Environmental Consultants

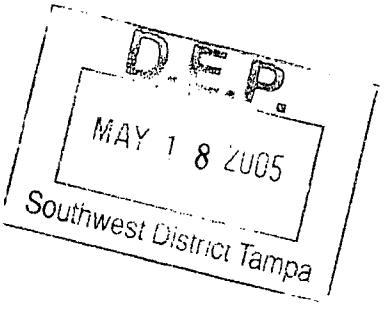
3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619-2242

813 621-0080
FAX 813 623-6757

SCS ENGINEERS

May 18, 2005
File No. 09199056.02

Mr. Steve Morgan
Solid Waste Permitting
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619



Subject: Citrus County Central Landfill
Phase 2 Expansion
Permit No.21375-004-SC

Dear Mr. Morgan

On behalf of Citrus County, SCS Engineers (SCS) is submitting the enclosed Certification of Construction Completion and Liner Construction CQA Report for the above referenced project. A site visit is requested for the June 22, 2005.

Please contact us if you have any questions or comments regarding this submittal.

Very truly yours,

5/19/05

John A. Banks, P.E.
Project Manager
SCS ENGINEERS

Raymond J. Dever, P.E., DEE
Vice President
SCS ENGINEERS

cc: Susan J. Metcalfe, P.G., Citrus County

Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62-701.900(2)
Form Title Certification of Construction Completion
Effective Date May 19, 1994

DEP Application No. _____
(Filled by DEP)

Certification of Construction Completion of a Solid Waste Management Facility

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

DEP Construction Permit No: 21375-004-SC County: Citrus

Name of Project: Phase 2 Expansion

Name of Owner: Citrus County Board of County Commissioners

Name of Engineer: SCS Engineers

Type of Project:

Class I Landfill Lateral Expansion

Cost: Estimate $ 5,000,000 Actual $ 4,000,000

Site Design: Quantity: 350 ton/day Site Acreage: 80 Acres

Deviations from Plans and Application Approved by DEP:

1) Carbon Black Dispersion requirement for geomembrane was revised to match current industry standards.

2) 8-inch collection pipe changed from SDR 15.5 to 11 due to availability.

3) 24-inch riser pipe changed from SDR 15.5 to 17 due to availability.

Address and Telephone No. of Site: 230 West Gulf Lake Highway, Lecanto, FL 34461

Name(s) of Site Supervisor: Ms. Susan Metcalfe, P.G.

Date Site inspection is requested: June 22, 2004

This is to certify that, with the exception of any deviation noted above, the construction of the project has been completed in substantial accordance with the plans authorized by Construction

Permit No. 21375-004-SC :Dated: March 19, 2003

Date: 7/5/05

Signature of Professional Engineer

NO. 39397 STATE OF FLORIDA PROFESSIONAL ENGINEER

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

DEP
MAY 18 2005
Southwest District Tampa

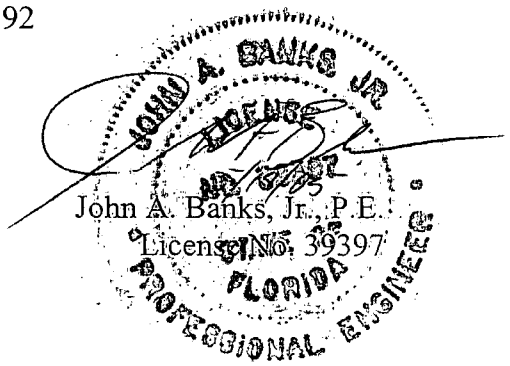
Certification of
Construction Completion Report
Citrus County Landfill
Phase 2 Expansion

Prepared for:

Citrus County Solid Waste Management Division
P.O. Box 340
Lecanto, Florida 34460

Prepared by:

SCS Engineers
3012 U.S. Highway 301 North
Suite 700
Tampa, Florida 33619
(813) 621-0080
Certificate of Authorization No. 00004892



John A. Banks, Jr., P.E.
License No. 39397

May 18, 2005
File No. 09199056.02

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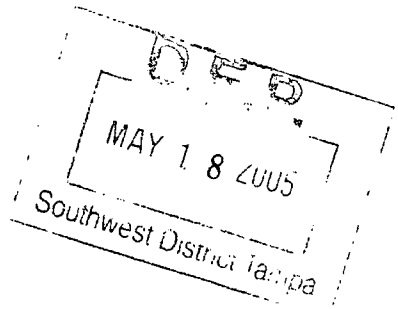

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C Daily Construction Quality Assurance Field Reports
D Record Drawings
E Manufacturer Geosynthetic Quality Control Test Reports
F Geosynthetic Conformance Test Reports
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SECTION 1

INTRODUCTION

On behalf of the Citrus County Solid Waste Management Division (County), SCS Engineers (SCS) has prepared this Certification of Construction Completion Report for the construction of Phase 2 Expansion at the Citrus County Landfill, located in Citrus County, Florida.

1.1 CONSTRUCTION PERMIT

The Florida Department of Environmental Protection (FDEP) in Tampa, Florida issued Construction Permit No. 21375-004-SC dated March 19, 2003 authorizing the County to construct the Phase 2 Landfill Capacity Expansion at the Citrus County Landfill. The liner construction included the installation and compaction of a 6-inch thick subbase on the floor of the cell, with a maximum hydraulic conductivity of $1x10^{-5}$ cm/sec, the installation of a primary and secondary 60-mil textured geomembranes with a geocomposite above each liner, a geogrid on the sideslopes, a leachate collection system, and a 2 ft. sand protective layer for the floor of the cell.

As of the submittal date of this construction completion certification several contractual construction issues remain incomplete; however, these items do not affect the regulated aspects of the project and are related to redundant or backup systems. We expect these issues to be resolved by the time of the site inspection.

1.2 PROJECT PERSONNEL

Responsible partners in the project were:

Owner
Citrus County Solid Waste Management Division (County)

Engineering Consultant
SCS Engineers (SCS) - Engineering, Construction Quality Assurance (CQA)

Contractors
Advance Construction Services, Inc. (Advance) - General Contractor

Subcontractors
Comanco Environmental Corporation (Comanco) - Liner Installer
Central Florida Surveying & Mapping (Central) - Survey

Soil Testing
Professional Service Industries, Inc. (PSI) - Quality Control testing

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Geomembrane Quality Assurance
SCS Engineers - CQA
TRI Environmental, Inc. (TRI) - Quality Assurance Testing of Geosynthetic Materials

The County and SCS had personnel located on site at the Citrus County Landfill for the project duration. Table 1-1 lists key project personnel, including those persons on site during the project for daily construction activities.

TABLE 1-1. RESPONSIBLE PEOPLE ASSIGNED TO THE PROJECT

Name	Representing	Title
Susan J. Metcalfe, P.G.	Citrus County	Director
Ray Dever, P.E.	SCS Engineers	Project Director
John Banks, P.E.	SCS Engineers	Project Manager, Engineer of Record
Dennis DuPont	SCS Engineers	Resident Engineer
Kurt Peterson Sreeram Jonnalagadda	SCS Engineers	Quality Assurance Inspectors

1.3 CONSTRUCTION CHANGES

Field Orders No. 6 and 8 address some changes made during construction at the request of the County.

These changes did not significantly impact the original permitted concept or design as they pertained to details regarding the electrical connections and materials of construction for electrical equipment supports and to ditch crossings.

The County received a permit modification on October 26, 2004 for the use of Geosynthetic Clay Liner (GCL).

GCL was not used on this project.

02220-2.02.B
See 02212-3.01.B
02776-3.03.A

1.4 PREPARATION OF PHASE 2 CELL

Prior to installation of the clay subbase, the Phase 2 cell subgrade was prepared by excavating, backfilling, and compacting to the grade as shown on the drawings. The surface of the prepared subgrade was free of sticks, greater than ¼ inch in diameter, roots, organic mater, and stones larger than ½ -inch in any dimension. Suitable subgrade soil material included poorly-graded sand (SP), silty-clayey sand (SM-SC), or clayey sand (SC) as classified by the Unified Soil Classification System. Suitable soil materials were not excessively wet or dry and were generally within three percent of the optimum moisture content range to achieve a 95 percent minimum compaction as determined by the Standard Proctor. The specifications required a

minimum of two in-place density tests per acre per lift. The results are included in the geotechnical report presented in Attachment A.

1.5 INSTALLATION OF CLAY LINER SUBBASE

02212-201.C
02776-3.03.A

Prior to installation of the 60-mil HDPE liner system, the Phase 2 clay subbase was constructed on the floor of the cell. Material for the clay subbase was obtained from a borrow source off site. The subbase was installed in six-inch lifts and compacted to the grades as shown on the drawings. The surface of the installed subbase was free of sticks greater than ¼ inch in diameter, roots, organic mater, and stones larger than ¼-inch in any dimension. Suitable subbase soil material included clayey sand (SC), fat clay (CH), or lean clay (CL) as classified by the Unified Soil Classification System. Suitable soil materials were not excessively wet or dry and were within three percent of the optimum moisture content range of 95 percent of maximum dry density as determined by the Standard Proctor test. The maximum hydraulic conductivity for the constructed subbase of $1x10^{-5}$ cm/sec was achieved as demonstrated in Attachment A. The specifications required a minimum of four in-place density tests per acre per lift.

1.6 DOCUMENTATION

The test reports are included in the geotechnical report presented in Attachment A.

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
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SOUTHWEST DISTRICT
TAMPA

SECTION 2

GEOSYNTHETIC INSTALLATION

SCS Engineers' Construction Quality Assurance (CQA) Representative was on site full-time to observe construction activities during the geomembrane liner system installation, in accordance with Florida Department of Environmental Protection (FDEP) rules. This section compiles the daily activities related to construction of the geomembrane liner system of the Citrus County, Landfill Capacity Expansion – Phase 2 (Phase 2).

2.1 REQUIREMENTS AND SPECIFICATIONS

As shown on the construction drawings, the double geomembrane liner system was comprised of (from the bottom up): a secondary 60-mil textured high density polyethylene (HDPE) liner, a secondary geocomposite (geonet with two geotextiles) serving as a leak detection layer; a primary 60-mil textured HDPE liner, and primary geocomposite (geonet with two geotextiles). The geomembrane manufacturer was GSE and the geocomposite manufacturer was Tenax. The geomembrane and geocomposite installer was Comanco Environmental Corporation (Comanco).

2.2 INSTALLATION SUMMARY

Comanco mobilized on December 6, 2004 and began installation of the liner system. The geomembrane liner system installation was completed on February 22, 2005. Geomembrane panels were deployed and numbered sequentially as placed, beginning at the corner of the southeast slope. The progression of the work is shown on the as-built panel layout drawing, which is included as Attachment B.

The CQA Representative observed and documented weather, construction and installation techniques, nondestructive geomembrane testing, and geomembrane repairs. Materials conformance testing was conducted to verify compliance with project specifications. The CQA Representative recorded construction activities in daily field reports, and observed and documented the following:

- Sub-base Acceptance
- Trial Welds
- Geomembrane Placement
- Geomembrane Seaming
- Geomembrane Non-Destructive Seam Testing
- Geomembrane Repairs

In addition, the CQA Representative chose locations for geomembrane seam destructive testing, then prepared and sent destructive seam samples to an independent laboratory (TRI) for testing.

2.2.1 Daily Field Reports

Daily field reports were prepared for each day the CQA Representatives were on site. Daily field reports, which include activities for the geomembrane system, are included as Attachment C.

2.2.2 On Site Personnel

The following SCS personnel performed the CQA duties:

- Kurt Peterson
- Sreeram Jonnalagadda

Comanco installers included the following personnel:

- Pablo Rivera, Project Manager
- Thomas Herrmann, Project Superintendent
- Eleazar Garza, Jr., Project Superintendent
- Jorge Carbajal Ruiz, Quality Control
- Basillio Bonilla, Foreman
- Librado Marcado, Master Seamer
- Braulio Ramirez, Master Seamer
- Roberto Zabeleta, Master Seamer
- Francisco Delgado, Geomembrane Welder
- Carlos Vanega, Geomembrane Welder

2.2.3 Record Drawings

Record drawings from Comanco and Advance, are included in Attachment B and D, respectively. The drawings depict the approximate installed location of each geomembrane panel, the location of destructive tests and as-built conditions.

2.3 GEOCOMPOSITE TESTING

2.3.1 Manufacturer Quality Control

The plans call for a geocomposite, which is a three-layer material comprised of an inner core of tri-planar high density polyethylene (HDPE) geonet between an upper and lower layer of geotextile. The textile is thermally fused to the geonet. Tenax, the geocomposite manufacturer performed testing on the material to verify compliance with the contract specifications prior to approval by SCS. Tenax performed manufacturer's quality control (MQC) tests on the geocomposite prior to delivery. The MQC tests were conducted in accordance with the manufacturer's quality control program. One test per every 100,000 square feet of geocomposite produced was performed. The quality control certificates, which contain the

recorded results for each roll of geocomposite tests, are included in Attachment E. In addition, the results of MQC tests for the resin are included in Attachment E.

Table 2-1 presents the results of the MQC testing compared with the project specifications. The tests indicate that the geocomposite and components met or exceeded the project specifications. The U.V. Resistance test was not provided because the manufacturer cited ASTM G154 which allows them to certify that the material meets the requirement. The manufacturer, Tenax submitted said certification and supporting documentation which is included in Attachment E.

TABLE 2-1. COMPARISON OF GEOCOMPOSITE PROPERTIES

Parameter	Specification	Range of MQC Test Results[1]
Geonet		
Polymer Density, Resin, (g/cm^3)	0.930 ✓	0.948
Polymer Density, Resin Plus Carbon Black, (g/cm^3)	0.940 ✓	0.945 – 0.952
Polymer Melt Index, (g/10 minutes)	1.0 max ✓	0.040 – 0.07
Carbon Black, (%)	2-3 range ✓	2.11 – 2.76
Nominal Thickness, (inches)	0.275 min ✓	0.301 – 0.345
Mass per Unit Area, (lbs/1000 ft^2)	270 min ✓	Not Tested
Tensile Strength, (ppi)	100 min ✓	102 – 189
Geotextile		
Fabric Weight, (oz/yd^2)	6.0 min ✓	6.0 – 7.7
Thickness, (Mils)	55 min ✓	71 – 94
Grab Strength, (lbs) MD	150 ✓	230.9 – 334.1
CD		214.0 – 280.7
Grab Elongation, (%) MD	50 ✓	115.1 – 160.8
CD		55.9 – 83.3
Trapezoid Tear Strength, (lbs) MD	65 ✓	79.0 – 120.9
CD		74.0 – 108.7
Puncture Resistance, (lbs)	90 min ✓	96.5 – 136.4
UV Resistance @ 500 hrs, (%)	90	Certified[3]
Water Flow Rate, (gpm/ ft^2)	110 ✓	110.7 – 140.9
AOS, sieve	#70 max (0.210) ✓	0.080 – 0.157
Geocomposite		
Peel Strength, (lbs/in)	1.0 average ✓	1.40 – 3.79[2]
Hydraulic Transmissivity, (m^2/sec)	1.8×10^{-3} min ✓	$1.80 \times 10^{-3} – 2.69 \times 10^{-3}$
Tensile Strength (MD), (lb/ft)	2380 average ✓	2471 – 2841
Geocomposite Friction Angle with:		
Geogrid supplied, (Degrees)	12.0° min ✓	12°
Textured HDPE Geomembrane supplied	16.5° min	24°

Notes:

1. Range of values.
2. Range of averages.
3. See explanation in text.

2.3.2 Conformance Testing

The geocomposite was visually examined by the CQA Representative as it was placed. Roll numbers were verified as conforming to rolls tested by Tenax under Manufacturer's Quality Control. The results of the conformance testing for the geocomposite are presented in Tables 2-2, 2-3, and 2-4 and laboratory results are included in Attachment F. The conformance tests were conducted by TRI Environmental, Inc. on material used in this project. The test results further verify that the geocomposite met the project specifications.

TABLE 2-2. COMPARISON OF GEONET PROPERTIES IN CONFORMANCE TESTING

Parameter	Specification	Range of Test Results[1]	Average of Test Results
Polymer Density, (g/cm^3)	0.940	0.946 – 0.955	0.952
Carbon Black, (%)	2-3 range	2.42 – 2.72	2.65
Thickness, (inches)	0.275 min	0.301-0.335	0.321
Mass per Unit Area, ($lbs/1000\ ft^2$)	270 min	339-374	350
Tensile Strength, (ppi)[2]	100 min	106-189	142

Notes:
1. Range of values.
2. Results form JLT Laboratories

TABLE 2-3. COMPARISON OF GEOTEXTILE PROPERTIES IN CONFORMANCE TESTING

Parameter	Specification	Range of Test Results[1]	Average of Test Results
Fabric Weight, (oz/yd^2)	6.0 min	6:06-8.03	6.93
Puncture Resistance, (lbs)	90 min	97-128	110
AOS, (sieve)	#70	80 – 120	100
Water Flow Rate (gpm/ft^2)	110 min	111-145	127

Notes:
1. Range of values (for top and bottom geotextile).

TABLE 2-4. COMPARISON OF DOUBLE SIDED GEOCOMPOSITE PROPERTIES IN CONFORMANCE TESTING

Parameter	Specification	Range of Test Results[1]	Average of Test Results
Peel Strength, (ppi)	1.0 average	1.1-3.1	1.8
Hydraulic Transmissivity, (m^2/sec)	1.8×10^{-3} min	$1.8 \times 10^{-3} - 2.5 \times 10^{-3}$	2.1×10^{-3}

Notes:

1. Range of averages.

2.4 SUBBASE ACCEPTANCE

Prior to deploying the geomembrane, the SCS CQA Representative, and Comanco visually inspected the subbase to be sure it was smooth and free of rocks, sharp stones, sticks, roots, sharp objects, and debris. A Subbase Surface Acceptance form signed by the SCS CQA Representative and Comanco Site Manager described the area on which geomembrane was to be deployed. Subbase Acceptance forms are included in Attachment G.

2.5 GEOMEMBRANE TESTING

2.5.1 Manufacturer Quality Control

GSE performed testing on the textured geomembrane material to verify compliance with the contract specifications prior to approval by SCS. GSE performed manufacturer's quality control (MQC) tests on the geomembrane prior to delivery. The MQC tests were conducted in accordance with the manufacturer's quality control program. One test per every 50,000 square feet of geomembrane produced was performed. The quality control certificates, which contain the results for geomembrane tests, are included in Attachment E. In addition, the results of MQC tests for geomembrane resins and welding rod are included in Attachment E.

Table 2-5 presents the results of the MQC testing compared with the project specifications of the materials. The tests indicate that the geomembrane met or exceeded the project specifications. The Carbon Black Dispersion requirement was changed from the original specification to match the current GRI GM13 specification. See correspondence included in Appendix E.

TABLE 2-5. COMPARISON OF TEXTURED GEOMEMBRANE PROPERTIES

Table 02776-1

Parameter	Specification	Range of MQC Test Results[1]
Thickness, (mils) avg.	60	60 – 61[2]
Tensile Yield Strength, (ppi) TD	126	159 – 173
MD	126	156 – 166
Tensile Break Strength, (ppi) TD	90	165 – 202
MD	90	176 – 228
Tensile Yield Elongation, (%) TD	12	15 – 16
MD	12	16 – 19
Tensile Break Elongation, (%) TD	100	471 – 592
MD	100	525 – 633
Tear Resistance, (lb.) min. avg. TD	42	55 – 61
MD	42	57 – 63
Puncture Resistance, (lb.) min. avg.	90	155 – 162
Density, (g/cm^3) min. avg.	0.940 ✓	0.942 – 0.946
Carbon Black Content, (%)	2.0 – 3.0	2.4 – 2.6
Carbon Black Dispersion, (views in Cat1 – Cat 2)[5]	9	9 – 10
Asperity Height, (mil) min. avg.	10	17 – 30

Notes:

1. Range of values unless specified.
2. Range of averages.
3. MD - Machine Direction.
4. TD - Transverse Direction.
5. Requirement revised to meet current GRI GM13 specification.

2.5.2 Conformance Testing

The geomembrane was visually examined by the SCS CQA Representative as it was placed. Roll numbers were verified as conforming to rolls tested by GSE under Manufacturer's Quality Control. The results of the conformance testing for the geomembrane are presented in Table 2-6 and laboratory results are included in Attachment F. The conformance tests were conducted by TRI Environmental, Inc. on material used in this project. The test results further verify that the geomembrane met the project specifications. Carbon Black Dispersion was tested based on standard GSE specification.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

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SOUTHWEST DISTRICT TAMPA

TABLE 2-6. COMPARISON OF TEXTURED GEOMEMBRANE PROPERTIES IN CONFORMANCE TESTING

Table 02776-1

Parameter	Specification	Range of Test Results[1]
Thickness, mils (min average)	60	68 – 70
Density, (g/cm^3) (min average)	0.940 ✓	0.945 – 0.946
Carbon Black Content, (%)	2.0 – 3.0	2:47 – 2.55
Carbon Black Dispersion, (rating)	All views in CAT 1 or 2	A1[4]
Tensile Yield Strength, (ppi) TD	126	165 – 188
MD	126	168 – 181
Tensile Break Strength, (ppi) TD	90	179 – 219
MD	90	219 – 251
Tensile Yield Elongation, (%) TD	12	14 – 16
MD	12	18 – 20
Tensile Break Elongation, (%) TD	100	473 – 615
MD	100	539 – 624

Notes:

1. Range of averages.
2. MD - Machine direction.
3. TD - Transverse direction.
4. Represents all views in Category 1

2.6 GEOGRID TESTING

2.6.1 Manufacturer Quality Control

Tensar supplied Product Specifications for the geogrid material to verify compliance with the contract specifications prior to approval by SCS.

Table 2-7 presents the results of the MQC testing compared with the project specifications of the materials. The tests indicate that the geogrid met or exceeded the project specifications. Results are provided in Attachment E.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
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TABLE 2-7. COMPARISON OF GEOGRID PROPERTIES

Parameter	Specification	Range of MQC Test Results
Open Area (% nom)	70	Not provided[3]
Flexural Rigidity (mg-cm min)	9,000	9,075
Ultimate Strength MD (lb/ft)	11,900	11,566-13,559
Strength @ 5% strain (lb/ft)	5,100	5,525-6,861
Tensile Modulus – MD (lb/in min)	161,000	161,343-178,615
Junctions – MD – strength (lb/ft min)	10,970	10,970
Polypropylene (% min)	98	N/A
Carbon Black (% min)	0.5	2.5 – 3.0

Notes:

1. D - Machine Direction.
2. Polyethylene was used in the manufacture of TENSAR geogrid.
3. Not a standard MQC test, see correspondence provided.

2.6.2 Conformance Testing

The geogrid was visually examined by the SCS CQA Representative as it was placed. Roll numbers were verified as conforming to rolls supplied by Tensar under Manufacturer's Quality Control. The results of the conformance testing for the geogrid are presented in Table 2-8 and laboratory results are included in Attachment F. The conformance tests were conducted by TRI Environmental, Inc. on material representative of the geogrid used in this project. The test results further verify that the geogrid met the project specifications.

TABLE 2-8. COMPARISON OF GEOGRID PROPERTIES IN CONFORMANCE TESTING

Parameter	Specification	Range of Test Results[1]
Open Area (% nom)	70	59.4 – 60.8
Flexural Rigidity (mg-cm min)	9,000	10,277,934 – 18,731,111
Ultimate Strength MD (lb/ft)	11,900	12,298 – 12,676
Strength @ 5% strain (lb/ft)	5,100	6,637 – 7003
Tensile Modulus – MD (lb/in min)	161,000	181,456 – 185,601
Junctions – MD – strength (lb/in min)	10,970	12,656 – 13,175
Polypropylene (% min)	98	N/A
Carbon Black (% min)	0.5	2.53 – 2.69

Notes:

1. Range of averages.
2. MD - Machine direction.
3. Polyethylene was used in the manufacture of TENSAR geogrid.

2.7 GEOSYNTHETIC LINER CONSTRUCTION

2.7.1 Panel Placement

Geomembrane panels were placed one at a time and temporarily secured along the edges with sandbags to prevent uplift by the wind. Adjacent panels were deployed and adjusted prior to seaming. Upon deployment, individual panels were assigned sequential panel numbers. Panel numbers, with the corresponding manufacturer's geomembrane roll number, were marked on the panels. These numbers were recorded by the CQA Representative and Comanco's Quality Control Technician. SCS' Geomembrane Placement Logs are included in Attachment H. Also recorded on the placement logs are length, width, thickness, and orientation of the panels along with the date the panels were deployed. A space for comments about the panels may include a weather description, a shape description of a panel that is not rectangular, or a more detailed description of location.

2.7.2 Geomembrane Seaming

The primary technique for geomembrane seaming, as required by the specifications, was double wedge fusion welding. Extrusion welding was used for repairs. Geomembrane seaming logs are included in Attachment I. Each seaming crew was required to produce trial welds with each machine before beginning seaming work with that machine, once in the morning and then again after the lunch break if welding was to take place in the afternoon. The weld was completed on a segment of surplus geomembrane, approximately 10 feet long for fusion welders. The seamers adjusted equipment temperatures to compensate for varying weather and seaming conditions. Double wedge welding machines were generally set to perform at speed settings of 2.7 to 4.4 and a temperature setting of 760 to 775 degrees Fahrenheit. Extrusion welders were generally set to temperature settings of 450 to 550 degrees Fahrenheit. The trial welds were tested for compliance with the project specifications at the site using Comanco's field tensiometer. Ten one-inch wide specimens were cut from each welded seam. The trial wedge-welded seams were required to meet or exceed the requirements of 88 pounds per inch (ppi) for peel strength and 120 ppi for shear strength with a Film Tear Bond (FTB) before welding on the deployed panels. The trial extrusion-extrusion welded seams were also required to meet 78 ppi for peel strength and 120 ppi for shear strength also with a FTB. Each of the specimens tested in peel and in shear exceeded the specification requirements as shown in the Trial Weld Logs included in Attachment J.

2.7.3 Non-Destructive Seam Tests

? See GRI GM19

A non-destructive test was conducted on the entire length of each seam. The fusion welder used on this project formed an air channel between the two welds, which was tested for integrity by pressurizing. To begin the test, each end of the air channel was sealed. A dial gauge was inserted at one end and the air channel was pressurized to a minimum of 25 to 30 pounds per square inch (psi) with an air pump. Once the pressure in the air channel stabilized, the time was noted. The pressure could not drop by more than 2 psi in 5 minutes for the seam to pass. At the end of the five minutes, the air channel at the opposite end of the dial gauge on the seam was lanced. A smooth steady drop in pressure as noted on the gauge, indicated that

the entire air channel in the seam had been tested. Non-destructive test logs were completed by the CQA Representative. The logs include seam number, an identification of the installer's technician performing the test, the pressure at the beginning and the end of the test, time and duration and pass/fail designation. Other comments on the logs may include a more detailed description of the seam. SCS non-destructive test logs are included in Attachment K.

2.7.4 Seam and Panel Repair

The geomembrane was repaired by patching. Patches were cut with rounded corners from excess geomembrane and were large enough to cover 6 inches beyond the edges of the damage. The patches were temporarily fastened in place using a hot air gun. The edge of the patch was then textured using a grinding machine. When the patch edge was cleaned of grinding debris, a weld was formed with an extrusion welder to secure the patch to the panel. The extruded weld was tested for leaks using a vacuum box assembly and a soapy solution.

Repairs were observed and documented by the CQA Representative on the Geomembrane Repair Log. Included on the repair log was the repair date, repair number, size, location, type of repair, and identification of the technicians who performed and tested the repair, along with additional comments. Geomembrane Repair Logs are presented in Attachment L.

2.7.5 Destructive Tests

As required in the specifications, a destructive test was performed for each 500 linear feet of geomembrane seam completed. A total of 62 destructive samples were tested on the secondary and primary liners. There were three failed samples for the secondary liner and no failed samples for the primary liner. Procedures for destructive test failure were followed. All other, including the additional samples, met or exceeded the specifications.

Destructive sample locations were chosen and marked by the CQA Representative. The samples were cut by a Comanco Quality Control Technician. Locations of each Destructive Sample are shown on the Comanco as-built panel layout drawing (Attachment B). Geomembrane material was removed for three sets of destructive sample specimens. One set was tested by Comanco and one set was archived. The third set was sent to TRI/Environmental, Inc. (TRI) in Austin, Texas, for quality assurance testing. Identification markings placed on the samples by the CQA Representative included a sequential number, panels included in the sample, date seamed, seamer's initials, and machine number. The top outside track was indicated on the samples.

The size of each destructive sample was approximately 12 inches by 48 inches with the seam centered lengthwise. The size allowed three sections, each approximately 12 inches by 18 inches for the respective testing. Defects in the geomembrane from the destructive test sampling were repaired as described previously.

Before the quality assurance sample was sent to TRI, Comanco first cut one coupon for testing on site with the remainder of the sample sent to TRI for testing. Comanco's test results were

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transmitted verbally to the CQA Representative on site when first known. TRI transmitted written reports to SCS when completed.

TRI performed shear tests to measure strength, and peel tests to measure adhesion of the seam. Testing was conducted in accordance with ASTM D6392. A 1.0-inch wide sample was tested at a grip separation speed of 2.0 inches per minute. For this project, the minimum acceptable test values were 88 pounds per inch (ppi) for peel strength and 120 ppi for shear strength with a Film Tear Bond (FTB) for wedge welded or extruded seams. Ten specimens were cut from each destructive sample for conformance testing, five in peel and five in shear. Destructive sample test results from TRI are included in Attachment M.

2.8 RAIN TARP

The rain tarp was installed according to the specifications and at the locations as directed by SCS.

2.9 ANCHOR TRENCH

The anchor trench was constructed according to the specifications and installed at the locations as shown on the Drawings.

SECTION 3

LEACHATE SYSTEM

3.1 LEACHATE COLLECTION PIPING

The 8-inch leachate collection piping system was installed as shown on the drawings and as specified except as follows:

The specified SDR for leachate piping (15.5) was not available. As a result SDR11 pipe was used for the 8-inch leachate collection lateral. SDR17 pipe was used for the 24-inch riser pipes as calculations show this would be acceptable because these pipes are located near the edge of the landfill and will not be subject to the loads from the full height of the landfill.

3.2 LEACHATE COLLECTION

The leachate collection trench and pumps and control system were constructed as specified and as shown on the drawings. Installed as specified in the leachate collection sump were two submersible pumps. The pumps are 10 horsepower, 460-volt, three-phase EPG WSD PT-30-5, set to turn off at 19 inches and on at 44 inches from the bottom of the sump. The high level alarm was set at 56 inches above the bottom of the sump. The pump model was changed from the specified EPG WDS 45-3 based on being a better fit for the required flow conditions (i.e., provides greater flow per given head condition).

3.3 LEAK DETECTION PUMP

The leachate detection system was constructed as specified and as shown on the drawings. A submersible EPG WSD PT-3-7, one horsepower, 460-volt, three-phase pump is used as needed to pump the detection system. The pump on level is set at 30 inches and the off level is set at 16 inches. The high alarm is set at 36 inches.

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SHEET 1 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Load on Pipe (Overburden)

Prism Loads, $P_E = wH$ Eq'n 7.1 See Source No. 1

w = unit weight

H = depth

	Depth (ft)	Unit Weight (lb/ft^3)	P_E (lb/ft^2)
Cover Soil	2	123.9	247.7
Intermediate Cover	1.5	123.9	185.8
Waste	174.5	74.0	12913.0
Drainage Sand	2	123.9	247.7

13,594.3 = TOTAL PRISM LOAD

Total Depth = 180 ft

Soil Arching, $P_m = C_D wB$

NOTE: The waste unit weight represents the combined unit weight of waste, daily cover, and moisture.

Pm = vertical soil pressure

B = trench width at pipe crown 3 ft

C_D = load coefficient $= \frac{1 - e^{-2Ku'H/B}}{2Ku'}$ Eq'n 7.3 See Source No. 1

e = natural log base number

K = Rankine earth pressure coefficient = $\tan^2(45-0.5*\phi)$

ϕ = internal soil friction angle = 27 degrees for waste

u' = friction coefficient between backfill and trench sides = tan ϕ

Soil Type	Ku'
Saturated Clay	0.110
Ordinary Clay	0.130
Saturated Top Soil	0.150
Sand and Gravel	0.165
Clean Granular Soil	0.192

	Ku'	C_D	P_m (lb/ft^2)
Cover Soil	0.150	0.60	225
Intermediate Cover	0.165	0.46	171
Waste	0.191	2.61	580
Drainage Sand	0.165	0.60	222

TOTAL SOIL ARCHING LOAD: 1,027.0 lb/ft^2

TOTAL SOIL ARCHING LOAD = 1,027 lb/ft^2

TOTAL PRISM LOAD = 13,594 lb/ft^2

MODIFIED ARCHING LOAD = $0.6P_M+0.4P_E$ = 6054 lb/ft^2 = 42.04 lb/in^2

TOTAL VERTICAL LOAD APPLIED TO PIPE, P_T = 13,594 lb/ft^2 = 94.40 lb/in^2

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CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

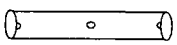
Effective pressure on pipe due to perforations:

$P_{EFF} = \frac{P_T \times 12}{(12-L_P)}$ (per EPA SW-870, p. 382)

L_P = Total accumulated length of perforations in one foot of pipe.

Since each perforation is 0.5" diameter and spaced at 6" on center

L_P = 0.5" x 4 = 2 inch



P_T = 42.04 psi

P_{EFF} = 50.4 psi

P_{EFF} = 7,265 psf

Check actual compressive pressure (S_A) per 3

S_A = 0.5 x (SDR - 1) x P(eff) = 252 psi

The recommended, long-term compressive strength (Y_s) design value for Driscoplex polyethylene pipe is 800 lb/in^2.

S_A (psi):		Y_s (psi):
252	<	800

Pipe passes wall compressive stress perforation calculations TRUE

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SHEET 3 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Constrained Pipe Wall Buckling (for Driscoplex OD controlled pipe)

$$P_{WC} = \frac{5.65 * \{RB'E' E^*[12(DR-1)^3]^{-1}\}^{0.5}}{N}$$ Eq'n 7-30 See Source No. 1

P_{WC} = allowable constrained buckling pressure (lb/in^2)

R = buoyancy reduction factor = 1 - 0.33 * (H'/H)

H' = groundwater height above pipe (ft)	-20	ft
H = cover above pipe (ft)	180	ft
B' = elastic support factor $=(1+ 4*e^{-0.065H})^{-1}$		
E' = soil reaction modulus (lb/in^2)	3000	lb/in^2 for moderate compaction/crushed rock, Table 7-7/Source No. 1
E = elastic modulus (lb/in^2)	23,000	lb/in^2 for 50 years at 100°F, Table 5-1/Source No. 1
I = moment of inertia = $t^3/12$	0.040	in^4/in
D_o = pipe outer diameter (in)	8.625	inches for a 8 inch diameter SDR 11 pipe (Driscopipe)
t = pipe wall thickness (in)	0.784	inches for a 8 inch diameter SDR 11 pipe (Driscopipe)
DR = pipe dimension ratio = D_o/t	11.0	SDR 11 pipe to be used
D_i = pipe inner diameter = D_o-2t (in)	7.057	inches for a 8 inch diameter SDR 11 pipe (Driscopipe)
N = safety factor	2	

	H (ft)	H' (ft)	B'	R	P_{WC} (lb/in^2)
180 ft Cover	180	-20	1.00	1.04	218.06

P_{WC} = 218.06 lb/in^2

P_{EFF} = 50.45 lb/in^2

Pipe passes contrained wall buckling calculations TRUE

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CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Constrained Pipe Wall Compressive Stress (for Driscoplex OD controlled pipe)

$S = \frac{P_T D_o}{228t}$ Eq'n 7-23 See Source No. 1

S = pipe wall compressive stress (lb/in^2)

P_T = vertical load applied to pipe w/ perfs (lb/ft^2)	7,265	lb/ft^2
D_o = pipe outside diameter (in)	8.625	inches for a 8 inch diameter SDR 11 pipe (Driscopipe)
t = pipe wall thickness (in)	0.784	inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

$S = \frac{P_T D_o}{228t} =$ 277.5 lb/in^2

The recommended, long-term compressive strength (Y_s) design value for Driscoplex polyethylene pipe is 800 lb/in^2.

S (psi):		Y_s (psi):
278	<	800

Pipe passes wall compressive stress calculations TRUE

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CLIENT	PROJECT	JOB NO.
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SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
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Iowa Formula

$$\Delta X = \frac{D_L K W_c r^3}{EI + 0.06er^4}$$ Eq'n 3.4 See Source No. 3

ΔX = horizontal deflection (in)

D_L = deflection lag factor

K = bedding constant — 0.1 typical value

W_c = Marston's load per unit length of pipe (lb/in)

r = mean radius of the pipe (in)

E = modulus of elasticity (lb/in^2)

I = moment of inertia of the pipe wall per unit length (in^3)

e = modulus of passive resistance fo the side fill ($lb/in^2(in)$)

Modified Iowa Formula

$$\Delta X = \frac{D_L K W_c r_m^3}{EI + 0.06E'r_m^3}$$ 3

ΔX = horizontal deflection (in)

D_L = deflection lag factor — 1.5 Marston Load

Typical Value for Marston Load 1.5

Typical Value for Prism Load 1.0

K = bedding constant — 0.1 typical value

P_T = Vertical load on pipe w/ perfs — 50.45 lb/in^2 — 7,265 lb/ft^2

W_c = Marston's load per unit length of pipe = $P_T * D_o$ (lb/in) — 435.13 lb/in

D_o = pipe outer diameter (in) — 8.625 inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

t = pipe wall thickness (in) — 0.784 inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

D_I = pipe inner diameter = D_o-2t (in) — 7.057 inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

D_m = pipe mean diameter = D_o - 1.06t — 7.79 inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

r_m = mean radius of the pipe (in) — 3.90 inches for a 8 inch diameter SDR 11 pipe (Driscopipe)

E = modulus of elasticity (lb/in^2) — 23,000 lb/in^2 for 50 years at 100°F, Table 5-1/Source No. 1

I = moment of inertia of the pipe wall per unit length — 0.040 in^4

E' = modulus of soil reaction (See Source No. 1) — 3000 lb/in^2 for moderate compaction and fine grained soils

$$\Delta X = \frac{D_L K W_c r_m^3}{EI + 0.06E'r_m^3} =$$ 0.333675 inch

% Ring Deflection = $(\Delta X/D_m) \times 100$ = 4.281 % Eq'n 7-38 See Source No. 1

Ring Bending Strain

$$\varepsilon = \frac{f_D \Delta X 2C}{D_M^2}$$

ε = wall strain (%)

f_D = deformation shape factor — 6 non-elliptical shape

D_M = mean diameter (in)

C = outer fiber wall centroid = 0.5 (1.06t) — 0.416 Eq'n 7-41 See Source No. 1

ΔX = ring deflection = $\Delta X/D_m$ — 0.043

$$\varepsilon = \frac{f_D \Delta X 2C}{D_M} =$$ 2.739 % Eq'n 7-37 See Source No. 1

The maximum ring bending strain for high performance polyethylene non-pressure pipe is 4.2%

Pipe passes ring bending strain calculations TRUE

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CLIENT	PROJECT	JOB NO.
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SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 11) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Sources:

1 : CPCHEM, The Performance Pipe Engineering Manual
Book 2, Chapter 7 : Buried Pipe Design
2002

2 : Foundation Design Principles and Practices
Second Edition
Donald P. Coduto
Chapter 7, Section 7.3 : Induced Stresses Beneath Shallow Foundations

3: Buried Pipe Design
A.P. Moser
Chapter 3

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Dimensions and Pressure Ratings
1000 Series Pipe

Attachment pg. 1/1

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Size	SDR	PSI @73.4	Weight lbs.	Dimensions - Inches Nominal O D	Approx. I D	Min. Wall
2"	11	160	.62	2.375	1.865	.216
	13.5	128	.52		2.023	.176
	15.5	110	.46		2.069	.153
	17	100	.42		2.095	.140
3"	7	267	2.00	3.500	2.500	.500
	9	200	1.62		2.722	.389
→	11	160	1.35		2.864	.318
	13.5	128	1.12		2.982	.259
	15.5	110	.99		3.048	.226
→	17	100	.91		3.088	.206
	19	89	.82		3.132	.184
	21	80	.74		3.166	.167
	26	64	.61		3.230	.135
	32.5	51	.49		3.284	.108
4"	7	267	3.31	4.500	3.214	.643
	9	200	2.67		3.500	.500
	11	160	2.23		3.682	.409
	13.5	128	1.85		3.834	.333
	15.5	110	1.63		3.920	.290
	17	100	1.50		3.970	.265
	19	89	1.35		4.026	.237
	21	80	1.23		4.072	.214
	26	64	1.00		4.154	.173
	32.5	51	.81		4.224	.138
5-3/8"	21	80	1.75	5.375	4.863	.256
	26	64	1.43		4.961	.207
	32.5	51	1.15		5.045	.165
5"	7	267	5.05	5.563	3.973	.795
	9	200	4.08		4.327	.618
	11	160	3.42		4.551	.506
	13.5	128	2.84		4.739	.412
	15.5	110	2.50		4.845	.359
	17	100	2.29		4.909	.327
	19	89	2.07		4.977	.293
	21	80	1.88		5.033	.265
	26	64	1.53		5.135	.214
	32.5	51	1.23		5.221	.171
6"	7	267	7.16	6.625	4.733	.946
	9	200	5.78		5.153	.736
	11	160	4.84		5.421	.602
	13.5	128	4.03		5.643	.491
	15.5	110	3.54		5.771	.427
	17	100	3.25		5.845	.390
	19	89	2.93		5.927	.349
	21	80	2.66		5.995	.315
	26	64	2.17		6.115	.255
	32.5	51	1.75		6.217	.204
7"	7	267	8.29	7.125	5.089	1.018
	9	200	6.69		5.541	.792
	11	160	5.61		5.829	.648
	13.5	128	4.66		6.069	.528
	15.5	110	4.10		6.205	.460
	17	100	3.76		6.287	.419
	19	89	3.39		6.375	.375
	21	80	3.08		6.445	.340
	26	64	2.51		6.577	.274
	32.5	51	2.02		6.685	.220

Size	SDR	PSI @73.4	Weight lbs.	Dimensions - Inches Nominal O D	Approx. I D	Min. Wall
8"	7	267	12.14	8.625	6.161	1.232
	9	200	9.80		6.709	.958
	11	160	8.21		7.057	.784
	13.5	128	6.82		7.347	.639
	15.5	110	6.00		7.513	.556
	17	100	5.50		7.611	.507
	19	89	4.96		7.717	.454
	21	80	4.52		7.803	.411
	26	64	3.68		7.961	.332
	32.5	51	2.97		8.095	.265
10"	7	267	18.86	10.750	7.678	1.536
	9	200	15.23		8.362	1.194
	11	160	12.75		8.796	.977
	13.5	128	10.59		9.158	.796
	15.5	110	9.33		9.362	.694
	17	100	8.55		9.486	.632
	19	89	7.71		9.618	.566
	21	80	7.01		9.726	.512
	26	64	5.71		9.924	.413
	32.5	51	4.62		10.088	.331
12"	7	267	26.53	12.750	9.108	1.821
	9	200	21.44		9.916	1.417
	11	160	17.94		10.432	1.159
	13.5	128	14.89		10.862	.944
	15.5	110	13.12		11.104	.823
	17	100	12.03		11.250	.750
	19	89	10.84		11.408	.671
	21	80	9.86		11.536	.607
	26	64	8.04		11.770	.490
	32.5	51	6.48		11.966	.392
13"	7	267	29.24	13.386	9.562	1.912
	9	200	23.62		10.412	1.487
	11	160	19.78		10.952	1.217
	13.5	128	16.43		11.402	.992
	15.5	110	14.46		11.658	.864
	17	100	13.26		11.812	.787
	19	89	11.96		11.976	.705
	21	80	10.86		12.112	.637
	26	64	8.87		12.356	.515
	32.5	51	7.15		12.562	.412
14"	7	267	31.99	14.000	10.000	2.000
	9	200	25.84		10.888	1.556
	11	160	21.64		11.454	1.273
	13.5	128	17.97		11.926	1.037
	15.5	110	15.81		12.196	.903
	17	100	14.52		12.352	.824
	19	89	13.07		12.526	.737
	21	80	11.90		12.666	.667
	26	64	9.69		12.924	.538
	32.5	51	7.83		13.138	.431
16"	9	200	33.75	16.000	12.444	1.778
	11	160	28.27		13.090	1.455
	13.5	128	23.46		13.630	1.185
	15.5	110	20.65		13.936	1.032
	17	100	18.95		14.118	.941
	19	89	17.07		14.316	.842
	21	80	15.53		14.476	.762
	26	64	12.66		14.770	.615
	32.5	51	10.21		15.016	.492

Values used in calculation

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Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Load on Pipe (Overburden)

Prism Loads, $P_E = wH$ Eq'n 7.1 See Source No. 1

w = unit weight

H = depth

	Depth (ft)	Unit Weight (lb/ft^3)	P_E (lb/ft^2)
Cover Soil	2	123.9	247.7
Intermediate Cover	1.5	123.9	185.8
Waste	174.5	74.0	12913.0
Drainage Sand	2	123.9	247.7

13,594.3 = TOTAL PRISM LOAD

Total Depth = 180 ft

Soil Arching, $P_m = C_D wB$

Pm = vertical soil pressure

B = trench width at pipe crown 3 ft

C_D = load coefficient $= \frac{1 - e^{-2Ku'H/B}}{2Ku'}$ Eq'n 7.3 See Source No. 1

e = natural log base number

K = Rankine earth pressure coefficient = $\tan^2(45-0.5*\phi)$

ϕ = internal soil friction angle = 27 degrees for waste

u' = friction coefficient between backfill and trench sides = $\tan \phi$

NOTE: The waste unit weight represents the combined unit weight of waste, daily cover, and moisture.

Soil Type	Ku'
Saturated Clay	0.110
Ordinary Clay	0.130
Saturated Top Soil	0.150
Sand and Gravel	0.165
Clean Granular Soil	0.192

	Ku'	C_D	P_m (lb/ft^2)
Cover Soil	0.150	0.60	225
Intermediate Cover	0.165	0.46	171
Waste	0.191	2.61	580
Drainage Sand	0.165	0.60	222

TOTAL SOIL ARCHING LOAD: 1,027.0 lb/ft^2

TOTAL SOIL ARCHING LOAD = 1,027 lb/ft^2

TOTAL PRISM LOAD = 13,594 lb/ft^2

MODIFIED ARCHING LOAD = $0.6P_M+0.4P_E$ = 6054 lb/ft^2 = 42.04 lb/in^2

TOTAL VERTICAL LOAD APPLIED TO PIPE, P_T = 13,594 lb/ft^2 = 94.40 lb/in^2

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS

SHEET 2 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

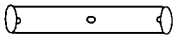
Effective pressure on pipe due to perforations:

$P_{EFF} = \frac{P_T \times 12}{(12-L_P)}$ (per EPA SW-870, p. 382)

L_P = Total accumulated length of perforations in one foot of pipe.

Since each perforation is 0.5" diameter and spaced at 6" on center

L_P = 0.5" x 4 = 2 inch



P_T = 42.04 psi

P_{EFF} = 50.4 psi

P_{EFF} = 7,265 psf

Check actual compressive pressure (S_A) per Driscopipe manual:

S_A = 0.5 x (SDR - 1) x P(eff) = 366 psi

The recommended, long-term compressive strength (Y_s) design value for Driscoplex polyethylene pipe is 800 lb/in^2.

S_A (psi):		Y_s (psi):
366	<	800

Pipe passes wall compressive stress perforation calculations TRUE

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JUL 21 2005
Southwest District Tampa

SCS ENGINEERS

SHEET 3 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Constrained Pipe Wall Buckling (for Driscoplex OD controlled pipe)

$$P_{WC} = \frac{5.65 * \{RB'E' E^*[12(DR-1)^3]^{-1}\}^{0.5}}{N}$$ Eq'n 7-30 See Source No. 1

P_{WC} = allowable constrained buckling pressure (lb/in^2)

R = buoyancy reduction factor = 1 - 0.33 * (H'/H)

H' = groundwater height above pipe (ft)	-20	ft
H = cover above pipe (ft)	180	ft
B' = elastic support factor $=(1+ 4*e^{-0.065H})^{-1}$		
E' = soil reaction modulus (lb/in^2)	3000	lb/in^2 for moderate compaction/crushed rock, Table 7-7/Source No. 1
E = elastic modulus (lb/in^2)	23,000	lb/in^2 for 50 years at 100°F, Table 5-1/Source No. 1
I = moment of inertia = $t^3/12$	0.014	in^4/in
D_o = pipe outer diameter (in)	8.625	inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
t = pipe wall thickness (in)	0.556	inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
DR = pipe dimension ratio = D_o/t	15.5	SDR 15.5 pipe to be used
D_I = pipe inner diameter = D_o-2t (in)	7.513	inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
N = safety factor	2	

	H (ft)	H' (ft)	B'	R	P_{WC} (lb/in^2)
180 ft Cover	180	-20	1.00	1.04	124.75

P_{WC} = 124.75 lb/in^2

P_{EFF} = 50.45 lb/in^2

Pipe passes contrained wall buckling calculations TRUE

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SCS ENGINEERS

SHEET 4 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Constrained Pipe Wall Compressive Stress (for Driscoplex OD controlled pipe)

$S = \frac{P_T D_o}{228t}$ Eq'n 7-23 See Source No. 1

S = pipe wall compressive stress (lb/in^2)

P_T = vertical load applied to pipe w/ perfs (lb/ft^2)	7,265	lb/ft^2
D_o = pipe outside diameter (in)	8.625	inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
t = pipe wall thickness (in)	0.556	inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)

$S = \frac{P_T D_o}{228t} =$ 391.3 lb/in^2

The recommended, long-term compressive strength (Y_s) design value for Driscoplex polyethylene pipe is 800 lb/in^2.

S (psi):		Y_s (psi):
391	<	800

Pipe passes wall compressive stress calculations TRUE

D.E.P.
JUL 2 1 2005
Southwest District Tampa

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SHEET 5 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED	DATE 7/21/05

Iowa Formula

$$\Delta X = \frac{D_L K W_c r^3}{EI + 0.06er^4}$$ Eq'n 3.4 See Source No. 3

ΔX = horizontal deflection (in)
D_L = deflection lag factor
K = bedding constant — 0.1 typical value
W_c = Marston's load per unit length of pipe (lb/in)
r = mean radius of the pipe (in)
E = modulus of elasticity (lb/in^2)
I = moment of inertia of the pipe wall per unit length (in^3)
e = modulus of passive resistance fo the side fill (lb/in^2(in))

Modified Iowa Formula

$$\Delta X = \frac{D_L K W_c r_m^3}{EI + 0.06E'r_m^3}$$ Eq'n 3.5 See Source No. 3

ΔX = horizontal deflection (in)
D_L = deflection lag factor — 1.5 Marston Load
Typical Value for Marston Load 1.5
Typical Value for Prism Load 1.0
K = bedding constant — 0.1 typical value
P_T = Vertical load on pipe w/ perfs — 50.45 lb/in^2 — 7.265 lb/ft^2
W_c = Marston's load per unit length of pipe = $P_T * D_o$ (lb/in) — 435.13 lb/in
D_o = pipe outer diameter (in) — 8.625 inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
t = pipe wall thickness (in) — 0.556 inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
D_i = pipe inner diameter = D_o-2t (in) — 7.513 inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
D_m = pipe mean diameter = D_o - 1.06t — 8.04 inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
r_m = mean radius of the pipe (in) — 4.02 inches for a 8 inch diameter SDR 15.5 pipe (Driscopipe)
E = modulus of elasticity (lb/in^2) — 23,000 lb/in^2 for 50 years at 100°F, Table 5-1/Source No. 1
I = moment of inertia of the pipe wall per unit length — 0.014 in^4
E' = modulus of soil reaction (See Source No. 1) — 3000 lb/in^2 for moderate compaction and fine grained soils

$$\Delta X = \frac{D_L K W_c r_m^3}{EI + 0.06E'r_m^3} =$$ 0.352654 inch

% Ring Deflection = $(\Delta X/D_m) \times 100$ = 4.389 % Eq'n 7-38 See Source No. 1

Ring Bending Strain

$$\varepsilon = \frac{f_D \Delta X 2C}{D_M^2}$$

ε = wall strain (%)
f_D = deformation shape factor — 6 non-elliptical shape
D_M = mean diameter (in)
C = outer fiber wall centroid = 0.5 (1.06t) — 0.295 Eq'n 7-41 See Source No. 1
ΔX = ring deflection = $\Delta X/D_m$ — 0.044

$$\varepsilon = \frac{f_D \Delta X 2C}{D_M} =$$ 1.931 % Eq'n 7-37 See Source No. 1

The maximum ring bending strain for high performance polyethylene non-pressure pipe is 4.2%

Pipe passes ring bending strain calculations TRUE

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SCS ENGINEERS

SHEET 6 of 6

CLIENT	PROJECT	JOB NO.
Citrus County	Landfill Expansion	09199056.02

SUBJECT	BY	DATE
Pipe Crushing Calculations 8" Diameter (SDR 15.5) Leachate Collection Pipe	Ram	7/20/2005
	CHECKED LB	DATE 7/21/05

Sources:

1 : CPCHEM, The Performance Pipe Engineering Manual
Book 2, Chapter 7 : Buried Pipe Design
2002

2 : Foundation Design Principles and Practices
Second Edition
Donald P. Coduto
Chapter 7, Section 7.3 : Induced Stresses Beneath Shallow Foundations

3: Buried Pipe Design
A.P. Moser
Chapter 3

DEP
JUL 2 1 2005
Southwest District Tampa

DRISCOPIPE

Dimensions and Pressure Ratings

1000 Series Pipe

Attachment 1 pg. 1h

Dimensions - Inches

Size	SDR	PSI @73.4	Weight lbs.	Nominal O D	Approx. I D	Min. Wall
2"	11	160	.62	2.375	1.865	.216
	13.5	128	.52	"	2.023	.176
	15.5	110	.46	"	2.069	.153
	17	100	.42	"	2.095	.140
3"	7	267	2.00	3.500	2.500	.500
	9	200	1.62	"	2.722	.389
	11	160	1.35	"	2.864	.318
	13.5	128	1.12	"	2.982	.259
	15.5	110	.99	"	3.048	.226
	17	100	.91	"	3.088	.206
	19	89	.82	"	3.132	.184
	21	80	.74	"	3.166	.167
	26	64	.61	"	3.230	.135
	32.5	51	.49	"	3.284	.108
4"	7	267	3.31	4.500	3.214	.643
	9	200	2.67	"	3.500	.500
	11	160	2.23	"	3.682	.409
	13.5	128	1.85	"	3.834	.333
	15.5	110	1.63	"	3.920	.290
	17	100	1.50	"	3.970	.265
	19	89	1.35	"	4.026	.237
	21	80	1.23	"	4.072	.214
	26	64	1.00	"	4.154	.173
	32.5	51	.81	"	4.224	.138
5-3/8"	21	80	1.75	5.375	4.863	.256
	26	64	1.43	"	4.961	.207
	32.5	51	1.15	"	5.045	.165
5"	7	267	5.05	5.563	3.973	.795
	9	200	4.08	"	4.327	.618
	11	160	3.42	"	4.551	.506
	13.5	128	2.84	"	4.739	.412
	15.5	110	2.50	"	4.845	.359
	17	100	2.29	"	4.909	.327
	19	89	2.07	"	4.977	.293
	21	80	1.88	"	5.033	.265
	26	64	1.53	"	5.135	.214
	32.5	51	1.23	"	5.221	.171
6"	7	267	7.16	6.625	4.733	.946
	9	200	5.78	"	5.153	.736
	11	160	4.84	"	5.421	.602
	13.5	128	4.03	"	5.643	.491
	15.5	110	3.54	"	5.771	.427
	17	100	3.25	"	5.845	.390
	19	89	2.93	"	5.927	.349
	21	80	2.66	"	5.995	.315
	26	64	2.17	"	6.115	.255
	32.5	51	1.75	"	6.217	.204
7"	7	267	8.29	7.125	5.089	1.018
	9	200	6.69	"	5.541	.792
	11	160	5.61	"	5.829	.648
	13.5	128	4.66	"	6.069	.528
	15.5	110	4.10	"	6.205	.460
	17	100	3.76	"	6.287	.419
	19	89	3.39	"	6.375	.375
	21	80	3.08	"	6.445	.340
	26	64	2.51	"	6.577	.274
	32.5	51	2.02	"	6.685	.220
8"	7	267	12.14	8.625	6.161	1.232
	9	200	9.80	"	6.709	.958
	11	160	8.21	"	7.057	.784
	13.5	128	6.82	"	7.347	.639
	15.5	110	6.00	"	7.513	.556
	17	100	5.50	"	7.611	.507
	19	89	4.96	"	7.717	.454
	21	80	4.52	"	7.803	.411
	26	64	3.68	"	7.961	.332
	32.5	51	2.97	"	8.095	.265
10"	7	267	18.86	10.750	7.678	1.536
	9	200	15.23	"	8.362	1.194
	11	160	12.75	"	8.796	.977
	13.5	128	10.59	"	9.158	.796
	15.5	110	9.33	"	9.362	.694
	17	100	8.55	"	9.486	.632
	19	89	7.71	"	9.618	.566
	21	80	7.01	"	9.726	.512
	26	64	5.71	"	9.924	.413
	32.5	51	4.62	"	10.088	.331
12"	7	267	26.53	12.750	9.108	1.821
	9	200	21.44	"	9.916	1.417
	11	160	17.94	"	10.432	1.159
	13.5	128	14.89	"	10.862	.944
	15.5	110	13.12	"	11.104	.823
	17	100	12.03	"	11.250	.750
	19	89	10.84	"	11.408	.671
	21	80	9.86	"	11.536	.607
	26	64	8.04	"	11.770	.490
	32.5	51	6.48	"	11.966	.392
13"	7	267	29.24	13.386	9.562	1.912
	9	200	23.62	"	10.412	1.487
	11	160	19.78	"	10.952	1.217
	13.5	128	16.43	"	11.402	.992
	15.5	110	14.46	"	11.658	.864
	17	100	13.26	"	11.812	.787
	19	89	11.96	"	11.976	.705
	21	80	10.86	"	12.112	.637
	26	64	8.87	"	12.356	.515
	32.5	51	7.15	"	12.562	.412
14"	7	267	31.99	14.000	10.000	2.000
	9	200	25.84	"	10.888	1.556
	11	160	21.64	"	11.454	1.273
	13.5	128	17.97	"	11.926	1.037
	15.5	110	15.81	"	12.194	.903
	17	100	14.52	"	12.352	.826
	19	89	13.07	"	12.526	.737
	21	80	11.90	"	12.666	.667
	26	64	9.69	"	12.926	.538
	32.5	51	7.83	"	13.158	.431
16"	9	200	33.75	16.000	12.444	1.778
	11	160	28.27	"	13.090	1.455
	13.5	128	23.46	"	13.630	1.185
	15.5	110	20.65	"	13.936	1.032
	17	100	18.95	"	14.118	.941
	19	89	17.07	"	14.316	.842
	21	80	15.53	"	14.476	.762
	26	64	12.66	"	14.770	.615
	32.5	51	10.21	"	15.016	.492

JUL 21 2005
Outwater

02220 - 2.04. A
1 sample / acre

SECTION 4

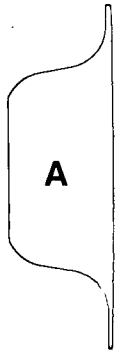
PROTECTIVE SAND COVER

4.1 TESTING

The project specifications required that the protective sand layer be composed of select sand having a hydraulic conductivity of greater than $1x10^{-3}$ cm/sec. On October 10, 2003 PSI provided a letter report (Attachment N) presenting the results of hydraulic conductivity testing on two samples of sand proposed for use as the protective sand layer. The sand samples were taken from two locations within the select sand stockpile which was obtained from the excavation of the cell. This material was separated from other soils that were excavated and is visually distinct from the other soil as a white sand. These results indicated the material exceeded the specification for hydraulic conductivity. Based on these results the proposed material was approved and placed over the liner system in the floor of the cell.

