mm	**71**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.6**	mm	**63**	mil	OIT(Standard) ASTM D3895	minutes	**125**

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.32**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26** N/mm	**149** ppi	**2,477** psi	
		Average Strength @ Break	**45** N/mm	**255** ppi	**4,256** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.73**
		Average Elongation @ Break	%			**825.0**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**226** N		**50.825** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**459** N		**103.16** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**578** N		**130.01** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: M. Holmes

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ROLL # **232225-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.48**	mm	**58**	mil
	MAX:	**1.72**	mm	**68**	mil
	AVE:	**1.587**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc				**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min					**.24**	
Carbon Black Content ASTM D4218	Range	%				**2.32**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**149**	ppi	**2,477**	psi
	Average Strength @ Break	**45**	N/mm	**255**	ppi	**4,256**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.73**	
	Average Elongation @ Break	%				**825.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**226**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**459**	N		**103.16**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**578**	N		**130.01**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: M. Holmes

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ROLL # **232226-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.501**	mm	**59**	mil
	MAX:	**1.701**	mm	**67**	mil
	AVE:	**1.58**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc				**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%				**2.32**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**149**	ppi	**2,477**	psi
	Average Strength @ Break	**45**	N/mm	**255**	ppi	**4,256**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.73**	
	Average Elongation @ Break	%				**825.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**226**	N			**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**459**	N			**103.16**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**578**	N			**130.01**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: [signature]

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ROLL # **232227-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH				
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.49**	mm	**59**	mil	Thickness	**1.5mm**	**60mil**
	MAX:	**1.72**	mm	**68**	mil	Length	**133.5** m	**438** feet
	AVE:	**1.583**	mm	**62**	mil	Width	**6.86** m	**22.5** feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.32**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26** N/mm	**149** ppi	**2,477** psi	
		Average Strength @ Break	**45** N/mm	**255** ppi	**4,256** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.73**
		Average Elongation @ Break	%			**825.0**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**226** N		**50.825** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**459** N		**103.16** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**578** N		**130.01** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232228-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH			
	MIN:	**1.495**	mm	**59**	mil		
	MAX:	**1.76**	mm	**69**	mil		
	AVE:	**1.592**	mm	**63**	mil		

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792	Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**	
Carbon Black Content ASTM D4218	Range		%			**2.32**	
Carbon Black Dispersion ASTM D5596	Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**149**	ppi	**2,477**	psi
	Average Strength @ Break	**45**	N/mm	**255**	ppi	**4,256**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield		%			**17.73**	
	Average Elongation @ Break		%			**825.0**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**226**	N		**50.825**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**459**	N		**103.16**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**578**	N		**130.01**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: M. Holmes

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microspike liner

HDPE

60 mil

Hallaton Duke Power Marshall Steam doc 7995

Terrell, NC

31 LONG rolls 60 HD micro	5	left
54 rolls 60 HD smooth	26	left
160 rolls 200mil geonet		
9 spools 5mm HD PETROMONT WELD ROD		

		METRIC DIMENSIONS										
roll #		width	length	area								
(P)232229	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	43	3114		MM195368
(P)232230	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	44	3110		MM195368
(P)232231	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	45	3108		MM195368
(P)232232	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	46	3111	2FT	MM195368
(P)232233	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	47	3110		MM195368
(P)232234	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	48	3106		MM195368
(P)232235	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	49	3105		MM195368
(P)232236	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	50	3099		MM195368
(P)232237	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	51	3101		MM195368
(P)232238	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	52	3102		MM195368
(P)232239	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	53	3128		MM195368
(P)232240	.06	6.86	133.5	915.8	RELEASED	60HD	smooth	54tot	54	3123		MM195368

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ROLL # **232229-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.508**	mm	**59**	mil	Length	**133.5**	m	**438**	feet
	MAX:	**1.72**	mm	**68**	mil	Width	**6.86**	m	**22.5**	feet
	AVE:	**1.599**	mm	**63**	mil	OIT(Standard) ASTM D3895	*minutes*	**125**		

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.27**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26** N/mm	**148** ppi	**2,466** psi	
		Average Strength @ Break	**45** N/mm	**255** ppi	**4,245** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.87**
		Average Elongation @ Break	%			**819.8**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**223** N		**50.031** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**414** N		**93.026** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**614** N		**137.95** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: *[signature]*
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ROLL # **232230-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.46**	mm	**57**	mil
	MAX:	**1.667**	mm	**66**	mil
	AVE:	**1.554**	mm	**61**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 minutes **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.27**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**26**	N/mm	**148** ppi	**2,466**	psi
	Average Strength @ Break	**45**	N/mm	**255** ppi	**4,245**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.87**	
	Average Elongation @ Break	%			**819.8**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**223**	N		**50.031**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**414**	N		**93.026**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**614**	N		**137.95**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232231-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.47**	mm	**58**	mil
	MAX:	**1.745**	mm	**69**	mil
	AVE:	**1.574**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895	*minutes*		**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.27**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**148**	ppi	**2,466** psi
		Average Strength @ Break	**45**	N/mm	**255**	ppi	**4,245** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.87**
		Average Elongation @ Break		%			**819.8**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**223**	N			**50.031** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**414**	N			**93.026** lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**614**	N			**137.95** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232232-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH		Thickness	**1.5mm**	**60mil**	
	MIN:	**1.477** mm	**58** mil		Length	**133.5** m	**438** feet	
	MAX:	**1.688** mm	**66** mil		Width	**6.86** m	**22.5** feet	
	AVE:	**1.575** mm	**62** mil		OIT(Standard) ASTM D3895	minutes	**125**	

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.27**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26** N/mm	**148** ppi	**2,466** psi	
		Average Strength @ Break	**45** N/mm	**255** ppi	**4,245** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.87**
		Average Elongation @ Break	%			**819.8**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**223** N		**50.031** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**414** N		**93.026** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**614** N		**137.95** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232233-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.474**	mm	**58**	mil
	MAX:	**1.754**	mm	**69**	mil
	AVE:	**1.567**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.27**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**148**	ppi	**2,466** psi
		Average Strength @ Break	**45**	N/mm	**255**	ppi	**4,245** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.87**
		Average Elongation @ Break		%			**819.8**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**223** N			**50.031** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**414** N			**93.026** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**614** N			**137.95** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232234-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC	ENGLISH		Thickness	**1.5mm**	**60mil**	
	MIN:	**1.497** mm	**59** mil		Length	**133.5** m	**438** feet	
	MAX:	**1.702** mm	**67** mil		Width	**6.86** m	**22.5** feet	
	AVE:	**1.575** mm	**62** mil		OIT(Standard) ASTM D3895	minutes	**125**	
Specific Gravity ASTM D792		Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g		- g /10 min			**.24**	
Carbon Black Content ASTM D4218		Range		%			**2.30**	
Carbon Black Dispersion ASTM D5596		Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield		**25** N/mm		**145** ppi	**2,414** psi	
		Average Strength @ Break		**43** N/mm		**246** ppi	**4,107** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.70**	
		Average Elongation @ Break		%			**818.3**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance			**223** N		**50.031** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load			**414** N		**93.026** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load			**614** N		**137.95** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures		1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%		300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

Signature: _____

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ROLL # **232235-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.458**	mm	**57**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.727**	mm	**68**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.579**	mm	**62**	mil	OIT(Standard) ASTM D3895	*minutes*	**125**

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.30**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25** N/mm	**145** ppi	**2,414** psi	
		Average Strength @ Break	**43** N/mm	**246** ppi	**4,107** psi	
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%			**17.70**
		Average Elongation @ Break	%			**818.3**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**223** N		**50.031** lbs	
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**414** N		**93.026** lbs	
Puncture Resistance ASTM D4833 (Modified)		Load	**614** N		**137.95** lbs	
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-8-06**

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ROLL # **232236-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.478**	mm	**58**	mil
	MAX:	**1.713**	mm	**67**	mil
	AVE:	**1.569**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density	g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	- g /10 min			**.24**
Carbon Black Content ASTM D4218		Range	%			**2.30**
Carbon Black Dispersion ASTM D5596		Category				**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25** N/mm	**145** ppi	**2,414**	psi
		Average Strength @ Break	**43** N/mm	**246** ppi	**4,107**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield	%		**17.70**	
		Average Elongation @ Break	%		**818.3**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change	%		**-0.31**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	**223** N		**50.031**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	**414** N		**93.026**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load	**614** N		**137.95**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs		**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs		**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-9-06**

Signature: *[signature]*
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ROLL # **232237-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.503** mm	**59**	mil	
	MAX:	**1.768** mm	**70**	mil	
	AVE:	**1.592** mm	**63**	mil	

Thickness	**1.5mm**	**60mil**		
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 *minutes* **125**

Specific Gravity ASTM D792		Density		g/cc			**.947**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**
Carbon Black Content ASTM D4218		Range		%			**2.30**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**25**	N/mm	**145**	ppi	**2,414** psi
		Average Strength @ Break	**43**	N/mm	**246**	ppi	**4,107** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.70**
		Average Elongation @ Break		%			**818.3**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**223** N			**50.031** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**414** N			**93.026** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**614** N			**137.95** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-9-06**

Signature: .....

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ROLL # **232238-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.5**	mm	**59**	mil
	MAX:	**1.707**	mm	**67**	mil
	AVE:	**1.58**	mm	**62**	mil

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet

OIT(Standard) ASTM D3895 *minutes* **125**

Specific Gravity ASTM D792	Density	g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g - g /10 min				**.24**	
Carbon Black Content ASTM D4218	Range	%			**2.30**	
Carbon Black Dispersion ASTM D5596	Category				**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield	**25**	N/mm	**145** ppi	**2,414**	psi
	Average Strength @ Break	**43**	N/mm	**246** ppi	**4,107**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%			**17.70**	
	Average Elongation @ Break	%			**818.3**	
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance	**223**	N		**50.031**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load	**414**	N		**93.026**	lbs
Puncture Resistance ASTM D4833 (Modified)	Load	**614**	N		**137.95**	lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-9-06**

Signature: .....

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ROLL # **232239-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH			
	MIN:	**1.453**	mm	**57**	mil		
	MAX:	**1.706**	mm	**67**	mil		
	AVE:	**1.579**	mm	**62**	mil		

Thickness	**1.5mm**		**60mil**	
Length	**133.5**	m	**438**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**125**	

Specific Gravity ASTM D792		Density		g/cc			**.947**	
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.24**	
Carbon Black Content ASTM D4218		Range		%			**2.17**	
Carbon Black Dispersion ASTM D5596		Category					**1**	
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield		**26** N/mm		**149** ppi	**2,484**	psi
		Average Strength @ Break		**45** N/mm		**258** ppi	**4,308**	psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break		Average Elongation @ Yield		%			**17.56**	
		Average Elongation @ Break		%			**845.0**	
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.31**	
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance			**227** N		**50.990**	lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load			**397** N		**89.353**	lbs
Puncture Resistance ASTM D4833 (Modified)		Load			**593** N		**133.29**	lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures		1500 hrs			**CERTIFIED**	
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%		300 hrs			**ONGOING**	

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-9-06**

Signature: .....

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ROLL # **232240-06** Lot # **MM195368** **Liner Type:SMOOTH HDPE**

Thickness Measurement ASTM D5199 (Modified)		METRIC		ENGLISH		Thickness	**1.5mm**	**60mil**
	MIN:	**1.499**	mm	**59**	mil	Length	**133.5** m	**438** feet
	MAX:	**1.72**	mm	**68**	mil	Width	**6.86** m	**22.5** feet
	AVE:	**1.581**	mm	**62**	mil	OIT(Standard) ASTM D3895	minutes	**125**

Specific Gravity ASTM D792	Density	g/cc				**.947**
MFI ASTM D1238 COND. E GRADE: **7002**	Melt Flow Index 190°C /2160 g	- g /10 min				**.24**
Carbon Black Content ASTM D4218	Range	%				**2.17**
Carbon Black Dispersion ASTM D5596	Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)	Average Strength @ Yield		**26**	N/mm	**149** ppi	**2,484** psi
	Average Strength @ Break		**45**	N/mm	**258** ppi	**4,308** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield Lo = 2.0" Break	Average Elongation @ Yield	%				**17.56**
	Average Elongation @ Break	%				**845.0**
Dimensional Stability ASTM D1204 (Modified)	Average Dimensional Change	%				**-0.31**
Tear Resistance ASTM D1004 (Modified)	Average Tear Resistance		**227**	N		**50.990** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)	Load		**397**	N		**89.353** lbs
Puncture Resistance ASTM D4833 (Modified)	Load		**593**	N		**133.29** lbs
ESCR ASTM D1693	Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397	pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6209 Duke Power Marshall Steam Station**
Destination **Terrell, NC**

Date: **8-9-06**

Signature: _____

Quality Control Department

60HDSM.FRM
REV 06
12/23/05

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04373

Your material number

Quality certificate

Repeat printout

Date
2006/06/29 10:46:18

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80100846 000010

Order number and item
27404 000010

Vehicule
UNPX 123962

Material : S-7002 PETROMONT HDPE-7002
Batch MM 195368 / Qty 88,320 KG 194,712 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.238	0.170	
Flow Index 190C 21.6kg	g/10mi	24.5	21.0	27.0
Density Annealed 15C/min	g/cc	0.9371	0.9365	0.9385
Pellet Count	#/g	26	20	35
Oxydative Induction Time	min	162	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

Dan Brewer

From: Grant Palmer [gp-agru@sc.rr.com]
Sent: Friday, September 01, 2006 10:03 AM
To: CHAS H SELLS Dan Brewer
Cc: HALLATON Scott Brinkerhoff; HALLATON Kennedy Garber
Subject: retest result for Marshall Steam roll 232239-06
Importance: High

Scott / Dan,

attached is Agru's retest for the ASTM D4833 Puncture Resistance.

ASTM D4833 was the method listed in the specifications.

This was done at Dan Brewer's request, to re-qualify rolls 232239-06 & 232240-06 for the Marshall Steam project.

Dan, please CC me on any correspondence regarding the re-qualification of the rolls in question.

Time may be of the essence, as Hallaton has requested additional rolls at the site.

Best Regards,

Grant Palmer
Quality Control Manager, Agru America
500 Garrison Road, Georgetown, SC 29440
Ph: (843) 546-0600 Ext 1014
Toll Free: (800) 373-2478(AGRU)
mobile (843) 240-1379
fax: (843) 546-0516
gp-agru@sc.rr.com www.agruamerica.com

To view certs:
To open an attached PDF file. you must have Acrobat® Reader® installed to view the attachment.
Go to www.adobe.com to download the reader

AGRU AMERICA
500 GARRISON ROAD
GEORGETOWN, SC 29440
800-321-1379
9/1/2006

Sample ID: 232239 06PP RETEST.mss
Method: ASTM D4833 Puncture (4x4).msm

Test Date: 9/1/2006
Operator: MTS

Sample Information:

Name	Value
Humidity =/- 10%	50 %
Material Type	smooth
Nominal Thickness	60mil
Production Date	8/8/06
Resin Lot Number	MM195368
Resin Type	HDPE
Roll Number	232239-06

Specimen Results:

Specimen #	Peak Load lbf						
1	138.840						
2	138.037						
3	137.993						
4	132.291						
5	137.535						
Mean	136.939						
Std. Dev.	2.640						

SMOOTH LINER

HDPE

60 mil

Hallaton Hanes Mill LF doc 7759

Winston Salem, NC

69 rolls 60 HD smooth	69	left
5 rolls 60 HD micro	5	left
60 rolls 40 LL smooth	60	to be made
70 LONG rolls 40 LL micro	70	to be made

roll #	METRIC DIMENSIONS wid	len	area			
(P)225102 .06	6.86	128	878.1	60HD smooth 69tot 1	2990	MM195254
(P)225103 .06	6.86	128	878.1	60HD smooth 69tot 2	2980	MM195254
(P)225104 .06	6.86	128	878.1	60HD smooth 69tot 3	2980	MM195254
(P)225105 .06	6.86	128	878.1	60HD smooth 69tot 4	2985	MM195254
(P)225106 .06	6.86	128	878.1	60HD smooth 69tot 5	2985	MM195254
(P)225107 .06	6.86	128	878.1	60HD smooth 69tot 6	2975	MM195254
(P)225108 .06	6.86	128	878.1	60HD smooth 69tot 7	2970	MM195254
(P)225109 .06	6.86	128	878.1	60HD smooth 69tot 8	2965	MM195254
(P)225110 .06	6.86	128	878.1	60HD smooth 69tot 9	2965	MM195254
(P)225111 .06	6.86	128	878.1	60HD smooth 69tot 10	2970	MM195254
(P)225112 .06	6.86	128	878.1	60HD smooth 69tot 11	2970	MM195254
(P)225113 .06	6.86	128	878.1	60HD smooth 69tot 12	2970	MM195254
(P)225114 .06	6.86	128	878.1	60HD smooth 69tot 13	2970	MM195254
(P)225115 .06	6.86	128	878.1	60HD smooth 69tot 14	2965	MM195254
(P)225116 .06	6.86	128	878.1	60HD smooth 69tot 15	2970	MM195254
(P)225117 .06	6.86	128	878.1	60HD smooth 69tot 16	2970	MM195254
(P)225118 .06	6.86	128	878.1	60HD smooth 69tot 17	2970	MM195254
(P)225119 .06	6.86	128	878.1	60HD smooth 69tot 18	2970	MM195254
(P)225120 .06	6.86	128	878.1	60HD smooth 69tot 19	2970	MM195254
(P)225121 .06	6.86	128	878.1	60HD smooth 69tot 20	2975	MM195254
(P)225122 .06	6.86	128	878.1	60HD smooth 69tot 21	2975	MM195254
(P)225123 .06	6.86	128	878.1	60HD smooth 69tot 22	2975	MM195254
(P)225224 .06	6.86	128	878.1	60HD smooth 69tot 23	2980	MM195254
(P)225225 .06	6.86	128	878.1	60HD smooth 69tot 24	2980	MM195254
(P)225226 .06	6.86	128	878.1	60HD smooth 69tot 25	2970	MM195254
(P)225227 .06	6.86	128	878.1	60HD smooth 69tot 26	2970	MM195254
(P)225228 .06	6.86	128	878.1	60HD smooth 69tot 27	2970	MM195254
(P)225229 .06	6.86	128	878.1	60HD smooth 69tot 28	2975	MM195254
(P)225230 .06	6.86	128	878.1	60HD smooth 69tot 29	2970	MM195254
(P)225231 .06	6.86	128	878.1	60HD smooth 69tot 30	2970	MM195254
(P)225232 .06	6.86	128	878.1	60HD smooth 69tot 31	2978	MM195254
(P)225233 .06	6.86	128	878.1	60HD smooth 69tot 32	2970	MM195254
(P)225234 .06	6.86	128	878.1	60HD smooth 69tot 33	2965	MM195254
(P)225235 .06	6.86	128	878.1	60HD smooth 69tot 34	2965	MM195254
(P)225236 .06	6.86	128	878.1	60HD smooth 69tot 35	2965	MM195254
(P)225237 .06	6.86	128	878.1	60HD smooth 69tot 36	2970	MM195254
(P)225238 .06	6.86	128	878.1	60HD smooth 69tot 37	2960	MM195254
(P)225239 .06	6.86	128	878.1	60HD smooth 69tot 38	2965	MM195254
✱ (P)225240 .06	6.86	128	878.1	60HD smooth 69tot 39	2965	MM195254
(P)225241 .06	6.86	128	878.1	60HD smooth 69tot 40	2960	MM195254
(P)225242 .06	6.86	128	878.1	60HD smooth 69tot 41	2960	MM195254
(P)225243 .06	6.86	128	878.1	60HD smooth 69tot 42	2970	MM195254
(P)225244 .06	6.86	128	878.1	60HD smooth 69tot 43	2970	MM195254
(P)225245 .06	6.86	128	878.1	60HD smooth 69tot 44	2970	MM195254
(P)225246 .06	6.86	128	878.1	60HD smooth 69tot 45	2970	MM195254
(P)225247 .06	6.86	128	878.1	60HD smooth 69tot 46	2970	MM195254
(P)225248 .06	6.86	128	878.1	60HD smooth 69tot 47	2960	MM195254
(P)225349 .06	6.86	128	878.1	60HD smooth 69tot 48	2960	MM195254
(P)225350 .06	6.86	128	878.1	60HD smooth 69tot 49	2965	MM195254

SMOOTH LINER

HDPE

60 mil

Hallaton Hanes Mill LF doc 7759

Winston Salem, NC

69 rolls 60 HD smooth	69	left
5 rolls 60 HD micro	5	left
60 rolls 40 LL smooth	60	to be made
70 LONG rolls 40 LL micro	70	to be made

roll #	METRIC DIMENSIONS wid	len	area			
(P)225351 .06	6.86	128	878.1	60HD smooth 69tot 50	2965	MM195254
(P)225352 .06	6.86	128	878.1	60HD smooth 69tot 51	2965	MM195254
(P)225353 .06	6.86	128	878.1	60HD smooth 69tot 52	2960	MM195254
(P)225354 .06	6.86	128	878.1	60HD smooth 69tot 53	2975	MM195254
(P)225355 .06	6.86	128	878.1	60HD smooth 69tot 54	2970	MM195254
(P)225356 .06	6.86	128	878.1	60HD smooth 69tot 55	2970	MM195254
(P)225357 .06	6.86	128	878.1	60HD smooth 69tot 56	2965	MM195254
(P)225358 .06	6.86	128	878.1	60HD smooth 69tot 57	2960	MM195254
(P)225359 .06	6.86	128	878.1	60HD smooth 69tot 58	2960	MM195254
(P)225360 .06	6.86	128	878.1	60HD smooth 69tot 59	2965	MM195254
(P)225361 .06	6.86	128	878.1	60HD smooth 69tot 60	2960	MM195254
★ (P)225362 .06	6.86	128	878.1	60HD smooth 69tot 61	2980	MM195254
(P)225363 .06	6.86	128	878.1	60HD smooth 69tot 62	2970	MM195254
(P)225364 .06	6.86	128	878.1	60HD smooth 69tot 63	2970	MM195254
(P)225365 .06	6.86	128	878.1	60HD smooth 69tot 64	2965	MM195254
(P)225366 .06	6.86	128	878.1	60HD smooth 69tot 65	2960	MM195254
(P)225367 .06	6.86	128	878.1	60HD smooth 69tot 66	2960	MM195254
(P)225368 .06	6.86	128	878.1	60HD smooth 69tot 67	2960	MM195254
(P)225369 .06	6.86	128	878.1	60HD smooth 69tot 68	2960	MM195254
(P)225370 .06	6.86	128	878.1	60HD smooth 69tot 69	2980	MM195254
(P)125424 .06	7	125	875	60HD micro 5tot 1	3286	MM194876
(P)125425 .06	7	125	875	60HD micro 5tot 2	3284	MM194876
(P)125426 .06	7	125	875	60HD micro 5tot 3	3286	MM194876
(P)125427 .06	7	125	875	60HD micro 5tot 4	3294	MM194876
(P)125428 .06	7	125	875	60HD micro 5tot 5	3304	MM194876

agru america quality control dept

quality certificate

ROLL # **225240-06** Lot # **MM195254** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	**1.404**	mm	**55**	mil
	MAX:	**1.723**	mm	**68**	mil
	AVE:	**1.561**	mm	**61**	mil

Thickness	**1.5mm**		**60mil**	
Length	**128**	m	**420**	feet
Width	**6.86**	m	**22.5**	feet
OIT(Standard) ASTM D3895		minutes	**140**	

Specific Gravity ASTM D792		Density		g/cc			**.946**
MFI ASTM D1238 COND. E GRADE:	**7002**	Melt Flow Index 190°C /2160 g	-	g /10 min			**.22**
Carbon Black Content ASTM D4218		Range		%			**2.57**
Carbon Black Dispersion ASTM D5596		Category					**1**
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	**26**	N/mm	**146**	ppi	**2,438** psi
		Average Strength @ Break	**46**	N/mm	**265**	ppi	**4,417** psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield		Average Elongation @ Yield		%			**17.52**
Lo = 2.0" Break		Average Elongation @ Break		%			**845.7**
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%			**-0.29**
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance		**218** N			**48.923** lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load		**469** N			**105.41** lbs
Puncture Resistance ASTM D4833 (Modified)		Load		**600** N			**134.84** lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs				**CERTIFIED**
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs				**ONGOING**

Customer: **Hallaton, Inc.**
PO: **P6167 Hanes Mill Landfill**
Destination **Winston-Salem, NC**

Date: **6-20-06**

Signature: _____

Quality Control Department

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REV 06
12/23/05

agru america quality control dept

quality certificate

ROLL # **225362-06** Lot # **MM195254** **Liner Type:SMOOTH HDPE**

		METRIC		ENGLISH	
Thickness Measurement ASTM D5199 (Modified)	MIN:	1.44	mm	57	mil
	MAX:	1.7	mm	67	mil
	AVE:	1.56	mm	61	mil

Thickness	1.5mm	60mil		
Length	128	m	420	feet
Width	6.86	m	22.5	feet
OIT(Standard) ASTM D3895		minutes	140	

Specific Gravity ASTM D792		Density		g/cc		.946
MFI ASTM D1238 COND. E GRADE:	7002	Melt Flow Index 190°C /2160 g - g /10 min				.22
Carbon Black Content ASTM D4218		Range		%		2.73
Carbon Black Dispersion ASTM D5596		Category				1
Tensile Strength ASTM D6693 ASTM D638 (Modified) (2 inches / minute)		Average Strength @ Yield	26	N/mm	149 ppi	2,479 psi
		Average Strength @ Break	46	N/mm	261 ppi	4,352 psi
Elongation ASTM D-6693 ASTM D638 (Modified) (2 inches / minute) Lo = 1.3" Yield		Average Elongation @ Yield		%		17.46
Lo = 2.0" Break		Average Elongation @ Break		%		847.9
Dimensional Stability ASTM D1204 (Modified)		Average Dimensional Change		%		-0.29
Tear Resistance ASTM D1004 (Modified)		Average Tear Resistance	222	N		49.830 lbs
Puncture Resistance FTMS 101 Method 2065 (Modified)		Load	462	N		103.86 lbs
Puncture Resistance ASTM D4833 (Modified)		Load	583	N		131.08 lbs
ESCR ASTM D1693		Minimum Hrs w / o Failures	1500 hrs			CERTIFIED
Notched Constant Tensile Load ASTM D5397		pass / fail @ 30%	300 hrs			ONGOING

Customer: **Hallaton, Inc.**
PO: **P6167 Hanes Mill Landfill**
Destination **Winston-Salem, NC**

Date: **6-22-06**

Signature: _____
Quality Control Department

60HDSM.FRM
REV 06
12/23/05

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04345

Your material number

Quality certificate

Repeat printout

Date
2006/05/30 16:02:17

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80099613 000010

Order number and item
26967 000010

Vehicule
UNPX 123842

Material : S-7002 PETROMONT HDPE-7002
Batch MM 195254 / Qty 87,640 KG 193,213 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.218	0.170	
Flow Index 190C 21.6kg	g/10mi	23.1	21.0	27.0
Density Annealed 15C/min	g/cc	0.9374	0.9365	0.9385
Pellet Count	#/g	26	20	35
Oxydative Induction Time	min	155	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

PÉTROMONT

Petromont and Company, Limited Partnership
Petromont Inc., Sole General Partner
10455 Metropolitain East
Montreal-East, QC, H1B 1A1
CANADA
Tel: 514-640-7400
http://www.petromont.qc.ca

Customer information

AGRU AMERICA
500 GARRISON RD
GEORGETOWN SC 29440
USA

Contact
PALMER GRANT 843-546-0516

Your reference
04345

Your material number

Quality certificate

Repeat printout

Date
2006/05/12 08:59:14

Delivery item
S-7002 PETROMONT HDPE-7002

Delivery number and item
80098814 000010

Order number and item
26959 000010

Vehicule
UNCX 815860

Material : S-7002 PETROMONT HDPE-7002
Batch MM 194876 / Qty 83,920 KG 185,012 lb

Characteristics	Unit	Value	Lower limit	Upper limit
Melt index 190C 2.16 kg	g/10mi	0.250	0.170	
Flow Index 190C 21.6kg	g/10mi	25.0	21.0	27.0
Density Annealed 15C/min	g/cc	0.9372	0.9365	0.9385
Pellet Count	#/g	28	20	35
Oxydative Induction Time	min	146	100	

*** End ***

Daniel L'Archevêque
Quality Control Laboratory
Authorized representative

Responsible Care®
Beyond what's required.

Petromont certifies that the batch number of the product list above meet its internal manufacturing specifications for the properties listed above.

3

SUBMITTAL LETTER

SUBMITTAL NO.: 0016
SUBMITTAL DATE: 08/12/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME: Marshall FGD Gypsum Landfill
OWNERS PROJECT NO.:
INTERNAL PROJECT NO.: 200603
OWNER: Duke Energy
OWNERS REP: Harold Backman
A/E NAME: Chas. H. Sells, Inc.
A/E REP: Dan Brewer PE
CONTRACTOR: Phillips and Jordan, Inc.
CONTRACTORS REP: Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER: 5.0
SEQUENCE. NO.: 6
SUBMISSION TYPE: A. Original Submission
SUBCONTRACTOR: Hallaton, Inc.
SUPPLIER:
MANUFACTURER:

SUBMITTAL DESCRIPTION: Leachate Collection & Removal System (LCRS)

ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
5.2	.4	SD	Geo-composite Transmissivity Test Results	
5.2	.4	SD	Manufacturer's QC Certification Geo-composite	
5.2	.4	SD	Manufacturer's QC Certification Geonet Polyethylene Resin	
5.2	.3	SD	Non-Woven Geotextile QC Certification	

Miscellaneous Info:

Please return three (3) copies of the Submittal Letter (letter only) to: 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 08/12/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- [X] **No Exception Taken**
- [ ] **Make Corrections Noted**
- [ ] **Amend and Resubmit**
- [ ] **Rejected - See Remarks**

Dan E. Brewer, P.E.

gineer: Chas. H. Sells, Inc. **Signed:** Dan E. Brewer **Date:** 8/18/06

=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

SKAPS Industries

Engineered Synthetic Products, Inc.

August 4, 2006
Hallaton, Inc.
100 E Pennsylvania Avenue
Suite 203
Towson, MD 21286

Ref. : Marshall Station Landfill, NC
Customer P.O. # P6230
Transnet 220-1-8

We certify that the Transnet 220-1-8 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	0.162	Minimum
Thickness	ASTM D 5199	mil	220 ± 20	Range
Carbon Black	ASTM D 4218	%	2.0	Minimum
Tensile Strength	ASTM D 5035	lbs/in	45	Minimum
Melt Flow	ASTM D 1238[2]	g/10 min	1.0	Maximum
Density	ASTM D 1505	g/cm^3	0.94	Minimum
Composite				
Ply Adhesion	GRI GC7	lb/in	1.0	MARV[5]
Transmissivity[1]	ASTM D 4716	m^2/sec	1.0 x 10^{-4}	MARV
Geotextile[3 & 4]				
Fabric Weight	ASTM D 5261	oz/yd^2	7.5	MARV
Grab Strength	ASTM D 4632	lbs	200	MARV
Thickness	ASTM D 1777	mils	100	MARV
Grab Elongation	ASTM D 4632	%	50	MARV
Tear Strength	ASTM D 4533	lbs	60	MARV
Puncture Resistance	ASTM D 4833	lbs	95	MARV
Mullen Burst	ASTM D 3786	psi	275	MARV
Water Flow Rate	ASTM D 4491	gpm/ft^2	100	MARV
Permittivity	ASTM D 4491	sec^{-1}	1.26	MARV
Permeability	ASTM D 4491	cm/sec	0.2	MARV
AOS	ASTM D 4751	US Sieve	100	MARV

Notes:

1 Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 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

SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092001	2092001 - N	2092.09	1.58	2.21	2.29×10^{-4}
2	2092002	2092002 - N	2092.09			
3	2092003	2092003 - N	2092.09			
4	2092004	2092004 - N	2092.09			
5	2092005	2092005 - N	2092.02			
6	2092006	2092006 - N	2092.02			
7	2092007	2092007 - N	2092.02			
8	2092008	2092008 - N	2092.02			
9	2092009	2092009 - N	2092.12			
10	2092010	2092010 - N	2092.12	1.32	2.10	
11	2092011	2092011 - N	2092.12			
12	2092012	2092012 - N	2092.12			
13	2092013	2092013 - N	2092.04			
14	2092014	2092014 - N	2092.04			
15	2092015	2092015 - N	2092.04			
16	2092016	2092016 - N	2092.04			
17	2092017	2092017 - N	2092.10			
18	2092018	2092018 - N	2092.10			
19	2092019	2092019 - N	2092.10			
20	2092020	2092020 - N	2092.10	1.53	2.17	
21	2092021	2092021 - N	2092.03			
22	2092022	2092022 - N	2092.03			
23	2092023	2092023 - N	2092.03			
24	2092024	2092024 - N	2092.03			
25	2092025	2092025 - N	2092.14			2.23×10^{-4}
26	2092026	2092026 - N	2092.14			
27	2092027	2092027 - N	2092.14			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

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 : **TN220-1-8**
Project : **Marshall Station 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)
2092001 - N	GOCX58008	0.9536	0.199	226	2.54	76	
2092002 - N	GOCX58008	0.9536					
2092003 - N	GOCX58008	0.9536					
2092004 - N	GOCX58008	0.9536					
2092005 - N	GOCX58008	0.9536					
2092006 - N	GOCX58008	0.9536					
2092007 - N	GOCX58008	0.9536					
2092008 - N	GOCX58008	0.9536					
2092009 - N	GOCX58008	0.9536					
2092010 - N	GOCX58008	0.9536	0.193	220	2.42	71	
2092011 - N	GOCX58008	0.9536					
2092012 - N	GOCX58008	0.9536					
2092013 - N	GOCX58008	0.9536					
2092014 - N	GOCX58008	0.9536					
2092015 - N	GOCX58008	0.9536					
2092016 - N	GOCX58008	0.9536					
2092017 - N	GOCX58008	0.9536					
2092018 - N	GOCX58008	0.9536					
2092019 - N	GOCX58008	0.9536					
2092020 - N	GOCX58008	0.9536	0.197	224	2.51	74	
2092021 - N	GOCX58008	0.9536					
2092022 - N	GOCX58008	0.9536					
2092023 - N	GOCX58008	0.9536					
2092024 - N	GOCX58008	0.9536					
2092025 - N	GOCX58008	0.9536					
2092026 - N	GOCX58008	0.9536					
2092027 - N	GOCX58008	0.9536					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092028	2092028 - N	2092.14			
2	2092029	2092029 - N	2092.01			
3	2092030	2092030 - N	2092.01	1.29	1.95	
4	2092031	2092031 - N	2092.01			
5	2092032	2092032 - N	2092.01			
6	2092033	2092033 - N	2092.16			
7	2092034	2092034 - N	2092.16			
8	2092035	2092035 - N	2092.16			
9	2092036	2092036 - N	2092.16			
10	2092037	2092037 - N	2092.06			
11	2092038	2092038 - N	2092.06			
12	2092039	2092039 - N	2092.06			
13	2092040	2092040 - N	2092.06	1.49	2.08	
14	2092041	2092041 - N	2092.18			
15	2092042	2092042 - N	2092.18			
16	2092043	2092043 - N	2092.18			
17	2092044	2092044 - N	2092.18			
18	2092045	2092045 - N	2092.08			
19	2092046	2092046 - N	2092.08			
20	2092047	2092047 - N	2092.08			
21	2092048	2092048 - N	2092.08			
22	2092049	2092049 - N	2092.15			
23	2092050	2092050 - N	2092.15	1.25	1.91	2.32×10^{-4}
24	2092051	2092051 - N	2092.15			
25	2092052	2092052 - N	2092.15			
26	2092053	2092053 - N	2092.07			
27	2092054	2092054 - N	2092.07			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

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 : **TN220-1-8**
Project : **Marshall Station 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)
2092028 - N	GOCX58008	0.9536					
2092029 - N	GOCX58008	0.9536					
2092030 - N	GOCX58008	0.9536	0.191	218	2.39	69	
2092031 - N	GOCX58008	0.9536					
2092032 - N	GOCX58008	0.9536					
2092033 - N	GOCX58008	0.9536					
2092034 - N	GOCX58008	0.9536					
2092035 - N	GOCX58008	0.9536					
2092036 - N	GOCX58008	0.9536					
2092037 - N	GOCX58008	0.9536					
2092038 - N	GOCX58008	0.9536					
2092039 - N	GOCX58008	0.9536					
2092040 - N	GOCX58008	0.9536	0.195	222	2.48	72	
2092041 - N	GOCX58008	0.9536					
2092042 - N	GOCX58008	0.9536					
2092043 - N	GOCX58008	0.9536					
2092044 - N	GOCX58008	0.9536					
2092045 - N	GOCX58008	0.9536					
2092046 - N	GOCX58008	0.9536					
2092047 - N	GOCX58008	0.9536					
2092048 - N	GOCX58008	0.9536					
2092049 - N	GOCX58008	0.9536					
2092050 - N	GOCX58008	0.9536	0.189	216	2.35	68	
2092051 - N	GOCX58008	0.9536					
2092052 - N	GOCX58008	0.9536					
2092053 - N	GOCX58008	0.9536					
2092054 - N	GOCX58008	0.9536					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092055	2092055 - N	2092.07			
2	2092056	2092056 - N	2092.07			
3	2092057	2092057 - N	2092.20			
4	2092058	2092058 - N	2092.20			
5	2092059	2092059 - N	2092.20			
6	2092060	2092060 - N	2092.20	1.45	2.03	
7	2092061	2092061 - N	2092.05			
8	2092062	2092062 - N	2092.05			
9	2092063	2092063 - N	2092.05			
10	2092064	2092064 - N	2092.05			
11	2092065	2092065 - N	2092.22			
12	2092066	2092066 - N	2092.22			
13	2092067	2092067 - N	2092.22			
14	2092068	2092068 - N	2092.22			
15	2092069	2092069 - N	2092.11			
16	2092070	2092070 - N	2092.11	1.21	1.89	
17	2092071	2092071 - N	2092.11			
18	2092072	2092072 - N	2092.11			
19	2092073	2092073 - N	2092.24			
20	2092074	2092074 - N	2092.24			
21	2092075	2092075 - N	2092.24			2.26×10^{-4}
22	2092076	2092076 - N	2092.24			
23	2092077	2092077 - N	2092.13			
24	2092078	2092078 - N	2092.13			
25	2092079	2092079 - N	2092.13			
26	2092080	2092080 - N	2092.13	1.67	1.99	
27	2092081	2092081 - N	2092.26			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

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 : **TN220-1-8**
Project : **Marshall Station 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)
2092055 - N	GOCX58008	0.9536					
2092056 - N	GOCX58008	0.9536					
2092057 - N	GOCX58008	0.9536					
2092058 - N	GOCX58008	0.9536					
2092059 - N	GOCX58008	0.9536					
2092060 - N	GOCX58008	0.9536	0.198	225	2.44	75	
2092061 - N	GOCX58008	0.9536					
2092062 - N	GOCX58008	0.9536					
2092063 - N	GOCX58008	0.9536					
2092064 - N	GOCX58008	0.9536					
2092065 - N	GOCX58008	0.9536					
2092066 - N	GOCX58008	0.9536					
2092067 - N	GOCX58008	0.9536					
2092068 - N	GOCX58008	0.9536					
2092069 - N	GOCX58008	0.9536					
2092070 - N	GOCX58008	0.9536	0.192	219	2.33	70	
2092071 - N	GOCX58008	0.9536					
2092072 - N	GOCX58008	0.9536					
2092073 - N	GOCX58008	0.9536					
2092074 - N	GOCX58008	0.9536					
2092075 - N	GOCX58008	0.9536					
2092076 - N	GOCX58008	0.9536					
2092077 - N	GOCX58008	0.9536					
2092078 - N	GOCX58008	0.9536					
2092079 - N	GOCX58008	0.9536					
2092080 - N	GOCX58008	0.9536	0.196	223	2.56	73	
2092081 - N	GOCX58008	0.9536					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092082	2092082 - N	2092.26			
2	2092083	2092083 - N	2092.26			
3	2092084	2092084 - N	2092.26			
4	2092085	2092085 - N	2092.17			
5	2092086	2092086 - N	2092.17			
6	2092087	2092087 - N	2092.17			
7	2092088	2092088 - N	2092.17			
8	2092089	2092089 - N	2092.23			
9	2092090	2092090 - N	2092.23	1.59	1.86	
10	2092091	2092091 - N	2092.23			
11	2092092	2092092 - N	2092.23			
12	2092093	2092093 - N	2092.19			
13	2092094	2092094 - N	2092.19			
14	2092095	2092095 - N	2092.19			
15	2092096	2092096 - N	2092.19			
16	2092097	2092097 - N	2092.27			
17	2092098	2092098 - N	2092.27			
18	2092099	2092099 - N	2092.27			
19	2092100	2092100 - N	2092.27	1.71	2.29	2.38×10^{-4}
20	2092101	2092101 - N	2092.21			
21	2092102	2092102 - N	2092.21			
22	2092103	2092103 - N	2092.21			
23	2092104	2092104 - N	2092.21			
24	2092105	2092105 - N	2092.30			
25	2092106	2092106 - N	2092.30			
26	2092107	2092107 - N	2092.30			
27	2092108	2092108 - N	2092.30			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

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 : **TN220-1-8**
Project : **Marshall Station 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)
2092082 - N	GOCX58008	0.9536					
2092083 - N	GOCX58008	0.9536					
2092084 - N	GOCX58008	0.9536					
2092085 - N	GOCX58008	0.9536					
2092086 - N	GOCX58008	0.9536					
2092087 - N	GOCX58008	0.9536					
2092088 - N	GOCX58008	0.9536					
2092089 - N	GOCX58008	0.9536					
2092090 - N	GOCX58008	0.9536	0.190	217	2.30	69	
2092091 - N	GOCX58008	0.9536					
2092092 - N	GOCX58008	0.9536					
2092093 - N	GOCX58008	0.9536					
2092094 - N	GOCX58008	0.9536					
2092095 - N	GOCX58008	0.9536					
2092096 - N	GOCX58008	0.9536					
2092097 - N	GOCX58008	0.9536					
2092098 - N	GOCX58008	0.9536					
2092099 - N	GOCX58008	0.9536					
2092100 - N	GOCX58008	0.9536	0.194	221	2.61	76	
2092101 - N	GOCX58008	0.9536					
2092102 - N	GOCX58008	0.9536					
2092103 - N	GOCX58008	0.9536					
2092104 - N	GOCX58008	0.9536					
2092105 - N	GOCX58008	0.9536					
2092106 - N	GOCX58008	0.9536					
2092107 - N	GOCX58008	0.9536					
2092108 - N	GOCX58008	0.9536					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092109	2092109 - N	2092.25			
2	2092110	2092110 - N	2092.25	1.68	2.19	
3	2092111	2092111 - N	2092.25			
4	2092112	2092112 - N	2092.25			
5	2092113	2092113 - N	2092.32			
6	2092114	2092114 - N	2092.32			
7	2092115	2092115 - N	2092.32			
8	2092116	2092116 - N	2092.32			
9	2092117	2092117 - N	2092.28			
10	2092118	2092118 - N	2092.28			
11	2092119	2092119 - N	2092.28			
12	2092120	2092120 - N	2092.28	1.77	2.34	
13	2092121	2092121 - N	2092.35			
14	2092122	2092122 - N	2092.35			
15	2092123	2092123 - N	2092.35			
16	2092124	2092124 - N	2092.35			
17	2092125	2092125 - N	2092.31			2.19×10^{-4}
18	2092126	2092126 - N	2092.31			
19	2092127	2092127 - N	2092.31			
20	2092128	2092128 - N	2092.31			
21	2092129	2092129 - N	2092.38			
22	2092130	2092130 - N	2092.38	1.60	2.22	
23	2092131	2092131 - N	2092.38			
24	2092132	2092132 - N	2092.38			
25	2092133	2092133 - N	2092.29			
26	2092134	2092134 - N	2092.29			
27	2092135	2092135 - N	2092.29			

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

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 : **TN220-1-8**
Project : **Marshall Station 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)
2092109 - N	GOCX58008	0.9536					
2092110 - N	GOCX58008	0.9536	0.189	216	2.53	71	
2092111 - N	GOCX58008	0.9536					
2092112 - N	GOCX58008	0.9536					
2092113 - N	GOCX58008	0.9536					
2092114 - N	GOCX58008	0.9536					
2092115 - N	GOCX58008	0.9536					
2092116 - N	GOCX58008	0.9536					
2092117 - N	GOCX58008	0.9536					
2092118 - N	GOCX58008	0.9536					
2092119 - N	GOCX58008	0.9536					
2092120 - N	GOCX58008	0.9536	0.199	226	2.66	74	
2092121 - N	GOCX58008	0.9536					
2092122 - N	GOCX58008	0.9536					
2092123 - N	GOCX58008	0.9536					
2092124 - N	GOCX58008	0.9536					
2092125 - N	GOCX58008	0.9536					
2092126 - N	GOCX58008	0.9536					
2092127 - N	GOCX58008	0.9536					
2092128 - N	GOCX58008	0.9536					
2092129 - N	GOCX58008	0.9536					
2092130 - N	GOCX58008	0.9536	0.193	220	2.58	69	
2092131 - N	GOCX58008	0.9536					
2092132 - N	GOCX58008	0.9536					
2092133 - N	GOCX58008	0.9536					
2092134 - N	GOCX58008	0.9536					
2092135 - N	GOCX58008	0.9536					

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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	Minimum	Average	
1	2092136	2092136 - N	2092.29			
2	2092137	2092137 - N	2092.37			
3	2092138	2092138 - N	2092.37			
4	2092139	2092139 - N	2092.37			
5	2092140	2092140 - N	2092.37	1.74	2.36	
6	2092141	2092141 - N	2092.34			
7	2092142	2092142 - N	2092.34			
8	2092143	2092143 - N	2092.34			
9	2092144	2092144 - N	2092.34			
10	2092145	2092145 - N	2092.36			
11	2092146	2092146 - N	2092.36			
12	2092147	2092147 - N	2092.36			
13	2092148	2092148 - N	2092.36			
14	2092149	2092149 - N	2092.33			
15	2092150	2092150 - N	2092.33	1.57	2.20	2.30×10^{-4}

* Transmissivity measured using water at 21 ± 2 °C (70 ± 4 °F) with a gradient of 0.25 and a confining pressure of 10000 psf between sand & liner after 100 hours.