4.2 PLACEMENT THICKNESS

The thickness of the in-place sand layer was verified by survey and physical thickness checks performed on February 20, 2005. The SCS site representative visually observed the contractor place a blunt ended rod through the sand layer to confirm a minimum of 2-foot thickness. The checks were performed on an approximate 100 foot grid. A sketch of thickness check locations is provided in Attachment N.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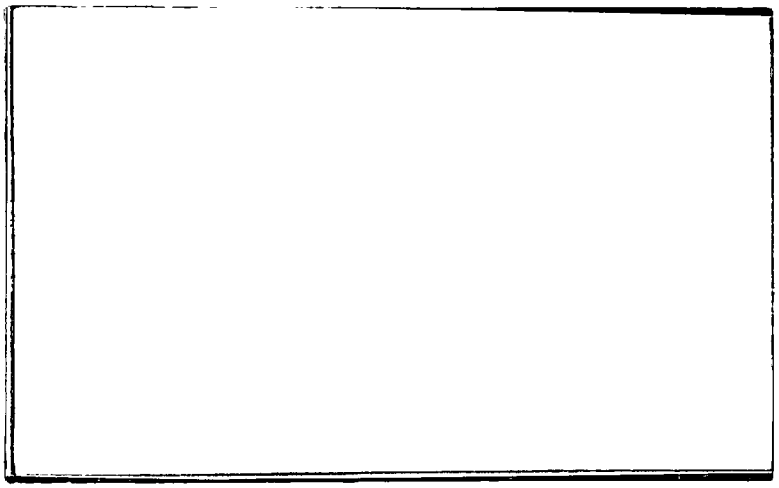


psi Information To Build On

Engineering • Consulting • Testing

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Information To Build On
Engineering • Consulting • Testing

GEOTECHNICAL ENGINEERING SERVICES REPORT

For the

LOW PERMEABILITY SOIL TESTING RESULTS/ CQC CERTIFICATION OF COMPLETION CITRUS COUNTY CENTRAL LANDFILL CITRUS COUNTY, FLORIDA

Prepared for

Mr. Ken Pitts
Advanced Construction
400 Neal Road
Cantonment, Florida 35233

Prepared by

Professional Service Industries, Inc.
5801 Benjamin Center Drive
Suite 112
Tampa, Florida 33634
Telephone (813) 886-1075
Fax (813) 888-6514
Engineering Business No. 3684

PSI Project No. 390-30102

February 11, 2005
(Revised April 21, 2005)

PSI Information To Build On
Engineering • Consulting • Testing

February 11, 2005
Revised April 21, 2005

Mr. Ken Pitts
Advance construction
400 Neal Road
Cantonment, Florida 35233

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Re: Citrus County Central Land Fill
Low Permeability Soil Testing Results/
CQC Certification of Completion
Citrus county, Florida
PSI Report No. 390-30102

Dear Mr. Pitts:

This letter forwards the results of the laboratory soils testing performed on the low permeability soil samples obtained by a representative of our firm, from the site for the Citrus county Central Landfill in citrus county, Florida. Laboratory and field testing activities were completed during the months of October through December 2005. also, this letter is to serve as the CQC Certification of Completion.

The laboratory testing was performed to verify that the soil specimens collected met/exceeded project specifications for low permeability soil. The tests performed included flexible wall permeability tests (ASTM D-5084), Atterberg limits test (ASTM D-4318), organic content determinations (ASTM D2974 and was #200 sieve test (ASTM D1140). Table 1 in Appendix A at the end of this report shows the results of the laboratory soils tests as well as the corresponding project specifications. Individual test reports for the permeability testing are also attached. The attached drawing at the end of this report shows the approximate sample locations.

In addition to the laboratory testing, a PSI representative performed field density tests and thickness checks on the prepared subbase. Individual field density reports including thickness measurements at the test locations are attached in Appendix B for reference. Also, prior to the installation of the subbase, PSI obtained samples of the proposed low permeability subbase soils and determined their maximum dry density and optimum moisture content using the Standard Proctor method (ASTM D-698/ASTM D 2216). The results of those determinations are attached in Appendix B for reference.

Based on the results of the laboratory and field-testing summarized above, PSI certifies to the best of our knowledge the following:

1. The Prepared Subbase was constructed in accordance with the approved project Drawings and specifications.

2. The Prepared Subbase meets all requirements of the approved project Drawings and specifications.

3. Any damage to the Prepared Subbase from any construction operation has been repaired as specified.

The laboratory permeability tests results are presented in the attached Table 1. All permeability test results indicate that the liner soils meet or exceed specification requirements. Table 2 indicates the clay thickness measurement results. The twenty three (23) thickness tests indicate the liner thickness meets or exceeds the minimum specified thickness. The test locations are shown on sheet 1. The individual field compaction test reports are attached and show the test locations as well as the results for the subgrade soils and the liner soils. The eighteen (18) subgrade compaction tests below the liner indicate compaction requirements were met or exceeded. The liner compaction tests (eight field compaction tests plus eight permeability locations) indicate the liner was compacted equal to or greater than the specification requirements.

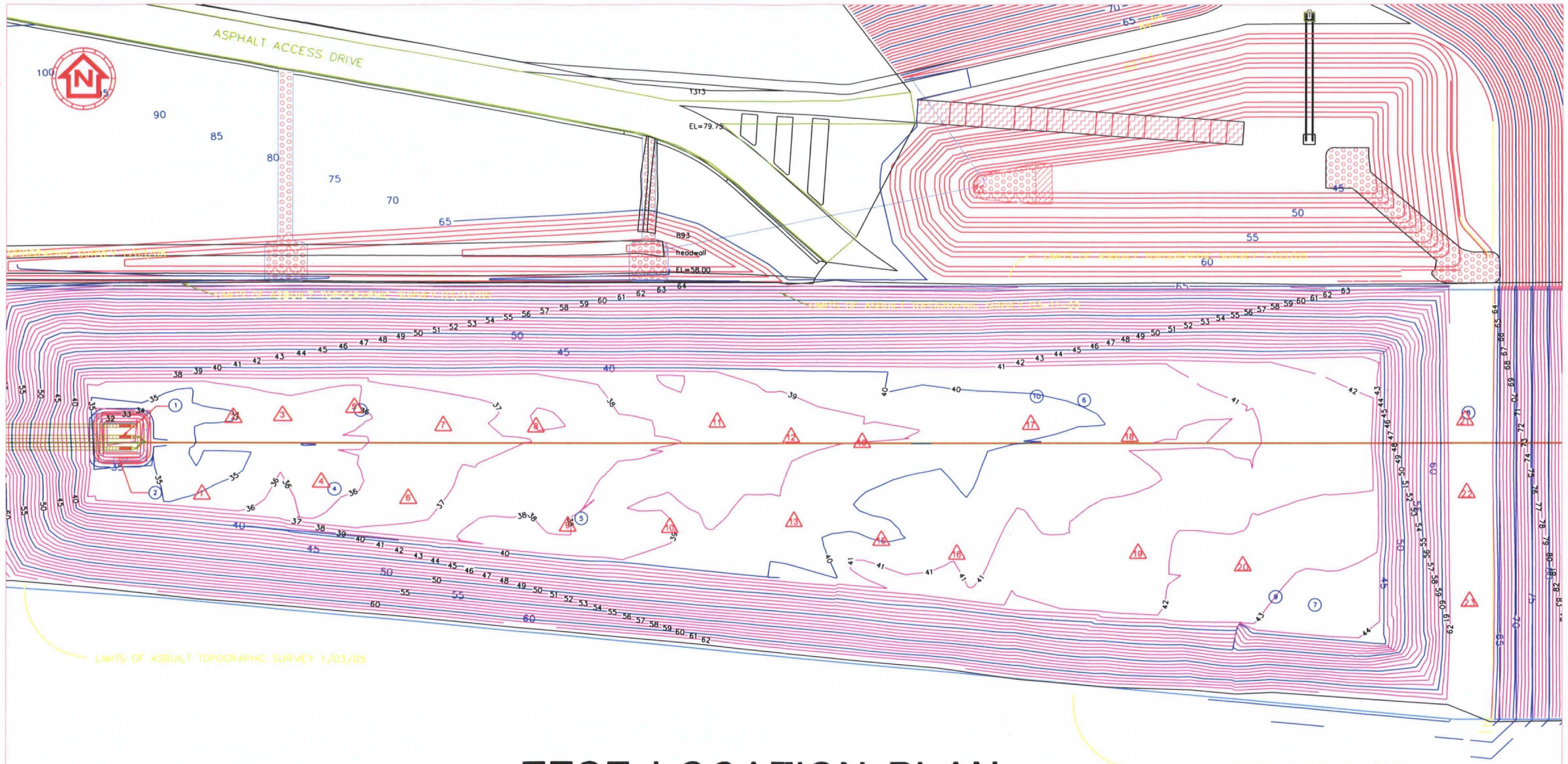
Should you have any questions or require additional information, please do not hesitate to call our office.

Respectfully submitted,
Professional Service Industries, Inc.

Nyasha S. Seale, E.I.
Branch Manager

Rees Nickerson, P.E.
Chief Engineer
FL Registration No. 35792

REES NICKERSON PE 35792 STATE OF FLORIDA PROFESSIONAL ENGINEER



TEST LOCATION PLAN

0 60

PLAN SCALE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

LEGEND

(10) Approximate Location of Laboratory Tests

(23) Approximate Location of Clay Thickness Tests

DRAWN	NS
CHECKED	NS
APPROVED	NS
SCALE	NOTED

GEOTECHNICAL SERVICES

CITRUS COUNTY LANDFILL

CITRUS COUNTY, FLORIDA

psi Information To Build On
Engineering Consulting Testing

DATE	PROJ. NO	SHEET
4/21/05	390-30102	SHEET 1

P:\775-Geo\2009

TABLE 1 LABORATORY TEST RESULTS					
#	Sample Location	Constant Head Permeability (cm/sec)	Atterberg Limit	% Passing #200 Sieve	% Organic Content
1	Bottom of Sump	9.3×10^{-8}	LL=44, PI=19	52%	0.5%
2	South Side of Sump Slope	4.2×10^{-8}	LL=47, PI=21	53%	0.5%
3	150' E. & 10' S. of NW Corner of Landfill Bottom	1.0×10^{-7}	LL=50, PI=22	65%	.5 %
4	250' E. & 15' N. of SW Corner of Landfill Bottom	2.1×10^{-7}	LL=43, PI=19	59%	0.5%
5	390' E. & 20' N. of SW Corner of Landfill Bottom	1.4×10^{-8}	LL=41, PI=23	63%	0.5%
6	180' W. & 20' S. of NE Corner of Landfill Bottom	9.0×10^{-8}	LL=58, PI=40	65%	0.6%
7	90' W. & 25' N. of SE Corner of Landfill Bottom	2.6×10^{-8}	LL=42, PI=20	56%	0.6 %
8	65' S. & 10' E. of NW corner of Shelf B	1.5×10^{-8}	LL=43, PI=23	55%	0.5%
9	110' W. & 20' N. of SE Corner of Landfill Bottom	Not Tested	LL=49, PI=28	65%	0.6%
10	220' W. & 15' S. of NE Corner of Landfill Bottom	Not Tested	LL=48, PI=22	64%	0.5%
Project Specifications		**$\leq 1.0 \times 10^{-5}$**	**20<LL<80 10<PI<40**	**> 20%**	**1%**

TABLE 2 CLAY THICKNESS MEASUREMENTS	
Test Location	Measured Thickness (inches)
1	8.13
2	9
3	6.25
4	8.25
5	6
6	6.75
7	7.5
8	7
9	6.25
10	6.5
11	6.75
12	7.5
13	7
14	6.5
15	6.75
16	6.75
17	8
18	8
19	6.75
20	8
21	8.5
22	7.5
23	7

APPENDIX A

PSI

PERM WORK SHEET CELL

PROJECT NAME	:	CITRUS LANDFILL LAB#G1093	PROJECT # :	390-30102
ASTM METHOD	:	ASTM D-5084	DATE	: 12.8.4
SAMPLE SOURCE	:	SMALL SHELBY TUBE PERM #1		
VISUAL CLASSIFICATION	:	YELLOW BROWN CLAY TR. SAND		

WET WEIGHT	(gms)	343.630	
MOISTURE	(%)	19.651	
LENGTH "L"	(cm)	4.130	
DIAMETER	(cm)	7.520	
WET DENSITY	(pcf)	116.896	
DRY DENSITY	(pcf)	97.698	100+% Compaction - 91pcf max density
SPECIMEN AREA "A"	(cm^2)	44.415	
SPECIMEN VOLUME	(cm^2)	183.432	
VOID RATIO "e"		0.780	
Initial Height of Mercury		5.000	3.388 =H1
Final Height of Mercury		4.500	2.868 =H2
ELAPSED TIME "t"	(sec)	402	
TEMP	(C)	20	
hydraulic gradient		10	
VISCOSITY CORR. "R"		1	
K	(cm/sec)	9.3E-08	9.3E-08
CHAMBER PRESSURE	(psi) :	75	
BACKPRESSURE	(psi) :	70	
PORE PRESSURE	(psi) :	5	

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
C27	13.71	61.02	53.25	19.7

TESTED BY _____ REVIEWED BY: 11/12/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET — CELL

PROJECT NAME : CITRUS LANDFILL LAB#G1093 PROJECT # : 390-30102

ASTM METHOD : ASTM D-5084 DATE : 12.8.4

SAMPLE SOURCE : SMALL SHELBY TUBE PERM #2 SOUTH SIDE OF SUMP

VISUAL CLASSIFICATION : YELLOW BROWN CLAY

WET WEIGHT	(gms)	301.550
MOISTURE	(%)	33.659
LENGTH "L"	(cm)	3.896
DIAMETER	(cm)	7.249
WET DENSITY	(pcf)	117.025
DRY DENSITY	(pcf)	87.555
SPECIMEN AREA "A"	(cm^2)	41.271
SPECIMEN VOLUME	(cm^2)	160.792
VOID RATIO "e"		1.154

96% Compaction – 91% max density

Initial Height of Mercury	5.000	3.388	=H1
Final Height of Mercury	4.500	2.868	=H2
ELAPSED TIME "t" (sec)	891		
TEMP (C)	20		
hydraulic gradient	11		
VISCOSITY CORR. "R"	1		
K (cm/sec)	4.2E-08	4.2E-08	

CHAMBER PRESSURE (psi) :	75	
BACKPRESSURE (psi) :	70	
PORE PRESSURE (psi) :	5	

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
S30	13.63	58.74	47.38	33.7

TESTED BY: _____ REVIEWED BY: 11/12/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET CELL

PROJECT NAME	:	CITRUS LANDFILL	PROJECT # :	390-30102
ASTM METHOD	:	ASTM D-5084	DATE	:	12.1.4
SAMPLE SOURCE	:	SMALL SHELBY TUBE # 3			
VISUAL CLASSIFICATION	:	BROWN/LT GRAY CLAY			

WET WEIGHT	(gms)	368.850
MOISTURE	(%)	40.663
LENGTH "L"	(cm)	4.999
DIAMETER	(cm)	7.203
WET DENSITY	(pcf)	112.989
DRY DENSITY	(pcf)	80.325
SPECIMEN AREA "A"	(cm^2)	40.749
SPECIMEN VOLUME	(cm^2)	203.704
VOID RATIO "e"		1.494

92% Compaction - 87 pcf max density

Initial Height of Mercury		9.500	8.076	=H1
Final Height of Mercury		9.000	7.555	=H2
ELAPSED TIME "t"	(sec)	195.0		
TEMP	(C)	24		
hydraulic gradient		20		
VISCOSITY CORR "R"		1		
K	(cm/sec)	1.0E-07	1.0E-07	

CHAMBER PRESSURE	(psi) :	75
BACKPRESSURE	(psi) :	70
PORE PRESSURE	(psi) :	5

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
C1	13.5	51.24	40.33	40.7

TESTED BY _____ REVIEWED BY 1/12/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET CELL

PROJECT NAME :	CITRUS LANDFILL	PROJECT # :	390-30102
ASTM METHOD :	ASTM D-5084	DATE :	12.1.4
SAMPLE SOURCE :	SMALL SHELBY TUBE # 4		
VISUAL CLASSIFICATION :	BROWN/LT GRAY CLAY TR GRAVEL		

WET WEIGHT	(gms)	360.430
MOISTURE	(%)	34.470
LENGTH "L"	(cm)	4.765
DIAMETER	(cm)	7.252
WET DENSITY	(pcf)	114.271
DRY DENSITY	(pcf)	84.979
SPECIMEN AREA "A"	(cm^2)	41.305
SPECIMEN VOLUME	(cm^2)	196.820
VOID RATIO "e"		1.233

93% compaction - 91 pcf max density

Initial Height of Mercury		9.000	7.555 =H1
Final Height of Mercury		8.000	6.513 =H2
ELAPSED TIME "t"	(sec)	193.8	
TEMP	(C)	20	
hydraulic gradient		20	
VISCOSITY CORR. "R"		1	
K	(cm/sec)	2.1E-07	2.1E-07

CHAMBER PRESSURE	(psi) :	75
BACKPRESSURE	(psi) :	70
PORE PRESSURE	(psi) :	5

TARE #	TARE WGHT	TARE+WET	TARE+DRY	MOISTURE
S16	13.43	57.59	46.27	34.5

TESTED BY: _____ REVIEWED BY: 11/2/05

Technician Date Supervisor/ Manager Date

psi

PSI

PERM WORK SHEET CELL

PROJECT NAME : CITRUS LANDFILL PROJECT # : 390-30102

ASTM METHOD : ASTM D-5084 DATE : 12.1 4

SAMPLE SOURCE : SMALL SHELBY TUBE # 5

VISUAL CLASSIFICATION : BROWN/LT GRAY CLAY

WET WEIGHT	(gms)	277.580
MOISTURE	(%)	46.395
LENGTH "L"	(cm)	3.929
DIAMETER	(cm)	7.173
WET DENSITY	(pcf)	109.094
DRY DENSITY	(pcf)	74.520
SPECIMEN AREA "A"	(cm^2)	40.410
SPECIMEN VOLUME	(cm^2)	158.772
VOID RATIO "e"		1.860

86% Compaction - 87pcf max density

Initial Height of Mercury		8.000	6.513	=H1
Final Height of Mercury		7.500	5.993	=H2
ELAPSED TIME "t"	(sec)	1405.1		
TEMP	(C)	20		
hydraulic gradient		21		
VISCOSITY CORR. "R"		1		
K	(cm/sec)	1.4E-08	1.4E-08	

CHAMBER PRESSURE	(psi) :	75
BACKPRESSURE	(psi) :	70
PORE PRESSURE	(psi) :	5

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
S40	13.35	35.28	28.33	46 4

TESTED BY: _____ REVIEWED BY: 11/12/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET CELL

PROJECT NAME	:	CITRUS LANDFILL	PROJECT # :	390-30102
ASTM METHOD	:	ASTM D-5084	DATE	:	12.1.4
SAMPLE SOURCE	:	SMALL SHELBY TUBE # 6		
VISUAL CLASSIFICATION	:	BROWN/LT GRAY CLAY		

WET WEIGHT	(gms)	377.690
MOISTURE	(%)	33.794
LENGTH "L"	(cm)	5.149
DIAMETER	(cm)	7.239
WET DENSITY	(pcf)	111.212
DRY DENSITY	(pcf)	83.122
SPECIMEN AREA "A"	(cm^2)	41.157
SPECIMEN VOLUME	(cm^2)	211.919
VOID RATIO "e"		1.271

95% compaction - 87 pcf max density

Initial Height of Mercury		9.500	8.076 =H1
Final Height of Mercury		9.000	7.555 =H2
ELAPSED TIME "t"	(sec)	222.37	
TEMP	(C)	24	
hydraulic gradient		20	
VISCOSITY CORR. "R"		1	
K	(cm/sec)	9.0E-08	9.0E-08

CHAMBER PRESSURE	(psi)	75
BACKPRESSURE	(psi)	70
PORE PRESSURE	(psi)	5

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
T14	13.51	40.63	33.78	33.8

TESTED BY: _____ REVIEWED BY: [signature] 11/8/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET CELL

PROJECT NAME	:	CITRUS LANDFILL	PROJECT # :	390-30102
ASTM METHOD	:	ASTM D-5084	DATE :	12.1.4
SAMPLE SOURCE	:	SMALL SHELBY TUBE # 7		
VISUAL CLASSIFICATION	:	BROWN/LT GRAY CLAY TR SAND		

WET WEIGHT	(gms)	404.200
MOISTURE	(%)	28.135
LENGTH "L"	(cm)	5.042
DIAMETER	(cm)	7.249
WET DENSITY	(pcf)	121.208
DRY DENSITY	(pcf)	94.594
SPECIMEN AREA "A"	(cm^2)	41.271
SPECIMEN VOLUME	(cm^2)	208.089
VOID RATIO "e"		0.920

100+% Compaction - 91 pcf max density

Initial Height of Mercury		9.500	8.076 =H1
Final Height of Mercury		9.000	7.555 =H2
ELAPSED TIME "t"	(sec)	760.0	
TEMP	(C)	20	
hydraulic gradient		20	
VISCOSITY CORR. "R"		1	
K	(cm/sec)	2.6E-08	2.6E-08

CHAMBER PRESSURE	(psi) :	75
BACKPRESSURE	(psi) :	70
PORE PRESSURE	(psi) :	5

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
A21	13.5	42.83	36.39	28.1

TESTED BY _____ REVIEWED BY: 11/12/05

Technician Date Supervisor/ Manager Date

PSI

PERM WORK SHEET

CELL

PROJECT NAME : CITRUS LANDFILL LAB#G1093 PROJECT # : 390-30102

ASTM METHOD : ASTM D-5084 DATE : 12.8.4

SAMPLE SOURCE : SMALL SHELBY TUBE PERM #8

VISUAL CLASSIFICATION : YELLOW BROWN CLAY

WET WEIGHT	(gms)	312.540
MOISTURE	(%)	28.951
LENGTH "L"	(cm)	4.006
DIAMETER	(cm)	7.160
WET DENSITY	(pcf)	120.910
DRY DENSITY	(pcf)	93.764
SPECIMEN AREA "A"	(cm^2)	40.264
SPECIMEN VOLUME	(cm^2)	161.297
VOID RATIO "e"		0.947
Initial Height of Mercury		8.000
Final Height of Mercury		7.500
ELAPSED TIME "t"	(sec)	1317.39
TEMP	(C)	20
hydraulic gradient		20
VISCOSITY CORR. "R"		1
K	(cm/sec)	1.5E-08

100+% compaction - 91 pcf max density

6.513 =H1

5.993 =H2

1.5E-08

CHAMBER PRESSURE (psi) : 75

BACKPRESSURE (psi) : 70

PORE PRESSURE (psi) : 5

TARE #	TARE WGHT.	TARE+WET	TARE+DRY	MOISTURE
M44	13.74	49.15	41.2	29.0

TESTED BY: _____ REVIEWED BY: 11/12/05

Technician Date Supervisor/ Manager Date

APPENDIX B

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: November 28, 2004 OUR REPORT NO.: 390-30102-76

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 92% ~~90%~~ Mi
1		0-6		90.0	28.3	115.9	90.3	100.3	6 - A
2		0-6		90.0	27.9	115.5	90.3	100.3	6 - A
3		0-6		90.0	28.8	115.8	89.9	99.9	6 - A
4		0-6		90.0	30.0	115.8	89.1	99.0	6 - A
5		0-6		90.0	26.9	120.6	95.0	105.6	6 - A

TEST LOCATION: ~~SUBBASE~~ Liner SOILS - BOTTOM OF LANDFILL

1	150' E. & 10' S. OF THE NW CORNER OF LANDFILL
2	250' E. & 15' N. OF THE SW CORNER OF LANDFILL (7")
3	390' E. & 20' N. OF THE SW CORNER OF LANDFILL (7")
4	180' E. & 20' S. OF THE NE CORNER OF LANDFILL (7.25")
5	90' W. & 25' N. OF THE SE CORNER OF LANDFILL (6.25")

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN: Lbs. per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS: 1. FILL MATERIAL 2. BACKFILL 3. BASE COURSE 4. SUBBASE 5. SOIL CEMENT 6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER
REMARKS: 98% OF STANDARD PROCTOR
DEPTH OF TEST REFERENCED IN INCHES
0 = TOP OF SUBBASE
TECHNICIAN: DR

STANDARD COUNT M: D:
ADJUSTMENT DATA M: D:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Respectfully submitted,
Professional Service Industries, In

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: November 28, 2004 OUR REPORT NO.: 390-30102-76

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% ~~98%~~ Mi
6		0-1		106.5	10.1	116.5	105.8	99.3	6 - A
7		0-1		106.5	9.9	116.6	106.1	99.6	6 - A

TEST LOCATION: SUBGRADE SOIL - BOTTOM OF LANDFILL PAD

6	240' W. & 20' S. OF THE NE CORNER OF LANDFILL
7	350' W. & 15' S. OF THE NE CORNER OF LANDFILL

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN: Lbs. per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS:
1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER
STANDARD COUNT M: D:
ADJUSTMENT DATA M: D:

REMARKS: 98% OF STANDARD PROCTOR
DEPTH OF TEST REFERENCED IN FEET
0 = TOP OF SUBGRADE

TECHNICIAN: DR

Respectfully submitted,
Professional Service Industries, In

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: December 02, 2004

OUR REPORT NO.: 390-30102-78

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 92% ~~98%~~ Mi
1		0-6		91.0	28.5	116.5	90.7	99.7	4 - A
2		0-6		91.0	26.9	114.3	90.1	99.0	4 - A
3		0-6		91.0	28.2	116.7	91.0	100.0	4 - A

TEST LOCATION: ~~SUBBASE~~ Liner SOILS

1	65' S. & 10' E. OF THE NW CORNER OF SHELF B (8.5")
2	BOTTOM OF SUMP (8.5")
3	S. SIDE OF SUMP (8")

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN: Lbs. per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS:
1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

REMARKS: 98% OF MODIFIED PROCTOR
DEPTH OF TEST REFERENCED IN INCHES
0 = TOP OF SUBBASE SOILS

TECHNICIAN: DR

Respectfully submitted,
Professional Service Industries, In

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS.
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: December 03, 2004 OUR REPORT NO.: 390-30102-79

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Mi
1		0-1		106.5	10.6	115.4	104.3	97.9	6 - A
2		0-1		106.5	10.1	113.3	102.9	96.6	6 - A
3		0-1		106.5	9.9	116.6	106.1	99.6	6 - A
4		0-1		106.5	10.8	116.7	105.3	98.9	6 - A
5		0-1		106.5	10.0	114.3	103.9	97.6	6 - A
6		0-1		106.5	10.7	114.7	103.6	97.3	6 - A

TEST LOCATION: SUBGRADE SOILS

1	75' N. & 40' E. OF THE SW CORNER TOP OF SHELF B
2	30' S. & 60' E. OF THE NE CORNER TOP OF SHELF B
3	110' W. & 15' S. OF THE SE CORNER OF BOTTOM OF LANDFILL
4	100' W. & 10' N. OF THE NE CORNER OF BOTTOM OF LANDFILL
5	240' E. & 20' N. OF THE NW CORNER OF BOTTOM OF LANDFILL
6	240' E. & 20' S. OF THE SW CORNER OF BOTTOM OF LANDFILL

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN, Lbs per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS:
1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER

STANDARD COUNT M: D:
ADJUSTMENT DATA M: D:

REMARKS: 95% OF MODIFIED PROCTOR
DEPTH OF TEST REFERENCED IN FEET
0 = TOP OF SUBGRADE

TECHNICIAN: DR

Respectfully submitted,
Professional Service Industries, In

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

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REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: December 03, 2004

OUR REPORT NO.: 390-30102-79

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Mi
7		0-1		106.5	10.6	116.0	104.9	98.5	6 - A
8		0-1		106.5	10.0	116.7	106.1	99.6	6 - A
9		0-1		106.5	9.9	115.7	105.3	98.9	6 - A
10		0-1		106.5	10.8	116.7	105.3	98.9	6 - A
11		0-1		106.5	10.1	114.9	104.4	98.0	6 - A
12		0-1		106.5	10.6	117.1	105.9	99.4	6 - A

TEST LOCATION: SUBGRADE SOIL

7	35' E. & 20' S. OF THE SW CORNER OF BOTTOM OF LANDFILL
8	35' E. & 20' N. OF THE NW CORNER OF BOTTOM OF LANDFILL
9	20' N. & 60' W. OF THE NW CORNER OF BOTTOM OF LANDFILL
10	20' S. & 45' W. OF THE SW CORNER OF BOTTOM OF LANDFILL
11	10' S. & 25' W. OF THE NW CORNER OF BOTTOM OF LANDFILL IN PIPE TRENCH
12	10' S. & 110' W. OF THE NW CORNER OF BOTTOM OF LANDFILL IN PIPE TRENCH

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN: Lbs. per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS:
1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION.
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

REMARKS: 95% OF MODIFIED PROCTOR
DEPTH OF TEST REFERENCED IN FEET
0 = TOP OF SUBGRADE

TECHNICIAN: DR

Respectfully submitted,
Professional Service Industries, In

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

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REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

REPORT OF FIELD COMPACTION TESTS

TESTED FOR: MR. KEN PITTS
ADVANCED CONSTRUCTION
400 NEAL ROAD
CANTONMENT, FL 32533

PROJECT: CITRUS COUNTY LANDFILL

DATE: December 08, 2004

OUR REPORT NO.: 390-30102-80

TEST DATA:

TEST NO.	TEST DEPTH	ELEVATION	SOIL ID NUMBER	MAXIMUM LAB DRY DENSITY	WATER CONTENT	WET DENSITY	DRY DENSITY	PERCENT COMPACTION	COMMENTS* Spec. 95% Mi:
1		0-1		106.5	10.9	116.9	105.4	99.0	6 - A
2		0-1		106.5	11.9	117.3	104.8	98.4	6 - A
3		0-1		106.5	10.3	115.8	105.0	98.6	6 - A
4		0-1		106.5	10.6	115.4	104.3	97.9	6 - A

TEST LOCATION: SUBGRADE SOILS

1	320' W. & 40' N. OF THE SE CORNER OF BOTTOM OF LANDFILL ON SLOPE
2	300' W. & 15' N. OF THE SE CORNER OF BOTTOM OF LANDFILL ON SLOPE
3	330' W. & 10' S. OF THE SE CORNER OF BOTTOM OF LANDFILL
4	305' W. & 10' S .OF THE SE CORNER OF BOTTOM OF LANDFILL

NOTES: TESTS PERFORMED PER ASTM D2922-96 & ASTM D3017-96
DENSITIES SHOWN: Lbs. per cubic foot
WATER CONTENT: Percent of dry weight
PERCENT COMPACTION: Based on maximum dry density obtained on sample indicated by soil ID number.

*COMMENTS:
1. FILL MATERIAL
2. BACKFILL
3. BASE COURSE
4. SUBBASE
5. SOIL CEMENT
6. OTHER

A. TEST RESULTS COMPLY WITH SPECIFICATION
B. PERCENT COMPACTION DOES NOT COMPLY WITH SPECIFICATIONS
C. RETEST OF PREVIOUS TEST
D. MOISTURE IN EXCESS OF SPECIFICATIONS
E. MOISTURE BELOW SPECIFICATIONS

TEST INSTRUMENT: TROXLER

STANDARD COUNT M: D:

ADJUSTMENT DATA M: D:

REMARKS: 95% OF MODIFIED PROCTOR
DEPTH OF TEST REFERENCED IN FEET
0 = TOP OF SUBGRADE

TECHNICIAN: DR

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Respectfully submitted,
Professional Service Industries, In

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

THESE TEST RESULTS APPLY ONLY TO THE SPECIFIC LOCATIONS NOTED AND MAY NOT REPRESENT ANY OTHER LOCATIONS OR ELEVATIONS
REPORTS MAY NOT BE REPRODUCED, EXCEPT IN FULL, WITHOUT WRITTEN PERMISSION BY PROFESSIONAL SERVICE INDUSTRIES, INC.

psi Information To Build On
Engineering • Consulting • Testing

RESULTS OF LABORATORY TESTING

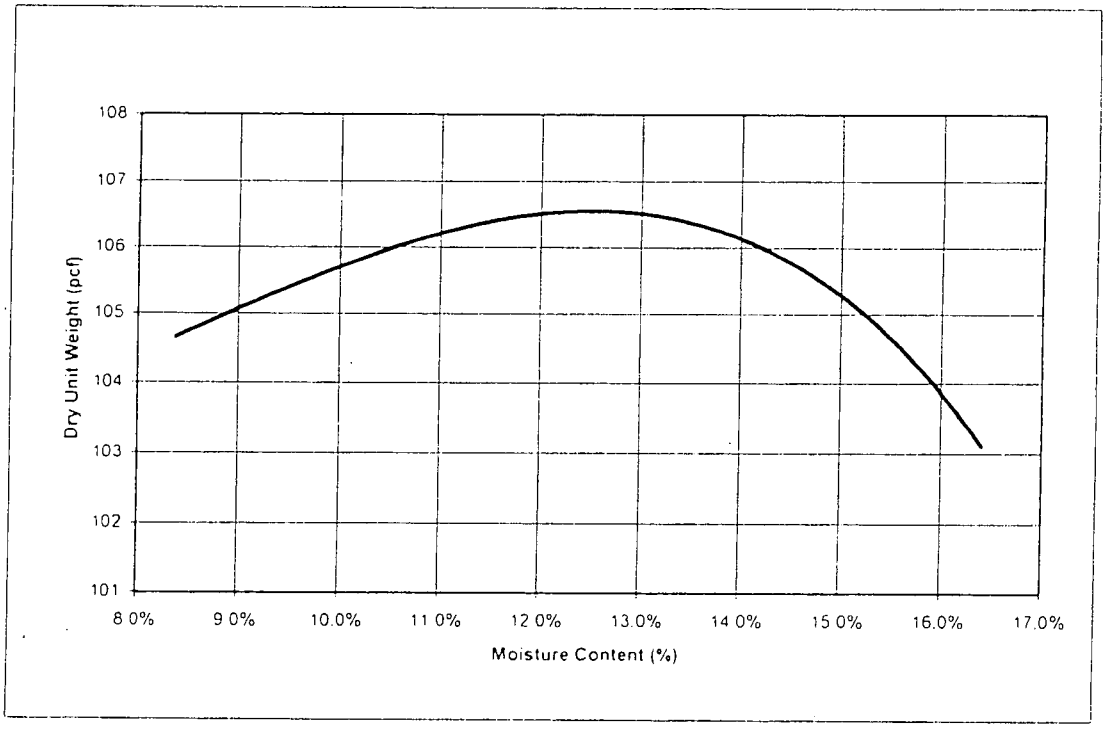
Tested For: Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, FL 32533

Project: Citrus County
Central Landfill

Date: 6/11/04

Project No. 390-30102
Report No. 34

MOISTURE-DENSITY RELATIONSHIP



Maximum Density 106.5 pcf
Optimum Moisture 12.5 %
Test Method: ASTM D-698 Standard
Sampled by: PSI

Description: Very Pale Brown Fine SAND

Sample Location: Natural Ground, New Cell

Percent Passing #200: 6%

Respectfully Submitted,
Professional Service Industries, Inc.

Kevin H. Scott, E.I
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

These test results apply only to the specific locations noted and may not represent any other location. Reports may not be reproduced, except in full, without permission by Professional Service Industries, Inc. (Fla. Engineering Business No. 3684)

034_std proctor.xls

Information To Build On
Engineering • Consulting • Testing

RESULTS OF LABORATORY TESTING

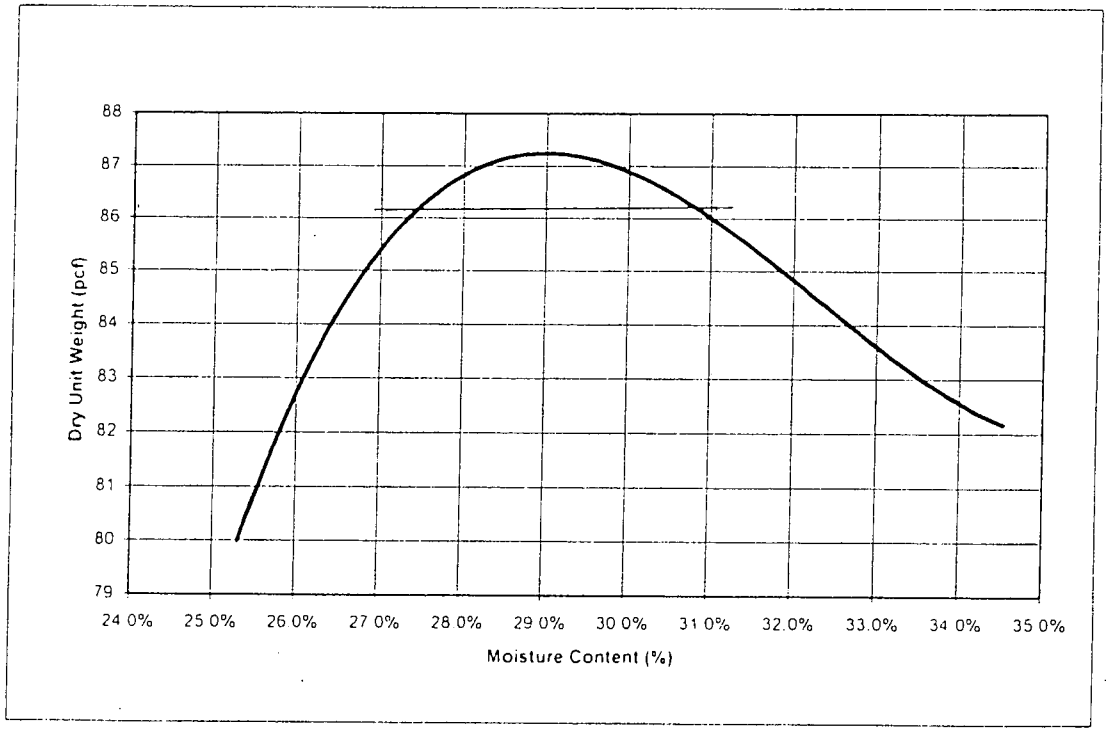
Tested For: Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, FL 32533

Project: Citrus County
Central Landfill

Date: 6/18/04

Project No. 390-30102
Report No. 39

MOISTURE-DENSITY RELATIONSHIP



Maximum Density 87.0 pcf
Optimum Moisture 29.0 %
Test Method: ASTM D-698 Standard
Sampled by: PSI
LL: 70 PI: 49

Description: Pale Brown Sandy Clay

Sample Location: Stockpile, Imported Material

Percent Passing #200: 59%

Respectfully Submitted,
Professional Service Industries, Inc.

Kevin H. Scott, E.I
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

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039_std proct xls

psi Information To Build On
Engineering • Consulting • Testing

RESULTS OF LABORATORY TESTING

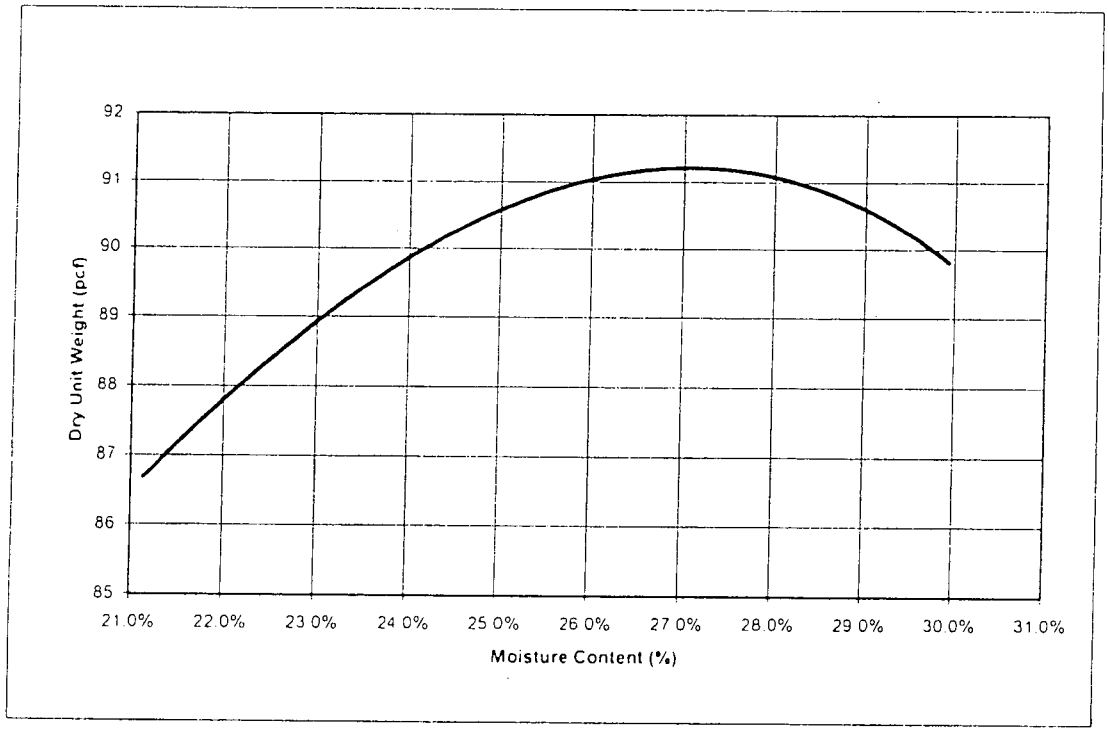
Tested For: Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, FL 32533

Project: Citrus County
Central Landfill

Date: 6/22/04

Project No. 390-30102
Report No. 40

MOISTURE-DENSITY RELATIONSHIP



Maximum Density 91.5 pcf
Optimum Moisture 27.0 %
Test Method: ASTM D-698 Standard
Sampled by: PSI
LL: 58 PI: 40

Description: Reddish Brown clayey SAND
Sample Location: Stockpile, Imported Material
Percent Passing #200 - 49%

Respectfully Submitted,
Professional Service Industries, Inc.

Kevin H. Scott, E.I
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

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040_std proctor xls

PSI *Information To Build On*
Engineering • Consulting • Testing

RESULTS OF LABORATORY TESTING

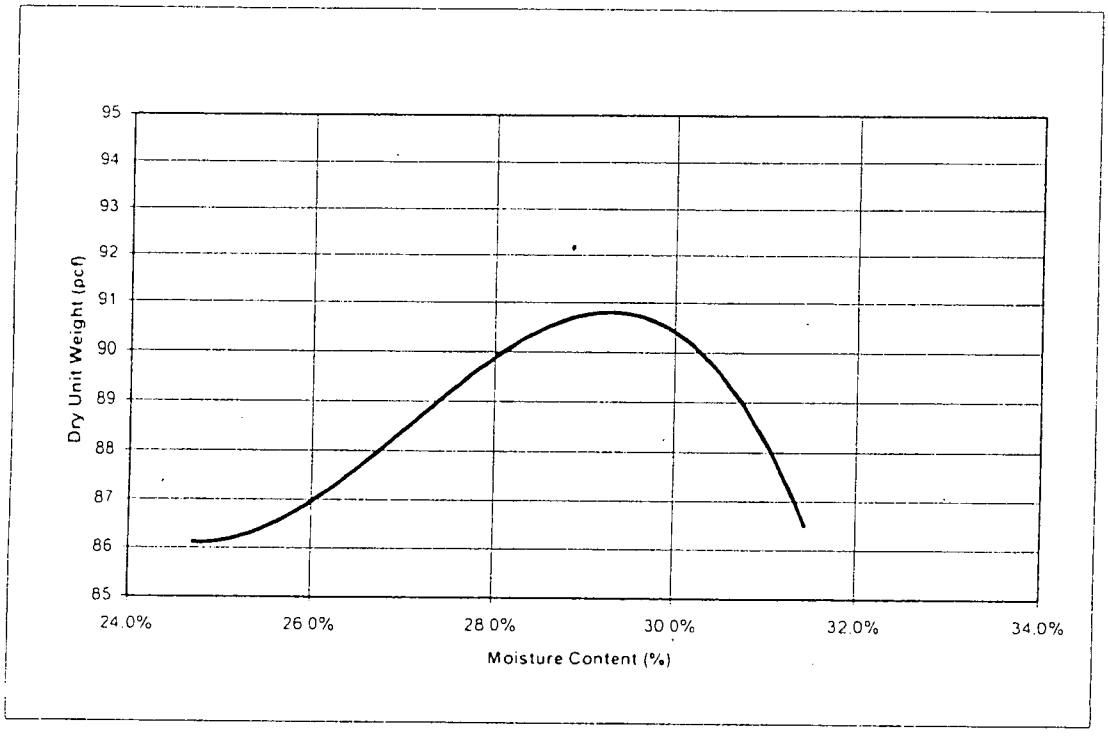
Tested For: Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, FL 32533

Project: Citrus County
Central Landfill

Date: 6/29/04

Project No. 390-30102
Report No. 41

MOISTURE-DENSITY RELATIONSHIP



Maximum Density 91.0 pcf
Optimum Moisture 28.5 %
Test Method: ASTM D-698 Standard
Sampled by: PSI
LL= 68 PI= 49

Description: Pale Brown Sandy CLAY

Sample Location: Borrow Pit

-200 = 62%

Respectfully Submitted,
Professional Service Industries, Inc.

Kevin H. Scott, E.I
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

These test results apply only to the specific locations noted and may not represent any other location. Reports may not be reproduced, except in full, without permission by Professional Service Industries, Inc. (Fla. Engineering Business No. 3684)

041_std proc.xls

PSI Information To Build On
Engineering • Consulting • Testing

July 7, 2004

Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, Florida 35233

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

RE: Borrow Source Qualification Letter
Citrus County Land Fill Phase II Expansion
Citrus County, Florida
PSI Report No. 390-30102

Dear Mr. Pitts:

This letter forwards the results of the laboratory soils testing performed on representative samples of the proposed low permeability soil to be used for the Citrus County Landfill Phase II Expansion in Citrus County, Florida. The laboratory testing was performed to verify that the soil specimens collected meet/exceed the project specifications for low permeability soil as specified in Table 02212-1 of the contract documents. The tests performed included flexible wall permeability tests (ASTM D-5084), Atterberg limits tests (ASTM D-4318), wash #200 sieve tests (ASTM-D1140), Maximum Dry Density and Optimum Moisture Content by Standard Proctor Method (ASTM D-698) and Natural Moisture Content determinations (ASTM D-2216). As required by the project specifications (Section 02212, Part 1, 1.03-C-4) three samples were collected for the above mentioned series of tests. The samples were collected from material stockpiled onsite that came from the proposed borrow source owned by DM and Sons, Inc. located at 5490 W. Homosassa Trails in Lecanto, Florida. In addition, one (1) sample of the stockpiled proposed low permeability soil and leachate collected from the landfill were tested for Leachate Compatibility using the U.S. EPA Test Method 9100. The table on the following page shows the results of the laboratory soils tests as well as the corresponding project specifications.

Should you have any questions or require additional information, please do not hesitate to call our office.

Respectfully Submitted,
Professional Service Industries, Inc.

Kevin H. Scott, E.I.
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154
7-7-04

Attachment: Table 1 – Laboratory Tests for Low Permeability Soil Borrow Source Acceptance

KHS/JMP_39030102_Borrow Source Qualification Letter

Table 1
Laboratory Test Results For Low Permeability Soil Borrow Source Acceptance
Citrus County Land Fill Phase II Expansion
Citrus County, Florida
PSI Report No. 390-30102

Sample Location and Description	*Constant Head Permeability (ASTM D-5084) (cm/sec)*	*Percent Compaction & Moisture Content*	*Natural Moisture Content (ASTM D-2216)*	*Standard Proctor (ASTM D-698)*	*Atterberg Limit (ASTM D-4318)*	*Wash #200 (ASTM D-1140)*	*Leachate Compatibility (EPA T.M. 9100) (cm/sec)*
Stockpile Pale Brown Sandy Clay	1.99×10^{-6}	98.8% @ 14.2%	26.5 %*	87.0 pcf @ 29.0%	LL=70, PI=49	59%	4.6×10^{-6}
Stockpile Reddish Brown Clayey Sand	2.62×10^{-6}	98.3% @ 24.0%	21.8 %*	91.5.0 pcf @ 27.0%	LL=58, PI=40	49%	---
Stockpile Pale Brown Sandy Clay	4.11×10^{-7}	96.7% @ 21.7%	25.0 %*	91.0 % @ 28.5%	LL=68, PI=49	62%	---
Project Specifications	**$\leq 1.0 \times 10^{-5}$**	**Min. 92%**	**---**	**---**	**20<LL<80 10<PI<40**	**> 20%**	**$\leq 1.0 \times 10^{-5}$**

* Natural Moisture Content as determined from samples obtained from stockpile.

ATTACHMENT B

LINER AS-BUILT DRAWINGS

1560821 (1)

NORTH

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

LEGEND	
P PANEL NUMBER	FUSION CAP
R REPAIR NUMBER	REPAIR
DS DESTRUCTIVE SAMPLE NUMBER	DESTRUCTIVE SAMPLE
T T WELD	EXTRUSION WELD

PHASE 2 EXPANSION
PRIMARY
LAYER
AS-BUILT

CITRUS COUNTY
CENTRAL LANDFILL

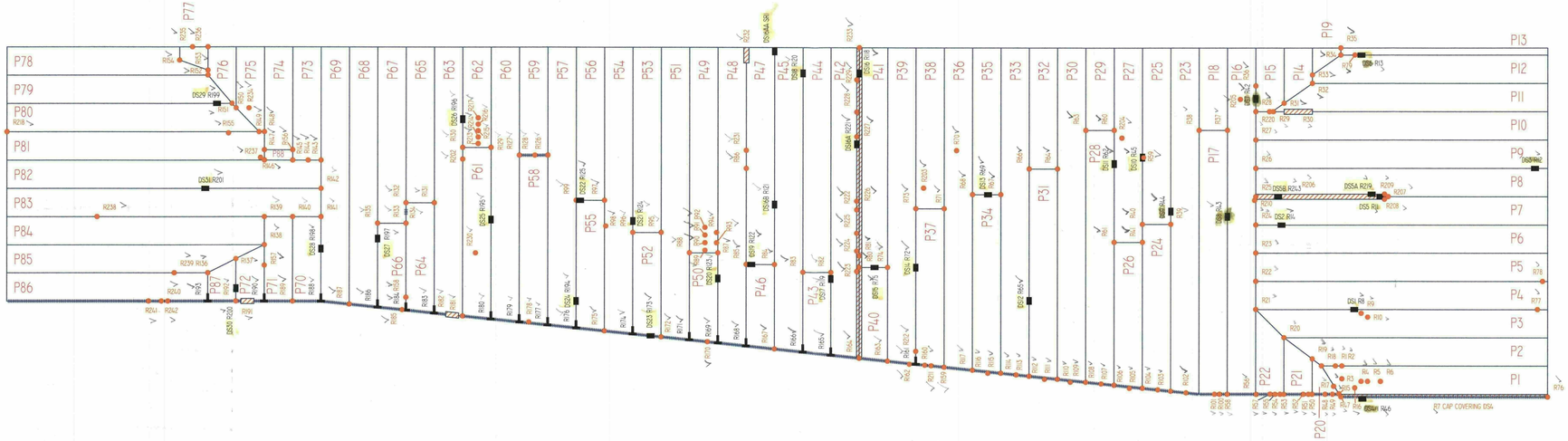
GSE
60 MIL
TEXTURED

COMANCO
ENVIRONMENTAL CORPORATION
7911 PROFESSIONAL PLACE
TAMPA, FLORIDA 33637
TELEPHONE: (813) 988-8829
FAX: (813) 988-8779

DRAWN BY:	WDS	CHKD. BY:	RL
DATE:	2-14-04	APPRVD. BY:	PR
PLOT SCALE:	1" = 50'	FILE NAME:	CITRUS COUNTY CENTRAL LANDFILL
PROJECT NO.:	03-1088	DWG. NO:	1

Primary

NORTH


P77
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P28
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P24
P17
P22
P21
P20
DSS1 R201
DSS2 R71
DSS3 R64
DSS4 R221
DSS5 R26
DSS6 R24
DSS7 R20
DSS8 R214
DSS9 R202
DSS10 R96
DSS11 R73
DSS12 R54
DSS13 R59
DSS14 R52
DSS15 R50
DSS16 R43
DSS17 R40
DSS18 R37
DSS19 R34
DSS20 R31
DSS21 R28
DSS22 R25
DSS23 R22
DSS24 R19
DSS25 R16
DSS26 R13
DSS27 R10
DSS28 R7
DSS29 R99
DSS30 R238
DSS31 R240
DSS32 R242
DSS33 R244
DSS34 R246
DSS35 R248
DSS36 R250
DSS37 R252
DSS38 R254
DSS39 R256
DSS40 R258
DSS41 R260
DSS42 R262
DSS43 R264
DSS44 R266
DSS45 R268
DSS46 R270
DSS47 R272
DSS48 R274
DSS49 R276

ATTACHMENT C

DAILY CONSTRUCTION QUALITY ASSURANCE FIELD REPORTS

BEST AVAILABLE COPY

SCS ENGINEERS DAILY FIELD REPORT 0745 – 1500

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-17-04 **Contract Day:** +6 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Komatsu 300 excavator A	Ft. Loader A		
JD 650 dozer A	Trackhoe } staff A		
off road dump A	Cat D6 dozer }		
on road dump A			

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	6	

Description of Construction Activity Advance completed removal of discharge pipe and headwall for old pump station — Advance continues to grade cell using JD 650 dozer, excavator and 1 off road dump — Advance continues to remove excavated material from stock pile using Ft. Loader, on road dump and OHE trucks — Some clay being hauled to SW clay stockpile

List of Subcontractors
SMG

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
		667,500 cy

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-17-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-13-04 **Contract Day:** +7 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:** 1.0in **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-14-04

SCS ENGINEERS DAILY FIELD REPORT 0730 - 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-14-04 **Contract Day:** +8 **Contract Duration:** 365

note: 1" of rain on 6-13-04 shower @ 1450 TO 1530 - 0.5in, rain cont. off & on still raining

Weather
Temperature: (AM) 85 **(PM)** 90 **Rain:** 1.8in **Duration of rain:** 1450→
Description of weather: Foggy early - To clear by 0900 Then cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	on road dump	A	sheepsfoot roller	I
JD 650 dozer	A	on road dump	A	water truck	I
off road dump	A	F.L. loader	A	Track hoe	at pit A
off road dump	A	grader	A	Cat D6 dozer	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	8	

Description of Construction Activity Advance continues to bring in clay with on road Trucks - clean trucks and haul of excavated material loaded by F.L. loader - some GMG trucks - Advance has Surveyors on site getting sub-grade top shots - Advance grading sub-grade and removing cut material out of cell.

List of Subcontractors
GMG
Surveyors,

List of Materials Delivered
Truck #13 for Geocomposite - 8 rolls 20,800 ft²
(Note: 6 rolls to be removed #40001 TO 40006 when Commando comes on site)

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-14-04

SCS ENGINEERS DAILY FIELD REPORT 0900-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-15-04 **Contract Day:** +9 **Contract Duration:** 365
rain start 1700 →

Weather
Temperature: (AM) 86 **(PM)** 88 **Rain:** 0.75 **Duration of rain:** 1700 on →
Description of weather: cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	off road dump removed		sheepfoot roller	I
JD650 dozer	A	SD70D roller Ingersoll-Rand delivered		Cat D6 dozer > offsite	A
FT Loader	A	on road dump	A	Truck hoe	
off road dump	A	on road dump	A	water Truck	I
				grader	A

Personnel on site:

2	8	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Safety Meeting. Advance continues To bring clay To site - Advance removing excavated material using Ft. loader 2 on road dumps 4 SPMC Trucks + Advance continues To shape - grade off Excavator JD650 dozer and grader 1 off road dump - Surveyors - Topo for TRI. Section PSI on site 101 PQC - 99% Sub-Grade - walked no foreign material Advance start placing clay with MT31 Moxy off road dump #93 3 samples of Geogrid + shipped To TRI spread clay with JD650 dozer

List of Subcontractors

SMB	PSI	
Surveyors		

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-15-04

185
27/5000 24.1 86.5
27
230
216
140
135
50

0750-1800

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-16-04 **Contract Day:** +10 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: clear - to part ly cloudy

List of Active Equipment on site

Kawasaki 300 excavator	A	on road dump	A	grader	A
JD 650 dozer	A	on road dump	A	Track hoe > 40 ft	A
Ft. Loader	A	smooth roller	1 hr.	Cat D6 dozer	
off road dump	A	sheep foot roller	I		

Personnel on site:
2 (one for 1 day) — **No. of Superintendents**
8 — **No. of Skilled**
_____ — **No. of Laborers**

Description of Construction Activity Advance continues to grade cell
Advance continues to remove excavated material from stockpile
Ft. load 2 on road dumps 4 SM & Trucks — no work on
Test Section — some clay brought to stockpile

List of Subcontractors
SMG

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
CY		

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 6-16-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0745

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-17-04 **Contract Day:** 711 **Contract Duration:** 365

Weather
Temperature: (AM) 64 **(PM)** 91 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Kamatsu 300 excavator	A	on road dump	A	smooth roller	1
JD650 dozer	A	on road dump	A	water truck	1
off road dump	A	grader	A	track hoe	1
FT loader	A	sheepfoot roller	1	Cat D6 dozer	1

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	9	

Description of Construction Activity Advance placing a retaining berm in area of wash out in SW corner of Cell 1 PST on site. Took basic tests in soil test pad to see where we are 25-28% moisture 82-86% compaction. Use dozer to scarify clay to dry + wet to crossing. All to test next lift = 100% compaction OK. Advance continues to remove stock pile material using FT loader on road dumps and 6 MT trucks — grading & shaping with clay being brought to clay stockpile.

List of Subcontractors
SMC
PST

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-17-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0840-1650

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-18-04 **Contract Day:** +12 **Contract Duration:** 365

Weather
Temperature: (AM) 86 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear - Partly cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	on road dump	A	sheepfoot roller	1
JD 650 dozer	A½	on road dump	A	Cat Dozer 963	1
FT loader	A	grader	A	Track hoe	1
off road dump	A2	water truck	1	Smooth roller	A

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	8	

Description of Construction Activity Advance preparing another section for clay - surveyors shot sub-grade - PST tested for compaction Test pit clay moisture is high about 25% Advance removing excepted material using FT loader 2 dump and SMG Trucks. Advance beginning placing clay for next section

Progress Meeting 4:45

Advance made 9 passes on clay (5 w/26 + 4 w/26)
moisture at 25.6% 90.1% compaction

List of Subcontractors
PST SMG
Surveyors

List of Materials Delivered
clay for sub-base

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-18-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2004
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-19-04 **Contract Day:** 119 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents **No. of Skilled** **No. of Laborers**

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-21-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-20-04 **Contract Day:** +14 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Komatsu 300 excavator A	Bomag roller A	
VD65 Dozer A		
Off road dump A		
Grader A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-21-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

BEST AVAILABLE COPY

SCS ENGINEERS DAILY FIELD REPORT 0745 – 1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-21-04 **Contract Day:** +15 **Contract Duration:** 365
Ht. rain at 0830 — drops only

Weather
Temperature: (AM) 86 **(PM)** 97 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy No rain over weekend

List of Active Equipment on site

Kenatsu 300 excavator	A2	on road dump	A2	Water truck	1
D6TD dozer	1	on road dump	A2	smooth drum roller	1
Ft. Loader	A2	Cat D6 dozer	1	sheep foot roller	1
off road dump	A2	Track hoe	1	grader added Kenatsu dozer	

Personnel on site:
2 — No. of Superintendents
6 — No. of Skilled
3 — No. of Laborers

Description of Construction Activity Advance continues to grade in cell 1. Advance continues to remove material from excavation stockpile using 2 on road and some SMB trucks. 2 on road dump trucks removed from site @ 1400 hrs. and Kenatsu D5 dozer delivered. PST testing on test pad indicate is one spot 23.7% moisture and 95% compaction other areas not as good. Scraping with grader to mix and dry then will run sheepsfoot roller. PST would be back Tomorrow @ 0800. Advance might have enough clay on site for Sub-base in clay stockpile.

Universal Engineering Sciences on site (at request of SCS + County) for CQA Proctor

List of Subcontractors
PST
SMB

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-21-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0700-1800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-22-04 **Contract Day:** +16 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Komatsu 300 excavator	A2	offroad dump	A	water truck	F
JD 650 dozer	A	sheepfoot roller	I	cat 6 dozer > at pit	
Komatsu 65 dozer	A	smooth roller	I	Trackhoe /	
grader	I	FT. Loader	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	4	

Description of Construction Activity Safety Meeting
Advance removing zone excavate material using FT Loader and 8 WC Trucks — Dynapac grading cell — PST moving Test for Moisture & density - waiting for Proctor results — Surveyors setting grades

Proctor - received - Tests in cell pad begin 1450 Test 1 1st Thickness 5 1/2" marked 5 locations for Tests — Thickness not passing — will add material ~~Tomorrow~~ Tomorrow?
10 samples Taken

List of Subcontractors
SWC
PST
Surveyors

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-27-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0730-1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-23-04 **Contract Day:** +17 **Contract Duration:** 365
0.75" overnight

Weather
Temperature: (AM) 84 **(PM)** 93 **Rain:** 0.75 **Duration of rain:** _____
Description of weather: clear To partly cloudy

List of Active Equipment on site

Kumatsu 300 excavator	A	off road dump	A	Cat Dozer	
Komatsu D5 dozer	A	sheep foot roller	A	Track hoe	
JD 650 Dozer	A	smooth roller	A	Water Truck	
Ft. Loader	A	grader	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	4	

Description of Construction Activity Advance grading roads from last night's rain - surveyors + PST on site, Advance loading 5 dump trucks from excavated material stockpile with Ft. Loader - grading + rolling

Test pad was scarified (wet from rain) new material from construction pile brought to test pad - spread with dozer JD 650 Cat D-4 roller 2X with sheep foot roller cut with excavator grader 2 X passes w/ 1 X passes with smooth

List of Subcontractors
PST
Surveyors
SMG

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-23-04

F.D. 10

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0730-1745

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-24-04 **Contract Day:** 718 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 300 excavator ~~2~~ 4	Sheepfoot roller ~~2~~ 4	FT. Loader 4
Komatsu 65 dozer ~~2~~ 4	Smooth roller ~~2~~ 4	Cat Dozer ~~2~~ 4
JD 650 dozer 4	grader ~~2~~ 4	Trackhoe
Offroad dump. ~~2~~ 4	Water Truck ~~2~~ 4	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	9	

Description of Construction Activity Advance continues to trim & grade cell — Advance continues to remove material from excavated stockpile using FT. loader & SMG trucks — Surveyors checking grades and placing grade stakes PSI on site to observe work on test section — should be ready for tests sheepfoot 2 pass - Trim with grader 10 pass smooth roller 25-28% moisture 89-92% compaction clay layer should be good

Used water truck to wet clay — left Tire tracks

List of Subcontractors

SMG surveyors	PSI	

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Deanna N. DuPont **Date** 6-24-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

95% compaction req'd by spec 02220-Table 1

BEST AVAILABLE COPY

SCS ENGINEERS DAILY FIELD REPORT 0720-1745

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-25-04 **Contract Day:** +19 **Contract Duration:** 365

1600hrs rain began brief shower

Weather
Temperature: (AM) 86 **(PM)** 92 **Rain:** 0 **Duration of rain:** _____
Description of weather: clear to cloudy

List of Active Equipment on site

Komatsu 300 excavator A	grader ~A	Komatsu 65 dozer
JD 650 dozer A	6 sheepfoot roller	Trackhoe > at pit
F.T. loader A ~	smooth roller ~A	cat D6 dozer > at pit
off road dump A ~	watertruck	

Personnel on site:
2 No. of Superintendents
3 No. of Skilled
No. of Laborers

Description of Construction Activity Advance decided to pull test for Test pad, want to wet pad 1st, using proctor #3 Mexden, 91.5 pcf Opt. Moisture 2.0% 1926 min comp, 95 Test pad constructed using JD 650 dozer to place clay about 8" loose - graded to trim to thickness of 6" min. then smooth drum roller with vibrator on 1 pass - then 10 passes with smooth drum with vibrator off. Wet for overnight next day (today) quick test with nuclear 29.2% moisture 95.8% compaction Progress Meeting No. 4, after meeting SCS, Advanced PSI went to Test section - decided to dry and re-compact PSI & Universal pulled mixed then split, sample to go to Tel Lab for Proctor. PSI indicated Test pad material Too wet

List of Subcontractors
PSI
Some SMG Trucks
Surveyors.

List of Materials Delivered
1

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 6-25-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-26-04 **Contract Day:** #15-120 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 300 excavator A	Smooth drum roller A	
JD650 dozer A		
Offroad dump A		
grader A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	

Description of Construction Activity Advance continues to place clay in cell bottom load in to offroad truck by excavator spread with JD650 dozer in 12" lifts then wet spray to about 4-6" thickness graded roll off before leaving site to seal (Pass 3)

List of Subcontractors
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-26-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-27-04 **Contract Day:** ~~146~~ 121 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents **No. of Skilled** **No. of Laborers**

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-28-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-28-04 **Contract Day:** ~~+2~~ +22 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to Partly cloudy

List of Active Equipment on site

Komatsu 300 excavator A	Smooth roller I	FL loader A
JD 650 dozer A	Sheep foot roller I	
Komatsu 65 dozer A	water truck	
offroad dump A	grader	

Personnel on site:

3	3	3 conc,
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance Concrete crew on site To form up headwalls and work on culverts, Advance Timing grading shaping slopes no work on clay

List of Subcontractors

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-28-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0700-1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-29-04 **Contract Day:** #18 of 423 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** 1.5" rain after 1730 hrs **Duration of rain:** _____
Description of weather: clear - cloudy

List of Active Equipment on site

Komatsu 200 excavator A	off road dump A	water truck
Komatsu 65 dozer	grader	
JD 650 dozer	smooth roller	
FT. Loader	sheepfoot roller	

Personnel on site:

3	3	3 cons.
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Safety Meeting - Concrete crew working on culvert #1 - Advance has PSI on site claims Test Pad is ready - 5 points marked for test on test pad.

Location	% moisture	density compaction	Thickness
#1 →	26.8	91.2	6 1/2 - 7"
#2	28.3	88.9	8 3/4"
#3	28.1	88.7	8 1/4
#4	27.7	89.0	9"
#5	28.9	90.1	8"

List of Subcontractors
Surveyor
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0730-

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-30-04 **Contract Day:** 119+24 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** ~~~~ **Duration of rain:** _____
Description of weather: clear to partly cloud

List of Active Equipment on site

Komatsu Excavator A	smooth roller I	FT. Loader
Komatsu 65 dozer A	sheep foot roller I	
Offroad dump A	grader	
JD 650 dozer	water truck I	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
3	3	3 conc.

Description of Construction Activity Universal on site - cell very wet from 1.5 in rain last night - sample #1 Taken within 3' of PST #1 moisture 34.2% dens. 85.0 comp. 93.4 using 91.0 Proctor depth 6' plus. Conc. crew working on crossing 11B headwalls - Advance grading cell slopes and access road.

List of Subcontractors
Universal

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 6-30-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0800 — 1800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-7-1-04 **Contract Day:** PTO +25 **Contract Duration:** 365
1330 Arrive To 1500 — Trace

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear To cloudy

List of Active Equipment on site

Komatsu 300 excavator A	grader I	water Truck I
Komatsu 65 dozer A	FT. Loader	
offroad dump A	smooth roller I	
JD 650 dozer	sheepfoot roller I	

Personnel on site:

3	3	3
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance continues To work on access road To cell — Conc. crew working on crossing "B". PSI is scheduled To test Conc — Forms not ready rebar not ready

Concrete crew left site today To go back for proper supplies and equipment — did not have a Trailer, generator and some other required tools, some material and ~~no~~ was inappropriate and did not have a local supply.

Power connected To storm water pump station control Panel

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-1-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7/2/04 **Contract Day:** +26 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Kimatsu 300 excavator A		
Kamatsu 65 dozer A		
offroad dump A		

Personnel on site:

2	3	—
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Conc. Crew not here went back to main office for material & equip. Advance continues to work on Access rd to Cell and fine grade slopes.

Progress Meeting #47

Advance stopped work at 1200 hrs and left site at 1230 hrs for the holiday weekend.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-2-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02 (Const.)

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-3-04 **Contract Day:** T 27 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-6-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-4-04 **Contract Day:** +28 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-6-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-5-04 **Contract Day:** +29 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-6-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700-1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-6-04 **Contract Day:** +30 **Contract Duration:** 365

Weather
Temperature: (AM) 86 **(PM)** 94 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 300 excavator	A	grader	I	Trackhoe w/ pipe	I
Komatsu 65 dozer	A	Smooth roller	I	Cat D6 dozer	I
ID 650 dozer	A	sheepfoot roller	I	F.E. loader	I
off road dump	A	water truck	I		

Personnel on site:

3	4	2 conc.
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Conc. placed on site for retaining walls. Surveyors on site for grade stakes - Advance continues to fine grade cell. Site to Wednesday. Advance getting pre-cell bottom ready for subgrade QC.

List of Subcontractors
Surveyors - short time on site

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-6-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-7-04 **Contract Day:** +31 **Contract Duration:** 365

C.T. Rain 1500-1510 not even a Trace

Weather
Temperature: (AM) 86 **(PM)** 94 **Rain:** Trace (after 1730) **Duration of rain:** 7
Description of weather: clear To cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	smooth roller	2A	FT. Loader	1
Komatsu 65 dozer	A	sheep foot roller	1	Trackhoe	1 at A+A2
JD 650 dozer	2A	grader	1A2	Cat D6 dozer	1
off road dump	A2	water truck	1		

Personnel on site:

3	4	2 conc.
No. of Superintendents (2A for 1 day)	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Conc. crew working on headwalls for Crossing "B" - fine grading sub-grade in West end of cell — Surveyors on site for sub-grade Topo at west end of cell - PSI on site to test sub grade - and monitor clay installation-placement

List of Subcontractors

Surveyors
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Sub-base 50'x200'x1.5'FT = 5,000FT³ = 185 yd.³ (Test Section)		185 yd.³

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 7-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-8-04 **Contract Day:** 132 **Contract Duration:** 365

Weather
Temperature: (AM) 86 **(PM)** 94 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to cloudy

List of Active Equipment on site

Komatsu 300 excavator I	grader I	water truck I
Komatsu loader A	FT. loader A	Trackhoe > 6 tons A
J.D. 650 dozer A	smooth roller I	Cat D6 dozer /
offroad dump - Repair	sheep foot roller I	

Personnel on site:

3	4	3
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity PSI on site for clay installation. E&H on site to check stormwater pumps systems. Conc. crew finishing footer section after crossing "B" — Advance removed some material excavated by using FT. loader and 5 MC Trucks

Received Fax of Rpt #1 from Universal - Taken next to PSI #1 on Test section
Repair OK
footer poured OK for Wing wall No. crossing "B"

List of Subcontractors

PSI	SMC	
E&H		

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-8-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-9-04 **Contract Day:** +33 **Contract Duration:** 365

1520 rain start 1600 end 0,3in rain.

Weather
Temperature: (AM) 86 **(PM)** 94 **Rain:** 0.3in **Duration of rain:** 40min
Description of weather: clear – cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	Smooth drum roller	F	Water Truck	I
Komatsu 65 dozer	A	Sheep foot roller	F	Tractor Loader	A
JD 650 dozer	Repair	Grader	I	Cat D6 dozer	A
Off road dump	A	IFT loader	A		

Personnel on site:

3	4	3
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance Conc. Form & pour 4' Stoop for manwell at crossing "B". Advance trench for pipe to site and backfill. Ret. on site to monitor clay placement and conc. test from Entech.

Progress 1415 to 1445

Received RFI submittal 3-7A & 7-5B

List of Subcontractors

PST

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-9-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File; 09199056.04/Const/

SCS ENGINEERS DAILY FIELD REPORT 0800-1300

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-10-04 **Contract Day:** +34 **Contract Duration:** 365

Weather
Temperature: (AM) 86 **(PM)** 96 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 300 excavator A		
Komatsu 65 dozer A		
offroad dump A		

Personnel on site:

1	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continued to work on access to sump + cell – cutting in ditch on N. side of access road – ~~removing stone material from excavation stock~~

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-11-04 **Contract Day:** +35 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** 0.6in, **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-12-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-12-04 **Contract Day:** +36 **Contract Duration:** 365

0.6 in rain overweekend – Sunday rain began 1700 hrs continue

Weather

Temperature: (AM) 86 **(PM)** 96 **Rain:** Trace **Duration of rain:** _____

Description of weather: clear to ~~partly~~ cloudy

List of Active Equipment on site

Komatsu 300 excavator	A	off road dump	1	grader	1
Komatsu D5 dozer	A	JD 650 dozer repair		Track hoe > 4ft	
Sheep foot roller	A	Water truck	1	Cat bladozer	
FT. Loader	A	smooth Roller	1		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	4	

Description of Construction Activity Advance installing remainder of 24" CPP for Swale "A" – Advance removing material from excavation stock pile using FT Loader and SMG Trucks – PST on site to check completion on 24" RCP installation. 100 ft. 5 lengths of 20' installed

List of Subcontractors

SMG
PST

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
24" CPP	100'	280'

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-12-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-13-04 **Contract Day:** 737 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 94 **Rain:** — **Duration of rain:** _____
Description of weather: clear to cloudy

List of Active Equipment on site

Kumatsu 300 excavator A	JD650 dozer repair I	water Truck E
Kamatsu 65 dozer A	Smooth roller A2 I	Trackhoe \ diff. A
offroad dump A2	sheepfoot roller I	Cat Dozer
FT Loader A2	grader A2	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	4	

Description of Construction Activity Safety Meeting — Advance moving material excavated To stockpile to County for cover using FT loader + offroad dump. Advance grading & spreading clay To day

hauling in more clay to day stockpile

measured clay installed To site —

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Silt-fence	Tested 10,000 ft	80,088 ft. 2

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 7-13-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 - 1800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-14-04 **Contract Day:** +38 **Contract Duration:** 365

0.1 in rain Early morning

Weather
Temperature: (AM) 84 **(PM)** 94 **Rain:** 0.1 in **Duration of rain:** _____
Description of weather: clear - partly cloudy

List of Active Equipment on site

Komatsu PC300 excavator	A	grader		water truck	1
Komatsu WA 250 loader	A	FT. loader		trackhoe	1 PT 1
JD 650 dozer repair	I	Smooth roller	A2	Cat D6 dozer	1
off road dump	A	Sheepsfoot roller			

Personnel on site:

1 for Conc. 2	4 (1 - partial day)	3 Conc.
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Surveyors on site - Did a Topo as built for haul road Access Road, intersection for new county traffic pattern. - Advance working on crossing #1 Conc. crew working on forms for Wingwalls crossing #5 Assisted Susie for Field Order #15 Received draft Pay App #12 - revised numbers

List of Subcontractors
Surveyors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-14-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0750-

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-15-04 **Contract Day:** + 39 **Contract Duration:** 365

shower began 1150-1220 Trace
" " 1400-1405 Tot. 0.1"

Weather
Temperature: (AM) 84 **(PM)** 90 **Rain:** 0.1" **Duration of rain:**
Description of weather: cloudy

List of Active Equipment on site

Komatsu 300 excavator A	grader A-2	Water Truck I	
Komatsu 65 dozer A	Smooth roller A-2	Trackhoe w/pit I	
offroad dump A	sheepsfoot roller I	CAT Dozer to be removed	
JD 650 dozer repaired	FT Loader I		

Personnel on site: (1-sonic)

3	3	3 sonic
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Kirk left 2:00

Description of Construction Activity Advance working on access road to sump/cell — compacting material for crossing "A" — concrete crew working on injection wells crossing 15B — PST on site for densities on Crossing "A"

List of Subcontractors
Surveyors
PST

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-15-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-16-04 **Contract Day:** +40 **Contract Duration:** 365

Light Shower 2 1200 Onsite Time

Weather
Temperature: (AM) 84 **(PM)** 92 **Rain:** _____ **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

Komatsu 300 excavator A	grader A2	water Truck 1 T
Komatsu 65 dozer A	smooth roller I	Track hoe I
JD 650 dozer repair	sheep foot roller I	
off road dump A2	Ft. Loader I	

Personnel on site:

1-conc.	3	3-conc.
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to work on access road to cell/sump - Conc. crew working on wing walls for crossing "B"

Progress Meeting # 49

Monitor well protective pipe was hit - did not affect integrity of well itself - well will need to be lowered for road installation

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-16-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/const/9

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7/17/04 SAT **Contract Day:** +41 **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 89 **Rain:** 1.75" **Duration of rain:** 1 3/4" IN GUAGE
Description of weather: OVERCAST

List of Active Equipment on site RAIN LATE P.M. FRI. CLAY SATURATED

KOMATSU 300 EXC. 1	Grader #2	
" 6.5 LOADER 1		
MOXY OFF ROAD TRUCK 1		
VIBRATORY ROLLER #2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3 OP	

CONCRETE CREW 1 FM 2 TECH

Description of Construction Activity CONCRETE CREW ON SITE CONTINUED TO FORM HEADWALL AT BOX CULVERTS. DOWN BACKFILLED AROUND FORM.

DIRT GROUP HAULING TOP SOIL - MULCH TO SIDE SLOPES

PSI - DRANK ON SITE TOOK 6 IN PLACE DENSITIES OF HAUL ROAD USING 122 AS PROCTOR - USING MODIFIED PROCTOR FOR LBR SAND WAS CONSISTENT WITH SUBGRADE OF ROAD IN COLOR AND APPEARANCE. ALTERNATED SIDES OF ROAD TOOK TEST AT 0+55, 0+75, 1+75, 2+75, 3+55, 4+75 ALL OVER 96%

List of Subcontractors
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont 7-19-04 **Date** 7/17/04

KURT PETERSON

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-18-04 **Contract Day:** +42 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** 3.81" **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity Rain.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-19-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-19-04 **Contract Day:** T 43 **Contract Duration:** 365

3.8 in in our rain gauge over weekend
Light rain continues almost 0.4 by 1200

Weather
Temperature: (AM) 78 **(PM)** 88 **Rain:** ~~3.8~~in **Duration of rain:** _____
Description of weather: cloudy rain light

List of Active Equipment on site

Track hoe (A1)		
D650 dozer A2		

Personnel on site:

(1-conc.) 3	1 (for 3 hr.)	
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity No Activity

Rain tarp delivered today 10 rolls of 75'-90' ft ea
100 x 200 ft = 21,600 ft.² each = 216,000 ft.² Total

Conc. creed used 2" pump to pump portion at crossing B

List of Subcontractors

List of Materials Delivered

Rain Tarp	216,000 ft.²	

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-19-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700 - 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-20-04 **Contract Day:** 144 **Contract Duration:** 365

Weather
Temperature: (AM) 79 **(PM)** 89 **Rain:** ____ **Duration of rain:** ____
Description of weather: overcast to partly cloudy

List of Active Equipment on site

Personnel on site:

(1 conc.) 3	3 only (2-4 hrs)	3 conc.
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Conc. crew attempting to level and clean up at crossing "B". No other Activity. Safety Meeting.

Pay App #12 complete except for original of #4, Exhibit D.

4" Pump delivered to site. Sheepfoot roller removed.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-20-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-21-04 **Contract Day:** 145 **Contract Duration:** 365

shower began 1600 hrs for 15 min Trace

Weather
Temperature: (AM) 82 **(PM)** 89 **Rain:** ~~—~~ **Duration of rain:** _____
Description of weather: clear - cloudy

List of Active Equipment on site

Kimatsu 300 excavator	A	grader	A	offroad dump	A
Komatsu D5 dozer	A	sheepfoot roller	removed	Trackhoe	I
JD 650 dozer	I	Smooth roller	I		
Ft. Loader	I	Water truck	I		

Personnel on site:

3 (1 cond)	3	3 conc.
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Conc. crew work on forms for N. wing wall at crossing "B" - Advance grading drive roads

Advance cutting access ramp into cell 2

Pump delivered to site

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-21-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0730-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-27-04 **Contract Day:** +46 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** ____ **Duration of rain:** ____
Description of weather: slight overcast

List of Active Equipment on site

Komatsu 300 excavator A1 2nd	grader	A0 2	FT. Loader A-2
Komatsu 65 dozer A	smooth roller	I	
310 SD dozer A	water truck	I	
Off road dump A-2	Trackhoe	I	

Personnel on site:
(1-conf) 2 DOT 3 | 3 | 3 conc. (1 1/2 day)
No. of Superintendents | **No. of Skilled** | **No. of Laborers**

Description of Construction Activity Conc. crew working on lining wall forms crossing "B" — Advance placing pump today in cell.
Cutting new access road in to sump
Conc. crew left before 11:00
Project Meeting No. 50
Komatsu 300 excavator removed in afternoon

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-27-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0730 - 1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-23-04 **Contract Day:** +47 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: hazy

List of Active Equipment on site

5k Trackhoe	2	grader	A		
Komatsu 65 dozer	A	smooth roller	I		
D5 650 dozer	A(+)	water Truck	I		
off-road dump	2	FT. Loader	A½		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	

Description of Construction Activity Advance pumping water out of cell #1 To sump - Fine grading slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-23-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/const/ ~~minutes~~

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-24-04 Sat **Contract Day:** +48 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** 1.01" in gage **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
	2	

Description of Construction Activity No Activity other then pumping from cell 6 hrs 7 to 10 + 1130-1430

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-23-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-25-04 Sun **Contract Day:** +49 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

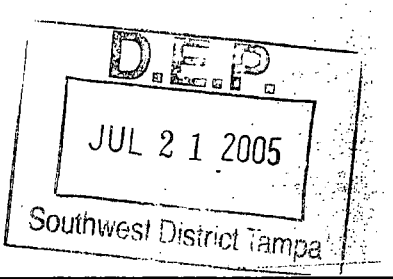
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-23-04



SCS ENGINEERS DAILY FIELD REPORT 10

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7/26/05 **Contract Day:** +50 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 93 **Rain:** — **Duration of rain:**
Description of weather:

List of Active Equipment on site

6.5 KOMATSU DOZER 1	4" HYD PUMP 1	10650 HEPO DOZER 1
140G GRADER 1	MOXY OFF ROAD TRUCK 1	
966 LOADER 1	WATER TRUCK 1	
VIBRATORY ROLLER 1	300 EXCAVATOR 1	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
DIRT GRP / QC	2 OP	CONCRETE

Description of Construction Activity CONTRACTOR ON SITE REGRADING WEST SLOPE 3 TO 1 WEST OF HAUL ROAD. SET DIVERSION BERMS FOR RAIN EVENTS. CONTINUED PUMPING SUMP WITH 4" HYD. PUMP

CONCRETE CREW - INSTALLING CUTWATER STRIP AT NORTH WING WALL AT CULVERT B. PREPARING FOR TOMARROWS POUR

EXCELTECH ON SITE TOO WET - WHOMY PAINT

BEGAN CLEANING BOTTOM OF CELL B1 DEMUCK'N & AND PUSHING SILT TO SUMP AREA

CONTRACTOR - STOP WORK AT 1:30

List of Subcontractors

Excelsitech		

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7/26/05

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 8

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7/27/04 **Contract Day:** +51 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 93 **Rain:** _____ **Duration of rain:** _____
Description of weather: LIGHT SPRINKLE

List of Active Equipment on site

6.5 KOMATSU DOZER I	MOXY OFF ROAD TRUCK A2	VIBRATORY ROLLER F
HYE KOMATSU DOZER A	4" HYD. PUMP A	JD 650 DOZER A
140 G GRADER A	330 KOMATSU EXCAVATOR A2	
966 LOADER A	WATER TRUCK F	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
DIST GRD 1 SUP 1 QC	3 OP 1 FM	3 LAB

Description of Construction Activity CONTRACTOR CONTINUED RE GRADING WEST 3 TO 1 SLOPE IN PREPARATION OF SODDING.

CONTINUED CLEANING BOTTOM OF CELL BY DEWATERING AND PUSHING MATERIALS UP SIDE SLOPES TO DRY OUT BOTTOM OF CELL

REVIEWED SUMP DRAWING WITH CONTRACTOR

CONCRETE CREW POURED CULVERT B NORTH WING WALL
HELD SAFETY MEETING WITH CREW
PSI ON SITE CHECKING SLUMP AND TEMP. OF CONCRETE TOOK 4 CYLINDERS FOR BREAK TESTING

List of Subcontractors
PSI

List of Materials Delivered
10 YDS³ 4000 5" SLUMP

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont Kurt Pettersen **Date** 7/27/04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-28-04 **Contract Day:** +52 **Contract Duration:** 365

Weather rain began 1630 continued
Temperature: (AM) 84 **(PM)** 89 **Rain:** 3.2" **Duration of rain:** _____
Description of weather: clear - cloudy

List of Active Equipment on site

Trackhoe	A2	smooth roller	A2
grader	A	off road dump	2
JD 650 dozer	A	water truck Pine pump	
FT. Loader	A2	Komatsu 65	1 (down)

Personnel on site:

1 conc. 1	3	3 conc.
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance pumping water out of cell ~~from~~ Advance working on N. slope from access road and access road. Conc. working on wing walls cross slope "B"
Berney's Pumps and F+H Electric on site to check wiring and pre test storm water pumps.
Cell was pumped down before rain began - no standing water

List of Subcontractors
F+H Electric
Berney's Pumps

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-28-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-29-04 **Contract Day:** +53 **Contract Duration:** 365

Weather
Temperature: (AM) 84 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

grader	A		
Conc, ~~Komatsu~~ Trackhoe	A		
FT Loader	A		
JD 650 dozer	A		

Personnel on site:

1 Conc.	2	3 conc.
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance grading access Road, pumping cell #, conc. work at crossing "B", repairing washouts N. to Stump Excelatech on site for painting - primary Pump station

S/T fence was leaned over — Advance repaired and extended - berm along entrance road

Tnemec Paint F066-3360A/BA20021100/2 / Grey / 56, 510000 CL Series 66 Part A Hi build Epoxoline

B066-0060/BA20030162900/converter/56: 5.00006L 66B-Converter / also 65-B, 160B, 161-B, 1261-B

List of Subcontractors
Excelatech

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G DuPont **Date** 7-29-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800–1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-30-04 **Contract Day:** +54 **Contract Duration:** 365

Weather
Temperature: (AM) 92 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Trackhoe A# 0515 "B"	Smoothroller A2	
JD650 Dozer A		
grader A2		
waterpump A-conc.		

Personnel on site:
(1 conc) 1 + ½ day | 2 | 3 conc.
No. of Superintendents | **No. of Skilled** | **No. of Laborers**

Description of Construction Activity Conc. crew working on wing wall for crossing "B" and getting ready for forming footers for crossing "C" — Alliance has pump running to dewater cell — fine grading slopes — Surveyors placing grade stakes

Progress Meeting No. 51

PSI on site — rebar + forms OK RFI on Forms to wide and blend wing wall to creek OK by ~~Eng~~ SCS — Vibrator on site Conc. Truck on site @ 1345 — small blowout 2-3 ft.3 — repaired vibrated remainder in OK

List of Subcontractors
Surveyors
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 7-30-04

J.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/Correspondence

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 7-31-04 **Contract Day:** 455 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance running pumps

No other Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-2-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-1-04 **Contract Day:** +54 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-2-04

RECEIVED
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 – 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-2-04 **Contract Day:** +57 **Contract Duration:** 365

1.8in of rain over weekend

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: cloudy – clear

List of Active Equipment on site about 3

grader	A/	~~a couple hours~~	
1D650	A/		
Pump all day	A and night		
Trackhoe	A/hr		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance continues to pump water out of cell into sump – Repairing washouts and cuts – silt fence to be repaired – ✓ repaired KM

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-2-04

D.E.P.
JUL 21. 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700 – 1530

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-3-04 **Contract Day:** +58 **Contract Duration:** 365

rain 0925 – 1005 – 0.3in

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** 0.3in **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

Grader 4th AE	water Truck I	off road dump I
JD650 dozer 3rd A	Smooth drum roller I	
Pump On A	Komatsu 65 dozer down	
Trackhoe A/M	FT. Loader I	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
(1 conc) 1	2	2

Description of Construction Activity Advance ~~End~~ filling pump – moving pump – pump on – Conc. crew removing forms Safety meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-3-04

JUL 2 1 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830-1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-4-04 **Contract Day:** +59 **Contract Duration:** 365
Lf. shaw 1015 — 1300

Weather
Temperature: (AM) 80 **(PM)** 88 **Rain:** 0.4 in **Duration of rain:** _____
Description of weather: cloudy -- intermeated showers

List of Active Equipment on site

Trackhoe	A½	Watertruck	I	Komatsu 65 dozer	I
JD650 dozer	A½	Smoothroller	I		
grader	A½	FT loader	I		
pump on	A	offroad dump	I		

Personnel on site:

(1 Conc) 2	2	3
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance repairing slopes - grading roads pump on — Conc. crew constructing forms for wing wall footer for crossing 'C'.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-4-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0740-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-5-04 **Contract Day:** +60 **Contract Duration:** 365
rain 1010 — 1105 Trace

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** Trace **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Trackhoe	A-2	Water Truck	I	6 wheel dump	I
JD 650 dozer	A	3 wheel roller	I		
Komatsu 65 dozer being repaired		Pump On	A		
Grader	A-1	FT Loader	I		

Personnel on site:

(1 conc) 7	2	3 conc.
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance grading slopes - wet spots pumping from off - Conc. crew getting footer forms & Rebar ready for Conc. Excelatech on site to paint pump station pedestal for cleaning. Inemec #A F041-0004 BA2004017500, clear 56-500062 Converter 73-B, Series 73 Part B enduroshield Paint Series 73 Part A, 6484 weathered Brown, 502010258, BSA25 I had Conc. crew make sure vibrator on site for pour This Afternoon.

List of Subcontractors
Excelatech

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-5-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-1815

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-6-04 **Contract Day:** +61 **Contract Duration:** 365

0830 Lt drizzle 1015-
rain 1015-1130

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** 0.7in **Duration of rain:**
Description of weather: cloudy

List of Active Equipment on site

Trackhoe A.V.	Grader	offroad dump
JD650 dozer A.V.	Smooth roller	
Komatsu 65 Dozer A.V.	offroad dump	
Pump	FT. Loader	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
(1 conc)	7	3 conc,

Description of Construction Activity Conc. crew constructing forms for wing walls at Crossing 11 Cell 1 Advance pushing sludge to sump end of cell to dry dry material Excaletech - drying pipe to perm

List of Subcontractors
Excaletech

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-6-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/consl/F

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-7-04 **Contract Day:** +62 **Contract Duration:** 365

Weather
Temperature: (AM) ~~80~~ **(PM)** ~~88~~ **Rain:** _____ **Duration of rain:** _____
Description of weather: ~~cloudy~~

List of Active Equipment on site

~~Backhoe~~		
~~JD650 dozer~~		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
	1	

Description of Construction Activity Advance pumped water out of cell into swamp. - no other activity 5 hr.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont ~~Dennis G. DuPont~~ **Date** 8-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-8-04 **Contract Day:** +63 **Contract Duration:** 365

3 Air, 3 Silt Sweep.

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8/9/04 **Contract Day:** +64 **Contract Duration:** 365

overnight 4.1 in. of rain included Fri. of 0.7 in. 4.1 - 0.7 = 3.4 in

Weather
Temperature: (AM) 76 **(PM)** 89 **Rain:** — **Duration of rain:** —
Description of weather: OVERCAST BECOMING SUNNY IN PM

ALL OTHER EQUIPMENT IDLE

List of Active Equipment on site

1 D6 Dozer	A		
4" Hyd. Pump	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2 of?	

Description of Construction Activity ADVANCE ON-SITE AT 7:00 AM
EMPTIED RAIN GUAGE FROM FRIDAY AUG. 6TH. GUAGE SHOWED 4.10 INCHES OF RAIN OVER WEEKEND. CELL HAS STANDING WATER - ADVANCE (including Fill) RUNNING 4" PUMP TO DEWATER CELL. ADVANCE REWORKING DRAINAGE SWALE ON NORTH SLOPE AND BUILDING ADDITIONAL DIVERSION BERMS AT MAIN HAUL ROAD.
CONCRETE CREW - IN ROUTE FROM PENSACOLA
CELL TO WET TO PRODUCTIVELY WORK - OPERATORS SENT HOME AT 10:30. SUPT. STAYED AND CONTINUED TO MONITOR CONDITIONS
ALL SIDE SLOPES CONTINUE TO BECOME HEAVILY ERODED DUE TO RAIN.
BARNEY'S PUMP - ONSITE WORKING ON PANEL CONTROLING STORMWATER PUMPS.
NOTED SILT FENCE DOWN IN AREA BY CONTRACTORS ENTRANCE - ADVANCE TO REPAIR AND BEEF UP WITH HAY BALES.

List of Subcontractors
BARNEY'S PUMP

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8/9/04 / 8-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-10-04 **Contract Day:** +65 **Contract Duration:** 365

Weather
Temperature: (AM) 90 **(PM)** 88 **Rain:** trace **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

JD650 Dozer A		
Komatsu 65 Dozer A		
Track hoe A		
pump on port day A		

Personnel on site:

(1 conc) 2	2	(2 conc)
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance grading washes in cell - pumped a little water - Conc building forms for crossing "C" wing walls and curbing. - Advance doing some erosion control at crossing "A". Hay bale placed in perimeter ditch to control sedimentation

Conc. crew out @ 16:50

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-10-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1830

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-11-04 **Contract Day:** +66 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 92 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Kamatsu 65 dozer A		
JD650 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
(1 conc) 2	2	2 conc.

Description of Construction Activity Pumping from Storm water Sump to East ditch pump start 0955' at 0950 water at weir continue pumping
Advance reinforced swale "B" in cell – fine grade slopes in cell to eliminate minor erosion – water has been pumped out of cell via storm drain only water in cell at west end of cell – silt fence OK – berms OK – access road to cell excavation & Storm water Sump berm OK – pump (Storm water) still on @ 1440 dropped water in sump about 7' maybe 2' above Sump Box?
Conc. getting ready to pour last of concrete at crossing "C" 1600hrs. Conc. on site need more for center –

List of Subcontractors
PSI for Conc.

List of Materials Delivered
Perf Pipe delivered (Not Acceptable)

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-11-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1300

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-17-04 **Contract Day:** #67 **Contract Duration:** 365

1300 start

Weather
Temperature: (AM) 80 **(PM)** 84 **Rain:** 0.2in, **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

Komatsu 65 dozer 1/4		
JD650 dozer 1/4		
grader 1/4		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
0	2 left @ 1300 hrs.	

Description of Construction Activity Advance prepared for storm
no supervisors Hurricane Charlie pending tstm. hit tomorrow
Conc. crew left at 0800 hrs

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-17-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-13-04 **Contract Day:** +68 **Contract Duration:** 365

Weather no rain
Temperature: (AM) _____ **(PM)** _____ **Rain:** ~~0.77in~~ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Hurricane expected today
No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-16-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/Const/7

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-14-04 **Contract Day:** +69 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

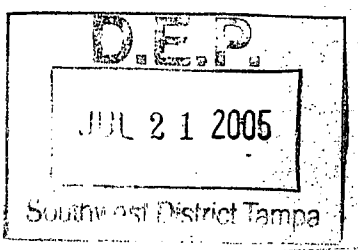
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-16-04



SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-15-04 **Contract Day:** +70 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-16-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0745-1515

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-16-04 **Contract Day:** +71 **Contract Duration:** 365

1.8in rain over weekend

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Komatsu 65 dozer #1		
Grader #1		
Trackhoe #2		

Personnel on site:

short time 1	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance pumping out of cell into storm water swamp - dressing slopes for erosion (mined off road dump removed from site

III stopped work 15:15 off-site

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-16-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700-1540

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-17-04 **Contract Day:** +72 **Contract Duration:** 365

rain @ 1520 rain cont.

Weather
Temperature: (AM) 80 **(PM)** 91 **Rain:** 1.7in **Duration of rain:** _____
Description of weather: clear to partly cloudy to cloudy

List of Active Equipment on site

Track hoe A2	grader A2	
JD 650 dozer A2		
Komatsu 65 dozer A		
pump on A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
(1 cont.) 2	2	1 + (1 - sick)

Description of Construction Activity Advance Blading, Dumping out of cell into sump. Advance Fine grading East slope — Conc. crew removing forms at Crossing "C" grading concrete. Safety Meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-17-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0005 - 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 6-18-04 **Contract Day:** +73 **Contract Duration:** 365
1.7 in last night

Weather
Temperature: (AM) 80 **(PM)** 91 **Rain:** — **Duration of rain:** _____
Description of weather: clear To partly cloudy

List of Active Equipment on site

Trackhoe AZ	grader AZ	
Kamatsu 65 dozer A		
JD650 dozer A 2		
pump ON A		

Personnel on site:
(1 conc) 2 2 2 conc.
No. of Superintendents **No. of Skilled** **No. of Laborers**

Description of Construction Activity Advance pumping water out of cell into sumps - repairing eroding grading slopes. Concrete Crew finishing conc. structures. - Advance pushing mud - sediment in cell bottom - Conc. crew plugging 1" ø holes running storm water pump into ditch with hay bales

rubbish

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 6-18-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-170

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-19-04 **Contract Day:** 174 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 92 **Rain:** — **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

Trackhoe	A-2	water truck	I		
Komatsu 65 dozer	A	Smooth roller	I		
J.D 650 dozer	A	FT Loader	I		
grader	A-2	Pump on short time yard	A		

Personnel on site:
(1 conc) 1 **No. of Superintendents** 2 **No. of Skilled** 2 conc. **No. of Laborers**

Description of Construction Activity Advance pumping mud Corp. rubbish Wingwells - Filling in 4 ft holes. Conc. left site in AM
Advance moving sand off clay - drying material
stripping sand off clay
Progress Meeting #53

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-19-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0750-1500

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-20-04 **Contract Day:** +75 **Contract Duration:** 365

rain start @ 1315hrs shower

Weather
Temperature: (AM) 80 **(PM)** 86 **Rain:** _____ **Duration of rain:** _____
Description of weather: Partly cloudy

List of Active Equipment on site

Komatsu 65 dozer A		
JD650 dozer A		
Pump on A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
+(1 part day) 1	2	

Description of Construction Activity Advance Trimming sand off clay pumping from cell to sump - grading slopes

Advance off site @ 1300hrs.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-20-04

D.E.P.
JUL 21 2005
Southwest District Tampa

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SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-21-04 **Contract Day:** +76 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity NO Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-23-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-22-04 **Contract Day:** +77 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

0.1 in rain over weekend

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-23-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0736-1660

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-23-04 **Contract Day:** +78 **Contract Duration:** 365
0.1in over weekend 1.15 shower

Weather
Temperature: (AM) 78 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy / t. showers not even a trace in gage

List of Active Equipment on site

Kawasaki 65 dozer A+		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	1	

Description of Construction Activity Advance graded roads a little then left very little Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-23-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700 - 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-24-04 **Contract Day:** 779 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

JD 650 Dozer A2		
Komatsu Dozer A		
Ft. loader A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Safety Meeting — Advance working on crossing "A" — pushing up mud to remove from cell bottom — shot elev. at crossing "A" 1-2' too low at liner — bring in more fill material. Advance grade & Set base material East and South sections of cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-24-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830 - 1530

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-25-04 **Contract Day:** +80 **Contract Duration:** 365

Weather
Temperature: (AM) 79 **(PM)** 89 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Ft. Loader A		
Komatsu 65 dozer A2		
Track hoe A3		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	1	

Description of Construction Activity Advance continues to remove mud and dry up cell - called drier clay to seal - material probably be tested for moisture & compaction, East & South sections Wet Mud moved to near cell exit to be ready to be hauled out of cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-25-04

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JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-26-04 **Contract Day:** +81 **Contract Duration:** 365

shower start @ 1520-1535; no seven trace in gage

Weather
Temperature: (AM) 78 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Komatsu 65 dozer	A		
JD 650 dozer	A		
FL loader	A2		
Track hoe	A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance continues to move wet material for loading to holding area at haul road in cell 1. Surveyed seep in west slope of excavation.

	elev.
℄ Road at	120.00
Seep	104.05
Perk Point	111.81
DRAin 0 LF	107.75

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-26-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830-1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-27-04 **Contract Day:** +82 **Contract Duration:** 365
rain start @ 1630

Weather
Temperature: (AM) 79 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Smooth roller A		
JD 650 dozer A		
FT Loader A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance working on Crossing "A"
Progress Meeting 54
Advance left early afternoon @ 1230 hrs

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-27-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/const/7

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-28-04 **Contract Day:** + 83 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-30-04

D.E.P.
JUL 2 1 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-29-04 **Contract Day:** 184 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-30-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0740-1715

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-30-04 **Contract Day:** +85 **Contract Duration:** 365
0131, over weekend

Weather
Temperature: (AM) 79 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: Partly Cloudy Tocker

List of Active Equipment on site

Komatsu bulldozer	A	
CAT D6D dozer	A	
FE loader	A	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	8	

Description of Construction Activity Advance - fine grading slopes - tensal driving roads - seep - still leaking
Advance grading entrance haul road between sand stockpile and New DRA.
No Activity on sub-base

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-30-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0700 - 1540

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 8-31-04 **Contract Day:** +86 **Contract Duration:** 365
Trace at night of 8-31-04

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** Trace **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu D5 Dozer A		
JD 650 dozer A		
F.L. Loader A2		

Personnel on site:
(1-Hdq) 1 2 _____
No. of Superintendents **No. of Skilled** **No. of Laborers**

Description of Construction Activity Advance fine grading slopes - Access Road
11 rolls of Turf Mat delivered
No Activity on sub-base

List of Subcontractors

List of Materials Delivered
11 rolls Turf Mat TOT-on site 14

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 8-31-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830 – 1430

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-1-04 **Contract Day:** +87 **Contract Duration:** 365

Trace overnight

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** 0.2" after hours **Duration of rain:**
Description of weather: clear

List of Active Equipment on site

Komatsu 65 Dozer A	Smooth Roller I	
JD 650 dozer A	FT. Loader I	
Grader A	Pump I	
Water Truck I		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance grading slopes – Advance grading perm. const. gate to keep water on site + flowing to NewRA

Received Submittal No. 39A – Test Section Report

No Activity in Cell sub-base

Advance graded seep area on west slope

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-1-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0750-1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-2-04 **Contract Day:** +88 **Contract Duration:** 365

0.21 in rain last night

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

JD 650 dozer AZ		
FT. Looker AZ		
Grader AZ		
Komatsu 65 dozer AZ		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Seep is visable even after grading
Advance working on swale "A" at Cell #4
Advance prepared site for sewer weather, left site around noon. 1 Engineer for Advance (Kane) stayed

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 9-2-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0740 - 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-3-04 **Contract Day:** +89 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity Today — Karla here for Progress Meeting No. 55 Site ready for severe weather

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-3-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.04/0031

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-9-04 **Contract Day:** +90 **Contract Duration:** 365

Weather
Temperature: (AM) 86 **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity
delivered pump flange adapter

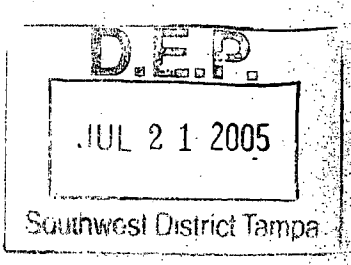
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-7-04



SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-5-04 **Contract Day:** 791 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity
Hurricane Frances
delivered pump fitting To County yesterday

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-6-04 **Contract Day:** +92 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity
Hurricane Frances
onsite to check for damage - assist county setting pump for storm water

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830-1830

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-7-04 **Contract Day:** +93 **Contract Duration:** 365

Weather
Temperature: (AM) 90 **(PM)** 88 **Rain:** 0.9" **Duration of rain:** 6 hrs. windy. Rain all day off on and weaker from storm This
Description of weather: rain cloudy all day

List of Active Equipment on site

Komatsu 65 dozer AF		
Track hoe AF		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
	1	

Description of Construction Activity Advance- one operator on site to run pump - repair washouts, move berms as needed / grade & repair storm damage (in pad) - Fl. inspection - Attended meeting -

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-8-04 **Contract Day:** 194 yesterday 0. **Contract Duration:** 365

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BY SOUTHWEST DISTRICT

Weather
Temperature: (AM) 90 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Komatsu D5 dozer A-1		
JD 650 dozer A-1		

Personnel on site:

1	1	
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance repairing erosion 4 washouts in cell - pump running

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-8-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-1630

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-9-04 **Contract Day:** +95 **Contract Duration:** 365
LT, Rain 0000 Trace

Weather
Temperature: (AM) 79 **(PM)** 89 **Rain:** _____ **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

JD650 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1		

Description of Construction Activity Advance - pumping out well dressing slopes / repairing washouts

off road dump delivered Today

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-9-04

D.E.P.
JUL 21 2005
Southwest District

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-10-04 **Contract Day:** +96 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

JD 450 dozer 4		
Komatsu 65 dozers		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Proj. Meeting #56 - Advance Safety Meeting - pumping water out of storm sump grading & berming for storm prep. - silt fence being installed going to sump

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 0919905604 (0754)

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-11-04 **Contract Day:** 197 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity installed some berms - pumped water from storm sump

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-13-04

DEP
JUL 21 2005

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-12-04 **Contract Day:** 198 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

1	2	
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance pumped water from sump

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-13-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0745 - 1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-13-04 **Contract Day:** +99 **Contract Duration:** 365

Weather 2.14" rain over weekend shower @ 1545 not even a Trace
Temperature: (AM) 60 **(PM)** 89 **Rain:** ____ **Duration of rain:** ____
Description of weather: clear - cloudy

List of Active Equipment on site

JD650 dozer A		
offroad dump A		
pump at sump on A		

Personnel on site:

2	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to pump water out of storm sump almost down to be able to remove sludge from bottom of sump - fuel low - drain from other equip. To keep pump and JD650 dozer running - fuel should be delivered today Sump pumped down -

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-13-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-14-04 **Contract Day:** +100 **Contract Duration:** 365

Weather
Temperature: (AM) 78 **(PM)** 89 **Rain:** — **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

Offroad dump A		
Komatsu 65 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance hauling material for county — fueling, monitoring pump for dewatering storm water sump — preparing for sever weather associated ~~fro~~ with Hurricane Ivan.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-14-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1500

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-15-04 **Contract Day:** +101 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 89 **Rain:** — **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

offroad dump A		
komatsu 65 dozer A		
pumps running A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance hauling material for County - running pumps fine grading slopes.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-15-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-16

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-16-04 **Contract Day:** +102 **Contract Duration:** 365
0.1 in from over night

Weather
Temperature: (AM) 79 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

JD650 dozer A		
Offroad dump A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance hauled material for county – operated pumps-dewatering sump + cell. graded roads

No progress Meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-16-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-17-04 **Contract Day:** +103 **Contract Duration:** 365

Weather
Temperature: (AM) 80 **(PM)** 96 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear To Partly cloudy

List of Active Equipment on site

JD650 dozer A		
Offroad dump A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance pump from cell To Sump — hauling material for county
No Progress Meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-17-04

D.E.P.
JUL 21 2005
Solid Waste Section

File: 09199056.02 (C)

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-18-04 **Contract Day:** 704 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

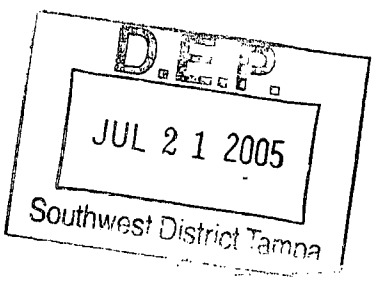
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-20-04



SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-17-04 **Contract Day:** + 105 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

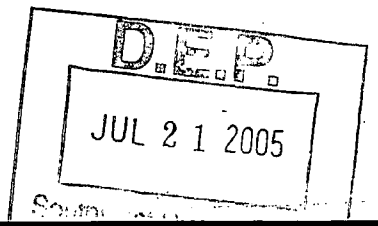
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-20-04



SCS ENGINEERS DAILY FIELD REPORT 0815-1615

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-20-04 **Contract Day:** +106 **Contract Duration:** 365

no rain over weekend began 1315 stop 1615 no Trace in gage

Weather
Temperature: (AM) 76 **(PM)** 86 **Rain:** 0.2in after work **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

JD650 dozer A		
Komatsu 65 dozer AZ		
Kobelco excavator AZ		
grader AZ		

Personnel on site:

1	2	
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance grading slopes - pumping out of cell into sump

SCS & County relocated SG in DRA closed site from west side to East side same SG conn. of 104.00 ft AGVD

Last Day of approved Time by Change Order #1

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-20-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 – 1540

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services
+ Liquidated Damages

Date: 9-21-04 **Contract Day:** +107 **Contract Duration:** 365
0.2 in last night

Weather
Temperature: (AM) 78 **(PM)** 86 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

1650 dozer A		
Trackhoe A2		
offroad dump A3		
Komatsu 65 dozer A2		

Personnel on site:

1	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Safety Meeting – Advance grading slopes – pumping water – helped move county pump W.L. in old side DRA = 103.5 elev. seep is damp but not flowing

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-21-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 - 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-22-04 **Contract Day:** +108 (+240) **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer A		
Komatsu 65 dozer ½ A Hook		
Trackhoe ½ A		
grader A Z		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance pumping water out of sump pump from cell bid Alternate — new power unit on site at end of day — grading slopes

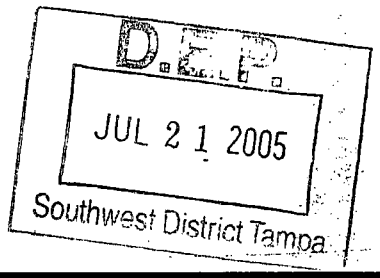
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-22-04



SCS ENGINEERS DAILY FIELD REPORT 0740 – 1530

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-23-04 **Contract Day:** +340 **Contract Duration:** 365

Weather
Temperature: (AM) 78 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer A		
Trackhoe ½ A2		
grader ½ A2		
Komatsu 65 dozer AX		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance grading slopes, pumping out of cell (new paper haul) – pumping out of storm water swamp. Advance began scraping sand off day to go back to slopes.

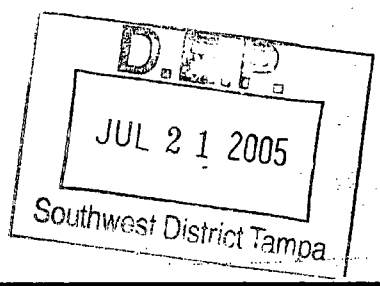
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-23-04



SCS ENGINEERS DAILY FIELD REPORT 0800-

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-24-04 **Contract Day:** 4 LD **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 89 **Rain:** — **Duration of rain:** _____
Description of weather: clear To partly Cloudy

List of Active Equipment on site

JD650 dozer A		
Komatsu 65 dozer-AZ		
Trackhoe AZ		
Grader AZ		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance pumping from cell 7 to stormwater sump grading slopes — grading off sand from clay on East end of cell pump running

Progress Meeting No. 57

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-24-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/Const./

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-25-04 **Contract Day:** 5 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance pumped water & pushed mud.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-27-04

DEP
JUL 21 2005
Southwest District

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-26-04 **Contract Day:** 6 1/2 D **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Hurricane Jeanne No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-27-04

D.E.P.
JUL 21 2005
Southwest District Tampa

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SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-27-04 **Contract Day:** 710 **Contract Duration:** 365
4.2 in from Hurricane Jeanne

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather: windy cloudy

List of Active Equipment on site

D6D dozer	2
Komatsu dozer	1
Trackhoe	1
offroad dump	2

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
0	2	

Description of Construction Activity Advance attempted to run pump — would not start
graded roads and helped County

Replacemgt Off rod Truck delivered — no tailgate removed existing off road dump truck

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-27-04

D.E.P.
JUL 21 2005
Southwest District

SCS ENGINEERS DAILY FIELD REPORT 0730-2000

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-28-04 **Contract Day:** 8 LD **Contract Duration:** 365

Weather
Temperature: (AM) 76 **(PM)** 88 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

Track hoe A 2		
Off road dump A		
JD 650 dozer A 2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1-½ day	2	

Description of Construction Activity Advance helped County Advance had Sun Belt on site to repair pump control power unit running — no pumping (intake plugged with sand + dug out pump head — repaired began pumping late in afternoon @ 1600 hrs.

Safety Meeting in afternoon

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-28-04

SFD
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-29-04 **Contract Day:** 960 **Contract Duration:** 365

Weather
Temperature: (AM) 77 **(PM)** 88 **Rain:** Trace **Duration of rain:** 0 1130
Description of weather: partly cloudy

List of Active Equipment on site

Truck hoe A		
JD650 dozer A		
Kenatsu 65 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance continues to pump water — regrading cell slopes — replace berm at swale 11 BM

Progress Meeting #58

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-29-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 9-30-04 **Contract Day:** 10 of 10 **Contract Duration:** 365

Weather
Temperature: (AM) 76 **(PM)** 88 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear To partly cloudy

List of Active Equipment on site

JD650 dozer A1		
Komatsu 65 dozer A		
Trackhoe A1		
grader A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance continues To pump water — skim sand in cell — repair slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 9-30-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0745-1545

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-1-04 **Contract Day:** 11 LD **Contract Duration:** 365

Weather
Temperature: (AM) 78 **(PM)** 90 **Rain:** — **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

JD650 dozer A		
Komatsu 65 dozer A		
Off road A2		
Trackhoe A4		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance continues to pump water from cell - grade slopes - skim sand off clay

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-1-04

DEP
JUL 21 2005
Southwest District Tampa

File! 09199056.02/const/ 7

SCS ENGINEERS DAILY FIELD REPORT none

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-2-04 **Contract Day:** 1240 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** — **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

1060 dozer	A		
Komatsu 65 dozer	A		
Grader	A2		
Trackhoe	A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance pump/dewater — graded slopes — Access Road

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-3-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-1500

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-3-04 **Contract Day:** 1340 **Contract Duration:** 365

Weather
Temperature: (AM) 78 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer A		
Komatsu dozer A		
grader A2		
Trackhoe A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance continues to pump water - grade slope & access Road

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-3-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830-1640

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-4-04 **Contract Day:** 14 LD **Contract Duration:** 365

rain shower began at 1630 - continued

Weather
Temperature: (AM) 78 **(PM)** 90 **Rain:** Trace **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 150 Dozer A		
Komatsu 65 Dozer A		
Off Road Trackhoe A2		
grader A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance continues to pump water - grade slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-4-04

DEP
JUL 21 2005

SCS ENGINEERS DAILY FIELD REPORT 0815-1715

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-5-04 **Contract Day:** 15LD **Contract Duration:** 365

Weather
Temperature: (AM) 78 **(PM)** 90 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 65 dozer A-2		
JD650 dozer A		
Truck hyc A-2		
offroad dump A		

Personnel on site:

2	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to prep water for the slope began hauling slop out of cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-5-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT off

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-6-04 **Contract Day:** 16 40 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Truck hoe A 2		
Offroad 4		
JD650 dozer A		
Komatsu D5 dozer A 2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance pumped water-removed mud skimmed sand from clay

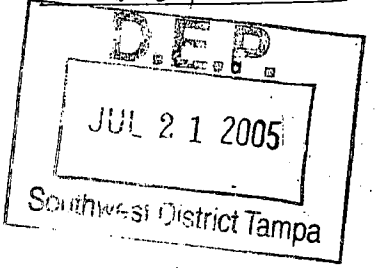
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-7-04



SCS ENGINEERS DAILY FIELD REPORT 0745-1650

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-7-04 **Contract Day:** 17 40 **Contract Duration:** 365

Weather
Temperature: (AM) 76 **(PM)** 84 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Trackhoe A ≈		
Off road dump A		
D650 dozer A		
Kamatsu 65 dozer AZ		

Personnel on site:

2	2	
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance pumped water - removed mud - pumped from sump

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-7-04

DEP
JUL 21 2005
Southwest Dist

SCS ENGINEERS DAILY FIELD REPORT 0800-

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-8-04 **Contract Day:** 184 LD **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 84 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer A		
Komatsu D5 dozer A2		
Trackhoe A2		
offroad Truck A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance continues To reshape
materials (slop) from cell - dewatering - grading

Progress Meeting No. 59

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-8-04

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File: 09199056.02/const/7

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-9-04 **Contract Day:** 194D **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

1	2	
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity SCS not on site – Advance continues to do recovery work – grading slopes – pushing wet material to West and removing from cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-10-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1400

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-10-04 **Contract Day:** 204D **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 86 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

JD 650 dozer A		
Komatsu 65 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	1	

Description of Construction Activity Advance continues to grade slopes for recovery

Advance left at 1400 hrs.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-10-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0740-1640

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-11-04 **Contract Day:** 21 LD **Contract Duration:** 365

Weather
Temperature: (AM) 70 **(PM)** 84 **Rain:** 0.3½ **Duration of rain:** entire day
0.1 in overnight
Lt. showers + 0.2 in during
Description of weather: cloudy - rain

List of Active Equipment on site

JD650 dozer A		
Komatsu fs Skidder A2		
Track hoe A2		
off road dump A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance worked on slopes for a while then left -
DRA pumped down seep still flowing

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-11-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0740-1710

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-12-04 **Contract Day:** 7740 **Contract Duration:** 365

Weather
Temperature: (AM) 70 **(PM)** 84 **Rain:** _____ **Duration of rain:** _____
Description of weather: cloudy

List of Active Equipment on site

JD650 dozer A		
Kawasaki 65 dozer A2		
Track hoe A3		
Off road dump A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Advance loading out saturated sand silt clay mud from cell.
West ditch is saturated but no standing water except at box culvert crossings - min. DRA is pumped down
Scrap-towing
Safety Meeting

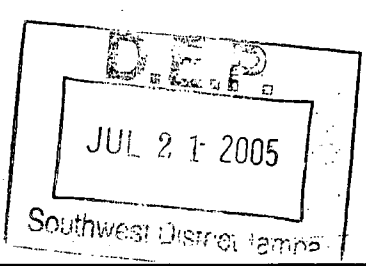
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-12-04



SCS ENGINEERS DAILY FIELD REPORT Not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-13-04 **Contract Day:** 234D **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continued to remove saturated material from cell bottom grade slopes Sep flowing

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-14-04

D.E.P.
JUL 21 2005
Southwest District

SCS ENGINEERS DAILY FIELD REPORT 0800 —

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-14-04 **Contract Day:** 214D **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 92 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer A		
Komatsu 65 dozer A2		
Trackhoe A2		
offroad dump A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance continues to grade slopes and remove material from cell bottom.

Seep - is flowing

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-14-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 –

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-15-04 **Contract Day:** 25 LD **Contract Duration:** 365
Rain start 0830 – 0900

Weather
Temperature: (AM) 70 **(PM)** 76 **Rain:** 0.4 in **Duration of rain:** ½ hr
Description of weather: cloudy rain to partly cloudy to clear

List of Active Equipment on site

JD650 dozer	A		
Komatsu 65 dozer	A2		
Trackhoe	A2		
6ffroad dump	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	

Description of Construction Activity Seep still flowing even before rain
Advance removing saturated material from cell bottom.
Progress Meeting No. 60

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-15-04

DEP
JUL 21 2005
Southwest District Tampa

File: 09199056.02/consl/7

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-16-04 **Contract Day:** 2640 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity Advance continues to recover cell - remove saturated material - grade slopes

Cat D5 dozer delivered along with Company Truck
Water Truck removed

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-17-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-17-04 **Contract Day:** 274D **Contract Duration:** 365

Weather
Temperature: (AM) 70 **(PM)** 85 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Komatsu 65 dozer	I	offroad Truck - brake about 0930
JD650 dozer	A	
Track hoe	A	
Cat D5 dozer	A	

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	

Description of Construction Activity #1 Advance continues to recover cell - haul saturated material until Truck broke - grade slopes & push saturated material to west end.