APPROVED 5 QA

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SKAPS Industries

Engineered Synthetic Products, Inc.

Product : **TN220-1-8**
Project : **Marshall Station 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)
2092136 - N	GOCX58008	0.9536					
2092137 - N	GOCX58008	0.9536					
2092138 - N	GOCX58008	0.9536					
2092139 - N	GOCX58008	0.9536					
2092140 - N	GOCX58008	0.9536	0.197	224	2.69	72	
2092141 - N	GOCX58008	0.9536					
2092142 - N	GOCX58008	0.9536					
2092143 - N	GOCX58008	0.9536					
2092144 - N	GOCX58008	0.9536					
2092145 - N	GOCX58008	0.9536					
2092146 - N	GOCX58008	0.9536					
2092147 - N	GOCX58008	0.9536					
2092148 - N	GOCX58008	0.9536					
2092149 - N	GOCX58008	0.9536					
2092150 - N	GOCX58008	0.9536	0.191	218	2.60	68	

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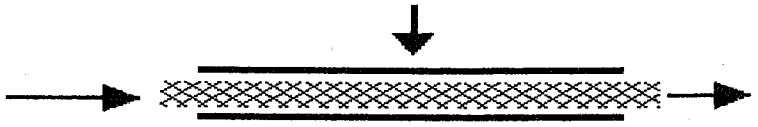
571 Industrial Parkway, Commerce, GA 30529 **Phone:** 706-336-7000 Fax: 706-336-7007 **Email:** skaps@skaps.com

SKAPS Industries

ASTM D 4716

Client:	Hallaton, Inc.	**Job #**	2092
Project:	Marshall Station Landfill, NC		
Product:	TN220-1-8		

Test Configuration:



12 X 12 Test Surface

Test Information:

Boundary Conditions:	Sand Geocomposite Liner	**Normal Load:** **Gradient:** **Seating Time:** **Flow Direction:**	10000 psf 0.25 ft 100 hours MD

Test Results:

Roll No.	Pressure (psf)	Gradient, ft	Transmissivity, m^2/sec
			100 hours
2092001	10000	0.25	2.29×10^{-4}
2092025			2.23×10^{-4}
2092050			2.32×10^{-4}
2092075			2.26×10^{-4}
2092100			2.38×10^{-4}
2092125			2.19×10^{-4}
2092150			2.30×10^{-4}

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 : TN220-1-8
Project : Marshall Station 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 %	MD TRAP lbs.	XMD TRAP lbs.	PUNCTURE lbs.	THICKNESS mil	MULLEN psi	AOS us sieve	WATER-FLOW gpm/sq f	PERM-ABL cm/sec	PERM-ITY sec^{-1}
2092001	2092.09	8.24	227	68	237	81	101	116	138	121	431	100	103	0.43	1.37
2092025	2092.14	8.53	233	71	241	75	99	103	133	125	427	100	103	0.43	1.37
2092050	2092.15	8.29	231	65	235	84	99	103	133	120	427	100	103	0.43	1.37
2092075	2092.24	8.44	235	74	238	80	104	109	135	123	433	100	103	0.43	1.37
2092100	2092.27	8.17	228	70	236	82	104	109	135	121	433	100	103	0.43	1.37
2092125	2092.31	8.38	234	72	243	85	102	105	131	125	430	100	103	0.43	1.37
2092150	2092.33	8.38	234	72	243	85	102	105	131	125	430	100	103	0.43	1.37

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 : Marshall Station Landfill, NC
Geocomposite Manufacturer : SKAPS Industries
Geocomposite Production Plant : Commerce, GA
Geocomposite Brand Name : TN220-1-8

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*
Trademark Plastics Corporation	Chevron, TX	HDPE	GOCX58008	Density	ASTM D 1505	gm/cc	0.949	0.949
				Melt Flow Index	ASTM D 1238[(a)]	gm/10 min	0.12	0.11

(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

SUBMITTAL LETTER

SUBMITTAL NO.: 0010
SUBMITTAL DATE: 07/22/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER:	5.0	SUBCONTRACTOR:	Hallaton, Inc.
SEQUENCE. NO.:	4	SUPPLIER:	
SUBMISSION TYPE:	B. 1st Resubmission	MANUFACTURER:	

SUBMITTAL DESCRIPTION: Leachate Collection & Removal System (LCRS)
ASTM Reference:
ORIGINAL SUBMITTAL NO.: 5

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
5.2	.4	SD	Manufacturer's Info., Geo-composite (8 oz. non-woven geotextile)	Single & Double Sided Composite
5.2	.4	SD	Manufacturer's Info., Geonet	
5.2	.3	SD	Manufacturer's Info., Non-Woven Geotextile 8oz.	

Miscellaneous Info:

Please note Manufacturer's Certification regarding revised "AOS", transmissivity test results will be submitted under separate cover. Please return three (3) copies of the reviewed/approved submittal to: Bruce Sekaly, 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 07/22/2006

By: B Sekaly
Bruce Sekaly

APPROVAL/NOTES:

- ☐ **No Exception Taken**
- ☐ **Make Corrections Noted**
- ☐ **Amend and Resubmit**
- ☐ **Rejected - See Remarks**

Engineer: _____ **Signed:** _____ **Date:** _____

*SD=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

Engineered Synthetic Products, Inc.

212 North Way
Birmingham, AL 35242
(205)981-1900; FAX (205)981-1901
email: g_kscott@bellsouth.net

Wednesday, July 19, 2006

Mr. Kennedy Garber
Hallaton, Inc.
100 East Pennsylvania Avenue
Suite 203
Towson, MD 21286

Re: Marshall Station FGD Residue Landfill
Terrell, NC

Dear Mr. Garber:

We wish to certify that the Skaps Industries' GT-180 and GE-180 nonwovens to be supplied to the above project will meet the Apparent Opening Size requirement of a #100 sieve as stated in Table 5-2 of the project specifications. The GE-180 will be used on both sides of the Transnet 220 geonet and the GT-180 will be supplied separately. We will make some adjustments in our manufacturing of these products in order to meet the #100 sieve size requirement.

Sincerely,

Greg Scott
Engineered Synthetic Products, Inc.

ENGINEERED SYNTHETIC PRODUCTS, INC.

405 Hood Road
Lilburn, GA 30047
Phone (770)564-1857

DRAINAGE PRODUCT DESCRIPTION SHEET
Marshall Station FGD Residue Landfill, Terrell, NC
TRANSNET 220-2-8 ~~*~~ Double

Transnet 220-2-8 is a superior quality drainage media made by extruding two sets of HDPE strands together to form a diamond shaped net. The net is then heat laminated to an 8 ounce non-woven fabric on each side. This three dimensional structure provides excellent planar liquid flow. The Transnet 220-2-8 conforms to the physical property values listed below:

NET PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Melt Flow Index	ASTM D-1238	g/10 min	1.0 max
Thickness	ASTM D-5199	mils	200
Density of Polymer	ASTM D-1505	g/cm^2	0.94
Carbon Black	ASTM D-1603	%	2-3
Transmissivity (Composite)	ASTM D-4716	m^2/sec	2.25×10^{-4} *
Tensile Strength	ASTM D-5035	lbs/in.	45
Ply Adhesion	GRI GC7	lbs/in	1.0

*Transmissivity of the geocomposite measured using water at 20 Degrees C with a gradient of 0.1 under a confining pressure of 10,000 psf, between two steel plates after a 15 minute seating time. Values may vary based on dimension of the transmissivity specimen and specific laboratory.

STYLE GE-180

GE-180 is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13. GE-180 conforms to the physical property values below:

FABRIC PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Weight	ASTM D-3776	oz.	7.5
Grab Tensile	ASTM D-4632	lbs	200
Grab Elongation	ASTM D-4632	%	50
Trap Tear	ASTM D-4533	lbs	60
Puncture	ASTM D-4833	lbs	95
Mullen Burst Strength	ASTM D-3786	Psi	275
Hydraulic Conductivity	ASTM D-4491	cm/s	0.2
UV Resistance	ASTM D-4355	%/hours	70/500
AOS	ASTM D-4751	US Sieve	100

*At time of manufacturing. Handling may change these properties.

To the best of our knowledge the information contained herein is accurate. However, ESP, Inc. cannot anticipate all conditions under which ESP=s product information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety or suitability of our products either alone or in combination with other products. Final determination of the suitability of any information or material for the use contemplated, of its manner of use, and whether the suggested use infringes any patents is the sole responsibility of the user.

ENGINEERED SYNTHETIC PRODUCTS, INC.

405 Hood Road
Lilburn, GA 30047
Phone (770)564-1857

DRAINAGE PRODUCT DESCRIPTION SHEET
Marshall Station FGD Residue Landfill, Terrell, NC
TRANSNET 220-1-8 * Single

Transnet 220-1-8 is a superior quality drainage media made by extruding two sets of HDPE strands together to form a diamond shaped net. The net is then heat laminated to an 8 ounce non-woven fabric one side. This three dimensional structure provides excellent planar liquid flow. The Transnet 220-2-8 conforms to the physical property values listed below:

NET PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Melt Flow Index	ASTM D-1238	g/10 min	1.0 max
Thickness	ASTM D-5199	mils	200
Density of Polymer	ASTM D-1505	g/cm^2	0.94
Carbon Black	ASTM D-1603	%	2-3
Transmissivity (Composite)	ASTM D-4716	m^2/sec	1×10^{-4} *
Tensile Strength	ASTM D-5035	lbs/in.	45
Ply Adhesion	GRI GC7	lbs/in	1.0

*Transmissivity of the geocomposite measured using water at 20 Degrees C with a gradient of 0.25 under a confining pressure of 10,000 psf, between sand and 60 mil HDPE after a 100 hour seating time. Values may vary based on dimension of the transmissivity specimen and specific laboratory.

STYLE GE-180

GE-180 is a superior quality, nonwoven geotextile produced by needlepunching together 100% polypropylene staple fibers in a random network to form a high strength dimensionally stable fabric. The polypropylene fibers are specially formulated to resist ultraviolet light deterioration, and are inert to commonly encountered soil chemicals. The fabric will not mildew, is non-biodegradable, and is resistant to damage from insects and rodents. Polypropylene is stable within a ph range of 2 to 13. GE-180 conforms to the physical property values below:

FABRIC PROPERTY	TEST METHOD	UNITS	MINIMUM AVERAGE ROLL VALUE
Weight	ASTM D-3776	oz.	7.5
Grab Tensile	ASTM D-4632	lbs	200
Grab Elongation	ASTM D-4632	%	50
Trap Tear	ASTM D-4533	lbs	60
Puncture	ASTM D-4833	lbs	95
Mullen Burst Strength	ASTM D-3786	Psi	275
Hydraulic Conductivity	ASTM D-4491	cm/s	0.2
UV Resistance	ASTM D-4355	%/hours	70/500
AOS	ASTM D-4751	US Sieve	100

*At time of manufacturing. Handling may change these properties.

To the best of our knowledge the information contained herein is accurate. However, ESP, Inc. cannot anticipate all conditions under which ESP=s product information and our products, or the products of other manufacturers in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety or suitability of our products either alone or in combination with other products. Final determination of the suitability of any information or material for the use contemplated, of its manner of use, and whether the suggested use infringes any patents is the sole responsibility of the user.

SUBMITTAL LETTER

SUBMITTAL NO.: 0011
SUBMITTAL DATE: 07/22/2006

PHILLIPS AND JORDAN, INC.

2100 Fairfax Road
Suite 101-D
Greensboro, NC 27407
TEL: 336.478.0265
FAX: 336.478.0269

PROJECT SUMMARY

PROJECT NAME:	Marshall FGD Gypsum Landfill	OWNERS PROJECT NO.:	
INTERNAL PROJECT NO.:	200603		
OWNER:	Duke Energy	OWNERS REP:	Harold Backman
A/E NAME:	Chas. H. Sells, Inc.	A/E REP:	Dan Brewer PE
CONTRACTOR:	Phillips and Jordan, Inc.	CONTRACTORS REP:	Page Riley

SUBMITTAL SUMMARY

SPEC. NUMBER:	5.0	SUBCONTRACTOR:	
SEQUENCE. NO.:	5	SUPPLIER:	
SUBMISSION TYPE:	A. Original Submission	MANUFACTURER:	

SUBMITTAL DESCRIPTION: Leachate Collection & Removal System (LCRS)

ASTM Reference:

PARA.:	ITEM:	TYPE:	DESCRIPTION	REMARKS
5.2	.1	SD	Manufacturer's Info.-8oz. Geotextile-Leachate Collection Pipe Wrap	

Miscellaneous Info:

Please note Manufacturer's Certification to the 100 sieve AOS. Please return three (3) copies of the reviewed/approved submittal to: Bruce Sekaly, 242 Bear Run Ln., Kernersville, NC 27284.

Certification Statement:

By this submittal, I hereby certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the Contract Drawings and Specifications except as noted.

Date: 07/22/2006

By: BSekaly
Bruce Sekaly

APPROVAL/NOTES:

- ☐ **No Exception Taken**
- ☐ **Make Corrections Noted**
- ☐ **Amend and Resubmit**
- ☐ **Rejected - See Remarks**

ngineer: _____ **Signed:** _____ **Date:** _____

SD=Shop Drawings/Data; M=Operation/Maintenance Manual; S=Sample; P=Preliminary Submittal; R=Request For Information

Engineered Synthetic Products, Inc.
212 North Way
Birmingham, AL 35242
(205)981-1900; FAX (205)981-1901
email: g_kscott@bellsouth.net

Wednesday, July 19, 2006

Mr. Kennedy Garber
Hallaton, Inc.
100 East Pennsylvania Avenue
Suite 203
Towson, MD 21286

Re: Marshall Station FGD Residue Landfill
Terrell, NC

Dear Mr. Garber:

We wish to certify that the Skaps Industries' GT-180 and GE-180 nonwovens to be supplied to the above project will meet the Apparent Opening Size requirement of a #100 sieve as stated in Table 5-2 of the project specifications. The GE-180 will be used on both sides of the Transnet 220 geonet and the GT-180 will be supplied separately. We will make some adjustments in our manufacturing of these products in order to meet the #100 sieve size requirement.

Sincerely,

Greg Scott
Engineered Synthetic Products, Inc.

Sales Office:
Engineered Synthetic Products, Inc.
Phone (770) 564-1857
Fax (770) 564-1818
www.espgeosynthetics.com

Geotextile Product Description Sheet

Marshall Station FGD Residual Landfill, Terrell, NC

SKAPS GT-180
8 oz Nonwoven Geotextile

SKAPS GT-180 is a needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, which are formed into a random network for dimensional stability. SKAPS GT-180 resists ultraviolet deterioration, rotting, biological degradation, naturally encountered basics and acids. Polypropylene is stable within a ph range of 2 to 13. SKAPS GT-180 conforms to the physical property values listed below:

PROPERTY	TEST METHOD	UNIT	M.A.R.V. (Minimum Average Roll Value)
Weight	ASTM D 5261	oz/sy	7.5
Grab Tensile	ASTM D 4632	lbs	200
Grab Elongation	ASTM D 4632	%	50
Trapezoid Tear Strength	ASTM D 4533	lbs	60
Puncture Resistance	ASTM D 4833	lbs	95
Mullen Burst Strength	ASTM D 3786	psi	275
Hydraulic Conductivity*	ASTM D 4491	cm/sec	0.2
AOS*	ASTM D 4751	US Sieve (mm)	100 (.150)
UV Resistance	ASTM D 4355	%/hrs	70/500

* At the time of manufacturing. Handling, storage, and shipping may change these properties.

PACKAGING	
Roll Dimensions (W x L) – ft	15 x 690
Square Yards Per Roll	1,150
Estimated Roll Weight - lbs	650

This information is provided for reference purposes only and is not intended as a warranty or guarantee. SKAPS assumes no liability in connection with the use of this information.

SKAPS Industries, 316 S. Holland Dr., Pendergrass, GA 30567, Phone (706) 693-3440, Fax (706) 693-3450, Email: info@skaps.com

Made in U.S.A.

4

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Project Start Date: 08/25/06
Project Location: Terrell, NC
Page: 1 of 4

Material: HDPE Textured
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
8/25/2006	T1	1:20	Slope	429118	22.5	72	1620
8/25/2006	T2	1:22	Slope	429118	22.5	73	1642.5
8/25/2006	T3	1:28	Slope	429118	22.5	71	1597.5
8/25/2006	T4	1:30	Slope	429118	22.5	54	1215
8/25/2006	T5	1:31	Slope	429118	8	33	264
8/25/2006	T6	1:34	Slope	429118	22.5	65	1462.5
8/25/2006	T7	1:40	Slope	429118	22.5	63	1417.5
8/25/2006	T8	1:41	Slope	429119	22.5	63	1417.5
8/25/2006	T9	1:45	Slope	429119	22.5	62	1395
8/25/2006	T10	1:50	Slope	429119	5	30	150
8/25/2006	T11	1:52	Slope	429119	22.5	60	1350
8/25/2006	T12	1:55	Slope	429119	22.5	60	1350
8/25/2006	T13	1:57	Slope	429119	22.5	57	1282.5
8/25/2006	T14	2:00	Slope	429119	22.5	55	1237.5
8/25/2006	T15	2:04	Slope	429119	22.5	54	1215
8/25/2006	T16	2:10	Slope	429239	4	23	92
8/25/2006	T17	2:15	Slope	429239	22.5	50	1125
8/25/2006	T18	2:18	Slope	429239	22.5	50	1125
8/25/2006	T19	2:20	Slope	429239	22.5	49	1102.5
8/25/2006	T20	2:23	Slope	429239	22.5	49	1102.5
8/25/2006	T21	2:25	Slope	429239	4	20	80
8/25/2006	T22	2:28	Slope	429239	22.5	48	1080
8/25/2006	T23	2:30	Slope	429239	22.5	46	1035
8/25/2006	T24	2:33	Slope	429239	22.5	46	1035
8/25/2006	T25	2:35	Slope	429239	22.5	45	1012.5
8/25/2006	T26	2:38	Slope	429232	3	20	60
8/25/2006	T27	2:40	Slope	429232	22.5	41	922.5
8/25/2006	T28	2:44	Slope	429232	22.5	41	922.5
8/25/2006	T29	2:49	Slope	429232	22.5	41	922.5
8/25/2006	T30	2:53	Slope	429232	22.5	41	922.5
8/25/2006	T31	2:56	Slope	429232	22.5	40	900
8/25/2006	T32	2:50	Slope	429232	3	17	51
8/25/2006	T33	3:00	Slope	429232	22.5	40	900
8/25/2006	T34	3:03	Slope	429232	22.5	45	1012.5
8/25/2006	T35	5:01	Slope	429232	22.5	70	1575
8/25/2006	T36	5:05	Slope	423237	6	32	192
8/25/2006	T37	5:10	Slope	423237	22.5	76	1710
8/25/2006	T38	5:13	Slope	423237	22.5	76	1710
8/25/2006	T39	5:20	Slope	423237	22.5	75	1687.5
8/25/2006	T40	5:21	Slope	423237	3	33	99
8/25/2006	T41	5:30	Slope	423237	22.5	78	1755
8/25/2006	T42	5:35	Slope	423237	22.5	78	1755
8/28/2006	T43	11:15	Slope	429230	22.5	80	1800
8/28/2006	T44	11:23	Slope	429230	22.5	77	1732.5
8/28/2006	T45	11:28	Slope	429230	22.5	77	1732.5
8/28/2006	T46	11:31	Slope	429230	22.5	78	1755
8/28/2006	T47	11:36	Slope	429230	22.5	81	1822.5
8/28/2006	T48	11:40	Slope	429116	22.5	80	1800
					Total This Page		55145.5

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Project Start Date: 08/25/06
Project Location: Terrell, NC
Page: 2 of 4

Material: HDPE Textured
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
8/28/2006	T49	11:46	Slope	429116	22.5	79	1777.5
8/28/2006	T50	11:51	Slope	429116	22.5	83	1867.5
8/28/2006	T51	11:58	Slope	429116	22.5	80	1800
8/28/2006	T52	12:00	Slope	429116	22.5	84	1890
8/28/2006	T53	12:05	Slope	429340	22.5	83	1867.5
8/28/2006	T54	12:10	Slope	429340	22.5	84	1890
8/28/2006	T55	12:20	Slope	429340	22.5	83	1867.5
8/28/2006	T56	12:22	Slope	429340	22.5	86	1935
8/28/2006	T57	12:28	Slope	429343	22.5	87	1957.5
8/28/2006	T58	12:34	Slope	429343	22.5	87	1957.5
8/28/2006	T59	12:40	Slope	429343	22.5	90	2025
8/28/2006	T60	12:43	Slope	429343	22.5	90	2025
8/28/2006	T61	12:50	Slope	429225	22.5	93	2092.5
8/28/2006	T62	1:00	Slope	429225	22.5	96	2160
8/28/2006	T63	1:05	Slope	429225	22.5	97	2182.5
8/28/2006	T64	1:10	Slope	429225	22.5	98	2205
8/28/2006	T65	1:28	Slope	429117	22.5	98	2205
8/28/2006	T66	5:40	Slope	429117	22.5	44	990
8/28/2006	T67	5:50	Slope	429117	22.5	50	1125
8/28/2006	T68	5:54	Slope	429117	22.5	50	1125
8/28/2006	T69	5:58	Slope	429117	22.5	56	1260
8/28/2006	T70	6:05	Slope	429117	22.5	56	1260
8/28/2006	T71	6:10	Slope	429117	22.5	50	1125
8/28/2006	T72	6:15	Slope	429117	22.5	60	1350
8/28/2006	T73	6:00	Slope	429117	5	24	120
8/28/2006	T68	5:54	Slope	429117	22.5	50	1125
8/28/2006	T69	5:58	Slope	429117	22.5	56	1260
8/28/2006	T70	6:05	Slope	429117	22.5	56	1260
8/28/2006	T71	6:10	Slope	429117	22.5	50	1125
8/28/2006	T72	6:15	Slope	429117	22.5	60	1350
8/28/2006	T73	6:00	Slope	429117	5	24	120
8/29/2006	T74	3:10	Slope	429115	22.5	70	1575
8/29/2006	T75	3:14	Slope	429115	22.5	66	1485
8/29/2006	T76	3:20	Slope	429115	22.5	66	1485
8/29/2006	T77	3:23	Slope	429115	22.5	64	1440
8/29/2006	T78	3:27	Slope	429115	22.5	63	1417.5
8/29/2006	T79	3:35	Slope	429115	22.5	61	1372.5
8/29/2006	T80	3:40	Slope	429238	22.5	59	1327.5
8/29/2006	T81	3:45	Slope	429238	22.5	58	1305
8/29/2006	T82	3:50	Slope	429238	22.5	58	1305
8/29/2006	T83	4:00	Slope	429238	22.5	55	1237.5
8/29/2006	T84	4:10	Slope	429238	22.5	53	1192.5
8/29/2006	T85	4:15	Slope	429238	22.5	50	1125
8/29/2006	T86	4:20	Slope	429238	22.5	49	1102.5
8/29/2006	T87	4:25	Slope	429236	22.5	47	1057.5
8/29/2006	T88	4:30	Slope	429236	22.5	46	1035
8/29/2006	T89	4:35	Slope	429236	22.5	43	967.5
8/29/2006	T90	4:40	Slope	429236	22.5	41	922.5
					Total This Page		69652.5

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Project Start Date: 08/25/06
Project Location: Terrell, NC
Page: 3 of 4

Material: HDPE Textured
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
8/29/2006	T91	4:45	Slope	429236	22.5	40	900
8/29/2006	T92	4:50	Slope	429236	22.5	40	900
8/29/2006	T93	5:05	Slope	429236	22.5	46	1035
8/29/2006	T94	5:10	Slope	429236	22.5	51	1147.5
8/29/2006	T95	5:15	Slope	429236	16	29	464
8/30/2006	T96	9:30	Slope	429233	22.5	71	1597.5
8/30/2006	T97	9:34	Slope	429233	22.5	73	1642.5
8/30/2006	T98	9:38	Slope	429233	22.5	75	1687.5
8/30/2006	T99	9:45	Slope	429233	22.5	77	1732.5
8/30/2006	T100	9:50	Slope	429233	22.5	79	1777.5
8/30/2006	T101	10:05	Slope	429235	22.5	81	1822.5
8/30/2006	T102	10:12	Slope	429235	22.5	84	1890
8/30/2006	T103	10:20	Slope	429235	22.5	84	1890
8/30/2006	T104	10:27	Slope	429235	22.5	87	1957.5
8/30/2006	T105	10:40	Slope	429228	22.5	89	2002.5
8/30/2006	T106	10:45	Slope	429228	22.5	92	2070
8/30/2006	T107	10:50	Slope	429228	22.5	93	2092.5
8/30/2006	T108	10:57	Slope	429228	22.5	97	2182.5
8/30/2006	T109	11:00	Slope	429227	22.5	100	2250
9/8/2006	T110	11:15	Slope	429227	22.5	81	1822.5
9/8/2006	T111	11:20	Slope	429227	22.5	85	1912.5
9/8/2006	T112	11:25	Slope	429114	22.5	85	1912.5
9/8/2006	T113	11:28	Slope	429114	22.5	90	2025
9/8/2006	T114	11:32	Slope	429114	22.5	97	2182.5
9/8/2006	T115	11:40	Slope	429114	22.5	100	2250
9/8/2006	T116	11:45	Slope	429227	22.5	75	1687.5
9/8/2006	T117	11:50	Slope	429227	11	37	407
9/8/2006	T118	12:15	Slope	429344	5	13	65
9/8/2006	T119	12:12	Slope	429344	20	47	940
9/8/2006	T120	12:10	Slope	429344	22.5	77	1732.5
9/8/2006	T121	12:05	Slope	429344	22.5	101	2272.5
9/8/2006	T122	12:00	Slope	429344	22.5	97	2182.5
9/8/2006	T123	12:20	Slope	429222	22.5	96	2160
9/8/2006	T124	12:25	Slope	429222	22.5	97	2182.5
9/8/2006	T125	12:30	Slope	429222	22.5	97	2182.5
9/8/2006	T126	12:35	Slope	429222	22.5	97	2182.5
9/8/2006	T127	12:38	Slope	429223	22.5	96	2160
9/8/2006	T128	12:40	Slope	429223	22.5	97	2182.5
9/8/2006	T129	12:42	Slope	429223	22.5	97	2182.5
9/8/2006	T130	12:48	Slope	429223	22.5	96	2160
9/8/2006	T131	12:53	Slope	429344	22.5	99	2227.5
9/8/2006	T132	4:30	Slope	429341	22.5	103	2317.5
9/8/2006	T133	4:35	Slope	429341	22.5	99	2227.5
9/8/2006	T134	4:40	Slope	429341	22.5	97	2182.5
9/8/2006	T135	4:50	Slope	429341	22.5	99	2227.5
9/9/2006	T136	2:20	Slope	429120	22.5	102	2295
9/9/2006	T137	2:25	Slope	429120	22.5	95	2137.5
9/9/2006	T138	2:30	Slope	429120	22.5	69	1552.5
					Total This Page		86993.5

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286

410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Project Start Date: 08/25/06

Project Location: Terrell, NC

Page: 4 of 4

Material: HDPE Textured

Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
9/9/2006	T139	2:35	Slope	429120	22.5	40	900
9/9/2006	T140	2:40	Slope	429120	22.5	31	697.5
9/9/2006	T141	2:50	Slope	429343	22.5	42	945
9/9/2006	T142	2:55	Slope	429343	10	20	200
9/9/2006	T143	3:05	Slope	429343	22.5	62	1395
9/9/2006	T144	3:10	Slope	429343	22.5	88	1980
9/9/2006	T145	3:15	Slope	429343	22.5	101	2272.5
9/9/2006	T146	3:19	Slope	429343	22.5	123	2767.5
9/9/2006	T147	3:25	Slope	429226	22.5	140	3150
9/9/2006	T148	3:33	Slope	429226	22.5	110	2475
9/9/2006	T149	3:40	Slope	429226	22.5	111	2497.5
9/9/2006	T150	3:50	Slope	429342	22.5	110	2475
9/8/2006	T151	3:00	Sump	429344	22.5	25	562.5
9/11/2006	T152	7:37	Slope	429342	22.5	135	3037.5
9/11/2006	T153	7:40	Slope	429342	22.5	113	2542.5
9/11/2006	T154	7:45	Slope	429224	22.5	113	2542.5
9/11/2006	T155	7:50	Slope	429224	22.5	115	2587.5
9/11/2006	T156	7:55	Slope	429224	22.5	125	2812.5
9/11/2006	T157	8:05	Slope	429229	22.5	122	2745
9/11/2006	T158	8:15	Slope	429229	22.5	115	2587.5
9/11/2006	T159	8:20	Slope	429229	22.5	103	2317.5
9/11/2006	T160	8:30	Slope	429231	22.5	58	1305
9/11/2006	T161	8:40	Slope	429231	10	12	120
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					Total This Page		44915

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Project Start Date: 08/25/06
Project Location: Terrell, NC
Page: 1 of 2

Material: HDPE Smooth
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
8/26/2006	S1	1:40	Floor	232234	22.5	430	9675
8/26/2006	S2	1:50	Floor	232232	22.5	435	9787.5
8/26/2006	S3	2:00	Floor	232235	22.5	437	9832.5
8/26/2006	S4	2:10	Floor	232109	22.5	439	9877.5
8/26/2006	S5	2:20	Floor	231352	22.5	438	9855
8/26/2006	S6	2:30	Floor	232103	22.5	437	9832.5
8/26/2006	S7	2:37	Floor	232233	22.5	436	9810
8/26/2006	S8	2:48	Floor	232122	22.5	430	9675
8/26/2006	S9	2:58	Floor	232228	22.5	431	9697.5
8/26/2006	S10	3:10	Floor	231357	22.5	431	9697.5
8/26/2006	S11	3:28	Floor	232116	22.5	430	9675
8/26/2006	S12	3:40	Floor	232102	22.5	433	9742.5
8/26/2006	S13	4:10	Floor	232105	22.5	434	9765
8/26/2006	S14	4:35	Floor	232112	22.5	436	9810
8/26/2006	S15	4:55	Floor	232227	22.5	420	9450
8/27/2006	S16	9:48	Floor	232104	22.5	420	9450
8/27/2006	S17	10:15	Floor	232236	22.5	396	8910
8/27/2006	S18	10:20	Floor	232236	13	26	338
8/27/2006	S19	10:46	Floor	232113	22.5	277	6232.5
8/27/2006	S20	10:56	Floor	232113	17	80	1360
8/27/2006	S21	11:10	Floor	232113	11	80	880
8/27/2006	S22	11:35	Floor	232106	22.5	439	9877.5
8/27/2006	S23	1:00	Floor	232237	22.5	439	9877.5
8/27/2006	S24	1:25	Floor	232225	22.5	441	9922.5
8/27/2006	S25	1:30	Floor	232110	22.5	440	9900
8/27/2006	S26	1:45	Floor	232111	22.5	440	9900
8/27/2006	S27	2:00	Floor	232119	22.5	439	9877.5
8/27/2006	S28	2:30	Floor	232108	22.5	439	9877.5
8/27/2006	S29	2:45	Floor	232121	22.5	440	9900
8/27/2006	S30	3:00	Floor	231358	22.5	436	9810
8/27/2006	S31	3:30	Floor	232101	22.5	433	9742.5
8/27/2006	S32	3:50	Floor	231356	22.5	435	9787.5
8/27/2006	S33	4:15	Floor	232230	22.5	432	9720
8/27/2006	S34	5:00	Floor	232117	22.5	430	9675
8/27/2006	S35	5:15	Floor	232226	22.5	365	8212.5
8/27/2006	S36	5:28	Floor	232226	16	105	1680
8/27/2006	S37	5:45	Floor	232115	22.5	190	4275
8/27/2006	S38	5:50	Floor	232115	22.5	129	2902.5
8/27/2006	S39	6:10	Floor	232115	11	80	880
8/28/2006	S40	3:30	Floor	232224	22.5	440	9900
8/28/2006	S41	3:45	Floor	232118	22.5	424	9540
8/28/2006	S42	4:00	Floor	232114	22.5	431	9697.5
8/28/2006	S43	4:15	Floor	232231	22.5	427	9607.5
8/28/2006	S44	4:25	Floor	231351	22.5	438	9855
8/28/2006	S45	4:45	Floor	232107	22.5	444	9990
8/29/2006	S46	10:40	Floor	231354	22.5	438	9855
8/29/2006	S47	10:50	Floor	231353	22.5	410	9225
8/29/2006	S48	11:00	Floor	231355	22.5	424	9540
					Total This Page		406380.5

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Panel Placement Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Project Start Date: 08/25/06
Project Location: Terrell, NC
Page: 2 of 2

Material: HDPE Smooth
Thickness: 60 mil

Date Deployed	Panel No.	Time Deployed	Panel Location	Roll No.	Width (FT)	Length (FT)	Area (SQ FT)
8/29/2006	S49	11:20	Floor	232229	22.5	433	9742.5
8/29/2006	S50	11:30	Floor	231247	22.5	393	8842.5
8/29/2006	S51	11:45	Floor	231284	22.5	378	8505
8/29/2006	S52	12:00	Floor	231249	22.5	343	7717.5
8/29/2006	S53	2:10	Floor	231250	22.5	416	9360
9/8/2006	S54	11:10	Floor	230120	22.5	132	2970
9/8/2006	S55	11:00	Floor	230120	22.5	137	3082.5
9/8/2006	S56	1:35	Floor	230130	22.5	148	3330
9/8/2006	S57	1:45	Floor	231359	22.5	157	3532.5
9/8/2006	S58	1:55	Floor	231359	22.5	170	3825
9/8/2006	S59	2:00	Floor	231246	22.5	95	2137.5
9/8/2006	S60	2:02	Floor	231359	22.5	85	1912.5
9/8/2006	S61	2:15	Floor	231246	22.5	197	4432.5
9/8/2006	S62	2:25	Floor	231246	22.5	146	3285
9/8/2006	S63	2:30	Floor	232123	22.5	55	1237.5
9/8/2006	S64	2:35	Floor	232123	22.5	226	5085
9/9/2006	S65	11:10	Floor	232123	22.5	147	3307.5
9/9/2006	S66	11:20	Floor	232240	22.5	104	2340
9/9/2006	S67	11:25	Floor	232240	22.5	271	6097.5
9/9/2006	S68	11:30	Floor	232240	22.5	61	1372.5
9/9/2006	S69	11:33	Floor	232241	22.5	211	4747.5
9/9/2006	S70	11:36	Floor	232241	22.5	197	4432.5
9/9/2006	S71	11:45	Floor	232238	22.5	85	1912.5
9/9/2006	S72	11:50	Floor	232238	22.5	288	6480
9/9/2006	S73	12:00	Floor	232238	22.5	52	1170
9/9/2006	S74	1:50	Floor	232239	22.5	240	5400
9/9/2006	S75	2:00	Floor	232239	22.5	190	4275
9/10/2006	S76	2:15	Floor	225362	22.5	50	1125
9/10/2006	S77	2:20	Floor	225362	22.5	247	5557.5
9/10/2006	S78	2:25	Floor	225362	22.5	104	2340
9/10/2006	S79	2:35	Floor	225240	22.5	128	2880
9/10/2006	S80	2:45	Floor	225240	22.5	196	4410
9/10/2006	S81	2:55	Floor	225240	22.5	75	1687.5
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					Total This Page		138532.5

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HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 1 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
1	AT	T41/42/S21	8/27/2006	P	2x2	MX8	HV	P	8/30/06
2	AT	T39/41/S21	8/27/2006	P	2x2	MX8	HV	P	8/30/06
3	AT	T38/39/S20	8/27/2006	P	2x2	MX8	HV	P	8/30/06
4	AT	S21/20/T38	8/27/2006	P	2x2	MX8	HV	P	8/30/06
5	AT	S20/T37/38	8/27/2006	P	2x2	MX8	HV	P	8/30/06
6	AT	S19/20/21	8/27/2006	P	2x2	MX8	HV	P	8/30/06
7	AT	T35/37/S20	8/27/2006	P	2x2	MX8	HV	P	8/30/06
8	AT	T1/35/S20	8/27/2006	P	4x4	MX8	HV	P	8/30/06
9	MD	T1 End of Panel	8/27/2006	P	2x2	MX8	HV	P	8/30/06
10	AT	T1/2/S20	8/27/2006	P	2x2	MX8	HV	P	8/30/06
11	AT	T2/3/S20	8/27/2006	P	2x2	MX8	HV	P	8/30/06
12	AT	T3/4/S20	8/27/2006	P	2x2	MX8	HV	P	8/30/06
13	AT	T4/6/S19/20	8/27/2006	P	5x3	MX8	HV	P	8/30/06
14	AT	T6/S18/19	8/27/2006	P	2x2	MX8	HV	P	8/30/06
15	AT	S17/18/19	8/27/2006	P	2x2	MX8	HV	P	8/30/06
16	MD	S18 Middle Panel	8/27/2006	P	1x1	MX8	HV	P	8/30/06
17	AT	T6/7/S18	8/27/2006	P	2x2	MX8	HV	P	8/30/06
18	AT	T7/8/S18	8/27/2006	P	2x2	MX8	HV	P	8/30/06
19	AT	T8/S17/18	8/27/2006	P	2x2	MX8	HV	P	8/30/06
20	AT	T8/9/S17	8/27/2006	P	2x2	MX8	HV	P	8/30/06
21	AT	T9/11/S17	8/27/2006	P	2x2	MX8	HV	P	8/30/06
22	AT	T11/S16/17	8/27/2006	P	2x2	MX8	HV	P	8/30/06
23	AT	T11/12/S16	8/27/2006	P	2x2	MX8	HV	P	8/30/06
24	AT	T12/13/S16	8/27/2006	P	2x2	MX8	HV	P	8/30/06
25	AT	S15/16/T13	8/27/2006	P	2x2	MX8	HV	P	8/30/06
26	AT	T13/14/S15	8/27/2006	P	2x2	MX8	HV	P	8/30/06
27	AT	S14/15/T14	8/27/2006	P	2x2	MX8	HV	P	8/30/06
28	AT	T14/15/S14	8/27/2006	P	2x2	MX8	HV	P	8/30/06
29	AT	T15/17/S13/14	8/27/2006	P	4x2	MX8	HV	P	8/30/06
30	AT	T17/18/S13	8/27/2006	P	2x2	MX8	HV	P	8/30/06
31	AT	S12/13/T18	8/27/2006	P	4x2	MX8	HV	P	8/30/06
32	DT14	S12/13 5>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
33	AT	T18/19/S12	8/27/2006	P	1x1	MX8	HV	P	8/30/06
34	AT	S11/12/T19	8/27/2006	P	2x2	MX8	HV	P	8/30/06
35	AT	T19/20/S11	8/27/2006	P	2x2	MX8	HV	P	8/30/06
36	AT	T20/S10/11	8/27/2006	P	2x2	MX8	HV	P	8/30/06
37	AT	T20/22/S10	8/27/2006	P	2x2	MX8	HV	P	8/30/06
38	AT	S9/10/T22/23	8/27/2006	P	4x3	MX8	HV	P	8/30/06
39	AT	T23/24/S8/9	8/27/2006	P	4x2	MX8	HV	P	8/30/06
40	AT	S7/8/T24/25	8/27/2006	P	2x2	MX8	HV	P	8/30/06

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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 2 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
41	AT	S6/7/T27/25	8/27/2006	P	3x3	MX8	HV	P	8/30/06
42	AT	T27/28/S6	8/27/2006	P	3x2	MX8	HV	P	8/30/06
43	AT	S5/6/T28	8/27/2006	P	3x3	MX8	HV	P	8/30/06
44	AT	T28/29/S5	8/27/2006	P	2x2	MX8	HV	P	8/30/06
45	AT	S4/5/T29	8/27/2006	P	2x2	MX8	HV	P	8/30/06
46	AT	T29/30/S4	8/27/2006	P	2x2	MX8	HV	P	8/30/06
47	AT	T30/S3/4	8/27/2006	P	2x2	MX8	HV	P	8/30/06
48	AT	T30/31/S3	8/27/2006	P	2x2	MX8	HV	P	8/30/06
49	AT	S2/3/T31	8/27/2006	P	2x2	MX8	HV	P	8/30/06
50	AT	T33/31/S2	8/27/2006	P	2x2	MX8	HV	P	8/30/06
51	AT	T33/S1/2	8/27/2006	P	2x2	MX8	HV	P	8/30/06
52	AT	T33/34/S1	8/27/2006	P	2x2	MX8	HV	P	8/30/06
53	AT	T31/32/33	8/27/2006	P	2x2	MX8	HV	P	8/30/06
54	AT	T25/26/27	8/27/2006	P	2x2	MX8	HV	P	8/30/06
55	DT2	T22/23 28'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
56	AT	T20/21/22	8/27/2006	P	2x1	MX8	HV	P	8/30/06
57	MD	T18 Mid Panel	8/27/2006	P	2x2	MX8	HV	P	8/30/06
58	AT	T15/16/17	8/27/2006	P	2x2	MX8	HV	P	8/30/06
59	AT	T9/10/11	8/27/2006	P	2x2	MX8	HV	P	8/30/06
60	DT1	T9/11 15'>EOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
61	AT	T3/4/5	8/27/2006	P	2x2	MX8	HV	P	8/30/06
62	AT	T35/36/37	8/27/2006	P	3x2	MX8	HV	P	8/30/06
63	DT3	T36/37 15'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
64	AT	T39/40/41	8/27/2006	P	2x2	MX8	HV	P	8/30/06
65	DT15	S14/15 350'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
66	DT13	S11/12 100'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
67	DT12	S10/11 160'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
68	DT11	S9/S10 240'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
69	DT10	S8/9 310'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
70	DT9	S7/8 375'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
71	DT8	S5/6 15'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
72	DT7	S4/5 75'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
73	DT6	S3/4 140'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
74	DT5	S2/3 205'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
75	DT4	S1/2 285'>BOS	8/27/2006	P	4x2	MX8	HV	P	8/30/06
76	AT	S1/2/22/23	8/28/2006	P	7x2	MX8	HV	P	8/30/06
77	SM	S2/23	8/28/2006	P	22.5x2	MX8	HV	P	8/30/06
78	AT	S2/3/23/24	8/28/2006	P	3x3	MX8	HV	P	8/30/06
79	SM	S3/24	8/28/2006	P	22.5x2	MX8	HV	P	8/30/06
80	AT	S3/4/24/25	8/28/2006	P	3x3	MX8	HV	P	8/30/06