SCS + Advance checked 3 way plug valve with locking adjuster wheel in the closed position water flowed out of pumps indicating valve would work as a Tee

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-17-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-18-04 **Contract Day:** 284D **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Track hoe A	grader A2	
650 JD dozer A		
Komatsu 65 dozer A		
Cat D5 dozer A		

Personnel on site:

2	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-19-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0830 – 1610

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-19-04 **Contract Day:** 294D **Contract Duration:** 365

Weather
Temperature: (AM) 76 **(PM)** 86 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer	A	grader	A2		
Komatsu D5 dozer	A	roller	A2		
Cat D5 dozer	A				
Track hoe	A2				

Personnel on site:

1	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to fine grade slopes push and get saturated material ready to be removed.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-19-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-20-04 **Contract Day:** 320 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:** 0.6in from Advance **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Cat D5 dozer A		
JD 650 dozer A		
Komatsu Trackhoe A		
Komatsu 65 dozer A		

Personnel on site:

2	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to recover cell - grade slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-21-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-21-04 **Contract Day:** 31 40 **Contract Duration:** 365
0.24in overnight

Weather
Temperature: (AM) 76 **(PM)** 86 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

JD650 dozer A	Track hoe A2	
Kemtan 65 dozer A2		
CatD6 dozer A		
back hoe A2		

Personnel on site:

2	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to grade slopes and recover cell
Safety meeting
backhoe delivered – Track hoe removed

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-21-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 02C00-1400

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-27-04 **Contract Day:** 324D **Contract Duration:** 365

Weather
Temperature: (AM) 75 **(PM)** 86 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer	Az	Grader	Az		
Komatsu 65 dozer	Az	roller	Az		
Cat D5 dozer	A				
~~Track~~ backhoe	A	MT31	(down)		

Personnel on site:

2	3	1
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity Advance sealed existing clay with roller - continues to work on grading slopes.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-27-04

D.E.P.
JUL 21-2005
Southwest District Tampa

File 09199056.02/const/7

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-23-04 **Contract Day:** 332D **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 82 **Rain:** _____ **Duration of rain:** _____
Description of weather: Clear

List of Active Equipment on site

Komatsu D5 dozer A		
Cat D5 dozer A		
Back hoe A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	1

Description of Construction Activity Advance continues to grade slope for storm recovery

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-24-04
Carmen Bruno Citrus County

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 –

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-24-04 **Contract Day:** 340 **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 82 **Rain:** ____ **Duration of rain:** ____
Description of weather: clear

List of Active Equipment on site

Komatsu 65 dozer A/C		
Cat D5 dozer A		
backhoe A		

Personnel on site:

1	1	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance grading slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-24-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0745-1720

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-25-04 **Contract Day:** 35 LD **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 85 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

rubber tire hoe A		
Cat D5 dozer A		
Grader AZ		
roller AZ		

Personnel on site:

2	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance grading slopes - cleaning storm water sump

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-25-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800 - 1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-26-04 **Contract Day:** 36 40 **Contract Duration:** 365

Weather
Temperature: (AM) 77 **(PM)** 85 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

cat D6 dozer	A	roller A2	
rubber tire hoe	A		
JD 650 dozer	A		
grader	A2		

Personnel on site:

2	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues with recovery grading slopes and removing mud from storm water sump.

Area of seep in west slope – wet

Safety Meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-26-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-27-04 **Contract Day:** 3740 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** 84 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer	A	grader	A		
Cat D5 dozer	A				
Back hoe	A				
Komatsu 65 dozer	A				

Personnel on site:

2	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to grade slopes and recover cell – worked on swale "B"

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-28-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0815-1640

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-28-04 **Contract Day:** 386 **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 85 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

JD 650 dozer A	grader A	
Cat D5 dozer A		
back hoe A2		
Komatsu 65 dozer A2		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
2	2	1

Description of Construction Activity Advance continues to grade slopes and recover cell - worked on subtitle "B"

Seep area still wet.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-28-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-29-04 **Contract Day:** 394D **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 95 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

JD650 dozer A		
Cat D5 dozer A		
back hoe A2		
Komatsu 65 dozer A2		

Personnel on site:

2	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to grade slopes and recover cell. worked on swale "B11

Seep is visable

Project Meeting No. 62

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 10-29-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File: 09199056.02/const/7

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-30-04 **Contract Day:** 40LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-1-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 10-31-04 **Contract Day:** 41 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)**_____ **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

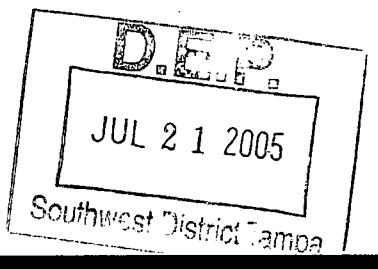
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-1-04



SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-1-04 **Contract Day:** 4240 **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 85 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear to partly cloudy

List of Active Equipment on site

Cat D5 dozer A		
JD 650 dozer A		
puck hoe A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance is working on cleaning storm water sump and cutting Trench on west slope for leachate discharge

replacement attend dump truck delivered this afternoon.

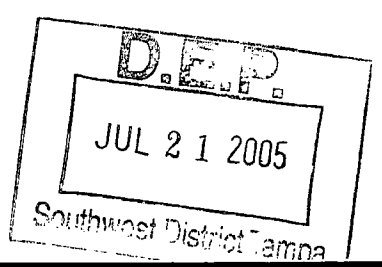
List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-1-04



SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-2-04 **Contract Day:** 430 **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 85 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Cat D6 dozer A		
JD 650 dozer A		
back hoe A		
offroad dump A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance is clearing out cell bottom and fine grading West slope

Safety Meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-2-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0820 — 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-3-04 **Contract Day:** 440 **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 86 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Cat D5 dozer A		
JD650 dozer A		
back hoe A		
offroad dump A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance cleaning bottom of cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-3-04

D.E.P.
JUL 21 2005
Solid Waste Section

0820 – 1700

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-4-04 **Contract Day:** 45 LD **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 86 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear – partly cloudy

List of Active Equipment on site

CAT D5 dozer A		
JD 650 dozer A		
back hoe A		
Off road dump A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues To grade slopes and construct/clean up cell bottom. surveyors – setting grade stakes

List of Subcontractors
Surveyors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-4-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0810 - 1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-5-04 **Contract Day:** 461D **Contract Duration:** 365
0.1in over last night

Weather
Temperature: (AM) 70 **(PM)** 76 **Rain:** 0.1in over **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer	A		
Cat D5 dozer	A		
back hoe	A		
off road dump	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1		

Description of Construction Activity Trackhoe - JD - delivered this AM
Advance continues to clean cell bottom - construct leachate discharge Trench -

Progress Meeting #63

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-5-04

D.E.P.
JUL 21 2005
Southwest District Tampa

File 09199056.02/const

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-6-04 **Contract Day:** 47LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** 84 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer A		
Cat D5 dozer A		
backhoe A		
Truckhoe A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800- 1200

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-7-04 **Contract Day:** 484D **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 75 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD650 dozer A		
Cat D5 dozer A		
Track hoe A		
back hoe A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to grade slopes, cut leachate discharge line Trench, construct Cell Sump.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-7-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0745 - 1715

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-8-04 **Contract Day:** 496D **Contract Duration:** 365

Weather
Temperature: (AM) 68 **(PM)** 85 **Rain:** — **Duration of rain:** _____
Description of weather: Clear

List of Active Equipment on site

JD 650 dozer	A		
Cat D5 dozer	A		
Track hoe	A		
back hoe	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	2	1

Description of Construction Activity Above grading slopes - worked sump area of cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-8-04

DEP
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-9-04 **Contract Day:** 504D **Contract Duration:** 365
LT drizzle @1200

Weather
Temperature: (AM) 64 **(PM)** 72 **Rain:** ____ **Duration of rain:** 570min
Description of weather: partly cloudy

List of Active Equipment on site

JD 650 dozer A	offroaddump A2	
Cat D5 dozer A		
Track hoe A		
back hoe A≈		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to work on slopes – access road – clean off liner South side and reconstruct County drainage swale disc. Surveyors on site layout leachate pipe trench for grade and anchor trench on west berm slope.

List of Subcontractors
Surveyors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-9-04

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-10-04 **Contract Day:** 51 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

JD 650 dozer A	roller A2	
Cat D5 dozer A1		
Track hoe A		
offroad dump A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance - removed material from cell bottom - grubbed ~~stopes~~ slopes - trench for leachate disc. pipe on West slope.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 11-11-04

D.E.P.
JUL 21 2005

SCS ENGINEERS DAILY FIELD REPORT 0715 – 1615

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-11-04 **Contract Day:** 52 LD **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 80 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer A		
Cat D5 dozer A		
Truck Int. A		
off road dump A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance removing material from storm water sump – grading slopes & constructing Trench for leachate disc. pipe on west slope

Safety Meeting Today

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-11-04

DEP
JUL 21 2005

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-12-04 **Contract Day:** 5340 **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 81 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Trackhoe A		
off road dump A		
JD 6TD dozer A		
Cat D5 dozer A		

Personnel on site:

1	2	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to grade slopes — construct trench for leachate disc. pipe on West Slope

Progress Meeting No. 64

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-12-04

D.E.P.
JUL 21 2005

File/09199056.02/const/7

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-13-04 **Contract Day:** 54 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer A~	backhoe I	
Cat D5 dozer A		
offroad dump A~		
Truck hoe A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	1	1

Description of Construction Activity Cleaned out sump box for storm water pump station - graded slopes

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-14-04

D.E.P.
JUL 21 2005

SCS ENGINEERS DAILY FIELD REPORT 0900

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-14-04 **Contract Day:** 5550 **Contract Duration:** 365
0.4in .00 overnight

Weather
Temperature: (AM) 70 **(PM)** 78 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Cat D5 dozer	A	back hoe	A		
JD 450 dozer	I				
offroad dump	I				
Truck hoe	A				

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	1	1

Description of Construction Activity Advance graded slopes — perm shift and drainage flowline for storm water ditch at South side

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-14-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0720-1640

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-15-04 **Contract Day:** 560 **Contract Duration:** 365

Weather
Temperature: (AM) 68 **(PM)** 78 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD120 Track hoe on site A		
Track hoe pit pit A		
Cat D6 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	1	1

Description of Construction Activity Advance began excavating clay from clay borrow source

Advance completed County stormwater ditch relocation on South side of cell.

List of Subcontractors
SMG

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
clay		

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-15-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-16-04 **Contract Day:** 576 **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Track hoe at pit A		
Track hoe at site A		
Cat D6 dozer A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	1	1

Description of Construction Activity Advance excavated clay from borrow pit and brought to site

Surveyors checked and set fill cut/fill stakes for day in cell.

Smooth drum roller replaced with larger smooth drum roller

List of Subcontractors
Surveyors
SMB

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
clay		70 loads

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-17-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0840

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-17-04 **Contract Day:** 586D **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Track hoe at pit A		
Track hoe at site A		
Cat D6 dozer A		

Personnel on site:

1	1	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to excavate clay from borrow pit and bring to site.
Completed bringing clay to site stockpile

List of Subcontractors
SMG

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity
c/cy		2

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-17-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0800-1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-18-04 **Contract Day:** 594D **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 75 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Cat D5 dozer A2		
JD 650 dozer A		
4 wheel dump A		
JD 120 Trackhoe A2		

Personnel on site:

1	1	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance preparing cell for clays
Don for Volusia Enterprise on site JD mets. for sod
Water Truck delivered
Trackhoe from pit brought to site
Komatsu 65 dozer removed for repair
Safety Meeting

List of Subcontractors

List of Materials Delivered

64 ~~25~~ pallets of sod	25,600 SF	25,600 SF

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-18-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

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SCS ENGINEERS DAILY FIELD REPORT 0810-1600

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-19-04 **Contract Day:** 604D **Contract Duration:** 365

Weather
Temperature: (AM) 68 **(PM)** 78 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Trackhoe	A2	grader	A
Trackhoe	I	offroad dump	A
Cat D5 dozer	A2	roller	A2
JD650 dozer	A		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	1

Description of Construction Activity Advance placing fine mulch for sod. Surveyors placing grade stakes for sub-base - grading slopes while placing mulch

Progress Meeting No. 65

2 more Advance operators on site.

List of Subcontractors
Volusia Enterprise (sod) (Don's Sod)
Surveyors

List of Materials Delivered

1565 sod pallets	62,400 SF	88,000 SF

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-19-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT not on site

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-20-04 **Contract Day:** 61 CD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** 76 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	1

Description of Construction Activity Advance contractor to prepare cell bottom for clay & min. grade slopes. Sand installed on West and North slopes

List of Subcontractors
Volusia Enterprise

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Sand delivered – Installation complete		88,000 SF

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-21-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0800-1445

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-21-04 **Contract Day:** 624D **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 80 **Rain:** — **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

grader	A	Front loe	A2	water truck	I
JD 650 dozer	A	backhoe	I		
Cat D5 Dozer	A	off road dump	A		
Track hoe	~A	roller	A2		

Personnel on site:

1	3	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to prepare cell bottom for clay installation — prepare slope for clay fine grade existing clay for surface tests

no clay moved to cell

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-21-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0800 – 1700

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-22-04 **Contract Day:** 630 **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 81 **Rain:** **Duration of rain:**
Description of weather: clear to partly cloudy

List of Active Equipment on site

JD 650 dozer	A	back hoe	A		
Cat D5 dozer	A	water truck	A		
off road dump	A	roller	A		
grader	A	Trackhoe	A		

Personnel on site:

1	4	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity PSI on site - no area was ready for day testing - left site - Advance continues to prepare cell for clay installation - fine grade slope - prepare swale "B" shelf area for clay

Began clay installation - grading

List of Subcontractors
PSI on site - short time

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-22-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0740

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-23-04 **Contract Day:** 64LD **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 80 **Rain:** _____ **Duration of rain:** _____
Description of weather: partly cloudy

List of Active Equipment on site

JD 650 dozer	A	grader	A		
Cat D5 dozer	A	water Truck	I		
Truck hoe	A	off road dump	A		
backhoe	X I	roller	A		

Personnel on site:

1	4	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance installing clay - grading fine grading slopes preparing Swale "B" bench for clay - PSI began Tekky samples & Testing sub-base Safety Meeting

List of Subcontractors
PSI
Surveyors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-23-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0740-1535

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-24-04 **Contract Day:** 651D **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 80 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Grader ~~roller~~	A	off road dump	A		
roller	A	Track hoe	A		
Cat D5 dozer	A	back hoe	1		
JD 650 Dozer	A				

Personnel on site:

1	4	1
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to install clay sub-base and prepare swale "B" shelf for clay

Surveyors setting grades for sub-base

Progress Meeting No. 66

Advance left about 1230hrs

List of Subcontractors
Surveyors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative Dennis G. DuPont **Date** 11-24-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-25-04 **Contract Day:** 66 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-26-04 **Contract Day:** 67 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents **No. of Skilled** **No. of Laborers**

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-27-04 **Contract Day:** 684D **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity No Activity

List of Subcontractors

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-28-04 **Contract Day:** 69 LD **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity N/O Activity

List of Subcontractors

List of Materials Delivered

List of Quantities Installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

BEST AVAILABLE COPY

SCS ENGINEERS DAILY FIELD REPORT OBID - 1740

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-29-04 **Contract Day:** 704D **Contract Duration:** 365

Orbin rain over Holiday weekend

Weather
Temperature: (AM) 72 **(PM)** 79 **Rain:** 0 **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

Trackhoe	A	roller	A2		
Backhoe	A2	grader	A		
D5 cat dozer	A	off-road dump	A		
D 650 dozer	A				

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
1	3	2

Description of Construction Activity Advance continues to fine grade slopes - prepare sub-base - pump water from ~~2~~ cell sump to storm water sump

Comanco mobilized to site - filling sand bags - setting up equipment

List of Subcontractors
Comanco

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11-29-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0810-1800

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11-30-04 **Contract Day:** 71 LD **Contract Duration:** 365

Weather
Temperature: (AM) 74 **(PM)** 80 **Rain:** _____ **Duration of rain:** _____
Description of weather: clear

List of Active Equipment on site

JD 650 dozer	A	roller	A 2		
Cat D5 dozer	A	Trackhoe	A		
off road dump	A	back hoe	A 2		
grader	A				

Personnel on site:

1	3	2
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance continues to get swale "B" shelf ready for sub-base - fine grade slopes - cleaning cell sump for clay tests - permeter.

Liner pre-installation meeting

List of Subcontractors

Comanco
PSI on site - areas not ready - left

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 12/1/04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 1140 - 1730

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12-1-04 **Contract Day:** 72LD **Contract Duration:** 365

Weather
Temperature: (AM) 72 **(PM)** 80 **Rain:** _____ **Duration of rain:** _____
Description of weather: cloudy To partly cloudy

List of Active Equipment on site

JD650 dozer	A	grader	A2 - repair leak	
Cat D5 dozer	A	backhoe	A2	
Track hoe	A	roller	A2	
offroad dump	A1			

Personnel on site:

1	3	& 1 (+part day)
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance preparing sub-base for PSI Test - fine grading slopes
Commco inventoring & moving Eco composite
Placing clay on shelf

List of Subcontractors
Commco part day

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 12-1-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0745-1655

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12-2-04 **Contract Day:** 736 **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** — **Duration of rain:** _____
Description of weather: partly cloudy to clear

List of Active Equipment on site

JD 650 dozer	A	roller	A 2		
Cat D5 dozer	A	grader	A		
Track hoe	A	back hoe	A 2		
offroad dump	A				

Personnel on site:

1	3	2
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance completed placing sub-base fine grading sub-base and slopes - began cleaning liner for tie-in area. Sub-base on grade 13" shelf installed. PSI on site pulled last of permeability tests Safety Meeting

List of Subcontractors
PSI

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 12-2-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT 0745-1520

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12-3-04 **Contract Day:** 741-D **Contract Duration:** 365

Weather
Temperature: (AM) 54 **(PM)** 65 **Rain:** — **Duration of rain:** _____
Description of weather: Clear

List of Active Equipment on site

JD650 dozer	A	grader	A		
Cat D5 dozer	A	roller	A2		
Track hoe	A	offroad dump	A		
back hoe	A2	Water Truck			

Personnel on site:

1	3	2
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Advance fine grading cell bottom + slopes - cleaning liner tie in

Surveyors on site for as built survey - would continue tomorrow.

Progress Meeting #7

PST on site - took all depth checks Sub-base thickness 6 inches or better - density tests 95% or better

Verbal - Results of 1st batch of perms. 1×10^{-5} or better - (by phone) ~~densitys~~

List of Subcontractors
PS Surveyors
PST

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 12-13-04

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. PHASE II EXPANSION LINER INSTALLATION Project Number: 09199056.02

Owner: CITRUS CO. Contractor: ADVANCE/COMANCO

Date: 12/6/04 Contract Day: _____ Contract Duration: _____ Days Remaining: _____

Weather

Temperature: (AM) 54 (PM) 82 Rain: _____ Duration of Rain: _____

Description of weather: DAILY CLOUDY

List of Equipment on site: (A) for active (I) for idle

JD 225C EXCAVATOR		
LULL		
TRACK CRAWLER		

Personnel on site:

1 SUPT	1 QC	TECH 12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ON SITE 7:00 AM HELD SAFETY MEETING ADVANCE EXCAVATING ANCHOR TRENCH AT EAST TOP OF SLOPE. RE-COMPACTING AND DRESSING EAST BOTTOM AT TOE OF SLOPE, CLEANING SOUTH TIE-IN SEAM. REMOVING STICKS AND RAKING UNEVEN SUBGRADE ON EAST SLOPE. ADVANCE ISSUED LETTER TO COMANCO TO BEGIN DEPLOYMENT OF LINER AS RESULTS OF ALL PERM TEST HAVE NOT BEEN RECEIVED BY ENGINEER. ADVANCE IS AWARE THEY ARE PROCEEDING AT THEIR OWN RISK.

COMANCO BEGAN DEPLOYING PANEL S1 ON EAST SLOPE AT SOUTH TIE-IN OVER ACCEPTED SUBGRADE AT 1:55. DEPLOYED PANELS S1 - S4 AFTER PASSING TRIAL WELDS FUSSION WELDED SEAMS. HEAT TACKED SOUTH TIE IN. SAND BAGGED LEADING EDGE OF PANEL S4 LEFT SITE AT 5:00 PM

List of Subcontractors

COMANCO

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity Est.	Accumulated Quantity
60 MIL HDPE	17,314	17,314

Field Representative KA Date 12/6/04

doesn't comply w/ CQA pg. 10

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F PHASE II EXPANSION Project Number: 09199056.02

Owner: CITRUS CO Contractor: ADVANCE/COMANCO

Date: 12/7/04 TUE Contract Day: Contract Duration: Days Remaining:

Weather
Temperature: (AM) 59 (PM) 83 Rain: Duration of Rain:
Description of weather: SUNNY BECOMING CLOUDY

List of Equipment on site: (A) for active (I) for idle

JD 225C EXCAVATOR		
LULL		
TRACK CRAWLER		

Personnel on site:

1 SUPT	1 QC	TECH 12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ON SITE 7:00 AM. ADVANCE CONTINUED TO EXCAVATE ANCHOR TRENCH ON EAST SLOPE AND NORTH SLOPE. ENCOUNTERED PROBLEM WITH FILTER POINT MAT ON NORTH SLOPE AT ANCHOR TRENCH ENGINEER GAVE DIRECTION TO SAW CUT MAT TO MAINTAIN STRAIGHT ANCHOR TRENCH. CONTINUED DRESSING SUBGRADE

COMANCO DEPLOYED PANELS 55 - 513 COMPLETING EAST SLOPE. WEDGE WELDED SEAMS AND EXTRUDED 51-T1. MARKED SDS 1-5. FIELD TEST ON 51/T1 FAILED APPEARED TECH OVERGROUND SHEET QC DECIDED TO CAP SEAM. COMANCO BEGAN AIR TESTING FUSION WELDED SEAMS AND MAKING REPAIRS. LEFT SITE AT 5:00 PM

List of Subcontractors
COMANCO

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity (est)	Accumulated Quantity
60 mil HDPE	39,014 SF	56,328

Field Representative [signature] Date 12/7/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F. PHASE II EXPANSION Project Number: 9199056.02

Owner: CITRUS CO. Contractor: ADVANCE / COMANCO

Date: 12/8/04 WED Contract Day: 3 Contract Duration: _____ Days Remaining: _____

Weather
Temperature: (AM) 65 (PM) 85 Rain: ~ Duration of Rain: _____
Description of weather: SUNNY & CLEAR

List of Equipment on site: (A) for active (I) for idle

TRACK CRAWLER		
LULL FK. LIFT		
225 C EXCAVATOR		

Personnel on site:

1 SUPT	1 QC	TECH 12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE ON SITE CONTINUED BACKFILLING HAUL ROAD ON NORTH SLOPE, AND DRESSING SIDE SLOPES AND BOTTOM FOR PREPARATION OF LINER INSTALLATION.

COMANCO ON SITE DEPLOYING COMIL TEXTURED OVER ACCEPTED SUBGRADE DEPLOYED PANELS 514 - 527 TIEING IN AND COMPLETING EAST SLOPE WEDGE WELDED ALL SEAMS. CONTINUED AIR TESTING SEAMS AND MAKING REPAIRS. BEGAN CAP STRIP AT 51/TI WHERE EXTRUDED SEAM FAILED MARKED SDS 6 AT 512/513. FIELD TESTED ALL DESTRUCTS TO DATE AND SHIPPED TO TRI FOR LAB TESTING

LEFT SITE AT 5:39

List of Subcontractors
COMANCO

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity EST	Accumulated Quantity
60 MIL HDPE	32,109	88,437

Field Representative KAQ Date 12/8/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F. PHASE II EXPANSION Project Number: 09199056.02

Owner: CITRUS COUNTY Contractor: ADVANCE / COMANCO

Date: 12/9/04 THUR Contract Day: _____ Contract Duration: _____
Days Remaining: _____

Weather
Temperature: (AM) 69 (PM) 83 Rain: _____ Duration of Rain: _____
Description of weather: SUNNY & CLEAR BECOMING WINDY IN PM

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1 SUPT.	1 QC	12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE ON SITE CONTINUED TO PREP SIDE SLOPES AND BOTTOM OF CELL. CONTINUED TO UNCOVER TIE IN ON SOUTH SLOPE. APPEARS THERE IS NOT A 5' WIDE AREA TO TIE NEW LINER LAYERS TO OLD AND WHEN PULLING BACK EXISTING SOILS SW IS BEING ENCOUNTERED WELL WITH IN THE 10' AREA TO BE CLEARED.

COMANCO DEPLOYED PANELS 5-28 THRU 41 WEDGE WELDED

AIR TESTING AND MAKING REPAIRS + CONTINUED WELDING ON CAP AT S1/T1

MARKED DESTRUCT SAMPLES SDS-7-10 AND SDS 4-1 PULLED & TESTED 7, 8, 44
RESULTS OF DESTRUCTS RECEIVED IN LATE AFTERNOON SDS 1-3 PASSING SDS-5 FAILED WITH FOIL INCORSION, SDS-6 PASSED

List of Subcontractors LEFT SITE AT 6:15 PM

COMANCO

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
60 MIL HDPE	51018	139,455

Field Representative KA Date 12/9/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO LF Project Number: 09198056.02

Owner: CITRUS CO. Contractor: ADVANCE / COMANCO

Date: 12/10/04 FRI Contract Day: Contract Duration: Days Remaining:

Weather
Temperature: (AM) 65 (PM) 75 Rain: .5 Duration of Rain: 1 HR
Description of weather: OVERCAST WITH RAIN IN AM WIDDY BECOMING CLEAR IN PM

List of Equipment on site: (A) for active (I) for idle

LWLL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1	1 QC	12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE CONTINUED FINE GRADING SUBGRADE. EXAMINED SUBGRADE PRIOR TO RAIN WITH ENG. SOME SLIGHT DESICCATION WHICH SEALED AFTER RAIN — NEED TO REMOVE SAND FROM TOP OF CLAY IN AREAS WHERE RAMP WAS CUT

COMANCO - PERFORMING DETAIL WORK MAKING REPAIRS COMPLETED AIR TESTING SEAMS FROM THURS. LABELING AND DOCUMENTING REPAIRS. TRACING SDS-5 THAT FAILED ON EAST SLOPE. RECEIVED DESTRUCTIVE INFO FROM TRI SEAMS FOR SDS 7, 8 & 4.1 PASSED. MARKED SDS 11-15 ON EAST BOTTOM. WERE CUT BUT NOT SAMPLED. STAGING DECOMPOSITE FOR DEPLOYMENT TO MARCH

doesn't comply w/ QAP pg 13

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
HDPE 60 MIL		

Field Representative KA Date 12/10/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS COUNTY L.F. PHASE II EXPANSION Project No. 09199056.02

Owner: CITRUS COUNTY Contractor: ADVANCE/COMANCO

Date: 12/13/04 Contract Day: _____ Contract Duration (days): _____

Days Remaining: _____

Temperature: (AM) 43 (PM) 84 Rain: _____ Duration of Rain: _____

Description of Weather: SUNNY AND CLEAR

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1 SUPT	1 QC	12 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE CONTINUED PREPARING SUBGRADE FOR LINER INSTALLATION AND DEWATERED SUMP FROM FRIDAYS RAIN EVENT

COMANCO DEPLOYED PANELS 542 - 557 NORTH TO SOUTH OVER ACCEPTED SUBGRADE. WEDGE WELDED ALL SEAMS - DID NOT AIR TEST. CUT SDS 9-15 FIELD TESTED. SDS SAMPLES WERE SHIPPED TO TRI FOR LAB TESTING.

List of Subcontractors:

List of Materials Delivered:

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
60 MIL HDPE	55,440	194,876

Field Representative _____ Date 12/13/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F PHASE II EXP Project No. 9199056.02

Owner: CITRUS COUNTY Contractor: ADVANCE / COMANCO

Date: 12/14/04 Contract Day: _____ Contract Duration (days): _____

Days Remaining: _____

Temperature: (AM) 45 (PM) 70 Rain: — Duration of Rain: —

Description of Weather: SUNNY & COOL

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1	10C	12 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE ON SITE EXCAVATING NORTH AT UP WEST SLOPE TO WEST AT. DEMUCKING SUMP AREA. SLIGHT PROBLEM WITH TRANSITION TO ANCHOR TRENCH A TOP OF WEST SLOPE WHERE LEACHATE AND DETECTION RISER EXIT SLOPE JUST EAST OF BOX CULVERTS. CALLED ENGINEER - DECIDED TO MODIFY TRENCH SO AS TO KEEP ELEVATION AT EXISTING TRENCH BY MOVING THIS TRENCH AREA SLIGHTLY WESTWARD — EAST — IN FRONT OF BOX CULVERT, THEREBY KEEPING EL CONSISTENT AT RISER PIPES.

See notes 7/6/05 Response Attachment 10

COMANCO DEPLOYING LINER OVER ACCEPTED SUBGRADE - DEPLOYED PANELS SDS - 58 - 75 UP TO SUMP AREA. BEGAN AIR TESTING SEAMS FROM 12/13 DEPLOYMENT. MARKED DESTRUCTS SDS 16-22 RECEIVED LAB RESULTS FROM TRI → SDS 9-15 ALL PASSING

TOTAL DEPLOYED TODAY - APPROX - 59,400 - EXACT COUNT UNAVAILABLE DUE TO OPEN SEAMS

CONTINUED EXTRUSION WELDING TIE IN.

List of Subcontractors:

_____ _____ _____

_____ _____ _____

List of Materials Delivered:

_____ _____ _____

_____ _____ _____

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
60 MIL HDPE	48,686	243,587
COMPOSITE		45,410

Field Representative KMQ Date 12/14/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F PHASE II EXP Project No. 09199056.02

Owner: CITRUS CO. Contractor: ADVANCE/COMANCO

Date: 12/15/04 Contract Day: _____ Contract Duration (days): _____

Days Remaining: _____

Temperature: (AM) 45 (PM) 75 Rain: _____ Duration of Rain: _____

Description of Weather: SUNNY & COOL

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1	1 QC	12 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE REWORKING SUMP TO ACHIEVE 2 TO 1 SLOPE ON WEST SIDE. ENG. ON SITE.

COMANCO - DEPLOYED PANELS S 76 - 80, WEDGE WELDING ON WEST SLOPE. STOPPED DO TO REWORKING SUMP.

DETAILING PATCHES AND EXTRUSION WELDING - SOUTH TIE IN SEAM. AIR TESTING SEAMS

List of Subcontractors:

SURVEYOR

COMANCO

List of Materials Delivered:

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
60 MIL HDPE	APPROX. 10,736	254,318

Field Representative _____ Date 12/15/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F PHASE II EXT Project No. 09199056.02

Owner: CITRUS CO. Contractor: ADVANCE / COMANCO

Date: 12/16/04 THUR Contract Day: _____ Contract Duration (days): _____

Days Remaining: _____

Temperature: (AM) 50 (PM) 75 Rain: _____ Duration of Rain: _____

Description of Weather: SUNNY & CLEAR

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1	1 QC	12 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE COMPLETED REWORK OF SUMP 1

COMANCO DEPLOYED PANELS 581-87 ON WEST SLOPE
WEDGE WELDED ALL SEAMS. BLACKED-OUT SECONDARY.
AIR TESTING SEAMS - CONTINUED EXTRUSION WELDING TIE IN.

BEGAN MAKING REPAIRS - CUT AND TESTED 16-B - THRU 22
SHIPPED FOR TESTING - TO TRI

ROM - ON SITE

List of Subcontractors:

List of Materials Delivered:

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
60m HDPE	APPROX 26526	280,844

Field Representative _____ Date 12/16/04

SCS ENGINEERS DAILY FIELD REPORT

Project: CITRUS CO. L.F PHASE II EXT Project No. 09905602

Owner: CITRUS CO. Contractor: ADVANCE / COMANCO

Date: 12/18/04 FRI Contract Day: _____ Contract Duration (days): _____

Days Remaining: _____

Temperature: (AM) 50 (PM) 75 Rain: _____ Duration of Rain: _____

Description of Weather: SUNNY & CLEAR

List of Equipment on site: (A) for active (I) for idle

LULL		
225 EXCAVATOR		
TRACK CRAWLER		

Personnel on site:

1	1 QC	12
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity ADVANCE WORKING ON SOUTH SLOPE HAULING EXCESS MATERIAL.

COMANCO - CONTINUED AIR TESTING AND PATCHING REPAIRS. CAPING SEAMS AT 7 & 8 AND 52/53 WITH DESTRUCTIVE SAMPLES 5 AND 16 FAILED MARKED SDS 23 - 31 FOR FIELD TESTING

V-BOXING REPAIRS EAST OF SEAMS 51/52 IN PREPARATION OF DEPLOYING COMPOSITE

List of Subcontractors:

List of Materials Delivered:

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
		280,294

Field Representative _____ Date _____

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/18/04 SAT **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
LULL		
Track Crawler		

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers
CONANCO 1 SUPT	1 QC	Tech 12

Description of Construction Activity
NO SCS Personnel on site. CONANCO CONTINUED WITH DEPLOYING GEOCOMPOSITE IN NORTH-SOUTH DIRECTION FROM NORTH ANCHOR TRENCH

List of Subcontractors
CONANCO

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
GEOCOMPOSITE	APPROX 35,100 + 10,475	45,575 SF

Field Representative Dennis G. DuPont (Rem) **Date** 12/20/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/19/04 SUN **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) _____ **(PM)** _____ **Rain:** _____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

NO ACTIVITY ON THIS DATE

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont **Date** 12/20/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/20/04 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 35 **(PM)** 50 **Rain:**_____ **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

JD 225 C EXCAVATOR		
LULL		
TRUCK CRAWLER		

Personnel on site:

COMANCO 1 SUPT	1 OPC	Tech 12
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

COMANCO CONTINUED TO INSTALL THE GEOCOMPOSITE ON THE NORTH SOUTH DIRECTION. COMANCO DEPLOYED PANELS S27 TO S87. THEY CONTINUED TO ZIP TIE THE PANELS ON THE SLOPES. EARLIER IN THE DAY BURN-OUT THERE WAS DAMAGE TO GEOCOMPOSITE DUE TO ON THE NORTH EAST SLOPE. THIS WAS REPAIRED LATER IN THE DAY

See 7/6/05 Attachment 11

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Field Representative Dennis G. DuPont **Date** 12/20/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/29/04 (Wed) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** --- **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
CULL		
Truck Crawlers		

Personnel on site:

COMANCO 2 SUPT	1 QC	Tech 11
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco started deploying primary geomembrane. Advance had to clean the dirt accumulated on the geocomposite at the South east corner. Dirt was accumulated due to the rain event caused during the weekend. This is the first day of work after Christmas break. Four panels of geomembrane (Primary) were deployed from East to west, starting from the South east slope.

List of Subcontractors

Comanco

List of Materials Delivered

60-mil Geomembrane

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane (Primary)	15,917 (approx)	15,917 (approx)
Geocomposite (Secondary)	---	226,627 SF

Field Representative Dennis G. DuPont Ram _____ **Date** 12/29/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/30/04 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD225C Excavator		
LULL		
Truck Crawler		

Personnel on site:

COMANCO 2 SUPT	1 QC	Tech 12
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

COMANCO continued to deploy primary geomembrane They finished deploying Geomembrane on the east slope and continued to place panels in North-South direction. A total of 15 panels were deployed starting from P5 to P19. Four destruct samples were marked.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane (Primary)	50,510 (approx)	66,427 (approx)
Geo Composite (Secondary)	-	226,627

Field Representative Dennis G. DuPont (Ram) **Date** 12/31/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 12/31/04 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 70 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225 C Excavator		
LULL		
Truck Crawler		

Personnel on site:

COMANCO 1	1 QC	Tech II
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

COMANCO Continued to deploy geomembrane in the North-South direction, at the South east slope. A total of six panels were deployed starting from P20 to P25. one destruct sample was marked making a total of five destruct samples. comanco started non-destruct test on the seams. They worked half day as advance instructed before in the meeting

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane	13,106 (approx)	79,533 SF
Geocomposite (Secondary)	-	226,627

Field Representative Dennis G. DuPont **Date** 12/31/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/10/05 (SAT) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** – **Duration of rain:** –
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

No construction activity on site.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane	–	79,533 SF
GeoComposite (secondary)	–	226,627 SF

Field Representative Dennis G. DuPont **Date** 1/10/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/2/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

NO Construction activity on site

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane	-	79,533 SF
Geo composite (secondary)	-	226,627 SF

Field Representative Dennis G. DuPont **Date** 1/2/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/3/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** — **Duration of rain:** —
Description of weather:

List of Active Equipment on site

JD 225 C Excavator		
LULL		
Track Crawler		

Personnel on site:

Comanco 1	1 QC	Tech II
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Day started with safety meeting at 7:00 Am. Comanco continued to deploy geotanposite (Secondary) on the north slope and NorthWest Slope. Comanco field tested the marked destruct samples. These five destruct samples were shipped to TRI. Comanco started marking repairs on the primary geomembrane.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane (Primary)	—	79,533 SF (approx)
Geo Composite (secondary)	40,057 SF	266,684 SF (approx)

Dennis G. DuPont
Field Representative Ram **Date** 1/3/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/4/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
LGCL		
Truck Crawler		

Personnel on site:

Comanco 1	1 G.C	11 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco continued to deploy geocomposite. They installed 21 panels from S206 or S226. Comanco completed installing secondary geocomposite. Comanco continued with the repairs of the primary geomembrane. In total Comanco repaired 25 locations today.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Secondary Geocomposite	22,028 SF	288,712 SF
Primary Geomembrane	-	79,533 SF (approx)

Field Representative Dennis G. DuPont (Rep) **Date** 1/5/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11/5/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
CULL		
TRUCK CRAWLER		

Personnel on site:

1 Superintendent	1 Orc	11 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco continued to install primary geomembrane. A total of 19 panels were deployed starting from P26 to P44. Comanco continued with the repairs on the primary geomembrane. Two representatives from the County took tour today and inspected the installation.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Secondary Geocomposite	-	288,712
Primary Geomembrane	66902 SF	146,435

Field Representative Dennis G. DuPont Dennis G. DuPont **Date** 11/5/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/6/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
Loll		
Truck Crawley		

Personnel on site:

Comanco 1	1 QA	11 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco continued to deploy liner (Primary) in the North-South direction. A total of 14 (P45 to P58 Geomembrane panels were deployed. Comanco continued to air test the seams. Seven destruct samples were marked. The total number of destruct samples marked till date were 15.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	41,294	187,729 SF

Dennis G. DuPont

Field Representative _____ (Rom) **Date** 1/6/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/7/04 (Fri) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** — **Duration of rain:** —
Description of weather:

List of Active Equipment on site

JD 225C EX Carbtor		
LULL		
TRUK Crawler		

Personnel on site:

2 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco did not deploy any liner today. They started air tests on the seams that were completed on Thursday (1/6/04). Seven destruct samples were shipped today. Comanco also started the repairs on the primary liner's Geomembrane

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	—	187,729 SF

Field Representative Dennis G. DuPont (Rons) **Date** 1/7/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/8/04 (SAT) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

Personnel on site:

2 SUPT	18C	10 TECH
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

No SCC personnel on site. Comanco repaired liner on phase 1. Comanco did not perform any liner installation on this date.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	-	187,729 SF

Field Representative Dennis G. DuPont **Date** 1/8/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11/9/04 (SUN) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

Personnel on site:

No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

Comanco didn't perform any liner activity on site Advanco placed the 24" detention headwall pipe today

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	-	187,729 SF

Dennis G. DuPont
Field Representative Ram **Date** 11/9/04

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/10/04 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225 Excavator		
Lull		
Trk crawler		

Personnel on site:

Comanco 2	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco deployed 21 panels of primary geomembrane today. Comanco continued with the repairs on the primary geomembrane. Four destruct samples PDS-16 through PDS-19 were marked today.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geomembrane (Primary)	49,826 (approx)	237,555 (approx)

Dennis G. DuPont

Field Representative _____ **Date** 1/10/-5

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/11/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 70 **Rain:** – **Duration of rain:** –
Description of weather:

List of Active Equipment on site

JD 225 C EXCAVATOR		
LULL		
TRUCK CRAWLER		

Personnel on site:

2 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco did not install any liner today. Comanco started vacuum tests on the primary geomembrane. Air tests were also performed on the seams that were welded yesterday. Five new destructs were marked. A total of 9 destruct samples (PDS 16 to PDS 24) were sent to TRC today. Comanco performed repair work on the liner. A total of 122 repairs were marked to day.

until

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary geomembrane	–	237,555 (approx)

Dennis G. DuPont

Field Representative _____ **Date** 1/11/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/12/05 (wed) **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

JD 225 C Excavator		
Loc		
Tyjc Crawler		

Personnel on site:

2 Supt	1 Gc	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco started installing primary Geocomposite today. They started from the south east corner and completed placing geocomposite on the east slope. Advance spotted liner damage on phase 1 near the phase 1/phase 2 Tie in. Comanco repaired the damage. one destruct. PDS-15A was sent to TRI for retest. Comanco continued to Tie in the existing liner to the new liner on the south side.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	-	237,555 SF
primary Geocomposite	54,413 SF	54,413 SF

Field Representative Dennis G. DuPont **Date** 1/12/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/13/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 75 **Rain:** — **Duration of rain:** —
Description of weather:

List of Active Equipment on site

JD 225C Excavator		
CVLL		
TRUK Crawler		

Personnel on site:

2 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco continued to deploy primary geocomposite starting on the north slope in the north east corner. Comanco continued to deploy the geocomposite in the north south direction. Comanco performed vacuum test on the repairs at the South Tie in. On the afternoon one crew continued to extrusion weld at the South Tie in. The destruct sample that was sent to TRI for retest (PDS-15A) passed the specifications. Comanco's equipment maintenance personnel was on site in the morning.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary geomembrane	—	237,555 SF
Primary geocomposite	33980 SF (approx)	88,393 SF (approx)

Dennis G. DuPont

Field Representative _____ **Date** 1/13/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 11/4/05 **Contract Day:** — **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 60 **Rain:** 1.1 inches **Duration of rain:** _____
Description of weather:

List of Active Equipment on site

Personnel on site:

2 SUPT	—	—
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity

No activity on site due to rain. Contractor may continue to deploy geocomposite on Saturday 11/5/05 depending on weather.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	—	237,555 SF
Primary Geocomposite	—	88,345 SF

Field Representative Dennis G. DuPont (Roam) **Date** 11/4/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** COMANCO Advance Construction Services

Date: 1/15/05 SAT **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 50 **(PM)** 64 **Rain:** _____ **Duration of rain:** _____
Description of weather: OVERCAST

List of Active Equipment on site

LULL	D5 DOZER	
225 EXCAVATOR		
TRACK CRAWLER		
D4 DOZER		

Personnel on site:

1	1	10
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity WORK NOT OBSERVED BY SCS
COMANCO DEPLOYING PRIMARY GEO COMPOSITE. DEPLOYED PANELS 44-57

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
PRIMARY COMPOSITE	9687.5	98080.5 SF

Dennis G. DuPont
Field Representative _____ **Date** 1/15/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services / COMANCO

Date: 1/17/05 MoJ **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 38 **(PM)** 50 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & COOL

List of Active Equipment on site

LULL FORKLIFT	D5 DOZER	
225 C EXCAVATOR		
TRACK CRAWLER		
D4 DOZER		

Personnel on site:

1 SUPT	2 QC	10 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO ON SITE DEPLOYING PRIMARK COMPOSITE. DEPLOYED APPROXIMATELY 70,837.5 SF ON EAST BOTTOM INSPECTED SPACING OF WIRE TIES AND SEWING OF SEAMS. DEPLOYED NORTH TO SOUTH WITH CABLE AND BLOCK AND TACKLE

DEPLOYED PANELS 58-105

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
PRIMARY COMPOSITE	70,837.5	168,918

Field Representative Dennis G. DuPont **Date** 1/17/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services (Commco)

Date: 1/18/05 TUES **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 32 **(PM)** 48 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & CLEAR COOL

List of Active Equipment on site

LULL FORKLIFT	D5 DOZER	
225 EXCAVATOR		
TRACK CRAWLER		
D4 DOZER		

Personnel on site:

1 SUPT	2 QC	10
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity Commco on-site deploying primary composite. Deployed approximately 46,137.5. Inspected spacing of ties and sewing of seams pulling panels 106-138 from north to south with pulley system.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary geocomposite	46,137.5	215,055.5

Field Representative Dennis G. DuPont **Date** 1/18/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** COMANCO Advance Construction Services

Date: 1/19/05 WED **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 38 **(PM)** 58 **Rain:** — **Duration of rain:** _____
Description of weather: SUNNY & CLEAR

List of Active Equipment on site

LULL FORKLIFT	D5 DOZER	
225 EXCAVATOR		
TRACK CRAWLER		
D4 DOZER		

Personnel on site:

1	2 RC	10 TECHS
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity COMANCO ON SITE DEPLOYING PRIMARY COMPOSITE NORTH TO SOUTH WITH PULLEY SYSTEM. DEPLOYED APPROXIMATELY 40,762 SF. - PANELS 106 - 166.

INSPECTED SPACING OF TIES AND SEWING. HAD COMANCO EXTEND PANELS IN EAST ANCHOR TRENCH. ADVANCE BACKFILLED AND EXCAVATED ANCHOR TRENCH FOR GEO GRID.

HELD - FIELD MEETING WITH ADVANCE AND COMANCO TO FIND OUT THEIR SCHEDULE TO COMPLETE THE LINER AND PRE-CONSTRUCTION ON INSTALLATION OF GRID.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geo composite	40,762	255,817.5

Field Representative Dennis G. DuPont RAD **Date** 1/19/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Comanco Advance Construction Services

Date: 1/20/05 THUR **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 49 **(PM)** 64 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & CLEAR

List of Active Equipment on site

LULL FORKLIFT	D5 DOZER	
225 EXCAVATOR		
TRACK CRAWLER		
D4 DOZER		

Personnel on site:

1 SUPT	2 QC	10 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO CONTINUED TO DETAIL PRIMARY COMPOSITE. INSPECTED SEWING AND PLACEMENT OF TIES ADVANCE EXCAVATING W/BACKHOE TRENCH. CONECTING PRIMARY TO EXISTING COMPOSITE ON SOUTH TIE-IN

ADVANCE - CUTTING RISER AND RE-INSTALLING PIPE IN SUMP

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity

Dennis G. DuPont
Field Representative KP **Date** 1/20/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion LINER INSTALLATION **Project number:** 09199056.02

Owner: Citrus County **Contractor:** COMANCO Advance Construction Services

Date: 1/21/05 FRI **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 49 **(PM)** 69 **Rain:** — **Duration of rain:** —
Description of weather: SUNNY & CLEAR

List of Active Equipment on site

LULL FORKLIFT	D5 DOZER I	
225 EXCAVATOR		
TRACK CRAWLER		
D4 DOZER I		

Personnel on site:

1	2	10 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO ONSITE BEGAN DEPLOYING GEO-GRID ON EAST SLOPE. DEPLOYED PANELS 1-42 FOR A TOTAL OF 40,077.12 SF

ADVANCE - PLACING ROCK AT LEAK DETECTION PIPE - RE-EXCAVATED ANCHOR TRENCH ON WEST TOP OF SLOPE.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
GEOGRID	41,053.76	41,053.76

Dennis G. DuPont
Field Representative KAD **Date** 1/21/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services (COMANCO)

Date: 1/24/05 MON **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 30 **(PM)** 45 **Rain:** _____ **Duration of rain:** _____
Description of weather: COOL & CLEAR

List of Active Equipment on site

LULL FORK LIFT		

Personnel on site:

1	1	11 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO ON SITE - CONTINUED TO DEPLOY GEOGRID ON EAST AND NORTH SLOPE. DEPLOYED PANELS 43-125 INSPECTING SPACING OF TIES
ADVANCE DIGGING ANCHOR TRENCH ON NORTH SIDE - CONTINUED PLACEMENT OF GRAVEL AROUND LEAK DETECTION RISER

List of Subcontractors

_____ _____ _____
_____ _____ _____

List of Materials Delivered

_____ _____ _____
_____ _____ _____

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
GEOGRID	39,754.48	80,808.24

Field Representative Dennis G. DuPont KAQ **Date** 1/24/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** COMANCO Advance Construction Services

Date: 1/25/04 TUES **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 35 **(PM)** 50 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & COOL

List of Active Equipment on site

LULL FORK LIFT		

Personnel on site:

1 SUPT	1 QC	11 TECH
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO ON SITE - CONTINUED DEPLOYMENT OF GEOGRID ON NORTH SIDE OF CELL. DEPLOYED AND TIED PANELS 126—258. INSPECTED SPACING OF TIES

ADVANCE CONTINUED EXCAVATING ANCHOR TRENCH AND CLEARING SOUTH TOP OF BERM FOR GEOGRID DEPLOYMENT.

ADVANCE CONT- DEPLOYMENT OF GRAVEL AROUND LEAK DETECTION RISER

List of Subcontractors

_____ _____ _____

_____ _____ _____

List of Materials Delivered

_____ _____ _____

_____ _____ _____

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
GEOGRID	39,549.54	120,357.80

Field Representative Dennis G. DuPont **Date** 1/25/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** COMANCO Advance Construction Services

Date: 1/26/05 WED **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 40 **(PM)** 65 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & CLOUD

List of Active Equipment on site

LULL FORKLIFT		

Personnel on site:

1 FOREMAN		7 TECH
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity COMANCO CONTINUED DEPLOYMENT OF GEOGRID ON NORTH AND SOUTH SLOPES. DEPLOYED PANELS 359 – 386

ADVANCE – CONTINUED PLACEMENT OF GRAVEL AT LEACHATE DETECTION RISER

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
GEOGRID	39335.92	159,693.72

Field Representative Dennis G. DuPont **Date** 1/26/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/27/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 45 **(PM)** 68 **Rain:** _____ **Duration of rain:** _____
Description of weather: SUNNY & CLOUD

List of Active Equipment on site

LULL FORK LIFT		

Personnel on site:

1	1	6
No. of Superintendents	No. of Skilled	No. of Laborers

Description of Construction Activity COMANCO ON SITE CONTINUED TO DEPLOY 650GRID - DEPLOYED PANELS 387-396 ON SOUTH SLOPE. INSTALLED TIES

COMANCO - CLEANING SITE AND EXTENDED SECONDARY COMPOSITE IN ANCHOR TRENCH

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
650GRID	2637.80	162,331.52

Field Representative Dennis G. DuPont KA **Date** 1/27/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 1/31/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 55 **(PM)** 65 **Rain:** — **Duration of rain:** —
Description of weather:

List of Active Equipment on site

LULL - Fork Lift		

Personnel on site:

1	1 S C	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco installed Geomembrane on the west slope starting from the southwest corner. A total of 5 panels were installed from P80 to P84. Comanco helped Advance to place geotextile cover on the leachate detection pipe (24" HDPE). Advance started pumping the rainwater from the sump in the morning. Two Bentrup samples were marked today. They will be shipped to TRI tomorrow.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geomembrane	21687.5	259242.5 SF
Geogrid	—	162,331.52 SF

Dennis G. DuPont
Field Representative Raw **Date** 1/31/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/1/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 65 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

CUCC		

Personnel on site:

2 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco continued to deploy primary geomembrane on the north slope and the north west corner. Comanco completed all the air tests on the seams. Comanco started repairs on the installed geomembrane. Five deshoots were marked today. (PDS -27 through PDS-31) Comanco stopped working on the liner at 5:00 PM today as the crew has expired. Advance will renew the insurance documents and submit to the County tomorrow.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary Geocomposite	20,571.5	279,814 SF (approx)

Dennis G. DuPont

Field Representative Ram **Date** 2/2/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/2/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 65 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

CULL		

Personnel on site:

1 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco installed the rain tarp on the east slope. Comanco finished vacuum testing all the repairs on the primary liner. Comanco didnot starts working until 10:00 AM in the morning. Advance submitted the insurance documents to the county in the morning. Comanco started working after the county approved the insurance documents.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Rain tarp	275' x 200' = 55,000SF	55,000 SF

Dennis G. DuPont
Field Representative Rayn **Date** 2/2/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: _____ **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 60 **(PM)** 65 **Rain:** _____ **Duration of rain:** 10 min at 4:30 pm
Description of weather:

List of Active Equipment on site

LCL		

Personnel on site:

2 SUPT	1 SK	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

reported 10/6

Description of Construction Activity

Comanco continued to deploy primary geocomposite on the west slope and the north west corner. Earlier in the day there was a damage in the liner due to the roll down of dump truck carrying sand on the north slope. Primary visual inspection showed no damages on the geomembrane only geogrid and primary geocomposite had damaged caused due to the slide of the truck. Impacted zip ties on the geocomposite panels.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
primary geocomposite	44,802.75 SF	289,132.25
~~P~~ Geogrid	—	162,331.52

Dennis G. DuPont

Field Representative _____ **Date** 2/3/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/4/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 42 **(PM)** 56 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

LULL		

Personnel on site:

2 SUPT	1 Oic	11 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity
Conaco installed geo composite on the South slope at the Southwest corner. Inspected Cross Seam and Sewing. In the afternoon conaco installed geogrid on the South slope. Inspected the Zip ties on the geo grid.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
geo composite	9,300 SF	298,432.25 SF
geogrid	6,042.96 SF	168,374.5 SF

Field Representative Dennis G. DuPont **Date** 2/4/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/5/05 **Contract Day:** - **Contract Duration:** 365

Weather
Temperature: (AM) 50 **(PM)** 65 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

LULL (fork lift)		
Dozer		
Excavator		

Personnel on site:

1 SUPT	1 QC	10 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco repaired the damage caused due to the 5th road truck slide into the cell. Comanco repaired the damages on the primary composite and liner. Repairs were marked on the primary liners and repaired. All the repairs were vacuum Tested. 3 new panels were placed instead on primary geocomposite panels, P95, P97, P99.

List of Subcontractors

1

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Primary geocomposite	3235	301,667.25 SF

Dennis G. DuPont

Field Representative _____ **Date** 2/5/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/7/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 70 **Rain:** — **Duration of rain:** —
Description of weather:

List of Active Equipment on site

LULL		

Personnel on site:

1 SUPT	1 QC	9 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanche continued to install roof tarp on the north side and on the west slope. Inspected ties for the geogrid. Comanche will be temporarily hold off their installation of geogrid on the west slope until they get additional material. Advance will continue to install the leachate risers pipe and perforated pipe and get the west slope ready for Comanche to install geogrid and rain tarp.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geogrid	36,152 SF	204,527 SF

Field Representative Dennis G. DuPont Ram **Date** 2/7/05

SCS ENGINEERS DAILY FIELD REPORT

Project: Phase 2 Expansion **Project number:** 09199056.02

Owner: Citrus County **Contractor:** Advance Construction Services

Date: 2/21/05 **Contract Day:** _____ **Contract Duration:** 365

Weather
Temperature: (AM) 65 **(PM)** 70 **Rain:** - **Duration of rain:** -
Description of weather:

List of Active Equipment on site

LVLC		

Personnel on site:

–	1 Foreman	4 Tech
No. of Superintendents	**No. of Skilled**	**No. of Laborers**

Description of Construction Activity

Comanco completed to deploy the geogrid on the west slope. Comanco started to deploy Rain tarp on the west slope starting from the South west corner. It is anticipated that comanco will complete deploying their rain tarp by tomorrow.

List of Subcontractors

List of Materials Delivered

List of Quantities installed this date:

Item Description	Quantity	Accumulated Quantity
Geogrid	12,674.5 SF	217,201 SF
Rain tarp	21,200 SF	76,200 SF

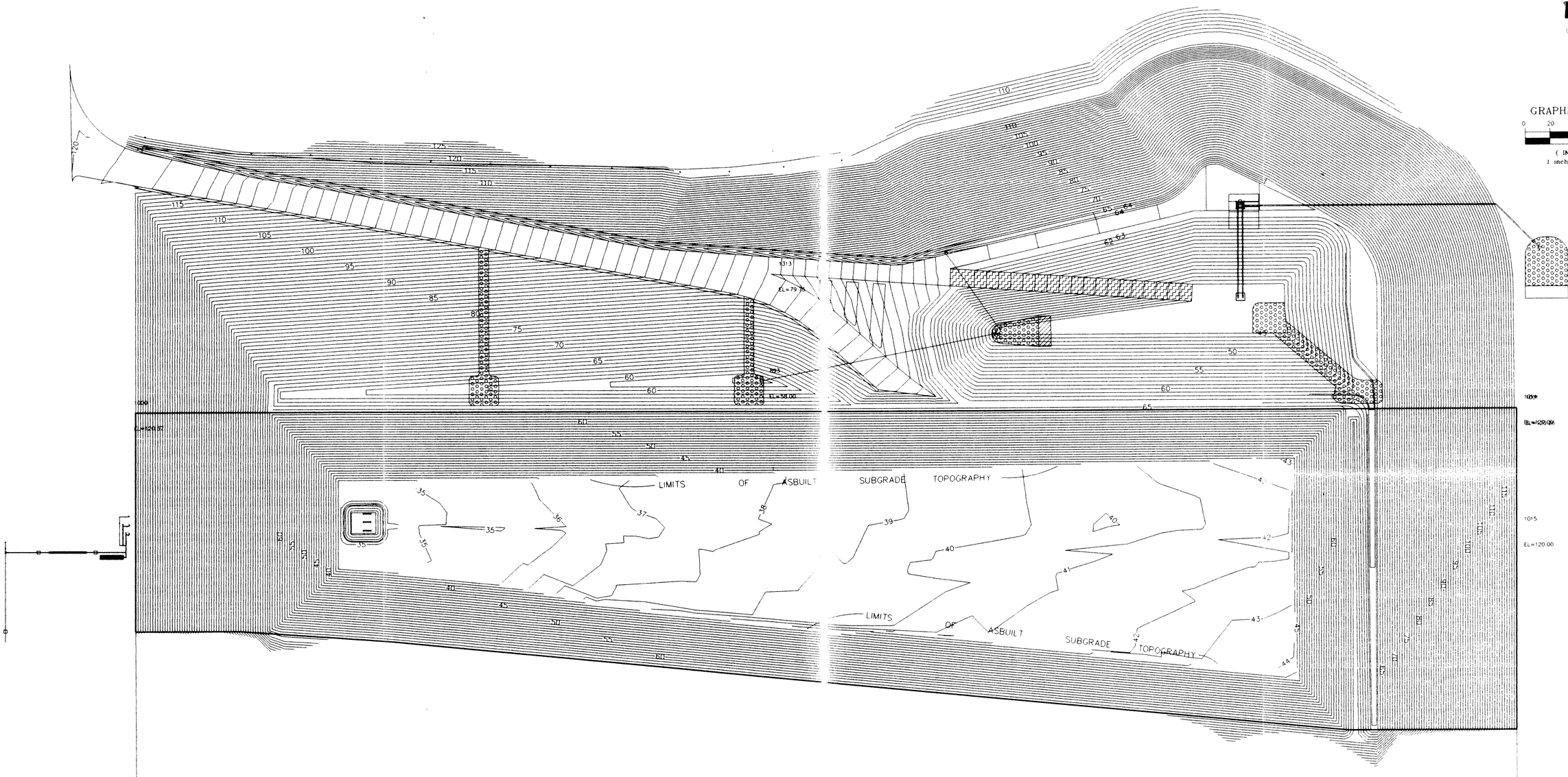
Field Representative Dennis G. DuPont Ram **Date** 2/21/05

ATTACHMENT D

RECORD DRAWINGS

SUBGRADES AS-BUILT

PLAT OF A SPECIFIC PURPOSE SURVEY



SURVEY NOTES:

1. ADDITIONS OR DELETIONS TO SURVEY DRAWINGS BY OTHER THAN THE SIGNED PARTY OR PARTIES IS PROHIBITED BY LAW WITHOUT WRITTEN CONSENT OF THE SIGNED PARTY OR PARTIES.
2. ELEVATIONS AS SHOWN HEREON, IF ANY, ARE BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.
3. THE EXPECTED USE OF THE PROPERTY AS DESCRIBED HEREON, AS CLASSIFIED IN THE MINIMUM TECHNICAL STANDARDS (61G17-6 OF THE FLORIDA ADMINISTRATIVE CODE), IS "COMMERCIAL/HIGH RISK". THE MINIMUM RELATIVE DISTANCE ACCURACY FOR THIS TYPE OF BOUNDARY SURVEY IS 1 FOOT IN 10,000 FEET. THE ACCURACY OBTAINED BY MEASUREMENT AND CALCULATION OF A CLOSED GEOMETRIC FIGURE WAS FOUND TO MEET OR EXCEED THIS REQUIREMENT.

LEGEND AND ABBREVIATIONS

L	= ARC LENGTH
R	= RADIUS
D	= DELTA
C	= CHORD DISTANCE
CB	= CHORD BEARING
R/W	= RIGHT OF WAY
(P)	= PLAT
(F)	= FIELD MEASURED
FB/P	= FIELD BOOK & PAGE
O	= SET IRON ROD AND CAP (LB 6443)
@	= FOUND IRON ROD
■	= 4" X 4" CONCRETE MONUMENT (NO I.D.)
-u-	= UTILITY LINES
--o--	= CHAIN LINK FENCE
-X-	= WIRE FENCE
⧉	= UTILITY SPLICE BOX
Ø	= UTILITY POLE
W	= WELL
	= CONCRETE SLAB

REVISIONS

NO	DATE	DESCRIPTION	FB/P	BY	PROJECT #
2	12/12/04	ASBUILT CELL FLOOR TOPO	DC	GWS	03-487
1	7/15/04	ASBUILT CELL FLOOR TOPO	DC	GWS	03-487

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAY 18 2005
SOUTHWEST DISTRICT
TAMPA

1" = 40'
SCALE
GWS
DRAWN BY
03-487
PROJECT NO.
07/08/04
FIELD DATE
DATA COLLECTOR
FIELD VOL.
D-332
MAP NO.

Certified to: ADVANCE CONSTRUCTION

CENTRAL FLORIDA ENGINEERING, SURVEYING & MAPPING, INC.
CERTIFICATE NO. 6443
3703 EAST FOREST DRIVE
Inverness, Florida 34453-0787
Phone (352) 344-2016
FAX (352) 344-5336

SURVEYORS CERTIFICATE

THIS IS TO CERTIFY TO THE SUBGRADE AS BUILT TOPOGRAPHIC SURVEY SHOWN HEREON

THIS SURVEY [illegible] REQUIREMENTS OF THE FLORIDA [illegible] RDS AS CONTAINED IN [illegible] OF THE FLORIDA ADMINISTRATIVE [illegible]

Gary W. Smith

Florida Registered Land Surveyor No. 4577

THIS SURVEY INVALID UNLESS EMBOSSED WITH A SURVEYORS IMPRESSION SEAL

Subgrade

4

CONTRACTOR SUBMITTAL CERTIFICATION

Project: Citrus County Landfill Phase II Expansion
Specification #: _____ Submittal #: _____
Resubmittal: Yes ☐ No ☐ (Sub. #SUB01 - SD999)

The attached submittal conforms to all requirements of the Contract Documents (Attach all supporting documentation, in accordance with Contract Document requirements).

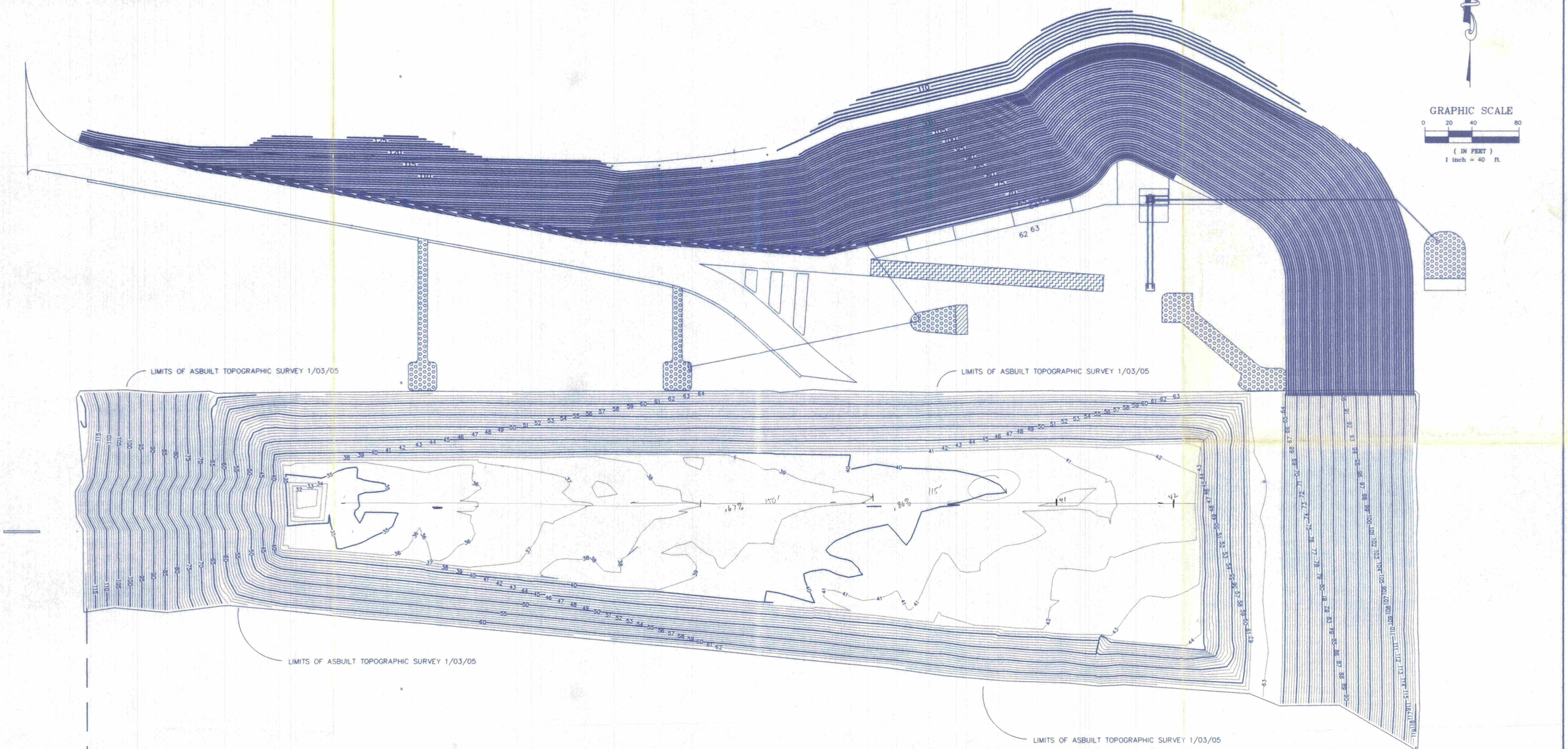
_____ _____
Authorized Contractor Representative Date

The attached submittal does not conform to the requirements of the Contract Documents, and as such represents a substitution. The attached submittal includes that supporting documentation and has addressed the information required for acceptance of substitutions (in accordance with Contract Document requirements).

_____ _____
Authorized Contractor Representative Date

CLAY AS-BUILT

PLAT OF A SPECIFIC PURPOSE SURVEY



GRAPHIC SCALE

0 20 40 80

(IN FEET)
1 inch = 40 ft.

SURVEY NOTES:

1. ADDITIONS OR DELETIONS TO SURVEY DRAWINGS BY OTHER THAN THE SIGNED PARTY OR PARTIES IS PROHIBITED BY LAW WITHOUT WRITTEN CONSENT OF THE SIGNED PARTY OR PARTIES.
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LEGEND AND ABBREVIATIONS

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FB/P	= FIELD BOOK & PAGE
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◎	= FOUND IRON ROD
■	= 4" X 4" CONCRETE MONUMENT (NO I.D.)
-u-	= UTILITY LINES
-o-	= CHAIN LINK FENCE
-x-	= WIRE FENCE
⊠	= UTILITY SPLICE BOX
Ø	= UTILITY POLE
Ⓦ	= WELL
CONC	= CONCRETE SLAB

REVISIONS

NO.	DATE	DESCRIPTION	FB/P	BY	PROJECT #
2	1/03/05	ASBUILT TOPOGRAPHIC SURVEY	DC	GWS	03-487
1	7/15/04	ASBUILT CELL FLOOR TOPO	DC	GWS	03-487

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAY 18 2005
SOUTHWEST DISTRICT TAMPA

1"= 40'
SCALE
GWS
DRAWN BY
03-487
PROJECT NO.
07/08/04
FIELD DATE
DATA COLLECTOR
FIELD VOL.
D-332
MAP NO.

Certified to: ADVANCE CONSTRUCTION
CITRUS COUNTY BOARD OF COUNTY COMMISSIONERS

CENTRAL FLORIDA ENGINEERING, SURVEYING & MAPPING, INC.
CERTIFICATE NO. 6443
3703 EAST FOREST DRIVE
Inverness, Florida 34453-0787
Phone (352) 344-2016
FAX (352) 344-5336

SURVEYORS CERTIFICATE

THIS IS TO CERTIFY TO THE AS BUILT TOPOGRAPHIC SURVEY DATED 1/03/05 LIMITS (R SURVEY) AS SHOWN

THIS SURVEY MEETS ALL APPLICABLE REQUIREMENTS OF THE FLORIDA MINIMUM TECHNICAL STANDARDS AS CONTAINED IN CHAPTER 61G17-6 OF THE FLORIDA ADMINISTRATIVE CODE.

Gary W. Smith, P.L.S.

Florida Registered Land Surveyor No. 4577

THIS SURVEY INVALID UNLESS EMBOSSED WITH A SURVEYORS IMPRESSION SEAL.

Subbase (top of clay)

(6)

CONTRACTOR SUBMITTAL CERTIFICATION

Project: Citrus County Landfill Phase II Expansion
Specification #: 1535 Submittal #: 49
Resubmittal: Yes ☐ No ☒ (Sub. # S0001 - S0999)

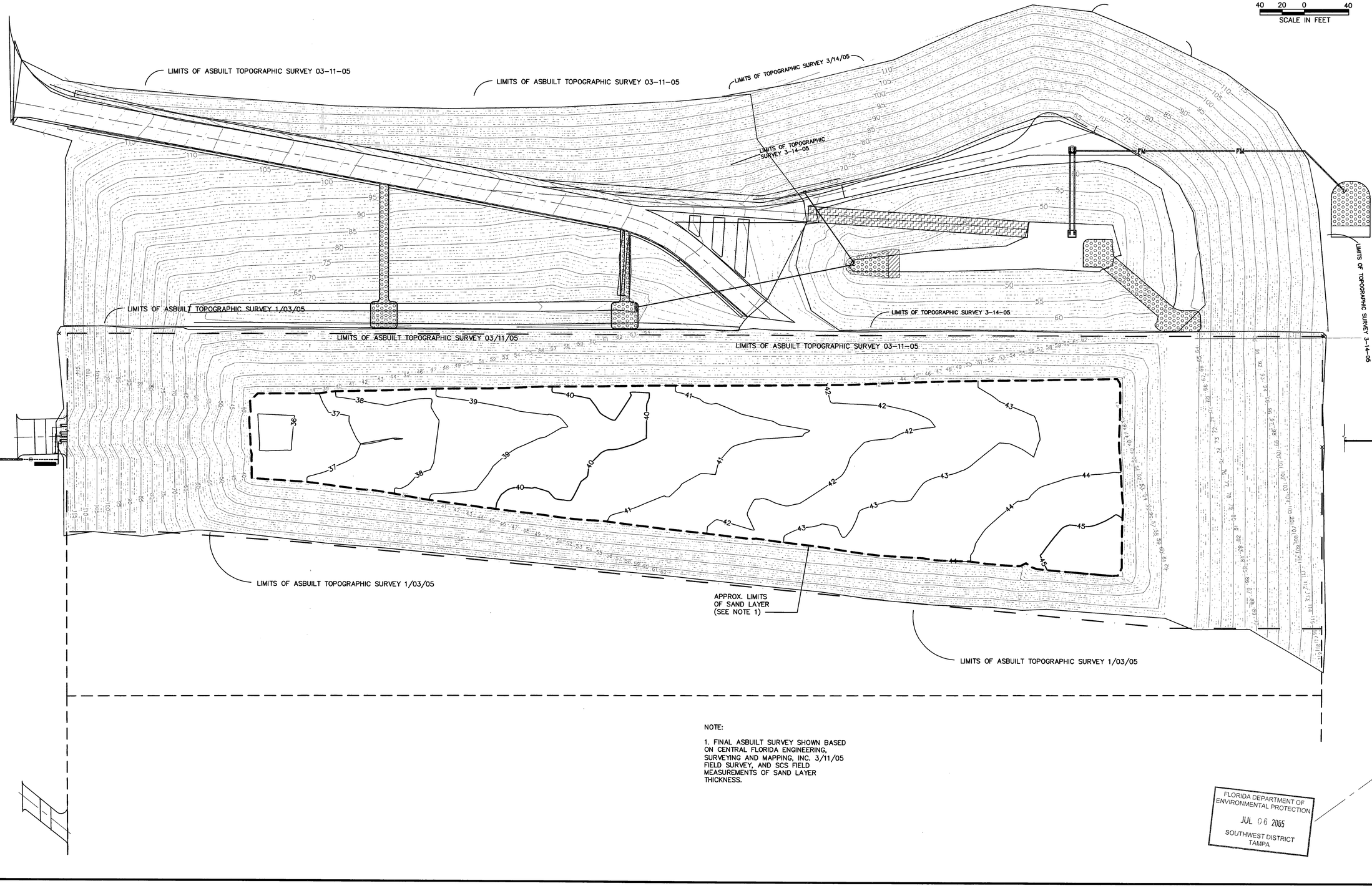
The attached submittal conforms to all requirements of the Contract Documents (Attach all supporting documentation, in accordance with Contract Document requirements).

Authorized Contractor Representative — Date: 4/13/05

The attached submittal does not conform to the requirements of the Contract Documents, and as such represents a substitution. The attached submittal includes that supporting documentation and the additional information required for acceptance of substitutions (in accordance with Contract Document requirements).

Authorized Contractor Representative — Date

FINAL AS-BUILT



N

40 20 0 40
SCALE IN FEET

NOTE:

1. FINAL ASBUILT SURVEY SHOWN BASED ON CENTRAL FLORIDA ENGINEERING, SURVEYING AND MAPPING, INC. 3/11/05 FIELD SURVEY, AND SCS FIELD MEASUREMENTS OF SAND LAYER THICKNESS.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

JOHN A. BAKER JR. 39067 STATE OF FLORIDA REGISTERED PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION	BY
1			

DRAWING TITLE: FINAL RECORD TOPOGRAPHIC SURVEY

PROJECT TITLE: CENTRAL LANDFILL PHASE II EXPANSION RECORD DRAWINGS

Top of Sand

CLIENT: CITRUS COUNTY SOLID WASTE MANAGEMENT DIVISION CITRUS COUNTY, FLORIDA

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
3012 U.S. HWY. 301 NORTH, SUITE 700, TAMPA, FL 33619
PH: (813) 621-0080 FAX NO. (813) 623-6757

PROJ. NO.	DWN. BY:	CHK. BY:	Q/A REVW. BY:
09199056.05	PEI	JAB	BJC
DSN. BY:			APP. BY:
BJC/LEK			RJD

CADD FILE: 995605SAND.dwg

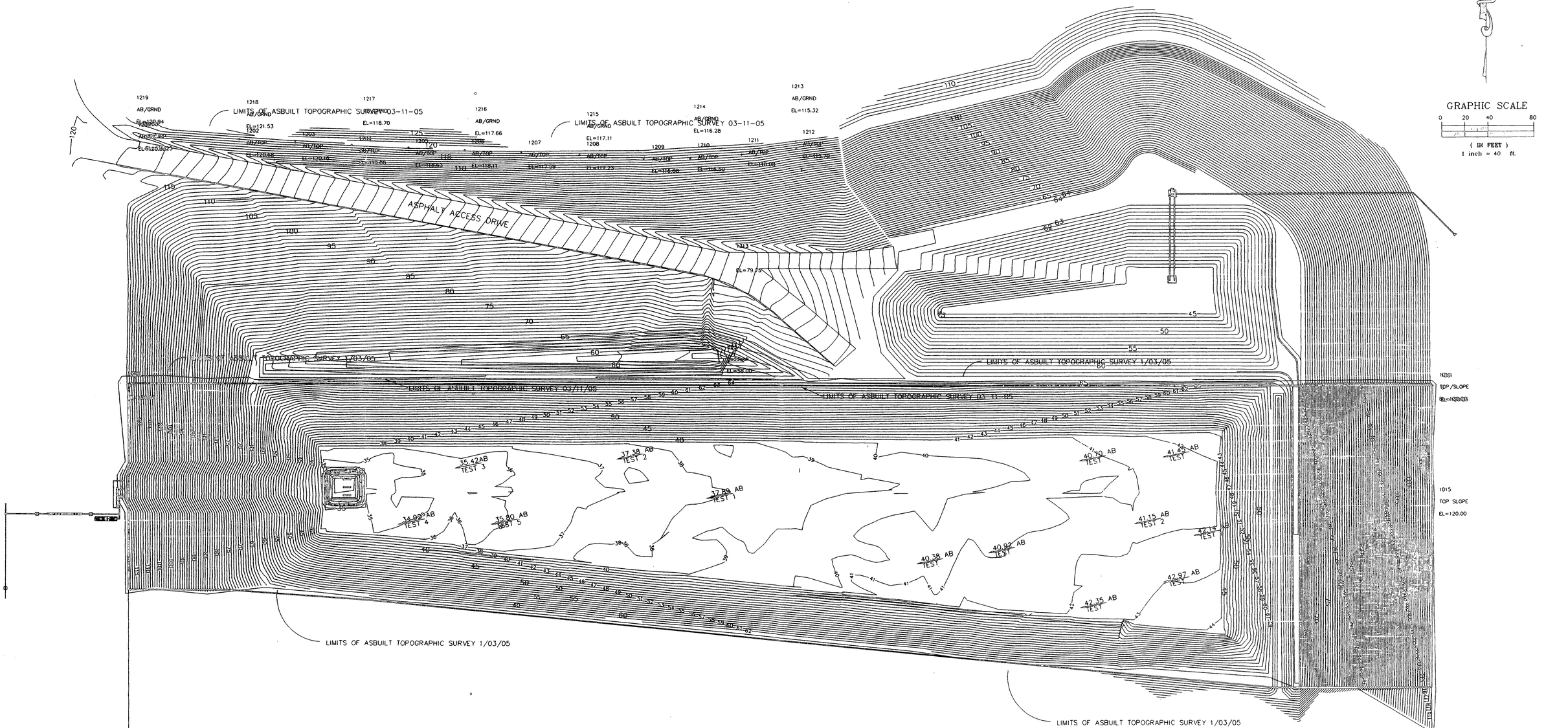
DATE: JULY 2005

SCALE: 1" = 40'

DRAWING NO.: 3 of 3

G:\PROJECT\09199056.13\RecordDrawings\995605SAND.dwg Jul 05, 2005 - 11:41am Layout Name: Sand Site Bv. 2378sda

PLAT OF A SPECIFIC PURPOSE SURVEY



SURVEY NOTES:

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LEGEND AND ABBREVIATIONS

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-o-	= CHAIN LINK FENCE
-x-	= WIRE FENCE
	= UTILITY SPLICE BOX
	= UTILITY POLE
	= WELL
	= CONCRETE SLAB

REVISIONS

NO.	DATE	DESCRIPTION	FB/P	BY	PROJECT #
3	03/11/05	ASBUILT TOPO AS SHOWN	DC	GWS	03-487
2	12/12/04	ASBUILT CELL FLOOR TOPO	DC	GWS	03-487
1	7/15/04	ASBUILT CELL FLOOR TOPO	DC	GWS	03-487

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
MAY 18 2005
SOUTHWEST DISTRICT
TAMPA

1" = 40'
SCALE
GWS
DRAWN BY
03-487
PROJECT NO.
07/08/04
FIELD DATE
DATA COLLECTOR
FIELD VOL.
D-332
MAP NO.

Certified to: ADVANCE CONSTRUCTION

CENTRAL FLORIDA ENGINEERING,
SURVEYING & MAPPING, INC.
CERTIFICATE NO. 6443
3703 EAST FOREST DRIVE
Inverness, Florida 34453-0787
Phone (352) 344-2016
FAX (352) 344-5336

SURVEYORS CERTIFICATE

THIS IS TO CERTIFY TO THE SUBSCRIBED AS BUILT TOPOGRAPHIC SURVEY AS SHOWN HEREON

THIS SURVEY MEETS OR EXCEEDS THE REQUIREMENTS OF THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61G17-6 OF THE FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 OF THE FLORIDA STATUTES.

Gary W. [illegible]
REGISTERED LAND SURVEYOR
STATE OF FLORIDA
NO. 4577

Florida registration number 4577
THIS SURVEY IS NOT VALID UNLESS EMBOSSED WITH A SURVEYOR'S IMPRESSION SEAL.

CONTRACTOR SUBMITTAL CERTIFICATION

Project: Citrus County Landfill Phase II Expansion
Specification #: 1355 Submittal #: 47
Resubmittal: Yes ☐ No ☒ (Sub. #SD001 - SD999)

The attached submittal conforms to all requirements of the Contract Documents (Attach all supporting documentation, in accordance with Contract Document requirements).

Authorized Contractor Representative — Date 4/13/05

The attached submittal does not conform to the requirements of the Contract Documents, and as such represents a substitution. The attached submittal includes that supporting documentation and the additional information required for acceptance of substitutions (in accordance with Contract Document requirements).

Authorized Contractor Representative — Date

ATTACHMENT E

MANUFACTURER
GEOSYNTHETIC QUALITY CONTROL TEST REPORTS

GEOCOMPOSITE

QUALITY CONTROL

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

April 21, 2004

Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

Reference: U.V. stability of geotextile for Citrus County, FL
Long Term Compression on TD-7 (geonet used for Tendrain 770-2)

Dear Mr. Rivera-

To alleviate concern for UV exposure, all Tenax Ultra-Vera™ geotextiles are UV stabilized using **H**indered **A**mine **L**ight **S**tabilized polypropylene (HALS). Hindered Amine Light Stabilizers (HALS) are the most effective of the light stabilizers for polypropylene. HALS work by retarding the photo degradation of plastics by decomposing the radical intermediates formed during the degradation process. Tenax uses a continuous filament process, which allows us to control the formulation of the extruded polymer by adding increased stabilizers during processing. The UV resistance can be increased far beyond that of other geotextiles and therefore extend the time Ultra-Vera™ may be left uncovered without damage or degradation.

Tenax Corporation manufactured the geotextile used in the Citrus County, FL with a formulation that results in a certifiable UV exposure of 95% retained strength after 500 hr exposure per ASTM G 154 (find attached this standard). In addition find attached the exposure data that Tenax has accumulated over the last couple of years running at this formulation using Techmer UV stabilizer (20 % loaded) at a concentration of 1000ppm into the polypropylene mixture. All the data tested with this loading resulted in a retained strength of the geotextile greater than 95% after 500 hrs of exposure. In addition I have added the Techmer certification showing the UV stabilizer supplied to Tenax is loaded at the correct concentration of 20%.

I have added per requests of the SCS engineers the long-term compression on the TD-7. The attached figure on page 3 in the attachment shows the results of 10,000-hour compressive creep tests on tri-planar geonets, TD-7 under normal loads of 2,000psf and 25,000psf respectively. This TD-7 is the geonet that is used in the manufacture of the Citrus County Landfill Tendrain 770-2. The creep curve under 2,000psf load is used to determine the creep reduction factor for the first case (initial phase of waste placement), and the creep curve under 25,000psf is used for the second case (landfill prior to final closure).

Please call me if you have any further questions at 410-522-7000*108

Yours Truly,

Tim Bauters, Ph.D.
Director of Quality

Enclosure:

- ASTM G154
- UV exposure data on 6 to 7 Oz/yd^2 non-woven geotextile loaded at 1000 ppm UV stabilizer
- Techmer Certifications (supplier of UV stabilizer)
- Technical note regarding long-term compression

Tenax Laboratory

UV Exposure

Roll Number:	2015495	Tech:	Kimble	UV Set Point:	100.0
Lot Number:	20116	Date:	10/7/2002	UV Stab:	Techmer
Exposer Time:	513	Type:	UV506	UV Loading:	20%
		Color:	White		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	572.9	542.0	105.70%
2	408.5	386.2	105.77%
3	389.3	406.4	95.79%
4	433.4	506.3	85.60%
5	549.0	641.3	85.61%
6	626.6	555.4	112.82%
Average:	496.6	506.3	
Std Dev:	98.7	96.2	
COV:	19.9	19.0	

Total Exposed	Total Control	Total Percent
496.62	506.3	98.09%

Cross Direction

Sample Number	Exposed	Control	% Retained
1			#DIV/0!
2			#DIV/0!
3			#DIV/0!
4			#DIV/0!
5			#DIV/0!
6			#DIV/0!
Average:	#DIV/0!	#DIV/0!	
Std Dev:	#DIV/0!	#DIV/0!	
COV:	#DIV/0!	#DIV/0!	

Total Exposed	Total Control	Total Percent
#DIV/0!	#DIV/0!	#DIV/0!

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	2020613	Tech:	Geri	UV Set Point:	100.0
Lot Number:	20153	Date:	1/21/2003	UV Stab:	Techmer
Exposer Time:	501	Type:	UV507	UV Loading:	20%
		Color:	Yellow		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	630.3	744.2	84.69%
2	732.6	531.5	137.84%
3	624.7	724.0	86.28%
4	625.0	565.1	110.60%
5	790.3	594.9	132.85%
6	816.4	808.9	100.93%
Average:	703.2	661.4	
Std Dev:	88.2	112.3	
COV:	12.5	17.0	

Total Exposed	Total Control	Total Percent
703.22	661.4	106.32%

Cross Direction

Sample Number	Exposed	Control	% Retained
1			#DIV/0!
2			#DIV/0!
3			#DIV/0!
4			#DIV/0!
5			#DIV/0!
6			#DIV/0!
Average:	#DIV/0!	#DIV/0!	
Std Dev:	#DIV/0!	#DIV/0!	
COV:	#DIV/0!	#DIV/0!	

Total Exposed	Total Control	Total Percent
#DIV/0!	#DIV/0!	#DIV/0!

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	2020730	Tech:	Geri	UV Set Point:	100.0
Lot Number:	20154	Date:	1/22/2003	UV Stab:	Techmer
Exposer Time:	500	Type:	UV507	UV Loading:	20%
		Color:	White		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	832.2	753.8	110.40%
2	893.4	781.5	114.32%
3	780.1	796.0	98.00%
4	572.1	796.2	71.85%
5	828.5	713.3	116.15%
6	668.7	740.9	90.26%
Average:	762.5	763.6	
Std Dev:	119.8	33.4	
COV:	15.7	4.4	

Total Exposed	Total Control	Total Percent
762.50	763.6	**99.85%**

Cross Direction

Sample Number	Exposed	Control	% Retained
1			#DIV/0!
2			#DIV/0!
3			#DIV/0!
4			#DIV/0!
5			#DIV/0!
6			#DIV/0!
Average:	#DIV/0!	#DIV/0!	
Std Dev:	#DIV/0!	#DIV/0!	
COV:	#DIV/0!	#DIV/0!	

Total Exposed	Total Control	Total Percent
#DIV/0!	#DIV/0!	**#DIV/0!**

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	3000813	Tech:	Geri	UV Set Point:	100.0
Lot Number:	30008	Date:	2/6/2003	UV Stab:	Techmer
Exposer Time:	500 hours	Type:	UV506	UV Loading:	20%
		Color:	Orange		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	793.0	706.6	112.23%
2	743.4	547.1	135.88%
3	635.2	773.2	82.15%
4	796.2	600.0	132.70%
5	522.4	522.1	100.06%
6	593.6	939.6	63.18%
7	957.7	695.3	137.74%
8	852.9	477.6	178.58%
9	703.9	707.4	99.51%
10	813.4	591.4	137.54%
11	459.7	616.9	74.52%
12	470.1	986.6	47.65%
Average:	695.1	680.3	
Std Dev:	159.5	157.7	
COV:	22.9	23.2	

Total Exposed	Total Control	Total Percent
695.13	680.3	102.18%

Cross Direction

Sample Number	Exposed	Control	% Retained
1	820.4	831.9	98.62%
2	696.1	685.6	101.53%
3	978.8	914.9	106.98%
4	1175.0	985.9	119.18%
5	1058.0	923.0	114.63%
6	1074.0	1021.0	105.19%
7	676.0	779.6	86.71%
8	720.3	665.2	108.28%
9	924.0	977.2	94.56%
10	1140.0	848.6	134.34%
11	947.4	931.8	101.67%
12	1087.0	914.6	118.85%
Average:	941.4	873.3	
Std Dev:	176.4	114.5	
COV:	18.7	13.1	

Total Exposed	Total Control	Total Percent
941.42	873.3	107.80%

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	3001182	Tech:	Geri	UV Set Point:	100.0
Lot Number:	30010	Date:	2/12/2003	UV Stab:	Techmer
Exposer Time:	500	Type:	UV506	UV Loading:	20%
		Color:	White		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	429.9	625.5	68.73%
2	536.1	716.0	74.87%
3	600.5	423.5	141.79%
4	528.3	729.4	72.43%
5	1003.0	429.3	233.64%
6	516.5	511.1	101.06%
7	501.2	492.3	101.81%
8	655.8	888.6	73.80%
9	403.9	492.1	82.08%
10	535.3	755.4	70.86%
11	852.9	492.1	173.32%
12	408.2	498.3	81.92%
Average:	581.0	587.8	
Std Dev:	180.8	150.7	
COV:	31.1	25.6	

Total Exposed	Total Control	Total Percent
580.97	587.8	**98.84%**

Cross Direction

Sample Number	Exposed	Control	% Retained
1	743.1	863.1	86.10%
2	826.3	890.2	92.82%
3	782.6	1021.0	76.65%
4	849.4	812.1	104.59%
5	809.1	761.9	106.20%
6	814.5	762.1	106.88%
7	1143.0	916.0	124.78%
8	1015.0	736.4	137.83%
9	1026.0	831.9	123.33%
10	944.2	798.9	118.19%
11	885.0	922.7	95.91%
12	.898.	929.1	#VALUE!
Average:	894.4	853.8	
Std Dev:	123.3	85.0	
COV:	13.8	10.0	

Total Exposed	Total Control	Total Percent
894.38	853.8	**104.76%**

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	4000132	Tech:	Lillie/Geri	UV Set Point:	100.0
Lot Number:	40000	Date:	2/20/2004	UV Stab:	Techmer
Exposer Time:	500 hours	Type:	UV506	UV Loading:	20%
		Color:	Orange		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	367.8	648.6	56.71%
2	518.3	632.2	81.98%
3	613.6	877.7	69.91%
4	654.3	687.5	95.17%
5	692.6	763.8	90.68%
6	891.4	618.2	144.19%
7	672.2	696.7	96.48%
8	666.1	713.6	93.34%
9	768.6	326.9	235.12%
10	778.8	369.8	210.60%
11	567.7	492.8	115.20%
12	561.5	497.1	112.96%
Average:	646.1	610.4	
Std Dev:	136.3	161.2	
COV:	21.1	26.4	

Total Exposed	Total Control	Total Percent
646.08	610.4	105.84%

Cross Direction

Sample Number	Exposed	Control	% Retained
1	774.3	768.1	100.81%
2	678.4	568.0	119.44%
3	744.7	576.0	129.29%
4	748.0	616.8	121.27%
5	724.3	536.6	134.98%
6	574.7	481.5	119.36%
7	712.0	573.4	124.17%
8	672.0	534.7	125.68%
9	574.7	680.6	84.44%
10	559.7	614.2	91.13%
11	689.4	665.8	103.54%
12	814.0	524.2	155.28%
Average:	688.9	595.0	
Std Dev:	82.3	79.6	
COV:	11.9	13.4	

Total Exposed	Total Control	Total Percent
688.85	595.0	115.77%

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	3002223	Tech:	Geri	UV Set Point:	100.0
Lot Number:	30015	Date:	2/27/2003	UV Stab:	Techmer
Exposer Time:	500 hours	Type:	UV506	UV Loading:	20%
		Color:	White		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	465.4	923.8	50.38%
2	683.5	590.6	115.73%
3	596.0	284.8	209.27%
4	704.2	562.4	125.21%
5	449.8	754.1	59.65%
6	588.2	353.3	166.49%
7	847.0	1011.0	83.78%
8	678.4	636.8	106.53%
9	629.5	334.0	188.47%
10	634.4	636.5	99.67%
11	429.3	568.9	75.46%
12	605.4	531.5	113.90%
Average:	609.3	599.0	
Std Dev:	119.1	221.2	
COV:	19.5	36.9	

Total Exposed	Total Control	Total Percent
609.26	599.0	**101.72%**

Cross Direction

Sample Number	Exposed	Control	% Retained
1	1058.0	944.2	112.05%
2	1048.0	1159.0	90.42%
3	1105.0	799.2	138.26%
4	1061.0	1157.0	91.70%
5	1076.0	977.2	110.11%
6	1025.0	1041.0	98.46%
7	929.4	1280.0	72.61%
8	1004.0	950.3	105.65%
9	1001.0	1238.0	80.86%
10	1213.0	962.4	126.04%
11	1032.0	1021.0	101.08%
12	1286.0	1168.0	110.10%
Average:	1069.9	1058.1	
Std Dev:	96.0	142.3	
COV:	9.0	13.4	

Total Exposed	Total Control	Total Percent
1069.87	1058.1	**101.11%**

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	3002223	Tech:	Geri	UV Set Point:	100.0
Lot Number:	30015	Date:	2/27/2003	UV Stab:	Techmer
Exposer Time:	1000	Type:	UV506	UV Loading:	20%
		Color:	Orange		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	695.6	753.3	92.34%
2	676.7	731.8	92.47%
3	392.6	451.9	86.88%
4	644.8	528.6	121.98%
5	519.5	464.6	111.82%
6	559.7	503.4	111.18%
7	634.4	462.6	137.14%
8	398.5	494.0	80.67%
9	441.2	469.8	93.91%
10	488.9	576.9	84.75%
11	466.3	443.8	105.07%
12	494.8	288.7	171.39%
Average:	534.4	514.1	
Std Dev:	106.5	126.5	
COV:	19.9	24.6	

Total Exposed	Total Control	Total Percent
534.42	514.1	**103.95%**

Cross Direction

Sample Number	Exposed	Control	% Retained
1	743.1	863.1	86.10%
2	826.3	890.2	92.82%
3	782.6	1021.0	76.65%
4	849.4	812.1	104.59%
5	809.1	761.9	106.20%
6	814.5	762.1	106.88%
7	1143.0	916.0	124.78%
8	1015.0	736.4	137.83%
9	1026.0	831.9	123.33%
10	944.2	798.9	118.19%
11	885.0	922.7	95.91%
12	.898.	929.1	#VALUE!
Average:	894.4	853.8	
Std Dev:	123.3	85.0	
COV:	13.8	10.0	

Total Exposed	Total Control	Total Percent
894.38	853.8	**104.76%**

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	3008325	Tech:	Geri	UV Set Point:	100.0
Lot Number:	30067	Date:	8/15/2003	UV Stab:	Techmer
Exposer Time:	500 hours	Type:	UV506	UV Loading:	20%
		Color:	White		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	435.4	301.9	144.22%
2	445.5	317.9	140.14%
3	412.9	296.1	139.45%
4	261.5	324.6	80.56%
5	364.2	277.9	131.05%
6	388.2	277.9	139.69%
7	371.4	311.5	119.23%
8	381.5	315.8	120.80%
9	322.4	305.5	105.53%
10	340.1	271.3	125.36%
11	379.2	303.5	124.94%
12	408.6	297.9	137.16%
Average:	375.9	300.2	
Std Dev:	50.8	17.0	
COV:	13.5	5.7	

Total Exposed	Total Control	Total Percent
375.91	300.2	125.24%

Cross Direction

Sample Number	Exposed	Control	% Retained
1	1047.0	938.0	111.62%
2	967.1	900.9	107.35%
3	891.0	806.2	110.52%
4	977.2	781.5	125.04%
5	1134.0	995.3	113.94%
6	1046.0	936.1	111.74%
7	965.8	880.5	109.69%
8	834.9	953.7	87.54%
9	956.4	888.6	107.63%
10	1048.0	965.1	108.59%
11	845.9	1150.0	73.56%
12	1007.0	927.0	108.63%
Average:	976.7	926.9	
Std Dev:	88.3	93.8	
COV:	9.0	10.1	

Total Exposed	Total Control	Total Percent
976.69	926.9	105.37%

All Tests done in accordance with ASTM G 154

Tenax Laboratory

UV Exposure

Roll Number:	4000132	Tech:	Lillie/Geri	UV Set Point:	100.0
Lot Number:	40000	Date:	2/20/2004	UV Stab:	Techmer
Exposer Time:	500 hours	Type:	UV506	UV Loading:	20%
		Color:	Orange		

Machine Direction

Sample Number	Exposed	Control	% Retained
1	367.8	648.6	56.71%
2	518.3	632.2	81.98%
3	613.6	877.7	69.91%
4	654.3	687.5	95.17%
5	692.6	763.8	90.68%
6	891.4	618.2	144.19%
7	672.2	696.7	96.48%
8	666.1	713.6	93.34%
9	768.6	326.9	235.12%
10	778.8	369.8	210.60%
11	567.7	492.8	115.20%
12	561.5	497.1	112.96%
Average:	646.1	610.4	
Std Dev:	136.3	161.2	
COV:	21.1	26.4	

Total Exposed	Total Control	Total Percent
646.08	610.4	105.84%

Cross Direction

Sample Number	Exposed	Control	% Retained
1	774.3	768.1	100.81%
2	678.4	568.0	119.44%
3	744.7	576.0	129.29%
4	748.0	616.8	121.27%
5	724.3	536.6	134.98%
6	574.7	481.5	119.36%
7	712.0	573.4	124.17%
8	672.0	534.7	125.68%
9	574.7	680.6	84.44%
10	559.7	614.2	91.13%
11	689.4	665.8	103.54%
12	814.0	524.2	155.28%
Average:	688.9	595.0	
Std Dev:	82.3	79.6	
COV:	11.9	13.4	

Total Exposed	Total Control	Total Percent
688.85	595.0	115.77%

All Tests done in accordance with ASTM G 154

Technical Note

Determining Creep Reduction Factor for Tri-Planar Geonets

In this technical note, the Creep Reduction Factor, RF_{cr} is determined to account for the creep that takes place in a tri-planar geonet between the seating period of 100 hours and two time periods. The first case is to represent the initial phase of waste placement, and the second case is to represent the stage of the landfill prior to final closure where waste thickness reaches its maximum height. The reduction factor for creep is then applied to the transmissivity value determined from performance test with a 100-hour seating to account for the creep deformation.

The attached Figure shows the results of 10,000-hour compressive creep tests on tri-planar geonets under normal loads of 2,000psf and 25,000psf respectively. The creep curve under 2,000psf load is used to determine the creep reduction fact for the first case (initial phase of waste placement), and the creep curve under 25,000psf is used for the second case (landfill prior to final closure). The following Equation[1] is used to determine the Creep Reduction Factor, RF_{cr}

$$RF_{cr} = \left[\frac{(t_{CO} / t_{virgin}) - (1 - n_{virgin})}{(t_{CR} / t_{virgin}) - (1 - n_{virgin})} \right]^3$$

Where:

T_{CO} = thickness after load application for 100 hours

t_{virgin} = initial thickness under 2.9 psi (ASTM D5199)

t_{CR}= thickness at the time period of interest

n_{virgin} = initial porosity

---

[1] Giroud, J.P., Zhao, A., and Richardson, G., 2000, "Effect of Thickness Reduction on Geosynthetic Hydraulic Transmissivity", Special Issue on Liquid Collection Systems, *Geosynthetics International*, Vol.7, Nos. 4-6, pp. 433-452.

Case 1: Using the compressive creep curve under 2000psf load (Initial Phase of Waste Placement):

t_{CO} = t_{100h} = 7.62*0.975 = 7.43 mm

t_{virgin} = 7.62 mm (300 mils)

t_{CR} (use 4,000 hours) = t_{4000h} = 7.62*0.965 = 7.35 mm

n_{virgin} = 0.75 (calculated)

Substituting these values in the above Equation:

RC_{CR} = **1.05**

Case 2: Using the compressive creep curve under 25,000psf load (Landfill Prior to Final Closure):

t_{CO} = t_{100h} = 7.62*0.7 = 5.32 mm

t_{virgin} = 7.62 mm (300 mils)

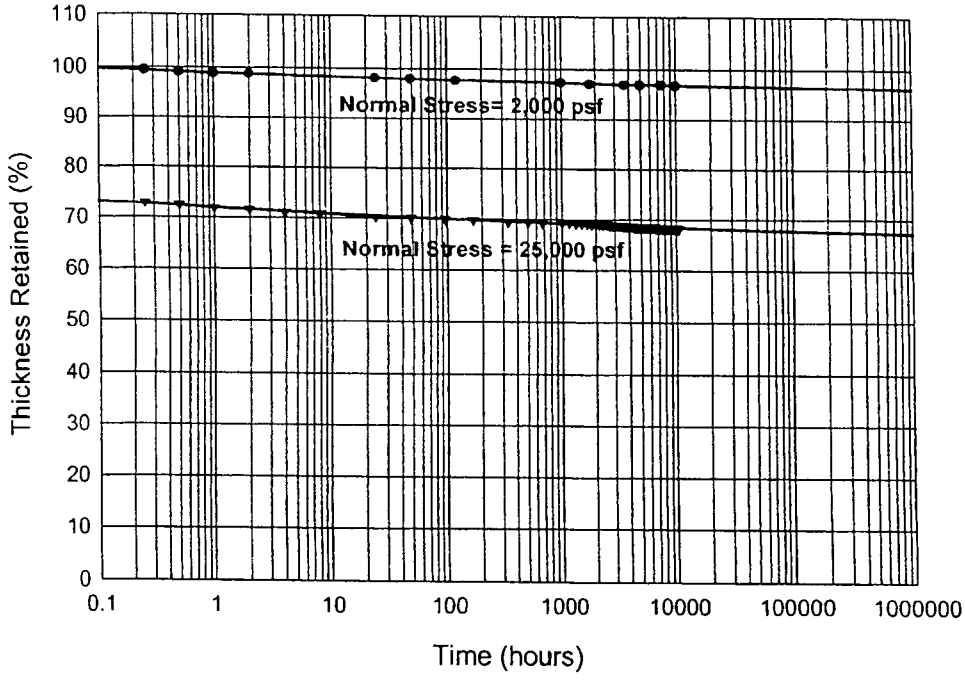
t_{CR} (use 17,000 hours) = t_{17000h} = 7.62*0.675 = 5.14 mm

n_{virgin} = 0.75 (calculated)

Substituting these values in the above Equation:

RC_{CR} = **1.20** (for landfill prior to final closure)

Compressive Creep Data on Tendrain



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CERTIFICATE OF ANALYSIS

Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY

(251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2002121045079
PO Number:
Pounds Shipped:

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	45
% Volatiles	165º C	%	.07
Pellets Per Gram			65
% Nitrogen			2.58
Yellowness Index			21.86
UV%			21.81

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CERTIFICATE OF ANALYSIS

Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY

(251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2002111043639
PO Number:
Pounds Shipped: 5,181

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	44.2
% Volatiles	165º C	%	.08
Pellets Per Gram			67
% Nitrogen			2.40
Yellowness Index			17.48
UV%			20.54

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Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY (251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2004011061372
PO Number:
Pounds Shipped: 10,030

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	40.2
% Volatiles	165º C	%	.11
Pellets Per Gram			65
% Nitrogen			2.25
Yellowness Index			16.13
UV%			19.01

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CERTIFICATE OF ANALYSIS

Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY (251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003011047114
PO Number:
Pounds Shipped: 4,824

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	38.1
% Volatiles	165º C	%	.14
Pellets Per Gram			68
% Nitrogen			2.54
Yellowness Index			20.02
UV%			21.47

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Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY (251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003031049396
PO Number:
Pounds Shipped: 5,400

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	42.95
% Volatiles	165º C	%	.11
Pellets Per Gram			64
% Nitrogen			2.43
Yellowness Index			21.78
UV%			20.54

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Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY (251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003061053481
PO Number:
Pounds Shipped: 9,000

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	36.9
% Volatiles	165º C	%	.09
Pellets Per Gram			64
% Nitrogen			2.35
Yellowness Index			20.04
UV%			19.86

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Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY

(251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003081056239
PO Number:
Pounds Shipped: 9,000

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	42.3
% Volatiles	165º C	%	.13
Pellets Per Gram			68
% Nitrogen			2.31
Yellowness Index			18.24
UV%			19.52

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Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY

(251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003121060166
PO Number:
Pounds Shipped: 5,134

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	42.3
% Volatiles	165º C	%	.11
Pellets Per Gram			64
% Nitrogen			2.35
Yellowness Index			19.78
UV%			19.86

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CERTIFICATE OF ANALYSIS

Date: 04/19/2004
Customer: Tenax Corporation

Attn:
JOHNATHAN MCCULLEY

(251) 578-6140

Product Number: PPM11057

Description: 20% TINUVIN 111
Lot Number: E2003041050524
PO Number:
Pounds Shipped: 5,400

Parameter	Test Condition	Units	Lot Results
Melt Index	230º C	g/10 min	38.9
% Volatiles	165º C	%	.11
Pellets Per Gram			67
% Nitrogen			2.49
Yellowness Index			18.2
UV%			21.04

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Document prepared by: SMULL

Designation: G 154 – 00a

Standard Practice for Operating Fluorescent Light Apparatus for UV Exposure of Nonmetallic Materials[1]

This standard is issued under the fixed designation G 154; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the basic principles and operating procedures for using fluorescent UV light, and water apparatus intended to reproduce the weathering effects that occur when materials are exposed to sunlight (either direct or through window glass) and moisture as rain or dew in actual usage. This practice is limited to the procedures for obtaining, measuring, and controlling conditions of exposure. A number of exposure procedures are listed in an appendix; however, this practice does not specify the exposure conditions best suited for the material to be tested.

NOTE 1—Practice G 151 describes performance criteria for all exposure devices that use laboratory light sources. This practice replaces Practice G 53, which describes very specific designs for devices used for fluorescent UV exposures. The apparatus described in Practice G 53 is covered by this practice.

1.2 Test specimens are exposed to fluorescent UV light under controlled environmental conditions. Different types of fluorescent UV light sources are described.

1.3 Specimen preparation and evaluation of the results are covered in ASTM methods or specifications for specific materials. General guidance is given in Practice G 151 and ISO 4892-1. More specific information about methods for determining the change in properties after exposure and reporting these results is described in ISO 4582.

1.4 The values stated in SI units are to be regarded as the standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

1.6 This standard is technically similar to ISO 4892-3 and ISO DIS 11507.

2. Referenced Documents

2.1 *ASTM Standards:*

D 3980 Practice for Interlaboratory Testing of Paint and Related Materials[2]

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method[3]

G 53 Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials[4]

G 113 Terminology Relating to Natural and Artificial Weathering Tests for Nonmetallic Materials[4]

G 151 Practice for Exposing Nonmetallic Materials in Accelerated Test Devices That Use Laboratory Light Sources[4]

2.2 *CIE Standard:*

CIE-Publ. No. 85: Recommendations for the Integrated Irradiance and the Spectral Distribution of Simulated Solar Radiation for Testing Purposes[5]

2.3 *ISO Standards:*

ISO 4582, Plastics—Determination of the Changes of Colour and Variations in Properties After Exposure to Daylight Under Glass, Natural Weathering or Artificial Light[6]

ISO 4892-1, Plastics—Methods of Exposure to Laboratory Light Sources, Part 1, Guidance[6]

ISO 4892-3, Plastics—Methods of Exposure to Laboratory Light Sources, Part 3, Fluorescent UV lamps[6]

ISO DIS 11507, Paint and Varnishes—Exposure of Coatings to Artificial Weathering in Apparatus—Exposure to Fluorescent Ultraviolet and Condensation Apparatus[6]

3. Terminology

3.1 *Definitions*—The definitions given in Terminology G 113 are applicable to this practice.

3.2 *Definitions of Terms Specific to This Standard*—As used

[1] This practice is under the jurisdiction of ASTM Committee G3 on Weathering and Durability and is the direct responsibility of Subcommittee G03.03 on Simulated and Controlled Exposure Tests.

Current edition approved June 10, 2000. Published September 2000. Originally published as G 154 – 97. Last previous edition G 154 – 00.

[2] Discontinued 1998. See *1998 Annual Book of ASTM Standards*, Vol 06.01.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] *Annual Book of ASTM Standards*, Vol 14.04.

[5] Available from Secretary, U.S. National Committee, CIE, National Institute of Standards and Technology (NIST), Gaithersburg, MD 20899.

[6] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

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in this practice, the term *sunlight* is identical to the terms *daylight* and *solar irradiance, global* as they are defined in Terminology G 113.

4. Summary of Practice

4.1 Specimens are exposed to repetitive cycles of light and moisture under controlled environmental conditions.

4.1.1 Moisture is usually produced by condensation of water vapor onto the test specimen or by spraying the specimens with demineralized/deionized water.

4.2 The exposure condition may be varied by selection of:

4.2.1 The fluorescent lamp,

4.2.2 The lamp's irradiance level,

4.2.3 The type of moisture exposure,

4.2.4 The timing of the light and moisture exposure,

4.2.5 The temperature of light exposure, and

4.2.6 The temperature of moisture exposure, and

4.2.7 The timing of a light/dark cycle.

4.3 Comparison of results obtained from specimens exposed in same model of apparatus should not be made unless reproducibility has been established among devices for the material to be tested.

4.4 Comparison of results obtained from specimens exposed in different models of apparatus should not be made unless correlation has been established among devices for the material to be tested.

5. Significance and Use

5.1 The use of this apparatus is intended to induce property changes associated with the end use conditions, including the effects of the UV portion of sunlight, moisture, and heat. These exposures may include a means to introduce moisture to the test specimen. Exposures are not intended to simulate the deterioration caused by localized weather phenomena, such as atmospheric pollution, biological attack, and saltwater exposure. Alternatively, the exposure may simulate the effects of sunlight through window glass. Typically, these exposures would include moisture in the form of condensing humidity.

NOTE 2—**Caution:** Refer to Practice G 151 for full cautionary guidance applicable to all laboratory weathering devices.

5.2 Variation in results may be expected when operating conditions are varied within the accepted limits of this practice. Therefore, no reference shall be made to results from the use of this practice unless accompanied by a report detailing the specific operating conditions in conformance with the Section 10.

5.2.1 It is recommended that a similar material of known performance (a control) be exposed simultaneously with the test specimen to provide a standard for comparative purposes. It is recommended that at least three replicates of each material evaluated be exposed in each test to allow for statistical evaluation of results.

6. Apparatus

6.1 *Laboratory Light Source*—The light source shall be fluorescent UV lamps. A variety of fluorescent UV lamps can be used for this procedure. Differences in lamp intensity or spectrum may cause significant differences in test results. A detailed description of the type(s) of lamp(s) used should be stated in detail in the test report. The particular testing application determines which lamp should be used. See Appendix X1 for lamp application guidelines.

NOTE 3—Do not mix different types of lamps. Mixing different types of lamps in a fluorescent UV light apparatus may produce major inconsistencies in the light falling on the samples, unless the apparatus has been specifically designed to ensure a uniform spectral distribution.

NOTE 4—Many fluorescent lamps age significantly with extended use. Follow the apparatus manufacturer's instructions on the procedure necessary to maintain desired irradiance (**1,2**).

6.1.1 Actual irradiance levels at the test specimen surface may vary due to the type or manufacturer of the lamp used, or both, the age of the lamps, the distance to the lamp array, and the air temperature within the chamber and the ambient laboratory temperature. Consequently, the use of a radiometer to monitor and control the radiant energy is recommended.

6.1.2 Several factors can affect the spectral power distribution of fluorescent UV lamps:

6.1.2.1 Aging of the glass used in some types of lamps can result in changes in transmission. Aging of glass can result in a significant reduction in the short wavelength UV emission of some lamp types,

6.1.2.2 Accumulation of dirt or other residue on lamps can affect irradiance,

6.1.2.3 Thickness of glass used for lamp tube can have large effects on the amount of short wavelength UV radiation transmitted, and

6.1.2.4 Uniformity and durability of phosphor coating.

6.1.3 *Spectral Irradiance*:

NOTE 5—Fluorescent UVA lamps are available with a choice of spectral power distributions that vary significantly. The more common may be identified as UVA-340 and UVA-351. These numbers represent the characteristic nominal wavelength (in nm) of peak emission for each of these lamp types. The actual peak emissions are at 343 and 350 nm, respectively.

6.1.3.1 *Spectral Irradiance of UVA-340 Lamps for Daylight UV*—The spectral power distribution of UVA-340 fluorescent lamps shall comply with the requirements specified in Table 1.

NOTE 6—The main application for UVA-340 lamps is for simulation of the short and middle UV wavelength region of daylight.

6.1.3.2 *Spectral Irradiance of UVA-351 Lamps for Daylight UV Behind Window Glass*—The spectral power UV behind window glass of UVA-351 fluorescent lamps shall comply with the requirements specified in Table 2.

NOTE 7—The main application for UVA-351 lamps is for simulation of the short and middle UV wavelength region of daylight which has been filtered through window glass (**3**).

6.1.3.3 *Spectral Irradiance of UVB-313 Lamps*—The spectral power distribution of UVB-313 fluorescent lamps shall comply with the requirements specified in Table 2.

NOTE 8—Fluorescent UVB lamps have the spectral distribution of radiation peaking near the 313-nm mercury line. They emit significant amounts of radiation below 300 nm, the nominal cut on wavelength of global solar radiation, that may result in aging processes not occurring outdoors. Use of this lamp is not recommended for sunlight simulation. See Table 3.

6.2 *Test Chamber*—The design of the test chamber may

TABLE 1 Relative Spectral Power Distribution Specification for UVA-340 Lamps for Daylight UV

Bandpass, nm	Fluorescent UVA-340 Lamp[A]	Sunlight[B]
Ultraviolet Wavelength Region		
Irradiance as a percentage of total irradiance from 260 to 400 nm		
260–270	0.0 %	0
271–280	0.0 %	0
281–290	0.0 %	0
291–300	< 0.2 %	0
301–320	6.2–8.6 %	5.6 %
321–340	27.1–30.7 %	28.5 %
341–360	34.2–35.4 %	24.7 %
361–380	19.5–23.7 %	25.6 %
381–400	6.6–7.8 %	7.6 %
Ultraviolet and Visible Wavelength Region		
Irradiance as a percentage of total irradiance from 300 to 800 nm[C]		
300–400	87.3 %[D]	11 %[E]
401–700	12.7 %[D]	72 %[E]

[A]UVA-340 data—The ranges given are based on spectral power distribution measurements made for lamps of different ages and operating at different levels of controlled irradiance. The ranges given are based on three sigma limits from the averages of this data.

[B]Sunlight data—The sunlight data is for global irradiance on a horizontal surface with a air mass of 1.2, column ozone 0.294 atm cm, 30 % relative humidity, altitude 2100 m (atmopsheric pressure of 787.8 mb), and an aerosol represented by an optical thickness of 0.81 at 300 nm and 0.62 at 400 nm.

[C]Data from 701 to 800 nm is not shown.

[D]UVA-340 data—Because the primary emission of fluorescent UV lamps is concentrated in the 300- to 400-nm bandpass, there are limited data available for visible light emissions of fluorescent UV lamps. Therefore, the data in this table are based on very few measurements and are representative only.

[E]Sunlight data—The sunlight data is from Table 4 of CIE Publication Number 85, global solar irradiance on a horizontal surface with an air mass of 1.0, column ozone of 0.34 atm cm, 1.42-cm precipitable water vapor, and an aerosol represented by an optical thickness of 0.1 at 500 nm.

TABLE 2 Relative Spectral Power Distribution Specification for UVA-351 Lamps for Daylight UV Behind Window Glass

Bandpass, nm	Fluorescent UVA-351 Lamp[A]	Estimated Window Glass Filtered Sunlight[B]
Ultraviolet Wavelength Region		
Irradiance as a percentage of total irradiance from 260 to 400 nm		
260–270	0.0 %	0 %
271–280	0.0 %	0 %
281–290	0.0 %	0 %
290–300	< 0.1 %	0 %
301–320	0.9–3.3 %	0.1–1.5 %
321–340	18.3–22.7 %	9.4–14.8 %
341–360	42.7–44.5 %	23.2–23.5 %
361–380	24.8–28.2 %	29.6–32.5 %
381–400	5.8–7.6 %	30.9 –34.5 %
Ultraviolet and Visible Wavelength Region		
Irradiance as a percentage of total irradiance from 300 to 800 nm[C]		
300–400	90.1 %[D]	9.0–11.1 %[E]
401–700	9.9 %[D]	71.3–73.1 %[E]

[A]UVA-351 data—The ranges given are based on spectral power distribution measurements made for lamps of different ages and operating at different levels of controlled irradiance. The ranges given are based on three sigma limits from the averages of this data.

[B]Sunlight data—The sunlight data is for global irradiance on a horizontal surface with an air mass of 1.2, column ozone 0.294 atm cm, 30 % relative humidity, altitude 2100 m (atmospheric pressure of 787.8 mb), and an aerosol represented by an optical thickness of 0.081 at 300 nm and 0.62 at 400 nm. The range is determined by multiplying solar irradiance by the upper and lower limits for transmission of single strength window glass samples used for studies conducted by ASTM Subcommittee G03.02.

[C]Data from 701 to 800 nm is not shown.

[D]UVA-351 data—Because the primary emission of fluorescent UV lamps is concentrated in the 300- to 400-nm bandpass, there are limited data available for visible light emissions of fluorescent UV lamps. Therefore, the data in this table are based on very few measurements and are representative only.

[E]Sunlight data—The sunlight data is from Table 4 of CIE Publication Number 85, global solar irradiance on a horizontal surface with an air mass of 1.0, column ozone of 0.34 atm cm, 1.42-cm precipitable water vapor, and an aerosol represented by an optical thickness of 0.1 at 500 nm. The range is determined by multiplying solar irradiance by the upper and lower limits for transmission of single strength window glass samples used for studies conducted by ASTM Subcommittee G03.02.

vary, but it should be constructed from corrosion resistant material and, in addition to the radiant source, may provide for means of controlling temperature and relative humidity. When required, provision shall be made for the spraying of water on the test specimen for the formation of condensate on the exposed face of the specimen or for the immersion of the test specimen in water.

6.2.1 The radiant source(s) shall be located with respect to the specimens such that the uniformity of irradiance at the specimen face complies with the requirements in Practice G 151.

6.2.2 Lamp replacement, lamp rotation, and specimen repositioning may be required to obtain uniform exposure of all specimens to UV radiation and temperature. Follow manufacturer's recommendation for lamp replacement and rotation.

6.3 *Instrument Calibration*—To ensure standardization and accuracy, the instruments associated with the exposure apparatus (for example, timers, thermometers, wet bulb sensors, dry bulb sensors, humidity sensors, UV sensors, and radiometers) require periodic calibration to ensure repeatability of test results. Whenever possible, calibration should be traceable to national or international standards. Calibration schedule and procedure should be in accordance with manufacturer's instructions.

6.4 *Radiometer*—The use of a radiometer to monitor and control the amount of radiant energy received at the sample is recommended. If a radiometer is used, it shall comply with the requirements in Practice G 151.

6.5 *Thermometer*—Either insulated or un-insulated black or white panel thermometers may be used. The un-insulated thermometers may be made of either steel or aluminum. Thermometers shall conform to the descriptions found in Practice G 151.

6.5.1 The thermometer shall be mounted on the specimen rack so that its surface is in the same relative position and subjected to the same influences as the test specimens.

6.5.2 Some specifications may require chamber air temperature control. Positioning and calibration of chamber air temperature sensors shall be in accordance with the descriptions found in Practice G 151.

NOTE 9—Typically, these devices control by black panel temperature only.

6.6 *Moisture*—The test specimens may be exposed to moisture in the form of water spray, condensation, or high humidity.

6.6.1 *Water Spray*—The test chamber may be equipped with a means to introduce intermittent water spray onto the test specimens under specified conditions. The spray shall be uniformly distributed over the samples. The spray system shall be made from corrosion resistant materials that do not contaminate the water used.

TABLE 3 Relative Spectral Power Distribution Specification for UVB-313 Lamps

Bandpass, nm	Fluorescent UVB-313 Lamp[A,B]	Sunlight[C]
Ultraviolet Wavelength Region[A]		
Irradiance as a percentage of total irradiance from 260 to 400 nm		
260–270	< 0.1 %	0
271–280	0.1–0.7 %	0
281–290	3.2–4.4 %	0
291–300	10.7–13.7 %	0
301–320	38.0–44.6 %	5.6 %
321–340	25.5–30.9 %	18.5 %
341–360	7.7–10.7 %	21.7 %
361–380	2.5–5.5 %	26.6 %
381–400	0.0–1.5 %	27.6 %
Ultraviolet and Visible Wavelength Region		
Irradiance as a percentage of total irradiance from 300 to 800 nm[D]		
300–400	88.5 %[E]	11 %[F]
401–700	11.5 %[E]	72 %[F]

[A]UVB-313 data—Some UVB lamps have measurable emittance at the 254-nm mercury line. This may affect test results for some materials.