Defect Code:
BO - Burn Out
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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 3 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
81	SM	S4/25	8/28/2006	P	22.5x2	MX8	HV	P	8/30/06
82	AT	S4/5/25/26	8/28/2006	P	3x3	MX8	HV	P	8/30/06
83	SM	S5/S26	8/28/2006	P	22.5x2	MX8	HV	P	8/30/06
84	AT	S5/6/26/27	8/28/2006	P	3x3	MX8	HV	P	8/30/06
85	AT	S6/7/27/28	8/28/2006	P	4x2	MX8	HV	P	8/30/06
86	AT	S7/8/28/29	8/28/2006	P	5x2	MX8	HV	P	8/30/06
87	AT	S8/929/30	8/28/2006	P	3x3	MX8	HV	P	8/30/06
88	AT	S9/10/30	8/28/2006	P	3x3	MX8	HV	P	8/30/06
89	AT	S10/30/31	8/28/2006	P	4x2	MX8	HV	P	8/30/06
90	AT	S10/11/31/32	8/28/2006	P	4x2	MX8	HV	P	8/30/06
91	AT	S11/12/32/33	8/28/2006	P	4x2	MX8	HV	P	8/30/06
92	AT	S12/13/33	8/28/2006	P	4x2	MX8	HV	P	8/30/06
93	AT	S33/34/13	8/28/2006	P	4x2	MX8	HV	P	8/30/06
94	AT	S13/14/34/35	8/28/2006	P	2x2	MX8	HV	P	8/30/06
95	AT	S14/15/35	8/28/2006	P	2x2	MX8	HV	P	8/30/06
96	AT	S15/37 BOS	8/28/2006	P	6x3	MX8	HV	P	8/30/06
97	AT	S15/37 10'>BOS	8/28/2006	P	5x2	MX8	HV	P	8/30/06
98	AT	S15/35/37	8/28/2006	P	3x2	MX8	HV	P	8/30/06
99	AT	S15/16/37	8/28/2006	P	4x2	MX8	HV	P	8/30/06
100	MD	S37/38/16	8/28/2006	P	1x1	MX8	HV	P	8/30/06
101	AT	S38 Top/Mid Panel	8/28/2006	P	4x2	MX8	HV	P	8/30/06
102	AT	S35/36/37	8/28/2006	P	2x2	MX8	HV	P	8/30/06
103	AT	T64/65/S35	8/28/2006	P	2x2	MX8	HV	P	8/30/06
104	AT	T63/64/S35	8/28/2006	P	2x2	MX8	HV	P	8/30/06
105	AT	T62/63/S35	8/28/2006	P	3x2	MX8	HV	P	8/30/06
106	DT36	T62/63 20'>EOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
107	WR/AT	T62/S35 18'>BOS	8/28/2006	P	3x3	MX8	HV	P	8/30/06
108	AT	T61/62/S35	8/28/2006	P	3x3	MX8	HV	P	8/30/06
109	AT	T60/61/S35	8/28/2006	P	2x2	MX8	HV	P	8/30/06
110	AT	T60/S35/36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
111	AT	T59/60/S36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
112	AT	T58/59/S36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
113	WR/AT	T58/S36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
114	AT	T57/58/S36	8/28/2006	P	2x3	MX8	HV	P	8/30/06
115	WR/AT	T57/S36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
116	AT	T56/57/S36	8/28/2006	P	2x2	MX8	HV	P	8/30/06
117	DT35	T56/57 60'>BOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
118	AT	T56/S36/37/38	8/28/2006	P	3x2	MX8	HV	P	8/30/06
119	AT	T55/56/S38	8/28/2006	P	2x2	MX8	HV	P	8/30/06
120	AT	T54/55/S38	8/29/2006	P	3x2	MX8	HV	P	8/30/06

Defect Code:

BO - Burn Out
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FT – Pressure Test Cut
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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
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Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 4 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
121	AT	T53/54/S38	8/29/2006	P	2x2	MX8	HV	P	8/30/06
122	AT	T52/53/S38	8/29/2006	P	2x2	MX8	HV	P	8/30/06
123	AT	T51/52/S38/39	8/29/2006	P	3x2	MX8	HV	P	8/30/06
124	AT	T50/51/S39	8/29/2006	P	2x2	MX8	HV	P	8/30/06
125	AT	T49/50/S39	8/29/2006	P	2x2	MX8	HV	P	8/30/06
126	AT	T48/49/S39	8/29/2006	P	2x2	MX8	HV	P	8/30/06
127	AT	T48/S39/17	8/29/2006	P	2x2	MX8	HV	P	8/30/06
128	AT	T47/48/S17	8/29/2006	P	2x2	MX8	HV	P	8/30/06
129	AT	T47/S17/19/17	8/29/2006	P	2x2	MX8	HV	P	8/30/06
130	BO/AT	T47/S19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
131	AT	T46/47/S19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
132	AT	T45/46/S19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
133	AT	T44/45/S19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
134	AT	T43/44/S19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
135	DT51	T43/S19	8/30/2006	P	5x2	MX8	HV	P	8/30/06
136	AT	T43/S21/19	8/29/2006	P	2x2	MX8	HV	P	8/30/06
137	AT	T42/43/S21	8/29/2006	P	5x2	MX8	HV	P	8/30/06
138	DT32	S35/37 200'>BOS	8/30/2006	P	4x2	MX8	HV	P	8/30/06
139	DT31	S34/35 200'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
140	DT30	S33/34 150'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
141	DT28	S31/32 350'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
142	DT29	S32/33 300'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
143	DT27	S30/31 80'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
144	DT26	S29/30 15'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
145	DT25	S28/29 8'>EOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
146	DT23	S26/27 70'>EOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
147	DT22	S25/26 200'>BOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
148	DT20	S23/24 250'>EOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
149	DT21	S24/25 315'>EOS	8/28/2006	P	4x2	MX8	HV	P	8/30/06
150	DT43	S22/46 25'>BOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
151	DT44	S47/48 41'>EOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
152	DT45	S48/49 112'>BOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
153	DT46	S49/50 188'>EOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
154	DT47	S50/51 100'>EOS	8/29/2006	P	4x2	MX8	HV	P	8/30/06
155	AT	S51/52/53/S45	8/29/2006	P	4x2	MX8	HV	P	8/30/06
156	AT	S44/45/50/51	8/29/2006	P	2x2	MX8	HV	P	8/30/06
157	BO/AT	S49/50	8/29/2006	P	2x2	MX8	HV	P	8/30/06
158	AT	S49/50/43/44	8/29/2006	P	3x2	MX8	HV	P	8/30/06
159	AT	S48/49/42/43	8/29/2006	P	3x2	MX8	HV	P	8/30/06
160	AT	S41/42/47/48	8/29/2006	P	2x2	MX8	HV	P	8/30/06

Defect Code:

BO - Burn Out
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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

HALLATON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 5 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
161	AT	S40/41/46/47	8/29/2006	P	2x2	MX8	HV	P	9/1/06
162	AT	S46/40/22	8/29/2006	P	3x3	MX8	HV	P	9/1/06
163	BO/AT	S22/40	8/29/2006	P	1x1	MX8	HV	P	9/1/06
164	AT	S22/1/40	8/29/2006	P	3x2	MX8	HV	P	9/1/06
165	DT37	S1/40 175'>BOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
166	DT38	S40/41 95'>EOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
167	DT39	S41/42 25'>BOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
168	DT40	S43/44 85'>EOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
169	DT41	S44/45 270'>EOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
170	DT48	S45/53 45'>BOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
171	AT	T34/S1/40	8/29/2006	P	3x2	MX8	HV	P	9/1/06
172	AT	T34/66/S40	8/29/2006	P	2x2	MX8	HV	P	9/1/06
173	AT	T66/S40/41	8/29/2006	P	2x2	MX8	HV	P	9/1/06
174	AT	T66/67/S41	8/29/2006	P	2x2	MX8	HV	P	9/1/06
175	AT	T67/68/S41	8/30/2006	P	2x2	MX8	HV	P	9/1/06
176	AT	T68/S41/42	8/29/2006	P	2x2	MX8	HV	P	9/1/06
177	AT	T68/69/S42	8/29/2006	P	2x2	MX8	HV	P	9/1/06
178	AT	T68/69/73	8/30/2006	P	4x2	MX8	HV	P	9/1/06
179	BO/AT	T68/73 15'>BOS	8/28/2006	P	2x2	MX8	HV	P	9/1/06
180	DT42	T69/70 15'>EOS	8/28/2006	P	5x2	MX8	HV	P	9/1/06
181	AT	T69/S42/43	8/28/2006	P	2x2	MX8	HV	P	9/1/06
182	AT	T69/70 /S43	8/28/2006	P	3x2	MX8	HV	P	9/1/06
183	AT	T70/S43/44	8/28/2006	P	2x2	MX8	HV	P	9/1/06
184	AT	T70/71/S44	8/28/2006	P	1x1	MX8	HV	P	9/1/06
185	AT	T71/S44	8/28/2006	P	2x2	MX8	HV	P	9/1/06
186	AT	T71/72/S44	8/28/2006	P	2x2	MX8	HV	P	9/1/06
187	AT	T72/S44/45	8/28/2006	P	1x1	MX8	HV	P	9/1/06
188	AT	T94/T72/S45	8/30/2006	P	3x2	MX8	HV	P	9/1/06
189	AT	T93/94/S45	8/30/2006	P	2x2	MX8	HV	P	9/1/06
190	AT	T93/94/95	8/30/2006	P	3x2	MX8	HV	P	9/1/06
191	AT	T92/93/S53	8/30/2006	P	5x3	MX8	HV	P	9/1/06
192	AT	T91/92/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
193	AT	T90/91/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
194	AT	T89/90/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
195	AT	T88/89/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
196	AT	T87/88/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
197	AT	T86/87/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
198	AT	T85/86/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
199	DT50	T85/86 20'>BOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
200	AT	T84/85/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06

Defect Code:
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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 6 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
201	AT	T83/84/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
202	AT	T82/83/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
203	AT	T81/82/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
204	AT	T80/81/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
205	AT	T80/S53	8/30/2006	P	1x1	MX8	HV	P	9/1/06
206	AT	T79/80/S53	8/30/2006	P	3x2	MX8	HV	P	9/1/06
207	AT	T79/S53	8/30/2006	P	2x1	MX8	HV	P	9/1/06
208	AT	T78/79/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
209	AT	T77/78/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
210	AT	T76/77/S53	8/30/2006	P	2x2	MX8	HV	P	9/1/06
211	DT49	T76/77 7'>BOS	8/30/2006	P	5x2	MX8	HV	P	9/1/06
212	AT	T75/76/S53	8/29/2006	P	2x2	MX8	HV	P	9/1/06
213	AT	T74/75/S52/53	8/29/2006	P	4x2	MX8	HV	P	9/1/06
214	BO/AT	T74/75 10'>BOS	8/29/2006	P	3x2	MX8	HV	P	9/1/06
215	AT	T74/96/S52	8/30/2006	P	3x2	MX8	HV	P	9/1/06
216	AT	T96/97/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
217	AT	T97/98/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
218	AT	T98/T99/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
219	AT	T99/100/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
220	AT	T100/101/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
221	AT	T101/102/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
222	AT	T102/103/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
223	DT54	T103/S52 130'>BOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
224	AT	T103/104/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
225	AT	T104/105/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
226	AT	T105/106/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
227	AT	T106/107/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
228	AT	T107/108/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
229	AT	T108/109/S52	8/30/2006	P	2x2	MX8	HV	P	9/1/06
230	DT53	T88/S53 90'>EOS	8/30/2006	P	5x2	MX8	HV	P	9/1/06
231	DT16	S15/16 26'>EOS	8/28/2006	P	4x2	MX8	HV	P	9/1/06
232	DT17	S16/17 216'>BOS	8/28/2006	P	4x2	MX8	HV	P	9/1/06
233	DT18	S17/19 228'>BOS	8/28/2006	P	4x2	MX8	HV	P	9/1/06
234	DT19	S22/23 200'>BOS	8/28/2006	P	4x2	MX8	HV	P	9/1/06
235	DT33	T43/44 10'>BOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
236	DT34	T49/50 8'>BOS	8/29/2006	P	4x2	MX8	HV	P	9/1/06
237	DT43	S22/46 22'>BOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
238	DT44	S47/48 40'>EOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
239	DT45	S48/49 310'>EOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06
240	DT46	S49/50 170'>EOS	8/30/2006	P	4x2	MX8	HV	P	9/1/06

Defect Code:

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FM – Fishmouth
FT – Pressure Test Cut
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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 7 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
241	DT47	S50/51 279'>BOS	8/30/2006	P	4x2	MX8	HV	Pass	9/1/06
242	DT52	T22/S10 8'>BOS	8/30/2006	P	4x2	MX8	HV	Pass	9/1/06
243	DT55	S10/31 10'>BOS	8/30/2006	P	4x2	MX8	HV	Pass	9/1/06
244	AT	T109/110/S54	9/9/2006	P	2x2	MX8	HV	Pass	9/10/06
245	AT	T109/S54 3'>EOS	9/9/2006	P	2x2	MX8	HV	Pass	9/10/06
246	DT56	T109/110 65'>BOS	9/9/2006	P	4x2	MX8	HV	Pass	9/10/06
247	AT	T110/111/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
248	AT	T111/112/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
249	AT	T112/113/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
250	AT	T113/114/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
251	AT	T114/115/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
252	AT	T115/121/S54	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
253	AT	T121/120/115	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
254	AT	T120/115/116	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
255	AT	T120/119/116	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
256	AT	T119/116/117	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
257	AT	T118/119/117	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
258	DT57	T115/116 58'>BOS	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
259	AT	T121/122/S54	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
260	AT	T122/S54/55	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
261	AT	T122/123/S55	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
262	DT58	T122/123 10'>BOS	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
263	AT	T123/124/S55/56	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
264	MD	1' E S55/56 3' N S56/24	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
265	AT	T124/125/S56/57	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
266	AT	T125/126/S57	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
267	AT	T126/S57/58	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
268	AT	T126/127/S58	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
269	AT	T127/S58/59	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
270	AT	T127/128/S59	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
271	AT	T128/S59/61	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
272	AT	T128/129/S61	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
273	AT	T129/S61/63	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
274	AT	T129/130/S63	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
275	AT	T130/S63/64	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
276	AT	T130/131/S64	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
277	AT	S63/64/62	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
278	AT	S61/62/63	9/8/2006	P	4x2	MX8	HV	Pass	9/10/06
279	DT59	T128/129 50'>EOS	9/9/2006	P	4x2	MX8	HV	Pass	9/10/06
280	AT	S59/60/61	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06

Defect Code:

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FT – Pressure Test Cut
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MD - Material Damage
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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.

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410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 8 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
281	AT	S58/59/60	9/8/2006	P	2x2	MX8	HV	Pass	9/10/06
282	DT62	S59/61 50'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
283	DT61	S56/57 130'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
284	AT	T109/S52/54	9/9/2006	P	3x2	MX9	HV	Pass	9/10/06
285	AT	S52/54/55	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
286	AT	S51/52/55/56	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
287	AT	S50/51/56/57	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
288	AT	S49/50/57/58	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
289	AT	S48/49/58/60	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
290	AT	S47/48/60/61	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
291	DT63	S47/61 12'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
292	AT	S46/47/61/62	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
293	MD	2' N S46/62 3' E S46/47	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
294	AT	S46/62/64	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
295	AT	S46/22/64	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
296	MD	3' N S22/64 2' E S46/22	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
297	MD	3' N S22/64 5' E S46/22	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
298	MD	3' N S22/64 9' E S46/22	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
299	MD	6' N S22/64 5' E S46/22	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
300	AT	T131/S64/66	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
301	AT	T131/132/S60	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
302	AT	T132/S66/67	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
303	AT	T132/133/S67	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
304	AT	T133/S67/69	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
305	AT	T133/134/S69	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
306	DT60	T133/134 80'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
307	AT	S69/71/T134	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
308	AT	S71/T134/135	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
309	AT	S71/72/T135/136	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
310	AT	S72/74/T136/137	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
311	AT	S74/T151/137	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
312	AT	T151/137 7'>BOS	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
313	AT	T137/138/151	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
314	AT	T144/151/138	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
315	AT	T138/139/143/144	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
316	AT	T139/140/141/143	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
317	DT65	T139/140 20'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
318	AT	T140/141/142	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
319	DT66	T147/148 85'>BOS	9/9/2006	P	4x2	MX9	HV	Pass	9/10/06
320	AT	T145/146/151	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06

Defect Code:

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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 9 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
321	AT	T146/151/S74	9/9/2006	P	2x2	MX9	HV	Pass	9/10/06
322	AT	T146/147/S74	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
323	AT	S70/71/72	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
324	AT	S69/70/71	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
325	AT	S73/74/75	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
326	AT	S72/73/74	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
327	DT70	S72/74 50'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
328	AT	S68/69/70	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
329	AT	S47/68/69	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
330	DT69	S68/70 30'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
331	AT	S65/66/67	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
332	AT	S64/65/66	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
333	DT67	S62/64 30'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
334	DT68	S65/67 6'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
335	AT	S73/75/28/29	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
336	AT	S72/73/27/28	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
337	AT	S26/27/70/72	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
338	AT	S25/26/68/70	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
339	AT	S24/25/67/68	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
340	AT	S23/24/65/67	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
341	AT	S74/76/T147	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
342	AT	S76/77/T147	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
343	AT	S77/T147/148	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
344	AT	S77/79/T148	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
345	AT	T1148/149/S79	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
346	DT73	S79/T149 4'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
347	AT	T149/150/S79/80	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
348	AT	S74/75/76	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
349	AT	S75/76/77	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
350	AT	S77/78/79	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
351	AT	S78/79/80	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
352	DT71	S75/77 75'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
353	DT72	S78/80 50'>BOS	9/10/2006	P	4x2	MX9	HV	Pass	9/10/06
354	AT	S33/34/81	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
355	AT	T65/S34 12'>BOS	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
356	AT	S80/81/33/32	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
357	AT	S78/80/31/32	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
358	AT	S77/78/30/31	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
359	AT	S75/77/29/30	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06
360	AT	T150/152/S80	9/10/2006	P	2x2	MX9	HV	Pass	9/10/06

Defect Code:

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WR - Wrinkle
WS - Welder restart
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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.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Repair Log

Project No.: 0623-5106
Project Name: Marshall Steam Sation
Project Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 10 of 10

Material: HDPE
Thickness: 60 mil

Repair #	Defect Code	Defect Location	Repair Date	Repair Type	Approx Size	Machine ID	Repair Tech	Vacuum Test	
								P/F	Date
T361	AT	T152/159/160	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
362	AT	T152/160/161	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
363	DT74	T160/161 6'>BOS	9/12/2006	P	4x2	MX9	HV	Pass	9/10/06
364	AT	T152/159/S80	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
365	AT	T158/159/S80	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
366	AT	T157/158/S80	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
367	MD	5' E S80/T157 2' N T157/158	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
368	AT	T156/157/S80	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
369	AT	S80/81/T156	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
370	AT	T155/156/S81	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
371	DT75	T155/156 100'>BOS	9/12/2006	P	4x2	MX9	HV	Pass	9/10/06
372	AT	T154/155/S81	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
373	MD	1' E S81/154 12'>BOS	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
374	MD	1' E S81/154 10' S153/154	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
375	AT	S81/T153/154	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
376	AT	S81/34/T153	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
377	AT	S34/T65/153	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
378	MD	20' E R378 1' N T153/65	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
379	DT76	T65/153 40'>EOS	9/12/2006	P	4x2	MX9	HV	Pass	9/10/06
380	MD	1' E S80/T150 12' S T 150/152	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
381	MD	10' E S80/T150 12' S T150/152	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
382	MD	15' E S80/T150 12' S T150/152	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
383	AT	T144/145/151	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
384	AT	S64/65/22/23	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06
385	AT	S38/39/16/17	9/12/2006	P	2x2	MX9	HV	Pass	9/10/06

Defect Code:
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GB-Grind & Bead
BT-Boot

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6

HALLAHON, INC.
100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 Fax 410-583-7720

Geomembrane Field Trial Seam Log

Project No.: 0623-5106
Project Name: Marshall Station
Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 1 of 4

Material: sm and Tx
60 mil Thickness

Project Seam Requirements

	Fusion:	Extrusion:
Peel:		
Shear:		

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	8/25/2006	1:50	92	M10	HT	850/70		91	91	86			121	122	127			Pass	HT	
								102	89	95										
2	8/25/2006	1:55	92	M10	HT	850/58		95	98	96			112	113	111			Pass	HT	
								90	97	91										
3	8/25/2006	2:00	92	M13	MR	850/70		88	100	98			131	113	103			Pass	MR	
								117	120	93										
4	8/25/2006	2:05	92	M8	JO	850/70		85	101	95			106	126	119			Pass	JO	
								92	90	91										
5	8/25/2006	2:10	92	M8	JO	860/550		98	92	90			119	121	120			Pass	JO	
								96	88	94										
6	8/26/2006	1:45	94	M8	JO	860/70		99	100	95			120	124	121			Pass	JO	
								91	100	110										
7	8/26/2006	1:55	92	M10	HT	850/72		102	108	101			120	122	120			Pass	HT	
								106	108	103										
8	8/26/2006	2:05	92	M13	MR	850/70		105	104	108			111	117	118			Pass	MR	
								101	104	106										
9	8/27/2006	7:33	93	M10	ER	860/60		120	119	123			160	162	164			Pass	ER	
								125	121	`120										
10	8/27/2006	7:45	65	MX8	HV		500/400	98	103	108			149	147	149			Pass	HV	
11	8/27/2006	7:57	65	M8	JO	860/70		117	127	123			143	151	151			Pass	JO	
								115	114	117										
12	8/27/2006	8:10	65	M13	MR	850/70		131	132	130			135	145	131			Pass	MR	
								132	123	132										
13	8/27/2006	1:16	90	MX8	HV		500/400	100	101	116			119	129	124			Pass	HV	
14	8/27/2006	1:50	90	M10	ER	860/70		111	115	113			128	139	131			Pass	ER	
								104	107	108										

HALLAYON, INC.
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Geomembrane Field Trial Seam Log

Project No.: 0623-5106
Project Name: Marshall Station
Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 2 of 4

Material: sm and Tx

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

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	8/27/2006	2:25	90	M8	JO	860/70		98	99	98			131	129	127			P	JO	SM/SM
								101	115	99										
16	8/27/2006	2:40	90	M13	MR	860/68		111	105	104			119	124	118			P	MR	SM/SM
								104	107	106										
17	8/28/2006	7:40	75	MX8	HV		500/400	108	119	117			140	150	148			P	HV	TX/TX
18	8/28/2006	8:25	75	M8	JO	850/680		107	109	109			141	148	141			P	JO	SM/SM
								120	119	122										
19	8/28/2006	8:40	75	M13	MR	850/650		104	125	120			156	164	159			P	MR	SM/SM
								124	114	114										
20	8/28/2006	12:00	85	M10	HT	850/650		113	103	110			133	131	135			P	HT	SM/SM
								109	108	106										
21	8/28/2006	12:05	85	M10	HT	850/620		100	103	101			141	138	143			P	HT	SM/TX
								108	105	107										
22	8/28/2006	2:00	85	M8	JO	850/650		100	109	112			146	139	140			P	JO	SM/SM
								117	116	121										
23	8/28/2006	2:15	85	M13	MR	850/630		101	94	106			121	127	120			P	MR	SM/SM
								97	95	105										
24	8/28/2006	12:20	85	MX8	HV		500/400	95	99	96			122	126	130			P	HV	TX/TX
25	8/29/2006	7:30	75	MX8	HV		500/400	108	120	115			135	140	138			P	HV	TX/TX
26	8/29/2006	10:00	80	M10	HT	850/700		108	110	104			129	133	127			P	HT	SM/SM
								105	110	101										
27	8/29/2006	10:52	80	M8	JO	860/700		100	110	112			148	141	151			P	JO	SM/SM
								106	114	115										
28	8/29/2006	11:05	80	M13	MR	850/700		99	102	98			140	135	145			P	MR	SM/SM
								100	106	100										

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Geomembrane Field Trial Seam Log

Project No.: 0623-5106
Project Name: Marshall Station
Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 3 of 4

Material: sm and Tx

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

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	8/29/2006	1:45	85	MX8	HV		500/400	97	98	97			127	129	134			Pass	HV	TX/TX
30	8/29/2006	2:00	85	M13	MR	850/600		122 97	102 106	109 116			132	132	128			Pass	MR	SM/TX
31	8/29/2006	2:10	85	M8	JO	850/620		110 110	109 112	105 99			125	127	120			Pass	JO	SM/TX
32	8/30/2006	8:00	77	MX8	HV		500/400	108	105	97			150	147	142			Pass	HV	TX/TX
33	8/30/2006	9:25	78	M8	JO	860/650		117 106	115 110	120 119			160	171	166			Pass	JO	SM/SM
34	8/30/2006	9:35	78	M13	MR	850/650		120 131	121 115	110 121			146	140	166			Pass	MR	SM/SM
35	8/30/2006	10:15	75	M10	HT	850/620		113 110	119 109	116 111			135	132	133			Pass	HT	SM/TX
36	8/30/2006	1:30	85	MX8	HV		500/400	95	95	100			128	136	130			Pass	HV	TX/TX
37	9/8/2006	11:07	75	M8	JO	850/700		109 115	117 112	117 121			160	157	163			Pass	JO	SM/SM
38	9/8/2006	11:15	75	M13	MR	850/650		122 106	118 109	107 126			165	163	170			Pass	MR	SM/SM
39	9/8/2006	11:28	75	M10	HT	850/620		107 118	124 120	119 117			151	147	146			Pass	HT	SM/TX
40	9/8/2006	12:45	75	M11	IF	850/650		110 113	109 113	111 112			153	150	143			Pass	IF	SM/SM
41	9/8/2006	1:45	80	M11	IF	850/620		96 95	98 94	97 93			127	130	129			Pass	IF	SM/TX
42	9/8/2006	2:38	80	MX9	HV		500/390	109	98	104			148	136	143			Pass	HV	TX/TX

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Geomembrane Field Trial Seam Log

Project No.: 0623-5106
Project Name: Marshall Station
Start Date: 8/25/2006
Project Location: Terrell, NC
Page: 4 of 4

Material: sm and Tx

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

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			
43	9/9/2006	11:20	80	M10	HT	850/700		109 115	109 108	114 120			132	133	138			P	HT	SM/SM
44	9/9/2006	11:24	89	M13	MR	850/700		122 128	126 109	123 110			131	125	135			P	MR	SM/SM
45	9/9/2006	11:31	89	M8	JO	860/700		112 115	109 109	111 106			153	150	146			P	JO	SM/SM
46	9/9/2006	16:10	90	MX9	HV		500/400	109	110	105			129	132	140			P	HV	SM/SM
47	9/10/2006	14:45	88	M8	JO	860/700		110 105	102 108	106 107			132	140	137			P	JO	SM/SM
48	9/10/2006	15:00	88	M13	MR	850/700		117 120	118 119	115 139			143	138	129			P	MR	SM/SM
49	9/11/2006	18:50	77	M8	JO	860/650		126 128	137 128	125 130			171	159	162			P	JO	SM/SM
50	9/11/2006	19:00	75	M10	HT	850/650		111 117	121 116	118 115			168	167	172			P	HT	SM/SM
51	9/11/2006	19:10	75	M13	MR	850/650		111 124	102 118	112 129			177	175	174			P	MR	SM/SM
52	9/11/2006	8:00	75	MX9	HV		500/400	112	109	108			129	136	140			P	HV	SM/SM
53	9/12/2006	8:00	70	M10	HT	850/620		99 90	101 109	100 103			140	167	140			P	HT	SM/TX
54	9/12/2006	8:15	70	MX9	HV		500/400	104	111	117			139	142	121			P	HV	SM/TX

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

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Material: _____

_____ mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
1	T9/11	8/27/2006	M*	JO	860/70%		96	82									P	RK	
							90	92											
2	T22/23	8/27/2006	M8	JO	860/70%		93	103									P	RK	
							112	104											
3	T36/37	8/27/2006	M13	MR	860/70%		92	107									P	RK	
							111	90											
4	S1/2	8/27/2006	M8	JO	860/70%		89	91									P	RK	
							99	101											
5	S2/3	8/27/2006	M10	HT	860/70%		91	99									P	RK	
							87	100											
6	S3/4	8/27/2006	M13	MR	860/70%		92	101									P	RK	
							90	108											
7	S4/5	8/27/2006	M8	JO	860/70%		91	91									P	RK	
							89	89											
8	S5/6	8/27/2006	M10	HT	860/70%		92	96									P	RK	
							89	91											
9	S7/8	8/27/2006	M8	JO	860/70%		101	87									P	RK	
							91	112											
10	S8/9	8/27/2006	M10	HT	860/70%		95	95									P	RK	
							91	95											
11	S9/10	8/27/2006	M13	MR	860/70%		96	92									P	RK	
							91	98											
12	S10/11	8/27/2006	M8	JO	860/70%		108	93									P	RK	
							99	101											
13	S11/12	8/27/2006	M10	HT	860/70%		87	98									P	RK	
							83	93											

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

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Material: Smooth/Textured

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
14	S12/13	8/27/2006	M13	MR	860/70%		92	95									P	RK	
							92	93											
15	S14/15	8/27/2006	M10	HT	860/70%		101	92									P	RK	
							99	94											
16	S15/16	8/28/2006	M8	JO	860/70%		123	115									P	MS	
							119	97											
17	S16/17	8/28/2006	M13	MR	860/70%		101	106									P	MS	
							124	118											
18	S17/19	8/28/2006	M8	JO	860/70%		94	97									P	MS	
							125	102											
19	S22/23	8/28/2006	M8	JO	860/70%		94	101									P	MS	
							90	105											
20	S23/24	8/28/2006	M13	MR	860/70%		112	119									P	MS	
							109	105											
21	S24/25	8/28/2006	M10	HT	860/70%		106	98									P	MS	
							108	115											
22	S25/26	8/28/2006	M8	JO	860/70%		104	94									P	MS	
							98	105											
23	S26/27	8/28/2006	M13	MR	860/70%		104	121									P	MS	
							118	104											
24	S27/28	8/28/2006	M10	HT	860/70%		101	104									P	MS	
							107	108											
25	S28/29	8/28/2006	M8	JO	860/70%		92	92									P	MS	
							103	94											
26	S29/30	8/28/2006	M13	MR	860/70%		99	107									P	MS	
							96	90											

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

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Material: Smooth/Textured

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
27	S30/31	8/28/2006	M10	HT	860/70%		107	101									P	MS	
							102	96											
28	S31/32	8/28/2006	M8	JO	860/70%		98	100									P	MS	
							100	96											
29	S32/33	8/28/2006	M13	MR	860/70%		90	103									P	MS	
							107	92											
30	S33/34	8/28/2006	M8	JO	860/70%		94	96									P	MS	
							104	102											
31	S34/35	8/28/2006	M13	MR	860/70%		102	91									P	MS	
							94	105											
32	S35/37	8/28/2006	M8	JO	860/70%		95	96									P	MS	
							98	99											
33	T43/44	8/29/2006	M13	MR	860/70%		97	104									P	MS	
							118	105											
34	T49/50	8/29/2006	M13	MR	860/70%		108	108									P	MS	
							94	116											
35	T56/57	8/29/2006	M10	HT	860/70%		117	116									P	MS	
							114	113											
36	T62/63	8/29/2006	M8	JO	860/70%		94	90									P	MS	
							102	101											
37	S51/40	8/29/2006	M13	MR	860/70%		91	95									P	MS	
							98	97											
38	S40/41	8/29/2006	M8	JO	860/70%		103	100									P	MS	
							96	97											
39	S41/42	8/29/2006	M10	HT	860/70%		93	98									P	MS	
							94	101											

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

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Material: Smooth/Textured

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
40	S43/44	8/29/2006	M8	JO	860/70%		102	93									P	MS	
							99	106											
41	S44/45	8/29/2006	M10	HT	860/70%		94	90									P	MS	
							95	96											
42	S32/33	8/29/2006	M13	MR	860/70%		108	102									P	MS	
							112	117											
43	S33/34	8/30/2006	M10	HT	860/70%		90	93									P	MS	
							90	94											
44	S34/35	8/30/2006	M13	MR	860/70%		91	94									P	MS	
							97	90											
45	S35/37	8/30/2006	M10	HT	860/70%		91	91									P	MS	
							93	94											
46	T43/44	8/30/2006	M8	JO	860/70%		91	96									P	MS	
							94	91											
47	T49/50	8/30/2006	M13	MR	860/70%		94	91									P	MS	
							94	94											
48	T56/57	8/30/2006	M10	HT	860/70%		91	94									P	MS	
							92	96											
49	T62/63	8/30/2006	M8	JO	860/70%		97	97									P	MS	
							92	107											
50	S51/40	8/30/2006	M13	MR	860/70%		100	101									P	MS	
							103	107											
51	S40/41	8/30/2006	M10	HT	860/70%		92	116									P	MS	
							109	94											
52	S41/42	8/30/2006	M10	HT	860/70%		102	101									P	MS	
							105	108											

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

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Material: Smooth/Textured

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
53	T88/S53	8/30/2006	M10	HT	860/70%		101	93									P	MS	
							102	92											
54	S52/T103	8/30/2006	M10	HT	860/70%		102	91									P	MS	
							93	108											
55	S10/31	8/30/2006	M10	HT	860/70%		103	106									P	MS	
							115	109											
56	T109/110	9/9/2006	M13	MR	860/70%		95	116									P	MS	
							109	93											
57	T115/116	9/9/2006	M10	HT	860/70%		107	109									P	MS	
							114	119											
58	T122/123	9/9/2006	M10	HT	860/70%		111	109									P	MS	
							100	97											
59	T128/129	9/9/2006	M8	JO	860/70%		96	107									P	MS	
							104	112											
60	T133/134	9/9/2006	M8	JO	860/70%		91	97									P	MS	
							103	101											
61	S55/56	9/9/2006	M11	IF	860/70%		93	96									P	MS	
							86	82											
62	S59/61	9/9/2006	M8	JO	860/70%		111	122									P	MS	
							90	98											
63	S61/47	9/9/2006	M10	HT	860/70%		100	112									P	MS	
							109	101											
64	T123/S55	9/9/2006	M11	IF	860/70%		145	132									P	MS	
							126	121											
65	T139/140	9/10/2006	M8	JO	860/70%		92	96									P	MS	
							104	109											

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Geomembrane Seam Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Start Date: 8/25/2006

Project Location: Terrell, NC

Page: 6 of 6

Material: Smooth/Textured

60 mil Thickness

Project Seam Requirements

Fusion:		Extrusion:	
Peel:		Peel:	
Shear:		Shear:	

DT#	Location	Date Removed	Welder ID		Wedge	Extruder	Seam Strength										Pass Fail	Tech ID	Remarks
			Machine	Operator	Temp/ Speed ºF/fpm	Temp/ Preheat ºF/ºF	Peel (ppi) IN / OUT					Shear (ppi)							
							1	2	3	4	5	1	2	3	4	5			
66	T147/148	9/10/2006	M13	MR	860/70%		96	89									P	MG	
							101	107											
67	S62/64	9/10/2006	M13	MR	860/70%		106	106									P	MG	
							100	118											
68	S65/67	9/10/2006	M10	HT	860/70%		92	104									P	MG	
							96	90											
69	S68/70	9/10/2006	M13	MR	860/70%		99	94									P	MG	
							106	109											
70	S72/74	9/10/2006	M13	MR	860/70%		117	115									P	MG	
							110	111											
71	S75/77	9/11/2006	M13	MR	860/70%		92	90									P	MG	
							88	84											
72	S78/80	9/11/2006	M13	MR	860/70%		100	106									P	MG	
							112	111											
73	S79/T149	9/11/2006	M8	JO	860/70%		122	113									P	MG	
							112	111											
74	T160/161	9/12/2006	M8	JO	860/70%		98	105									P	MG	
							97	98											
75	T155/156	9/12/2006	M13	MR	860/70%		114	101									P	MG	
							99	111											
76	T65/153	9/12/2006	M13	MR	860/70%		101	105									P	MG	
							116	98											

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HALLA[illegible]ON, INC.

100 E. PENNSYLVANIA [illegible]E., TOWSON, MD 21286

410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marhall Steam Station

Weld Date: 8/25/2006

Project Location: Terrel,NC

Page: 1 of 1

Material: HDPE Textured

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
T42/41	5;45	M.R	M13	860	60%	BOS	EOS-TIE-IN	78	30	29	6;18	6:23	D.V		8/25/2006	P
T46/41	5;30	M.R	M13	860	60%	T39/40/41	EOS-TIE-IN	33	30	29	6;21	6:26	D.V		8/25/2006	P
T41/79	6:00	J.O	M8	860	70%	BOS	T39/40/41	43	30	29	6;16	6:21	D.V		8/25/2006	P
T40/79	5;50	J.O	M8	860	70%	T39/40/41	EOS-AT	32	30	30	6;24	6:29	D.V		8/25/2006	P
T39/38	5;28	M.R	M13	860	60%	BOS-AT	EOS	75	30	29	6;12	6:17	D.V		8/25/2006	P
T38/77	5;15	J.O	M8	860	70%	BOS-AT	EOS	76	30	29	6;10	6:15	D.V		8/25/2006	P
T37/36	5;12	M.R	M13	860	60%	BOS-AT	T35/36/37	32	30	29	6;00	6:05	D.V		8/25/2006	P
T36/35	5;32	J.O	M8	860	70%	BOS-AT	T35/36/37	27	30	30	6;01	6:06	D.V		8/25/2006	P
T32/35	5;38	J.O	M8	860	70%	T35/26/37	EOS-TIE-IN	43	30	29	6;07	6:12	D.V		8/25/2006	P
T35/1	5;01	J.O	M8	860	70%	BOS-AT	EOS	70	30	29	6;04	6:09	D.V		8/25/2006	P
T1/2	2;00	H.T	M10	860	70%	BOS-AT	EOS	72	32	30	3;22	3:27	D.V		8/25/2006	P
T2/3	2;10	H.T	M10	860	70%	BOS-AT	EOS	71	34	33	3;24	3:29	D.V		8/25/2006	P
T3/4	2;40	H.T	M10	860	70%	T3/4/5	EOS-TIE-IN	40	31	31	3;26	3:31	D.V		8/25/2006	P
T3/5	2;35	H.T	M10	860	70%	BOS-AT	T3/4/5	71	31	30	3;35	3:40	D.V		8/25/2006	P
T4/5	2;25	H.T	M10	860	70%	BOS-AT	T3/4/5	33	30	30	3;36	3:41	D.V		8/25/2006	P
T4/6	2;53	H.T	M10	860	70%	BOS-AT	EOS	54	30	30	3;38	3:43	D.V		8/25/2006	P
T6/7	3;00	H.T	M10	860	70%	BOS-AT	EOS	63	30	30	3;40	3:45	D.V		8/25/2006	P
T7/8	3;10	H.T	M10	860	70%	BOS-AT	EOS	63	31	30	3;42	3:47	D.V		8/25/2006	P
T8/9	2;20	M.R	M13	860	60%	BOS-AT	EOS	62	31	30	3;50	3:55	D.V		8/25/2006	P
T9/11	2;56	J.O	M8	860	70%	T9/10/11	EOS-TIE-IN	30	31	30	4;03	4:08	D.V		8/25/2006	P
T9/10	2;54	J.O	M8	860	70%	BOS-AT	T9/10/11	30	32	31	3;59	4:04	D.V		8/25/2006	P
T10/11	2;45	M.R	M13	860	60%	BOS-AT	T9/10/11	30	31	31	4;00	4:05	D.V		8/25/2006	P
T11/12	2;35	M.R	M13	860	60%	BOS-AT	BOS	60	30	29	4;10	4:15	D.V		8/25/2006	P
T12/13	2;50	M.R	M13	860	60%	BOS-AT	BOS	59	30	30	4;22	4:27	D.V		8/25/2006	P
T13/14	3;11	M.R	M13	860	60%	BOS-AT	BOS	55	31	31	4;13	4:18	D.V		8/25/2006	P
T14/15	3;15	M.R	M13	860	60%	BOS-AT	BOS	54	30	30	4;25	4:30	D.V		8/25/2006	P
T15/16	3;19	J.O	M8	860	70%	BOS-AT	T15/16/17	23	30	29	4;27	4:32	D.V		8/25/2006	P
T16/17	3;17	J.O	M8	860	70%	BOS-AT	T15/16/17	23	30	30	4;30	4:35	D.V		8/25/2006	P
T15/17	3;21	J.O	M8	860	70%	T15/16/17	EOS-AT	23	30	29	4;31	4:36	D.V		8/25/2006	P
T17/18	3;24	J.O	M8	860	70%	BOS-AT	EOS	50	30	29	4;38	4:43	D.V		8/25/2006	P
T18/19	3;47	J.O	M8	860	70%	BOS-AT	EOS	49	30	30	4;40	4:45	D.V		8/25/2006	P
T19/20	3;58	J.O	M8	860	70%	BOS-AT	EOS	49	30	30	4;40	4:45	D.V		8/25/2006	P
T20/21	4;16	J.O	M8	860	70%	BOS-AT	T20/21/22	20	30	30	4;51	4:56	D.V		8/25/2006	P

HALLA[illegible]ON, INC.