[B]UVB-313 data—The ranges given are based on spectral power distribution measurements made for lamps of a different ages and operating at different levels of controlled irradiance. The ranges given are based on three sigma limits from the averages of this data. Lamps that meet this specification are available from different manufacturers. These lamps may have significantly different irradiance levels (that is, total light output), but still have the same relative spectral power distribution.

[C]Sunlight data—The sunlight data in for global irradiance on a horizontal surface with a air mass of 1.2, column ozone 0.294 atm cm, 30 % relative humidity, altitude 2100 m (atmospheric pressure of 787.8 mb), and an aerosol represented by an optical thickness of 0.081 to 300 nm and 0.62 at 400 nm.

[D]Data from 701 to 800 nm is not shown.

[E]UVB-313 data—Because the primary emission of fluorescent UV lamps is concentrated in the 300- to 400-nm bandpass, there is limited data available for visible light emissions of fluorescent UV lamps. Therefore, the data in this table are based on very low measurements and are representative only.

[F]Sunlight data—The sunlight data is from Table 4 of CIE Publication Number 85, global solar irradiance on a horizontal surface with an air mass of 1.0, column ozone of 0.34 atm cm, 1.42-cm precipitable water vapor, and an aerosol represented by an optical thickness of 0.1 at 500 nm.

6.6.1.1 *Spray Water Quality*—Spray water shall have a conductivity below 5 µS/cm, contain less than 1-ppm solids, and leave no observable stains or deposits on the specimens. Very low levels of silica in spray water can cause significant deposits on the surface of test specimens. Care should be taken to keep silica levels below 0.1 ppm. In addition to distillation, a combination of deionization and reverse osmosis can effectively produce water of the required quality. The pH of the water used should be reported. See Practice G 151 for detailed water quality instructions.

6.6.2 *Condensation*—The test chamber may be equipped with a means to cause condensation to form on the exposed face of the test specimen. Typically, water vapor shall be generated by heating water and filling the chamber with hot vapor, which then is made to condense on the test specimens.

6.6.3 *Relative Humidity*—The test chamber may be equipped with a means to measure and control the relative humidity. Such instruments shall be shielded from the lamp radiation.

6.7 *Specimen Holders*—Holders for test specimens shall be made from corrosion resistant materials that will not affect the test results. Corrosion resistant alloys of aluminium or stainless steel have been found acceptable. Brass, steel, or copper shall not be used in the vicinity of the test specimens.

6.8 *Apparatus to Assess Changes in Properties*—The necessary apparatus required by ASTM or ISO relating to the determination of the properties chosen for monitoring shall be used (see also ISO 4582).

7. Test Specimen

7.1 Refer to Practice G 151.

8. Test Conditions

8.1 Any exposure conditions may be used as long as the exact conditions are detailed in the report. Appendix X2 shows some representative exposure conditions. These are not necessarily preferred and no recommendation is implied. These conditions are provided for reference only.

9. Procedure

9.1 Identify each test specimen by suitable indelible marking, but not on areas used in testing.

9.2 Determine which property of the test specimens will be evaluated. Prior to exposing the specimens, quantify the appropriate properties in accordance with recognized ASTM or international standards. If required (for example, destructive testing), use unexposed file specimens to quantify the property. See ISO 4582 for detailed guidance.

9.3 *Mounting of Test Specimens*—Attach the specimens to the specimen holders in the equipment in such a manner that the specimens are not subject to any applied stress. To assure uniform exposure conditions, fill all of the spaces, using blank panels of corrosion resistant material if necessary.

NOTE 10—Evaluation of color and appearance changes of exposed materials shall be made based on comparisons to unexposed specimens of the same material which have been stored in the dark. Masking or shielding the face of test specimens with an opaque cover for the purpose of showing the effects of exposure on one panel is not recommended. Misleading results may be obtained by this method, since the masked portion of the specimen is still exposed to temperature and humidity that in many cases will affect results.

9.4 *Exposure to Test Conditions*—Program the selected test conditions to operate continuously throughout the required number of repetitive cycles. Maintain these conditions throughout the exposure. Interruptions to service the apparatus and to inspect specimens shall be minimized.

9.5 *Specimen Repositioning*—Periodic repositioning of the specimens during exposure is not necessary if the irradiance at the positions farthest from the center of the specimen area is at least 90 % of that measured at the center of the exposure area. Irradiance uniformity shall be determined in accordance with Practice G 151.

9.5.1 If irradiance at positions farther from the center of the exposure area is between 70 and 90 % of that measured at the center, one of the following three techniques shall be used for specimen placement.

9.5.1.1 Periodically reposition specimens during the exposure period to ensure that each receives an equal amount of radiant exposure. The repositioning schedule shall be agreed upon by all interested parties.

9.5.1.2 Place specimens only in the exposure area where the irradiance is at least 90 % of the maximum irradiance.

9.5.1.3 To compensate for test variability randomly position replicate specimens within the exposure area which meets the

irradiance uniformity requirements as defined in 9.5.1.

9.6 *Inspection*—If it is necessary to remove a test specimen for periodic inspection, take care not to handle or disturb the test surface. After inspection, the test specimen shall be returned to the test chamber with its test surface in the same orientation as previously tested.

9.7 *Apparatus Maintenance*—The test apparatus requires periodic maintenance to maintain uniform exposure conditions. Perform required maintenance and calibration in accordance with manufacturer's instructions.

9.8 Expose the test specimens for the specified period of exposure. See Practice G 151 for further guidance.

9.9 At the end of the exposure, quantify the appropriate properties in accordance with recognized ASTM or international standards and report the results in conformance with Practice G 151.

NOTE 11—Periods of exposure and evaluation of test results are addressed in Practice G 151.

10. Report

10.1 The test report shall conform to Practice G 151.

11. Precision and Bias

11.1 *Precision*:

11.1.1 The repeatability and reproducibility of results obtained in exposures conducted according to this practice will vary with the materials being tested, the material property being measured, and the specific test conditions and cycles that are used. In round-robin studies conducted by Subcommittee G03.03, the 60° gloss values of replicate PVC tape specimens exposed in different laboratories using identical test devices and exposure cycles showed significant variability (3). The variability shown in these round-robin studies restricts the use of "absolute specifications" such as requiring a specific property level after a specific exposure period (4,5).

11.1.2 If a standard or specification for general use requires a definite property level after a specific time or radiant exposure in an exposure test conducted according to this practice, the specified property level shall be based on results obtained in a round-robin that takes into consideration the variability due to the exposure and the test method used to measure the property of interest. The round-robin shall be conducted according to Practice E 691 or Practice D 3980 and shall include a statistically representative sample of all laboratories or organizations that would normally conduct the exposure and property measurement.

11.1.3 If a standard or specification for use between two or three parties requires a definite property level after a specific time or radiant exposure in an exposure test conducted according to this practice, the specified property level shall be based on statistical analysis of results from at least two separate, independent exposures in each laboratory. The design of the experiment used to determine the specification shall take into consideration the variability due to the exposure and the test method used to measure the property of interest.

11.1.4 The round-robin studies cited in 11.1.1 demonstrated that the gloss values for a series of materials could be ranked with a high level of reproducibility between laboratories. When reproducibility in results from an exposure test conducted according to this practice have not been established through round-robin testing, performance requirements for materials shall be specified in terms of comparison (ranked) to a control material. The control specimens shall be exposed simultaneously with the test specimen(s) in the same device. The specific control material used shall be agreed upon by the concerned parties. Expose replicates of the test specimen and the control specimen so that statistically significant performance differences can be determined.

11.2 *Bias*—Bias can not be determined because no acceptable standard weathering reference materials are available.

12. Keywords

12.1 accelerated; accelerated weathering; durability; exposure; fluorescent UV lamps; laboratory weathering; light; lightfastness; non-metallic materials; temperature; ultraviolet; weathering

APPENDIXES

(Nonmandatory Information)

X1. APPLICATION GUIDELINES FOR TYPICAL FLUORESCENT UV LAMPS

X1.1 General

X1.1.1 A variety of fluorescent UV lamps may be used in this practice. The lamps shown in this section are representative of their type. Other lamps, or combinations of lamps, may be used. The particular application determines which lamp should be used. The lamps discussed in this Appendix differ in the total amount of UV energy emitted and their wavelength spectrum. Differences in lamp energy or spectrum may cause significant differences in test results. A detailed description of the type(s) of lamp(s) used shall be stated in detail in the test report.

X1.1.2 All spectral power distributions (SPDs) shown in this section are representative only and are not meant to be used to calculate or estimate total radiant exposure for tests in fluorescent UV devices. Actual irradiance levels at the test specimen surface will vary due to the type and/or manufacturer of the lamp used, the age of the lamps, the distance to the lamp array, and the air temperature within the chamber.

NOTE X1.1—All SPDs in this appendix were measured using a spectroradiometer with a double grating monochromator (1-nm band pass) with a quartz cosine receptor. The fluorescent UV SPDs were measured at the sample plane in the center of the allowed sample area. SPDs for

sunlight were measured in Phoenix, AZ at solar noon at the summer solstice with a clear sky, with the spectroradiometer on an equatorial follow-the-sum mount.

X1.2 Simulations of Direct Solar UV Radiation Exposures

X1.2.1 *UVA-340 Lamps*—For simulations of direct solar UV radiation the UVA-340 lamp is recommended. Because UVA-340 lamps typically have little or no UV output below 300 nm (that is considered the "cut-on" wavelength for terrestrial sunlight), they usually do not degrade materials as rapidly as UVB lamps, but they may allow enhanced correlation with actual outdoor weathering. Tests using UVA-340 lamps have been found useful for comparing different nonmetallic materials such as polymers, textiles, and UV stabilizers. Fig. X1.1 illustrates the SPD of the UVA-340 lamp compared to noon, summer sunlight.

X1.2.2 *UVB-313 Lamps*—The UVB region (280 to 315 nm) includes the shortest wavelengths found in sunlight at the earth's surface and is responsible for considerable polymer damage. There are two commonly available types of UVB-313 lamps that meet the requirements of this document. These are known commercially as the UVB-313 and the FS-40. These lamps emit different amounts of total energy, but both peak at 313 nm and produce the same UV wavelengths in the same relative proportions. In tests using the same cycles and temperatures, shorter times to failure are typically observed when the lamp with higher UV irradiance is used. Furthermore, tests using the same cycles and temperatures with these two lamps may exhibit differences in ranking of materials due to difference in the proportion of UV to moisture and temperature.

NOTE X1.2—The Fig. X1.2 illustrates the difference between the lamps.

X1.2.2.1 All UVB-313 lamps emit UV below the normal sunlight cut-on. This short wavelength UV can produce rapid polymer degradation and often causes degradation by mechanisms that do not occur when materials are exposed to sunlight. This may lead to anomalous results. Fig. X1.2 shows the spectral power distribution (SPD) of typical UVB-313 lamps compared to the SPD of noon, summer sunlight.

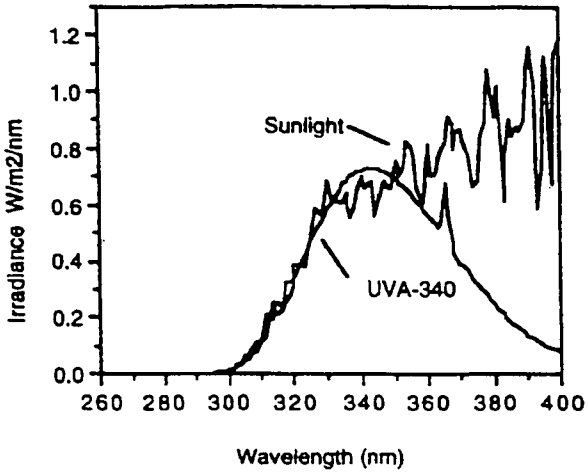

FIG. X1.1 Spectral Power Distributions of UVA-340 Lamp and Sunlight

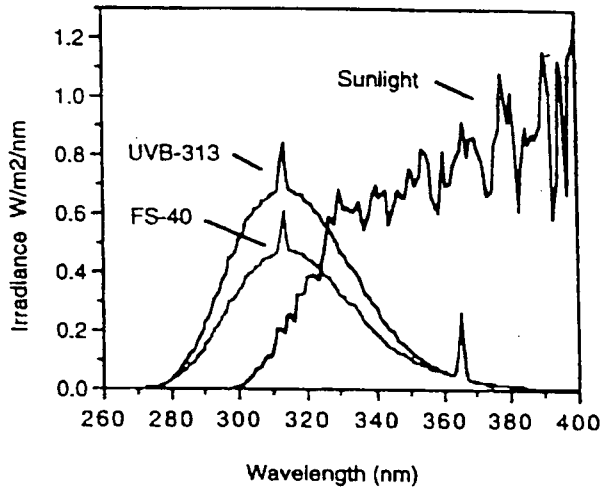

FIG. X1.2 Spectral Power Distributions of UVB Lamps and Sunlight

X1.3 Simulations of Exposures to Solar UV Radiation Through Window Glass

X1.3.1 *Filtering Effect of Glass*

Glass of any type acts as a filter on the sunlight spectrum (see Fig. X1.3). Ordinary glass is essentially transparent to light above about 370 nm. However, the filtering effect becomes more pronounced with decreasing wavelength. The shorter, more damaging UVB wavelengths are the most greatly affected. Window glass filters out most of the wavelengths below about 310 nm. For purposes of illustration, only one type of window glass is used in the accompanying graphs. Note that glass transmission characteristics will vary due to manufacturer, production lot, thickness, or other factors.

X1.3.2 *UVA-351 Lamps*

For simulations of sunlight through window glass, UVA-351 lamps are recommended. The UVA-351 is used for these applications because the low end cut-on of this lamp is similar to that of direct sunlight which has been filtered through window glass (Fig. X1.4).

NOTE X1.3—UVB-313 lamps are not recommended for simulations of sunlight through window glass. Most of the emission of UVB-313 lamps

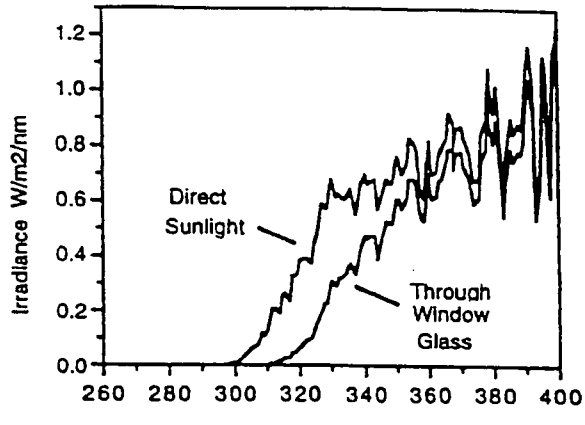

FIG. X1.3 Direct Sunlight and Sunlight Through Window Glass

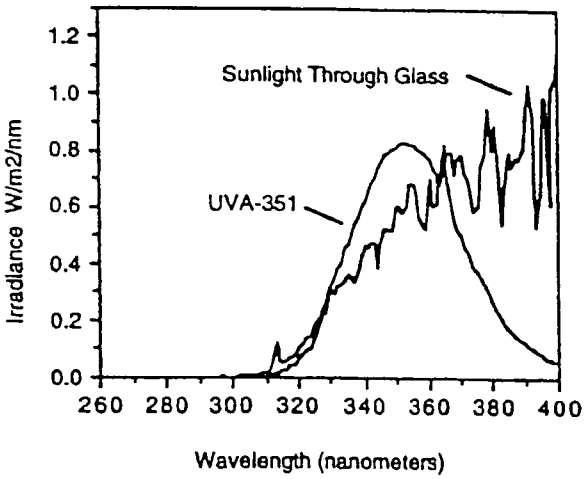

FIG. X1.4 Spectral Power Distributions of UVA-351 Lamp and Sunlight Through Window Glass

is in the short wavelength UV that is filtered very efficiently by glass. Because of this, very little energy from this short wavelength region will reach materials in "behind glass" applications. This is because window glass filters out about 80 % of the energy from UVB-313 lamps, as shown in Fig. X1.5. As a result of filtering out these short wavelengths, its total effective energy is very limited. Further, because there is little longer wavelength energy, the glass-filtered UVB-313 is actually less severe than a UVA Lamp.

X1.4 Simulations of Exposures Where Glass or Transparent Plastic Forms Part of the Test Specimen

X1.4.1 *UVA-340 Lamps*

In some instances (for example, window sealants), glass or transparent plastic is part of the test specimen itself and normally acts as a filter to the light source. In these special cases, the use of UVA-340 lamps is recommended since the glass or plastic will filter the spectrum of the lamp in the same way that it would filter sunlight. Fig. X1.6 compares the spectral power distribution of sunlight filtered through window glass to the spectral power distribution of the UVA-340 lamp, both unfiltered and filtered through window glass.

NOTE X1.4—UBV-313 lamps are lamps not recommended for exposures where glass or transparent plastic forms part of the test specimen. See Note X1.3.

NOTE X1.5—UVA-351 lamps are not recommended for exposures where glass or transparent plastic forms part of the test specimen. This is because the UVA-351 has a special power distribution in the short wave UV region that is similar to sunlight that has already been filtered by window glass. As shown in Fig. X1.7, using this lamp through window glass or other transparent material further filters out the short wavelength UV and results in a spectrum that is deficient in the short wavelength UV.

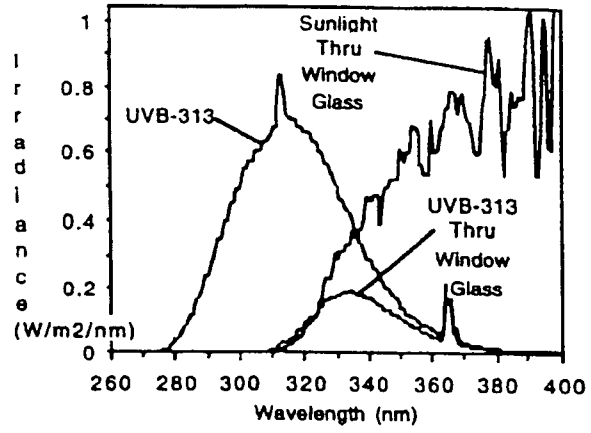

FIG. X1.5 Spectral Power Distributions of Unfiltered UVB-313 Lamp, UVB-313 Through Window Glass, and Sunlight Through Window Glass

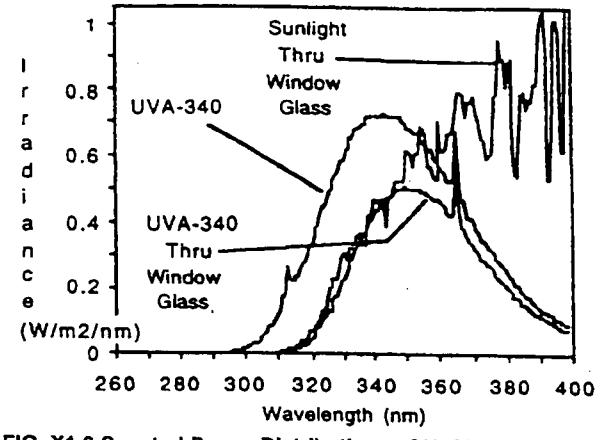

FIG. X1.6 Spectral Power Distributions of Unfiltered UVA-340 Lamp, UVA-340 Through Window Glass, and Sunlight Through Window Glass

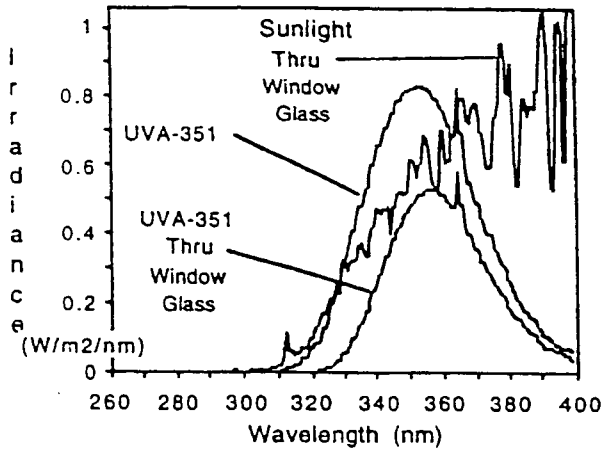

FIG. X1.7 Spectral Power Distributions of Unfiltered UVA-351 Lamp, UVA-351 Through Window Glass, and Sunlight Through Window Glass

X2. EXPOSURE CONDITIONS

X2.1 Any exposure conditions may be used, as long as the exact conditions are detailed in the report. Following are some representative exposure conditions. These are not necessarily preferred and no recommendation is implied. These conditions are provided for reference only (See Table X2.1).

NOTE X2.1—Cycle 1 is a commonly used exposure cycle for coatings and plastics. Cycle 2 has been widely used for coatings. Cycles 3 and 4 have been used for exterior automotive materials. Cycle 5 has been used for roofing materials. Cycle 6 has been used for high irradiance exposures of coatings and plastics. Cycle 7 has been used for thermal shock and for erosion testing of coatings for wood.

NOTE X2.2—When selecting programs of UV exposure followed by condensation, allow at least 2 h per interval to assure attainment of equilibrium.

NOTE X2.3—Surface temperature of specimens is an essential test quantity. Generally, degradation processes accelerate with increasing temperature. The specimen temperature permissible for the accelerated test depends on the material to be tested and on the aging criterion under consideration.

NOTE X2.4—Irradiance data shown is typical. Frequently, the irradiance is not controlled in this type of exposure device.

NOTE X2.5—The light output of fluorescent lamps is affected by the temperature of the air which surrounds the lamps. Consequently, in testers without feed-back-loop control of irradiance, the lamp output will decrease with increasing chamber temperature.

NOTE X2.6—Laboratory ambient temperature may have an effect on the light output of devices without feed-back-loop control of irradiance. Some fluorescent UV devices use laboratory ambient air to cool the lamps and thereby compensate for the drop in light output at higher exposure temperatures (see Note X2.5).

X2.2 For the most consistent results, it is recommended that apparatus without feed-back-loop control of irradiance be

TABLE X2.1 Common Exposure Conditions

Cycle	Lamp	Typical Irradiance	Approximate Wavelength	Exposure Cycle
1	UVA-340	0.77 W/m²/nm	340 nm	8 h UV at 60 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature
2	UVB-313	0.63 W/m²/nm	310 nm	4 h UV at 60 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature
3	UVB-313	0.44 W/m²/nm	310 nm	8 h UV at 70 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature
4	UVA-340	1.35 W/m²/nm	340 nm	8 h UV at 70 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature
5	UVB-313	0.55 W/m²/nm	310 nm	20 h UV at 80 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature
6	UVA-340	1.35 W/m²/nm	340 nm	8 h UV at 60 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature.
7	UVA-340	1.35 W/m²/nm	340 nm	8 h UV at 60 (± 3) °C Black Panel Temperature; 0.25 h water spray (no light), temperature not controlled; 3.75 h condensation at 50 (± 3) °C Black Panel Temperature
8	UVB-313	28 W/m²	270 to 700 nm	8 h UV at 70 (± 3) °C Black Panel Temperature; 4 h Condensation at 50 (± 3) °C Black Panel Temperature

operated in an environment in which the ambient temperature is maintained between 18 and 27°C. Apparatus operated in ambient temperatures above or below this range may produce irradiances different from devices operated in the recommended manner.

NOTE X2.7—Fluorescent UV lamps emit relatively little infrared radiation when compared to xenon arc and carbon arc sources. In fluorescent UV apparatus, the primary heating of the specimen surface is by convection from heated air passing across the panel. Therefore, there is a minimal difference between the temperature of an insulated or uninsulated black or white panel thermometer, specimen surface, air in the test chamber, or different colored samples (3).

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QUALITY CONTROL SUMMARY

Tenax Tendrain 770-2

Date: February 27, 2004

Batch 1

Project: Citrus County LF

Prepared for: Comanco Environmental

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

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Tab 1

SECTION ONE

CERTIFICATION AND SPECIFICATON

TENAX® Corporation

TENDRAIN 770-2

Double-Sided Geocomposite

Citrus Co. LF, FL

The drainage geocomposite is comprised of a **tri-planar** geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven high UV resistant **Ultra Vera** geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming to the values and test methods listed below.

Property	Test Methods	Units	Value	Qualifier	Test Frequency
Resin					
• Density	ASTM D 1505	g/cm³	0.94	MAV	lot
• Melt Flow Index	ASTM D 1238	g/10min	1.0	Max	lot
Geonet Core[4]					
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	1200 (17.5)	MAV	50,000 sf
• Compressive Behavior[2] % Retained thickness @50,000 psf	ASTM D1621	%	50	MAV	50,000 sf
• Creep Reduction Factor based on 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 25,000 psf.	GRI-GC8	-	1.14		
• Thickness[3]	ASTM D 5199	mil (mm)	300 (7.6)	MAV	50,000 sf
• Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
Geotextile[4]					
• U.V. Resistance (500 hrs)	ASTM G 154	%	95	MAV	Per formula
• AOS	ASTM D 4751	US Std. Sieve (mm)	70 (0.212)	MARV	500,000 sf
• Mass/Unit Area	ASTM D 5261	oz/yd² (g/m²)	6 (203)	MARV	100,000 sf
• Water Flow Rate	ASTM D 4491	gpm/ft² (lpm/m²)	110 (4480)	MARV	500,000 sf
• Mullen Burst	ASTM D3786	psi	325	MARV	100,000 sf
• Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
• Tear Strength	ASTM D 4533	lbs (N)	65 (289)	MARV	100,000 sf
• Grab Tensile	ASTM D 4632	lbs (N)	170 (756)	MARV	100,000 sf
• Thickness	ASTM D 5199	mil (mm)	65 (1.7)	MARV	100,000 sf
Geocomposite					
• Peel Adhesion[5] – MD	F904 Modified	lb/in (g/in)	1.0 (454)	MAV	100,000 sf
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	2380 (34.8)	MAV	50,000 sf
• Labeling	Product code, geotextile type, roll dimensions, finished product lot and roll number.				
Hydraulic Behavior of Geocomposite					
•Transmissivity[6] - MD					
Gradient / Load			15,000 psf (720 kPa)		
0.1	ASTM D 4716 GRI - GC8	m²/sec	$1.8*10^{-3}$	MAV	200,000 sf

Qualifiers: MARV = Minimum Average Roll Value (MARV) MAV = Minimum Average Value

NOTES:

1. Tensile properties are tested by manufacturer per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness is measured by manufacturer per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination.
5. Peel Adhesion is tested by the manufacturer per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10-inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
6. Geocomposite transmissivity is measured by manufacturer per ASTM D4716 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours according to GRI-GC8.

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1/1/03

SECTION TWO

GEONET REPORT AND MQC

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Geonet MQC Test Results

Product TD 7 Wide
Project
Lot # Batch 1
Dimensions 13' x 1840'
Testing Lab

	Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Resin Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	Resin MFI ASTM D1238 (g/10min)	Tensile Strength ASTM D4595 (lb/ft)	
	0400001	2/12/2004	321	0.948	2.76	0.044	1323	110,25
#2	0400003	2/13/2004	320	0.948	2.69	0.044	1430	119,17
	0400005	2/14/2004	316	0.948	2.54	0.044	1536	128
	0400007	2/15/2004	307	0.948	2.65	0.044	1543	128,58
#1	0400009	2/15/2004	301	0.948	2.46	0.044	1486	123,83
Average			**313**	**0.948**	**2.62**	**0.044**	**1463**	
Standard Dev.			**9**	**0.000**	**0.12**	**0.000**	**91**	
Specifications			**300**	**0.940**	**2.00**	**< 1**	**1200**	

Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0400001	58.67	50
	0400003	57.17	50
	0400005	64.12	50
	0400007	57.24	50
	0400009	59.68	50
	Average (Specs)	**59.38**	**50**

Tested by _____ **Date** 2/27/2004
Andrew Barker

Checked by _____ **Date** 2/27/2004
David Mitchell

SECTION THREE

GEOTEXTILE MQC

01-Mar-2004

Product Grade: UV506

Lot Number: 40006

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC

QA/QC Laboratory

Evergreen, Alabama

Nonwoven Test

Rolls

Lot Summary

Reviewed By:

QA: _____

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4000966	02/04/2004	7.1	287.9	128.5	266.2	70.7	331.0	132.5	94.3	85.7	79	1.69	0.299	126.5	0.083
4000968	02/04/2004	7.2	291.9	144.0	250.7	75.6	355.0				81				
4000970	02/04/2004	7.2	312.4	140.9	254.5	73.0	328.0	128.6	120.9	108.3	83				
4000972	02/04/2004										78				
4000973	02/04/2004	7.1													
4000974	02/06/2004	7.3	305.5	134.0	238.7	72.1	365.0	129.1	90.4	98.3	81	1.55	0.328	116.0	0.082
4000976	02/06/2004	7.7	316.1	127.1	245.9	64.3	375.0	135.8	80.3	87.5	83	1.48	0.308	111.0	0.082
4000978	02/06/2004										93				
4000980	02/06/2004	7.2	311.3	130.0	261.0	69.4	351.0	136.4	79.0	77.8	90				
4000982	02/06/2004										77				
4001026	02/09/2004										76				
4001028	02/08/2004	7.4	306.9	130.3	262.2	69.5	353.0	125.7	90.7	86.8	81	1.61	0.329	121.0	0.082
4001030	02/09/2004										79				
4001032	02/09/2004	7.2	302.9	129.7	264.0	69.4	336.0	129.0	96.8	79.8	76				
4001034	02/09/2004										78				
4001036	02/09/2004	7.7	308.4	136.4	279.7	74.3	354.0	129.0	98.7	88.7	94				
4001038	02/09/2004										91				
4001040	02/09/2004	7.6	293.3	136.0	250.1	71.0	361.0	118.9	111.7	98.0	89				
4001041	02/09/2004	7.4	281.0	142.2	253.9	70.1									
	Average =	7.3	301.6	134.5	257.0	70.9	350.9	129.4	95.9	90.1	82.8	1.58	0.316	118.6	0.082
	Standard Deviation =	.2	11.3	5.9	11.2	3.0	15.1	5.3	13.6	9.7	6.1	.09	0.015	6.7	0.001

SECTION FOUR

GEOCOMPOSITE MQC

Tenax Corporation

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 1

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	Bottom Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
0400007	0400009	40000971	4001035	2.56	2.01	1	1.85×10^{-3}	1.80×10^{-3}
0400008	0400009	40000971	4001035					
0400009	0400009	4001037	4001035					
0400010	0400009	4001037	4001035					
0400011	0400009	4001037	4001035					
0400012	0400009	4001037	4001035					
0400013	0400009	4001037	4001035					
0400014	0400009	4001037	4001035					
0400015	0400009	4001037	4001035					
0400016	0400008	4000970	4001036					
0400017	0400008	4000970	4001036					
0400018	0400008	4000970	4001036					
0400019	0400008	4000970	4001036					
0400020	0400008	4000970	4001036					
0400021	0400008	4001040	4001036					
0400022	0400008	4001040	4001034					
0400023	0400006	4001040	4001034					
0400024	0400006	4001040	4001034					
0400025	0400006	4001040	4001034					
0400026	0400006	4001040	4001034					
0400027	0400006	4000972	4001034					
0400028	0400006	4000972	4001034					
0400029	0400006	4000972	4001041					
0400030	0400004	4000972	4001041					
0400031	0400004	4000972	4001041					
0400032	0400006	4000972	4001041					
0400033	0400006	4000972	4001041					
0400034	0400006	4000972	4001041					
0400035	0400006	4001029	4001041					
0400036	0400006	4001029	4001031					
0400037	0400006	4001029	4001031					
0400038	0400006	4001029	4001031					

ok

* a confining pressure of 15000 psf at a gradient of .1 with water at 20 degrees C with boundary conditions of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours

Tested by:.....

Checked by:.....

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 1

Tensile Strength (ASTM D4595)

Roll #	Yield Strength
0400007	2624.00
0400019	2786.00
SPEC	**2380 lbs/ft min.**

Tested By: _____ Date: 2/21/2004
David Mitchell

Checked By: _____ Date: 2/21/2004
Tim Bauters, Ph.D.

Tab 2

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

QUALITY CONTROL SUMMARY
Tenax Tendrain 770-2
Date: March 1, 2004
Batch 2

Project: Citrus County LF

Prepared for: Comanco Environmental

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

Performance In Plastic Technology℠

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

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TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION ONE

SPECIFICATON

Performance in Plastic Technology℠

TENAX® Corporation

ENDRAIN 770-2

Double-Sided Geocomposite

Citrus Co. LF, FL

The drainage geocomposite is comprised of a **tri-planar** geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven high UV resistant **Ultra Vera** geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming to the values and test methods listed below.

Property	Test Methods	Units	Value	Qualifier	Test Frequency
Resin					
• Density	ASTM D 1505	g/cm^3	0.94	MAV	lot
• Melt Flow Index	ASTM D 1238	g/10min	1.0	Max	lot
Geonet Core[4]					
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	1200 (17.5)	MAV	50,000 sf
• Compressive Behavior[2] % Retained thickness @50,000 psf	ASTM D1621	%	50	MAV	50,000 sf
• Creep Reduction Factor based on 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 25,000 psf.	GRI-GC8	-	1.14		
• Thickness[3]	ASTM D 5199	mil (mm)	300 (7.6)	MAV	50,000 sf
• Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
Geotextile[4]					
• U.V. Resistance (500 hrs)	ASTM G 154	%	95	MAV	Per formula
• AOS	ASTM D 4751	US Std. Sieve (mm)	70 (0.212)	MARV	500,000 sf
• Mass/Unit Area	ASTM D 5261	oz/yd^2 (g/m^2)	6 (203)	MARV	100,000 sf
• Water Flow Rate	ASTM D 4491	gpm/ft^2 (lpm/m^2)	110 (4480)	MARV	500,000 sf
• Mullen Burst	ASTM D3786	psi	325	MARV	100,000 sf
• Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
• Tear Strength	ASTM D 4533	lbs (N)	65 (289)	MARV	100,000 sf
Grab Tensile	ASTM D 4632	lbs (N)	170 (756)	MARV	100,000 sf
ickness	ASTM D 5199	mil (mm)	65 (1.7)	MARV	100,000 sf
ocomposite					
• Peel Adhesion[5] – MD	P904 Modified	lb/in (g/in)	1.0 (454)	MAV	100,000 sf
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	2380 (34.8)	MAV	50,000 sf
• Labeling	Product code, geotextile type, roll dimensions, finished product lot and roll number.				
Hydraulic Behavior of Geocomposite					
•Transmissivity[6] - MD					
Gradient / Load			15,000 psf (720 kPa)		
0.1	ASTM D 4716 GRI - GC8	m^2/sec	1.8*10^{-3}	MAV	200,000 sf

Qualifiers: MARV = Minimum Average Roll Value (MARV) MAV = Minimum Average Value

NOTES:

1. Tensile properties are tested by manufacturer per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness is measured by manufacturer per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination.
5. Peel Adhesion is tested by the manufacturer per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10-inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
6. Geocomposite transmissivity is measured by manufacturer per ASTM D4716 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours according to GRI-GC8.

TENAX Engineered for Life

Sales/Technical Service
4800 East Monument Street • Baltimore, Maryland 21205 • 410.522.7000 • 410.522.7015 (fax) • 800.356.8495
www.tenaxus.com

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1/1/03

SECTION TWO

GEONET REPORT AND MQC

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: (410) 522-7000 Order Line: (800) 356-8495
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS
Web Site: www.tenaxus.com

Geonet MQC Test Results

Product TD 7 Wide
Project
Lot # batch 2
Dimensions 13' x 1840'
Testing Lab

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Resin Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	Resin MFI ASTM D1238 (g/10min)	Tensile Strength ASTM D4595 (lb/ft)
0400001	2/12/2004	321	0.948	2.76	0.044	1323
0400003	2/13/2004	320	0.948	2.69	0.044	1430
0400005	2/14/2004	316	0.948	2.54	0.044	1536
0400007	2/15/2004	307	0.948	2.65	0.044	1543
0400009	2/15/2004	301	0.948	2.46	0.044	1486
0400011	2/27/2004	324	0.948	2.50	0.040	2079
Average		**315**	**0.948**	**2.60**	**0.043**	**1566**
Standard Dev.		**9**	**0.000**	**0.12**	**0.002**	**264**
Specifications		**300**	**0.940**	**2.00**	**< 1**	**1200**

Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0400001	58.67	50
	0400003	57.17	50
	0400005	64.12	50
	0400007	57.24	50
	0400009	59.68	50
	0400011	66.88	50
	Average (Specs)	**60.63**	**50**

Tested by Andrew Barker **Date** 3/1/2004

Checked by David Mitchell **Date** 3/1/2004

SECTION THREE

GEOTEXTILE MQC

01-Mar-2004

Product Grade: UV506

Lot Number: 40006

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama
Nonwoven Test Rolls Lot Summary

Reviewed By:

QA: _____

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4000966	02/04/2004	7.1	287.9	128.5	266.2	70.7	331.0	132.5	94.3	85.7	79	1.69	0.299	126.5	0.083
4000968	02/04/2004	7.2	291.9	144.0	250.7	75.6	355.0				81				
4000970	02/04/2004	7.2	312.4	140.9	254.5	73.0	328.0	128.6	120.9	108.3	83				
4000972	02/04/2004										78				
4000973	02/04/2004	7.1													
4000974	02/06/2004	7.3	305.5	134.0	238.7	72.1	365.0	129.1	90.4	98.3	81	1.55	0.328	116.0	0.082
4000976	02/06/2004	7.7	316.1	127.1	245.9	64.3	375.0	135.8	80.3	87.5	83	1.48	0.308	111.0	0.082
4000978	02/06/2004										93				
4000980	02/06/2004	7.2	311.3	130.0	261.0	69.4	351.0	136.4	79.0	77.8	90				
4000982	02/06/2004										77				
4001026	02/09/2004										76				
4001028	02/08/2004	7.4	306.9	130.3	262.2	69.5	353.0	125.7	90.7	86.8	81	1.61	0.329	121.0	0.082
4001030	02/09/2004										79				
4001032	02/09/2004	7.2	302.9	129.7	264.0	69.4	336.0	129.0	96.8	79.8	76				
4001034	02/09/2004										78				
4001036	02/09/2004	7.7	308.4	136.4	279.7	74.3	354.0	129.0	98.7	88.7	94				
4001038	02/09/2004										91				
4001040	02/09/2004	7.6	293.3	136.0	250.1	71.0	361.0	118.9	111.7	98.0	89				
4001041	02/09/2004	7.4	281.0	142.2	253.9	70.1									
	Average =	7.3	301.6	134.5	257.0	70.9	350.9	129.4	95.9	90.1	82.8	1.58	0.316	118.6	0.082
	Standard Deviation =	.2	11.3	5.9	11.2	3.0	15.1	5.3	13.6	9.7	6.1	.09	0.015	6.7	0.001

SECTION FOUR

GEOCOMPOSITE MQC

Tenax Corporation

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 2

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	BottomGeotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
0400039	0400003	4001029	4001031	3.79	3.50	1		
0400040	0400003	4001029	4001031					
0400041	0400003	4001029	4001031					
0400042	0400003	4000673	4001031					
0400043	0400003	4000673	4001031					
0400044	0400003	4000673	4000671					
0400045	0400003	4000673	4000671					
0400046	0400003	4000673	4000671					
0400047	0400005	4000673	4000671					
0400048	0400005	4000673	4000671					
0400049	0400005	4000670	4000671					
0400050	0400005	4000670	4000981					
0400051	0400005	4000670	4000981					
0400052	0400005	4000670	4000981					
0400053	0400005	4000670	4000981					
0400054	0400005	4000670	4000981					
0400055	0400005	4000670	4000981					
0400056	0400002	4001030	4000981					
0400057	0400002	4001030	4001028					
0400058	0400002	4001030	4001028					
0400059	0400002	4001030	4001028					
0400060	0400002	4001030	4001028					
0400061	0400002	4001030	4001028					
0400062	0400002	4001030	4001028					
0400063	0400002	4001030	4001028					
0400064	0400002	4000981	4001028					
0400065	0400002	4000981	4000982					
0400066	0400002	4000981	4000982					
0400067	0400002	4000981	4000982					
0400068	0400002	4000981	4000982					
0400069	0400001	4000981	4000982					
0400070	0400001	4000981	4000982					
0400071	0400011	4000981	4000982					
0400072	0400011	4000981	4000982					
0400073	0400011	4000981	4000982					
0400074	0400011	4000981	4000982					
0400075	0400011	4002012	4000982					
0400076	0400011	4002012	4000982					

* a confining pressure of 15000 psf at a gradient of .1 with water at 20 degrees C with boundary conditions of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours

Tested by: AB

Checked by: DM

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 2

Tensile Strength (ASTM D4595)

Roll #	Yield Strength
0400039	2510.00
0400058	2841.00
SPEC	**2380 lbs/ft min.**

Tested By: Andrew Barker Date: 2/25/2004

Checked By: David Mitchell Date: 2/25/2004

Tab 3

QUALITY CONTROL SUMMARY
Tenax Tendrain 770-2
Date: March 4, 2004
Batch 3 and 4

Project: Citrus County LF

Prepared for: Comanco Environmental

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

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Geonet Report and MQC 2

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Geocomposite MQC 4

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION ONE

SPECIFICATION

Performance in Plastic Technology℠

TENAX® Corporation

ENDRAIN 770-2

Double-Sided Geocomposite

Citrus Co. LF, FL

The drainage geocomposite is comprised of a **tri-planar** geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven high UV resistant **Ultra Vera** geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming to the values and test methods listed below.

Property	Test Methods	Units	Value	Qualifier	Test Frequency
Resin					
• Density	ASTM D 1505	g/cm^3	0.94	MAV	lot
• Melt Flow Index	ASTM D 1238	g/10min	1.0	Max	lot
Geonet Core[4]					
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	1200 (17.5)	MAV	50,000 sf
• Compressive Behavior[2] % Retained thickness @50,000 psf	ASTM D1621	%	50	MAV	50,000 sf
• Creep Reduction Factor based on 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 25,000 psf.	GRI-GC8	-	1.14		
• Thickness[3]	ASTM D 5199	mil (mm)	300 (7.6)	MAV	50,000 sf
• Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
Geotextile[4]					
• U.V. Resistance (500 hrs)	ASTM G 154	%	95	MAV	Per formula
• AOS	ASTM D 4751	US Std. Sieve (mm)	70 (0.212)	MARV	500,000 sf
• Mass/Unit Area	ASTM D 5261	oz/yd^2 (g/m^2)	6 (203)	MARV	100,000 sf
• Water Flow Rate	ASTM D 4491	gpm/ft^2 (lpm/m^2)	110 (4480)	MARV	500,000 sf
• Mullen Burst	ASTM D3786	psi	325	MARV	100,000 sf
• Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
• Tear Strength	ASTM D 4533	lbs (N)	65 (289)	MARV	100,000 sf
Grab Tensile	ASTM D 4632	lbs (N)	170 (756)	MARV	100,000 sf
Thickness	ASTM D 5199	mil (mm)	65 (1.7)	MARV	100,000 sf
Geocomposite					
• Peel Adhesion[5] – MD	F904 Modified	lb/in (g/in)	1.0 (454)	MAV	100,000 sf
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	2380 (34.8)	MAV	50,000 sf
• Labeling	Product code, geotextile type, roll dimensions, finished product lot and roll number.				
Hydraulic Behavior of Geocomposite					
•Transmissivity[6] - MD					
Gradient / Load			15,000 psf (720 kPa)		
0.1	ASTM D 4716 GRI - GC8	m^2/sec	$1.8*10^{-3}$	MAV	200,000 sf

Qualifiers: MARV = Minimum Average Roll Value (MARV) MAV = Minimum Average Value

NOTES:

1. Tensile properties are tested by manufacturer per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness is measured by manufacturer per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination.
5. Peel Adhesion is tested by the manufacturer per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10-inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
6. Geocomposite transmissivity is measured by manufacturer per ASTM D4716 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours according to GRI-GC8.

TENAX Engineered for Life

Sales/Technical Service
4800 East Monument Street • Baltimore, Maryland 21205 • 410.522.7000 • 410.522.7015 (fax) • 800.356.8495
www.tenaxus.com

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1/1/03

TENAX® Corporation
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Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION TWO

GEONET REPORT AND MQC

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: (410) 522-7000 Order Line: (800) 356-8495
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS
Web Site: www.tenaxus.com

Geonet MQC Test Results

Product TD 7 Wide
Project
Lot # batch 3 and 4
Dimensions 13' x 1840'
Testing Lab Tenax

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Resin Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	Resin MFI ASTM D1238 (g/10min)	Tensile Strength ASTM D4595 (lb/ft)
0400009	2/15/2004	301	0.948	2.46	0.044	1486
0400011	2/27/2004	324	0.948	2.50	0.040	2079
0400013	2/28/2004	323	0.948	2.55	0.044	1945
0400015	2/29/2004	325	0.948	2.57	0.044	1989
0400017	3/2/2004	345	0.948	2.11	0.044	2271
0400019	3/1/2004	309	0.948	2.64	0.044	1689
0400022	3/2/2004	313	0.948	2.64	0.044	1619
Average		**320**	**0.948**	**2.50**	**0.043**	**1868**
Standard Dev.		**14**	**0.000**	**0.18**	**0.002**	**279**
Specifications		**300**	**0.940**	**2.00**	**< 1**	**1200**

400016 #4

Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0400009	59.68	50
	0400011	66.88	50
	0400013	65.20	50
	0400015	61.00	50
	0400017	54.89	50
	0400019	62.43	50
	0400022	63.11	50
	Average (Specs)	**61.88**	**50**

Tested by DM for AB **Date** 3/4/2004
Andrew Barker

Checked by DM Mitchell **Date** 3/4/2004
David Mitchell

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION THREE

GEOTEXTILE MQC

04-Mar-2004

Product Grade: UV506

Lot Number: 40004

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama
Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA:

Engineer:

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4000666	01/29/2004	7.2	334.1	134.6	280.7	67.2	395.0	131.6	101.9	93.9	86	1.58	0.330	118.7	0.086
4000670	01/29/2004	7.4	297.2	120.1	260.2	65.7	411.0	136.2	101.2	96.2	84	1.54	0.283	115.5	0.080
4000674	01/29/2004	7.4	312.8	123.8	257.6	64.7	385.0	126.7	95.2	94.3	75	1.56	0.307	117.1	0.083
Average =		7.3	314.7	126.2	266.2	65.9	397.0	131.5	99.5	94.8	81.5	.03	0.033	2.3	0.004
Standard Deviation =		.1	18.5	7.5	12.7	1.3	13.1	4.8	3.7	1.2	6.1				

01-Mar-2004

Product Grade: UV506

Lot Number: 40006

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama
Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA: _____

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4000966	02/04/2004	7.1	287.9	128.5	266.2	70.7	331.0	132.5	94.3	85.7	79	1.69	0.299	126.5	0.083
4000968	02/04/2004	7.2	291.9	144.0	250.7	75.6	355.0				81				
4000970	02/04/2004	7.2	312.4	140.9	254.5	73.0	328.0	128.6	120.9	108.3	83				
4000972	02/04/2004										78				
4000973	02/04/2004	7.1													
4000974	02/06/2004	7.3	305.5	134.0	238.7	72.1	365.0	129.1	90.4	98.3	81	1.55	0.328	116.0	0.082
4000976	02/06/2004	7.7	316.1	127.1	245.9	64.3	375.0	135.8	80.3	87.5	83	1.48	0.308	111.0	0.082
4000978	02/06/2004										93				
4000980	02/06/2004	7.2	311.3	130.0	281.0	69.4	351.0	136.4	79.0	77.8	90				
4000982	02/06/2004										77				
4001026	02/09/2004										76				
4001028	02/08/2004	7.4	306.9	130.3	262.2	69.5	353.0	125.7	90.7	88.8	81	1.61	0.329	121.0	0.082
4001030	02/09/2004										79				
4001032	02/09/2004	7.2	302.9	129.7	264.0	69.4	336.0	129.0	96.8	79.8	76				
4001034	02/09/2004										78				
4001036	02/09/2004	7.7	308.4	136.4	279.7	74.3	354.0	129.0	98.7	88.7	94				
4001038	02/09/2004										91				
4001040	02/09/2004	7.6	293.3	136.0	250.1	71.0	361.0	118.9	111.7	98.0	89				
4001041	02/09/2004	7.4	281.0	142.2	253.9	70.1									
	Average =	7.3	301.6	134.5	257.0	70.9	350.9	129.4	95.9	90.1	82.8	1.58	0.316	118.6	0.082
	Standard Deviation =	.2	11.3	5.9	11.2	3.0	15.1	5.3	13.6	9.7	6.1	.09	0.015	6.7	0.001

04-Mar-2004

Product Grade: UV506

Lot Number: 40009

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama
Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA: KP

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4002001	02/15/2004	7.4	290.7	129.7	248.2	68.3	411.0	127.8	90.0	90.7	83	1.76	0.253	131.7	0.103
4002005	02/16/2004	7.3	299.4	133.3	262.7	72.3	369.0	131.1	95.8	83.3	82				
4002009	02/16/2004	7.5	294.6	129.3	245.5	70.8	407.0	124.4	84.7	84.8	84				
4002013	02/16/2004	7.5	292.1	128.2	251.4	62.9	418.0	132.7	85.7	83.1	79				
4002014	02/16/2004	7.4						134.5	93.2	89.2	85	1.50	0.297	112.0	0.083
4002016	02/16/2004	7.2	296.1	121.4	235.1	55.9		123.5	89.6	83.8	77	1.50	0.296	112.3	0.080
4002028	02/17/2004	7.3	281.7	118.1	246.6	57.2	396.0	121.8	80.8	77.1	82				
4002030	02/17/2004	7.4	277.2	115.1	232.7	57.7	395.0								
	Average =	7.4	290.3	125.0	246.0	63.6	399.3	128.0	88.5	84.6	82.0	1.59	0.282	118.7	0.089
	Standard Deviation =	.1	8.0	6.8	10.1	6.9	17.3	4.9	5.2	4.4	2.8	.15	0.025	11.3	0.013

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SECTION FOUR

GEOCOMPOSITE MQC

Tenax Corporation

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 3

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	BottomGeotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
				2.25	2.04	1	2.69×10^{-3}	1.80×10^{-3}
0400077	0400011	4002012	4000666					
0400078	0400011	4002012	4000666					
0400079	0400011	4002012	4000666					
0400080	0400011	4002012	4000666					
0400081	0400011	4002012	4000666					
0400082	0400011	4002003	4000666					
0400083	0400011	4002003	4002008					
0400084	0400010	4002003	4002008					
0400085	0400010	4002003	4002008					
0400086	0400010	4002003	4002008					
0400087	0400012	4002003	4002008					
0400088	0400012	4002003	4002008					
0400089	0400012	4002003	4002008					
0400090	0400012	4002030	4002008					
0400091	0400012	4002030	4002002					
0400092	0400012	4002030	4002002					
0400093	0400012	4002030	4002002					
0400094	0400012	4002030	4002002					
0400095	0400013	4002030	4002002					
0400096	0400013	4002030	4002002					
0400097	0400013	4002013	4002002					
0400098	0400013	4002013	4002002					
0400099	0400013	4002013	4002006					
0400100	0400013	4002013	4002006					
0400101	0400013	4002013	4002006					
0400102	0400013	4002013	4002006					
0400103	0400013	4002013	4002006					
0400104	0400014	4002010	4002006					
0400105	0400014	4002010	4002007					
0400106	0400014	4002010	4002007					
0400107	0400014	4002010	4002007					
0400108	0400014	4002010	4002007					
0400109	0400014	4002010	4002007					
0400110	0400014	4002010	4002007					
0400111	0400014	4002010	4002007					
0400112	0400016	4002111	4002007					
0400113	0400016	4002111	4002007					
0400114	0400016	4002011	4002007					

* a confining pressure of 15000 psf at a gradient of .1
with water at 20 degrees C with boundary conditions
of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours

Tested by:.....

Checked by:.....

Tenax Corporation

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 4

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	BottomGeotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
0400115	0400016	4002011	4002007	2.79	2.33	1		
0400116	0400016	4002011	4002007					
0400117	0400016	4002011	4002007					
0400118	0400016	4002011	4002005					
0400119	0400016	4002011	4002005					
0400120	0400016	4000968	4002005					
0400121	0400016	4000968	4002005					
0400122	0400017	4000968	4002005					
0400123	0400017	4000968	4002005					
0400124	0400017	4000968	4002005					
0400125	0400017	4000968	4002029					
0400126	0400017	4000672	4002029					
0400127	0400017	4000672	4002029					
0400128	0400017	4000672	4002029					
0400129	0400017	4000672	4002029					
0400130	0400018	4000672	4002029					
0400131	0400018	4000672	4002029					
0400132	0400018	4000672	4000669					
0400133	0400018	4002004	4000669					
0400134	0400018	4002004	4000669					
0400135	0400018	4002004	4000669					
0400136	0400018	4002004	4000669					
0400137	0400018	4002004	4000669					
0400138	0400019	4002004	4000669					
0400139	0400019	4002004	4000669					
0400140	0400019	4002004	4000969					
0400141	0400019	4001038	4000969					
0400142	0400019	4001038	4000969					
0400143	0400019	4001038	4000969					
0400144	0400019	4001038	4000969					
0400145	0400019	4001038	4000969					
0400146	0400019	4001038	4000969					
0400147	0400022	4000980	4000667					
0400148	0400022	4000980	4000667					
0400149	0400022	4000980	4000667					
0400150	0400022	4000980	4000667					
0400151	0400022	4000980	4000667					
0400152	0400022	4000980	4000667					

4

* a confining pressure of 15000 psf at a gradient of .1 with water at 20 degrees C with boundary conditions of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours

Tested by: AB

Checked by: DM

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 3 and 4

Tensile Strength (ASTM D4595)

Roll #	Yield Strength
0400077	2537.00
0400096	2511.00
0400115	2497.00
0400134	2725.00

SPEC	**2380 lbs/ft min.**

Tested By: Andrew Barker Date: 3/1/2004

Checked By: David Mitchell Date: 3/1/2004

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
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Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

QUALITY CONTROL SUMMARY
TENAX Tendrain 770-2
Batches 1 to 6

Project: Citrus County LF

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

Performance in Plastic Technology℠

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4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
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Certification Resins used 1

MASS POLYMERS CORPORATION

198 WEST HIGH STREET
SOMERVILLE, NJ 08876

(908) 725-3133
FAX (908) 725-9677

January 31, 2004

Mr. Kevin Dolinar
Tenax Corporation
4800 E. Monument Street
Baltimore, MD 21206

ORDER CONFIRMATION

Customer P.O. Number	1691
Product Type	HDPE
Manufacturer/Grade Number	Formosa E924 OG
Railcar Number	FPAX 950087
Manufacturer Date	8/16/03
Delivery Date	1/31/04
Product Weight	194,700 lbs

PROPERTY	RESULTS	ASTM TEST METHOD
Melt Index (190/2.16)	0.043 g/10 min	D – 1238
Density	0.949 g/cm^3	D – 1505

Sincerely,

Stephen Dazzo

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

QUALITY CONTROL SUMMARY
Tenax Tendrain 770-2
Date: March 8, 2004
Batch 5 and 6

Project: Citrus County LF

Prepared for: Comanco Environmental

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

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Geotextile MQC 3

Geocomposite MQC 4

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
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SECTION ONE

SPECIFICATION

TENAX® Corporation

[redacted]NDRAIN 770-2

Double-Sided Geocomposite

Citrus Co. LF, FL

The drainage geocomposite is comprised of a **tri-planar** geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven high UV resistant **Ultra Vera** geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming to the values and test methods listed below.

Property	Test Methods	Units	Value	Qualifier	Test Frequency
Resin					
• Density	ASTM D 1505	g/cm^3	0.94	MAV	lot
• Melt Flow Index	ASTM D 1238	g/10min	1.0	Max	lot
Geonet Core[4]					
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	1200 (17.5)	MAV	50,000 sf
• Compressive Behavior[2] % Retained thickness @50,000 psf	ASTM D1621	%	50	MAV	50,000 sf
• Creep Reduction Factor based on 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 25,000 psf.	GRI-GC8	-	1.14		
• Thickness[3]	ASTM D 5199	mil (mm)	300 (7.6)	MAV	50,000 sf
• Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
Geotextile[4]					
• **U.V. Resistance (500 hrs)**	**ASTM G 154**	%	**95**	MAV	Per formula
• AOS	ASTM D 4751	US Std. Sieve (mm)	70 (0.212)	MARV	500,000 sf
• Mass/Unit Area	ASTM D 5261	oz/yd^2 (g/m^2)	6 (203)	MARV	100,000 sf
• Water Flow Rate	ASTM D 4491	gpm/ft^2 (lpm/m^2)	110 (4480)	MARV	500,000 sf
• Mullen Burst	ASTM D3786	psi	325	MARV	100,000 sf
• Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
• Tear Strength	ASTM D 4533	lbs (N)	65 (289)	MARV	100,000 sf
• Grab Tensile	ASTM D 4632	lbs (N)	170 (756)	MARV	100,000 sf
• [redacted]ickness	ASTM D 5199	mil (mm)	65 (1.7)	MARV	100,000 sf
[redacted]composite					
• Peel Adhesion[5] – MD	F904 Modified	lb/in (g/in)	1.0 (454)	MAV	100,000 sf
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	2380 (34.8)	MAV	50,000 sf
• Labeling	Product code, geotextile type, roll dimensions, finished product lot and roll number.				
Hydraulic Behavior of Geocomposite					
•Transmissivity[6] - MD					
Gradient / Load			15,000 psf (720 kPa)		
0.1	ASTM D 4716 GRI - GC8	m^2/sec	1.8*10^{-3}	MAV	200,000 sf

Qualifiers: MARV = Minimum Average Roll Value (MARV) MAV = Minimum Average Value

NOTES:

1. Tensile properties are tested by manufacturer per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness is measured by manufacturer per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination.
5. Peel Adhesion is tested by the manufacturer per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10-inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
6. Geocomposite transmissivity is measured by manufacturer per ASTM D4716 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours according to GRI-GC8.