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410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marhall Steam Station

Weld Date: 8/25/2006

Project Location: Terrel,NC

Page: 2 of 2

Material: HDPE Textured

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
T20/22	4:18	JO	M8	860	70%	T20/21/22	EOS-TIE	29	30	30	4:50	4:55	DV		8/25/2006	P
T21/22	4:07	JO	M8	860	70%	BOS-AT	T21/22/23	20	30	30	4:53	4:58	DV		8/25/2006	P
T22/23	4:27	JO	M8	860	70%	BOS-AT	EOS	46	30	29	5:00	5:05	DV		8/25/2006	P
T23/24	3:45	MR	M13	860	60%	BOS-AT	EOS	40	30	30	5:06	5:11	DV		8/25/2006	P
T24/25	3:58	MR	M13	860	60%	BOS-AT	EOS	45	30	30	5:11	5:16	DV		8/25/2006	P
T25/26	4:43	JO	M8	860	70%	BOS-AT	T25/26/27	20	30	30	5:19	5:24	DV		8/25/2006	P
T25/27	4:45	JO	M8	860	70%	T25/26/27	EOS-TIE	21	30	30	5:28	5:33	DV		8/25/2006	P
T26/27	4:05	MR	M13	860	60%	BOS-AT	T25/26/27	20	30	29	5:21	5:26	DV		8/25/2006	P
T27/28	4:15	MR	M13	860	60%	BOS-AT	EOS	41	30	29	5:36	5:41	DV		8/25/2006	P
T28/29	4:30	MR	M13	860	60%	BOS-AT	EOS	41	30	30	5:31	5:36	DV		8/25/2006	P
T28/30	4:10	HT	M10	860	70%	BOS-AT	EOS	41	30	30	5:33	5:28	DV		8/25/2006	P
T30/31	4:20	HT	M10	860	70%	BOS-AT	EOS	40	30	30	5:40	5:45	DV		8/25/2006	P
T31/32	4:07	HT	M10	860	70%	BOS-AT	T31/32/33	17	30	30	5:44	5:49	DV		8/25/2006	P
T31/33	4:08	HT	M10	860	70%	T31/32/33	EOS-TIE	23	31	30	5:42	5:47	DV		8/25/2006	P
T32/33	4:00	HT	M10	860	70%	BOS-AT	T31/32/33	17	30	29	5:49	5:54	DV		8/25/2006	P
T33/34	3:45	HT	M10	860	70%	BOS-AT	EOS	40	30	29	5:41	5:46	DV		8/25/2006	P

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410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marhall Steam Station
Weld Date: 8/26/2006
Project Location: Terrel,NC
Page: 1 of 1

Material: HDPE Smooth
Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
S1/2	2:02	JO	M8	860	70%	BOS	EOS TIE IN	434	31	31	4:06	4:11	MS		8/26/2006	P
S2/3	2:08	HT	M10	850	70%	BOS	EOS 435	435	31	31	4:08	4:13	MS		8/26/2006	P
S3/4	2:15	MR	M13	850	70%	BOS	EOS TIE IN	437	30	30	4:11	4:16	MS		8/26/2006	P
S4/5	2:50	JO	M8	860	70	BOS	EOS 439	439	31	31	4:20	4:25	MS		8/26/2006	P
S5/6	3:00	HT	M10	850	70%	BOS	EOS TIE IN	438	30	29	4:22	4:27	MS		8/26/2006	P
S6/7	3:18	MR	M13	850	70%	BOS	EOS 437	437	30	30	4:24	4:29	MS		8/26/2006	P
S7/8	3:45	JO	M8	860	70	BOS	EOS TIE IN	436	30	30	4:33	4:38	MS		8/26/2006	P
S8/9	3:55	HT	M10	850	70%	BOS	EOS 430	430	30	30	4:38	4:43	MS		8/26/2006	P
S9/10	4:16	MR	M13	850	70%	BOS	EOS TIE IN	431	31	31	5:20	5:25	HV		8/26/2006	P
S10/11	4:37	JO	M8	860	70%	BOS	EOS 431	431	32	32	5:25	5:30	HV		8/26/2006	P
S11/12	4:40	HT	M10	850	70%	BOS	EOS TIE IN	430	30	30	5:26	5:31	HV		8/26/2006	P
S12/13	5:22	MR	M13	850	70%	BOS	EOS 473	433	30	29	6:10	6:15	HV		8/26/2006	P
S13/14	5:26	JO	M8	860	70%	BOS	EOS TIE IN	434	32	31	6:12	6:17	HV		8/26/2006	P
S14/15	5:30	HT	M10	850	70%	BOS	EOS 436	436	31	31	6:15	6:20	HV		8/26/2006	P

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100 E. PENNSYLVANIA AV[illegible]., TOWSON, MD 21286

410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marhall Steam Station

Weld Date: 8/27/2006

Project Location: Terrel,NC

Page: 1 of 4

Material: SMOOTH

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
S21/T42	1:05	ER	M10	860	70%	BOS	EOS	22.5	30	30	4:26	4:31	MS		8/27/2006	P
S21/T41		ER	M10	860	70%	BOS	EOS	22.5	30	28	4:23	4:28	MS		8/27/2006	P
S21/T37		ER	M10	860	70%	BOS	EOS	22.5	30	30	4:20	4:25	MS		8/27/2006	P
S21/T38		ER	M10	860	70%	BOS	EOS	22.5	30	30	4:16	4:21	MS		8/27/2006	P
S20/T37		ER	M10	860	70%	BOS	EOS	11	30	29	4:10	4:15	MS		8/27/2006	P
S21/T35		ER	M10	860	70%	BOS	EOS	22.5	31	30	4:08	4:13	MS		8/27/2006	P
S20/T1	11:57	ER	M10	860	70%	BOS	EOS	22.5	30	30	4:03	4:08	MS		8/27/2006	P
S20/T2		ER	M10	860	70%	BOS	EOS	22.5	30	30	4:01	4:06	MS		8/27/2006	P
S20/T3		ER	M10	860	70%	BOS	EOS	22.5	30	30	3:58	4:03	MS		8/27/2006	P
S20/T4		ER	M10	860	70%	BOS	EOS	12	31	30	3:56	4:01	MS		8/27/2006	P
S19/T6		ER	M10	860	70%	BOS	EOS	10	30	30	3:48	4:53	MS		8/27/2006	P
S18/T6		ER	M10	860	70%	BOS	EOS	12	30	30	3:40	3:45	MS		8/27/2006	P
S18/T7		ER	M10	860	70%	BOS	EOS	22.5	30	30	3:13	3:18	MS		8/27/2006	P
S17/T8		ER	M10	860	70%	BOS	EOS	10	30	30	3:12	3:17	MS		8/27/2006	P
S17/T8		ER	M10	860	70%	BOS	EOS	11	30	30	3:10	3:15	MS		8/27/2006	P
S17/T9		ER	M10	860	70%	BOS	EOS	22.5	30	30	3:07	3:12	MS		8/27/2006	P
S17/T11		ER	M10	860	70%	BOS	EOS	7	30	29	3:05	3:10	MS		8/27/2006	P
S16/T11		ER	M10	860	70%	BOS	EOS	5	30	30	3:04	3:09	MS		8/27/2006	P
S16/T12		ER	M10	860	70%	BOS	EOS	22.5	30	29	3:00	3:05	MS		8/27/2006	P
S16/T13		ER	M10	860	70%	BOS	EOS	5	30	30	2:54	2:59	MS		8/27/2006	P
S15/T13		ER	M10	860	70%	BOS	EOS	16	30	29	2:52	2:57	MS		8/27/2006	P
S15/T14		ER	M10	860	70%	BOS	EOS	13	30	30	2:50	2:55	MS		8/27/2006	P
S14/T14		ER	M10	860	70%	BOS	EOS	8	31	31	8:40	8:45	MS		8/27/2006	P
S14/T15		ER	M10	860	70%	BOS	EOS	22.5	30	30	8:41	8:46	MS		8/27/2006	P
S13/T17		ER	M10	860	70%	BOS	EOS	13	30	30	8:44	8:49	MS		8/27/2006	P
S13/T18		ER	M10	860	70%	BOS	EOS	7	30	30	8:50	8:55	MS		8/27/2006	P
S12/T18		ER	M10	860	70%	BOS	EOS	13	30	30	8:52	8:57	MS		8/27/2006	P
S12/T19		ER	M10	860	70%	BOS	EOS	8	30	29	8:57	9:02	MS		8/27/2006	P
S11/T19		ER	M10	860	70%	BOS	EOS	10	30	30	9:07	9:12	MS		8/27/2006	P
S11/T20		ER	M10	860	70%	BOS	EOS	12	30	30	9:04	9:09	MS		8/27/2006	P
S10/T20		ER	M10	860	70%	BOS	EOS	9	30	30	9:11	9:16	MS		8/27/2006	P
S10/T22		ER	M10	860	70%	BOS	EOS	12	30	30	9:12	9:15	MS		8/27/2006	P
S9/T23		ER	M10	860	70%	BOS	EOS	22.5	30	29	9:19	9:24	MS		8/27/2006	P

HALLA[illegible]ON, INC.

100 E. PENNSYLVANIA AVE., TOWSON, MD 21286

410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marhall Steam Station

Material: SMOOTH

Weld Date: 8/27/2006

Project Location: Terrel,NC

Thickness: 60 mil

Page: 2 of 4

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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
22/23	1:23	MR	M13	860	70%	BOS	EOS	434	30	30	6:13	6:18	MS		8/27/2006	P
23/24	1;30	MR	M13	860	70%	BOS	EOS	439	30	30	6;10	6:15	MS		8/27/2006	P
24/25	1;48	ER	M10	860	70%	BOS	EOS	440	30	30	6;07	6:12	MS		8/27/2006	P
25/26	1;58	JO	M8	860	70%	BOS	EOS	440	30	30	6;05	6:10	MS		8/27/2006	P
26/27	2;30	MR	M13	860	70%	BOS	EOS	440	30	30	6;03	6:08	MS		8/27/2006	P
27/28	2;45	ER	M10	860	70%	BOS	EOS	439	31	31	5;59	6:04	MS		8/27/2006	P
28/29	2;57	JO	M8	860	70%	BOS	EOS	439	30	30	5;53	5:58	MS		8/27/2006	P
29/30	3;10	MR	M13	860	70%	BOS	EOS	410	30	30	5;52	5:57	MS		8/27/2006	P
30/31	3;40	ER	M10	860	70%	BOS	EOS	436	30	30	5;49	5:54	MS		8/27/2006	P
31/32	4;33	JO	M8	860	70%	BOS	EOS	433	30	30	5;42	5:47	MS		8/27/2006	P
32/33	4;30	MR	M13	860	70%	BOS	EOS	435	30	30	5;40	5:45	MS		8/27/2006	P
33/34	4;57	JO	M8	860	70%	BOS	EOS	432	31	30	6;51	6:56	MS		8/27/2006	P
34/35	5;35	MR	M13	860	70%	BOS	EOS	432	31	30	6;52	6:57	MS		8/27/2006	P
35/37	4;07	JO	M8	860	70%	BOS	EOS	105	30	30	7;22	7:27	MS		8/27/2006	P
35/36	4;24	JO	M8	860	70%	BOS	EOS	190	30	30	7;54	7;59	MS		8/27/2006	P
37/38	6;10	ER	M10	860	70%	BOS	EOS	129	31	30	7;48	7:53	MS		8/27/2006	P
38/39	6;20	MR	M13	860	70%	BOS	EOS	81	30	29	7;49	7:54	MS		8/27/2006	P
36/37	5;51	JO	M8	860	70%	BOS	EOS	17	30	30	7;52	7:57	MS		8/27/2006	P
S1/22		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;43	6:48	MS		8/27/2006	P
2/R77		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;41	6:46	MS		8/27/2006	P
23/R77		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;40	6:45	MS		8/27/2006	P
7/R78		ER	M10	860	70%	BOS	EOS	22.5	30	29	6;34	6:39	MS		8/27/2006	P
24/R78		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;37	6:42	MS		8/27/2006	P
4/R81		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;30	6:35	MS		8/27/2006	P
R81/S25		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;32	6:37	MS		8/27/2006	P
5/R83		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;27	6:33	MS		8/27/2006	P
21/R83		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;26	6:31	MS		8/27/2006	P
S6/27		ER	M10	860	70%	BOS	EOS	22.5	30	30	6;20	6:25	MS		8/27/2006	P
S7/28		ER	M10	860	70%	BOS	EOS	22.5						MS	8/27/2006	P
S8/29		ER	M10	860	70%	BOS	EOS	22.5						MS	8/27/2006	P
S9/30		ER	M10	860	70%	BOS	EOS	22.5	30	30	5;36	5:41	MS		8/27/2006	P
S6/31		ER	M10	860	70%	BOS	EOS	22.5	30	30	5;33	5"38	MS		8/27/2006	P
S11/32		ER	M10	860	70%	BOS	EOS	22.5	30	30	5:31	5:36	MS		8/27/2006	P

HALLATON, INC.

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410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Weld Date: 8/27/2006

Project Location: Terrel,NC

Page: 3 of 4

Material: SMOOTH

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
S12/33	4:57	ER	M10	860	70%	BOS	EOS	22.5	30	30	5:30	5:35	MS		8/27/2006	P
S31/37		ER	M10	860	70%	BOS	EOS	10	30	30	6:50	6:55	MS		8/28/2006	P
S13/34		ER	M10	860	70%	BOS	EOS	22.5	30	30	6:57	7:02	MS		8/28/2006	P
S14/35		ER	M10	860	70%	BOS	EOS	22.5	30	30	7:10	7:15	MS		8/28/2006	P
15/35		ER	M10	860	70%	BOS	EOS	15	30	30	7:14	7:19	MS		8/28/2006	P
77/15		ER	M10	860	70%	BOS	EOS	22.5	30	30	7:26	7:31	MS		8/28/2006	P
16/37		ER	M10	860	70%	BOS	EOS	10	30	30	7:30	7:35	MS		8/28/2006	P
56/38		ER	M10	860	70%	BOS	EOS	22.5	30	30	7:34	7:39	MS		8/28/2006	P
17/39		ER	M10	860	70%	BOS	EOS	20	30	30	7:46	7:51	MS		8/28/2006	P

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Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Weld Date: 8/27/2006

Project Location: Terrel,NC

Page: 4 of 4

Material: SMOOTH

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
S8/T24		ER	M10	860	70%	BOS	EOS	22.5	30	29	9:24	9:29	MS		8/27/2006	P
S7/T25		ER	M10	860	70%	BOS	EOS	22.5	30	29	9:28	9:33	MS		8/27/2006	P
S6/T27		ER	M10	860	70%	BOS	EOS	16	30	30	9:30	9:35	MS		8/27/2006	P
S6/T28		ER	M10	860	70%	BOS	EOS	5	30	29	9:32	9:37	MS		8/27/2006	P
S5/T28		ER	M10	860	70%	BOS	EOS	17	30	30	9:41	9:46	MS		8/27/2006	P
S5/T29		ER	M10	860	70%	BOS	EOS	4	30	30	9:42	9:47	MS		8/27/2006	P
S4/T29		ER	M10	860	70%	BOS	EOS	17	30	30	9:43	9:48	MS		8/27/2006	P
S4/T30		ER	M10	860	70%	BOS	EOS	4	30	30	9:47	9:52	MS		8/27/2006	P
S3/T30		ER	M10	860	70%	BOS	BOS	17	30	29	9:50	9:55	MS		8/27/2006	P
S3/T31		ER	M10	860	70%	BOS	BOS	4	30	30	9:52	9:57	MS		8/27/2006	P
S2/T11		ER	M10	860	70%	BOS	BOS	16	30	30	9:56	10:01	MS		8/27/2006	P
S21/T33		ER	M10	860	70%	BOS	BOS	5	30	29	10:00	10:05	MS		8/27/2006	P
S1/T33		ER	M10	860	70%	BOS	BOS	7	30	29	10:02	10:07	MS		8/27/2006	P
S1/T34		ER	M10	860	70%	BOS	BOS	13	30	30	10:03	10:08	MS		8/27/2006	P
S15/16	10:08	JO	M8	860	70%	BOS TIE IN	EOS	420	30	30	3:23	3:28	MS		8/27/2006	P
16/17	10:20	MR	M13	860	70%	BOS	EOS TIE IN	423	30	28	3:25	3:30	MS		8/27/2006	P
S17/18	11:10	JO	M8	860	70%	BOS TIE IN	S17/18/19	41	30	29	3:32	3:37	MS		8/27/2006	P
S18/19	11:05	JO	M8	860	70%	BOS	EOS	22.5	30	29	3:42	3:47	MS		8/27/2006	P
S17/19	11:14	JO	M8	860	70%	S17/18/19	EOS	355	30	30	3:27	3:32	MS		8/27/2006	P
S19/20	11:32	MR	M13	860	70%	BOS TIE IN	S19/20/21	80	30	30	3:50	3:55	MS		8/27/2006	P
S20/21	11:50	MR	M13	860	70%	BOS	S19/20/21	11	30	30	4:14	4:19	MS		8/27/2006	P
S19/21	11:40	MR	M13	860	70%	S19/20/21	EOS	80	30	30	4:17	4:22	MS		8/27/2006	P

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Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Weld Date: 8/28/2006
Project Location: Terrel,NC
Page: 1 of 3

Material: SMOOTH
Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
42/43	11;21	JO	M8	850	63%	BOS	EOS	80	30	30	2;14	2;19	MS		8/29/2006	P
43/44	11;20	MR	M13	850	63%	BOS	EOS	80	30	30	2;12	2;17	MS		8/29/2006	P
44/45	11;35	JO	M8	850	63%	BOS	EOS	77	30	29	2;10	2;15	MS		8/29/2006	P
45/46	11;38	MR	M13	850	63%	BOS	EOS	77	30	30	2;09	2;14	MS		8/29/2006	P
46/47	11;53	JO	M8	850	61%	BOS	EOS	78	30	30	1;57	2;02	MS		8/29/2006	P
47/48	11;53	MR	M13	850	61%	BOS	EOS	81	30	30	1;56	2;01	MS		8/29/2006	P
48/47	12;00	JO	M8	850	61%	BOS	EOS	80	30	30	1;54	1;59	MS		8/29/2006	P
47/50	12;10	MR	M13	850	61%	BOS	EOS	79	30	30	1;52	1;57	MS		8/29/2006	P
50/51	12;23	JO	M8	850	61%	BOS	EOS	83	30	30	1;42	1;47	MS		8/29/2006	P
51/52	12;40	JO	M8	850	61%	BOS	EOS	80	30	29	1;41	1;46	MS		8/29/2006	P
52/53	12;27	MR	M13	850	61%	BOS	EOS	84	30	30	1;40	1;45	MS		8/29/2006	P
53/54	12;20	HT	M10	850	61%	BOS	EOS	83	30	30	1;38	1;43	MS		8/29/2006	P
54/55	12;30	HT	M10	850	61%	BOS	EOS	84	30	30	1;29	1;34	MS		8/29/2006	P
55/56	12;45	HT	M10	850	61%	BOS	EOS	83	30	30	1;28	1;33	MS		8/29/2006	P
56/57	1;00	HT	M10	850	61%	BOS	EOS	86	30	30	1;32	1;37	MS		8/29/2006	P
57/58	1;10	HT	M10	850	61%	BOS	EOS	87	30	29	1;24	1;29	MS		8/29/2006	P
58/59	1;21	HT	M10	850	61%	BOS	EOS	87	30	30	3;52	3;57	MS		8/29/2006	P
59/60	12;48	MR	M13	850	61%	BOS	EOS	90	30	30	3;56	4;01	MS		8/29/2006	P
60/61	1;08	MR	M13	850	61%	BOS	EOS	90	30	30	3;58	4;03	MS		8/29/2006	P

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Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Weld Date: 8/28/2006

Project Location: Terrel,NC

Page: 2 of 3

Material: SMOOTH

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
61/62	1:00	JO	M8	850	63%	BOS	EOS	96	30	30	3:29	3:34	MS		8/28/2006	P
62/63	1:12	JO	M8	850	63%	BOS	EOS	97	30	30	3:28	3:33	MS		8/28/2006	P
63/64	1:25	JO	M8	850	63%	BOS	EOS	98	30	30	3:27	3:32	MS		8/28/2006	P
64/65	1:40	JO	M8	850	63%	BOS	EOS	98	30	29	3:26	3:31	MS		8/28/2006	P
T65/S35	2:30	HT	M10	850	61%	BOS	EOS	7	30	30	3:00	3:05	MS		8/28/2006	P
T64/S35	2:33	HT	M10	850	61%	BOS	EOS	22.5	30	29	3:10	3:15	MS		8/28/2006	P
T63/S35	2:37	HT	M10	850	61%	BOS	EOS	22.5	30	30	3:12	3:17	MS		8/28/2006	P
T62/S35	2:40	HT	M10	850	61%	BOS	EOS	18	30	30	3:15	3:20	MS		8/28/2006	P
T62/S35	2:42	HT	M10	850	61%	BOS	EOS	9.5	30	30	3:17	3:22	MS		8/28/2006	P
T61/S35	2:43	HT	M10	850	61%	BOS	EOS	22.5	30	30	3:35	3:40	MS		8/28/2006	P
T60/S36	2:47	HT	M10	850	61%	BOS	EOS	22.5	30	29	3:40	3:45	MS		8/28/2006	P
T51/S36	2:50	HT	M10	850	61%	BOS	EOS	22.5	30	29	3:42	3:47	MS		8/28/2006	P
T50/S36	2:53	HT	M10	850	61%	BOS	EOS	22.5	30	30	3:46	3:51	MS		8/28/2006	P
T57/S36	6:00	HT	M10	850	61%	BOS	EOS	22.5	30	30	6:05	6:10	MS		8/28/2006	P
T56/S36	6:03	HT	M10	850	61%	BOS	EOS	16	30	30	6:05	6:10	MS		8/28/2006	P
T56/S38	6:05	HT	M10	850	61%	BOS	EOS	6.5	30	29	6:10	6:15	MS		8/28/2006	P
T55/S38	6:07	HT	M10	850	61%	BOS	EOS	22.5	30	30	6:12	6:17	MS		8/28/2006	P
T54/S38	6:10	HT	M10	850	61%	BOS	EOS	22.5	30	29	6:17	6:22	MS		8/28/2006	P
T51/S39	6:14	HT	M10	850	61%	BOS	EOS	22.5	30	30	6:27	6:32	MS		8/28/2006	P
T50/S39	6:17	HT	M10	850	61%	BOS	EOS	22.5	30	30	6:29	6:34	MS		8/28/2006	P
T49/S39	6:20	HT	M10	850	61%	BOS	EOS	22.5	30	29	6:32	6:37	MS		8/28/2006	P
T48/S39	6:24	HT	M10	850	61%	BOS	EOS	22.5	30	30	7:26	7:31	MS		8/29/2006	P
T48/S17	6:27	HT	M10	850	61%	BOS	EOS	22.5	30	30	7:28	7:33	MS		8/29/2006	P
T48/S39	6:30	HT	M10	850	61%	BOS	EOS	7	30	30	7:31	7:36	MS		8/29/2006	P
T48/S17	6:31	HT	M10	850	61%	BOS	EOS	15	30	29	7:35	7:40	MS		8/29/2006	P
T47/S18	6:33	HT	M10	850	61%	BOS	EOS	22	30	29	7:40	7:45	MS		8/29/2006	P
T46/S18	6:36	HT	M10	850	61%	BOS	EOS	22.5	30	30	7:42	7:47	MS		8/29/2006	P
T45/S18	6:39	HT	M10	850	61%	BOS	EOS	22.5	30	30	7:45	7:50	MS		8/29/2006	P
T44/S18	6:44	HT	M10	850	61%	BOS	EOS	22.5	30	30	7:51	7:56	MS		8/29/2006	P
T43/S18	6:47	HT	M10	850	61%	BOS	EOS	12	30	29	7:53	7:58	MS		8/29/2006	P
T66/T34	5:49	JO	M8	850	61%	BOS	EOS	44	30	30	7:02	7:07	MS		8/29/2006	P
T66/S40	6:18	JO	M8	850	61%	BOS	EOS	22.5	30	30	8:57	9:02	MS		8/29/2006	P
T67/T66	5:57	JO	M8	850	61%	BOS	EOS	50	30	30	9:05	9:10	MS		8/29/2006	P

HALLAT[illegible]N INC
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Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Steam Station
Weld Date: 8/28/2006
Project Location: Terrel,NC
Page: 3 of 3

Material: SMOOTH
Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
T67/S41	6:21	JO	M8	850	61%	BOS	EOS	22.5	30	30	8:59	9:04	MS		8/29/2006	P
T68/S42	6:25	JO	M8	850	61%	BOS	EOS	22.5	30	30	8:55	9:00	MS		8/29/2006	P
T69/S42	6:28	JO	M8	850	61%	BOS	EOS	12	30	30	8:48	8:53	MS		8/29/2006	P
T69/S43	6:21	JO	M8	850	61%	BOS	EOS	11	30	30	8:49	8:54	MS		8/29/2006	P
T70/S43	6:32	JO	M8	850	61%	BOS	EOS	22.5	30	30	8:47	8:52	MS		8/29/2006	P
T71/R	6:37	JO	M8	850	61%	BOS	EOS	20	30	30	9:34	9:39	MS		8/29/2006	P
R/S44	6:43	JO	M8	850	61%	BOS	EOS	16	30	30	8:39	8:44	MS		8/29/2006	P
T72/S45	6:46	JO	M8	850	61%	BOS	EOS	20	30	30	8:35	8:40	MS		8/29/2006	P
T67/68	6:10	MR	M13	850	70%	BOS	EOS	10	30	30	9:12	9:17	MS		8/29/2006	P
T68/69	6:18	JO	M8	850	70%	BOS	EOS	30	30	30	9:18	9:23	MS		8/29/2006	P
T68/T73	6:23	JO	M8	850	70%	BOS	EOS	20	30	30	9:26	9:31	MS		8/29/2006	P
T69/T73	6:08	JO	M8	850	70%	BOS	EOS	24	30	30	9:25	9:30	MS		8/29/2006	P
T69/70	6:18	MR	M13	850	70%	BOS	EOS	56	30	30	9:30	9:35	MS		8/29/2006	P
T70/71	6:25	MR	M13	850	70%	BOS	EOS	55	30	30	9:31	9:36	MS		8/29/2006	P
T71/72	6:30	MR	M13	850	70%	BOS	EOS	60	30	30	9:37	9:42	MS		8/29/2006	P
S1/S40	3:47	MR	M13	850	70%	BOS	EOS	470	30	30	8:11	8:16	MS		8/29/2006	P
S41/S40	3:58	JO	M8	850	70%	BOS	EOS	424	30	30	8:14	8:19	MS		8/29/2006	P
S41/S42	4:10	HT	M10	850	70%	BOS	EOS	431	30	30	8:16	8:21	MS		8/29/2006	P
S42/S43	4:50	MR	M13	850	70%	BOS	EOS	417	30	30	8:19	8:24	MS		8/29/2006	P
S43/S44	5:00	JO	M8	850	70%	BOS	EOS	417	30	30	8:30	8:35	MS		8/29/2006	P
S44/S45	5:00	HT	M10	850	70%	BOS	EOS	438	30	30	8:33	8:38	MS		8/29/2006	P
S22/S40	3:40	MR	M13	850	70%	BOS	EOS	20	30	30	2:21	2:26	MS		8/29/2006	P

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410-583-7700 Fax 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Weld Date: 8/29/2006

Project Location: Terrel,NC

Page: 1 of 2

Material: SMOOTH

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
S40/S46	1;50	JO	M8	850	70%	BOS	EOS	22.5	30	30	2;13	2;18	MS		8/29/2006	P
S41/S17	1;53	JO	M8	850	70%	BOS	EOS	22.5	30	30	2;09	2;14	MS		8/29/2006	P
S42/48	1;56	JO	M8	850	70%	BOS	EOS	22.5	30	30	2;07	2;12	MS		8/29/2006	P
S43/S49	2;18	JO	M8	850	70%	BOS	EOS	22.5	30	30	2;21	2;26	MS		8/29/2006	P
44/50	2;22	JO	M8	850	70%	BOS	EOS	25	30	30	2;26	2;31	MS		8/29/2006	P
45/51	2;27	JO	M8	850	70%	BOS	EOS	25	30	30	2;32	2;27	MS		8/29/2006	P
46/22	10;30	HT	M10	850	70%	BOS	EOS	438	30	29	1;36	1;41	MS		8/29/2006	P
46/47	11;05	JO	M8	850	70%	BOS	EOS	420	30	30	1;55	2;00	MS		8/29/2006	P
47/48	11;23	MR	M13	850	70%	BOS	EOS	424	31	30	1;07	1;12	MS		8/29/2006	P
48/49	11;42	HT	M10	850	70%	BOS	EOS	433	30	30	2;01	2;06	MS		8/29/2006	P
49/50	12;10	JO	M8	850	70%	BOS	EOS	393	30	30	2;23	2;28	MS		8/29/2006	P
50/51	12;16	MR	M13	850	70%	BOS	EOS	378	30	30	2;30	2;35	MS		8/29/2006	P
51/52	12;30	HT	M10	850	70%	BOS	EOS	343	30	30	2;35	2;40	MS		8/29/2006	P
52/53	4;00	HT	M10	850	70%	BOS	EOS	22.5	30	30	4;42	4;47	MS		8/29/2006	P
T75/S53	4;28	HT	M10	850	70%	BOS	EOS	22.5	30	30	4;52	4;57	MS		8/29/2006	P
T74/S52	4;25	HT	M10	850	70%	BOS	EOS	22.5	30	30	4;50	4;55	MS		8/29/2006	P
T76/S53	4;31	HT	M10	850	70%	BOS	EOS	22.5	30	30	5;02	5;07	MS		8/29/2006	P
T77/S53	4;34	HT	M10	850	70%	BOS	EOS	22.5	31	31	5;57	6;02	MS		8/29/2006	P
T78/S53	4;37	HT	M10	850	70%	BOS	EOS	22.5	31	31	6;05	6;10	MS		8/29/2006	P
T79/S53	4;40	HT	M10	850	70%	BOS	EOS	22.5	30	30	7;23	7;28	MS		8/30/2006	P
T80/S53	4;43	HT	M10	850	70%	BOS	EOS	22.5	30	30	7;32	7;37	MS		8/30/2006	P
T81/S53	4;47	HT	M10	850	70%	BOS	EOS	22.5	30	29	7;42	7;47	MS		8/30/2006	P
T82/S53	4;50	HT	M10	850	70%	BOS	EOS	22.5	30	30	7;46	7;51	MS		8/30/2006	P
T83/S53	4;53	HT	M10	850	70%	BOS	EOS	22.5	30	30	7;52	7;57	MS		8/30/2006	P
T84/S53	4;56	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;02	8;07	MS		8/30/2006	P
T85/S53	4;59	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;08	8;13	MS		8/30/2006	P
T86/S53	5;02	HT	M10	850	70%	BOS	EOS	22.5	30	29	8;15	8;20	MS		8/30/2006	P
T87/S53	5;05	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;27	8;32	MS		8/30/2006	P
T88/S53	5;08	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;30	8;35	MS		8/30/2006	P
T89/S53	5;11	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;37	8;42	MS		8/30/2006	P
T90/S53	5;14	HT	M10	850	70%	BOS	EOS	22.5	30	30	8;50	8;55	MS		8/30/2006	P
T91/S53	5;17	HT	M10	850	70%	BOS	EOS	22.5	30	30	9;02	9;07	MS		8/30/2006	P
T92/S53	5;20	HT	M10	850	70%	BOS	EOS	22.5	30	30	9;08	9;13	MS		8/30/2006	P

HALL[illegible]ON, INC.

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Seaming and Non Destructive Test Log

Project No.: 0623-5106

Project Name: Marshall Steam Station

Weld Date: 8/29/2006

Project Location: Terrel,NC

Page: 2 of 2

Material: HDPE

Thickness: 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	Test Date	Pass / Fail
									PSI		Time		Tech			
									Start	Finish	Start	Finish				
T93/S53	5:23	HT	M10	850	61%	BOS	EOS	25	30	30	9:14	9:19	MS		8/30/2006	P
T94/S45	5:28	HT	M10	850	61%	BOS	EOS	5	30	30	9:23	9:28	MS		8/30/2006	P
T94/T72	5:21	JO	M8	850	70%	BOS	EOS	51	30	30	9:26	9:31	MS		8/30/2006	P
T93/94	5:15	MR	M13	850	70%	BOS	EOS	25	30	30	9:21	9:26	MS		8/30/2006	P
T94/95	5:16	JO	M8	850	70%	BOS	EOS	29	30	30	9:30	9:35	MS		8/30/2006	P
T93/95	5:22	MR	M13	850	70%	BOS	EOS	35	30	30	9:29	9:34	MS		8/30/2006	P
92/93	5:10	MR	M13	850	70%	BOS	EOS	40	30	30	9:11	9:16	MS		8/30/2006	P
92/91	5:05	JO	M8	850	70%	BOS	EOS	40	30	30	9:05	9:10	MS		8/30/2006	P
90/91	5:00	MR	M13	850	70%	BOS	EOS	40	30	29	8:59	9:04	MS		8/30/2006	P
89/90	4:58	JO	M8	850	70%	BOS	EOS	43	30	30	8:40	8:45	MS		8/30/2006	P
88/89	4:59	MR	M13	850	70%	BOS	EOS	46	30	30	8:35	8:40	MS		8/30/2006	P
87/88	4:51	JO	M8	850	70%	BOS	EOS	47	30	29	8:28	8:33	MS		8/30/2006	P
86/87	4:37	MR	M13	850	70%	BOS	EOS	49	30	30	8:25	8:30	MS		8/30/2006	P
85/86	4:30	MR	M13	850	70%	BOS	EOS	49	30	30	8:12	8:17	MS		8/30/2006	P
84/85	4:44	JO	M8	850	70%	BOS	EOS	50	30	30	8:06	8:11	MS		8/30/2006	P
83/84	4:32	JO	M8	850	70%	BOS	EOS	23	30	30	7:58	8:03	MS		8/30/2006	P
82/83	4:15	MR	M13	850	70%	BOS	EOS	53	30	30	7:50	7:55	MS		8/30/2006	P
81/82	4:02	MR	M13	850	70%	BOS	EOS	58	30	30	7:43	7:48	MS		8/30/2006	P
80/81	4:17	JO	M8	850	70%	BOS	EOS	58	30	30	7:40	7:45	MS		8/30/2006	P
79/80	4:05	JO	M8	850	70%	BOS	EOS	59	30	30	7:30	7:35	MS		8/30/2006	P
78/77	3:45	MR	M13	850	70%	BOS	EOS	61	30	30	7:19	7:24	MS		8/30/2006	P
77/78	3:34	MR	M13	850	70%	BOS	EOS	63	30	30	5:59	6:04	MS		8/30/2006	P
76/77	3:50	JO	M8	850	70%	BOS	EOS	64	30	30	5:56	6:01	MS		8/29/2006	P
75/76	3:35	JO	M8	850	70%	BOS	EOS	66	30	30	4:57	5:02	MS		8/29/2006	P
74/75	3:21	JO	M8	850	70%	BOS	EOS	68	30	30	4:48	4:53	MS		8/29/2006	P
S53/45	2:30	HT	M10	850	70%	BOS	EOS	422	30	30	4:55	5:00	MS		8/29/2006	P

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Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 8/30/2006
Project Location: Terrell, NC
Page: 1 of 1

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	Air Pressure Test PSI Finish	Air Pressure Test Time Start	Air Pressure Test Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
T74/T96	9:39 AM	JO	M8	850	700%	BOS	EOS	70	30	29	11:30	11:35	MS		08/30/06	P
T96/97	9:56 AM	JO	M8	850	700%	BOS	EOS	72	32	31	11:31	11:36	MS		08/30/06	P
T97/98	9:45 AM	MR	M13	850	700%	BOS	EOS	74	30	30	11:33	11:38	MS		08/30/06	P
T98/99	10:06 AM	JO	M8	850	700%	BOS	EOS	76	30	30	11:37	11:42	MS		08/30/06	P
T99/100	10:18 AM	JO	M8	850	700%	BOS	EOS	78	30	30	11:51	11:56	MS		08/30/06	P
T100/101	10:06 AM	MR	M13	850	700%	BOS	EOS	80	34	30	11:49	11:54	MS		08/30/06	P
T101/102	10:15 AM	MR	M13	850	700%	BOS	EOS	82	31	30	11:47	11:52	MS		08/30/06	P
T102/103	10:28 AM	MR	M13	850	700%	BOS	EOS	83	30	29	11:45	11:50	MS		08/30/06	P
T103/104	10:40 AM	MR	M13	850	700%	BOS	EOS	86	30	29	12:50	12:55	MS		08/30/06	P
T104/105	10:36 AM	JO	M8	850	700%	BOS	EOS	87	30	30	12:52	12:57	MS		08/30/06	P
T105/106	10:58 AM	JO	M8	850	700%	BOS	EOS	90	30	30	12:53	12:58	MS		08/30/06	P
T106/107	11:14 AM	JO	M8	850	700%	BOS	EOS	92	30	29	12:57	13:02	MS		08/30/06	P
T107/108	11:37 AM	MR	M13	850	700%	BOS	EOS	95	30	30	1:48	1:53	MS		08/30/06	P
T108/109	11:07 AM	MR	M13	850	700%	BOS	EOS	98	30	29	1:47	1:52	MS		08/30/06	P
T109/S52	11:25 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:59	2:04	MS		08/30/06	P
T108/S52	11:27 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	1:51	1:56	MS		08/30/06	P
T107/S52	11:29 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:49	1:54	MS		08/30/06	P
T106/S52	11:31 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:40	1:45	MS		08/30/06	P
T105/S52	11:33 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	1:34	1:39	MS		08/30/06	P
T104/S52	11:35 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:37	1:42	MS		08/30/06	P
T103/S52	11:37 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	1:30	1:35	MS		08/30/06	P
T102/S52	11:39 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:26	1:31	MS		08/30/06	P
T101/S52	11:41 AM	HT	M10	850	620%	BOS	EOS	22.5	30	28	1:28	1:33	MS		08/30/06	P
T100/S52	11:43 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:20	1:25	MS		08/30/06	P
T99/S52	11:45 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:15	1:20	MS		08/30/06	P
T98/S52	11:47 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	1:16	1:21	MS		08/30/06	P
T97/S52	11:49 AM	HT	M10	850	620%	BOS	EOS	22.5	30	29	1:05	1:10	MS		08/30/06	P
T96/S52	11:51 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	1:02	1:07	MS		08/30/06	P
												0:05				
												0:05				
												0:05				
												0:05				
												0:05				
												0:05				
												0:05				
								1478								

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Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/8/2006
Project Location: Terrell, NC
Page: 1 of 3

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	Air Pressure Test PSI Finish	Air Pressure Test Time Start	Air Pressure Test Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
T109/110	11:25 AM	MR	M13	850	700%	BOS	EOS	84	30	29	12:27	12:32	MS		09/08/06	P
110/111	11:59 AM	MR	M13	850	700%	BOS	EOS	84	31	31	12:29	12:34	MS		09/08/06	P
111/112	12:11 PM	MR	M13	850	700%	BOS	EOS	85	30	29	12:30	12:35	MS		09/08/06	P
112/113	11:45 AM	JO	M8	850	700%	BOS	EOS	85	30	30	12:33	12:38	MS		09/08/06	P
113/114	12:02 PM	JO	M8	850	700%	BOS	EOS	90	30	30	12:36	12:41	MS		09/08/06	P
114/115	11:58 AM	HT	M10	850	700%	BOS	EOS	102	30	30	12:42	12:47	MS		09/08/06	P
115/116	12:10 PM	HT	M10	850	700%	BOS	EOS	75	30	29	12:45	12:50	MS		09/08/06	P
116/117	2:25 PM	HT	M10	850	700%	BOS	EOS	37	30	29	12:51	12:56	MS		09/08/06	P
117/118	2:45 PM	HT	M10	850	580%	BOS	EOS	13	30	30	2:51	2:56	MS		09/08/06	P
118/119	12:35 PM	HT	M10	850	700%	BOS	EOS	13	30	30	12:53	12:58	MS		09/08/06	P
117/119	2:41 PM	HT	M10	850	580%	BOS	EOS	25	30	29	2:48	2:53	MS		09/08/06	P
116/119	2:36 PM	HT	M10	850	680%	BOS	EOS	10	30	30	2:46	2:51	MS		09/08/06	P
119/120	12:30 PM	MR	M13	850	700%	BOS	EOS	47	30	29	12:50	12:55	MS		09/08/06	P
116/120	2:31 PM	HT	M10	850	580%	BOS	EOS	30	30	29	2:39	2:44	MS		09/08/06	P
115/120	2:30 PM	HT	M10	850	580%	BOS	EOS	3	30	30	1:31	1:36	MS		09/08/06	P
120/121	12:30 PM	JO	M8	850	700%	BOS	EOS	77	30	30	1:31	1:36	MS		09/08/06	P
115/121	2:25 PM	HT	M10	850	580%	BOS	EOS	25	30	30	2:35	2:40	MS		09/08/06	P
110/S54	1:59 PM	IF	M11	850	600%	BOS	EOS	22.5	30	30	2:01	2:06	MS		09/08/06	P
111/S54	2:04 PM	IF	M11	850	600%	BOS	EOS	22.5	30	29	2:04	2:09	MS		09/08/06	P
T112/S54	2:07 PM	IF	M11	850	700%	BOS	EOS	22.5	30	29	2:06	2:11	MS		09/08/06	P
113/S54	2:10 PM	IF	M11	850	700%	BOS	EOS	22.5	30	30	2:11	2:16	MS		09/08/06	P
114/S54	2:14 PM	IF	M11	850	700%	BOS	EOS	22.5	30	28	2:14	2:19	MS		09/08/06	P
115/S54	2:18 PM	IF	M11	850	700%	BOS	EOS	5	30	29	3:02	3:07	MS		09/08/06	P
121/122	12:17 PM	JO	M8	850	700%	BOS	EOS	95	30	30	1:35	1:40	MS		09/08/06	P
122/123	12:40 PM	HT	M10	850	700%	BOS	EOS	97	30	29	1:36	1:41	MS		09/08/06	P
123/124	12:43 PM	JO	M8	850	700%	BOS	EOS	97	30	30	1:40	1:45	MS		09/08/06	P
124/125	1:35 PM	HT	M10	850	700%	BOS	EOS	97	30	30	1:44	1:49	MS		09/08/06	P
125/126	12:53 PM	MR	M13	850	700%	BOS	EOS	97	30	30	3:38	3:43	MS		09/08/06	P
126/127	12:55 PM	JO	M8	850	700%	BOS	EOS	97	30	30	3:41	3:46	MS		09/08/06	P
127/128	1:30 PM	MR	M13	850	700%	BOS	EOS	98	30	30	3:48	3:53	MS		09/08/06	P
128/129	1:42 PM	JO	M8	850	700%	BOS	EOS	98	30	30	3:50	3:55	MS		09/08/06	P
129/130	1:47 PM	MR	M13	850	700%	BOS	EOS	132	30	30	3:55	4:00	MS		09/08/06	P
130/131	1:59 PM	JO	M8	850	700%	BOS	EOS	137	30	30	3:57	4:02	MS		09/08/06	P
S54/55	11:26 AM	JO	M8	850	700%	BOS	EOS	148	30	30	3:17	3:22	MS		09/08/06	P
S55/56	2:11 PM	MR	M13	850	700%	BOS	EOS	157	30	30	3:19	3:24	MS		09/08/06	P
S57/56	2:19 PM	IF	M11	850	700%	BOS	EOS	95	30	30	3:27	3:32	MS		09/08/06	P
								2447.5								

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410-583-7700 [illegible] 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/8/2006
Project Location: Terrell, NC
Page: 2 of 3

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	PSI Finish	Time Start	Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
S57/58	2:23 PM	JO	M8	850	650%	BOS	EOS	157	30	30	3:29	3:34	MS		09/08/06	P
58/59	2:42 PM	MR	M13	850	650%	BOS	EOS	95	30	30	4:22	4:27	MS		09/08/06	P
T121/S54	3:00 PM	IF	M11	850	600%	BOS	EOS	41	30	30	12:30	12:35	MS		09/08/06	P
122/S54	3:02 PM	IF	M11	850	600%	BOS	EOS	22.5	30	29	12:33	12:38	MS		09/08/06	P
123/S55	3:06 PM	IF	M11	850	600%	BOS	EOS	22.5	30	30	12:36	12:41	MS		09/08/06	P
124/S56	3:09 PM	IF	M11	850	600%	BOS	EOS	22.5	30	29	12:42	12:47	MS		09/08/06	P
125/S57	3:13 PM	IF	M11	850	600%	BOS	EOS	20	30	30	12:45	12:50	MS		09/08/06	P
126/S57	3:18 PM	IF	M11	850	600%	BOS	EOS	4	30	30	12:51	12:56	MS		09/08/06	P
126/S58	3:19 PM	IF	M11	850	600%	BOS	EOS	18.5	30	30	2:51	2:56	MS		09/08/06	P
127/S58	3:21 PM	IF	M11	850	600%	BOS	EOS	5	30	30	12:53	12:58	MS		09/08/06	P
127/S59	3:22 PM	IF	M11	850	600%	BOS	EOS	17.5	30	30	2:48	2:53	MS		09/08/06	P
128/S59	3:24 PM	IF	M11	850	600%	BOS	EOS	7.5	30	29	2:46	2:51	MS		09/08/06	P
128/S61	3:25 PM	IF	M11	850	600%	BOS	EOS	13	30	30	12:50	12:55	MS		09/08/06	P
129/S61	3:27 PM	IF	M11	850	600%	BOS	EOS	9	30	29	2:39	2:44	MS		09/08/06	P
129/S63	3:28 PM	IF	M11	850	600%	BOS	EOS	13	30	29	1:31	1:36	MS		09/08/06	P
130/S63	3:30 PM	IF	M11	850	600%	BOS	EOS	10	30	30	1:31	1:36	MS		09/08/06	P
130/S64	3:32 PM	IF	M11	850	600%	BOS	EOS	11	30	30	2:35	2:40	MS		09/08/06	P
131/S64	3:34 PM	IF	M11	850	600%	BOS	EOS	11	30	29	2:01	2:06	MS		09/08/06	P
S59/60	2:49 PM	JO	M8	850	650%	BOS	EOS	22.5	30	30	2:04	2:09	MS		09/08/06	P
58/60	2:56 PM	MR	M13	850	650%	BOS	EOS	85	30	30	2:06	2:11	MS		09/08/06	P
60/61	2:56 PM	JO	M8	850	650%	BOS	EOS	85	30	30	2:11	2:16	MS		09/08/06	P
59/61	2:56 PM	JO	M8	850	650%	BOS	EOS	75	30	30	2:14	2:19	MS		09/08/06	P
61/63	3:05 PM	HT	M10	850	700%	BOS	EOS	55	30	30	3:02	3:07	MS		09/08/06	P
62/63	2:58 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	1:35	1:40	MS		09/08/06	P
61/62	3:15 PM	HT	M10	850	700%	BOS	EOS	146	30	30	1:36	1:41	MS		09/08/06	P
63/64	3:07 PM	MR	M13	850	650%	BOS	EOS	55	30	30	1:40	1:45	MS		09/08/06	P
62/64	3:17 PM	MR	M13	850	650%	BOS	EOS	146	30	30	1:44	1:49	MS		09/08/06	P
64/46	3:35 PM	MR	M13	850	650%	BOS	EOS	20	30	30	3:38	3:43	MS		09/08/06	P
62/46	3:40 PM	HT	M10	850	700%	BOS	EOS	22.5	30	29	3:41	3:46	MS		09/08/06	P
61/47	3:43 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	3:48	3:53	MS		09/08/06	P
60/48	3:46 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	3:50	3:55	MS		09/08/06	P
22/64	3:45 PM	MR	M13	850	650%	BOS	EOS	22.5	30	30	3:55	4:00	MS		09/08/06	P
58/49	3:49 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	3:57	4:02	MS		09/08/06	P
57/50	3:53 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	3:17	3:22	MS		09/08/06	P
56/61	3:56 PM	HT	M10	850	700%	BOS	EOS	22.5	30	29	3:19	3:24	MS		09/08/06	P
55/52	3:59 PM	HT	M10	850	700%	BOS	EOS	22.5	30	29	3:27	3:32	MS		09/08/06	P
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100 E. PENNSYLVANIA [illegible] TOWSON, MD 21286
410-583-7700 [illegible] 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/8/2006
Project Location: Terrell, NC
Page: 3 of 3

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	PSI Finish	Time Start	Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
S54/T109	4:02 PM	HT	M10	850	700%	BOS	EOS	22.5	30	30	5:25	5:30	MS		09/09/06	P
131/132	5:16 PM	MR	M13	850	650%	BOS	EOS	99	30	30	8:25	8:30	MS		09/09/06	P
132/133	5:35 PM	MR	M13	850	650%	BOS	EOS	99	30	29	8:27	8:32	MS		09/09/06	P
133/134	5:50 PM	JO	M8	850	650%	BOS	EOS	99	30	30	8:30	8:35	MS		09/09/06	P
134/135	5:47 PM	MR	M13	850	650%	BOS	EOS	99	30	30	8:33	8:38	MS		09/09/06	P
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100 E. PENNSYLVANIA AVE., TOWSON, MD 21286
410-583-7700 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/9/2006
Project Location: Terrell, NC
Page: 1 of 2

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	PSI Finish	Time Start	Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
T135/136	2:15 PM	HT	M10	850	700%	BOS	EOS	99	30	30	5:05	5:10	MS		09/09/06	P
136/137	2:25 PM	JO	M8	850	650%	BOS	EOS	102	30	29	5:09	5:14	MS		09/09/06	P
137/138	2:30 PM	HT	M10	850	700%	BOS	EOS	85	30	30	5:31	5:36	MS		09/09/06	P
138/139	2:45 PM	JO	M8	850	650%	BOS	EOS	69	30	30	4:27	4:32	MS		09/09/06	P
139/140	2:56 PM	JO	M8	850	650%	BOS	EOS	40	30	30	4:44	4:49	MS		09/09/06	P
140/142	3:55 PM	HT	M10	850	580%	BOS	EOS	20	30	30	4:53	4:58	MS		09/09/06	P
141/142	3:28 PM	HT	M10	850	700%	BOS	EOS	20	30	30	4:55	5:00	MS		09/09/06	P
140/141	3:50 PM	HT	M10	850	580%	BOS	EOS	50	30	30	4:42	4:47	MS		09/09/06	P
141/143	3:20 PM	HT	M10	850	700%	BOS	EOS	42	30	30	4:40	4:45	MS		09/09/06	P
143/139	3:45 PM	HT	M10	850	580%	BOS	EOS	50	30	30	4:24	4:29	MS		09/09/06	P
143/144	3:08 PM	JO	M8	850	650%	BOS	EOS	69	30	30	4:25	4:30	MS		09/09/06	P
144/138	3:40 PM	HT	M10	850	580%	BOS	EOS	50	30	30	5:39	5:44	MS		09/09/06	P
131/S66	11:10 AM	HT	M10	850	620%	BOS	EOS	12	30	30	2:30	2:35	MS		09/09/06	P
132/S66	11:12 AM	HT	M10	850	620%	BOS	EOS	17	30	30	2:32	2:37	MS		09/09/06	P
132/S67	11:14 AM	HT	M10	850	620%	BOS	EOS	5	30	30	2:40	2:45	MS		09/09/06	P
133/S67	11:15 AM	HT	M10	850	620%	BOS	EOS	17	30	30	2:49	2:54	MS		09/09/06	P
133/S69	11:17 AM	HT	M10	850	620%	BOS	EOS	5	30	30	2:53	2:58	MS		09/09/06	P
134/S69	11:18 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	2:57	3:02	MS		09/09/06	P
135/S71	11:21 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	3:05	3:10	MS		09/09/06	P
T136/S72	11:24 AM	HT	M10	850	620%	BOS	EOS	22.5	30	30	5:08	5:13	MS		09/09/06	P
137/S79	11:27 AM	HT	M10	850	620%	BOS	EOS	5	30	30	5:23	5:28	MS		09/09/06	P
137/T151	4:45 PM	HT	M10	850	620%	BOS	7'>BOS	7	30	30	5:26	5:31	MS		09/09/06	P
137/T151	4:47 PM	HT	M10	850	620%	7'>BOS	EOS	20	30	30	5:28	5:33	MS		09/09/06	P
138/151	4:49 PM	HT	M10	850	620%	BOS	EOS	7	30	30	5:34	5:39	MS		09/09/06	P
S74/151	4:41 PM	HT	M10	850	620%	BOS	EOS	22.5	30	30	5:50	5:55	MS		09/09/06	P
146/151	4:38 PM	HT	M10	850	620%	BOS	EOS	11	30	30	5:46	5:51	MS		09/09/06	P
145/146	3:08 PM	MR	M13	850	700%	BOS	EOS	110	30	30	5:42	5:47	MS		09/09/06	P
146/147	3:22 PM	JO	M8	850	700%	BOS	EOS	140	30	30	6:07	6:12	MS		09/09/06	P
147/148	3:30 PM	MR	M13	850	700%	BOS	EOS	100	30	30	6:11	6:16	MS		09/09/06	P
148/149	3:46 PM	JO	M8	850	700%	BOS	EOS	100	30	30	6:14	6:19	MS		09/09/06	P
149/150	3:48 PM	MR	M13	850	700%	BOS	EOS	100	30	30	6:18	6:23	MS		09/09/06	P
S66/64	11:37 AM	MR	M13	850	700%	BOS	EOS	104	30	30	2:27	2:32	MS		09/09/06	P
66/65	11:25 AM	HT	M10	850	700%	BOS	EOS	22.5	30	30	3:15	3:20	MS		09/09/06	P
64/65	11:47 AM	MR	M13	850	700%	BOS	EOS	137	30	30	3:13	3:18	MS		09/09/06	P
65/22	11:57 AM	MR	M13	850	700%	BOS	EOS	10	30	30	3:14	3:19	MS		09/09/06	P
65/67	11:35 AM	HT	M10	850	700%	BOS	EOS	147	30	30	3:21	3:26	MS		09/09/06	P
								1662.5								

100 E. PENNSYLVANIA A[illegible] TOWSON, MD 21286
410-583-7700 [illegible]410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/9/2006
Project Location: Terrell, NC
Page: 2 of 2

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	PSI Finish	Time Start	Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
S67/68	11:56 AM	JO	M8	850	700%	BOS	EOS	67	30	30	3:27	3:32	MS		09/09/06	P
68/69	11:51 AM	JO	M8	850	700%	BOS	EOS	22.5	30	30	3:23	3:28	MS		09/09/06	P
66/67	11:45 AM	HT	M10	850	700%	BOS	EOS	104	30	30	2:34	2:39	MS		09/09/06	P
67/69	12:00 PM	JO	M8	850	700%	BOS	EOS	211	30	30	2:39	2:44	MS		09/09/06	P
69/71	12:43 PM	MR	M13	850	700%	BOS	EOS	85	30	30	2:59	3:04	MS		09/09/06	P
69/70	12:32 PM	MR	M13	850	700%	BOS	EOS	126	30	29	3:34	3:39	MS		09/09/06	P
70/71	12:15 PM	MR	M13	850	700%	BOS	EOS	22.5	30	30	3:37	3:42	MS		09/09/06	P
70/72	1:48 PM	JO	M8	850	700%	BOS	EOS	197	30	29	3:40	3:45	MS		09/09/06	P
71/72	2:00 PM	JO	M8	850	700%	BOS	EOS	85	30	30	3:06	3:11	MS		09/09/06	P
68/70	12:25 PM	MR	M13	850	700%	BOS	EOS	67	30	29	3:29	3:34	MS		09/09/06	P
72/73	2:10 PM	MR	M13	850	700%	BOS	EOS	52	30	30	3:48	3:53	MS		09/09/06	P
73/74	1:57 PM	MR	M13	850	700%	BOS	EOS	22.5	30	29	3:50	3:55	MS		09/09/06	P
73/75	2:37 PM	MR	M13	850	700%	BOS	EOS	52	30	30	4:00	4:05	MS		09/09/06	P
T146/S74	4:15 PM	HT	M10	850	700%	BOS	EOS	40	30	30	5:53	5:58	MS		09/09/06	P
T147/S74	4:10 PM	HT	M10	850	700%	BOS	EOS	40	30	30	6:08	6:13	MS		09/09/06	P
S29/75	4:12 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:40	6:45	MS		09/09/06	P
S28/73	4:15 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:34	6:39	MS		09/09/06	P
S26/70	4:17 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:30	6:35	MS		09/09/06	P
S25/68	4:20 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:29	6:34	MS		09/09/06	P
S24/67	4:23 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:28	6:33	MS		09/09/06	P
S23/65	4:25 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	6:26	6:31	MS		09/09/06	P
S74/75	2:50 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	3:56	4:01	MS		09/09/06	P
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100 E. PENNSYLVANIA TOWSON, MD 21286
410-583-7700 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/10/2006
Project Location: Terrell, NC
Page: 1 of 1

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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				
S27/72	10:20 AM	HV	MX9	500	400%	BOS	EOS	22.5	NA	NA		0:05		CS	09/10/06	P
S77/75	3:09 PM	MR	M13	850	700%	BOS	EOS	190	30	30	7:31	7:36	MS		09/11/06	P
S77/78	3:18 PM	JO	M8	850	700%	BOS	EOS	104	30	30	7:22	7:27	MS		09/11/06	P
S7576	3:00 PM	JO	M8	850	700%	BOS	EOS	22.5	30	29	7:30	7:35	MS		09/11/06	P
S74/75	3:05 PM	JO	M8	850	700%	20'>EOS	EOS	20	30	29	7:20	7:25	MS		09/11/06	P
S74/76	3:08 PM	JO	M8	850	700%	BOS	EOS	50	30	30	7:17	7:22	MS		09/11/06	P
S76/T147	5:00 PM	JO	M8	850	700%	BOS	EOS	22.5	30	29	5:04	5:09	MS		09/10/06	P
S76/77	3:28 PM	MR	M13	850	700%	BOS	EOS	52	30	29	7:15	7:20	MS		09/11/06	P
S77/79	3:45 PM	JO	M8	850	700%	BOS	EOS	128	30	29	4:40	4:45	MS		09/11/06	P
S78/79	3:37 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	7:53	7:58	MS		09/11/06	P
S77/78	3:18 PM	JO	M8	850	700%	BOS	EOS	104	30	29	7:50	7:55	MS		09/11/06	P
S78/80	3:46 PM	MR	M13	850	700%	BOS	EOS	104	30	30	7:51	7:56	MS		09/11/06	P
S79/80	3:59 PM	MR	M13	850	700%	BOS	EOS	128	30	30	4:42	4:47	MS		09/10/06	P
S80/81	4:02 PM	JO	M8	850	700%	BOS	EOS	75	30	30	8:00	8:05	MS		09/11/06	P
S77/30	4:05 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	8:20	8:25	MS		09/11/06	P
S78/31	4:08 PM	JO	M8	850	700%	BOS	EOS	22.5	30	29	8:08	8:13	MS		09/11/06	P
S80/32	4:10 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	8:09	8:14	MS		09/11/06	P
S81/33	4:12 PM	JO	M8	850	700%	BOS	EOS	22.5	30	30	8:01	8:06	MS		09/11/06	P
S80/T150	4:39 PM	JO	M8	850	620%	BOS	EOS	22.5	30	30	7:32	7:37	MS		09/11/06	P
S79/T149	4:43 PM	JO	M8	850	620%	BOS	EOS	22.5	30	30	4:50	4:55	DV		09/10/06	P
S79/T148	4:46 PM	JO	M8	850	620%	BOS	EOS	18	30	29	4:50	4:55	DV		09/10/06	P
S77/T148	4:48 PM	JO	M8	850	620%	BOS	EOS	4	30	30	4:57	5:02	DV		09/10/06	P
S77/T147	4:52 PM	JO	M8	850	620%	BOS	EOS	20	30	30	5:00	5:05	DV		09/10/06	P
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100 E. PENNSYLVANIA [illegible], TOWSON, MD 21286
410-583-7700 [illegible] 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/11/2006
Project Location: Terrell, NC
Page: 1 of 1

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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 PSI Start	PSI Finish	Time Start	Time Finish	Tech	Vac Test Tech	Test Date	Pass / Fail
S34/S81	9:50 AM	HV	MX9	500	400%	BOS	EOS	25	NA	NA	NA	#VALUE!		CS	09/11/06	P
T150/152	7:35 PM	JO	M8	850	650%	BOS	EOS	110	30	30	7:45	7:50	MS		09/12/06	P
T161/152	8:45 PM	HT	M10	850	680%	BOS	EOS	12	30	30	7:33	7:38	MS		09/12/06	P
T161/160	8:38 PM	JO	M8	850	650%	BOS	EOS	12	30	30	7:35	7:40	MS		09/12/06	P
T152/160	8:50 PM	HT	M10	850	680%	BOS	EOS	65	30	30	7:43	7:48	MS		09/12/06	P
T159/160	8:30 PM	HT	M10	850	680%	BOS	EOS	58	30	30	7:38	7:43	MS		09/12/06	P
T158/159	8:20 PM	MR	M13	850	650%	BOS	EOS	103	30	30	7:49	7:54	MS		09/12/06	P
T157/158	8:19 PM	JO	M8	850	650%	BOS	EOS	125	30	30	7:51	7:56	MS		09/12/06	P
T156/157	8:20 PM	HT	M10	850	680%	BOS	EOS	122	30	30	7:57	8:02	MS		09/12/06	P
T155/156	8:10 PM	MR	M13	850	650%	BOS	EOS	113	30	30	8:00	8:05	MS		09/12/06	P
T154/155	7:53 PM	JO	M8	850	650%	BOS	EOS	113	30	30	8:01	8:06	MS		09/12/06	P
T153/154	8:00 PM	HT	M10	850	680%	BOS	EOS	113	30	30	8:05	8:10	MS		09/12/06	P
T65/153	7:25 PM	MR	M13	850	650%	BOS	EOS	98	30	30	8:07	8:12	MS		09/12/06	P
T159/152	8:55 PM	HT	M10	850	680%	BOS	EOS	30	30	30	7:47	7:52	MS		09/12/06	P
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100 E. PENNSYLVANIA [illegible], TOWSON, MD 21286
410-583-7700 [illegible] 410-583-7720

Seaming and Non Destructive Test Log

Project No.: 0623-5106
Project Name: Marshall Station
Weld Date: 9/12/2006
Project Location: Terrell, NC
Page: 1 of 1

X HDPE ____ LDPE
X Smooth X Textured
Thickness: 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				
S34/T153	7:58 AM	HT	M10	850	580%	BOS	EOS	22.5	30	30	8:13	8:18	MS		09/12/06	P
S81/T153	8:00 AM	HT	M10	850	580%	BOS	EOS	22.5	30	30	8:13	8:18	MS		09/12/06	P
S81/T154	8:03 AM	HT	M10	850	580%	BOS	EOS	22.5	30	29	8:17	8:22	MS		09/12/06	P
S81/T155	8:06 AM	HT	M10	850	580%	BOS	EOS	22.5	30	29	8:19	8:24	MS		09/12/06	P
S81/T156	8:08 AM	HT	M10	850	580%	BOS	EOS	6	30	30	8:21	8:26	MS		09/12/06	P
S80/T156	8:09 AM	HT	M10	850	580%	BOS	EOS	17	30	30	8:25	8:30	MS		09/12/06	P
S80/T157	8:11 AM	HT	M10	850	580%	BOS	EOS	22.5	30	30	8:27	8:32	MS		09/12/06	P
S80/T158	8:14 AM	HT	M10	850	580%	BOS	EOS	22.5	30	29	8:29	8:34	MS		09/12/06	P
S80/T159	8:17 AM	HT	M10	850	580%	BOS	EOS	10	30	29	8:34	8:39	MS		09/12/06	P
S80/T152	8:18 AM	HT	M10	850	580%	BOS	EOS	22.5	30	30	8:42	8:47	MS		09/12/06	P
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												0:05				
								193.5								

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/25/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 1 of 2

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
			Carry Over			
T-1	429118	72	22.5	1620	TEL	
T-2	429118	73	22.5	1642.5	TEL	
T-3	429118	71	22.5	1597.5	TEL	
T-4	429118	54	22.5	1620	TEL	
T-5	429118	33	8	264	TEL	33x8
T-6	429118	65	22.5	1462.5	TEL	
T-7	429118	63	22.5	1417.5	TEL	
T-8	429119	63	22.5	1417.5	TEL	
T-9	429119	62	22.5	1395	TEL	
T-10	429119	30	5	150	TEL	5x30
T-11	429119	60	22.5	1350	TEL	
T-12	429119	60	22.5	1350	TEL	
T-13	429119	59	22.5	1327.5	TEL	
T-14	429119	55	22.5	1237.5	TEL	
T-15	429119	54	22.5	1215	TEL	
T-16	429239	23	4	92	TEL	4x23
T-17	429239	50	22.5	1125	TEL	
T-18	429239	50	22.5	1125	TEL	
T-19	429239	49	22.5	1102.5	TEL	
T-20	429239	49	22.5	1102.5	TEL	
T-21	429239	20	4	80	TEL	4x20
T-22	429239	48	22.5	1080	TEL	
T-23	429239	46	22.5	1035	TEL	
T-24	429239	46	22.5	1035	TEL	
T-25	429239	45	22.5	1012.5	TEL	
			Daily Total			
			Current Total			

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/25/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC

Carry Over

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-26	429232	20	3	60	TEL	20x3
T-27	429232	41	22.5	922.5	TEL	
T-28	429232	41	22.5	922.5	TEL	
T-29	429232	41	22.5	922.5	TEL	
T-30	429232	41	22.5	922.5	TEL	
T-31	429232	40	22.5	900	TEL	
T-32	429232	17	3	51	TEL	17x3
T-33	429232	40	22.5	900	TEL	
T-34	429232	45	22.5	1012.5	TEL	
T-35	429232	70	22.5	1575	TEL	
T-36	423237	32	6	192	TEL	32x6
T-37	423237	76	22.5	1710	TEL	
T-38	423237	76	22.5	1710	TEL	
T-39	423237	75	22.5	1687.5	TEL	
T-40	423237	33	3	99	TEL	33x3
T-41	423237	78	22.5	1755	TEL	
T-42	423237	78	22.5	1755	TEL	

Daily Total	44953
Current Total	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/26/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page:

Carry Over 44953

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
S-1	232234	430	22.5	9675	TEL	
S-2	232232	435	22.5	9787.5	TEL	
S-3	232235	437	22.5	9832.5	TEL	
S-4	232109	434	22.5	9765	TEL	
S-5	231352	438	22.5	9855	TEL	
S-6	232103	437	22.5	9832.5	TEL	
S-7	232233	436	22.5	9810	TEL	
S-8	232122	430	22.5	9675	TEL	
S-9	232228	431	22.5	9697.5	TEL	
S-10	231357	431	22.5	9697.5	TEL	
S-11	232116	430	22.5	9675	TEL	
S-12	232102	433	22.5	9742.5	TEL	
S-13	232105	434	22.5	9765	TEL	
S-14	232112	436	22.5	9810	TEL	
S-15	252227	420	22.5	9450	TEL	

Daily Total	146070
Current Total	191023

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/27/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page:

Carry Over 191023

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
S-16	232104	420	22.5	9450	TEL	
S-17	232236	396	22.5	8910	TEL	
S-18	232236	26	13	338	TEL	
S-19	232113	277	22.5	6232.5	TEL	
S-20	232113	80	17	1360	TEL	
S-21	232113	80	11	880	TEL	
S-22	232106	439	22.5	9877.5	TEL	
S-23	232237	439	22.5	9877.5	TEL	
S-24	232225	441	22.5	9922.5	TEL	
S-25	232110	440	22.5	9900	TEL	
S-26	232111	440	22.5	9900	TEL	
S-27	232115	439	22.5	9877.5	TEL	
S-28	232108	439	22.5	9877.5	TEL	
S-29	232121	440	22.5	9900	TEL	
S-30	231358	436	22.5	9810	TEL	
S-31	232101	433	22.5	9742.5	TEL	
S-32	231356	435	22.5	9787.5	TEL	
S-33	232230	432	22.5	9720	TEL	
S-34	232117	430	22.5	9675	TEL	
S-35	232226	365	22.5	8212.5	TEL	
S-36	232226	105	16	1680	TEL	
S-37	232115	190	22.5	4275	TEL	
S-38	232115	129	22.5	2902.5	TEL	
S-39	232115	80	22.5	1800	TEL	
			Daily Total	173908		
			Current Total	364931		

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/28/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC

			Carry Over	364931		
Panel #	**Roll Number**	**Length**	**Width**	**Approximate Area**	**CQA Initials**	**Remarks**
T-43	429230	72	22.5	1620	TEL	
T-44	429230	74	22.5	1665	TEL	
T-45	429230	76	22.5	1710	TEL	
T-46	429230	78	22.5	1755	TEL	
T-47	429230	77	22.5	1732.5	TEL	
T-48	429116	77	22.5	1732.5	TEL	
T-49	429116	80	22.5	1800	TEL	
T-50	429116	78	22.5	1755	TEL	
T-51	429116	82	22.5	1845	TEL	
T-52	429116	80	22.5	1800	TEL	
T-53	429340	83	22.5	1867.5	TEL	
T-54	429340	80	22.5	1800	TEL	
T-55	429340	86	22.5	1935	TEL	
T-56	429340	84	22.5	1890	TEL	
T-57	429343	88	22.5	1980	TEL	
T-58	429343	86	22.5	1935	TEL	
T-59	429343	90	22.5	2025	TEL	
T-60	429343	84	22.5	1890	TEL	
T-61	429225	85	22.5	1912.5	TEL	
T-62	429225	87	22.5	1957.5	TEL	
T-63	429225	92	22.5	2070	TEL	
T-64	429225	90	22.5	2025	TEL	
T-65	429117	91	22.5	2047.5	TEL	
S-40	232224	441	22.5	9922.5	TEL	
S-41	232118	430	22.5	9675		
			Daily Total			
			Current Total			

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/28/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 2 of 2

			Carry Over	364931		
Panel #	**Roll Number**	**Length**	**Width**	**Approximate Area**	**CQA Initials**	**Remarks**
S-42	232114	434	22.5	9765	TEL	
S-43	232231	444	22.5	9990	TEL	
S-44	232107	445	22.5	10012.5	TEL	
S-45	429117	441	22.5	9922.5	TEL	
T-66	429117	43	22.5	967.5	TEL	
T-67	429117	50	22.5	1125	TEL	
T-68	429117	52	22.5	1170	TEL	
T-69	429117	53	22.5	1192.5	TEL	
T-70	429117	53	22.5	1192.5	TEL	
T-71	429117	54	22.5	1215	TEL	
T-72	429227	53	22.5	1192.5	TEL	
T-73	429117	60	22.5	1350	TEL	
			Daily Total	111442.5		
			Current Total	476373.5		

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/29/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC

			Carry Over	476373.5		
Panel #	**Roll Number**	**Length**	**Width**	**Approximate Area**	**CQA Initials**	**Remarks**
S-46	231354	438	22.5	9855	TEL	
S-47	231353	410	22.5	9225	TEL	
S-48	231355	424	22.5	9540	TEL	
S-49	232229	433	22.5	9742.5	TEL	
S-50	231247	393	22.5	8842.5	TEL	
S-51	231284	378	22.5	8505	TEL	
S-52	231249	343	22.5	7717.5	TEL	
S-53	231250	416	22.5	9360	TEL	
T-74	429115	70	22.5	1575	TEL	
T-75	429115	66	22.5	1485	TEL	
T-76	429115	66	22.5	1485	TEL	
T-77	429115	64	22.5	1440	TEL	
T-78	429115	63	22.5	1417.5	TEL	
T-79	429115	64	22.5	1440	TEL	
T-80	429238	59	22.5	1327.5	TEL	
T-81	429238	58	22.5	1305	TEL	
T-82	429238	58	22.5	1305	TEL	
T-83	429238	55	22.5	1237.5	TEL	
T-84	429238	53	22.5	1192.5	TEL	
T-85	429238	50	22.5	1125	TEL	
T-86	429238	49	22.5	1102.5	TEL	
T-87	429236	47	22.5	1057.5	TEL	
T-88	429236	46	22.5	1035	TEL	
T-89	429236	43	22.5	967.5	TEL	
T-90	429236	41	22.5	922.5	TEL	
			Daily Total			
			Current Total			

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/29/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 2 of 2

Carry Over 476373.5

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-91	429236	40	22.5	900	TEL	
T-92	429236	40	22.5	900	TEL	
T-93	429236	46	22.5	1035	TEL	
T-94	429236	51	22.5	1147.5	TEL	
T-95	429236	29	16	464	TEL	

Daily Total	98654
Current Total	575027.5

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 8/30/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page:

Carry Over 575027.5

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-96	429233	71	22.5	1597.5	TEL	
T-97	429233	73	22.5	1642.5	TEL	
T-98	429233	75	22.5	1687.5	TEL	
T-99	429233	77	22.5	1732.5	TEL	
T-100	429233	79	22.5	1777.5	TEL	
T-101	429235	82	22.5	1845	TEL	
T-102	429235	84	22.5	1890	TEL	
T-103	429235	84	22.5	1890	TEL	
T-104	429235	87	22.5	1957.5	TEL	
T-105	429228	89	22.5	2002.5	TEL	
T-106	429228	92	22.5	2070	TEL	
T-107	429228	93	22.5	2092.5	TEL	
T-108	429228	97	22.5	2182.5	TEL	
T-109	429227	100	22.5	2250	TEL	

Daily Total	26617.5
Current Total	601645

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 9/8/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 1 of 2

			Carry Over	601645		
Panel #	**Roll Number**	**Length**	**Width**	**Approximate Area**	**CQA Initials**	**Remarks**
S-54	230120	132	22.5	2970	TEL	
S-55	230120	137	22.5	3082.5	TEL	
S-56	230130	148	22.5	3330	TEL	
S-57	231359	157	22.5	3532.5	TEL	
S-58	231359	170	22.5	3825	TEL	
S-59	23146	95	22.5	2137.5	TEL	
S-60	231354	85	22.5	1912.5	TEL	
S-61	231246	197	22.5	4432.5	TEL	
S-62	231246	146	22.5	3285	TEL	
S-63	231246	55	22.5	1237.5	TEL	
S-64	231246	226	22.5	5085	TEL	
T-110	429227	81	22.5	1822.5	TEL	
T-111	429227	85	22.5	1912.5	TEL	
T-112	429114	85	22.5	1912.5	TEL	
T-113	429114	90	22.5	2025	TEL	
T-114	429114	97	22.5	2182.5	TEL	
T-115	429114	100	22.5	2250	TEL	
T-116	429227	75	22.5	1687.5	TEL	
T-117	429227	37	11	407	TEL	
T-118	429344	13	5	65	TEL	
T-119	429344	47	20	940	TEL	
T-120	429344	77	22.5	1732.5	TEL	
T-121	429344	101	22.5	2272.5	TEL	
T-122	429344	97	22.5	2182.5	TEL	
T-123	429222	96	22.5	2160	TEL	
			Daily Total			
			Current Total			

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 9/8/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 2 of 2

Carry Over 601645

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-124	429222	97	22.5	2182.5	TEL	
T-125	429222	97	22.5	2182.5	TEL	
T-126	429222	97	22.5	2182.5	TEL	
T-127	429223	96	22.5	2160	TEL	
T-128	429223	97	22.5	2182.5	TEL	
T-129	429223	97	22.5	2182.5	TEL	
T-130	429223	96	22.5	2160	TEL	
T-131	429344	99	22.5	2227.5	TEL	
T-132	429341	103	22.5	2317.5	TEL	
T-133	429341	99	22.5	2227.5	TEL	
T-134	429341	97	22.5	2182.5	TEL	
T-135	429341	99	22.5	2227.5	TEL	

Daily Total	84797
Current Total	686442

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 9/9/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 1 of 2

			Carry Over	686442		
Panel #	**Roll Number**	**Length**	**Width**	**Approximate Area**	**CQA Initials**	**Remarks**
S-65	232123	147	22.5	3307.5	TEL	
S-66	232240	104	22.5	2340	TEL	
S-67	232240	271	22.5	6097.5	TEL	
S-68	232240	61	22.5	1372.5	TEL	
S-69	23241	211	22.5	4747.5	TEL	
S-70	23241	197	22.5	4432.5	TEL	
S-71	232238	85	22.5	1912.5	TEL	
S-72	232238	288	22.5	6480	TEL	
S-73	232238	52	22.5	1170	TEL	
S-74	232239	240	22.5	5400	TEL	
S-75	232239	190	22.5	4275	TEL	
T-136	429120	102	22.5	2295	TEL	
T-137	429120	95	22.5	2137.5	TEL	
T-138	429120	69	22.5	1552.5	TEL	
T-139	429120	40	22.5	900	TEL	
T-140	429120	31	22.5	697.5	TEL	
T-141	429343	42	10	420	TEL	
T-142	429343	20	10	200	TEL	
T-143	429343	62	22.5	1395	TEL	
T-144	429343	88	22.5	1980	TEL	
T-145	429343	101	22.5	2272.5	TEL	
T-146	429343	123	22.5	2767.5	TEL	
T-147	429226	140	22.5	3150	TEL	
T-148	429226	110	22.5	2475	TEL	
T-149	429226	111	22.5	2497.5	TEL	
			Daily Total			
			Current Total			

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE DEPLOYMENT REPORT

Material Description
60-mil HDPE - Agru

Date: 9/9/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 2 of 2

Carry Over: 686442

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-150	429342	110	22.5	2475	TEL	
T-151	429344	25	22.5	562.5	TEL	Sump Area

Daily Total	69312.5
Current Total	755754.5

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: ______________________

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GEOMEMBRANE DEPLOYMENT REPORT

Date:	9/10/2006
CHS Project Number:	46003.001
Project Name:	Marshall Steam Station
Project Location:	Catawa County, NC
Page:	1 of 1

Material Description
60-mil HDPE - Agru

Carry Over 755754.5

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
S-76	225362	50	22.5	1125	TEL	
S-77	225362	247	22.5	5557.5	TEL	
S-78	225362	104	22.5	2340	TEL	
S-79	225240	128	22.5	2880	TEL	
S-80	225240	196	22.5	4410	TEL	
S-81	225240	75	22.5	1687.5	TEL	
			Daily Total	18000		
			Current Total	773754.5		

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: ____________________

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GEOMEMBRANE DEPLOYMENT REPORT

Date: 9/11/2006
CHS Project Number: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawa County, NC
Page: 1 of 1

Material Description
60-mil HDPE - Agru

Carry Over: 773754.5

Panel #	Roll Number	Length	Width	Approximate Area	CQA Initials	Remarks
T-152	427342	135	22.5	3037.5	TEL	
T-153	427342	113	22.5	2542.5	TEL	
T-154	429224	113	22.5	2542.5	TEL	
T-155	429224	115	22.5	2587.5	TEL	
T-156	429224	125	22.5	2812.5	TEL	
T-157	429229	122	22.5	2745	TEL	
T-158	429229	115	22.5	2587.5	TEL	
T-159	429229	103	22.5	2317.5	TEL	
T-160	429231	58	22.5	1305	TEL	
T-161	429231	12	10	120	TEL	
			Daily Total	22597.5		
			Current Total	796352		

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: ____________________

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CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists
128 Overhill Drive, Suite 105, Mooresville, NC 28117
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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	10	13		
Time	7:45	1:16		
Tech Initials	HV	HV		
Machine #	X8	X8		

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R1	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T41/T42/S21
R2	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T39/T41/S21
R3	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T38/T39/S21
R4	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S21/S20/T38
R5	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S20/T37/T38
R6	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S19/S20/S21
R7	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T35/T37/S20
R8	P	4X4	HV	TEL	VB	CS	P	TEL	Intersection T1/T35/S20
R9	P	2X2	HV	TEL	VB	CS	P	TEL	4'N&10'W from SE corner T1
R10	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T1/T2/S20
R11	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T2/T3/S20
R12	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T3/T4/S20
R13	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T4/T6/S18/S19
R14	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T6/S18/S19
R15	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S17/S18/S19
R16	P	1X1	HV	TEL	VB	CS	P	TEL	Mid Panel S-18
R17	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T6/T7/S18
R18	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T7/T8/S18
R19	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T8/S17/S18
R20	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T8/T9/S17

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	10	13		
Time	7:45	1:16		
Tech Initials	HV	HV		
Machine #	X8	X8		

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R21	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T9/T11/S17
R22	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T11/S16/S17
R23	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T11/T12/S16
R24	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T12/T13/S16
R25	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S15/S16/T13
R26	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T13/T14/S15
R27	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S14/S15/T14
R28	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T14/T15/S14
R29	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T15/T17/S13/S14
R30	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T17/T18/S13
R31	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S12/S13/T18
R32	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 14
R33	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection T18/T19/S12
R34	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S11/S12/T19
R35	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T19/T20/S11
R36	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T20/S10/S11
R37	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T20/T22/S10
R38	P	4X3	HV	TEL	VB	CS	P	TEL	Intersection S9/S10/T22/T23
R39	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T23/T24/S8/S9
R40	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S7/S8/T24/T25

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	10	13		
Time	7:45	1:16		
Tech Initials	HV	HV		
Machine #	X8	X8		

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R41	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S6/S7/T27/T25
R42	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T27/T28/S6
R43	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S5/S6/T28
R44	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T28/T29/S5
R45	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S4/S5/T29
R46	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T29/T30/S4
R47	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T30/S3/S4
R48	P	4X4	HV	TEL	VB	CS	P	TEL	Intersection T30/T31/S3
R49	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S2/S3/T31
R50	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T33/T31/S2
R51	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T33/S1/S2
R52	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T33/T34/S1
R53	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T31/T32/T33
R54	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T25/T26/T29
R55	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #2
R56	P	2X1	HV	TEL	VB	CS	P	TEL	Intersection T20/T21/T22
R57	P	2X1	HV	TEL	VB	CS	P	TEL	MID-PANEL T18
R58	P	2X1	HV	TEL	VB	CS	P	TEL	Intersection T15/T16/T17
R59	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T9/T10/T11
R60	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #1

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	10	13		
Time	7:45	1:16		
Tech Initials	HV	HV		
Machine #	X8	X8		

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 4 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R61	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T3/T4/S5
R62	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T35/T36/T37
R63	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #3
R64	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T39/T40/T41
R65	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #15
R66	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #13
R67	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #12
R68	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #11
R69	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #10
R70	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #9
R71	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #8
R72	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #7
R73	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #6
R74	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #5
R75	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #4

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	21	24	18	23
Time	2:20	7:40	3:40	2:15
Tech Initials	HV	HV	MR	MR
Machine #	X8	X8	13	13

Date: 8/28/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R76	P	7X2	HV	TEL	VB	CS	P	TEL	Intersection S1/S2/S22/S23
R77	P	22.5X2	MR	TEL	AT	MS	P	TEL	Intersection (Butt) S2/S23
R78	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection (Butt) S2/S3/S23/S24
R79	P	22.5X2	MR	TEL	AT	MS	P	TEL	Butt S3/S24
R80	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S3/S4/S24/S25
R81	P	22.5X2	MR	TEL	AT	MS	P	TEL	Butt S4/S25
R82	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S4/S5/S25/S26
R83	P	22.5X2	MR	TEL	AT	MS	P	TEL	Butt S4/S26
R84	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S5/S6/S26/S27
R85	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S6/S7/S27/S28
R86	P	5X2	HV	TEL	VB	CS	P	TEL	Intersection S7/S8/S28/S29
R87	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S8/S9/S29/S30
R88	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S9/S10/S30/S31
R89	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S10/S11/S31/S32
R90	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S11/S12/S32/S33
R91	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S12/S13/S33
R92	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S33/S34/S13
R93	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S13/S14/S34/S35
R94	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S14/S15/S35
R95	P	2X2	HV	TEL	VB	CS	P	TEL	N end S15/S35

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	21	24	18	23
Time	2:20	7:40	3:40	2:15
Tech Initials	HV	HV	MR	MR
Machine #	X8	X8	13	13

Date: 8/28/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R96	P	6X3	HV	TEL	VB	CS	P	TEL	10' S of N end S15/S35
R97	P	5X2	HV	TEL	VB	CS	P	TEL	Intersection S15/S35/S37
R98	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection S15/S16/S37
R99	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S37/S38/S16
R100	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection S38 - Mid Panel
R101	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S16/S17/S38/S39
R102	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S35/S36/S37
R103	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T64/T65/S35
R104	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T63/T64/S35
R105	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T62/T63/S35
R106	P	4X2	HV	TEL	VB	CS	P	TEL	LDT # 36
R107	P	2X2	HV	TEL	VB	CS	P	TEL	TYN 18' N of Bus @ T62/S35
R108	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T61/T62/S35
R109	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T60/T61/S35
R110	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T60/S35/S36
R111	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T59/T60/S36
R112	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T58/T59/S36
R113	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T58/S36
R114	P	2X3	HV	TEL	VB	CS	P	TEL	Intersection T56/T58/S36
R115	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T57/S36

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	21	24	18	23
Time	2:20	7:40	3:40	2:15
Tech Initials	HV	HV	MR	MR
Machine #	X8	X8	13	13

Date: 8/28/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R116	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T56/T57/S36
R231	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 16
R232	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 17
R233	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 18
R234	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 19

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	26	30		
Time	7:30	1:45		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R117	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 35
R118	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T56/S36/S37/S38
R119	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T55/T56/S38
R120	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T54/T55/S38
R121	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T53/T54/S38
R122	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T52/T53/S38
R123	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T51/T52/S39/S38
R124	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T50/T51/S39
R125	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T49/T50/S39
R126	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T48/T49/S39
R127	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T48/S39/S17
R128	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T47/S17/T48
R129	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T47/S17/S19/S17
R130	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T47/S19
R131	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T46/T47/S19
R132	P	2X2	HV	TEL	VB	CS	P	TEL	IntersectionT45/T46/S19
R133	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T44/T45/S19
R134	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T43/T44/S19
R135	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 51
R136	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T43/S21/S19

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	26	30		
Time	7:30	1:45		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R137	P	5X2	HV	TEL	VB	CS	P	TEL	Intersection T42/T43/S21
R138	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 32
R139	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #31
R140	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 30
R141	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 28
R142	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 29
R143	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 27
R144	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 26
R145	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 25
R146	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 23
R147	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 22
R148	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 20
R149	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 21
R150	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 43
R151	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 44
R152	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 45
R153	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 46
R154	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 47
R155	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S52/S51/S45/S53
R156	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S50/S51/S44/S45

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CHAS. H. SELLS, INC.
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704.662.0100 Fax 704.662.0101

GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	26	30		
Time	7:30	1:45		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R157	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 24
R158	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection S49/S50/S43/S44
R159	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection S48/S49/S42/S43
R160	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S47/S48/S41/S42
R161	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S40/S41/S46/S47
R162	P	3X3	HV	TEL	VB	CS	P	TEL	Intersection S46/S40/S22
R163	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection S22/S40
R164	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection S22/S1/S40
R165	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 37
R166	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 38
R167	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 39
R169	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 41
R171	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T34/T66/S1/S40
R172	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T34/T66/S40
R173	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T66/S40/S41
R174	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T66/T67/S41
R175	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T67/T68/S41
R176	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T68/S41/S42
R177	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T68/T69/S42
R178	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T69/T73/T68

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	26	30		
Time	7:30	1:45		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 4 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R179	P	2X2	HV	TEL	VB	CS	P	TEL	15' W of E end T73/T68
R180	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 42
R181	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T69/S42/S43
R182	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T69/T70/S43
R183	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T70/S43/S44
R184	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection T71/T70/S44
R185	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T71/S44
R186	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T71/T72/S44
R187	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection T72/S44/S45
R212	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T75/T76/S53
R213	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T74/T75/S53/S52
R214	P	3X2	HV	TEL	VB	CS	P	TEL	10' W of E end T74/T75
R235	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 33
R236	P	4X2	HV	TEL	VB	CS	P	TEL	LDT # 34

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	33	37		
Time	8:00	1:30		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/30/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R168	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 40
R170	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #48
R188	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T94/T72/S45
R189	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T93/T94/S45
R190	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T93/T94/T95
R191	P	5X3	HV	TEL	VB	CS	P	TEL	Intersection T92/T93/S53
R192	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T91/T92/S53
R193	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T90/T91/S53
R194	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T89/T90/S53
R195	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T88/T89/S53
R196	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T87/T88/S53
R197	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T86/T87/S53
R198	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T85/T86/S53
R199	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 50
R200	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T84/T85/S53
R201	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T83/T84/S53
R202	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T82/T83/S53
R203	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T81/T82/S53
R204	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T80/T81/S53
R205	P	1X1	HV	TEL	VB	CS	P	TEL	Intersection T80/S53

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	33	37		
Time	8:00	1:30		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/30/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R206	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T79/T80/S53
R207	P	2X1	HV	TEL	VB	CS	P	TEL	Intersection T79/S53
R208	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T78/T79/S53
R209	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T77/T78/S53
R210	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T76/T77/S53
R211	DS	5X2	HV	TEL	VB	CS	P	TEL	LDT # 49
R215	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T74/T96/S52
R216	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T96/T97/S52
R217	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T97/T98/S52
R218	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T98/T99/S52
R219	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T99/T100/S52
R220	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T100/T101/S52
R221	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T101/T102/S52
R222	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T102/T103/S52
R223	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 54
R224	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T103/T104/S52
R225	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T104/T105/S52
R226	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T105/T106/S52
R227	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T106/T107/S52
R228	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T107/T108/S52

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	33	37		
Time	8:00	1:30		
Tech Initials	HV	HV		
Machine #	MX8	MX8		

Date: 8/30/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R229	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T108/T109/S52
R230	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 53
R237	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 43
R238	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 44
R239	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 45
R240	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 46
R241	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #47
R242	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 52
R243	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 55

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	43			
Time	2:38			
Tech Initials	HV			
Machine #	X9			

Date: 9/8/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R247	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T110/T111/S54
R248	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T211/T112/S54
R249	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T112/T113/S54
R250	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T113/T114/S54
R251	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T114/T115/S54
R252	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T115/T121/S54
R253	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T121/T120/T115
R254	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T120/T115/T116
R255	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T120/T119/T116
R256	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T119/T116/T117
R257	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T118/T119/T117
R258	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 57
R259	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T121/T122/S54
R260	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T122/S54/S55
R261	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T122/T123/S55
R62	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 58
R263	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T123/T124/S55/S56
R264	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S55/S56/S24
R265	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T124/T125/S56/S57
R266	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T125/T126/S57

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	43			
Time	2:38			
Tech Initials	HV			
Machine #	X9			

Date: 9/8/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R267	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T126/S57/S58
R268	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T126/T127/S58
R269	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T127/S58/S59
R270	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T127/T128/S59
R271	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T128/S59/S61
T272	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T128/T129/S61
R273	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T129/S61/S63
R274	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T129/T130/S63
R275	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T130/S63/S64
R276	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection T130/T131/S64
R277	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S63/S64/S62
R278	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S61/S62/S63
R280	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S59/S60/S61
R281	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S58/S59/S60

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	47			
Time	4:10			
Tech Initials	HV			
Machine #	X9			

Date: 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R279	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 59
R282	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 62
R283	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 61
R284	P	3X2	HV	TEL	VB	CS	P	TEL	Intersection T109/S52/S54
R285	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S52/S54/S55
R286	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S52/S51/S55/S56
R287	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S31/S50/S56/S57
R288	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S50/S49/S57/S58
R289	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S49/S48/S58/S60
R290	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S48/S47/S60/S61
R291	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 63
R292	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S46/S47/S61/S62
R293	P	2X2	HV	TEL	VB	CS	P	TEL	2' N of S46/S56 & 3' E of S46/S47
R294	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S46/S63/S64
R295	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S46/S22/S64
R296	P	4X2	HV	TEL	VB	CS	P	TEL	3' N S22/S64 - 2' E S46/S22
R297	P	2X2	HV	TEL	VB	CS	P	TEL	3' N S22/S64 - 5' E S46/S22
R298	P	2X2	HV	TEL	VB	CS	P	TEL	3' N S22/S64 - 9' E S46/S22
R299	P	4X2	HV	TEL	VB	CS	P	TEL	6' N S22/S64 - 5' E S46/S22
R300	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T131/S64/S66