TENAX Engineered for Life

Sales/Technical Service
4800 East Monument Street • Baltimore, Maryland 21205 • 410.522.7000 • 410.522.7015 (fax) • 800.356.8495
www.tenaxus.com

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1/1/03

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION TWO

GEONET REPORT AND MQC

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: (410) 522-7000 Order Line: (800) 356-8495
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS
Web Site: www.tenaxus.com

Geonet MQC Test Results

Product TD 7 Wide
Project Citrus County
Lot # Batch 5 and 6
Dimensions 13' x 1840'
Testing Lab Tenax

Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Resin Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	Resin MFI ASTM D1238 (g/10min)	Tensile Strength ASTM D4595 (lb/ft)
0400015	2/29/2004	325	0.948	2.57	0.044	1989
0400017	3/2/2004	345	0.948	2.11	0.044	2271
0400019	3/1/2004	309	0.948	2.64	0.044	1689
0400021	3/1/2004	310	0.948	2.59	0.044	1647
0400022	3/2/2004	313	0.948	2.64	0.044	1619
0400024	3/3/2004	306	0.948	2.56	0.040	1844
0400026	3/4/2004	309	0.948	2.54	0.040	1795
0400028	3/5/2004	309	0.945	2.52	0.044	1515
0400030	3/5/2004	311	0.945	2.60	0.070	1575

#5 → 0400021

0400029 → #6

	Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Resin Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	Resin MFI ASTM D1238 (g/10min)	Tensile Strength ASTM D4595 (lb/ft)
Average			315	0.947	2.53	0.046	1771
[redacted] Dev.			13	0.001	0.16	0.009	238
[redacted]fications			300	0.940	2.00	< 1	1200

Compression

Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	0400015	61.00	50
	0400017	54.89	50
	0400019	62.43	50
	0400021	61.25	50
	0400022	63.11	50
	0400024	60.70	50
	0400026	58.70	50
	0400028	62.88	50
	0400030	59.40	50
	Average (Specs)	60.48	50

[redacted] by _____ Date 3/8/2004
Andrew Barker

Checked by _____ Date 3/8/2004
David Mitchell

TENAX® Corporation
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Baltimore, Maryland 21205
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SECTION THREE

GEOTEXTILE MQC

04-Mar-2004

Product Grade: UV506

Lot Number: 40004

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama

Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA:

Engineer:

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4000666	01/29/2004	7.2	334.1	134.6	280.7	67.2	395.0	131.6	101.9	93.9	86	1.58	0.330	118.7	0.086
4000670	01/29/2004	7.4	297.2	120.1	260.2	65.7	411.0	136.2	101.2	96.2	84	1.54	0.283	115.5	0.080
4000674	01/29/2004	7.4	312.8	123.8	257.6	64.7	385.0	126.7	95.2	94.3	75	1.56	0.307	117.1	0.083
Average =		7.3	314.7	126.2	266.2	65.9	397.0	131.5	99.5	94.8	81.5	.03	0.033	2.3	0.004
Standard Deviation =		.1	18.5	7.5	12.7	1.3	13.1	4.8	3.7	1.2	6.1				

01-Mar-2004

Product Grade: UV506

Lot Number: 40006

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama

Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA: _____

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2) ✓	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2) ✓	A.O.S. ASTM D4751 (mm) ✓
4000966	02/04/2004	7.1	287.9	128.5	266.2	70.7	331.0	132.5	94.3	85.7	79	1.69	0.299	128.5	0.083
4000968	02/04/2004	7.2	291.9	144.0	250.7	75.6	355.0				81				
4000970	02/04/2004	7.2	312.4	140.9	254.5	73.0	328.0	128.6	120.9	108.3	83				
4000972	02/04/2004										78				
4000973	02/04/2004	7.1													
4000974	02/06/2004	7.3	305.5	134.0	238.7	72.1	365.0	129.1	90.4	98.3	81	1.55	0.328	116.0	0.082
4000976	02/06/2004	7.7	316.1	127.1	245.9	64.3	375.0	135.8	80.3	87.5	83	1.48	0.308	111.0	0.082
4000978	02/06/2004										93				
4000980	02/06/2004	7.2	311.3	130.0	261.0	69.4	351.0	136.4	79.0	77.8	90				
4000982	02/06/2004										77				
4001026	02/09/2004										76				
4001028	02/08/2004	7.4	306.9	130.3	262.2	69.5	353.0	125.7	90.7	86.8	81	1.61	0.329	121.0	0.082
4001030	02/09/2004										79				
4001032	02/09/2004	7.2	302.9	129.7	264.0	69.4	336.0	129.0	96.8	79.8	76				
4001034	02/09/2004										78				
4001036	02/09/2004	7.7	308.4	136.4	279.7	74.3	354.0	129.0	98.7	88.7	94				
4001038	02/09/2004										91				
4001040	02/09/2004	7.6	293.3	136.0	250.1	71.0	361.0	118.9	111.7	98.0	89				
4001041	02/09/2004	7.4	281.0	142.2	253.9	70.1									
	Average =	7.3	301.6	134.5	257.0	70.9	350.9	129.4	95.9	90.1	82.8	1.58	0.316	118.6	0.082
	Standard Deviation =	.2	11.3	5.9	11.2	3.0	15.1	5.3	13.6	9.7	6.1	.09	0.015	6.7	0.001

04-Mar-2004

Product Grade: UV506

Lot Number: 40009

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama

Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA:

Engineer:

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4002001	02/15/2004	7.4	290.7	129.7	248.2	68.3	411.0	127.8	90.0	90.7	83	1.76	0.253	131.7	0.103
4002005	02/16/2004	7.3	299.4	133.3	262.7	72.3	369.0	131.1	95.8	83.3	82				
4002009	02/16/2004	7.5	294.6	129.3	245.5	70.8	407.0	124.4	84.7	84.8	84				
4002013	02/16/2004	7.5	292.1	128.2	251.4	62.9	418.0	132.7	85.7	83.1	79				
4002014	02/16/2004	7.4						134.5	93.2	89.2	85	1.50	0.297	112.0	0.083
4002016	02/16/2004	7.2	296.1	121.4	235.1	55.9		123.5	89.6	83.8	77	1.50	0.296	112.3	0.080
4002028	02/17/2004	7.3	281.7	118.1	246.6	57.2	396.0	121.8	80.8	77.1	82				
4002030	02/17/2004	7.4	277.2	115.1	232.7	57.7	395.0	128.0	88.5	84.6	82.0	1.59	0.282	118.7	0.089
	Average =	7.4	290.3	125.0	246.0	63.6	399.3	4.9	5.2	4.4	2.8	.15	0.025	11.3	0.013
	Standard Deviation =	.1	8.0	6.8	10.1	6.9	17.3								

04-Mar-2004

Product Grade: UV506

Lot Number: 40012

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL LLC
QA/QC Laboratory
Evergreen, Alabama

Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA:

Engineer:

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear ASTM D4533 CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Hydraulic Tests ASTM D4491 Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4002360	02/25/2004	6.3	247.7	131.7	229.4	68.5	327.0	100.8	89.2	74.0	78	1.67	0.334	125.6	0.126
4002364	02/25/2004	6.4	246.9	124.4	225.0	66.7	331.0	104.8	89.2	78.8	78				
4002377	02/26/2004	6.2	264.3	140.0	233.6	83.3		104.4	110.6	88.5	79	1.65	0.313	123.7	0.107
4002381	02/26/2004	6.4	239.1	135.7	224.8	78.2	333.0	104.2	88.2	76.1	78				
4002385	02/26/2004	6.5	238.9	134.4	228.6	74.2	336.0	104.9	97.2	97.8	76				
4002389	02/26/2004	6.3	245.9	128.6	214.0	67.4		101.8	103.1	100.4	79	1.88	0.361	140.9	
4002393	02/27/2004	6.5	245.5	129.2	229.5	70.1	333.0	107.4	110.8	91.9	76				
4002397	02/27/2004	6.0	243.2	130.3	229.5	69.5	328.0	101.2	106.7	97.8	71				
4002401	02/27/2004	6.3	241.4	137.5	228.0	77.9	336.0	97.3	104.6	94.9	78				
4002403	02/27/2004	6.1	239.1	133.2	219.6	65.3		98.8	115.6	91.0	82	1.48	0.271	110.7	0.157
4002408	02/27/2004	6.4													
4002409	02/27/2004	6.4	248.9	127.6	218.0	66.7									
4002410	02/27/2004	6.5	252.6	137.6	227.7	68.9	340.0	110.8	98.8	85.3	83	1.56	0.340	117.0	0.156
4002414	02/27/2004	6.1	244.9	136.7	241.4	69.3	337.0	104.0	102.7	97.8	79				
4002418	02/27/2004	6.1	243.4	135.7	215.5	74.9	325.0	104.1	97.5	86.7	76				
4002434	02/28/2004	6.5	230.9	153.1	221.2	76.1	331.0	104.7	116.3	92.8	78	1.68	0.320	126.0	0.156
4002438	02/28/2004	6.3	257.6	160.8	220.5	72.0	326.0	96.5	93.3	89.0	82				
4002442	02/28/2004	6.4	239.7	136.8	229.1	73.6	325.0	98.8	113.2	108.7	80	1.56	0.320	116.0	0.156
	Average =	6.3	245.3	136.1	225.6	71.9	331.4	102.8	102.3	90.7	78.2	1.64	0.323	122.8	0.143
	Standard Deviation =	.2	7.8	9.0	6.9	5.0	5.0	3.8	9.5	9.2	2.8	.13	0.028	9.8	0.021

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: 410-522-7000 Order Line: (800) 356-8495
Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

SECTION FOUR

GEOCOMPOSITE MQC

Tenax Corporation

Traceability, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 5

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	BottomGeotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
				2.04	2.13	1	1.95×10^{-3}	1.80×10^{-3}
0400153	0400021	4002364	4002365					
0400154	0400021	4002364	4002365					
0400155	0400021	4002364	4002365					
0400156	0400021	4002364	4002365					
0400157	0400021	4002399	4002398					
0400158	0400021	4002399	4002398					
0400159	0400021	4002399	4002398					
0400160	0400021	4002399	4002398					
0400161	0400023	4002399	4002398					
0400162	0400023	4002399	4002398					
0400163	0400023	4002400	4002385					
0400164	0400023	4002400	4002385					
0400165	0400023	4002400	4002385					
0400166	0400025	4002400	4002385					
0400167	0400025	4002400	4002385					
0400168	0400025	4002400	4002385					
0400169	0400025	4002400	4002385					
0400170	0400025	4002400	4002385					
0400171	0400025	4002401	4002383					
0400172	0400025	4002401	4002383					
0400173	0400025	4002401	4002383					
0400174	0400025	4002401	4002383					
0400175	0400025	4002401	4002383					
0400176	0400025	4002401	4002383					
0400177	0400028	4002401	4002383					
0400178	0400028	4002382	4002381					
0400179	0400020	4002382	4002381					
0400180	0400020	4002381	4002382					
0400181	0400020	4002381	4002382					
0400182	0400020	4002381	4002382					
0400183	0400020	4002381	4002382					
0400184	0400020	4002381	4002382					
0400185	0400020	4002412	4002339					
0400186	0400020	4002412	4002339					
0400187	0400020	4002412	4002339					
0400188	0400029	4002412	4002339					
0400189	0400029	4002412	4002339					
0400190	0400029	4002412	4002339					

* a confining pressure of 15000 psf at a gradient of .1
with water at 20 degrees C with boundary conditions
of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours

Tested by:.....

Checked by:.....

Tenax Corporation

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2 Wide
JOB: Citrus County
Batch : 6

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top Geotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	BottomGeotextile ASTM F904 Peel Adhesion lbs/in (avg.peaks)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
0400191	0400029	4002412	4002339	1.40	2.56	1		
0400192	0400029	4002412	4002339					
0400193	0400029	4002384	4002363					
0400194	0400029	4002384	4002363					
0400195	0400029	4002384	4002363					
0400196	0400030	4002384	4002363					
0400197	0400030	4002384	4002363					
0400198	0400030	4002384	4002363					
0400199	0400030	4002384	4002363					
0400200	0400030	4002362	4002361					
0400201	0400030	4002362	4002361					
0400202	0400030	4002362	4002361					
0400203	0400030	4002362	4002361					
0400204	0400030	4002362	4002361					
0400205	0400024	4002362	4002361					
0400206	0400024	4002362	4002361					
0400207	0400024	4002362	4002361					
0400208	0400024	4002437	4002436					
0400209	0400024	4002437	4002436					
0400210	0400024	4002437	4002436					
0400211	0400024	4002437	4002436					
0400212	0400024	4002437	4002436					
0400213	0400024	4002437	4002436					
0400214	0400026	4002437	4002436					
0400215	0400026	4002437	4002436					
0400216	0400026	4002435	4002411					
0400217	0400026	4002435	4002411					
0400218	0400026	4002435	4002411					
0400219	0400026	4002435	4002411					
0400220	0400026	4002435	4002411					
0400221	0400026	4002435	4002411					
0400222	0400026	4002435	4002411					
0400223	0400027	4002435	4002411					
0400224	0400027	4002434	4002417					
0400225	0400027	4002434	4002417					
0400226	0400027	4002434	4002417					
0400227	0400027	4002434	4002417					
0400228	0400027	4002434	4002417					

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Tested by:.....

Checked by:.....

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 5

Tensile Strength (ASTM D4595)

Roll #	Yield Strength
0400153	2544.00
0400172	2512.00

SPEC	**2380 lbs/ft min.**

Tested By: David Mitchell Date: 3/7/2004

Checked By: Tim Bauters, Ph.D. Date: 3/7/2004

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Fax: 410-522-7015 Waste Mgt: (800) US-GRIDS

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 6

Tensile Strength (ASTM D4595)

Roll #	Yield Strength
0400191	2465.20
0400200	2546.30

SPEC	**2380 lbs/ft min.**

Tested By: David Mitchell Date: 3/7/2004

Checked By: Tim Bauters, Ph.D. Date: 3/7/2004

Tab 2

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

QUALITY CONTROL SUMMARY

Tenax Tendrain 770-2

Date: March 10, 2004

Batch 7

Project: Citrus County LF

Prepared for Comanco Environmental

Submitted to:
Pablo Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637
(813) 988-8829

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

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TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

SECTION ONE

SPECIFICATON

TENAX® Corporation

TENDRAIN 770-2

Double-Sided Geocomposite

Citrus Co. LF, FL

The drainage geocomposite is comprised of a **tri-planar** geonet structure consisting of thick supporting ribs with diagonally placed top and bottom ribs and with a thermally bonded, non-woven high UV resistant **Ultra Vera** geotextile on both sides. The product is capable of providing high Transmissivity in a soil environment under high normal loads and will have properties conforming to the values and test methods listed below.

Property	Test Methods	Units	Value	Qualifier	Test Frequency
Resin					
• Density	ASTM D 1505	g/cm³	0.94	MAV	lot
• Melt Flow Index	ASTM D 1238	g/10min	1.0	Max	lot
Geonet Core[4]					
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	1200 (17.5)	MAV	50,000 sf
• Compressive Behavior[2] % Retained thickness @50,000 psf	ASTM D1621	%	50	MAV	50,000 sf
• Creep Reduction Factor based on 10,000 hour test duration, extrapolated to 30 years and using a compressive load of 25,000 psf.	GRI-GC8	-	1.14		
• Thickness[3]	ASTM D 5199	mil (mm)	300 (7.6)	MAV	50,000 sf
• Carbon Black	ASTM D 4218	%	2-3	range	50,000 sf
Geotextile[4]					
• U.V. Resistance (500 hrs)	ASTM G 154	%	95	MAV	Per formula
• AOS	ASTM D 4751	US Std. Sieve (mm)	70 (0.212)	MARV	500,000 sf
• Mass/Unit Area	ASTM D 5261	oz/yd² (g/m²)	6 (203)	MARV	100,000 sf
• Water Flow Rate	ASTM D 4491	gpm/ft² (lpm/m²)	110 (4480)	MARV	500,000 sf
• Mullen Burst	ASTM D3786	psi	325	MARV	100,000 sf
• Puncture Resistance	ASTM D 4833	lbs (N)	90 (400)	MARV	100,000 sf
• Tear Strength	ASTM D 4533	lbs (N)	65 (289)	MARV	100,000 sf
• Grab Tensile	ASTM D 4632	lbs (N)	170 (756)	MARV	100,000 sf
• Thickness	ASTM D 5199	mil (mm)	65 (1.7)	MARV	100,000 sf
Geocomposite					
• Peel Adhesion[5] – MD	F904 Modified	lb/in (g/in)	1.0 (454)	MAV	100,000 sf
• Tensile Strength[1] – MD	ASTM D 4595	lb/ft (kN/m)	2380 (34.8)	MAV	50,000 sf
• Labeling	Product code, geotextile type, roll dimensions, finished product lot and roll number.				
Hydraulic Behavior of Geocomposite					
•Transmissivity[6] - MD					
Gradient / Load			15,000 psf (720 kPa)		
0.1	ASTM D 4716 GRI - GC8	m²/sec	$1.8*10^{-3}$	MAV	200,000 sf

Qualifiers: MARV = Minimum Average Roll Value (MARV) MAV = Minimum Average Value

NOTES:

1. Tensile properties are tested by manufacturer per ASTM D4595 with a specimen width of 8.0 in. and cross-head speed of 0.4 in/min
2. Short term compressive behavior tested by manufacturer every 50,000 square feet of product per ASTM D1621 with a 4 in.x 4 in. specimen and a constant rate of strain of 0.04 in./min.
3. Thickness is measured by manufacturer per ASTM D5199 with a 2.22 in. diameter presser foot and 2.9 psi pressure.
4. Geotextile and geonet properties listed are prior to lamination.
5. Peel Adhesion is tested by the manufacturer per modified ASTM F904, with a 2 inch wide (5 longitudinal ribs) by 10-inch long strip. The geotextile bonded to either side of the geonet is pulled apart at a peeling rate of 12 in/min., for at least 4 inches of peeling distance. The reported value for each laminated side is the average of the "peak" values from 5 tested samples. The 5 samples are cut evenly distributed along the roll width with a 1 foot margin from both edges of the roll.
6. Geocomposite transmissivity is measured by manufacturer per ASTM D4716 with testing boundary conditions as follows: steel plate / uniform sand / geocomposite / 60 mil HDPE geomembrane / steel plate, and seating period of 100 hours according to GRI-GC8.

TENAX Engineered for Life

Sales/Technical Service
4800 East Monument Street • Baltimore, Maryland 21205 • 410.522.7000 • 410.522.7015 (fax) • 800.356.8495
www.tenaxus.com

© 2002, Tenax Geotextiles are manufactured by Tenax, LLC., Evergreen, AL. Printed in the U.S.A. The information contained herein has been carefully compiled by Tenax Corporation and to the best of our knowledge accurately represents Tenax product. Final determination of the suitability of any information or material for the use contemplated and its manner of use is the sole responsibility of the user.

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

SECTION TWO

RESIN REPORT

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

Quality Control Laboratory

REVIEWED BY:
QA
ENGINEER

Melt Flow Index
ASTM D 1238
PROCEDURE B AUTOMATIC
Conditions: Test Temp 190 C / 2.16 kg (formerly Condition E)

Polyethylene

Geonet Lot No.	Railcar No.	Railcar Lot No.	Melt FlowIndex g/10 min ASTM D1238	Density g/cc ASTM D 1505
43011	CHVX-890063	BH21604	.280	.948

extruder
Baldor
year 2004

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

SECTION THREE

GEONET REPORT AND MQC

TENAX® Corporation
4800 East Monument Street
Baltimore, Maryland 21205
Office: (410) 522-7000 Order Line: (800) 356-8495
Fax: (410) 522-7015 Waste Mgt: (800) US-GRIDS
Web Site: www.tenaxus.com

Geonet MQC Test Results

Product	TD 7 Wide
Project	Citrus County
Lot #	Batch 7
Dimensions	
Testing Lab	Tenax

	Geonet Roll	Date Tested	Thickness ASTM D5199 (mils)	Density ASTM D1505 (g/cm3)	CarbonBlack ASTM D4218 (%)	MFI ASTM D1238 (g/10min)	Unit Weight ASTM D3776 (g/m2)	Tensile Strength ASTM D4595 (lb/ft)
	4300143	3/10/2004	316	0.951	2.40	0.044	1843	1384
	4300145	3/10/2004	301	0.952	2.60	0.044	1709	1229
	4300148	3/10/2004	321	0.952	2.11	0.044	1993	1437
	4300150	3/10/2004	337	0.952	2.52	0.044	1881	1360
Average			319	0.952	2.41	0.044	1856	1352
Standard Dev.			15	0.001	0.21	0.000	117	88
Specifications			275	0.940	2.00	< 1	1650	1200

Compression Load (psf)	Roll #	Thickness Retained (%)	Specification (%)
50000			50
	4300143	57.14	50
	4300145	57.60	50
	4300148	68.14	50
	4300150	57.00	50
	Average (Specs)	59.97	50

Tested by _____ Date 3/10/2004

Checked by _____ Date 3/10/2004

Jonathan McCulley

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

SECTION FOUR

GEOTEXTILE MQC

10-Mar-[redacted]

Product Grade: UV506

Lot Number: 40012

Color: ORANG

Roll Dimensions: 14ft x 1610ft

Tenax Mfg. AL[redacted]
QA/QC Laboratory
Evergreen, Alabama

Nonwoven Test
Rolls
Lot Summary

Reviewed By:

QA: _____

Engineer: _____

Roll No.	Test Date	Weight ASTM D5261 (oz/yd2)	Grab Tensile/Elongation ASTM D4632 M.D. Tens. (lbs)	M.D. Elong (%)	C.D. Tens. (lbs)	C.D. Elong (%)	M. Burst ASTM D3786 (psi)	Puncture Resistance ASTM D4833 (lbs)	Trap.Tear ASTM D4533 MD (lbs)	Trap.Tear CD (lbs)	Thickness ASTM D5199 (mils)	Hydraulic Tests ASTM D4491 Permit. (sec-1)	Perm.(Kv) (cm/sec)	Water Flow (gpm/ft2)	A.O.S. ASTM D4751 (mm)
4002385	02/26/2004	6.5	238.9	134.4	228.6	74.2	336.0	104.9	97.2	97.8	76	1.76	0.337	132.3	0.107
4002389	02/26/2004	6.3	245.9	128.6	214.0	67.4		101.8	103.1	100.4	79	1.88	0.361	140.9	
4002393	02/27/2004	6.5	245.5	129.2	229.5	70.1	333.0	107.4	110.8	91.9	76				
4002397	02/27/2004	6.0	243.2	130.3	229.5	69.5	328.0	101.2	106.7	97.8	71				
4002401	02/27/2004	6.3	241.4	137.5	228.0	77.9	336.0	97.3	104.6	94.9	78				
	Average =	6.3	243.0	132.0	225.9	71.8	333.3	102.5	104.5	96.6	75.9	1.82	0.349	136.6	0.107
	Standard Deviation =	.2	2.9	3.8	6.7	4.2	3.8	3.8	5.0	3.3	3.0	.08	0.017	6.1	0.000

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

SECTION FIVE

GEOCOMPOSITE MQC

TENAX CORPORATION

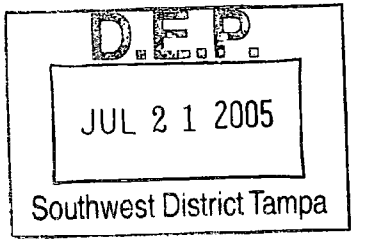
TENAX® Corp.
4800 East Monument Street
Baltimore, MD 21205
1-800-356-8495

Tracebility, Peel and Transmissivity report

PRODUCT : Tendrain 770-2
JOB: Citrus County Landfill
Batch : 7

COMPOSITE #	NET #	Top TEXTILE #	Bottom TEXTILE #	Top ASTM F904 Peel Adhesion lbs/in (avg.)	Bottom ASTM F904 Peel Adhesion lbs/in (avg.)	ASTM F904 Peel Adhesion lbs/in (req.)	ASTM D 4716 Transmissivity* (m2/sec) Value	ASTM D 4716 Transmissivity* (m2/sec) Required
				2.09	1.89	1.0	1.87×10^{-3}	1.80×10^{-3}
0400229	4300143	4002386	4002387					
0400230	4300143	4002386	4002387					
0400231	4300143	4002386	4002387					
0400232	4300143	4002386	4002387					
0400233	4300143	4002386	4002387					
0400234	4300143	4002386	4002387					
0400235	4300143	4002386	4002387					
0400236	4300149	4002386	4002387					
0400237	4300149	4002388	4002389					
0400238	4300149	4002388	4002389					
0400239	4300149	4002388	4002389					
0400240	4300149	4002388	4002389					
0400241	4300149	4002388	4002389					
0400242	4300150	4002388	4002389					
0400243	4300150	4002388	4002389					
0400244	4300150	4002388	4002389					
0400245	4300150	4002392	4002393					
0400246	4300150	4002392	4002393					
0400247	4300150	4002392	4002393					
0400248	4300150	4002392	4002393					
0400249	4300150	4002392	4002393					
0400250	4300151	4002392	4002393					
0400251	4300151	4002392	4002393					
0400252	4300151	4002392	4002393					
0400253	4300151	4002390	4002391					
0400254	4300151	4002390	4002391					
0400255	4300151	4002390	4002391					
0400256	4300151	4002390	4002391					
0400257	4300151	4002390	4002391					
0400258	4300152	4002390	4002391					
0400259	4300152	4002390	4002391					
0400260	4300152	4002390	4002391					
0400261	4300152	4002395	4002394					

* a confining pressure of 15000 psf at a gradient of 0.1
with water at 20 degrees C with boundary conditions
of plate/uniform sand/composite/60 milHDPE/ plate and a seating time of 100 hours



Tested by:.....
Checked by:..... T Baker on 7.20.05.

TENAX®
200 Miller Sellers Drive
Evergreen, Alabama 36401
Office: 251-578-9003 Web Site: http://www.tenaxus.com
Fax: 251-578-6141

MQC Geocomposite Tensile Strength - ASTM D4595

Product : Tendrain 770-2 wide
Job : Citrus County

Batch 7

Tensile Strength (ASTM D4595)

Roll #	Yield Strength	
0400229	2471.00	
0400248	2523.37	

SPEC	**2380 lbs/ft min.**	

Tested By: _____ Date: 3/10/2004
Rosalyn Forney

Checked By: _____ Date: 3/10/2004
Jonathan McCulley

GEOMEMBRANE

QUALITY CONTROL

GSE®
GSE Lining Technology, Inc.

19103 Gundle Road
Houston, Texas 77073
800-435-2008
713-443-8564
Fax: 281 – 230 - 8663

31 October 2003

Mr. Pablo J. Rivera
Comanco Environmental Corporation
7911 Professional Place
Tampa, Florida 33637

RE: Project: Citrus County Central Landfill Expansion
GSE Project No. 510258

Mr. Rivera,

Thank you for reviewing the GSE Specification Review for the aforementioned project. GSE will attempt to clarify the two issues raised by the engineer in this letter.

Asperity, U.V. Resistance, and Oven Aging.

- GSE currently tests all of its HDPE geomembrane products (smooth and textured) in accordance with the current industry standard, GRI Test Method GM13, rev. 6– 6/23/03. Asperity Height, U.V. Resistance, and Oven Aging are test performed within the aforementioned GRI Test Method. The project specifications for Asperity Height, U.V. Resistance, and Oven Aging listed in the project specifications (Table 02776.1) are identical to the values listed in GRI GM 13. GSE's finished product will meet or exceed these test values. Please see the GRI GM 13 specification values for Asperity Height, U.V. Resistance, and Oven Aging listed below

Geomembrane Property	Test Method	60 mil Test Value	Testing Frequency
Asperity Height (min avg.)	GM 12	10 mil	Every 2nd Roll
U.V. Resistance (Note 1) (a) Standard OIT (min. avg.) or (b) High Pressure OIT (min. avg.) % retained after 1600 hrs (Note 2)	GM11 D 3895 D 5885	 N.R. (Note 3) 50%	Per Each Formulation
Oven Aging (Note 4 & 5) (a) Standard OIT (min. avg.) % retained after 90 days or (b) High Pressure OIT (min. avg.) % retained after 90 days	D 5721 D 3895 D 5885	 55% 80%	Per Each Formulation

Notes:

(1) The condition of the test should be 20 hr. UV cycle at 75°C followed by 4 hr. condensation at 60°C.
(2) UV resistance is based on percent retained valued regardless of the original HP-OIT value.
(3) Not recommended since the high temperature of the Std-OIT test produces an unrealistic result for some of the antioxidants in the UV exposed samples.
(4) The manufacture has the option to select either one of the OIT methods listed to evaluate the antioxidant content in the geomembrane.
(5) It is also recommended to evaluate samples at 30 and 60 days to compare with the 90 day response.

Carbon Black Dispersion

- GSE currently tests all of its HDPE geomembrane products (smooth and textured) in accordance with the current industry standard, GRI Test Method GM13, rev. 6– 6/23/03. The current GM13 specification for Carbon Black Dispersion (ASTM D 5596) is as follows:

  - Carbon black dispersion (only near spherical agglomerates) for 10 different views:
    9 in Categories 1 or 2 and 1 in Category 3

If you should have any further questions, please do not hesitate to call me at (281) 230-8655.

Sincerely,

Terry Baker
GSE Technical Support

cc: File

COMANCO ENVIRONMENTAL CORPORATION
7911 Professional Place, Tampa, Florida 33637
Phone (813)988-8829 Fax (813)988-3720

SUBMITTAL CONTROL FORM

Project:	**Citrus County Landfill - Phase II Expansion**				
Engineer:	SCS Engineers	Project No.	9199056.02	Project Manager:	John Banks
Contractor:	Advanced Construction Services	Project No.	Bid No. 071-03	Project Manager:	Kenneth Pitts
Subcontractor:	COMANCO Environmental Corp.	Project No.	03-1088	Project Manager:	Pablo J. Rivera

COMPLETED BY CONTRACTOR:

Submittal Identifier:	**02776-002-A**	[X]	Original Submittal	[ ]	Supplement
Submitted:	January 12, 2004				
No. of Copies:	7	[ ]	Resubmittal	[ ]	Information Only

Submittal Description:	MQC Roll Certificates for GSE 60 mil HDPE Textured Geomembrane
Specification Identifier:	02776
Manufacturer:	GSE Lining Technology, Inc.
Installer:	COMANCO Environmental Corporation

ITEMS INCLUDED IN THIS SUBMITTAL:

Tab 1: MQC Roll Certifications (55 rolls)

GSE Roll Allocation

Order 29330
Customer Commanco
Site Citrus County Central Landfill Exp.

Roll#	*Resin Lot*	*Product Code*	*Description*	*Mfg. Date*	*Length*
102107948	8231127	HDT060A000	HDT060A000	12/5/2003	520
102107949	8231127	HDT060A000	HDT060A000	12/5/2003	520
102107950	8231127	HDT060A000	HDT060A000	12/5/2003	520
102107951	8231127	HDT060A000	HDT060A000	12/5/2003	520
102107952	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107953	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107954	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107955	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107956	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107957	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107958	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107959	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107960	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107961	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107962	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107963	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107964	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107965	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107966	8231127	HDT060A000	HDT060A000	12/6/2003	520
102107967	8231136	HDT060A000	HDT060A000	12/6/2003	520
102107968	8231136	HDT060A000	HDT060A000	12/6/2003	520
102107969	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107970	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107971	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107972	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107973	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107974	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107975	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107976	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107977	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107979	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107980	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107981	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107982	8231136	HDT060A000	HDT060A000	12/7/2003	520

Order 29330
Customer Commanco
Site Citrus County Central Landfill Exp.

Roll#	*Resin Lot*	*Product Code*	*Description*	*Mfg. Date*	*Length*
102107983	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107984	8231136	HDT060A000	HDT060A000	12/7/2003	520
102107985	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107986	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107987	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107988	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107989	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107990	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107992	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107993	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107994	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107995	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107996	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107997	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107998	8231136	HDT060A000	HDT060A000	12/8/2003	520
102107999	8231136	HDT060A000	HDT060A000	12/8/2003	520
102108000	8231136	HDT060A000	HDT060A000	12/8/2003	520
102108001	8231136	HDT060A000	HDT060A000	12/8/2003	520
102108002	8231136	HDT060A000	HDT060A000	12/9/2003	520
102108003	8231136	HDT060A000	HDT060A000	12/9/2003	520
102108004	8231136	HDT060A000	HDT060A000	12/9/2003	520

Chevron Phillips Chemical Company LP

CoA Date: 11/21/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
WESTFIELD TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86506145
PO #: 25716
Weight: 184200 LB
Ship Date: 11/21/2003
Package: BULK
Mode: Hopper Car
Car #: CHVX889207

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231136

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.070	g/10mi
HLMI Flow Rate	ASTM D1238	10.50	g/10mi
Density	ASTM D1505	0.9370	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799

Chevron Phillips Chemical Company LP

CoA Date: 11/20/2003

Certificate of Analysis

Shipped To: GSE LINING TECHNOLOGY INC HC
19103 GUNDLE ROAD
ALDINE TX 77090
USA

Recipient: DON BOHAC
Fax: 281-230-8630

CPC Delivery #: 86503989
PO #: 25716
Weight: 182900 LB
Ship Date: 11/20/2003
Package: BULK
Mode: Hopper Car
Car #: PSPX006612

Product:
MARLEX POLYETHYLENE K306 BULK

Lot Number: 8231127

Property	Test Method	Value	Unit
Melt Index	ASTM D1238	0.070	g/10mi
HLMI Flow Rate	ASTM D1238	12.60	g/10mi
Density	ASTM D1505	0.9370	g/cm3

The data set forth herein have been carefully compiled by Chevron Phillips Chemical Company LP. **However, there is no warranty of any kind, either expressed or implied, applicable to its use, and the user assumes all risk and liability in connection therewith.**

Jackie Edwards
Certification Systems Specialist

For CoA questions contact Peter Scheirman at 713-289-4799

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107948

ROLL IDENTIFICATION

Roll Number	102107948	
Product Name	HDT060A000	
Production Date	12/5/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,995 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(300)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	189	(331)
- M D		every 4th	90	(158)	213	(373)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		552	
- M D	(51 mm)	every 4th	100		587	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	60	(268)
- M D		every 4th	42	(187)	61	(271)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	161	(716)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
*Modified

GSE-8.2.4-007 Rev - - 02/03

APPROVED D.G. 12/6/2003 QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107949

ROLL IDENTIFICATION

Roll Number	102107949	
Product Name	HDT060A000	
Production Date	12/5/2003	
Length ≈ (+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,985 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(300)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	189	(331)
- M D		every 4th	90	(158)	213	(373)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		552	
- M D	(51 mm)	every 4th	100		587	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	60	(268)
- M D		every 4th	42	(187)	61	(271)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	161	(716)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107950

ROLL IDENTIFICATION

Roll Number	102107950	
Product Name	HDT060A000	
Production Date	12/5/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,980 1,805	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(300)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	189	(331)
- M D		every 4th	90	(158)	213	(373)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		552	
- M D	(51 mm)	every 4th	100		587	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	60	(268)
- M D		every 4th	42	(187)	61	(271)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	161	(716)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		30	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107951

ROLL IDENTIFICATION

Roll Number	102107951	
Product Name	HDT060A000	
Production Date	12/5/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(297)
- M D		every 4th	126	(221)	160	(281)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	187	(326)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		564	
- M D	(51 mm)	every 4th	100		539	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(262)
- M D		every 4th	42	(187)	61	(270)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		30	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107952

ROLL IDENTIFICATION

Roll Number	102107952	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,980 1,805	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(297)
- M D		every 4th	126	(221)	160	(281)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	187	(326)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		564	
- M D	(51 mm)	every 4th	100		539	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(262)
- M D		every 4th	42	(187)	61	(270)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107953

ROLL IDENTIFICATION

Roll Number	102107953	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(297)
- M D		every 4th	126	(221)	160	(281)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	187	(326)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		564	
- M D	(51 mm)	every 4th	100		539	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(262)
- M D		every 4th	42	(187)	61	(270)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107954

ROLL IDENTIFICATION

Roll Number	102107954	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,984 1,807	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(297)
- M D		every 4th	126	(221)	160	(281)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	187	(326)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		564	
- M D	(51 mm)	every 4th	100		539	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(262)
- M D		every 4th	42	(187)	61	(270)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		17	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107955

ROLL IDENTIFICATION

Roll Number	102107955	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,974 1,803	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	165	(288)
- M D		every 4th	90	(158)	192	(336)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		565	
- M D	(51 mm)	every 4th	100		617	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(244)
- M D		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(688)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		17	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107956

ROLL IDENTIFICATION

Roll Number	102107956	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	165	(288)
- M D		every 4th	90	(158)	192	(336)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		565	
- M D	(51 mm)	every 4th	100		617	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(244)
- M D		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(688)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		27	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107957

ROLL IDENTIFICATION

Roll Number	102107957
Product Name	HDT060A000
Production Date	12/6/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,980 1,805	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	165	(288)
- M D		every 4th	90	(158)	192	(336)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		565	
- M D	(51 mm)	every 4th	100		617	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(244)
- M D		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(688)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		27	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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12/6/2003
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107958

ROLL IDENTIFICATION

Roll Number	102107958	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	165	(288)
- M D		every 4th	90	(158)	192	(336)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		565	
- M D	(51 mm)	every 4th	100		617	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(244)
- M D		every 4th	42	(187)	58	(257)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(688)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.946	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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12/6/2003
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107959

ROLL IDENTIFICATION

Roll Number	102107959	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	162	(283)
- MD		every 4th	126	(221)	159	(278)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	174	(304)
- MD		every 4th	90	(158)	179	(313)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- MD	(51 mm)	every 4th	100		633	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- MD		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107960

ROLL IDENTIFICATION

Roll Number	102107960	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,990 1,810	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	162 ✓	(283)
- M D		every 4th	126	(221)	159 ✓	(278)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	174 ✓	(304)
- M D		every 4th	90	(158)	179 ✓	(313)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		633	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- M D		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944 ✓	
Carbon Black Content, %	ASTM D 1603*				✓	
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		27	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107961

ROLL IDENTIFICATION

Roll Number	102107961	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,996 1,813	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	162	(283)
- MD		every 4th	126	(221)	159	(278)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	174	(304)
- MD		every 4th	90	(158)	179	(313)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- MD	(51 mm)	every 4th	100		633	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- MD		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		27	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107962

ROLL IDENTIFICATION

Roll Number	102107962	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,990 1,810	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	162	(283)
- M D		every 4th	126	(221)	159	(278)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	174	(304)
- M D		every 4th	90	(158)	179	(313)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		633	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	55	(243)
- M D		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107963

ROLL IDENTIFICATION

Roll Number	102107963	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	165	(289)
- M D		every 4th	126	(221)	162	(283)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	175	(306)
- M D		every 4th	90	(158)	203	(355)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107964

ROLL IDENTIFICATION

Roll Number	102107964	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,994 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	165	(289)
- M D		every 4th	126	(221)	162	(283)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	175	(306)
- M D		every 4th	90	(158)	203	(355)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107965

ROLL IDENTIFICATION

Roll Number	102107965	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,980 1,805	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	165	(289)
- M D		every 4th	126	(221)	162	(283)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	175	(306)
- M D		every 4th	90	(158)	203	(355)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107966

ROLL IDENTIFICATION

Roll Number	102107966	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231127
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	165	(289)
- M D		every 4th	126	(221)	162	(283)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	175	(306)
- M D		every 4th	90	(158)	203	(355)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		575	
- M D	(51 mm)	every 4th	100		610	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(695)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.6	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		21	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
*Modified

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12/7/2003
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107967

ROLL IDENTIFICATION

Roll Number	102107967
Product Name	HDT060A000
Production Date	12/6/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	164 ✓	(287)
- M D		every 4th	126	(221)	158 ✓	(276)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	184 ✓	(321)
- M D		every 4th	90	(158)	176 ✓	(307)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		550	
- M D	(51 mm)	every 4th	100		582	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(257)
- M D		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	155	(692)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5 ✓	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10 ✓	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		21	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107968

ROLL IDENTIFICATION

Roll Number	102107968	
Product Name	HDT060A000	
Production Date	12/6/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,984 1,807	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	164	(287)
- M D		every 4th	126	(221)	158	(276)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	184	(321)
- M D		every 4th	90	(158)	176	(307)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		550	
- M D	(51 mm)	every 4th	100		582	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(257)
- M D		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(692)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		23	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107969

ROLL IDENTIFICATION

Roll Number	102107969	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,984 1,807	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	164	(287)
- MD		every 4th	126	(221)	158	(276)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	184	(321)
- MD		every 4th	90	(158)	176	(307)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		550	
- MD	(51 mm)	every 4th	100		582	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(257)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(692)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		23	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107970

ROLL IDENTIFICATION

Roll Number	102107970	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	164	(287)
- MD		every 4th	126	(221)	158	(276)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	184	(321)
- MD		every 4th	90	(158)	176	(307)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		550	
- MD	(51 mm)	every 4th	100		582	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(257)
- MD		every 4th	42	(187)	57	(252)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	155	(692)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107971

ROLL IDENTIFICATION

Roll Number	102107971
Product Name	HDT060A000
Production Date	12/7/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,996 1,813	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(291)
- M D		every 4th	126	(221)	165	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(328)
- M D		every 4th	90	(158)	182	(319)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		574	
- M D	(51 mm)	every 4th	100		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	162	(722)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107972

ROLL IDENTIFICATION

Roll Number	102107972	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(291)
- M D		every 4th	126	(221)	165	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(328)
- M D		every 4th	90	(158)	182	(319)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		574	
- M D	(51 mm)	every 4th	100		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	162	(722)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107973

ROLL IDENTIFICATION

Roll Number	102107973	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(291)
- M D		every 4th	126	(221)	165	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(328)
- M D		every 4th	90	(158)	182	(319)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		574	
- M D	(51 mm)	every 4th	100		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	162	(722)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107974

ROLL IDENTIFICATION

Roll Number	102107974
Product Name	HDT060A000
Production Date	12/7/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,990 1,810	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(291)
- M D		every 4th	126	(221)	165	(288)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(328)
- M D		every 4th	90	(158)	182	(319)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		574	
- M D	(51 mm)	every 4th	100		589	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(249)
- M D		every 4th	42	(187)	60	(265)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	162	(722)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.943	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107975

ROLL IDENTIFICATION

Roll Number	102107975
Product Name	HDT060A000
Production Date	12/7/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,986 1,808	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	160	(280)
- MD		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(310)
- MD		every 4th	90	(158)	199	(347)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- MD	(33 mm)	every 4th	12		18	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- MD	(51 mm)	every 4th	100		596	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(250)
- MD		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107976

ROLL IDENTIFICATION

Roll Number	102107976	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,980 1,805	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	160	(280)
- MD		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(310)
- MD		every 4th	90	(158)	204	(357)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- MD	(33 mm)	every 4th	12		19	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- MD	(51 mm)	every 4th	100		596	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(250)
- MD		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107977

ROLL IDENTIFICATION

Roll Number	102107977	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,966 1,799	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	160	(280)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(310)
- M D		every 4th	90	(158)	204	(357)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		19	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- M D	(51 mm)	every 4th	100		596	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(250)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107979

ROLL IDENTIFICATION

Roll Number	102107979
Product Name	HDT060A000
Production Date	12/7/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	160	(280)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	177	(310)
- M D		every 4th	90	(158)	204	(357)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		19	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- M D	(51 mm)	every 4th	100		596	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	56	(250)
- M D		every 4th	42	(187)	60	(266)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	159	(708)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		29	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107980

ROLL IDENTIFICATION

Roll Number	102107980	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,990 1,810	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	187	(327)
- M D		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		539	
- M D	(51 mm)	every 4th	100		607	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	60	(268)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(700)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		9	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

GSE-8.2.4-007 Rev - - 02/03

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12/8/2003
QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107981

ROLL IDENTIFICATION

Roll Number	102107981	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,006 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	57	(1.5)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	187	(327)
- M D		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		539	
- M D	(51 mm)	every 4th	100		607	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	60	(268)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(700)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		9	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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12/8/2003
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107982

ROLL IDENTIFICATION

Roll Number	102107982	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,004 1,816	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	187	(327)
- M D		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		539	
- M D	(51 mm)	every 4th	100		607	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	60	(268)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(700)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		9	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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12/8/2003
QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107983

ROLL IDENTIFICATION

Roll Number	102107983	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,008 1,818	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	156	(273)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	187	(327)
- M D		every 4th	90	(158)	211	(369)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		539	
- M D	(51 mm)	every 4th	100		607	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(253)
- M D		every 4th	42	(187)	60	(268)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(700)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		9	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107984

ROLL IDENTIFICATION

Roll Number	102107984	
Product Name	HDT060A000	
Production Date	12/7/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,010 1,819	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(279)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(329)
- M D		every 4th	90	(158)	212	(371)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		592	
- M D	(51 mm)	every 4th	100		576	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(256)
- M D		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	158	(704)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107985

ROLL IDENTIFICATION

Roll Number	102107985	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,994 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(279)
- MD		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(329)
- MD		every 4th	90	(158)	212	(371)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		592	
- MD	(51 mm)	every 4th	100		576	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(256)
- MD		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	158	(704)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107986

ROLL IDENTIFICATION

Roll Number	102107986
Product Name	HDT060A000
Production Date	12/8/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,010 1,819	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(279)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(329)
- M D		every 4th	90	(158)	212	(371)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		592	
- M D	(51 mm)	every 4th	100		576	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(256)
- M D		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	158	(704)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

APPROVED D.G. 12/8/2003 QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107987

ROLL IDENTIFICATION

Roll Number	102107987	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,000 1,814	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(279)
- M D		every 4th	126	(221)	164	(286)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	188	(329)
- M D		every 4th	90	(158)	212	(371)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		592	
- M D	(51 mm)	every 4th	100		576	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	57	(256)
- M D		every 4th	42	(187)	59	(262)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	158	(704)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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12/8/2003
QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107988

ROLL IDENTIFICATION

Roll Number	102107988	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,006 1,817	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(298)
- MD		every 4th	126	(221)	166	(290)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	198	(347)
- MD		every 4th	90	(158)	213	(372)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		568	
- MD	(51 mm)	every 4th	100		551	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(270)
- MD		every 4th	42	(187)	62	(277)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(706)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107989

ROLL IDENTIFICATION

Roll Number	102107989	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,004 1,816	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(298)
- M D		every 4th	126	(221)	166	(290)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	198	(347)
- M D		every 4th	90	(158)	213	(372)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		568	
- M D	(51 mm)	every 4th	100		551	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(270)
- M D		every 4th	42	(187)	62	(277)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	159	(706)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		26	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

GSE-8.2.4-007 Rev - - 02/03

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107990

ROLL IDENTIFICATION

Roll Number	102107990	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	4,002 1,815	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	170	(298)
- M D		every 4th	126	(221)	166	(290)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	198	(347)
- M D		every 4th	90	(158)	213	(372)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		568	
- M D	(51 mm)	every 4th	100		551	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(270)
- M D		every 4th	42	(187)	62	(277)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	159	(706)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		30	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107992

ROLL IDENTIFICATION

Roll Number	102107992	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,994 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(323)
- M D		every 4th	90	(158)	228	(400)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		471	
- M D	(51 mm)	every 4th	100		595	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(263)
- M D		every 4th	42	(187)	61	(273)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	157	(699)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		27	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107993

ROLL IDENTIFICATION

Roll Number	102107993	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,992 1,811	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(323)
- M D		every 4th	90	(158)	228	(400)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		471	
- M D	(51 mm)	every 4th	100		595	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(263)
- M D		every 4th	42	(187)	61	(273)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(699)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		30	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107994

ROLL IDENTIFICATION

Roll Number	102107994
Product Name	HDT060A000
Production Date	12/8/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	159	(278)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	185	(323)
- M D		every 4th	90	(158)	228	(400)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		16	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		471	
- M D	(51 mm)	every 4th	100		595	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	59	(263)
- M D		every 4th	42	(187)	61	(273)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	157	(699)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.942	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.4	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		30	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107995

ROLL IDENTIFICATION

Roll Number	102107995	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,984 1,807	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(290)
- M D		every 4th	126	(221)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	228	(399)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- M D	(51 mm)	every 4th	100		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(258)
- M D		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	160	(713)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107996

ROLL IDENTIFICATION

Roll Number	102107996
Product Name	HDT060A000
Production Date	12/8/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,978 1,804	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	57	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(290)
- M D		every 4th	126	(221)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	228	(399)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- M D	(51 mm)	every 4th	100		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(258)
- M D		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	160	(713)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102107997

ROLL IDENTIFICATION

Roll Number	102107997
Product Name	HDT060A000
Production Date	12/8/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	56	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(290)
- MD		every 4th	126	(221)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- MD		every 4th	90	(158)	228	(399)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- MD	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- MD	(51 mm)	every 4th	100		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(258)
- MD		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	160	(713)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107998

ROLL IDENTIFICATION

Roll Number	102107998	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.6)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	166	(290)
- M D		every 4th	126	(221)	165	(289)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	202	(353)
- M D		every 4th	90	(158)	228	(399)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		576	
- M D	(51 mm)	every 4th	100		573	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(258)
- M D		every 4th	42	(187)	62	(275)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	160	(713)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		20	

Order No. 29330
Customer Name Commanco
Project Name Citrus County Central Landfill Exp.
Location Leconto, FL
*Modified

APPROVED D.G. 12/9/2003 QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102107999

ROLL IDENTIFICATION

Roll Number	102107999	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,994 1,812	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	196	(342)
- M D		every 4th	90	(158)	199	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		495	
- M D	(51 mm)	every 4th	100		553	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(260)
- M D		every 4th	42	(187)	63	(281)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(694)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

APPROVED D.G. 12/9/2003 QA

Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108000

ROLL IDENTIFICATION

Roll Number	102108000	
Product Name	HDT060A000	
Production Date	12/8/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,996 1,813	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	196	(342)
- M D		every 4th	90	(158)	199	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		495	
- M D	(51 mm)	every 4th	100		553	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(260)
- M D		every 4th	42	(187)	63	(281)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	156	(694)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		24	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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QA

GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108001

ROLL IDENTIFICATION

Roll Number	102108001
Product Name	HDT060A000
Production Date	12/8/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,978 1,804	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	196	(342)
- M D		every 4th	90	(158)	199	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		495	
- M D	(51 mm)	every 4th	100		553	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(260)
- M D		every 4th	42	(187)	63	(281)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	156	(694)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108002

ROLL IDENTIFICATION

Roll Number	102108002
Product Name	HDT060A000
Production Date	12/9/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,984 1,807	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	171	(299)
- MD		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	196	(342)
- MD		every 4th	90	(158)	199	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		16	
- MD	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		495	
- MD	(51 mm)	every 4th	100		553	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	58	(260)
- MD		every 4th	42	(187)	63	(281)
Puncture Resistance, lb. (N)	ASTM D 4833	every 4th	90	(401)	156	(694)
Density, g/cc	ASTM D 1505	every 4th	0.940		0.944	
Carbon Black Content, %	ASTM D 1603*	every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		25	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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Roll Test Data Report

GSE Lining Technology, Inc.

Roll No. 102108003

ROLL IDENTIFICATION

Roll Number	102108003	
Product Name	HDT060A000	
Production Date	12/9/2003	
Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,982 1,806	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	60	(1.5)
Minimum		every roll	54	(1.4)	54	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	173	(303)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	201	(352)
- M D		every 4th	90	(158)	200	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		547	
- M D	(51 mm)	every 4th	100		525	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(273)
- M D		every 4th	42	(187)	63	(282)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(693)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

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GSE Lining Technology, Inc.

Roll Test Data Report

Roll No. 102108004

ROLL IDENTIFICATION

Roll Number	102108004
Product Name	HDT060A000
Production Date	12/9/2003

Length ≈(+/- 1%)	520 158	feet meters
Width (Nominal)	22.5 6.9	feet meters
Sheet Area	11,700 1,086	sq. feet sq. meters
Weight	3,978 1,804	pounds kilograms

RESIN INFORMATION

Lot Number	8231136
Type	K306
Supplier	Phillips

GSE RESIN TEST DATA

Property	Test Method	Results
Density, g/cc	ASTM D 1505	0.937
Melt index, g/10 min.	ASTM D 1238 (190/2.16)	0.07

Physical Property	Test Method	Test Frequency	Customer Minimum English	Customer Minimum Metric	Test Results English	Test Results Metric
Thickness, mil (mm)	ASTM D 5994					
Average		every roll	60	(1.5)	61	(1.5)
Minimum		every roll	54	(1.4)	55	(1.4)
Tensile Properties:	ASTM D638,Type IV / D6693					
Yield Strength, ppi (N/cm) - TD		every 4th	126	(221)	173	(303)
- M D		every 4th	126	(221)	163	(285)
Break Strength, ppi (N/cm) - TD		every 4th	90	(158)	201	(352)
- M D		every 4th	90	(158)	200	(349)
Yield Elongation, % - TD	gauge length = 1.3"	every 4th	12		15	
- M D	(33 mm)	every 4th	12		17	
Break Elongation, % - TD	gauge length = 2.0"	every 4th	100		547	
- M D	(51 mm)	every 4th	100		525	
Tear Resistance, lb. (N)	ASTM D 1004					
- TD		every 4th	42	(187)	61	(273)
- M D		every 4th	42	(187)	63	(282)
Puncture Resistance, lb. (N)	ASTM D 4833					
		every 4th	90	(401)	156	(693)
Density, g/cc	ASTM D 1505					
		every 4th	0.940		0.945	
Carbon Black Content, %	ASTM D 1603*					
		every 4th	2.0		2.5	
Carbon Black Dispersion	ASTM D 5596					
Views in Cat1 - Cat2		every 4th	9		10	
Asperity Height	GRI GM 12					
Average (mils) - Side A		every 2nd	10		22	

Order No.	29330
Customer Name	Commanco
Project Name	Citrus County Central Landfill Exp.
Location	Leconto, FL

*Modified

APPROVED D.G. 12/9/2003 QA

GEOGRID

QUALITY CONTROL

Earth Technologies, Inc.

1405 Third Avenue, Suite 8
Spring Lake, New Jersey 07762
Tel. 732 • 449 • 1799
Fax 732 • 449 • 1370
www.tensarcorp.com
tsheridan@tensarcorp.com

July 6, 2004

Comanco Environmental Corporation
Pablo J. Rivera
Senior Project Manager
7911 Professional Place
Tampa, Florida 33637
813-988-8829 Tel.
813-988-3720 Fax.

Dear Pablo:

I have reviewed your 6-16-04 memorandum regarding the shop drawing review for Tensar geogrids. The Quality Control testing requirements are listed in Section 1.03.B of the project specifications. Tensar Earth Technologies (TET) has supplied the data required. The memorandum lists material properties from Table 02950-1 of the specifications that were not reported in the quality control data.

Geosynthetic manufacturers routinely list properties in material data sheets that are not part of the QC test protocol i.e. permeability – geomembranes, apparent opening size-geotextiles, transmissivity – drainage nets. Open area and flexural rigidity are properties that TET can substantiate and certify but are not part of the QC protocol.

All Tensar uniaxial geogrids (i.e. UX1700HS) are manufactured from High Density Polyethylene.

TET lists "True Initial Modulus in Use" in our material property data sheets. This modulus is measured immediately upon loading and is embedded in the Instron systems software. I have included the "True Initial Modulus in Use" quality control data for the lots listed in your memorandum.

I hope this information resolves all the outstanding issues regarding Tensar geogrids at your site. Should you have any questions or need any additional materials please do not hesitate to call.

Very truly yours,

Terry Sheridan
Business Sector Manager
Environmental Market

The Tensar Corporation
1210 Citizens Parkway
Morrow, Georgia 30260
Tel. (770) 968-3255

June 9, 2004

Comanco Environmental Corporation
7911 Professional Place
Tampa, FL 33637
United States

Reference:

TENSAR ORDER NUMBER:	TET 013870
PURCHASE ORDER NUMBER:	171
BILL OF LADING NUMBER:	TMP - 0049089 and TMP - 0049090

Sold To:

20936-HQ
Comanco Environmental Corporation
7911 Professional Place
Tampa, FL 33637
United States

Ship To:

20936-CITRUS CTY
Comanco Environmental Corporation
C/O Citrus County Landfill
230 W Gulf To Lake Hwy
Lecanto, FL 34461
United States

This is to certify that the following Tensar Geogrid:

* UX170070

as manufactured by the Tensar Corporation in Morrow, Georgia USA, for the project referenced above has been manufactured and tested in accordance with the Tensar Quality Assurance Program. Quality control test data is enclosed.

The Tensar Corporation structural Geogrid meets the characteristics and properties per the enclosed material property data sheet dated February 2004, as directed by the Tensar Earth Technologies, Inc. design-engineering group. For technical support contact 1-800-TENSAR 1.

David Hall
Quality Assurance Laboratory Supervisor

Product Specification - Structural Geogrid UX1700HS

Tensar Earth Technologies, Inc. reserves the right to change its product specifications at any time. It is the responsibility of the specifier and purchaser to ensure that product specifications used for design and procurement purposes are current and consistent with the products used in each instance. Please contact Tensar Earth Technologies, Inc. at 800-836-7271 for assistance

The structural geogrid shall be an integrally formed grid structure manufactured of a stress resistant high density polyethylene material with molecular weight and molecular characteristics which impart: (a) high resistance to loss of load capacity or structural integrity when the geogrid is subjected to mechanical stress in installation; (b) high resistance to deformation when the geogrid is subjected to applied force in use; and (c) high resistance to loss of load capacity or structural integrity when the geogrid is subjected to long-term environmental stress.

The structural geogrid shall accept applied force in use by positive mechanical interlock (i.e. by direct mechanical keying) with: (a) compacted soil or construction fill materials; (b) contiguous sections of itself when overlapped and embedded in compacted soil or construction fill materials; and (c) rigid mechanical connectors such as bodkins, pins or hooks. The structural geogrid shall possess sufficient cross sectional profile to present a substantial abutment interface to compacted soil or particulate construction fill materials and to resist movement relative to such materials when subject to applied force. The structural geogrid shall possess sufficient true initial modulus to cause applied force to be transferred to the geogrid at low strain levels without material deformation of the reinforced structure. The structural geogrid shall possess complete continuity of all properties throughout its structure and shall be suitable for reinforcement of compacted soil or particulate construction fill materials to improve their long term stability in structural load bearing applications such as earth retention systems. The structural geogrid shall otherwise have the following characteristics:

Product Type: **Integrally Formed Structural Geogrid**
Load Transfer Mechanism: **Positive Mechanical Interlock**

Product Properties

Load Capacity	**Units**	**MD Values[1]**
▪ True Initial Modulus in Use[2]	kN/m(lb/ft)	2,350 (161,070)
▪ Tensile Strength @5% Strain[2]	kN/m(lb/ft)	75 (5,140)
▪ Ultimate Tensile Strength[2]	kN/m(lb/ft)	175 (11,990)
▪ Long-Term Allowable Load in Sands, Silts & Clay[3]	kN/m(lb/ft)	75.1 (5,140)
▪ Long-Term Allowable Load in Well Graded Sand[3]	kN/m(lb/ft)	73.0 (5,000)
▪ Long-Term Allowable Load in Aggregate[3]	kN/m(lb/ft)	71.6 (4,910)
Integrity of Product Structure		
▪ Junction Strength[4]	kN/m(lb/ft)	160 (10,970)
▪ Flexural Stiffness[5]	X1000 mg-cm	9,075
Durability		
▪ Resistance to Installation Damage[6]	%SC / %SW / %GP	95 / 92 / 90
▪ Resistance to Long Term Degradation[7]	%	100

Dimensions and Delivery

The structural geogrid shall be delivered to the jobsite in roll form with each roll individually identified and nominally measuring 1.33 meters (4.36 feet) in width and 61.0 meters (200.0 feet) in length. A typical truckload quantity is 144 rolls. On special request, the structural geogrid may also be custom cut to specific lengths or widths to suit site specific engineering designs.

Notes

1. Unless indicated otherwise, values shown are minimum average roll values determined in accordance with ASTM D-4759. Brief descriptions of test procedures are given in the following notes. Complete descriptions of test procedures are available on request from Tensar Earth Technologies, Inc.
2. True resistance to elongation when initially subjected to a load measured via ASTM D6637 without deforming test materials under load before measuring such resistance or employing "secant" or "offset" tangent methods of measurement so as to overstate tensile properties.
3. True strength available for resisting force in long-term load bearing applications is determined by reducing ultimate tensile strength by state-of-practice factors for installation damage, degradation in use, product integrity limitations and long-term product deformation per GRI-GG4.
4. Load transfer capability measured via GRI-GG2-87.
5. Resistance to bending force measured via ASTM D-5732-95, using specimen dimensions of 864 millimeters in length by 1 aperture in width.
6. Resistance to loss of load capacity or structural integrity when subjected to mechanical installation stress in clayey sand (SC), well graded sand (SW), and crushed stone classified as poorly graded gravel (GP). The material shall be sampled in accordance with ASTM D5818 and load capacity measured in accordance with ASTM D6637.
7. Resistance to loss of load capacity or structural integrity when subjected to chemically aggressive environments measured via EPA 9090 immersion testing.

Tensar Earth Technologies, Inc.
5883 Glenridge Drive, Suite 200
Atlanta, Georgia 30328-5363
(800) 836-7271

February 1, 2004

This product specification supersedes all prior specifications for the product described above and is not applicable to any products shipped prior to February 1, 2004.