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	47			
Time	4:10			
Tech Initials	HV			
Machine #	X9			

Date: 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R301	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T131/T132/S60
R302	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T132/S66/S67
R303	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T132/T133/S67
R304	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T133/S67/S69
R305	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T133/T134/S69
R306	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 60
R307	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S69/S71/T134
R308	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S71/T135/T154
R309	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S77/S72/T135/T136
R310	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S78/S74/T136/T137
R311	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S74/T151/T137
R312	P	2X2	HV	TEL	VB	CS	P	TEL	7' W of E end T151/137
R313	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T137/T138/T151
R314	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T144/T151/T138
R315	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T144/1243/T138/T139
R316	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T139/T140/T143/T141
R317	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 65
R318	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T140/t141/t142
R319	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 66
R320	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T145/T146/T151

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	47			
Time	4:10			
Tech Initials	HV			
Machine #	X9			

Date: 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 4 of 4

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R321	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T146/T151/S74
R244	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T109/T110/S4
R245	P	2X2	HV	TEL	VB	CS	P	TEL	3' S of T109/S54
R246	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 56

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Date: 9/10/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R322	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T146/T147/S74
R323	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S70/S71/S72
R324	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S69/S70/S71
R325	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S73/S74/S75
R326	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S72/S73/S74
R327	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 70
R328	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S68/S69/S70
R329	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S67/S69/S70
R330	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 69
R331	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S65/S66/S67
R332	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S64/S68/S66
R333	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #67
R334	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #68
R335	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S73/S75/S28/S29
R336	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S72/S73/S28/S27
R337	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S26/S27/S70/S72
R338	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S25/S26/S68/S70
R339	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S24/S25/S67/S68
R340	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S24/S25/S67/S68
R341	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S23/S24/S65/S67

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number				
Time				
Tech Initials				
Machine #				

Date: 9/10/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R342	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S74/S76/T147
R343	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S76/S77/T147
R344	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S77/T147/T148
R345	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S77/S79/T148

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	53			
Time	8:00			
Tech Initials	HV			
Machine #	MX9			

Date: 9/11/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R346	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T148/T149/S79
R347	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 73
R348	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T149/T150/S79/S80
R349	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S74/S75/S76
R350	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S75/S76/S77
R351	P	4X2	HV	TEL	VB	CS	P	TEL	Intersection S77/S78/S79
R352	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S78/S79/S80
R353	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 71
R354	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 72
R355	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S34/S33/S81
R356	P	2X2	TEL	TEL	VB	CS	P	TEL	12' S T65/S34
R357	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S80/S81/S33/S32
R358	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S80/S78/S31/S32
R359	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S77/S78/S30/S31
R360	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S77/S75/S29/S30

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	54			
Time	7:15			
Tech Initials	HV			
Machine #	MX9			

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R361	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T150/T152/S80
R362	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T152/T159/T160
R363	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T152/T160/T161
R364	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 74
R365	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T159/T152/S80
R366	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T158/T159/S80
R367	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T157/T158/S80
R368	P	2X2	HV	TEL	VB	CS	P	TEL	5' E S80/T157 & 2' N T157/T158
R369	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T156/T157/S80
R370	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S80/S81/T156
R371	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T155/T156/S81
R372	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT #75
R373	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection T154/T155/S81
R374	P	2X2	HV	TEL	VB	CS	P	TEL	1' E S81/T154 & 12' S T153/T154
R375	P	2X2	HV	TEL	VB	CS	P	TEL	1' E S81/T154 & 10' S T153/T154
R376	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S81/T153/T154
R377	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S81/S34/T153
R378	P	2X2	HV	TEL	VB	CS	P	TEL	Intersection S34/T65/T153
R379	P	2X2	HV	TEL	VB	CS	P	TEL	20' E of R378 & 1' N T153/T65
R380	DS	4X2	HV	TEL	VB	CS	P	TEL	LDT # 76

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE REPAIR TESTING LOG

Passing Trial Seams				
Number	54			
Time	7:15			
Tech Initials	HV			
Machine #	MX9			

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 2

Defect #	Repair Type	Approximate Dimension	Technician Initials	CQA Initials	Test Type	Technician Initials	Pass/Fail	CQA Initials	Remarks
R381	P	2X2	HV	TEL	VB	CS	P	TEL	1' E S80/T150 & 12' S T152/T150
R382	P	2X2	HV	TEL	VB	CS	P	TEL	10' E S80/T150 & 12' S T152/T150
R383	P	2X2	HV	TEL	VB	CS	P	TEL	15' E S80/T150 & 12' S T152/T150

Repair Type: T- 'T' weld; G&W - Grind & Weld; P - Patch; CAP - Cap Strip; DS - Destructive Sample
Testing Type: SP - Spark Test; VB - Vacuum Box; AT - Air Test

CQA Personnel: _____

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/25/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						89	95	91						
1	1:30 PM	10	HT	12.5	850	91	86	102	121	122	127	P	TEL	
						91	98	90						
2	1:47	10	HT	10	850	96	97	95	112	113	111	P	TEL	T/T
						82	100	99						
3	2:00	13	MR	12.5	860	117	120	93	131	113	103	P	TEL	
						85	101	95						
4	2:15	8	JO	12.5	850	92	90	91	106	126	122	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/26/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						99	100	95						
6	1:45 PM	8	JO	12.5	860	91	100	110	120	124	120	P	TEL	
						102	108	108						
7	1:55	10	HT	72%	850	106	108	108	120	122	120	P	TEL	
						105	104	108						
8	2:05	13	MR	12.5	850	101	104	106	111	117	118	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/27/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						120	119	123						
9	7:33 AM	10	ER	10	860	125	121	120	160	162	164	P	TEL	
						98	103	108						
10	7:45	X8	HV	500	400	96	97	95	149	147	149	P	TEL	EXT
						117	127	123						
11	7:57	8	JO	12.5	860	115	114	117	143	151	151	P	TEL	
						131	132	120						
12	8:10	13	MR	12.5	850	132	123	132	135	145	131	P	TEL	
						100	101	116						
13	1:16	X8	HV	500	400				119	129	124	P	TEL	EXT
						115	115	113						
14	1:50	10	ER	700	860	99	107	108	128	139	131	P	TEL	
						98	99	104						
15	2:25	8	JO	700	860	101	115	96	131	129	127	P	TEL	
						111	105	98						
16	2:40	13	MR	68%	860	104	107	99	119	124	118	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/28/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						104	125	120						
17	8:25 AM	8	JO	650	860	124	114	114	156	164	169	P	TEL	
						107	109	109						
18	8:40	13	MR	630	850	120	119	122	148	141	148	P	TEL	
						113	103	110						
19	12:00	10	HT	650	850	109	108	106	133	131	135	P	TEL	
						100	103	101						
20	12:05	10	HT	620	850	108	105	107	141	138	143	P	TEL	
						97	87	93						
21	2:20	8	HV	400	500				122	126	130	P	TEL	EXT
						100	105	104						
22	2:16	8	JO	65%	850	96	111	106	122	130	125	P	TEL	
						101	94	106						
23	2:15	13	MR	63%	850	97	95	105	121	127	120	P	TEL	
						108	119	117						
24	7:40	MX8	HV	400	500				140	130	148	P	TEL	EXT
						97	87	93						
25	2:20	MX8	HV	400	500				122	126	130	p	TEL	EXT

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/29/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						108	120	115						
26	7:30 AM	MX8	HV	460	500				135	140	138	P	TEL	EXT
						108	110	104						
27	10:00	10	HT	700	850	105	110	101	129	133	127	P	TEL	
						100	110	112						
28	10:52	8	JO	700	860	106	114	115	148	141	151	P	TEL	
						99	102	98						
29	11:05	13	MR	700	850	100	106	100	140	135	145	P	TEL	
						97	88	97						T/T
30	1:45	MX8	HV	400	500				127	129	134	P	TEL	EXT
						122	102	104						
31	2:00	13	MR	600	850	97	106	116	132	132	128	P	TEL	
						110	109	105						
32	2:10	8	JO	620	850	110	112	99	125	127	120	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 8/30/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						108	105	97						
33	8:00 AM	MX8	HV	400	500				150	147	142	P	TEL	EXT
						117	115	120						
34	9:25	8	JO	650	860	106	110	119	160	171	166	P	TEL	
						120	121	110						
35	9:35	13	MR	650	850	131	115	121	146	140	166	P	TEL	
						113	119	116						
36	10:15	10	HT	620	850	110	109	111	135	132	133	P	TEL	
						95	95	100						
37	1:30	MX8	HV	400	500				128	136	130	P	TEL	EXT

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 9/8/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						109	117	117						
38	11:07 AM	8	JO	700	850	115	112	121	163	157	160	P	TEL	
						122	118	107						
39	11:15	13	MR	650	850	106	110	126	165	163	170	P	TEL	
						107	124	110						
40	11:28	10	HT	620	850	118	120	112	146	147	151	P	TEL	
						134	124	125						
41	12:45	11	IF	650	850	129	127	126	136	133	137	P		S/T
						96	98	97						
42	1:45	11	IF	620	850	99	94	93	127	130	124	P		T/T
						105	98	104						
43	2:38	X9	HV	350	500				148	138	143	P		EXT

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 9/9/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

Sample Number	Approximate Time	Machine Number	Technician Initials	Machine Settings		Peel Test Results			Shear Test Results			Pass or Fail	CQA Initials	Remarks
				Preheat or Speed	Temp. Setting	1	2	3	1	2	3			
						109	109	114						
44	11:20 AM	10	HT	70%	850	115	108	120	132	133	138	P	TEL	
						122	126	123						
45	11:24	13	MR	700	850	128	109	110	131	125	135	P	TEL	
						112	109	111						
46	11:31	8	JO	700	860	115	110	106	153	150	146	P	TEL	
						109	111	105						
47	4:10	X9	HV	400	500				129	132	140	P	TEL	EXT

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 9/10/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						110	102	106						
48	2:45 PM	8	JO	70%	860	105	108	107	132	140	137	P	TEL	
						117	118	115						
49	3:00	13	MR	70%	850	120	110	139	143	138	129	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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Consulting Engineers, Surveyors & Photogrammetrists

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GEOMEMBRANE TRIAL SEAM LOG

Date: 9/11/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						126	137	125						
50	6:50 AM	M8	JO	650	850	128	138	130	171	159	162	P	TEL	
						111	121	118						
51	7:00	10	HT	650	850	112	116	115	168	167	172	P	TEL	
						111	103	112						
52	7:10	13	MR	650	850	124	118	129	147	175	174	P	TEL	
						112	109	100						
53	8:00	MX9	HV	400	500				129	136	140	P	TEL	EXT

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE TRIAL SEAM LOG

Date: 9/12/2006
CHS Project No. : 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Fusion	Extrusion

				Machine Settings		Peel Test Results			Shear Test Results					
Sample Number	Approximate Time	Machine Number	Technician Initials	Preheat or Speed	Temp. Setting	1	2	3	1	2	3	Pass or Fail	CQA Initials	Remarks
						104	111	117						
54	8:15 AM	MX9	HV	400	500				139	142	121	P	TEL	
						122	118	133						
55	7:15	10	HT	580	850	121	124	135	129	136	140	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE S[illegible]M DESTRUCTIVE SAMPLE LOG

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Fusion | Extrusion

Date: 8/26/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of

				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
LDT#1	T9/T11	8	8/26	P	P	TEL	P	P	9/1	12' N OF S END T9/T11
LDT#2	T22/T23	8	8/26	P	P	TEL	P	P	9/1	14' N OF S END T22/T23
LDT#3	T36/T37	13	8/26	P	P	TEL	P	P	9/1	7' W OF E END T36/T37
FDT#1	S1/S2	8	8/26	P	P	TEL	P	P		N END
FDT#2	S1/S2	8	8/26	P	P	TEL	P	P		S END
FDT#3	S2/S3	10	8/26	P	P	TEL	P	P		N END
FDT#4	S2/S3	10	8/26	P	P	TEL	P	P		S END
FDT#5	S3/S4	13	8/26	P	P	TEL	P	P		N END
FDT#6	S3/S4	13	8/26	P	P	TEL	P	P		S END
FDT#7	S4/S5	8	8/26	P	P	TEL	P	P		N END
FDT#8	S4/S5	8	8/26	P	P	TEL	P	P		S END
FDT#9	S5/S6	10	8/26	P	P	TEL	P	P		N END
FDT#10	S5/S6	10	8/26	P	P	TEL	P	P		S END
FDT#11	S6/S7	13	8/26	P	P	TEL	P	P		N END
FDT#12	S6/S7	13	8/26	P	P	TEL	P	P		S END
FDT#13	S7/S8	8	8/26	P	P	TEL	P	P		N END
FDT#14	S7/S8	8	8/26	P	P	TEL	P	P		S END
FDT#15	S8/S9	10	8/26	P	P	TEL	P	P		N END
FDT#16	S8/S9	10	8/26	P	P	TEL	P	P		S END
FDT#17	S9/S10	13	8/26	P	P	TEL	P	P		N END

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[illegible]M DESTRUCTIVE SAMPLE LOG

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Fusion | Extrusion

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of

				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
FDT#18	S9/S10	13	8/26	P	P	TEL	P	P		S END
LDT#4	S1/S2	8	8/27	P	P	TEL	P	P	9/1	154' S OF N END S1/S2
LDT#5	S2/S3	10	8/27	P	P	TEL	P	P	9/1	201' S OF N END S2/S3
LDT#6	S3/S4	13	8/27	P	P	TEL	P	P	9/1	133' N OF S END S3/S4
LDT#7	S4/S5	8	8/27	P	P	TEL	P	P	9/1	67' S OF N END S4/S5
LDT#8	S5/S6	10	8/27	P	P	TEL	P	P	9/1	12' N OF S END S5/S6
LDT#9	S7/S8	8	8/27	P	P	TEL	P	P	9/1	52' S OF N END S7/S8
LDT#10	S8/S9	10	8/27	P	P	TEL	P	P	9/1	126' N OF S END S8/S9
LDT#11	S9/S10	13	8/27	P	P	TEL	P	P	9/1	198' S OF N END S9/S10
LDT#12	S10/S11	8	8/27	P	P	TEL	P	P	9/1	165' S OF N END S10/S11
LDT#13	S11/S12	10	8/27	P	P	TEL	P	P	9/1	87' N OF S END S/11/S12
LDT#14	S12/S13	13	8/27	P	P	TEL	P	P	9/1	7' S OF N END S12/S13
LDT#15	S14/S15	10	8/27	P	P	TEL	P	P	9/1	51' NOF S END S14/S15
FDT#19	S10/S11	8	8/26	P	P	TEL	P	P		N END
FDT#20	S10/S11	8	8/26	P	P	TEL	P	P		S END
FDT#21	S11/S12	10	8/26	P	P	TEL	P	P		N END
FDT#22	S11/S12	10	8/26	P	P	TEL	P	P		S END
FDT#23	S12/S13	13	8/26	P	P	TEL	P	P		N END
FDT#24	S12/S13	13	8/26	P	P	TEL	P	P		S END
FDT#25	S13/S14	8	8/26	P	P	TEL	P	P		N END

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[illegible]M DESTRUCTIVE SAMPLE LOG

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Fusion Extrusion

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
FDT#26	S13/S14	8	8/26	P	P	TEL	P	P		S END
FDT#27	S14/S15	10	8/26	P	P	TEL	P	P	9/1	N END
FDT#28	S14/S15	10	8/26	P	P	TEL	P	P	9/1	S END
LDT#16	S15/S16	8	8/28	P	P	MA	P	P	9/1	267' N OF S END S15/S37
LDT#17	S16/S17	13	8/28	P	P	MA	P	P	9/1	216' S OF N END S16/S12
LDT#18	S17/S19	8	8/28	P	P	MA	P	P	9/1	228' S OF N END S18/S19
LDT#19	S22/S23	8	8/28	P	P	MA	P	P	9/1	200' S OF N END S22
LDT#20	S23/S24	13	8/28	P	P	MA	P	P	9/1	265' N OF S END S24
LDT#21	S24/S25	10	8/28	P	P	MA	P	P	9/1	283' S OF N END S25
LDT#22	S25/S26	8	8/28	P	P	MA	P	P	9/1	340' N OF S END S26
LDT#23	S26/S27	13	8/28	P	P	MA	P	P	9/1	367' S OF N END S27
LDT#24	S27/S28	10	8/28	P	P	MA	P	P	9/1	22' S OF N END S28/S27
LDT#25	S28/S29	8	8/28	P	P	MA	P	P	9/1	10' N OF S END S29
LDT#26	S29/S30	13	8/28	P	P	MA	P	P		20' S OF N END S29/S8
LDT#27	S30/S31	10	8/28	P	P	MA	P	P		70' N OF S END S30
LDT#28	S31/S32	8	8/28	P	P	MA	P	P		80' S OF N END S31/S10
LDT#29	S32/S33	13	8/28	P	P	MA	P	P		130' N OF S END S33
LDT#30	S33/S34	8	8/28	P	P	MA	P	P		149' S OF N END S33/S12
LDT#31	S34/S35	13	8/28	P	P	MA	P	P		226' S OF N END S35/S14
LDT#32	S35/S37	8	8/28	P	P	MA	P	P		170' S OF N END S37/S15

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

CHAS. H. SELLS, INC.

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Fusion | Extrusion

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
LDT#33	T43/T44	13	8/29	P	P	TEL	P	P		10' W OF E END T43/T44
LDT#34	T49/T50	13	8/29	P	P	TEL	P	P		8' E OF W END T49/T50
LDT#35	T56/T57	10	8/29	P	P	TEL	P	P		56' W OF E END T56/T57
LDT#36	T62/T63	8	8/29	P	P	TEL	P	P		20' E OF W END T62/T63
LDT#37	S1/S40	13	8/29	P	P	TEL	P	P		262' S OF N END S1/S40
LDT#38	S40/S41	8	8/29	P	P	TEL	P	P		93' S OF N END S40/S41
LDT#39	S41/S42	10	8/29	P	P	TEL	P	P		18' N OF S END S41/S42
LDT#40	S43/S44	8	8/29	P	P	TEL	P	P		346' N OF S END S43/S44
LDT#41	S44/S45	10	8/29	P	P	TEL	P	P		284' S OF N END S44/S45
LDT#42	T69/T70	13	8/29	P	P	TEL	P	P		8' S OF N END S69/S70
LDT#43	S22/S46	10	8/29	P	P	TEL	P	P		22' N OF S END S22/S46
LDT#44	S47/S48	13	8/29	P	P	TEL	P	P		40' S OF N END S47/S48
LDT#45	S48/S49	10	8/30	P	P	TEL	P	P		310' S OF N END S48/S49
LDT#46	S49/S50	8	8/30	P	P	TEL	P	P		190' S OF N END S49/S50
LDT#47	S51/S50	13	8/30	P	P	TEL	P	P		279' N OF S END S51/S50
LDT#48	S45/S53	10	8/30	P	P	TEL	P	P		42' N OF S END S45/S53
LDT#49	T76/T77	8	8/30	P	P	TEL	P	P		5' W OF E END T76/T77
LDT#50	T85/T86	13	8/30	P	P	TEL	P	P		17' W OF E END T85/T86
LDT#51	T43/S79	10	8/30	P	P	TEL	P	P		(TYN) 7' N OF W END T43/T44
LDT#52	T22/S10	10	8/30	P	P	TEL	P	P		(TYN) 8' W OF S END T20/T22

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[redacted]M DESTRUCTIVE SAMPLE LOG

CHAS. H. SELLS, INC.

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Fusion | Extrusion

Date: 8/30/2006 - 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
LDT#53	S53/T88	10	8/30	P	P	TEL	P	P	9/7	(TYN) 3' S OF T88/T89 ON TYN
LDT#54	S52/T103	10	8/30	P	P	TEL	P	P	9/7	(TYN) 5' N OF T102/T103 ON TYN
LDT#55	S10/S31	10	8/30	P	P	TEL	P	P	9/7	@ CNTR TYN 10'W OF S END S10/S11
LDT#56	T109/T110	13	9/8	P	P	TEL	P	P		10' E OF W END T109/T110
LDT#57	T115/T116	10	9/8	P	P		P	P		12' E OF W END T115/T116
LDT#58	T123/T122	10	9/8	P	P		P	P		8' S OF N END T123/T122
LDT#59	T128/T129	8	9/9	P	P		P	P		46' S OF N END T128/T129
LDT#60	T133/T134	8	9/9	P	P		P	P		10' N OF S END T133/T134
LDT#61	S56/S57	11	9/9	P	P		P	P		12' S OF N END S56/S57
LDT#62	S59/S61	8	9/9	P	P		P	P		26' N OF S END S59/S61
LDT#63	S61/S47	10	9/9	P	P		P	P		10' W OF E END S61/S47
LDT#64	T123/S55	11	9/9	P	P		P	P		TYN 5' OF N END T123/T124
LDT#65	T139/T140	8	9/10	P	P		P	P		10' N OF S END T139/T140
LDT#66	T147/T148	13	9/10	P	P		P	P		20' W OF E END T147/T148
LDT#67	S62/S64	13	9/10	P	P		P	P		25' S OF N END S62/S64
LDT#68	S65/S67	10	9/10	P	P		P	P		5' S OF N END S65/S67
LDT#69	S68/S70	13	9/10	P	P		P	P		29' S OF N END S68/S70
LDT#70	S72/S74	13	9/10	P	P		P	P		47' S OF N END S72/S74
LDT#71	S75/S77	13	9/11	P	P		P	P		74' S OF N END S75/S77
LDT#72	S78/S80	13		P	P		P	P		50' S OF N END S78/S80

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[illegible]M DESTRUCTIVE SAMPLE LOG

CHAS. H. SELLS, INC.

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Fusion Extrusion

Date: 9/11/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
LDT#73	S79/T149	8	9/11	P	P	TEL	P	P	9/13	TYN 3' S OF N END T149/T150
LDT#74	T160/T161	8	9/12	P	P	TEL	P	P	9/13	8' W OF E END T160/T161
LDT#75	T155/T156	13	9/12	P	P	TEL	P	P	9/13	20' E OF W END T155/T156
LDT#76	T65/T153	13	9/12	P	P	TEL	P	P	9/13	17' E OF W END T65/T153
FDT#29	S15/S16	8	8/27	P	P	TEL	P	P	8/27	N END
FDT#30	S15/S16	8	8/27	P	P	TEL	P	P	8/27	S END
FDT#31	S16/S17	13	8/27	P	P	TEL	P	P	8/27	N END
FDT#32	S16/S17	13	8/27	P	P	TEL	P	P	8/27	S END
FDT#33	S17/S19	8	8/27	P	P	TEL	P	P	8/27	N END
FDT#34	S17/S19	8	8/27	P	P	TEL	P	P	8/27	S END
FDT#35	S22/S23	8	8/27	P	P	TEL	P	P	8/27	N END
FDT#36	S22/S23	8	8/27	P	P	TEL	P	P	8/27	S END
FDT#37	S23/S24	13	8/27	P	P	TEL	P	P	8/27	N END
FDT#38	S23/S24	13	8/27	P	P	TEL	P	P	8/27	S END
FDT#39	S24/S25	10	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#40	S24/S25	10	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#41	S25/S26	8	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#42	S25/S26	8	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#43	S26/S27	13	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#44	S26/S27	13	8/27	P	P	TEL	P	P	8/27	S EOS

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[illegible]M DESTRUCTIVE SAMPLE LOG

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Fusion Extrusion

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
FDT#45	S27/S28	10	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#46	S27/S28	10	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#47	S28/S29	8	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#48	S28/S29	8	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#49	S29/S30	13	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#50	S29/S30	13	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#51	S30/S31	10	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#52	S30/S31	10	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#53	S31/S32	8	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#54	S31/S32	8	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#55	S32/S33	13	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#56	S32/S33	13	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#57	S33/S34	8	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#58	S33/S34	8	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#59	S34/S35	13	8/27	P	P	TEL	P	P	8/27	N EOS
FDT#60	S34/S35	13	8/27	P	P	TEL	P	P	8/27	S EOS
FDT#61	S40/S1	13	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#62	S40/S1	13	8/28	P	P	TEL	P	P	8/28	S EOS
FDT#63	S40/S41	8	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#64	S40/S41	8	8/28	P	P	TEL	P	P	8/28	S EOS

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE SEAM DESTRUCTIVE SAMPLE LOG

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Fusion Extrusion

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
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				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
FDT#65	S41/S42	10	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#66	S41/S42	10	8/28	P	P	TEL	P	P	8/28	S EOS
FDT#67	S42/S43	13	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#68	S42/S43	13	8/28	P	P	TEL	P	P	8/28	S EOS
FDT#69	S43/S44	8	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#70	S43/S44	8	8/28	P	P	TEL	P	P	8/28	S EOS
FDT#71	S44/S45	10	8/28	P	P	TEL	P	P	8/28	N EOS
FDT#72	S44/S45	10	8/28	P	P	TEL	P	P	8/28	S EOS
FDT#73	S46/S22	10	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#74	S46/S22	10	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#75	S46/S47	8	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#76	S46/S47	8	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#77	S47/S48	13	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#78	S47/S48	13	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#79	S48/S49	10	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#80	S48/S49	10	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#81	S49/S50	8	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#82	S49/S50	8	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#83	S50/S51	13	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#84	S50/S51	13	8/29	P	P	TEL	P	P	8/29	S EOS

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

GEOMEMBRANE S[redacted]M DESTRUCTIVE SAMPLE LOG

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
704.662.0100 Fax 704.662.0101

Fusion Extrusion

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: of

				Field Test Results			Lab Test Results			
Sample Number	Seam	Machine Number	Date Sampled	Peel Pass/Fail	Shear Pass/Fail	CQA Initials	Peel Pass/Fail	Shear Pass/Fail	Date of Notification	Remarks
FDT#85	S51/S52	10	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#86	S51/S52	10	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#87	S53/S45	10	8/29	P	P	TEL	P	P	8/29	N EOS
FDT#88	S53/S45	10	8/29	P	P	TEL	P	P	8/29	S EOS
FDT#89	S67/S69	8	9/9	P	P	TEL	P	P	9/9	N EOS
FDT#90	S67/S69	8	9/9	P	P	TEL	P	P	9/9	S EOS
FDT#91	S69/S71	13	9/9	P	P	TEL	P	P	9/9	N EOS
FDT#92	S69/S71	13	9/9	P	P	TEL	P	P	9/9	S EOS
FDT#93	S74/S75	13	9/10	P	P	TEL	P	P	9/10	N EOS
FDT#94	S46/S22	13	9/10	P	P	TEL	P	P	9/10	S EOS

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/25/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 2

PASSING TRIAL SEAMS				
Number	1	2	3	4
Time	1:30	1:47	2:00	2:15
Tech Initials	HT	HT	MR	JO

Fusion Extrusion

MACHINE #			
10	10	13	8

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Carry Over: Located Destruct Number	Remarks (Zone)
T1/T2	Anchor / Toe	2:00	MH	12.5	850	72			
T2/T3	Anchor / Toe	2:10	MH	12.5	850	71			
T3/T5	Anchor / Mid-panel	2:35	MH	12.5	850	33			Δ 33' x 8'
T4/T5	Anchor / Mid-panel	2:25	MH	12.5	850	33			
T3/T4	Mid-panel / Toe	2:28	MH	12.5	850	35			
T4/T6	Anchor / Toe	2:50	MH	12.5	850	65			
T6/T7	Anchor / Toe	3:00	MH	12.5	850	63			
T7/T8	Anchor / Toe	3:11	MH	12.5	850	63			
T8/T9	Anchor / Toe	2:20	MR	12.5	860	62			
T9/T10	Anchor / Mid-panel	2:54	JO	12.5	850	30			Δ
T9/T11	Mid-panel / Toe	2:56	JO	12.5	850	32		LDT#1	T/S
T10/T11	Anchor / Mid-panel	2:45	MR	12.5	860	30			Δ
T11/T12	Anchor / Toe	2:35	MR	12.5	860	60			
T12/T13	Anchor / Toe	2:50	MR	12.5	860	59			
T13/T14	Anchor / Toe	3:10	MR	12.5	860	55			
T14/T15	Anchor / Toe	3:25	MR	12.5	860	54			
T15/T16	Anchor / Mid-panel	3:19	JO	12.5	850	23			
T16/T17	Anchor / Mid-panel	3:07	JO	12.5	850	23			
T15/T17	Mid-panel / Toe	3:21	JO	12.5	850	27			
T17/T18	Anchor / Toe	3:34	JO	12.5	850	50			
T18/T19	Anchor / Toe	3:47	JO	12.5	850	49			
T19/T20	Anchor / Toe	3:58	JO	12.5	850	49			
T20/T21	Anchor / Mid-panel	4:16	JO	12.5	850	20			
T20/T22	Mid-panel / Toe	4:18	JO	12.5	850	29			
T21/T22	Mid-panel / Anchor	4:07	JO	12.5	850	20			
T22/T23	Anchor / Toe	4:27	JO	12.5	850	46	500	LDT#2	
T23/T24	Anchor / Toe	3:45	MR	12.5	860	46			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/25/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 2

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion Extrusion

MACHINE #			

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T24/T25	Anchor / Toe	3:58	MR	12.5	860	45			
T25/T26	Anchor / Mid-panel	4:43	JO	12.5	850	20			
T25/T27	Mid-panel / Toe	4:45	JO	12.5	850	21			
T26/T27	Anchor / Mid-panel	4:05	MR	12.5	860	20			
T27/T28	Anchor / Toe	4:15	MR	12.5	860	41			
T28/T29	Anchor / Toe	4:32	MR	12.5	860	41			
T29/T30	Anchor / Toe	4:30	HT	12.5	850	41			
T30/T31	Anchor / Toe	4:20	HT	12.5	850	40			
T31/T32	Anchor / Mid-panel	4:07	HT	12.5	850	17			
T31/T33	Anchor / Toe	4:08	HT	12.5	850	23			
T32/T33	Anchor / Mid-panel	4:00	HT	12.5	850	17			
T33/T34	Anchor / Toe	3:45	HT	12.5	850	40			
T1/T35	Anchor / Toe	5:01	JO	12.5	850	70			
T35/T36	Anchor / Mid-panel	5:32	JO	12.5	850	32			
T35/T37	Mid-panel / Anchor	5:35	JO	12.5	850	38			
T36/T37	Anchor / Mid-panel	5:12	MR	12.5	860	32	500	LDT#3	
T37/T38	Anchor / Toe	5:15	JO	12.5	850	76			
T38/T39	Anchor / Toe	5:28	MR	12.5	860	76			
T39/T40	Anchor / Mid-panel	5:50	JO	12.5	850	33			
T39/T41	Mid-panel / Toe	5:53	JO	12.5	850	43			
T40/T41	Anchor / Mid-panel	5:30	MR	12.5	860	33			
T41/T42	Anchor / Toe	5:45	MR	12.5	860	78			
	/								
	/								
	/								
	/								
	/								
					Daily Total	2076			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/26/200[illegible]
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

PASSING TRIAL SEAMS				
Number	6	7	8	
Time	1:45	1:55	2:05	
Tech Initials	JO	HT	MR	

Fusion (selected) Extrusion

MACHINE #		
8	10	13

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S1/S2	N Slope / S	2:02	JO	12.5	860	434	500	FDT # 1&2	LDT # 4
S2/S3	N Slope / S	2:08	HT	12.5	850	435	500	FDT # 3&4	LDT # 5
S3/S4	N Slope / S	2:15	MR	12.5	850	437	500	FDT # 5&6	LDT # 6
S4/S5	N Slope / S	2:50	JO	12.5	860	439	500	FDT # 7&8	LDT # 7
S5/S6	N Slope / S	3:00	HT	12.5	850	440	500	FDT # 9&10	LDT # 8
S6/S7	N Slope / S	3:18	MR	12.5	850	437		FDT #11&12	
S7/S8	N Slope / S	3:45	JO	12.5	860	436	500	FDT #13&14	LDT # 9
S8/S9	N Slope / S	3:55	HT	12.5	850	436	500	FDT #15&16	LDT # 10
S9/S10	N Slope / S	4:16	MR	12.5	850	432	500	FDT #17&18	LDT # 11
S10/S11	N Slope / S	4:37	JO	12.5	860	430	500	FDT #19&20	LDT # 12
S11/S12	N Slope / S	4:40	HT	12.5	850	433	500	FDT #21&22	LDT # 13
S12/S13	N Slope / S	5:22	MR	12.5	850	433	500	FDT #23&24	LDT # 14
S13/S14	N Slope / S	5:26	JO	12.5	860	439		FDT #25&26	
S14/S15	N Slope / S	5:30	HT	12.5	850	436	500	FDT #27&28	LDT # 15
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	/								

Daily Total:

CQA Personnel: ______________________

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/27/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 4

PASSING TRIAL SEAMS				
Number	9	11	12	14
Time	7:33	7:57	8:10	1:50
Tech Initials	ER	JO	MR	ER

Fusion Extrusion

MACHINE #			
10	8	13	10

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S15/S16	N Slope / S	10:08	JO	12.5	860	420		LDT #16	FDT #29&30
S16/S17	N Slope / S	10:30	MR	12.5	850	420		LDT #17	FDT #31&32
S17/S18	N Slope / S	11:10	JO	12.5	860	41			
S18/S19	Butt /	11:05	JO	12.5	860	22.5			
S17/S19	S18/S19 / S EOS	11:14	JO	12.5	860	355		LDT #18	FDT #33&34
S19/S20	E TYN / S EOS	11:37	MR	12.5	850	80			
S20/S21	Butt /	11:30	MR	12.5	850	11			
S21/S19	S20/S21 / S EOS	11:40	MR	12.5	850	80			
	/								
	/								
S20/T1	TYN /	11:57	ER	10.5	860	22.5			
S20/T2	TYN /	12:00	ER	10.5	860	22.5			
S20/T3	TYN /	12:03	ER	10.5	860	22.5			
S20/T4	TYN /	12:06	ER	10.5	860	12			
S19/T6	TYN /	12:09	ER	10.5	860	10			
S18/T6	TYN /	12:12	ER	10.5	860	12			
S18/T7	TYN /	12:15	ER	10.5	860	22.5			
S17/T8	TYN /	12:18	ER	10.5	860	10			
S17/T8	TYN /	12:21	ER	10.5	860	11			
S17/T9	TYN /	12:24	ER	10.5	860	22.5			
S17/T11	TYN /	12:27	ER	10.5	860	7			
S16/T11	TYN /	12:28	ER	10.5	860	5			
S16/T12	TYN /	12:33	ER	10.5	860	22.5			
S16/T13	TYN /	12:34	ER	10.5	860	5			
S15/T13	TYN /	12:37	ER	10.5	860	16			
S15/S14	TYN /	12:40	ER	10.5	860	13			
S19/T14	TYN /	12:42	ER	10.5	860	8			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/27/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 4

PASSING TRIAL SEAMS				
Number	15	16		
Time	2:25	2:40		
Tech Initials	JO	MR		

Fusion Extrusion

MACHINE #			
8	13		

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S14/S15	TYN /	12:43	ER	10.5	860	22.5			
S13/T17	TYN /	12:46	ER	10.5	860	13			
S13/T18	TYN /	12:48	ER	10.5	860	7			
S12/T18	TYN /	12:50	ER	10.5	860	13			
S12/T19	TYN /	12:51	ER	10.5	860	8			
S11/T19	TYN /	12:52	ER	10.5	860	10			
S11/T20	TYN /	12:54	ER	10.5	860	12			
S10/T20	TYN /	12:55	ER	10.5	860	9			
S10/T22	TYN /	12:58	ER	10.5	860	12	500	LDT #52	
S9/T23	TYN /	1:00	ER	10.5	860	22.5			
S8/T24	TYN /	1:03	ER	10.5	860	22.5			
S7/T25	TYN /	1:06	ER	10.5	860	22.5			
S6/T27	TYN /	1:09	ER	10.5	860	16			
S6/T28	TYN /	1:11	ER	10.5	860	5			
S5/T28	TYN /	1:13	ER	10.5	860	17			
S5/T29	TYN /	1:14	ER	10.5	860	4			
S4/T29	TYN /	1:16	ER	10.5	860	17			
S4/T30	TYN /	1:18	ER	10.5	860	4			
S3/T30	TYN /	1:20	ER	10.5	860	17			
S3/T31	TYN /	1:21	ER	10.5	860	4			
S2/T31	TYN /	1:22	ER	10.5	860	16			
S2/T33	TYN /	1:23	ER	10.5	860	5			
S1/T33	TYN /	1:24	ER	10.5	860	7			
S1/T34	TYN /	1:26	ER	10.5	860	13			
S21/T42	TYN /	1:05	ER	10.5	860	22.5			
S21/T41	TYN /	1:03	ER	10.5	860	22.5			
S21/T39	TYN /	1:08	ER	10.5	860	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date:	8/27/2008
CHS Project No.:	046003.001
Project Name:	Marshall Steam Station
Project Location:	Catawba County, NC
Page:	3 of 4

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion Extrusion

MACHINE #			

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S21/T38	TYN /	1:10	ER	10.5	860	22.5			
S20/T37	TYN /	1:13	ER	10.5	860	11			
T20/T35	TYN /	1:15	ER	10.5	860	22.5			
S21/T~~39~~43	TYN /	1:20	ER	10.5	860	22.5			
S22/S23	NEOS / SEOS	1:00	JO	12.5	860	439	500	LDT #19	FDT # 35&36
S23/S24	NEOS / SEOS	1:30	MR	12.5	850	439	500	LDT #20	FDT # 37&38
S24/S25	NEOS / SEOS	1:48	ER	12.5	860	440	500	LDT #21	FDT # 39&40
S25/S26	NEOS / SEOS	1:58	JO	12.5	860	440	500	LDT #22	FDT # 41&42
S26/S27	NEOS / SEOS	2:30	MR	12.5	850	440	500	LDT #23	FDT # 43&44
S27/S28	NEOS / SEOS	2:45	ER	12.5	860	439	500	LDT #24	FDT # 45&46
S28/S29	NEOS / SEOS	2:57	JO	12.5	860	439	500	LDT #25	FDT # 47&48
S29/S30	NEOS / SEOS	3:40	MR	12.5	850	440	500	LDT #26	FDT # 49&50
S30/S31	NEOS / SEOS	3:40	ER	12.5	860	436	500	LDT #27	FDT # 51&52
S31/S32	NEOS / SEOS	4:33	JO	12.5	850	433	500	LDT #28	FDT # 53&54
S32/S33	NEOS / SEOS	4:30	MR	12.5	850	435	500	LDT #29	FDT # 55&56
S33/S34	NEOS / SEOS	4:57	JO	12.5	850	432	500	LDT #30	FDT # 57&58
S34/S35	NEOS / SEOS	5:35	MR	12.5	851	430	500	LDT #31	FDT # 59&60
S35/S36	NEOS / SEOS	4:24	JO	12.5	852	190			
S35/S37	NEOS / SEOS	4:07	JO	12.5	853	105	500	LDT #32	
S37/S38	NEOS / SEOS	6:10	ER	12.5	854	129			
S38/S39	NEOS / SEOS	6:20	MR	12.5	855	80			
S1/S22	BUTT /	6:30	ER	12.5	856	22.5			
S36/S37	BUTT /	5:51	JO	12.5	857	17			
S2/R77	BUTT /	6:33	ER	12.5	858	22.5			
S23/R77	BUTT /	6:35	ER	12.5	859	22.5			
S3/R78	BUTT /	6:38	ER	12.5	860	22.5			
	/								
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/27/200

CHS Project No.: 046003.001

Project Name: Marshall Steam Station

Project Location: Catawba County, NC

Page: 4 of 4

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion Extrusion

MACHINE #			

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S24/R78	BUTT /	6:40	ER	12.5	850	22.5			
S41/R81	BUTT /	6:42	ER	12.5	850	22.5			
S25/R81	BUTT /	6:44	ER	12.5	850	22.5			
S5/R83	BUTT /	6:46	ER	12.5	850	22.5			
S26/R83	BUTT /	6:48	ER	12.5	850	22.5			
S6/S29	BUTT /	6:50	ER	12.5	850	22.5			
S7/S28	BUTT /	6:52	ER	12.5	850	22.5			
S8/S29	BUTT /	6:54	ER	12.5	850	22.5			
S9/S30	BUTT /	6:56	ER	12.5	850	22.5			
S10/S31	BUTT /	7:00	ER	12.5	850	22.5	500	LDT #55	
S11/S32	BUTT /	7:02	ER	12.5	850	22.5			
S12/S33	BUTT /	4:57	ER	12.5	850	22.5			
S13/S33	BUTT /	5:00	ER	12.5	850	10			
S13/S34	BUTT /	5:01	ER	12.5	850	22.5			
S14/S35	BUTT /	5:03	ER	12.5	850	22.5			
S15/S35	BUTT /	5:05	ER	12.5	850	15			
S15/S37	BUTT /	5:06	ER	12.5	850	22.5			
S16/S37	BUTT /	5:08	ER	12.5	850	10			
S16/S38	BUTT /	5:09	ER	12.5	850	22.5			
S17/S39	BUTT /	5:11	ER	12.5	850	20			
	/								
	/								
	/								
	/								
	/								
	/								
	/								
					Daily Total	8826.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/28/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

PASSING TRIAL SEAMS				
Number	17	18	19	
Time	8:28	8:40	12:00	
Tech Initials	JO	MR	HT	

Fusion Extrusion

MACHINE #			
8	13	10	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T42/T43	ANCHOR / TOE	11:21	JO	11.5	850	72			
T43/T44	ANCHOR / TOE	11:20	MR	11.5	850	74	500	LDT #33	
T44/T45	ANCHOR / TOE	11:35	JO	11.5	860	76			
T45/T46	ANCHOR / TOE	11:38	MR	11.5	850	78			
T46/T47	ANCHOR / TOE	11:53	JO	11.5	860	77			
T47/T48	ANCHOR / TOE	11:53	MR	11.5	850	77			
T48/T49	ANCHOR / TOE	12:08	JO	11.5	860	80			
T49/T50	ANCHOR / TOE	12:10	MR	11.5	850	78	500	LDT #34	
T50/T51	ANCHOR / TOE	12:23	JO	11.5	860	82			
T51/T52	ANCHOR / TOE	12:40	JO	11.5	860	80			
T52/T53	ANCHOR / TOE	12:27	MR	11.5	850	83			
T53/T54	ANCHOR / TOE	12:20	HT	11.5	850	80			
T54/T55	ANCHOR / TOE	12:30	HT	11.5	850	86			
T55/T56	ANCHOR / TOE	12:45	HT	11.5	850	84			
T56/T57	ANCHOR / TOE	1:00	HT	11.5	850	88	500	LDT #35	
T57/T58	ANCHOR / TOE	1:10	HT	11.5	850	86			
T58/T59	ANCHOR / TOE	1:21	HT	11.5	850	90			
T59/T60	ANCHOR / TOE	12:48	MR	11.5	850	84			
T60/T61	ANCHOR / TOE	1:08	MR	11.5	850	85			
T61/T62	ANCHOR / TOE	1:00	JO	11.5	850	87			
T62/T63	ANCHOR / TOE	1:12	JO	11.5	850	92	500	LDT #36	
T63/T64	ANCHOR / TOE	1:25	JO	11.5	850	90			
T64/T65	ANCHOR / TOE	1:40	MR	11.5	850	91			
S40/S1	TOE / S22	3:47	MR	11.5	850	441	500	LDT #37	FDT #61&62
S40/S41	TOE / S46	3:58	JO	11.5	850	424	500	LDT #38	FDT #63&64
S41/S42	TOE / S47	4:10	HT	11.5	850	419	500	LDT #39	FDT #65&66
S42/S43	TOE / S48	4:50	MR	11.5	850	434			FDT #67&68
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/28/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

PASSING TRIAL SEAMS				
Number	20	22	23	
Time	12:05	2:16	2:15	
Tech Initials	HT	JO	MR	

Fusion Extrusion

MACHINE #			
10	8	13	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S43/S44	TOE / S49	4:52	JO	11.5	850	445	500	LDT #40	FDT #69&70
S44/S45	TOE / S50	5:00	HT	11.5	850	441	500	LDT #41	FDT #71&72
T34/T66	ANCHOR / TOE	5:49	JO	11.5	850	40			
T66/T67	ANCHOR / TOE	5:57	JO	11.5	850	45			
T67/T68	ANCHOR / TOE	5:51	MR	11.5	850	50			
T68/T69	ANCHOR / TOE	6:15	JO	11.5	850	53			
T69/T70	ANCHOR / TOE	6:03	MR	11.5	850	54	500	LDT #42	
T71/T72	ANCHOR / TOE	6:30	MR	11.5	850	54			
T70/T71	ANCHOR / TOE	6:25	MR	11.5	850	51			
T68/T73	ANCHOR / TOE	6:23	JO	11.5	850	20			
T69/T73	ANCHOR / TOE	6:03	JO	11.5	850	24			
S22/S40	NEOS / SEOS	3:40	MR	11.5	850	28			
T65/S35	TYN /	2:30	HT	11.5	850	7			
T64/S35	TYN /	2:33	HT	11.5	850	22.5			
T63/S35	TYN /	2:37	HT	11.5	850	22.5			
T62/T35	TYN /	2:40	HT	11.5	850	18			
T62/S35	TYN /	2:42	HT	11.5	850	4			
T61/S35	TYN /	2:43	HT	11.5	850	22.5			
T60/S36	TYN /	2:47	HT	11.5	850	22.5			
T59/S36	TYN /	2:50	HT	11.5	850	22.5			
T58/S36	TYN /	2:53	HT	11.5	850	22.5			
T57/S36	TYN /	6:00	HT	11.5	850	22.5			
T56/S36	TYN /	6:03	HT	11.5	850	16			
T56/S38	TYN /	6:05	HT	11.5	850	65			
T55/S38	TYN /	6:07	HT	11.5	850	22.5			
T54/S38	TYN /	6:10	HT	11.5	850	22.5			
T53/S38	TYN /	6:14	HT	11.5	850	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/28/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion   Extrusion

MACHINE #			

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Carry Over: Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T52/S38	TYN /	6:17	HT	10.5	850	22.5			
T51/S39	TYN /	6:20	HT	10.5	850	22.5			
T50/S39	TYN /	6:24	HT	10.5	850	22.5			
T49/S39	TYN /	6:27	HT	10.5	850	22.5			
T48/S39	TYN /	6:30	HT	10.5	850	7			
T48/S17	TYN /	6:31	HT	10.5	850	15			
T47/S18	TYN /	6:33	HT	10.5	850	22			
T46/S18	TYN /	6:36	HT	10.5	850	22.5			
T45/218	TYN /	6:39	HT	10.5	850	22.5			
T44/S18	TYN /	6:44	HT	10.5	850	22.5			
T43/S18	TYN /	6:47	HT	10.5	850	12			
T66/S40	TYN /	6:18	JO	10.5	850	22.5			
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					Daily Total	5494			

CQA Personnel: ____________________

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/29/20[illegible]
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

PASSING TRIAL SEAMS				
Number	27	28	29	
Time	10:00	10:52	11:05	
Tech Initials	HT	JO	MR	

Fusion Extrusion

MACHINE #			
10	8	13	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T87/S53	TYN /	5:05	HT	12.5	850	22.5			
T88/S53	TYN /	5:08	HT	12.5	850	22.5	500	LDT #53	
T89/S53	TYN /	5:11	HT	12.5	850	22.5			
T90/S53	TYN /	5:14	HT	12.5	850	22.5			
T91/S53	TYN /	5:17	HT	12.5	850	22.5			
T92/S53	TYN /	5:20	HT	12.5	850	22.5			
T93/S53	TYN /	5:23	HT	12.5	850	22.5			
T94/S45	TYN /	5:28	HT	12.5	850	5			
T94/T72	ANCHOR / TOE	5:21	JO	12.5	850	51			
T93/T94	ANCHOR / TOE	5:15	MR	12.5	850	25			
T94/T95	ANCHOR / TOE	5:16	JO	12.5	850	29			
T93/T95	ANCHOR / TOE	5:22	MR	12.5	850	35			
T92/T93	ANCHOR / TOE	5:10	MR	12.5	850	40			
T92/T91	ANCHOR / TOE	5:05	JO	12.5	850	40			
T90/T91	ANCHOR / TOE	5:00	MR	12.5	850	40			
T89/T90	ANCHOR / TOE	4:58	JO	12.5	850	43			
T88/T89	ANCHOR / TOE	4:59	MR	12.5	850	46			
T87/T88	ANCHOR / TOE	4:51	JO	12.5	850	47			
T87/T86	ANCHOR / TOE	4:37	MR	12.5	850	49			
T85/T86	ANCHOR / TOE	4:30	MR	12.5	850	49	500	LDT #50	
T84/T85	ANCHOR / TOE	4:44	JO	12.5	850	50			
T84/T83	ANCHOR / TOE	4:32	JO	12.5	850	53			
T82/T83	ANCHOR / TOE	4:15	MR	12.5	850	53			
T81/T82	ANCHOR / TOE	4:02	MR	12.5	850	58			
T81/T80	ANCHOR / TOE	4:17	JO	12.5	850	58			
T79/T80	ANCHOR / TOE	4:05	JO	12.5	850	59			
T79/T78	ANCHOR / TOE	3:45	MR	12.5	850	61			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/29/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

PASSING TRIAL SEAMS				
Number	31	32		
Time	2:00	2:10		
Tech Initials	MR	JO		

Fusion Extrusion

MACHINE #			
13	8		

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Carry Over: Length From Previous Destruct(ft)	Carry Over: Located Destruct Number	Remarks (Zone)
S40/S46	BUTT /	1:50	JO	12.5	850	22.5			
S41/S47	BUTT /	1:53	JO	12.5	850	22.5			
S42/S48	BUTT /	1:56	JO	12.5	850	22.5			
S43/S49	BUTT /	2:18	JO	12.5	850	22.5			
S44/S50	NEOS / SEOS	2:22	JO	12.5	850	25			
S45/S51	NEOS / SEOS	2:27	JO	12.5	850	25			
S46/S22	NEOS / SEOS	10:30	HT	12.5	850	438	500	LDT #43	FDT #73&74
S46/S47	NEOS / SEOS	11:05	JO	12.5	850	420			FDT #75&76
S47/S48	NEOS / SEOS	11:23	MR	12.5	850	424	500	LDT #44	FDT #77&78
S48/S49	NEOS / SEOS	11:42	HT	12.5	850	433	500	LDT #45	FDT #79&80
S49/S50	NEOS / SEOS	12:10	JO	12.5	850	393	500	LDT #46	FDT #81&82
S50/S51	NEOS / SEOS	12:16	MR	12.5	850	378	500	LDT #47	FDT #83&84
S51/S52	NEOS / SEOS	12:30	HT	12.5	850	343			FDT #85&86
S52/S53	BUTT /	4:00	HT	12.5	850	22.5			
T75/S53	TYN /	4:28	HT	12.5	850	22.5			
T74/S52	TYN /	4:25	HT	12.5	850	22.5			
T76/S53	TYN /	4:31	HT	12.5	850	22.5			
T77/S53	TYN /	4:34	HT	12.5	850	22.5			
T78/S53	TYN /	4:37	HT	12.5	850	22.5			
T79/S53	TYN /	4:40	HT	12.5	850	22.5			
T80/S53	TYN /	4:43	HT	12.5	850	22.5			
T81/S53	TYN /	4:47	HT	12.5	850	22.5			
T82/S53	TYN /	4:50	HT	12.5	850	22.5			
T83/S53	TYN /	4:53	HT	12.5	850	22.5			
T84/S53	TYN /	4:56	HT	12.5	850	22.5			
T85/S53	TYN /	4:59	HT	12.5	850	22.5			
T86/S53	TYN /	5:02	HT	12.5	850	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/29/200

CHS Project No.: 046003.001

Project Name: Marshall Steam Station

Project Location: Catawba County, NC

Page: 3 of 3

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion Extrusion

MACHINE #			

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T78/T77	ANCHOR / TOE	3:34	MR	12.5	850	63			
T77/T76	ANCHOR / TOE	3:50	JO	12.5	850	64	500	LDT #49	
T76/T75	ANCHOR / TOE	3:35	JO	12.5	850	66			
T75/T74	ANCHOR / TOE	3:21	JO	12.5	850	68			
S53/S45	ANCHOR / TOE	2:30	HT	12.5	850	422	500	LDT #48	FDT #87&88
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	/				Daily Total	5015.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 8/30/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 2

PASSING TRIAL SEAMS				
Number	34	35	36	
Time	9:25	9:35	10:15	
Tech Initials	JO	MR	HT	

Fusion Extrusion

MACHINE #			
8	10	13	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T74/T96	ANCHOR / TOE	9:39	JO	11.5	860	70			
T96/T97	ANCHOR / TOE	9:56	JO	11.5	860	72			
T97/T98	ANCHOR / TOE	9:45	MR	11.5	850	74			
T98/T99	ANCHOR / TOE	10:06	JO	11.5	860	76			
T99/T100	ANCHOR / TOE	10:18	JO	11.5	860	78			
T100/T101	ANCHOR / TOE	10:06	MR	11.5	850	80			
T101/T102	ANCHOR / TOE	10:15	MR	11.5	850	82			
T102/T103	ANCHOR / TOE	10:28	MR	11.5	850	83			
T103/T104	ANCHOR / TOE	10:40	MR	11.5	850	86			
T104/T105	ANCHOR / TOE	10:36	JO	11.5	860	87			
T105/T106	ANCHOR / TOE	10:58	JO	11.5	860	90			
T106/T107	ANCHOR / TOE	11:14	JO	11.5	860	92			
T107/T108	ANCHOR / TOE	11:37	MR	11.5	860	95			
T108/T109	ANCHOR / TOE	11:07	MR	11.5	860	98			
T109/S52	TYN /	11:25	HT	11.5	850	22.5			
T108/S52	TYN /	11:27	HT	11.5	850	22.5			
T107/S52	TYN /	11:29	HT	11.5	850	22.5			
T106/S52	TYN /	11:31	HT	11.5	850	22.5			
T105/S52	TYN /	11:33	HT	11.5	850	22.5			
T104/S52	TYN /	11:35	HT	11.5	850	22.5			
T103/S52	TYN /	11:37	HT	11.5	850	22.5	500	LDT #54	
T102/S52	TYN /	11:39	HT	11.5	850	22.5			
T101/S52	TYN /	11:41	HT	11.5	850	22.5			
T100/S52	TYN /	11:43	HT	11.5	850	22.5			
T99/S52	TYN /	11:45	HT	11.5	850	22.5			
T98/S52	TYN /	11:47	HT	11.5	850	22.5			
T97/S52	TYN /	11:49	HT	11.5	850	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date:	8/30/200
CHS Project No.:	046003.001
Project Name:	Marshall Steam Station
Project Location:	Catawba County, NC
Page:	2 of 2

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion (selected) Extrusion

MACHINE #			

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
							Carry Over		
T96/S52	TYN /	11:51	HT	11.5	850	22.5			
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					Daily Total	1478			

CQA Personnel: ____________________

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/8/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

PASSING TRIAL SEAMS				
Number	38	39	40	
Time	11:07	11:15	11:28	
Tech Initials	JO	MR	HT	

Fusion Extrusion

MACHINE #			
8	13	10	

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T109/T110	ANCHOR / TOE	11:25	MR	650	850	84	500	LDT #56	
T110/T111	ANCHOR / TOE	11:59	MR	650	850	84			
T111/T112	ANCHOR / TOE	12:11	MR	650	850	85			
T112/T113	ANCHOR / TOE	11:45	JO	650	850	85			
T113/T114	ANCHOR / TOE	12:02	JO	650	850	90			
T114/T115	ANCHOR / TOE	11:08	HT	700	850	102			
T115/T116	ANCHOR / TOE	12:10	HT	700	850	75	500	LDT #57	
T116/T117	ANCHOR / MD PANEL	12:25	HT	700	850	37			
T117/T118	ANCHOR / MD PANEL	12:45	HT	700	850	13			
T118/T119	ANCHOR / MD PANEL	12:35	HT	700	850	13			
T117/T119	ANCHOR / MD PANEL	2:41	HT	700	850	25			
T116/T119	ANCHOR / MD PANEL	2:36	HT	700	850	10			
T119/T120	ANCHOR / MD PANEL	12:30	MR	650	850	47			
T116/T120	ANCHOR / MD PANEL	2:31	HT	700	850	30			
T115/T120	ANCHOR / MD PANEL	2:30	HT	700	850	3			
T120/T121	ANCHOR / MD PANEL	12:30	JO	650	850	77			
T115/T121	ANCHOR / MD PANEL	2:25	HT	700	850	25			
T121/T122	ANCHOR / TOE	12:12	JO	650	850	95			
T122/T123	ANCHOR / TOE	12:40	HT	700	850	97	500	LDT #58	
T123/T124	ANCHOR / TOE	12:43	JO	700	850	97			
T124/T125	ANCHOR / TOE	1:35	HT	700	850	97			
T125/T126	ANCHOR / TOE	12:53	MR	650	850	97			
T126/T127	ANCHOR / TOE	12:55	JO	650	850	97			
T127/T128	ANCHOR / TOE	1:30	MR	650	850	96			
T128/T129	ANCHOR / TOE	1:42	JO	650	850	97	500	LDT #59	
T129/T130	ANCHOR / TOE	1:47	MR	650	850	98			
T130/T131	ANCHOR / TOE	1:59	JO	650	850	98			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/8/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

PASSING TRIAL SEAMS				
Number	41	42		
Time	12:45	1:45		
Tech Initials	IF	IF		

Fusion Extrusion

MACHINE #			
11	11		

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S54/S55	NEOS / SEOS	1:28	JO	650	850	132			
S55/S56	NEOS / SEOS	2:11	MR	650	850	137			
S56/S57	NEOS / SEOS	2:19	IF	700	850	148	500	LDT #61	
S57/S58	NEOS / SEOS	2:23	JO	650	850	157			
S58/S59	NEOS / SEOS	2:42	MR	650	850	95			
S59/S60	BUTT /	2:49	JO	650	850	22.5			
S58/S60	NEOS / SEOS	2:56	MR	650	850	85			
S60/S61	NEOS / SEOS	2:56	JO	650	850	85			
S59/S61	NEOS / SEOS	2:56	JO		850	75	500	LDT #62	
S61/S63	NEOS / SEOS	3:05	HT	700	850	55			
S62/S63	BUTT /	2:58	HT	700	850	22.5			
S61/S62	NEOS / SEOS	3:15	HT	700	850	146			
S63/S64	NEOS / SEOS	3:07	MR	650	850	55			
S62/S64	NEOS / SEOS	3:17	MR	650	850	146	500	LDT #67	
S46/S62	NEOS / SEOS	3:35	MR		850	20			
S46/S62	BUTT /	3:40	HT	700	850	22.5			
S61/S47	BUTT /	3:43	HT	700	850	22.5	500	LDT #63	
S60/S48	BUTT /	3:46	HT	700	850	22.5			
S22/S64	BUTT /	3:45	MR	650	850	22.5			
S58/S49	BUTT /	3:49	HT	700	850	22.5			
S57/S50	BUTT /	3:53	HT	700	850	22.5			
S56/S51	BUTT /	3:56	HT	700	850	22.5			
S55/S52	BUTT /	3:55	HT	700	850	22.5			
S4/T109	TYN /	4:02	HT	700	850	22.5			
S54/T110	TYN /	1:59	IF	600	850	22.5			
S54/T111	TYN /	2:04	IF	600	850	22.5			
S54/T112	TYN /	2:07	IF	600	850	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/8/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

PASSING TRIAL SEAMS				
Number				
Time				
Tech Initials				

Fusion Extrusion

MACHINE #			

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S54/T113	TYN /	2:10	IF	11	850	22.5			
S54/T114	TYN /	2:14	IF	11	850	22.5			
S54/T115	TYN /	2:18	IF	11	850	5			
T121/S59	TYN /	3:00	IF	11	850	4			
T122/S54	TYN /	3:02	IF	11	850	22.5			
T123/S55	TYN /	3:06	IF	11	850	22.5	500	LDT #64	
T124/S56	TYN /	3:09	IF	11	850	22.5			
T125/S57	TYN /	3:13	IF	11	850	20			
T126/S57	TYN /	3:18	IF	11	850	4			
T126/S58	TYN /	3:19	IF	11	850	18.5			
T127/S58	TYN /	3:21	IF	11	850	5			
T127/S59	TYN /	3:22	IF	11	850	17.5			
T128/S59	TYN /	3:24	IF	11	850	7.5			
T128/S61	TYN /	3:25	IF	11	850	13			
T129/S61	TYN /	3:29	IF	11	850	9			
T129/S63	TYN /	3:28	IF	11	850	13			
T130/S63	TYN /	3:30	IF	11	850	10			
T130/S64	TYN /	3:32	IF	11	850	11			
S54/T109	TYN /	4:02	HT	11	850	22.5			
T132/T131	ANCHOR / TOE	5:16	MR	11	850	99			
T132/T133	ANCHOR / TOE	5:35	MR	11	850	99			
T133/T134	ANCHOR / TOE	5:50	JO	11	850	99	500	LDT #60	
T134/T135	ANCHOR / TOE	5:47	MR	11	850	99			
	/								
	/								
	/								
	/								
					Daily Total	4173.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/9/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

PASSING TRIAL SEAMS				
Number	44	45	46	
Time	11:20	11:24	11:31	
Tech Initials	HT	MR	JO	

Fusion Extrusion

MACHINE #			
10	13	8	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T135/T136	ANCHOR / TOE	2:15	HT	12.5	850	99			
T136/T137	ANCHOR / TOE	2:25	JO	12.5	850	102			
T137/T138	ANCHOR / TOE	2:30	HT	12.5	850	85			
T138/T139	ANCHOR / MD PANEL	2:45	JO	12.5	850	69			
T139/T140	ANCHOR / MD PANEL	2:56	JO	12.5	850	40	500	LDT # 65	
T140/T142	ANCHOR / MD PANEL	3:55	HT	12.5	850	20			
T141/T142	ANCHOR / MD PANEL	3:25	HT	12.5	850	20			
T140/T141	ANCHOR / MD PANEL	3:50	HT	12.5	850	50			
T141/T143	ANCHOR / MD PANEL	3:20	HT	12.5	850	42			
T143/T139	ANCHOR / MD PANEL	3:45	HT	12.5	850	50			
T143/T144	ANCHOR / MD PANEL	3:08	JO	12.5	850	69			
T144/T138	ANCHOR / MD PANEL	3:40	HT	12.5	850	50			
T146/T151	ANCHOR / MD PANEL	4:38	HT	12.5	850	11			
T145/T146	ANCHOR / TOE	3:08	MR	12.5	850	110			
T146/T147	ANCHOR / TOE	3:22	JO	12.5	850	140			
T147/T148	ANCHOR / TOE	3:30	MR	12.5	850	100	500	LDT #66	
T148/T149	ANCHOR / TOE	3:46	JO	12.5	850	100			
T149/T150	ANCHOR / TOE	3:48	MR	12.5	850	100			
S66/S64	NEOS / SEOS	11:37	MR	12.5	850	104			
S66/S65	BUTT /	11:25	HT	12.5	850	22.5			
S64/S65	NEOS / SEOS	11:47	MR	12.5	850	137			
S65/S22	BUTT /	11:57	MR	12.5	850	10			
S65/S67	NEOS / SEOS	11:35	HT	12.5	850	147	500	LDT #68	
S67/S68	NEOS / SEOS	11:56	JO	12.5	850	67			
S68/S69	BUTT /	11:51	JO	12.5	850	22.5			
S66/S67	NEOS / SEOS	11:45	HT	12.5	850	104			
S67/S69	NEOS / SEOS	12:00	JO	12.5	850	211			FDT# 89-90
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/9/2006
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 3

PASSING TRIAL SEAMS				
Number	44	45	46	
Time	11:20	11:24	11:31	
Tech Initials	HT	MR	JO	

Fusion Extrusion

MACHINE #			
10	13	8	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
S69/S71	NEOS / SEOS	12:43	MR	12.5	850	285			FDT # 91-92
S69/S70	NEOS / SEOS	12:32	MR	12.5	850	126			
S70/S71	BUTT /	12:15	MR	12.5	850	22.5			
S70/S72	NEOS / SEOS	1:48	JO	12.5	850	197			
S71/S72	NEOS / SEOS	2:00	JO	12.5	850	85			
S68/S70	NEOS / SEOS	12:25	MR	12.5	850	67	500	LDT #69	
S72/S73	NEOS / SEOS	2:10	MR	12.5	850	52			
S73/S74	BUTT /	1:57	MR	12.5	850	22.5			
S73/S75	NEOS / SEOS	2:37	MR	12.5	850	52			
T131/S66	TYN /	11:10	HT	11	850	12			
T132/S66	TYN /	11:12	HT	11	850	17			
T132/S67	TYN /	11:14	HT	11	850	5			
T133/S67	TYN /	11:15	HT	11	850	17			
T133/S69	TYN /	11:17	HT	11	850	5			
T134/S69	TYN /	11:18	HT	11	850	22.5			
T135/S71	TYN /	11:21	HT	11	850	22.5			
T136/S72	TYN /	11:24	HT	11	850	22.5			
T137/S71	TYN /	11:27	HT	11	850	5			
T137/T151	EEOS / WEOS	4:45	HT	11	850	7			
T137/T151	EEOS / WEOS	4:47	HT	11	850	20			
T138/T151	EEOS / WEOS	4:49	HT	11	850	7			
S74/T151	TYN /	4:41	HT	11	850	22.5			
T146/S74	TYN /	4:25	HT	11	850	40			
T147/S74	TYN /	4:10	HT	11	850	40			
S29/S75	BUTT /	4:12	JO	12.5	850	22.5			
S28/S73	BUTT /	4:15	JO	12.5	850	22.5			
S27/S72	BUTT /	10:20	HV	12.5	500	22.5			
					Daily Total				

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/9/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

PASSING TRIAL SEAMS				
Number	44	45	46	
Time	11:20	11:24	11:31	
Tech Initials	HT	MR	JO	

Fusion Extrusion

MACHINE #			
10	13	8	

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Carry Over: Length From Previous Destruct(ft)	Carry Over: Located Destruct Number	Remarks (Zone)
S26/S70	BUTT /	4:17	JO	12.5	850	22.5			
S25/S68	BUTT /	4:20	JO	12.5	850	22.5			
S24/S67	BUTT /	4:23	JO	12.5	850	22.5			
S23/S65	BUTT /	4:25	JO	12.5	850	22.5			
					Daily Total	3413.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/10/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

PASSING TRIAL SEAMS				
Number	48	49		
Time	2:45	3:00		
Tech Initials	JO	MR		

Fusion Extrusion

MACHINE #			
8	13		

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Carry Over: Located Destruct Number	Remarks (Zone)
S77/S75	STOE / NEOS	3:09	MR	12.5	850	190	500	LDT #71	
S77/S78	STOE / NEOS	3:13	JO	12.5	850	104			
S75/S76	BUTT /	3:00	JO	12.5	850	22.5			
S75/S74	BUTT /	3:05	JO	12.5	850	20			
S74/S76	STOE / NEOS	3:00	JO	12.5	850	50			
S76/T147	TYN /	5:00	JO	12.5	850	22.5			
S76/S77	STOE / NEOS	3:28	MR	12.5	850	50			
S77/S79	STOE / NEOS	3:45	JO	12.5	850	128			
S78/S79	BUTT /	3:37	JO	12.5	850	22.5			
S77/S78	STOE / NEOS	3:18	JO	12.5	850	104			
S78/S80	STOE / NEOS	3:46	MR	12.5	850	104	500	LDT #72	
S79/S80	STOE / NEOS	3:59	MR	12.5	850	128			
S80/S81	STOE / NEOS	4:02	JO	12.5	850	75			
S77/S30	BUTT /	4:05	JO	12.5	850	22.5			
S78/S31	BUTT /	4:08	JO	12.5	850	22.5			
S80/S32	BUTT /	4:10	JO	12.5	850	22.5			
S81/S33	BUTT /	4:12	JO	12.5	850	22.5			
S81/S34	BUTT /	9:50	HV	7	500	25			
S80/T150	TYN /	4:39	JO	11	850	22.5			
S79/T149	TYN /	4:43	JO	11	850	22.5	500	LDT #73	
S79/T148	TYN /	4:46	JO	11	850	18			
S77/T148	TYN /	4:48	JO	11	850	4			
S77/T147	TYN /	4:52	JO	11	850	20			
S72/S74	STOE / NEOS	2:30	MR	12.5	850	230	500	LDT #70	
	/								
	/								
	/								
					Daily Total	1452.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/11/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

PASSING TRIAL SEAMS				
Number	50	51	52	
Time	6:50	7:00	7:10	
Tech Initials	JO	HT	MR	

Fusion　Extrusion

MACHINE #			
8	10	13	

Carry Over

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Length From Previous Destruct(ft)	Located Destruct Number	Remarks (Zone)
T151/T152	ANCHOR / MD PANEL	8:55	HT	650	850	30			
T150/T152	ANCHOR / TOE	7:35	JO	650	850	110			
T161/T152	ANCHOR / MD PANEL	8:45	HT	600	850	12			
T161/T160	ANCHOR / MD PANEL	8:38	JO	650	850	12	500	LDT #74	
T`52/T160	ANCHOR / MD PANEL	8:50	HT	600	850	85			
T159/T160	ANCHOR / MD PANEL	8:30	HT	600	850	58			
T158/T159	ANCHOR / TOE	8:20	MR	650	850	103			
T157/T158	ANCHOR / TOE	8:19	JO	650	850	125			
T156/T157	ANCHOR / TOE	8:20	HT	600	850	122			
T155/T156	ANCHOR / TOE	8:10	MR	650	850	113	500	LDT #75	
T154/T155	ANCHOR / TOE	7:53	JO	650	850	113			
T65/T153	ANCHOR / TOE	7:25	MR	650	850	98	500	LDT #76	
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	/								
	/								
	/								
					Daily Total	981			

CQA Personnel: ______

Raw data provided by ESP & Associates - Project No. UG45.400

CHAS. H. SELLS, INC.
Consulting Engineers, Surveyors & Photogrammetrists

GEOMEMBRANE SEAM LOG

Date: 9/12/200
CHS Project No.: 046003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

PASSING TRIAL SEAMS				
Number	55			
Time	7:15			
Tech Initials	HT			

Fusion Extrusion

MACHINE #			
10			

Seam Number	Seam Start/Finish Point	Approx. Time	Technician Initials	Preheat or Speed	Temp. Setting(°F)	Approximate Length Weld(ft)	Carry Over: Length From Previous Destruct(ft)	Carry Over: Located Destruct Number	Remarks (Zone)
S34/T153	TYN /	7:58	HT	10.5	850	22.5			
S81/T153	TYN /	8:00	HT	10.5	850	22.5			
S81/T154	TYN /	8:03	HT	10.5	850	22.5			
S81/T155	TYN /	8:06	HT	10.5	850	22.5			
S81/T156	TYN /	8:08	HT	10.5	850	6			
S80/T156	TYN /	8:10	HT	10.5	850	17			
S80/T157	TYN /	8:10	HT	10.5	850	22.5			
S80/T158	TYN /	8:14	HT	10.5	850	22.5			
S80/T159	TYN /	8:17	HT	10.5	850	10			
S80/T152	TYN /	8:18	HT	10.5	850	22.5			
					Daily Total	190.5			

CQA Personnel: _____

Raw data provided by ESP & Associates - Project No. UG45.400

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CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
704.662.0100 Fax 704.662.0101

GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/25/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T1/T2	2:00-2:07	DV	3:22-3:27	32-30	P	TEL	
T2/T3	2:10-2:17	DV	3:24-3:29	34-33	P	TEL	
T3/T5	2:35-2:38	DV	3:35-3:40	31-30	P	TEL	
T4/T5	2:25-2:28	DV	3:36-3:41	30-30	P	TEL	
T3/T4	2:28-2:31	DV	3:21-3:26	31-31	P	TEL	
T4/T6	2:30-2:37	DV	3:38-3:43	30-30	P	TEL	
T6/T7	3::00-3:06	DV	3:40-3:45	30-30	P	TEL	
T7/T8	3:11-3:16	DV	3:42-3:47	31-30	P	TEL	
T8/T9	2:20-2:26	DV	3:50-3:55	31-30	P	TEL	
T9/T10	2:54-2:56	DV	3:59-4:04	32-31	P	TEL	
T9/T11	2:56-2:59	DV	3:58-4:03	31-30	P	TEL	
T10/T11	2:45-2:47	DV	4:00-4:05	31-31	P	TEL	
T11/T12	2:35-2:40	DV	4:10-4:15	30-29	P	TEL	
T12/T13	2:50-2:55	DV	4:12-4:17	30-30	P	TEL	
T13/T14	3:10-3:15	DV	4:13-4:18	31-31	P	TEL	
T14/T15	3:25-3:30	DV	4:25-4:30	30-30	P	TEL	
T15/T16	3:19-3:21	DV	4:27-4:32	30-29	P	TEL	
T16/T17	3:07-3:09	DV	4:30-4:35	30-30	P	TEL	
T15/T17	3:21-3:23	DV	4:31-4:36	30-29	P	TEL	
T17/T18	3:34-3:39	DV	4:38-4:43	30-29	P	TEL	
T18/T19	3:47-3:52	DV	4:40-4:45	30-30	P	TEL	
T19/T20	3:58-4:03	DV	4:40-4:45	30-30	P	TEL	
T20/T21	4:16-4:18	DV	4:51-4:56	30-30	P	TEL	
T20/T22	4:18-4:21	DV	4:50-4:55	30-30	P	TEL	
T21/T22	4:07-4:10	DV	4:53-4:58	30-30	P	TEL	
T22/T23	4:27-4:33	DV	5:00-5:05	30-29	P	TEL	
T23/T24	3:45-3:39	DV	5:06-5:11	30-30	P	TEL	
T24/T25	3:58-4:02	DV	5:11-5:16	30-30	P	TEL	
T25/T26	4:43-4:45	DV	5:19-5:24	30-30	P	TEL	
T25/T27	4:45-4:47	DV	5:23-5:28	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
704.662.0100 Fax 704.662.0101

GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/25/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 2

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T26/T27	4:05-4:07	DV	5:21-5:26	30-29	P	TEL	
T27/T28	4:15-4:19	DV	5:30-5:35	30-29	P	TEL	
T28/T29	4:32-4:36	DV	5:31-5:36	30-30	P	TEL	
T29/T30	4:30-4:34	DV	5:33-5:38	30-30	P	TEL	
T30/T31	4:20-4:24	DV	5:40-5:45	30-30	P	TEL	
T31/T32	4:07-4:08	DV	5:44-5:49	30-30	P	TEL	
T31/T33	4:08-4:10	DV	5:42-5:47	31-30	P	TEL	
T32/T33	4:00-4:02	DV	5:49-5:54	30-29	P	TEL	
T33/T34	3:45-3:49	DV	5:46-5:51	30-29	P	TEL	
T1/T35	5:01-5:07	DV	6:04-6:09	30-29	P	TEL	
T35/T36	5:32-5:35	DV	6:01-6:06	30-30	P	TEL	
T35/T37	5:35-5:40	DV	6:07-6:12	30-29	P	TEL	
T36/T37	5:12-5:15	DV	6:00-6:05	30-29	P	TEL	
T37/T38	5:15-5:20	DV	6:10-6:15	30-30	P	TEL	
T38/T39	5:28-5:33	DV	6:12-6:17	30-29	P	TEL	
T39/T40	5:50-5:53	DV	6:24-6:29	30-30	P	TEL	
T39/T41	5:53-5:58	DV	6:16-6:21	30-29	P	TEL	
T40/T41	5:30-5:33	DV	6:21-6:26	30-29	P	TEL	
T41/T42	5:45-5:50	DV	6:18-6:23	30-29	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/26/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 1

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S1/S2	2:02-2:37	MS	4:06-4:11	31-31	P	TEL	
S2/S3	2:08-2:44	MS	4:08-4:13	31-31	P	TEL	
S3/S4	2:15-2:50	MS	4:11-4:14	30-30	P	TEL	
S4/S5	2:50-3:26	MS	4:20-4:25	31-31	P	TEL	
S5/S6	3:00-3:37	MS	4:22-4:27	30-29	P	TEL	
S6/S7	3:18-4:54	MS	4:24-4:29	30-30	P	TEL	
S7/S8	3:45-4:22	MS	4:33-4:38	30-30	P	TEL	
S8/S9	3:55-4;31	MS	4:43-4:48	30-30	P	TEL	
S9/S10	4:16-4:51	HV	5:20-5:25	31-31	P	TEL	
S10/S11	4:37-5:16	HV	5:25-5:30	32-32	P	TEL	
S11/S12	4:40-5:17	HV	5:26-5:31	30-30	P	TEL	
S12/S13	5:22-6:01	HV	6:10-6:15	30-29	P	TEL	
S13/S14	5:26-6:02	HV	6:12-6:17	32-31	P	TEL	
S14/S15	5:30-6:06	HV	6:15-6:20	31-31	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 4

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S15/S16	10:08-10:44	MS	3:23-3:28	30-30	P	TEL	
S16/S17	10:30-11:03	MS	3:25-3:30	30-29	P	TEL	
S17/S18	11:10-11:14	MS	3:32-3:37	30-29	P	TEL	
S18/S19	11:05-11:07	MS	3:42-3:47	30-30	P	TEL	
S17/S19	11:14-11:45	MS	3:27-3;32	30-30	P	TEL	
S19/S20	11:37-11:42	MS	3:50-3:55	30-30	P	TEL	
S20/S21	11:30-11:33	MS	4:14-4:19	30-30	P	TEL	
S21/S19	11:40-11:48	MS	4:17-4:22	30-30	P	TEL	
TYN							
S20/T1	11:57-12:00	MS	4:03-4:08	30-30	P	TEL	
S20/T2	12:00-12:03	MS	4:01-4:06	30-30	P	TEL	
S20/T3	12:03-12:06	MS	3:58-4:03	30-30	P	TEL	
S20/T4	12:06-12:09	MS	3:56-4:01	30-30	P	TEL	
S19/T6	12:09-12:12	MS	3:48-3:53	30-30	P	TEL	
S18/T6	12:12-12:15	MS	3:40-3:45	30-30	P	TEL	
S18/T7	12:15-12:18	MS	3:13-3:18	30-30	P	TEL	
S17/T8	12:18-12:21	MS	3:12-3:17	30-30	P	TEL	
S17/T8	12:21-12:24	MS	3:10-3:15	30-30	P	TEL	
S17/T9	12:24-12:27	MS	3:07-3:12	30-30	P	TEL	
S17/T11	12:27-12:28	MS	3:05-3:10	30-29	P	TEL	
S16/T11	12:28-12:33	MS	3:04-3:09	30-30	P	TEL	
S16/T12	12:33-12:34	MS	3:00-3:05	30-29	P	TEL	
S16/T13	12:34-12:37	MS	2:54-2:59	30-30	P	TEL	
S15/T13	12:37-12:40	MS	2:52-2:57	30-29	P	TEL	
S15/T14	12:40-12:42	MS	2:50-2:55	30-30	P	TEL	
S19/T14	12:42-12:43	MS	8:40-8:45	31-31	P	TEL	
S14/T15	12:43-12:46	MS	8:41-8:46	30-30	P	TEL	
S13/T17	12:46-12:48	MS	8:44-8:49	30-30	P	TEL	
S13/T18	12:48-12:50	MS	8:50-8:55	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S25/S26	1:58-2:34	MS	6:05-6:10	30-30	P	TEL	
S26/S27	2:30-3:06	MS	6:03-6:08	30-30	P	TEL	
S27/S28	2:45-3:21	MS	5:59-6:04	31-31	P	TEL	
S28/S29	2:57-3:04	MS	5:53-5:58	30-30	P	TEL	
S29/S30	3:40-4:12	MS	5:52-5:57	30-30	P	TEL	
S30/S31	3:40-4:13	MS	5:44-5:49	30-30	P	TEL	
S31/S32	4:33-5:06	MS	5:42-5:47	30-30	P	TEL	
S32/S33	4:30-5:02	MS	5:40-5:45	31-30	P	TEL	
S33/S34	4:57-5:36	MS	6:51-6:56	30-30	P	TEL	
S34/S35	5:35-6:12	MS	6:52-6:57	30-30	P	TEL	
S35/S36	4:24-4:42	MS	7:24-7:29	30-30	P	TEL	
S35/S37	4:07-4:17	MS	7:22-7:27	30-30	P	TEL	
S37/S38	6:10-6:22	MS	7:40-7:45	31-30	P	TEL	
S38/S39	6:20-6:28	MS	7:49-7:54	30-29	P	TEL	
S1/S22	6:30-6:32	MS	6:43-6:43	30-30	P	TEL	
S36/S37	5:51=5:59	MS	7:52-7:57	30-30	P	TEL	
S1/S22	6:30-6:32	MS	6:43-6:48	30-30	P	TEL	
S2/R77	6:33-6:35	MS	6:41-6:46	30-30	P	TEL	
S23/R77	6:35-6:36	MS	6:40-6:45	30-30	P	TEL	
S3/R78	6:38-6:40	MS	6:34-6:39	30-29	P	TEL	
S4/R78	6:41-6:42	MS	6:37-6:42	30-30	P	TEL	
S4/R81	6:42-6:44	MS	6:30-6:35	30-30	P	TEL	
S25/R81	6:44-6:46	MS	6:50-6:55	30-30	P	TEL	
S5/R83	6:46-6:48	MS	6:55-7:00	30-30	P	TEL	
S26/R83	6:48-6:50	MS	7:00-7:05	30-30	P	TEL	
S6/S29	6:50-6:52	MS	6:20-6:25	30-30	P	TEL	
S7/S28	6:52-6:54	MS	6:25-6:36	30-30	P	TEL	
S8/S29	6:54-6:56	MS	6:30-6:35	30-30	P	TEL	
S29/S30	6:56-6:58	MS	5:36-5:41	30-30	P	TEL	
S10/S31	7:00-7:02	MS	5:33-5:38	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S11/S32	7:02-7:04	MS	5:33-5:38	30-30	P	TEL	
S12/S33	4:57-5:00	MS	6:50-6:55	30-30	P	TEL	
S13/S33	5:00-5:01	MS	6:50-6:55	30-30	P	TEL	
S13/S34	5:01-5:03	MS	6:53-6:58	30-30	P	TEL	
S14/S35	5:03-5:05	MS	7:10-7:15	30-30	P	TEL	
S15/S35	5:05-5:06	MS	7:14-7:19	30-30	P	TEL	
S15/S37	5:06-5:08	MS	7:26-7:31	30-30	P	TEL	
S16/S37	5:08-5:09	MS	7:30-7:35	30-30	P	TEL	
S16/S38	5:05-5:11	MS	7:34-7:37	30-30	P	TEL	
S17/S39	5:11-5:13	MS	7:46-7:51	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/27/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 2

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S12/T18	12:50-12:51	MS	8:53-8:58	30-30	P	TEL	
S12/T19	12:51-12:52	MS	8:57-9:02	30-29	P	TEL	
S11/T19	12:52-12:54	MS	9:07-9:12	30-30	P	TEL	
S11/T20	12:54-12:55	MS	9:04-9:09	30-30	P	TEL	
S10/T20	12:55-12:58	MS	9:11-9:16	30-30	P	TEL	
S10/T22	12:58-1:00	MS	9:12-9:17	30-30	P	TEL	
S9/T23	1:00-1:03	MS	9:19-9:24	30-29	P	TEL	
S8/T24	1:03-1:06	MS	9:24-9:29	30-29	P	TEL	
S7/T25	1:06-1:07	MS	9:28-9:33	30-29	P	TEL	
S6/T27	1:09-1:11	MS	9:30-9:35	30-30	P	TEL	
S6/T28	1:11-1"13	MS	9:32-9:37	30-29	P	TEL	
S5/T28	1:13-1:14	MS	9:41-9:46	30-30	P	TEL	
S5/T29	1:14-1:16	MS	9:42-9:47	30-30	P	TEL	
S4/T29	1:16-1:18	MS	9:43-9:48	30-30	P	TEL	
S4/T30	1:18-1:20	MS	9:50-9:55	30-29	P	TEL	
S3/T30	1:20-1:21	MS	9:47-9:52	30-30	P	TEL	
S3/T31	1:21-1:22	MS	9:52-9:57	30-30	P	TEL	
S2/T31	1:22-1:23	MS	9:51-9:56	30-30	P	TEL	
S2/T33	1:23-1:24	MS	10:00-10:05	30-29	P	TEL	
S1/T33	1:24-1:26	MS	10:05-10:10	30-29	P	TEL	
S1/T34	1:26-1:28	MS	10:03-10:08	30-29	P	TEL	
S21/T42	1:05-1:08	MS	4:26-4:31	30-30	P	TEL	
S21/T41	1:03-1:05	MS	4:23-4:28	30-28	P	TEL	
S21/T39	1:08-1:10	MS	4:20-4:25	30-30	P	TEL	
S21/T38	1:10-1:13	MS	4:16-4:21	30-30	P	TEL	
S21/T37	1:13-1:15	MS	4:10-4:15	30-29	P	TEL	
S20/T35	1:15-1:17	MS	4:08-4:13	30-30	P	TEL	
S22/S23	1:00-1:36	MS	6:13-6:18	30-30	P	TEL	
S23/S24	1:30-2:04	MS	6:10-6:15	30-30	P	TEL	
S24/S25	1:48-2:22	MS	6:07-6:12	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/28/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T42/T43	11:21	JO	2:14-2:19	30-30	P	MS	
T43/T44	11:20	MR	2:12-2:17	30-30	P	MS	
T44/T45	11:35	JO	2:10-2:15	30-29	P	MS	
T45/T46	11:38	MR	2:09-2:14	30-30	P	MS	
T46/T47	11:53	JO	1:57-2:02	30-30	P	MS	
T47/T48	11:53	MR	1:56-2:01	30-30	P	MS	
T48/T49	12:08	JO	1:54-1:59	30-30	P	MS	
T49/T50	12:10	MR	1:52-1:57	30-30	P	MS	
T50/T51	12:33	JO	1:42-1:47	30-30	P	MS	
T51/T52	12:40	JO	1:41-1:46	30-29	P	MS	
T52/T53	12:27	MR	1:40-1:45	30-30	P	MS	
T53/T54	12:20	HT	1:38-1:43	30-30	P	MS	
T54/T55	12:30	HT	1:29-1:34	30-30	P	MS	
T55/T56	12:46	HT	1:28-1:33	30-30	P	MS	
T56/T57	1:00	HT	1:27-1:32	30-30	P	MS	
T57/T58	1:10	HT	1:24-1:29	30-29	P	MS	
T58/T59	1:21	HT	3:52-3:57	30-30	P	MS	
T59/T60	12:48	MR	3:56-4:01	30-30	P	MS	
T60/T61	1:08	MR	3:58-4:03	30-30	P	MS	
T61/T62	1:00	JO	3:29-3:34	30-30	P	MS	
T62/T63	1:12	JO	3:28-3:33	30-30	P	MS	
T63/T64	1:25	JO	3:27-3:32	30-30	P	MS	
T64/T65	1:40	MR	3:26-3:31	30-29	P	MS	
S40/S1	3:47-4:22	MS	8:06-8:11	30-30	P	MS	
S40/S41	3:58-4:38	MS	8:09-8:14	30-30	P	MS	
S41/S42	4:10-4:42	MS	8:11-8:16	30-30	P	MS	
S42/S43	4:50-5:29	MS	8:14-8:19	30-30	P	MS	
S43/S44	4:52-5:35	MS	8:25-8:30	30-30	P	MS	
S44/S45	5:00-5:40	MS	8:25-8:33	30-30	P	MS	
T34/T66	5:49-5:54	MS	9:02-9:07	30-30	P	MS	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 8/28/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T66/T67	5:57-6:04	MS	9:05-9:10	30-30	P	TEL	
T67/T68	5:51-5:58	MS	9:07-9:13	30-30	P	TEL	
T68/T69	6:15-6:18	MS	9:18-9:23	30-30	P	TEL	
T69/T70	6:03-6:09	MS	9:25-9:30	30-30	P	TEL	
T71/T72	6:30-6:37	MS	9:32-9:37	30-30	P	TEL	
T70/T71	6:25-6:32	MS	9:26-9:31	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8-29-06
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S40/S46	1:50-1:52	MS	2:13-2:18	30-30	P	TEL	
S41/S47	1:53-1:55	MS	2:09-2:14	30-30	P	TEL	
S42/S48	1:56-1:58	MS	2:07-2:12	30-30	P	TEL	
S43/S49	2:18-2:20	MS	2:21-2:23	30-30	P	TEL	
S44/S50	2:22-2:25	MS	2:26-2:31	30-30	P	TEL	
S45/S51	2:27-2:31	MS	2:32-2:37	30-30	P	TEL	
S46/S22	10:30-11:10	MS	1:36-1:41	30-29	P	TEL	
S46/S47	11:05-11:45	MS	1:55-2:00	30-30	P	TEL	
S47/S48	11:23-12:04	MS	1:07-1:12	31-30	P	TEL	
S48/S49	11:42-12:05	MS	2:01-2:06	30-30	P	TEL	
S49/S50	12:10-12:52	MS	2:23-2:28	30-30	P	TEL	
S50/S51	12:16-12:48	MS	2:30-2:35	30-30	P	TEL	
S51/S52	12:30-1:04	MS	2:35-2:40	30-30	P	TEL	
S52/S53	4:00-4:02	MS	4:42-4:47	30-30	P	TEL	
T75/S53	4:28-4:31	MS	4:52-4:57	30-30	P	TEL	
T74/S52	4:25-4:27	MS	4:50-4:55	30-30	P	TEL	
T76/S53	4:31-4:33	MS	5:02-5:07	30-30	P	TEL	
T77/S53	4:34-4:36	MS	5:57-6:02	31-31	P	TEL	
T78/S53	4:37-4:39	MS	6:05-6:10	31-31	P	TEL	
T79/S53	4:40-4:42	MS	7:23-7:28	30-30	P	TEL	
T80/S53	4:43-4:45	MS	7:32-7:37	30-30	P	TEL	
T81/S53	4:47-4:49	MS	7:42-7:47	30-29	P	TEL	
T82/S53	4:50-4:52	MS	7:46-7:51	30-30	P	TEL	
T83/S53	4:53-4:55	MS	7:52-7:57	30-30	P	TEL	
T84/S53	4:56-4:58	MS	8:02-8:07	30-30	P	TEL	
T85/S53	4:59-5:02	MS	8:08-8:13	30-30	P	TEL	
T86/S53	5:02-5:04	MS	8:15-8:20	30-29	P	TEL	
T87/S53	5:05-5:07	MS	8:27-8:32	30-30	P	TEL	
T88/S53	5:08-5:10	MS	8:30-8:35	30-30	P	TEL	
T89/S53	5:11-5:13	MS	8:37-8:42	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/29/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 2 of 2

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T90/S53	5:14=5:16	MS	8:50-8:55	30-30	P	TEL	
T91/S53	5:17-5:19	MS	9:07-9:12	30-30	P	TEL	
T92/S53	5:20-5:22	MS	9:08-9:13	30-30	P	TEL	
T93/S53	5:23-5:25	MS	9:14-9:19	30-30	P	TEL	
T94/S45	5:28-5:29	MS	9:23-9:28	30-30	P	TEL	
T94/T72	5:21-5:26	MS	9:26-9:31	30-30	P	TEL	
T93/T94	5:15-5:18	MS	9:21-9:26	30-30	P	TEL	
T94/T95	5:16-5:19	MS	9:30-9:35	30-30	P	TEL	
T93/T95	5:22-5:25	MS	9:29-9:34	30-30	P	TEL	
T92/T93	5:10-5:15	MS	9:11-9:16	30-30	P	TEL	
T92/T91	5:05-5:10	MS	9:05-9:10	30-30	P	TEL	
T90/T91	5:00-5:05	MS	8:59-9:04	30-29	P	TEL	
T89/T90	4:58-5:02	MS	8:40-8:45	30-30	P	TEL	
T88/T89	4:59-5:03	MS	8:35-8:40	30-30	P	TEL	
T87/T88	4:51-4:56	MS	8:28-8:33	30-29	P	TEL	
T87/T86	4:37-4:41	MS	8:25-8:30	30-30	P	TEL	
T85/T86	4:30-4:34	MS	8:12-8:17	30-30	P	TEL	
T84/T85	4:44-4:50	MS	8:06-8:11	30-30	P	TEL	
T84/T83	4:32-4:47	MS	7:58-8:03	30-30	P	TEL	
T82/T83	4:15-4:20	MS	7:50-7:55	30-30	P	TEL	
T81/T82	4:02-4:07	MS	7:43-7:48	30-30	P	TEL	
T81/T80	4:17-4:22	MS	7:40-7:45	30-30	P	TEL	
T79/T80	4:05-4:10	MS	7:30-7:35	30-30	P	TEL	
T79/T78	3:45-3:50	MS	7:19-7:24	30-30	P	TEL	
T78/T77	3:34-3:38	MS	5:59-6:04	30-30	P	TEL	
T77/T76	3:50-3:55	MS	5:56-6;01	30-30	P	TEL	
T76/T75	3:35-3:40	MS	4:57-5:02	30-30	P	TEL	
T75/T74	3:21-3:25	MS	4:48-4:53	30-30	P	TEL	
S53/S45	2:30-3:06	MS	4:55-5:00	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	30
Min. Time Required	5
Max. Air Pressure Loss Allowed	3

Date: 8/30/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T74/T96	9:39-9:44	DV	11:30-11:35	30-29	P	TEL	
T96/T97	9:56-10:00	DV	11:31-11:36	32-31	P	TEL	
T97/T98	9:45-9:50	DV	11:33-11:38	30-30	P	TEL	
T98/T99	10:06-10:10	DV	11:37-11:42	30-30	P	TEL	
T99/T100	10:18-10:25	DV	11:51-11:56	30-30	P	TEL	
T100/T101	10:00-10:12	DV	11:49-11:54	34-33	P	TEL	
T101/T102	10:15-10:20	DV	11:47-11:52	31-30	P	TEL	
T102/T103	10:28-10:33	DV	11:45-11:50	30-29	P	TEL	
T103/T104	10:40-10:46	DV	12:50-12:55	30-29	P	TEL	
T104/T105	10:36-10:42	DV	12:52-12:57	30-30	P	TEL	
T105/T106	10:58-11:05	DV	12:53-12:58	30-30	P	TEL	
T106/T107	11:14-11:26	DV	12:57-1:02	30-29	P	TEL	
T107/T108	11:37-11:48	DV	1:48-1:53	30-30	P	TEL	
T108/T109	11:07-11:14	DV	1:47-1:52	30-29	P	TEL	
T109S52	11:25-11:27	DV	1:57-2:04	30-29	P	TEL	
T108/S52	11:27-11:29	DV	1:51-1:56	30-30	P	TEL	
T107/S52	11:29-11:31	DV	1:49-1:54	30-29	P	TEL	
T106/S52	11:31-11:33	DV	1:40-1:45	30-29	P	TEL	
T105/S52	11:33-11:35	DV	1:34-1:37	30-30	P	TEL	
T104/S52	11:35-11:37	DV	1:37-1:42	30-29	P	TEL	
T103/S52	11:37-11:39	DV	1:30-1:35	30-30	P	TEL	
T102/S52	11:39-11:41	DV	1:26-1:31	30-29	P	TEL	
T101/S52	11:41-11:43	DV	1:28-1;33	30-28	P	TEL	
T100/S52	11:43-11:45	DV	1:20-1:25	30-29	P	TEL	
T99/S52	11:45-11:47	DV	1:15-1:20	30-29	P	TEL	
T98/S52	11:47-11:49	DV	1:16-1:21	30-30	P	TEL	
T97/S52	11:49-11:51	DV	1:05-1:10	30-29	P	TEL	
T96/S52	11:51-11:53	DV	1:02-1:07	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/8/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 1 of 3

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T109/T110	11:25-11:30	MS	12:27-12:32	30-29	P	TEL	
T110/T111	11:59-12:04	MS	12:29-12:34	31-31	P	TEL	
T111/T112	12:11-12:16	MS	12:30-12:35	30-29	P	TEL	
T112/T113	11:45-12:00	MS	12:33-12:38	30-30	P	TEL	
T113/T114	12:02-12:07	MS	12:36-12:41	30-30	P	TEL	
T114/T115	11:58-12:07	MS	112:42-12:47	30-30	P	TEL	
T115/T116	12:10-12:15	MS	12:45-12:50	30-29	P	TEL	
T116/T117	12:25-12:30	MS	12:51-12:56	30-29	P	TEL	
T117/T118	12:45-12:46	MS	12:51-12:56	30-30	P	TEL	
T118/T119	12:35-12:37	MS	12:53-12:58	30-30	P	TEL	
T117/T119	2:41-2:42	MS	2:48-2:53	30-29	P	TEL	
T116/T119	2:36-2:38	MS	2:46-2:51	30-30	P	TEL	
T119/T120	12:30-12:35	MS	12:50-12:55	30-29	P	TEL	
T116/T120	2:31-2;39	MS	2:39-2:44	30-29	P	TEL	
T115/T120	2:30-2:31	MS	1:31-1:36	30-30	P	TEL	
T120/T121	12:30-12:35	MS	1:31-1:36	30-30	P	TEL	
T115/T121	2:25-2;27	MS	2:35-2:40	30-30	P	TEL	
T121/T122	12:12-12:24	MS	1:35-1:40	30-30	P	TEL	
T122/T123	12:40-12:50	MS	1:36-1:41	30-29	P	TEL	
T123/T124	12:43-12:51	MS	1:40-1:45	30-30	P	TEL	
T124/T125	1:35-1;46	MS	1:44-1:49	30-30	P	TEL	
T125/T126	12:53-1:04	MS	3:38-3:43	30-30	P	TEL	
T126/T127	12:55-1:07	MS	3:41-3:46	30-30	P	TEL	
T127/T128	1:30-1:42	MS	3:48-3:53	30-30	P	TEL	
T128/T129	1:42-1:55	MS	3:50-3:55	30-30	P	TEL	
T129/T130	1:47-1:57	MS	3:55-4:00	30-30	P	TEL	
T130/T131	1:59-2:09	MS	3:57-4:02	30-30	P	TEL	
S54/S55	1:28-1:41	MS	3:17-3:22	30-30	P	TEL	
S55/S56	2:11-2:25	MS	3:19-3:24	30-30	P	TEL	
S56/S57	2:19-2:41	MS	3;27-3:32	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/8/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S57/S58	2:23-2:33	MS	3:29-3:34	30-30	P	TEL	
S58/S59	2:42-2:51	MS	4:22-4:27	30-30	P	TEL	
S59/S60	2:49-2:51	MS	4:28-4:33	30-29	P	TEL	
S58/S60	2:56-3:02	MS	4:29-4:34	30-30	P	TEL	
S60/S61	2:56-3:02	MS	4:32-4:37	30-30	P	TEL	
S59/S61	2:52-3:01	MS	4:24-4:29	30-30	P	TEL	
S61/S63	3:05-3:10	MS	4:47-4:52	30-30	P	TEL	
S62/S63	2:58-3:01	MS	4:42-4:47	30-30	P	TEL	
S61/S62	3:15-3:27	MS	4:38-4:43	30-30	P	TEL	
S63/S64	3:17-3:20	MS	4:48-4:53	30-30	P	TEL	
S62/S64	3:17-3:29	MS	4:40-4:45	30-30	P	TEL	
S46/S62	3:35-3:37	MS	4:56-5:01	30-30	P	TEL	
S46/S62	3:40-3:43	MS	4:58-5:03	30-29	P	TEL	
S61/S47	3:43-3:45	MS	5:05-5:10	30-30	P	TEL	
S60/S48	3:46-3:48	MS	5:07-5:12	30-30	P	TEL	
S22/S64	3:45-3:47	MS	4:54-4:59	30-30	P	TEL	
S58/S49	3:49-3:51	MS	5:09-5:14	30-30	P	TEL	
S57/S50	3:53-3:55	MS	5:17-5:22	30-30	P	TEL	
S56/S51	3:56-3:58	MS	5:20-5:25	30-29	P	TEL	
S55/S52	3:59-4:02	MS	5:21-5:26	30-29	P	TEL	
S4/T109	4:02-4:05	MS	5:25-5:30	30-30	P	TEL	
S54/T110	1:59-2:02	MS	2:01-2:06	30-30	P	TEL	
S54/T111	2:04-2:07	MS	2:04-2:09	30-29	P	TEL	
S54/T112	2:07-2:10	MS	2:06-2:11	30-29	P	TEL	
S54/T113	2:10-2:13	MS	2:11-2:16	30-30	P	TEL	
S54/T114	2:14-2:16	MS	2:14-2:19	30-28	P	TEL	
S54/T115	2:18-2:20	MS	3:02-3:07	30-29	P	TEL	
T121/S54	3:00-3:01	MS	3:03-3:08	30-30	P	TEL	
T122/S54	3:02-3:05	MS	3:05-3:10	30-27	P	TEL	
T123/S55	3:06-3:08	MS	3:12-3:17	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/8/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page: 3 of 3

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T124/S56	3:09-3:11	MS	3:12-3:17	30-30	P	TEL	
T125/S57	3:13-3:15	MS	3:22-3:27	30-30	P	TEL	
T126/S57	3:18-3:19	MS	3:31-3:36	30-30	P	TEL	
T126/S58	3:19-3:21	MS	3:36-3:41	30-30	P	TEL	
T127/S58	3:21-3:22	MS	3:45-3:50	30-30	P	TEL	
T127/S59	3:22-3:23	MS	3:52-3:57	30-30	P	TEL	
T128/S59	3:24-3:26	MS	4:02-4:07	30-29	P	TEL	
T128/S61	3;25-3:27	MS	4:04-4:09	30-30	P	TEL	
T129/S61	3:27-3:29	MS	4:06-4:11	30-29	P	TEL	
T129/S63	3:28-3:29	MS	4:11-4:16	30-29	P	TEL	
T130/S63	3:30-3:32	MS	4:13-4:18	30-30	P	TEL	
T130/S64	3:32-3:33	MS	4:16-4:21	30-29	P	TEL	
T131/S64	3:34-3:35	MS	4:19-4:29	30-30	P	TEL	
T133/T134	5:50-6:02	MS	8:30-8:35	30-30	P	TEL	
S54/T109	4:02-4:04	MS	5:25-5:30	30-30	P	TEL	
T131/T132	5:16-5:27	MS	8:25-8:30	30-30	P	TEL	
T132/T133	5:35-5:45	MS	8:27-8:32	30-30	P	TEL	
T134/T135	5:47-5:58	MS	8:33-8:35	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T135/T136	2:15-2:23	MS	5:05-5:10	30-30	P	TEL	
T136/137	2:25-2:32	MS	5:09-5:14	30-29	P	TEL	
T137/138	2:30-2:35	MS	5:31-5:36	30-30	P	TEL	
T138/T139	2:45-2:48	MS	4:27-4:32	30-30	P	TEL	
T139/140	2:56-2:59	MS	4:44-4:49	30-30	P	TEL	
T140/142	3:55-3:56	MS	4:53-4:58	30-30	P	TEL	
T141/T142	3:28-3:30	MS	4:55-5:00	30-30	P	TEL	
T140/T141	3:50-3:55	MS	4:42-4:47	30-30	P	TEL	
T141/T143	3:20-3:25	MS	4:40-4:45	30-30	P	TEL	
T143/T139	3:45-3:48	MS	4:24-4:29	30-30	P	TEL	
T143/T144	3:08-3:14	MS	4:25-4:30	30-30	P	TEL	
T144/T138	3:40-3:44	MS	5:39-5:44	30-30	P	TEL	
T146/T151	4:38-4:39	MS	4:56-4:51	30-30	P	TEL	
T145/T146	3:08-3:19	MS	5:42-5:47	30-30	P	TEL	
T146/T147	3:22-3:35	MS	6:07-6:12	30-30	P	TEL	
T147/T148	3:30-3:40	MS	6:11-6:16	30-30	P	TEL	
T148/T149	3:46-3:55	MS	6:14-6:19	30-30	P	TEL	
T149/T150	3:48-3:58	MS	6:18-6:23	30-30	P	TEL	
S66/S64	11:37-11:47	MS	2:27-2:32	30-30	P	TEL	
S66/S65	11:25-11:27	MS	3:15-3:20	30-30	P	TEL	
S64/S65	11:47-12:01	MS	3:13-3:18	30-30	P	TEL	
S65/S22	11:57-11:58	MS	3:14-3:19	30-30	P	TEL	
S65/S67	11:35-11:46	MS	3:21-3:26	30-30	P	TEL	
S67/S68	11:56-12:02	MS	3:27-3:32	30-30	P	TEL	
S68/S69	11:51-11:54	MS	3:23-3:28	30-30	P	TEL	
S66/S67	11:45-11:55	MS	2:34-2:39	30-30	P	TEL	
S67/S69	12:00-12:18	MS	2:39-2:44	30-30	P	TEL	
S69/S71	12:43-1:00	MS	2:59-3:04	30-30	P	TEL	
S69/S70	12:32-12:41	MS	3:34-3:39	30-29	P	TEL	
S70/S71	12:15-12:12	MS	3:39-3:42	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	3

Date: 9/9/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S70/S72	1:48-2:03	MS	3:40-3:45	30-29	P	TEL	
S71/S72	2:00-2:07	MS	3:06-3:11	30-30	P	TEL	
S68/S70	12:25-12:31	MS	3:29-3:34	30-29	P	TEL	
S72/S73	2:10-2:13	MS	3:48-3:53	30-30	P	TEL	
S73/S74	1:57-2:00	MS	3:50-3:55	30-29	P	TEL	
S73/S75	2:57-3:01	MS	4:00-4:05	30-30	P	TEL	
T131/S66	11:10-11:11	MS	2:30-2:35	30-30	P	TEL	
T132/S66	11:12-11:14	MS	2:32-2:37	30-30	P	TEL	
T132/S67	11:14-11:15	MS	2:40-2:45	30-30	P	TEL	
T133/S67	11:15-11:16	MS	2:49-2:54	30-30	P	TEL	
T133/S69	11:17-11:18	MS	2:53-2:58	30-30	P	TEL	
T134/S69	11:18-11:21	MS	2:57-3:02	30-30	P	TEL	
T135/S71	11:21-11:23	MS	3:05-3:10	30-30	P	TEL	
T136/S72	11:24-11:27	MS	5:08-5:13	30-30	P	TEL	
T137/S71	11:27-11:28	MS	5:23-5:28	30-30	P	TEL	
T137/T151	4:45-4:46	MS	5:26-5:31	30-30	P	TEL	
T137/T151	4:47-4:49	MS	5:28-5:33	30-30	P	TEL	
S74/T151	4:41-4:44	MS	5:50-5:55	30-30	P	TEL	
T138/T151	4:49-4:50	MS	5:34-5:39	30-30	P	TEL	
T146/S74	4:25-4:28	MS	5:53-5:58	30-30	P	TEL	
T147/S74	4:10-4:11	MS	6:08-6:13	30-30	P	TEL	
S29/S75	4:12-4:14	MS	6:40-6:45	30-30	P	TEL	
S28/S73	4:15-4:18	MS	6:34-6:39	30-30	P	TEL	
S26/S70	4:17-4:19	MS	6:30-6:35	30-30	P	TEL	
S25/S68	4:20-4:23	MS	6:29-6:34	30-30	P	TEL	
S24/S67	4:23-4:26	MS	6:28-6:33	30-30	P	TEL	
S23/S65	4:25-4:27	MS	6:26-6:31	30-30	P	TEL	
					P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

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GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/10/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S77/S75	3:09-3:25	DV	7:31-7:36	30-30	P	TEL	
S77/S78	3:18-3:27	DV	7:22-7:37	30-30	P	TEL	
S75/S76	3:00-3:02	DV	7:30-7:35	30-29	P	TEL	
S75/S74	3:05-3:08	DV	7:20-7:25	30-29	P	TEL	
S74/S76	3:00-3:04	DV	7:17-7:22	30-30	P	TEL	
S76/T147	5:00-5:03	DV	5:04-5:09	30-29	P	TEL	
S76/S77	3:28-3:35	DV	7:15-7:20	30-29	P	TEL	
S77/S79	3:45-3:56	DV	4:40-4:45	30-29	P	TEL	
S78/S79	3:37-3:39	DV	7:53-7:58	30-30	P	TEL	
S77/S78	3:18-3:27	DV	7:50-7:55	30-29	P	TEL	
S78/S80	3:46-3:54	DV	7:51-7:56	30-30	P	TEL	
S79/S80	3:59-4:08	DV	4:42:4:47	30-30	P	TEL	
S80/S81	4:02-4:06	DV	8:00-8:05	30-30	P	TEL	
S77/S30	4:05-4:07	DV	8:20-8:25	30-30	P	TEL	
S78/S31	4:08-4:11	DV	8:08-8:13	30-29	P	TEL	
S80/S32	4:10-4:12	DV	8:09-8:14	30-30	P	TEL	
S81/S33	4:12-4:14	DV	8:01-8:06	30-30	P	TEL	
S80/T150	4:39-4:42	DV	7:32-7:37	30-28	P	TEL	
S79/T149	4:43-4:46	DV	4:50-4:55	30-30	P	TEL	
S79/T148	4:46-4:47	DV	4:50-4:55	30-29	P	TEL	
S77/T148	4:48-4:49	DV	4:57-5:03	30-30	P	TEL	
S77/T147	4:52-4:55	DV	5:00-5:05	30-30	P	TEL	
S72/S74	2:30-2:48	DV	5:15-5:20	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
704.662.0100 Fax 704.662.0101

GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/11/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
T151/T152	8:55-8:58	MS	7:47-7:52	30-30	P	TEL	
T150/T152	7:35-7:44	MS	7:45-7:50	30-30	P	TEL	
T161/T152	8:45-8:46	MS	7:33-7:38	30-30	P	TEL	
T161/T160	8:38-8:39	MS	7:35-7:40	30-30	P	TEL	
T152/T160	8:50-9:00	MS	7:43-7:48	30-30	P	TEL	
T159/T160	8:30-8:34	MS	7:38-7:43	30-30	P	TEL	
T158/T159	8:20-8:30	MS	7:49-7:54	30-30	P	TEL	
T157/T158	8:19-8:30	MS	7:51-7:56	30-30	P	TEL	
T156/T157	8:20-8:29	MS	7:57-8:02	30-30	P	TEL	
T155/T156	8:20-8:28	MS	8:00-8:05	30-30	P	TEL	
T154/T155	7:53-8:01	MS	8:01-8:06	30-30	P	TEL	
T65/T153	7:25-7:33	MS	8:07-8:12	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

CHAS. H. SELLS, INC.

Consulting Engineers, Surveyors & Photogrammetrists

128 Overhill Drive, Suite 105, Mooresville, NC 28117
704.662.0100 Fax 704.662.0101

GEOMEMBRANE SEAM PRESSURE TEST LOG

TEST SPECIFICATIONS	
Test Air Press.	
Min. Time Required	
Max. Air Pressure Loss Allowed	

Date: 9/12/2006
CHS Project No.: 46003.001
Project Name: Marshall Steam Station
Project Location: Catawba County, NC
Page:

Seam Number	Seam Start - Finish	Technician Initials	Test Time Start - Finish	Pressure Initial - Final	Pass/Fail	CQA Initials	Remarks
S34/T153	7:58-8:03	MS	8:13-8:18	30-29	P	TEL	
S81/T153	8:00-8:03	MS	8:13-8:18	30-29	P	TEL	
S81/T154	8:03-8:06	MS	8:17-8:22	30-30	P	TEL	
S81/T155	8:06-8:09	MS	8:19-8:24	30-30	P	TEL	
S81/T156	8:09-8:10	MS	8:21-8:26	30-29	P	TEL	
S80/T156	8:10-8:11	MS	8:25-8:30	30-29	P	TEL	
S80/T157	8:11-8:14	MS	8:27-8:32	30-29	P	TEL	
S80/T158	8:14-8:17	MS	8:29-8:34	30-29	P	TEL	
S80/T159	8:17-8:18	MS	8:34-8:39	30-29	P	TEL	
S80/T152	8:18-8:21	MS	8:42-8:47	30-30	P	TEL	

Reference: Raw Data Provided by ESP Associates Project No. UG45.400

CQA Personnel: _____

TRI / Environmental, Inc.
A Texas Research International Company

August 31, 2006

Mail To:

Mr. Thomas D. Graham, P.E.
Chas. H. Sells, Inc.
128 Overhill Drive, Suite 105
Mooresville, NC 28117

e-mail: tgraham@chashsells.com
fax: 704-662-0101

Bill To:

<= Same (Proj# 046003.001)

Dear Mr. Graham:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Duke Power - Marshall Steam Station Gypsum Landfill**
TRI Job Reference Number:	E2265-52-06
Material(s) Tested:	15 Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
NON-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-1**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	124	119	117	121	123	Peel A: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	127	122	122	126	123	Peel B: 124
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	164	162	165	164	163	Shear: 164
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-2**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	121	129	118	145	120	Peel A: 127
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	133	118	124	128	124	Peel B: 125
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	185	184	184	183	180	Shear: 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

The testing is based upon accepted industry practice as well as the test method listed. Test results reported herein do not apply to samples other than those tested. TRI neither accepts responsibility for nor makes claim as to the final use and purpose of the material. TRI observes and maintains client confidentiality. TRI limits reproduction of this report, except in full, without prior approval of TRI.

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **LDT-3**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	137	127	150	134	148	Peel A: 139
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	117	115	120	119	117	Peel B: 118
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	181	181	182	183	181	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **LDT-4**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	118	114	116	115	115	Peel A: 116
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	124	107	115	107	116	Peel B: 114
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	177	175	176	174	176	Shear: 176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-5**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	121	116	121	118	121	Peel A: 119
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	117	114	120	123	124	Peel B: 120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	174	171	171	171	170	Shear: 171
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-6**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	139	130	130	133	136	Peel A: 134
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	127	116	122	120	117	Peel B: 120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	169	169	169	169	169	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: LDT-7						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	105	108	107	107	107	Peel A: 107
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	112	109	113	112	114	Peel B: 112
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	170	160	165	166	163	Shear: 165
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: LDT-8						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	107	103	100	125	99	Peel A: 107
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	121	124	113	118	108	Peel B: 117
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	159	159	156	161	155	Shear: 158
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-9**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	114	117	117	115	107	Peel A: 114
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	122	123	123	127	126	Peel B: 124
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	170	166	170	168	166	Shear: 168
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-10**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	118	116	118	119	117	Peel A: 118
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	118	122	119	126	119	Peel B: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	170	169	170	170	167	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-11**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	115	123	134	133	130	Peel A: 127
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	127	116	107	133	118	Peel B: 120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	164	162	165	163	163	Shear: 163
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-12**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	110	108	122	108	118	Peel A: 113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	110	117	117	119	120	Peel B: 117
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	154	158	159	161	157	Shear: 158
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-13**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	115	113	114	115	117	115
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	121	123	124	131	128	125
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	167	166	167	168	166	167
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-14**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	121	102	126	106	109	113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	117	118	120	121	125	120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	164	161	164	162	161	162
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-52-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **LDT-15**						
	Weld: **Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	108	123	109	124	110	115
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	114	120	112	123	121	118
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	170	166	169	167	165	167
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

September 6, 2006

Mail To:

Mr. Thomas D. Graham, P.E.
Chas. H. Sells, Inc.
128 Overhill Drive, Suite 105
Mooresville, NC 28117

e-mail: tgraham@chashsells.com
fax: 704-662-0101

Bill To:

<= Same (Proj# 046003.001)

Dear Mr. Graham:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Duke Power - Marshall Steam Station Gypsum Landfill**
TRI Job Reference Number:	E2265-59-01
Material(s) Tested:	40 Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
NON-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-16**	* Insufficient material for required number of shear specimens.					
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	113	106	116	102	105	108
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	121	121	116	114	118	118
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	162	159	166	162	*	162
	Shear Elongation @ Break (%)	>50	>50	>50	>50		
Sample ID:	**LDT-17**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	104	105	97	131	121	112
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	125	114	120	121	121	120
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	167	167	164	166	171	167
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-18**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	108	108	114	115	111	111
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	110	110	111	109	102	108
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	165	155	166	165	163	163
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-19**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	122	118	119	119	118	119
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	108	108	110	113	110	110
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	173	168	169	169	169	170
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-20**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	135	135	137	141	127	Peel A: 135
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	137	128	135	133	135	Peel B: 134
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	171	172	170	171	174	Shear: 172
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-21**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	119	113	113	118	117	Peel A: 116
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	144	138	140	136	131	Peel B: 138
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	168	168	168	170	173	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **LDT-22**						
	Weld: **Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	106	107	112	109	109	109
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	116	110	108	113	116	113
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	168	170	169	170	172	170
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **LDT-23**						
	Weld: **Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	135	142	141	130	135	137
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	139	138	131	135	131	135
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	176	175	176	175	177	176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-24**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	107	107	109	105	106	Peel A: 107
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	119	109	106	113	111	Peel B: 112
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	172	172	172	172	168	Shear: 171
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-25**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	111	108	111	112	111	Peel A: 111
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	106	114	118	117	113	Peel B: 114
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	163	165	163	164	164	Shear: 164
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-26**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	139	141	107	108	131	125
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	129	129	123	131	126	128
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	166	164	167	168	168	167
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-27**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	123	123	120	119	115	120
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	115	119	127	122	126	122
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	158	159	161	159	158	159
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **LDT-28**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	112	111	110	111	113	Peel A: 111
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	124	119	120	121	118	Peel B: 120
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	162	162	161	161	162	Shear: 162
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **LDT-29**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	126	130	129	135	123	Peel A: 129
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	132	109	110	123	120	Peel B: 119
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	159	160	159	160	159	Shear: 159
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-30**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	122	117	122	120	120	Peel A: 120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	112	114	125	120	116	Peel B: 117
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	166	166	167	165	167	Shear: 166
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-31**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	107	126	133	134	107	Peel A: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	118	125	125	125	135	Peel B: 126
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	170	169	170	170	168	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-32**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	115	108	109	115	111	Peel A: 112
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	112	136	134	132	128	Peel B: 128
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	171	170	171	174	170	Shear: 171
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-33**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	140	136	145	139	141	Peel A: 140
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	120	122	122	120	115	Peel B: 120
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	182	182	182	180	184	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-34**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	160	142	140	140	139	Peel A: 144
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	124	124	120	124	130	Peel B: 124
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	183	181	183	179	178	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-35**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	114	115	116	116	117	Peel A: 116
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	130	128	128	132	144	Peel B: 132
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	183	182	183	185	182	Shear: 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **LDT-36**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	111	105	105	114	100	Peel A: 107
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	123	112	114	119	118	Peel B: 117
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	183	182	184	180	183	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **LDT-37**						
	Weld: **Heat Fusion**						
Side A	Peel Strength (ppi)	112	109	111	111	112	Peel A: 111
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	110	112	115	114	114	Peel B: 113
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	176	174	176	174	178	Shear: 176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: LDT-38						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	116	114	119	117	120	Peel A: 117
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	120	123	118	120	119	Peel B: 120
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	165	165	166	165	168	Shear: 166
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: LDT-39						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	110	109	111	109	108	Peel A: 109
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	114	119	111	115	112	Peel B: 114
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	172	172	174	172	173	Shear: 173
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-40**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	111	114	114	118	116	115
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	108	109	111	111	108	109
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	156	155	155	155	158	156
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-41**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	106	106	105	105	103	105
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	114	113	108	106	108	110
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	159	159	160	162	161	160
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-42**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	145	145	150	154	147	Peel A: 148
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	136	129	132	128	132	Peel B: 131
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	179	179	179	178	180	Shear: 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-43**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	104	94	104	103	112	Peel A: 103
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	122	114	116	114	117	Peel B: 117
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	167	167	167	167	169	Shear: 167
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-44**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	132	109	104	118	102	Peel A: 113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	119	103	104	119	119	Peel B: 113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	155	154	154	154	157	Shear: 155
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-45**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	131	111	105	124	108	Peel A: 116
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	114	108	121	118	120	Peel B: 116
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	169	168	169	168	165	Shear: 168
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-46**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	110	111	116	116	114	Peel A: 113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	107	110	106	110	107	Peel B: 108
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	164	164	162	163	166	Shear: 164
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-47**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	112	109	121	114	117	Peel A: 115
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	109	109	118	113	117	Peel B: 113
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	166	161	161	162	161	Shear: 162
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Material: HDPE

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TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-48**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	102	102	105	101	100	102
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	112	110	112	116	115	113
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	156	155	156	156	156	156
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-49**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	137	128	129	129	131	131
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	111	117	117	118	118	116
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	191	185	186	186	184	186
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI Log #: E2265-59-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-50**						
Weld:	**Heat Fusion**						
Side A							Peel A
Peel Strength (ppi)		146	131	149	130	141	139
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
Side B							Peel B
Peel Strength (ppi)		120	118	122	122	122	121
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
							Shear
Shear Strength (ppi)		188	183	184	185	182	184
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	
Sample ID:	**LDT-51**						
Weld:	**Heat Fusion**						
Side A							Peel A
Peel Strength (ppi)		120	130	121	125	120	123
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
Side B							Peel B
Peel Strength (ppi)		119	119	101	116	113	114
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
							Shear
Shear Strength (ppi)		170	172	169	176	168	171
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	

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TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-52**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	109	120	113	131	140	Peel A: 123
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	138	134	140	129	133	Peel B: 135
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	155	151	157	157	157	Shear: 155
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-53**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	95	92	131	94	94	Peel A: 101
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	102	104	107	104	104	Peel B: 104
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	154	154	155	155	156	Shear: 155
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-59-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: LDT-54						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	99	96	101	98	102	Peel A: 99
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	135	135	135	141	135	Peel B: 136
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	158	159	160	160	163	Shear: 160
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: LDT-55						
	Weld: Heat Fusion						
Side A	Peel Strength (ppi)	150	153	159	154	154	Peel A: 154
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	158	144	146	147	140	Peel B: 147
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	174	175	174	174	175	Shear: 174
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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September 12, 2006

Mail To:

Mr. Thomas D. Graham, P.E.
Chas. H. Sells, Inc.
128 Overhill Drive, Suite 105
Mooresville, NC 28117

e-mail: tgraham@chashsells.com
fax: 704-662-0101

Bill To:

<= Same (Proj# 046003.001)

Dear Mr. Graham:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Duke Power - Marshall Steam Station Gypsum Landfill**
TRI Job Reference Number:	E2265-66-10
Material(s) Tested:	18 Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
NON-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-56**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	116	127	126	128	121	Peel A: 124
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	113	118	123	118	121	Peel B: 119
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	173	175	178	173	175	Shear: 175
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-57**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	138	124	137	141	138	Peel A: 136
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	91	120	119	114	109	Peel B: 111
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	177	176	177	179	178	Shear: 177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-58**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	134	135	125	128	151	Peel A: 135
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	115	111	120	128	119	Peel B: 119
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	177	173	176	178	177	Shear: 176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-59**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	123	122	128	122	128	Peel A: 125
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	122	127	121	125	129	Peel B: 125
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	176	173	175	177	175	Shear: 175
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-60**						
Weld:	**Heat Fusion**						
Side A							Peel A
Peel Strength (ppi)		128	125	144	136	130	133
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
Side B							Peel B
Peel Strength (ppi)		145	98	111	140	144	128
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
							Shear
Shear Strength (ppi)		174	173	174	176	176	175
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	
Sample ID:	**LDT-61**						
Weld:	**Heat Fusion**						
Side A							Peel A
Peel Strength (ppi)		123	128	138	135	134	132
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
Side B							Peel B
Peel Strength (ppi)		115	114	103	108	107	109
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SE	SE	SE	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
							Shear
Shear Strength (ppi)		159	155	157	157	159	157
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-62**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	113	116	126	114	113	116
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	106	102	104	103	113	106
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	152	150	150	152	151	151
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-63**						
Weld:	**Heat Fusion**						
							Peel A
Side A	Peel Strength (ppi)	143	142	138	147	144	143
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Peel B
Side B	Peel Strength (ppi)	139	134	138	136	138	137
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
							Shear
	Shear Strength (ppi)	165	159	163	163	162	162
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-64**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	144	140	142	139	139	Peel A: 141
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	143	134	138	130	134	Peel B: 136
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	152	150	151	151	155	Shear: 152
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-65**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	124	120	124	122	122	Peel A: 122
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	116	116	117	115	116	Peel B: 116
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	171	170	169	167	168	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

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Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-66**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	122	149	120	149	153	Peel A: 139
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	126	118	122	125	125	Peel B: 123
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	177	176	175	176	175	Shear: 176
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-67**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	120	122	109	124	118	Peel A: 119
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	120	120	117	100	122	Peel B: 116
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	148	148	149	149	151	Shear: 149
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-68**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	104	101	108	109	104	Peel A: 105
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	111	110	117	135	116	Peel B: 118
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	165	163	164	166	163	Shear: 164
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-69**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	125	129	135	122	121	Peel A: 126
Side A	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side A	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	105	118	130	116	106	Peel B: 115
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	161	160	160	164	161	Shear: 161
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

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Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-70**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	140	135	110	112	110	Peel A: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	120	121	122	118	123	Peel B: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	162	159	160	166	162	Shear: 162
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-71**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	112	111	107	127	133	Peel A: 118
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	103	102	102	101	99	Peel B: 101
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	155	152	157	155	158	Shear: 155
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-66-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-72**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	127	128	128	125	130	Peel A: 128
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	117	109	112	111	109	Peel B: 112
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	151	151	151	151	151	Shear: 151
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-73**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	111	115	121	127	132	Peel A: 121
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	134	134	137	126	136	Peel B: 133
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	140	144	142	142	140	Shear: 142
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

September 13, 2006

Mail To:

Mr. Thomas D. Graham, P.E.
Chas. H. Sells, Inc.
128 Overhill Drive, Suite 105
Mooresville, NC 28117

e-mail: tgraham@chashsells.com
fax: 704-662-0101

Bill To:

<= Same (Proj# 046003.001)

Dear Mr. Graham:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

Project:	**Duke Power - Marshall Steam Station Gypsum Landfill**
TRI Job Reference Number:	E2265-69-02
Material(s) Tested:	3 Heat Fusion Weld Seam(s)
Test(s) Requested:	SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

Codes	
AD	Adhesion failure (100% Peel)
BRK	Break in sheeting away from Seam edge
SE	Break in sheeting at edge of seam
AD-BRK	Break in sheeting after some adhesion failure - partial peel
SIP	Separation in the plane of the sheet (leaving the bond intact)
FTB	Film tearing bond (all non "AD" failures)
NON-FTB	100% peel

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Melissa Hunter

Melissa Hunter
Project Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-69-02

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-74**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	148	124	124	124	130	Peel A: 130
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	146	122	144	133	141	Peel B: 137
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	178	177	178	179	178	Shear: 178
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**LDT-75**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	117	120	119	112	114	Peel A: 116
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	136	119	120	121	120	Peel B: 123
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	184	180	182	183	183	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: Chas. H. Sells, Inc.

Project: Duke Power - Marshall Steam Station Gypsum Landfill

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2265-69-02

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**LDT-76**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	148	150	149	146	147	Peel A: 148
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	147	154	140	150	138	Peel B: 146
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SE	SE	SE	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	185	180	185	184	183	Shear: 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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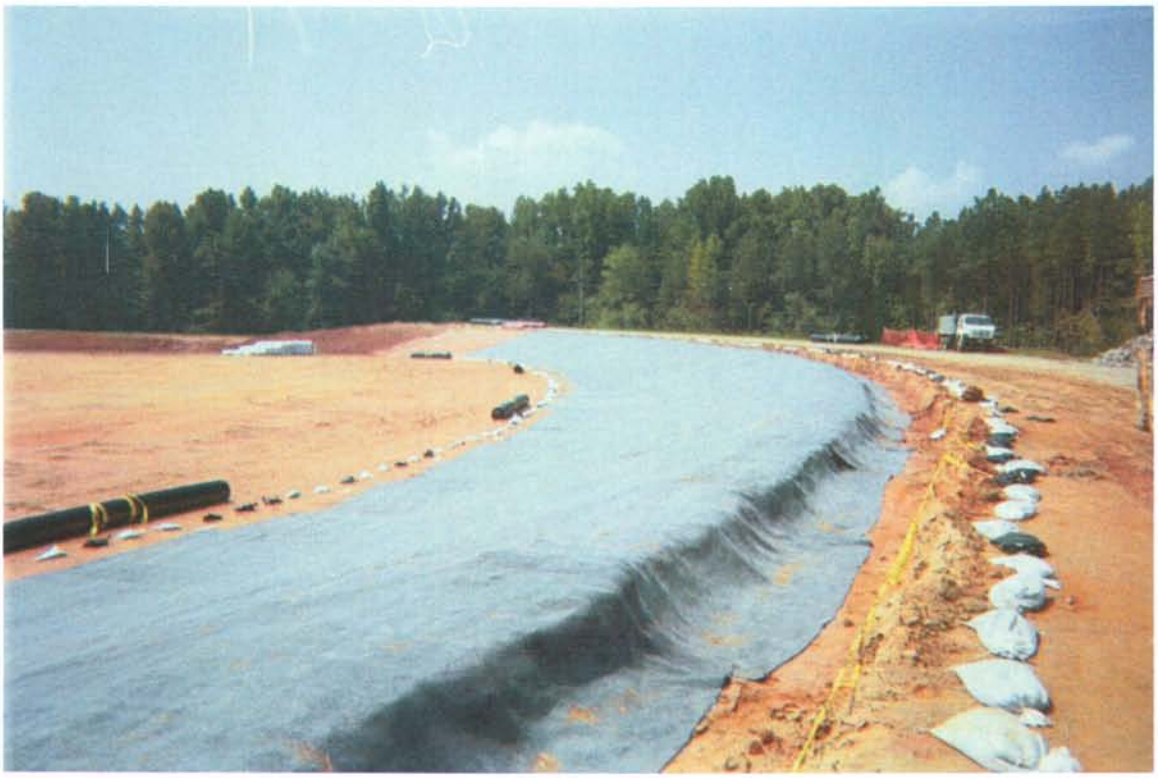
GCL placement along eastern slope

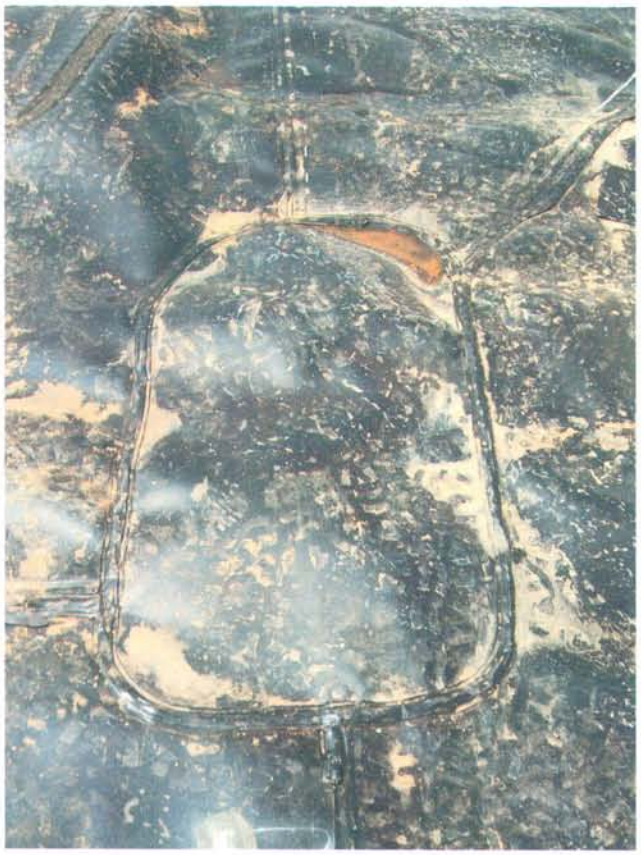


GCL placement along eastern slope and anchor trench

GCL placement on eastern floor at toe of slope

GCL placement along Southwest corner of stormwater detention basin

GCL placement along Southwest slope



Repair near south toe of slope

Repair near south toe of slope

Repair near center of cell approximately 200' Northwest of stormwater basin

Repair of LDT #45

Seams in Geotextile along floor of cell

Seaming process

Seam in geotextile at toe of slope

Seaming process

Geomembrane on floor from north slope

Geomembrane on floor from north slope, GCL placement on south slope

Geomembrane along north and eastern slopes

Geomembrane along eastern slope and anchor trench

Geomembrane placement on floor