THE TENSAR CORPORATION
1210 CITIZENS PARKWAY
MORROW, GEORGIA 30260

Operator name: DORIS
Sample Identification: 18778004M
Test Method Number: 8

TIME 18:05

UXQUINT 100 mm/min tensile test

Test Date:	Wednesday, April 28, 2004	
Interface Type:	5500	
Crosshead Speed:	100.0000	mm/min
Sample Rate (pts/secs):	20.0000	
Temperature:	73 F	
Humidity (%):	50	
Grip Distance:	1000.0000mm	
Specimen G. L.:	930.0000mm	

	Ult Load (N)	Displcment at Ult.Load (mm)	% Strain at Ult.Load (%)	Tensile @ 2% STRAIN (N)	Tensile @ 5% STRAIN (N)	Ultimate Tensile Strength (KN/M)	Tensile Strength 2% STRAIN (KN/M)	Tensile Strength 5% STRAIN (KN/M)	2% Tensile Modulus (KN/M)
1	4127.926	103.839	11.172	981.602	1891.827	190.710	45.350	87.402	2267.500
2	3912.542	98.409	10.574	904.578	1834.438	180.759	41.791	84.751	2089.575
3	3996.789	97.672	10.505	993.041	1921.653	184.652	45.878	88.780	2293.924
4	3899.750	92.355	9.934	1057.587	2034.903	180.168	48.861	94.013	2443.025
5	3944.118	96.717	10.403	1019.352	1960.935	182.218	47.094	90.595	2354.703
6	3910.510	93.250	10.030	1037.203	2004.501	180.666	47.919	92.608	2395.939
Mean	3965.272	97.040	10.436	998.894	1941.376	183.196	46.149	89.692	2307.444
S.D.	87.143	4.121	0.443	53.963	74.020	4.026	2.493	3.420	124.653
Mean +0.58 SD	4015.816	99.431	10.694	1030.192	1984.308	185.531	47.595	91.675	2379.743
Mean -0.58 SD	3914.729	94.650	10.179	967.595	1898.445	180.861	44.703	87.708	2235.146
Minimum	3899.750	92.355	9.934	904.578	1834.438	180.168	41.791	84.751	2089.575
Maximum	4127.926	103.839	11.172	1057.587	2034.903	190.710	48.861	94.013	2443.025

	True Initial Modulus (KN/M)
1	2601.337
2	2673.412
3	2884.862
4	3070.724
5	2892.571
6	2982.776
Mean	2850.947
S.D.	180.215
Mean +0.58 SD	2955.472
Mean -0.58 SD	2746.423
Minimum	2601.337
Maximum	3070.724

lb/ft

6147

5808
6443

$\frac{kN}{m}$ (68.53 conversion) = $\frac{lb}{ft}$

Ult Strength
mean 12,555
min 12,348
max 13,070

THE TENSAR CORPORATION
1210 CITIZENS PARKWAY
MORROW, GEORGIA 30260

Operator name: DORIS
Sample Identification: 18775004M
Test Method Number: 8

TIME 10:13

UXQUINT 100 mm/min tensile test

Test Date: Wednesday, April 28, 2004
Interface Type: 5500
Crosshead Speed: 100.0000 mm/min
Sample Rate (pts/secs): 20.0000
Temperature: 73 F
Humidity (%): 50
Grip Distance: 1000.0000mm
Specimen G. L.: 925.0000mm

did not meet spec

	Ult Load (N)	Displcment at Ult.Load (mm)	% Strain at Ult.Load (%)	Tensile @ 2% STRAIN (N)	Tensile @ 5% STRAIN (N)	Ultimate Tensile Strength (KN/M)	Tensile Strength 2% STRAIN (KN/M)	Tensile Strength 5% STRAIN (KN/M)	2% Tensile Modulus (KN/M)
1	3908.804	93.805	10.143	1045.336	2038.776	176.756	47.270	92.193	2363.504
2	3755.148	87.543	9.466	1038.420	2030.124	169.808	46.957	91.802	2347.867
3	4071.977	103.543	11.186	876.218	1849.090	184.135	39.623	83.616	1981.128
4	4035.540	101.568	10.970	857.213	1850.786	182.487	38.763	83.693	1938.158
5	4138.619	105.588	11.411	953.208	1917.740	187.148	43.104	86.720	2155.203
6	4015.695	103.579	11.197	956.806	1927.527	181.590	43.267	87.163	2163.339
7	4014.012	103.282	11.155	843.200	1828.949	181.514	38.130	82.705	1906.475
Mean	3991.399	99.844	10.790	938.629	1920.428	180.491	42.445	86.842	2122.239
S.D.	125.069	6.623	0.713	83.184	86.028	5.656	3.762	3.890	188.080
Mean +0.58 SD	4063.939	103.685	11.203	986.876	1970.324	183.771	44.627	89.098	2231.326
Mean -0.58 SD	3918.859	96.002	10.376	890.382	1870.532	177.211	40.263	84.585	2013.153
Minimum	3755.148	87.543	9.466	843.200	1828.949	169.808	38.130	82.705	1906.475
Maximum	4138.619	105.588	11.411	1045.336	2038.776	187.148	47.270	92.193	2363.504

	True Initial Modulus (KN/M)
1	2976.326
2	2938.546
3	2504.534
4	2663.729
5	2700.283
6	2697.275
7	2584.547
Mean	2723.606
S.D.	174.269
Mean +0.58 SD	2824.682
Mean -0.58 SD	2622.530
Minimum	2504.534
Maximum	2976.326

Ave 5952
min 5668
max 6318

Ult
Ave 12370
min 11,637
max 12826

THE TENSAR CORPORATION
1210 CITIZENS PARKWAY
MORROW, GEORGIA 30260

Operator name: barb
Sample Identification: 18773005m
Test Method Number: 8

TIME 11:56

UXQUINT 100 mm/min tensile test

Test Date: Tuesday, April 27, 2004
Interface Type: 5500
Crosshead Speed: 100.0000 mm/min
Sample Rate (pts/secs): 20.0000
Temperature: 73 F
Humidity (%): 50
Grip Distance: 1000.0000mm
Specimen G. L.: 925.0000mm

	Ult Load (N)	Displcment at Ult.Load (mm)	% Strain at Ult.Load (%)	Tensile @ 2% STRAIN (N)	Tensile @ 5% STRAIN (N)	Ultimate Tensile Strength (KN/M)	Tensile Strength 2% STRAIN (KN/M)	Tensile Strength 5% STRAIN (KN/M)	2% Tensile Modulus (KN/M)
1	4192.731	94.774	10.248	1100.960	2177.550	192.698	50.600	100.080	2530.006
2	4172.520	114.168	12.326	631.385	1754.269	191.769	29.018	80.626	1450.923
3	4330.961	106.621	11.539	1134.169	2178.890	199.051	52.126	100.142	2606.320
4	4268.816	106.854	11.556	1072.589	2113.905	196.195	49.296	97.155	2464.809
5	4256.976	103.660	11.217	1114.761	2164.836	195.651	51.234	99.496	2561.720
6	4253.559	103.338	11.176	1058.476	2093.500	195.494	48.648	96.217	2432.379
Mean	4245.927	104.903	11.344	1018.723	2080.492	195.143	46.821	95.619	2341.026
S.D.	56.839	6.312	0.677	191.743	163.660	2.612	8.812	7.522	440.625
Mean +0.58 SD	4278.894	108.564	11.736	1129.934	2175.415	196.658	51.932	99.982	2596.589
Mean -0.58 SD	4212.961	101.242	10.951	907.513	1985.568	193.628	41.709	91.257	2085.464
Minimum	4172.520	94.774	10.248	631.385	1754.269	191.769	29.018	80.626	1450.923
Maximum	4330.961	114.168	12.326	1134.169	2178.890	199.051	52.126	100.142	2606.320

	True Initial Modulus (KN/M)
1	3201.888
2	2796.173
3	3057.859
4	3056.253
5	3032.820
6	2908.617
Mean	3008.935
S.D.	139.832
Mean +0.58 SD	3090.038
Mean -0.58 SD	2927.832
Minimum	2796.173
Maximum	3201.888

Ave 6553
min 5525
MAX 6863

ult
Ave 13.374
min 13.142
max 13.642

QA - Assay Results Report

Report Date: 2004 Jul 02 01:55pm
Page: 1

Sample Number	Item	Assay Code	Min Spec	Max Spec	Target Spec	UOM	Results	Status	Excp Ind	User	Date Modified
18773013	UX170070	% CARBON BLACK	2	9	2.5	%	3	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	% JUNCTION ST MD	90	200	100	%	100	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	2% STR. MD KN/M	37	99	37	KN/M	46.8	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	2% TN MODULUS MD	1850	9999	1850	KN/M	2341	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	5% STR.. MD KN/M	75	999	75	KN/M	95.6	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	ABBRATURE MD	400	999	460	MM	455	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	BCW	0	24	0	MM	12	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	BRITTLENESS	0	3	0	NO.	3	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	JUNCTION MD	160	999	160	KN/M	195	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	NODE THICKNESS	0	9	7.9	MM	7.56	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	OUTER RIB WIDTH	1	25	10	MM	7	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	PEAK EXT MD	0	99	0	%	11.3	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	RIBS/METER	45.09	46.81	46.1	RB/M	46.13	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	SKEW	0	45	0	MM	26	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	TENSILES MD KN/M	175	999	175	KN/M	195.1	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	TRUE MODULUS MD	0	9999	0	KN/M	3008.9	PASS		Q012	2004 Apr 27 02:54pm
18773013	UX170070	WIDTH (M)	1.33	1.375	1.345	M	1.344	PASS		Q012	2004 Apr 27 05:00pm
18773013	UX170070	WT/LEGTH (KG/M)	0	9	1.123	KG/M	1.138	PASS		Q012	2004 Apr 27 02:54pm

13,371 lb/ft ok

QA - Assay Results Report

Report Date: 2004 Jul 02 03:55pm
Page: 1

Sample Number	Item	Assay Code	Min Spec	Max Spec	Target Spec	UOM	Results	Status	Excp Ind	User	Date Modified
18775004	UX170070	% CARBON BLACK	2	9	2.5	%	2.5	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	% JUNCTION ST MD	90	200	100	%	100	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	2% STR. MD KN/M	37	99	37	KN/M	41.7	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	2% TN MODULUS MD	1850	9999	1850	KN/M	2084.6	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	5% STR. MD KN/M	75	999	75	KN/M	86	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	APERATURE MD	410	999	460	MM	436	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	BOW	0	24	0	MM	18	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	BRITTLENESS	0	3	0	NO.	3	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	JUNCTION MD	160	999	160	KN/M	182.2	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	NODE THICKNESS	0	9	7.9	MM	7.42	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	OUTER RIB WIDTH	3	25	10	MM	8	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	PEAK EXT MD	0	99	0	%	11	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	RIBS/METER	45.09	46.61	46.1	RB/M	45.22	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	SKEW	0	45	0	MM	25	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	TENSILES MD KN/M	175	999	175	KN/M	182.3	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	TRUE MODULUS MD	0	9999	0	KN/M	2687.8	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	WIDTH (M)	1.33	1.375	1.345	M	1.371	PASS		Q122	2004 Apr 28 10:52am
18775004	UX170070	WT/LGTH (KG/M)	0	9	1.123	KG/M	1.1656	PASS		Q122	2004 Apr 28 10:52am

12,494 B/A ok

Tensar

The Tensar Corporation

1210 Citizens Parkway
Morrow, Georgia 30260
Tel. 770 • 968 • 3255
Fax 770 • 961 • 8239

11 June 2004

TO WHOM IT MAY CONCERN:

REFERENCE: CERTIFICATION OF RAW MATERIAL RESINS

This letter is to certify that the polyethylene used in the manufactured of Tensar® geogrids is a prime, virgin resin in compliance with the following ASTM D 1248 standard specifications:

Type II	Density >0.940 to 0.960 g/cm^3
Class A	Natural color with antioxidants
Category 5	Nominal Flow Rate ≤ 0.40 g/10 min (@ 190° C, 2.16 kg load)
Grade E5	Property list in Table 5 of the ASTM standard

There are no post-consumer or post-industrial resins in Tensar® geogrids.

Sincerely,

Donald G. Bright, Ph.D., P.E.
Director, Quality Assurance

ATTACHMENT F

GEOSYNTHETIC CONFORMANCE TEST REPORTS

02776-2.02.C
requires soil/gm test = 17°

CON/gg = 12°
CON/gm = 16.5°] 02930-TABLE 3

SGI TESTING SERVICES

A Georgia Limited Liability Company

5 April 2004

Mr. Kenneth W. Pitts
Advance Construction Services, Inc.
400 Neal Road
Cantonment, Florida 32533

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

Subject: Laboratory Test Results Transmittal
Interface Direct Shear Testing
Citrus County Landfill, Florida

Dear Mr. Pitts,

SGI Testing Services, LLC (SGI_{sm}) is pleased to present the attached test results for the above-mentioned project. The note section below addresses sample preparation, sample disposal and a disclosure statement.

SGI_{sm} appreciates the opportunity to provide laboratory testing services for this project. Should you have any questions regarding the attached document(s), or if you require additional information, please do not hesitate to contact the undersigned.

Sincerely,

Robert H. Swan, Jr.
President and CEO

Attachment

Note:
(1) Unless otherwise noted in the test results the sample(s) specimen(s) were prepared in accordance with the applicable test standards or generally accepted sampling procedures.
(2) Contaminated chemical samples and all related laboratory generated waste (i.e., test liquids, PPE, absorbents, etc.) will be returned to the client or designated representative(s), at the client's cost, within 60 days following the completion of the testing program, unless special arrangements for proper disposal are made with SGI_{sm}.
(3) Materials that are not contaminated will be discarded after test specimens and archived specimens are obtained. Archived specimens will be discarded 60 days after the samples are received at the laboratory, unless long-term storage arrangements are specifically made with the laboratory.
(4) The reported results apply only to the materials and test conditions used in the laboratory testing program. The results do not necessarily apply to other materials or test conditions. The test results should not be used in engineering analysis unless the test conditions model the anticipated field conditions. The testing was performed in accordance with general engineering testing standards and requirements. The reported results are submitted for the exclusive use of the client to whom they are addressed.

SGI4005/SGI04040

Mail To: SGI Testing Services, LLC
P.O. Box 2427
Lilburn, Georgia 30046-2427

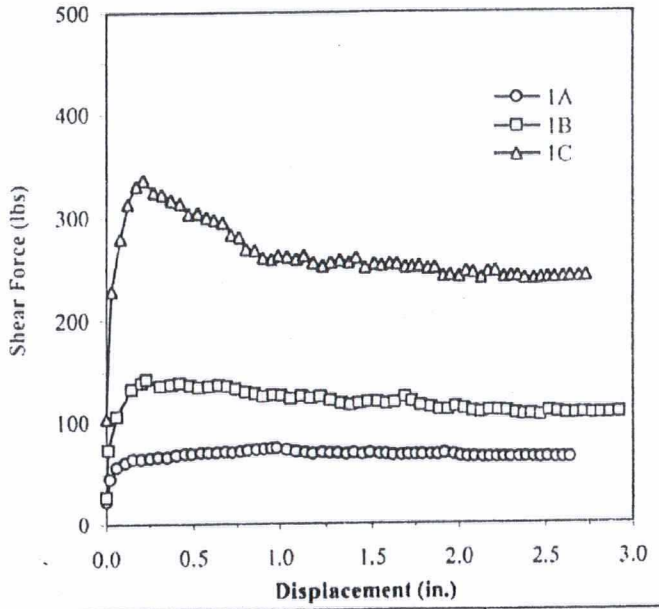
Web Site: www.interactionspecialists.com

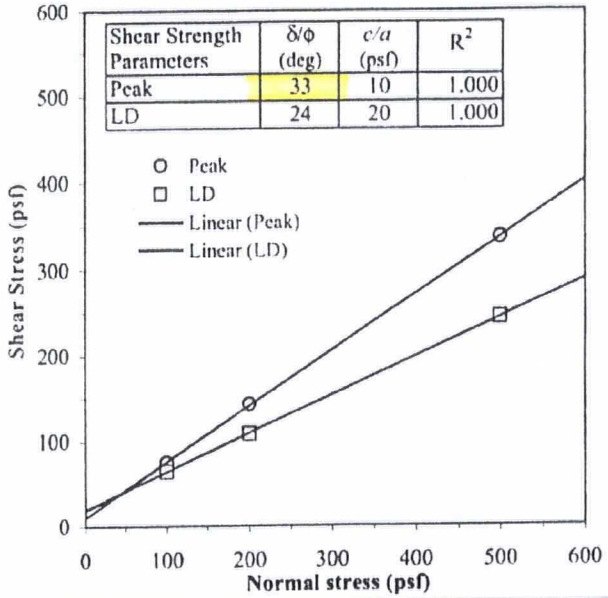
Facility Location
4405 International Boulevard
Suite B-117
Norcross, Georgia 30093

Phone: 770.931.8222 Fax: 770.931.8240

ADVANCE CONSTRUCTION SERVICES, INC. - CITRUS COUNTY LANDFILL, FLORIDA
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Test Series 1: Tenax Tendrain 770-2 geocomposite (Lot No. 35048 / Roll No. 3507353) against 60-mil GSE textured HDPE geomembrane (Roll No. 102107954) under wetted conditions





Shear Strength Parameters	δ/φ (deg)	c/a (psf)	R^2
Peak	33	10	1.000
LD	24	20	1.000

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking		Consolidation		Lower Soil			Upper Soil			GCL		Shear Stress		Failure Mode
				Stress (psf)	Time (hour)	Stress (psf)	Time (hour)	γ_{dl} (pcf)	ω_i (%)	ω_f (%)	γ_{dl} (pcf)	ω_i (%)	ω_f (%)	ω_i (%)	ω_f (%)	τ_p (psf)	τ_{LD} (psf)	
1A	12 x 12	100	0.040	-	-	-	-	-	-	-	-	-	-	-	-	74	64	(1)
1B	12 x 12	200	0.040	-	-	-	-	-	-	-	-	-	-	-	-	142	108	(1)
1C	12 x 12	500	0.040	-	-	-	-	-	-	-	-	-	-	-	-	336	243	(1)

Notes: (1) Sliding (i.e., shear failure) occurred between the geocomposite and the textured geomembrane during each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

DATE OF TEST: 12 March 2004

FIGURE NO. A-1

PROJECT NO. SGI4005

DOCUMENT NO. SGI04040

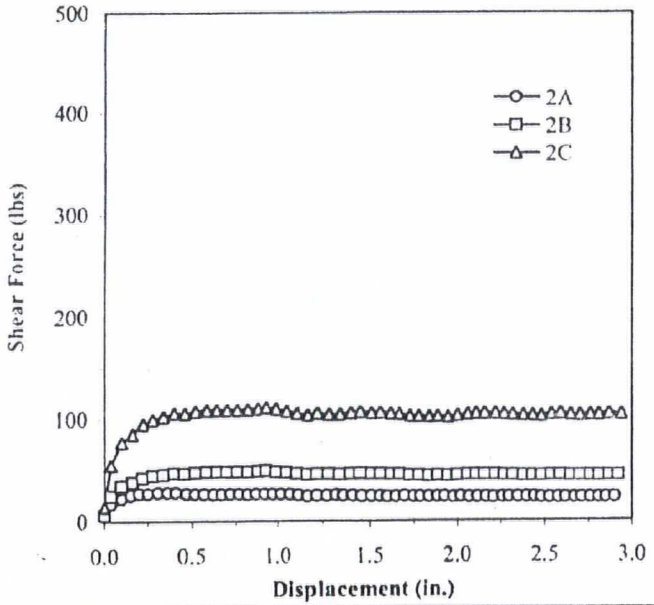
FILE NO.

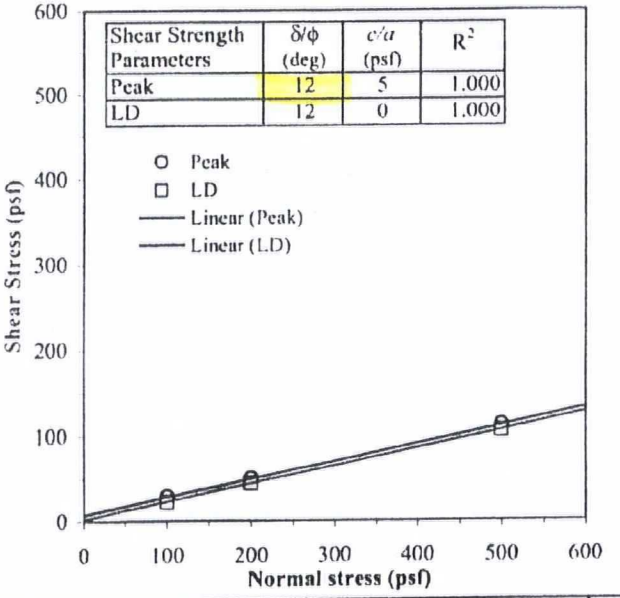
SGI TESTING SERVICES, LLC

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

ADVANCE CONSTRUCTION SERVICES, INC. - CITRUS COUNTY LANDFILL, FLORIDA
INTERFACE DIRECT SHEAR TESTING (ASTM D 5321)

Test Series 2: Tenax Tendrain 770-2 geocomposite (Lot No. 35048 / Roll No. 3507353) against Tensar UX170070 geogrid (Lot No. 18637 / Roll No. 28) under wetted conditions





Shear Strength Parameters	δ/ϕ (deg)	c/a (psf)	R^2
Peak	12	5	1.000
LD	12	0	1.000

Test No.	Shear Box Size (in. x in.)	Normal Stress (psf)	Shear Rate (in./min)	Soaking Stress (psf)	Soaking Time (hour)	Consolidation Stress (psf)	Consolidation Time (hour)	Lower Soil γ_{dl} (pcf)	Lower Soil ω_l (%)	Lower Soil ω_f (%)	Upper Soil γ_{dl} (pcf)	Upper Soil ω_l (%)	Upper Soil ω_f (%)	GCL ω_l (%)	GCL ω_f (%)	Shear Stress τ_p (psf)	Shear Stress τ_{LD} (psf)	Failure Mode
2A	12 x 12	100	0.040	-	-	-	-	-	-	-	-	-	-	-	-	28	22	(1)
2B	12 x 12	200	0.040	-	-	-	-	-	-	-	-	-	-	-	-	49	44	(1)
2C	12 x 12	500	0.040	-	-	-	-	-	-	-	-	-	-	-	-	111	105	(1)

Notes: (1) Sliding (i.e., shear failure) occurred between the geocomposite and the geogrid during each test.
(2) The reported total-stress parameters of friction angle and adhesion were determined from a best-fit line drawn through the test data. Caution should be exercised in using these strength parameters for applications involving normal stresses outside the range of the stresses covered by the test series. The large-displacement (LD) shear strength was calculated using the shear force measured at the end of the test.

DATE OF TEST: 15 March 2004

SGI TESTING SERVICES, LLC

FIGURE NO.	A-2
PROJECT NO.	SGI4005
DOCUMENT NO.	SGI04040
FILE NO.	

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

ATTACHMENTS

GEOCOMPOSITE CONFORMANCE

Geo Composite Conformance

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

March 3, 2004 (Update March 14, 2004)

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

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:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2193-84-06
Material(s) Tested:	2 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel (ASTM D 413, mod.) - GC Thickness (ASTM D 5199) - GN Mass Unit/Area (ASTM D 5261) - GN Density (ASTM D 1505) - GN Carbon Content (ASTM D 1603) - GN Mass Unit/Area (ASTM D 3776) - GT Puncture Strength (ASTM D 4833) - GT Apparent Opening Size (ASTM D 4751) - GT Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400007
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	21												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1			SPECIMEN 2			SPECIMEN 3						
Flow Rate/Unit Width (GPM/ft width)	1.00	1.01	1.00	0.72	0.72	0.72	0.86	0.89	0.86		0.86	0.12	
Hydraulic Transmissivity (m2/s)	2.0E-03	2.0E-03	2.0E-03	1.4E-03	1.5E-03	1.4E-03	1.8E-03	1.8E-03	1.8E-03		1.8E-03	2.4E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	1.0	0.7	1.7	1.9	0.8						1.2	0.5	1.0 min
A - MD Average peel strength (g/in)	454	318	772	863	363						554	221	
B - MD Average peel strength (ppi)	1.7	1.6	0.2	0.4	1.5						1.1	0.6	1.0 min
B - MD Average peel strength (g/in)	772	726	91	182	681						490	292	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	2544	2652	3120	2940	3036	2268					2760	300	2380 min
MD Elong. @ Max. Strength (%)	51	67	75	91	77	44					68	16	NA
Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.326	0.323	0.331	0.321	0.333	0.32	0.325	0.33	0.324	0.325	0.326	0.004	0.275 min
											0.320	<< min.	
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	22.16	22.30	23.29	22.69	21.92	21.14	20.49	20.59	20.01	22.34			
Mass/unit area (lbs./1000 sq.ft)	359	361	377	368	355	342	332	334	324	362	351	17	270 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	2.90	2.85									2.88	0.03	2 - 3
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.954	0.954	0.954								0.954	0.0000	0.940 min

MD Machine Direction
TD Transverse Direction

The testing herein 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.

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 TOP
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													✓
5" diameter circle (grams)	3.40	3.70	3.10	3.39	3.81	3.50	3.67	3.53	3.01	3.43			
Mass/Unit Area (oz/sq.yd)	7.91	8.61	7.21	7.89	8.86	8.14	8.54	8.21	7.00	7.98	8.03	0.56	6.0 min
Puncture Resistance (ASTM D 4833)													✓
Puncture Strength (lbs)	123	114	117	143	121	140	115	115	136	107	121	15	90 min
	101	115	115	103	157								
Apparent Opening Size (ASTM D 4751)													✓
Opening Size Diameter (mm)	0.125	0.212	0.150	0.125	0.125						0.147	0.034	0.210 max
US Sieve No.	120	70	100	120	120						100		70 min

MD Machine Direction
TD Transverse Direction

The testing herein 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.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 TOP
TRI Log #: E2193-84-06

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	102	102	102	102	102	105	105	105	105	105			
Time (s)	19	19	19	19	19	19	19	19	19	19			
Flow (L)	2.44	2.44	2.44	2.44	2.40	2.40	2.40	2.40	2.40	2.40			
Permittivity (s-1)	1.25	1.25	1.25	1.25	1.23	1.23	1.23	1.23	1.23	1.23			
Flow rate (GPM/ft2)	93	93	93	93	92	92	92	92	92	92			
Permeability (cm/s)	0.32	0.32	0.32	0.32	0.32	0.33	0.33	0.33	0.33	0.33			
Trial =>:	3					4							
Thickness (mils)	85	85	85	85	85	106	106	106	106	106			
Time (s)	15	15	15	15	15	18	18	18	18	18			
Flow (L)	2.76	2.76	2.76	2.72	2.72	2.20	2.20	2.20	2.24	2.24			
Permittivity (s-1)	1.79	1.79	1.79	1.76	1.76	1.19	1.19	1.19	1.21	1.21	1.36	0.24	
Flow rate (GPM/ft2)	134	134	134	132	132	89	89	89	90	90	102	18	
Permeability (cm/s)	0.39	0.39	0.39	0.38	0.38	0.32	0.32	0.32	0.33	0.33	0.34	0.03	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.36	✓	110 min
	Flow rate (GPM/ft2)	102		
	Permeability (cm/s)	0.34		

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 TOP Retest
TRI Log #: E2193-84-06

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	100	100	100	100	100	89	89	89	89	89			
Time (s)	20	20	20	20	20	20	20	20	20	20			
Flow (L)	2.12	2.12	2.12	2.12	2.12	2.32	2.32	2.32	2.32	2.32			
Permittivity (s-1)	1.03	1.03	1.03	1.03	1.03	1.13	1.13	1.13	1.13	1.13			
Flow rate (GPM/ft2)	77	77	77	77	77	84	84	84	84	84			
Permeability (cm/s)	0.26	0.26	0.26	0.26	0.26	0.25	0.25	0.25	0.25	0.25			
Trial =>:	3					4							
Thickness (mils)	96	96	96	96	96	93	93	93	93	93			
Time (s)	20	20	20	20	20	20	20	20	20	20			
Flow (L)	2.40	2.40	2.40	2.40	2.40	2.24	2.28	2.28	2.28	2.24			
Permittivity (s-1)	1.17	1.17	1.17	1.17	1.17	1.09	1.11	1.11	1.11	1.09	1.10	0.05	
Flow rate (GPM/ft2)	87	87	87	87	87	81	83	83	83	81	83	4	
Permeability (cm/s)	0.28	0.28	0.28	0.28	0.28	0.26	0.26	0.26	0.26	0.26	0.26	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.10	✓	110 min
	Flow rate (GPM/ft2)	83		
	Permeability (cm/s)	0.26		

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 BOTTOM
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	3.19	3.20	3.10	3.13	3.31	3.51	3.39	2.80	3.39	2.89			
Mass/Unit Area (oz/sq.yd)	7.42	7.44	7.21	7.28	7.70	8.16	7.89	6.51	7.89	6.72	7.42	0.49	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	112	125	120	138	115	140	123	134	126	121	124	11	90 min
	107	103	134	136	126								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.180	0.125	0.125	0.212	0.150						0.158	0.034	0.210 max
US Sieve No.	80	120	120	70	100						80		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 BOTTOM
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)													
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	87	87	87	87	87	90	90	90	90	90			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.80	2.76	2.76	2.76	2.76	2.20	2.24	2.24	2.24	2.24			
Permittivity (s-1)	1.51	1.49	1.49	1.49	1.49	1.19	1.21	1.21	1.21	1.21			
Flow rate (GPM/ft2)	113	111	111	111	111	89	90	90	90	90			
Permeability (cm/s)	0.33	0.33	0.33	0.33	0.33	0.27	0.28	0.28	0.28	0.28			
Trial =>:	3					4							
Thickness (mils)	89	89	89	89	89	85	85	85	85	85			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.68	2.68	2.64	2.64	2.64	2.68	2.64	2.64	2.64	2.64			
Permittivity (s-1)	1.45	1.45	1.42	1.42	1.42	1.45	1.42	1.42	1.42	1.42	1.39	0.11	
Flow rate (GPM/ft2)	108	108	107	107	107	108	107	107	107	107	104	8	
Permeability (cm/s)	0.33	0.33	0.32	0.32	0.32	0.31	0.31	0.31	0.31	0.31	0.31	0.02	
TEMPERATURE CORRECTED VALUES							Permittivity (s-1)				1.39		✓
							Flow rate (GPM/ft2)				104		110 min
							Permeability (cm/s)				0.31		

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 BOTTOM Retest
TRI Log #: E2193-84-06

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	86	86	86	86	86	86	86	86	86	86			
Time (s)	17	17	17	17	17	17	17	17	17	17			
Flow (L)	2.16	2.12	2.16	2.16	2.16	2.48	2.48	2.48	2.48	2.48			
Permittivity (s-1)	1.23	1.21	1.23	1.23	1.23	1.42	1.42	1.42	1.42	1.42			
Flow rate (GPM/ft2)	92	91	92	92	92	106	106	106	106	106			
Permeability (cm/s)	0.27	0.26	0.27	0.27	0.27	0.31	0.31	0.31	0.31	0.31			
Trial =>:	3					4							
Thickness (mils)	85	85	85	85	85	75	75	75	75	75			
Time (s)	17	17	17	17	17	17	17	17	17	17			
Flow (L)	2.08	2.08	2.80	2.12	2.08	2.88	2.88	2.88	2.84	2.84			
Permittivity (s-1)	1.19	1.19	1.60	1.21	1.19	1.64	1.64	1.64	1.62	1.62	1.39	0.18	
Flow rate (GPM/ft2)	89	89	120	91	89	123	123	123	121	121	104	13	
Permeability (cm/s)	0.26	0.26	0.35	0.26	0.26	0.31	0.31	0.31	0.31	0.31	0.29	0.03	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.39	✓	110 min
	Flow rate (GPM/ft2)	104		
	Permeability (cm/s)	0.29		

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400039
TRI Log #: E2193-84-06

Hydraulic Transmissivity (ASTM D 4716)

Compressive Load (psf):	15000
Hydraulic Gradient:	0.1
Seat Time (hours):	100
Test Temperature (C)	22

Direction Tested: machine direction
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate
Permeant: Water

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
	SPECIMEN 1				SPECIMEN 2								
Flow Rate/Unit Width (GPM/ft width)	0.99	0.96	0.97	0.97	0.95	0.97					0.97	0.01	
Hydraulic Transmissivity (m2/s)	2.0E-03	1.9E-03	1.9E-03	2.0E-03	1.9E-03	2.0E-03					1.9E-03	2.9E-05	1.8E-3 min

Peel Strength (GRI GC7)

A - MD Average peel strength (ppi)	1.1	1.5	2.4	2.2	3.0						2.0	0.7	1.0 min
A - MD Average peel strength (g/in)	499	681	1090	999	1362						926	305	
B - MD Average peel strength (ppi)	0.7	1.1	1.0	1.2	3.1						1.4	0.9	1.0 min
B - MD Average peel strength (g/in)	318	499	454	545	1407						645	389	

Note: A and B represent a randomly assigned top and bottom of the sample

Wide Width Tensile Properties (ASTM D 4595) - Geonet Component

MD Max. Strength (lb/ft)	2412	2676	2964	2880	3132	3180					2874	265	2380 min
MD Elong. @ Max. Strength (%)	50	60	58	72	83	87					68	13	NA

Thickness (ASTM D 5199) - Geonet Component

Thickness (inches)	0.325	0.328	0.321	0.332	0.336	0.335	0.330	0.336	0.327	0.331	0.330	0.005	0.275 min
											0.321	<< min.	

Mass/Unit Area (ASTM D 5261) - Geonet Component

5 in diameter circle - mass (grams)	20.90	20.41	20.48	20.59	20.81	20.77	22.06	22.65	21.90	21.91			
Mass/unit area (lbs./1000 sq.ft)	339	331	332	334	337	336	357	367	355	355	344	12	270 min

Carbon Black Content (ASTM D 1603, modified) - Geonet Component

% Carbon Black	2.59	2.69									2.64	0.05	2 - 3

Density (ASTM D 1505) - Geonet Component

Density (g/cm3)	0.954	0.954	0.954								0.954	0.0000	0.940 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 TOP
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	3.32	3.20	3.27	3.14	3.33	3.40	3.08	3.00	3.00	3.23			
Mass/Unit Area (oz/sq.yd)	7.72	7.44	7.61	7.30	7.75	7.91	7.16	6.98	6.98	7.51	7.44	0.31	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	126	131	103	138	126	137	112	113	90	120	120	15	90 min
	105	110	116	139	141								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.150	0.180	0.150						0.146	0.020	0.210 max
US Sieve No.	120	120	100	80	100						100		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 TOP
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)													
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	105	105	105	105	105	92	92	92	92	92			
Time (s)	18	18	18	18	18	15	15	15	15	15			
Flow (L)	2.28	2.28	2.28	2.32	2.28	2.48	2.48	2.48	2.48	2.48			
Permittivity (s-1)	1.23	1.23	1.23	1.25	1.23	1.61	1.61	1.61	1.61	1.61			
Flow rate (GPM/ft2)	92	92	92	94	92	120	120	120	120	120			
Permeability (cm/s)	0.33	0.33	0.33	0.33	0.33	0.38	0.38	0.38	0.38	0.38			
Trial =>:	3					4							
Thickness (mils)	96	96	96	96	96	97	97	97	97	97			
Time (s)	15	15	15	15	15	15	15	15	15	15			
Flow (L)	2.16	2.12	2.12	2.12	2.12	2.24	2.24	2.24	2.24	2.20			
Permittivity (s-1)	1.40	1.37	1.37	1.37	1.37	1.45	1.45	1.45	1.45	1.42	1.42	0.13	
Flow rate (GPM/ft2)	105	103	103	103	103	108	108	108	108	107	106	10	
Permeability (cm/s)	0.34	0.33	0.33	0.33	0.33	0.36	0.36	0.36	0.36	0.35	0.35	0.02	
TEMPERATURE CORRECTED VALUES						Permittivity (s-1)					1.42		110 min
						Flow rate (GPM/ft2)					106		
						Permeability (cm/s)					0.35		

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 TOP Retest
TRI Log #: E2193-84-06

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	95	95	95	95	95	91	91	91	91	91			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.16	2.16	2.16	2.16	2.16	2.36	2.40	2.36	2.36	2.36			
Permittivity (s-1)	1.17	1.17	1.17	1.17	1.17	1.27	1.29	1.27	1.27	1.27			
Flow rate (GPM/ft2)	87	87	87	87	87	95	97	95	95	95			
Permeability (cm/s)	0.28	0.28	0.28	0.28	0.28	0.29	0.30	0.29	0.29	0.29			
Trial =>:	3					4							
Thickness (mils)	99	99	99	99	99	99	99	99	99	99			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.16	2.16	2.16	2.12	2.16	2.24	2.20	2.20	2.20	2.24			
Permittivity (s-1)	1.17	1.17	1.17	1.14	1.17	1.21	1.19	1.19	1.19	1.21	1.20	0.05	
Flow rate (GPM/ft2)	87	87	87	86	87	90	89	89	89	90	90	4	
Permeability (cm/s)	0.29	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.30	0.30	0.29	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.20	110 min
	Flow rate (GPM/ft2)	90	
	Permeability (cm/s)	0.29	

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 BOTTOM
TRI Log #: E2193-84-06

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	3.08	3.29	2.97	3.01	3.22	3.21	3.23	3.13	2.90	3.37			
Mass/Unit Area (oz/sq.yd)	7.16	7.65	6.91	7.00	7.49	7.47	7.51	7.28	6.75	7.84	7.31	0.33	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	133	104	122	121	124	105	110	119	110	109	114	13	90 min
	84	121	111	133	97								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.150	0.150	0.125	0.125	0.150						0.140	0.012	0.210 max
US Sieve No.	100	100	120	120	100						100		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 BOTTOM
TRI Log #: E2193-84-06

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	94	94	94	94	94	85	85	85	85	85			
Time (s)	18	18	18	18	18	15	15	15	15	15			
Flow (L)	2.56	2.56	2.52	2.52	2.52	2.60	2.60	2.56	2.56	2.56			
Permittivity (s-1)	1.38	1.38	1.36	1.36	1.36	1.68	1.68	1.66	1.66	1.66			
Flow rate (GPM/ft2)	103	103	102	102	102	126	126	124	124	124			
Permeability (cm/s)	0.33	0.33	0.32	0.32	0.32	0.36	0.36	0.36	0.36	0.36			
Trial =>:	3					4							
Thickness (mils)	109	109	109	109	109	87	87	87	87	87			
Time (s)	18	18	18	18	18	15	15	15	15	15			
Flow (L)	2.24	2.24	2.28	2.24	2.28	2.68	2.68	2.68	2.68	2.68			
Permittivity (s-1)	1.21	1.21	1.23	1.21	1.23	1.73	1.73	1.73	1.73	1.73	1.50	0.21	
Flow rate (GPM/ft2)	90	90	92	90	92	130	130	130	130	130	112	16	
Permeability (cm/s)	0.33	0.33	0.34	0.33	0.34	0.38	0.38	0.38	0.38	0.38	0.35	0.02	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.50	110 min
	Flow rate (GPM/ft2)	112	
	Permeability (cm/s)	0.35	

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

March 19, 2004

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

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:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2193-94-05
Material(s) Tested:	2 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel (ASTM D 413, mod.) - GC Thickness (ASTM D 5199) - GN Mass Unit/Area (ASTM D 5261) - GN Density (ASTM D 1505) - GN Carbon Content (ASTM D 1603) - GN Mass Unit/Area (ASTM D 3776) - GT Puncture Strength (ASTM D 4833) - GT Apparent Opening Size (ASTM D 4751) - GT Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400153
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	21												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1				SPECIMEN 2								
Flow Rate/Unit Width (GPM/ft width)	1.25	1.26	1.25	0.91	0.91	0.89					1.08	0.17	
Hydraulic Transmissivity (m2/s)	2.5E-03	2.5E-03	2.5E-03	1.8E-03	1.8E-03	1.8E-03					2.2E-03	3.5E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	3.6	4.1	3.5	0.2	3.9						3.1	1.4	1.0 min
A - MD Average peel strength (g/in)	1634	1861	1589	91	1771						1389	656	
B - MD Average peel strength (ppi)	2.0	2.0	1.2	4.1	1.2						2.1	1.1	1.0 min
B - MD Average peel strength (g/in)	908	908	545	1861	545						953	482	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	2256	2460	2712	2772	2568	2568					2556	169	2380 min.
MD Elong. @ Max. Strength (%)	61	37	54	35	49	45					47	9	NA
Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.335	0.327	0.344	0.323	0.33	0.319	0.334	0.321	0.34	0.301	0.327 0.301	0.012 << min.	0.275 min
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	20.40	22.53	23.05	24.09	24.77	21.57	19.21	18.88	17.81	17.49			
Mass/unit area (lbs./1000 sq.ft)	330	365	373	390	401	349	311	306	289	283	340	40	270 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	0.41	0.42									0.42	0.00	2 - 3
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.0000	0.940 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400153 TOP
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.81	2.71	3.40	2.90	2.57	3.06	2.64	2.56	2.60	3.05			
Mass/Unit Area (oz/sq.yd)	6.54	6.30	7.91	6.75	5.98	7.12	6.14	5.95	6.05	7.09	6.58	0.60	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	84	108	100	86	109	97	97	130	92	103	103	12	90 min
	105	122	98	109	107								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.180	0.180	0.180						0.158	0.027	0.210 max
US Sieve No.	120	120	80	80	80						80		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400153 TOP
TRI Log #: E2193-94-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	89	89	89	89	89	78	78	78	78	78			
Time (s)	16	16	16	16	16	16	16	16	16	16			
Flow (L)	2.40	2.40	2.36	2.40	2.40	2.52	2.48	2.48	2.52	2.48			
Permittivity (s-1)	1.46	1.46	1.43	1.46	1.46	1.53	1.51	1.51	1.53	1.51			
Flow rate (GPM/ft2)	109	109	107	109	109	114	113	113	114	113			
Permeability (cm/s)	0.33	0.33	0.32	0.33	0.33	0.30	0.30	0.30	0.30	0.30			
Trial =>:	3					4							
Thickness (mils)	84	84	84	84	84	78	78	78	78	78			
Time (s)	16	16	16	16	16	16	16	16	16	16			
Flow (L)	2.48	2.48	2.48	2.44	2.44	2.48	2.44	2.44	2.44	2.44			
Permittivity (s-1)	1.51	1.51	1.51	1.48	1.48	1.51	1.48	1.48	1.48	1.48	1.49	0.03	
Flow rate (GPM/ft2)	113	113	113	111	111	113	111	111	111	111	111	2	
Permeability (cm/s)	0.32	0.32	0.32	0.32	0.32	0.30	0.29	0.29	0.29	0.29	0.31	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.49	110 min
	Flow rate (GPM/ft2)	111	
	Permeability (cm/s)	0.31	

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400153 BOTTOM
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.82	2.84	3.16	2.85	2.98	2.64	2.82	2.86	2.54	2.92			
Mass/Unit Area (oz/sq.yd)	6.56	6.61	7.35	6.63	6.93	6.14	6.56	6.65	5.91	6.79	6.61	0.37	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	96	98	117	107	103	89	122	102	99	100	101	10	90 min
	109	106	94	99	79								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.180	0.180	0.150	0.125	0.150						0.157	0.021	0.210 max
US Sieve No.	80	80	100	120	100						80		70 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400153 BOTTOM
TRI Log #: E2193-94-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	86	86	86	86	86	80	80	80	80	80			
Time (s)	18	18	18	18	18	18	18	18	18	18			
Flow (L)	2.56	2.52	2.52	2.52	2.52	2.96	2.96	2.96	2.96	2.96			
Permittivity (s-1)	1.38	1.36	1.36	1.36	1.36	1.60	1.60	1.60	1.60	1.60			
Flow rate (GPM/ft2)	103	102	102	102	102	119	119	119	119	119			
Permeability (cm/s)	0.30	0.30	0.30	0.30	0.30	0.32	0.32	0.32	0.32	0.32			
Trial =>:	3					4							
Thickness (mils)	83	83	83	83	83	72	72	72	72	72			
Time (s)	18	18	18	18	18	14	14	14	14	14			
Flow (L)	2.56	2.60	2.60	2.60	2.56	2.28	2.28	2.32	2.32	2.28			
Permittivity (s-1)	1.38	1.40	1.40	1.40	1.38	1.58	1.58	1.61	1.61	1.58	1.49	0.11	
Flow rate (GPM/ft2)	103	105	105	105	103	118	118	120	120	118	111	8	
Permeability (cm/s)	0.29	0.30	0.30	0.30	0.29	0.29	0.29	0.29	0.29	0.29	0.30	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.49	/	110 min
	Flow rate (GPM/ft2)	111		
	Permeability (cm/s)	0.30		

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400191
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	21												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1				SPECIMEN 2								
Flow Rate/Unit Width (GPM/ft width)	0.83	0.83	0.82	1.33	1.29	1.28					1.06	0.24	
Hydraulic Transmissivity (m2/s)	1.7E-03	1.7E-03	1.7E-03	2.7E-03	2.6E-03	2.6E-03					2.1E-03	4.8E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	2.5	1.9	1.6	1.8	2.7						2.1	0.4	1.0 min
A - MD Average peel strength (g/in)	1135	863	726	817	1226						953	193	
B - MD Average peel strength (ppi)	1.9	2.2	3.2	2.3	2.7						2.5	0.4	1.0 min
B - MD Average peel strength (g/in)	863	999	1453	1044	1226						1117	204	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	2376	2376	2856	2928	2220	2592					2558	261	2380 min Avg
MD Elong. @ Max. Strength (%)	58	61	62	89	39	56					61	15	NA
Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.319	0.335	0.317	0.327	0.324	0.314	0.329	0.309	0.328	0.308	0.321	0.009	0.275 min
											0.308	<< min.	
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	20.44	21.42	22.37	24.39	22.86	21.33	20.74	18.57	18.78	18.19			
Mass/unit area (lbs./1000 sq.ft)	331	347	362	395	370	346	336	301	304	295	339	31	270 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	2.72	2.79									2.76	0.04	2 - 3
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.955	0.955	0.956								0.955	0.0005	0.940 min

MD Machine Direction
TD Transverse Direction

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A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400191 TOP
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.90	2.97	2.82	2.48	2.97	2.88	3.20	2.64	2.92	2.59			
Mass/Unit Area (oz/sq.yd)	6.75	6.91	6.56	5.77	6.91	6.70	7.44	6.14	6.79	6.02	6.60	0.47	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	111	78	89	106	106	112	78	116	95	108	103	15	90 min
	92	132	117	117	90								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.180	0.180	0.180						0.158	0.027	0.210 max
US Sieve No.	120	120	80	80	80						80		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400191 TOP
TRI Log #: E2193-94-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	75	75	75	75	75	73	73	73	73	73			
Time (s)	16	16	16	16	16	16	16	16	16	16			
Flow (L)	2.32	2.28	2.28	2.28	2.28	2.68	2.68	2.68	2.76	2.76			
Permittivity (s-1)	1.41	1.38	1.38	1.38	1.38	1.63	1.63	1.63	1.67	1.67			
Flow rate (GPM/ft2)	105	104	104	104	104	122	122	122	125	125			
Permeability (cm/s)	0.27	0.26	0.26	0.26	0.26	0.30	0.30	0.30	0.31	0.31			
Trial =>:	3					4							
Thickness (mils)	68	68	68	68	68	70	70	70	70	70			
Time (s)	16	16	16	16	16	15	15	15	15	15			
Flow (L)	2.48	2.48	2.48	2.44	2.60	2.60	2.56	2.56	2.56	2.56			
Permittivity (s-1)	1.51	1.51	1.51	1.48	1.58	1.68	1.66	1.66	1.66	1.66	1.55	0.11	
Flow rate (GPM/ft2)	113	113	113	111	118	126	124	124	124	124	116	8	
Permeability (cm/s)	0.26	0.26	0.26	0.26	0.27	0.30	0.29	0.29	0.29	0.29	0.28	0.02	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.55	110 min
	Flow rate (GPM/ft2)	116	
	Permeability (cm/s)	0.28	

MD Machine Direction
TD Transverse Direction

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A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400191 BOTTOM
TRI Log #: E2193-94-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.93	2.83	2.68	2.68	2.80	3.05	2.60	2.99	2.79	2.69			
Mass/Unit Area (oz/sq.yd)	6.82	6.58	6.23	6.23	6.51	7.09	6.05	6.95	6.49	6.26	6.52	0.33	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	93	93	74	97	114	102	102	125	118	79	99	14	90 min
	99	94	116	89	95								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.212	0.212	0.180	0.180						0.182	0.032	0.210 max
US Sieve No.	120	70	70	80	80						70		70 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400191 BOTTOM
TRI Log #: E2193-94-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	80	80	80	80	80	73	73	73	73	73			
Time (s)	16	16	16	16	16	15	15	15	15	15			
Flow (L)	2.52	2.56	2.52	2.48	2.52	2.84	2.84	2.80	2.80	2.76			
Permittivity (s-1)	1.53	1.55	1.53	1.51	1.53	1.84	1.84	1.81	1.81	1.79			
Flow rate (GPM/ft2)	114	116	114	113	114	138	138	136	136	134			
Permeability (cm/s)	0.31	0.32	0.31	0.31	0.31	0.34	0.34	0.34	0.34	0.33			
Trial =>:	3					4							
Thickness (mils)	68	68	68	68	68	91	91	91	91	91			
Time (s)	13	13	13	13	13	15	15	15	15	15			
Flow (L)	2.68	2.60	2.60	2.64	2.60	2.20	2.20	2.20	2.16	2.16			
Permittivity (s-1)	2.00	1.94	1.94	1.97	1.94	1.42	1.42	1.42	1.40	1.40	1.68	0.22	
Flow rate (GPM/ft2)	150	145	145	148	145	107	107	107	105	105	126	16	
Permeability (cm/s)	0.35	0.34	0.34	0.34	0.34	0.33	0.33	0.33	0.32	0.32	0.33	0.01	
TEMPERATURE CORRECTED VALUES						Permittivity (s-1)					1.68		110 min
						Flow rate (GPM/ft2)					126		
						Permeability (cm/s)					0.33		

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

March 17, 2004

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

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:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2193-92-05
Material(s) Tested:	1 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel (ASTM D 413, mod.) - GC Thickness (ASTM D 5199) - GN Mass Unit/Area (ASTM D 5261) - GN Density (ASTM D 1505) - GN Carbon Content (ASTM D 1603) - GN Mass Unit/Area (ASTM D 3776) - GT Puncture Strength (ASTM D 4833) - GT Apparent Opening Size (ASTM D 4751) - GT Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400115
TRI Log #: E2193-92-05

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	20												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1				SPECIMEN 2								
Flow Rate/Unit Width (GPM/ft width)	1.00	1.00	1.01	1.34	1.31	1.37					1.17	0.17	
Hydraulic Transmissivity (m2/s)	2.1E-03	2.1E-03	2.1E-03	2.8E-03	2.7E-03	2.8E-03					2.4E-03	3.5E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	2.5	3.8	0.7	0.2	0.9						1.6	1.3	1.0 min
A - MD Average peel strength (g/in)	1135	1725	318	91	409						735	606	
B - MD Average peel strength (ppi)	1.6	0.1	1.0	1.9	2.8						1.5	0.9	1.0 min
B - MD Average peel strength (g/in)	726	45	454	863	1271						672	410	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	2724	2532	2988	2964	2748	2568					2754	175	2380 min
MD Elong. @ Max. Strength (%)	61	127	95	51	60	50					74	28	NA

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400115
TRI Log #: E2193-92-05

Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.303	0.315	0.332	0.323	0.332	0.332	0.338	0.321	0.314	0.304	0.321 0.303	0.012 << min.	0.275 min
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	18.97	20.05	20.65	22.33	23.05	23.76	24.03	21.95	19.42	18.38			
Mass/unit area (lbs./1000 sq.ft)	307	325	335	362	373	385	389	356	315	298	344	31	270 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	2.38	2.46									2.42	0.04	2 - 3
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.952	0.951	0.950								0.951	0.0008	0.940 min

MD Machine Direction
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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400115 TOP
TRI Log #: E2193-92-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.67	2.23	2.71	2.38	2.70	2.99	2.56	2.60	2.58	2.64			
Mass/Unit Area (oz/sq.yd)	6.21	5.19	6.30	5.54	6.28	6.95	5.95	6.05	6.00	6.14	6.06	0.45	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	105	105	108	77	78	111	106	92	98	94	100	14	90 min
	125	89	82	112	123								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.125	0.125	0.125						0.125	0.000	0.210 max
US Sieve No.	120	120	120	120	120						120		70 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400115 TOP
TRI Log #: E2193-92-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	79	79	79	79	79	70	70	70	70	70			
Time (s)	17	17	17	17	17	12	12	12	12	12			
Flow (L)	2.40	2.40	2.40	2.36	2.36	2.00	2.00	2.00	2.00	1.96			
Permittivity (s-1)	1.37	1.37	1.37	1.35	1.35	1.62	1.62	1.62	1.62	1.59			
Flow rate (GPM/ft2)	103	103	103	101	101	121	121	121	121	119			
Permeability (cm/s)	0.28	0.28	0.28	0.27	0.27	0.29	0.29	0.29	0.29	0.28			
Trial =>:	3					4							
Thickness (mils)	80	80	80	80	80	73	73	73	73	73			
Time (s)	14	14	14	14	14	14	14	14	14	14			
Flow (L)	2.40	2.40	2.36	2.36	2.36	2.44	2.40	2.44	2.40	2.40			
Permittivity (s-1)	1.66	1.66	1.64	1.64	1.64	1.69	1.66	1.69	1.66	1.66	1.57	0.13	
Flow rate (GPM/ft2)	125	125	122	122	122	127	125	127	125	125	118	9	
Permeability (cm/s)	0.34	0.34	0.33	0.33	0.33	0.31	0.31	0.31	0.31	0.31	0.30	0.02	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.57	110 min
	Flow rate (GPM/ft2)	118	
	Permeability (cm/s)	0.30	

MD Machine Direction
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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400115 BOTTOM
TRI Log #: E2193-92-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.80	3.12	3.17	3.33	3.17	2.75	2.95	2.70	2.90	3.28			
Mass/Unit Area (oz/sq.yd)	6.51	7.26	7.37	7.75	7.37	6.40	6.86	6.28	6.75	7.63	7.02	0.50	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	121	100	115	121	123	115	109	131	121	99	114	9	90 min
	108	113	120	101	107								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.125	0.150	0.125						0.130	0.010	0.210 max
US Sieve No.	120	120	120	100	120						120		70 min

MD Machine Direction
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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400115 BOTTOM
TRI Log #: E2193-92-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	92	92	92	92	92	95	95	95	95	95			
Time (s)	25	25	25	25	25	27	27	27	27	27			
Flow (L)	2.80	2.88	2.88	2.80	2.80	2.40	2.40	2.32	2.32	2.32			
Permittivity (s-1)	1.09	1.12	1.12	1.09	1.09	0.86	0.86	0.83	0.83	0.83			
Flow rate (GPM/ft2)	81	84	84	81	81	65	65	62	62	62			
Permeability (cm/s)	0.25	0.26	0.26	0.25	0.25	0.21	0.21	0.20	0.20	0.20			
Trial =>:	3					4							
Thickness (mils)	93	93	93	93	93	90	90	90	90	90			
Time (s)	20	20	20	20	20	20	20	20	20	20			
Flow (L)	2.64	2.56	2.56	2.56	2.56	2.48	2.48	2.48	2.48	2.44			
Permittivity (s-1)	1.28	1.24	1.24	1.24	1.24	1.20	1.20	1.20	1.20	1.18	1.10	0.16	
Flow rate (GPM/ft2)	96	93	93	93	93	90	90	90	90	89	82	12	
Permeability (cm/s)	0.30	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.27	0.26	0.03	
TEMPERATURE CORRECTED VALUES											Permittivity (s-1)		110 min
											Flow rate (GPM/ft2)		
											Permeability (cm/s)		
											1.10	✓	
											82		
											0.26		

MD Machine Direction
TD Transverse Direction

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March 17, 2004

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SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
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Bill To:

<= Same

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Project:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2193-90-05
Material(s) Tested:	1 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel (ASTM D 413, mod.) - GC Thickness (ASTM D 5199) - GN Mass Unit/Area (ASTM D 5261) - GN Density (ASTM D 1505) - GN Carbon Content (ASTM D 1603) - GN Mass Unit/Area (ASTM D 3776) - GT Puncture Strength (ASTM D 4833) - GT Apparent Opening Size (ASTM D 4751) - GT Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400077
TRI Log #: E2193-90-05

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	20												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1				SPECIMEN 2								
Flow Rate/Unit Width (GPM/ft width)	1.15	1.15	1.15	1.25	1.24	1.25					1.20	0.05	
Hydraulic Transmissivity (m2/s)	2.4E-03	2.4E-03	2.4E-03	2.6E-03	2.6E-03	2.6E-03					2.5E-03	1.0E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	0.6	0.7	0.7	3.7	2.3						1.6	1.2	1.0 min
A - MD Average peel strength (g/in)	272	318	318	1680	1044						726	557	
B - MD Average peel strength (ppi)	3.7	2.1	0.5	2.3	0.3						1.8	1.3	1.0 min
B - MD Average peel strength (g/in)	1680	953	227	1044	136						808	570	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	3024	2748	3480	2868	2604	2700					2904	290	2380 min
MD Elong. @ Max. Strength (%)	58	49	76	45	70	50					58	11	NA
Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.320	0.318	0.321	0.335	0.339	0.335	0.331	0.328	0.325	0.310	0.326	0.009	0.275 min
											0.310	<< min.	
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	20.32	20.31	21.10	21.52	23.16	23.93	24.80	23.09	22.37	20.76			
Mass/unit area (lbs./1000 sq.ft)	329	329	342	349	375	388	402	374	362	336	359	24	270 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	2.62	2.58									2.60	0.02	2 - 3
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.952	0.952	0.951								0.952	0.0005	0.940 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 TOP
TRI Log #: E2193-90-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	3.07	3.28	2.83	3.53	2.88	3.47	3.22	2.89	3.32	3.10			
Mass/Unit Area (oz/sq.yd)	7.14	7.63	6.58	8.21	6.70	8.07	7.49	6.72	7.72	7.21	7.35	0.54	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	110	115	144	147	97	138	119	154	158	115	128	17	90 min
	132	121	118	137	118								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.125	0.125	0.125	0.150						0.130	0.010	0.210 max
US Sieve No.	120	120	120	120	100						120		70 min

MD Machine Direction
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A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 TOP
TRI Log #: E2193-90-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	88	88	88	88	88	82	82	82	82	82			
Time (s)	20	20	20	20	20	20	20	20	20	20			
Flow (L)	2.28	2.28	2.28	2.28	2.28	2.92	2.88	2.88	2.80	2.88			
Permittivity (s-1)	1.11	1.11	1.11	1.11	1.11	1.42	1.40	1.40	1.36	1.40			
Flow rate (GPM/ft2)	83	83	83	83	83	106	105	105	102	105			
Permeability (cm/s)	0.25	0.25	0.25	0.25	0.25	0.30	0.29	0.29	0.28	0.29			
Trial =>:	3					4							
Thickness (mils)	81	81	81	81	81	89	89	89	89	89			
Time (s)	20	20	20	20	20	20	20	20	20	20			
Flow (L)	2.76	2.76	2.76	2.76	2.76	2.16	2.16	2.16	2.12	2.12			
Permittivity (s-1)	1.34	1.34	1.34	1.34	1.34	1.05	1.05	1.05	1.03	1.03	1.22	0.15	
Flow rate (GPM/ft2)	100	100	100	100	100	78	78	78	77	77	91	11	
Permeability (cm/s)	0.28	0.28	0.28	0.28	0.28	0.24	0.24	0.24	0.23	0.23	0.26	0.02	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.22	110 min
	Flow rate (GPM/ft2)	91	
	Permeability (cm/s)	0.26	

MD Machine Direction
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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 BOTTOM
TRI Log #: E2193-90-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	3.84	2.53	2.82	2.98	2.59	2.79	2.74	2.67	2.59	4.07			
Mass/Unit Area (oz/sq.yd)	8.93	5.88	6.56	6.93	6.02	6.49	6.37	6.21	6.02	9.47	6.89	1.20	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	121	108	104	110	95	90	113	86	104	98	103	10	90 min
	108	103	90	95	117								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.150	0.125	0.150	0.150	0.180						0.151	0.017	0.210 max
US Sieve No.	100	120	100	100	80						80		70 min

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 BOTTOM
TRI Log #: E2193-90-05

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	75	75	75	75	75	70	70	70	70	70			
Time (s)	16	16	16	16	16	17	17	17	17	17			
Flow (L)	2.52	2.52	2.52	2.52	2.48	2.12	2.12	2.08	2.08	2.12			
Permittivity (s-1)	1.53	1.53	1.53	1.53	1.51	1.21	1.21	1.19	1.19	1.21			
Flow rate (GPM/ft2)	114	114	114	114	113	91	91	89	89	91			
Permeability (cm/s)	0.29	0.29	0.29	0.29	0.29	0.22	0.22	0.21	0.21	0.22			
Trial =>:	3					4							
Thickness (mils)	78	78	78	78	78	65	65	65	65	65			
Time (s)	17	17	17	17	17	17	17	17	17	17			
Flow (L)	2.52	2.40	2.36	2.28	2.24	2.92	2.92	2.92	2.92	2.92			
Permittivity (s-1)	1.44	1.37	1.35	1.30	1.28	1.67	1.67	1.67	1.67	1.67	1.44	0.18	
Flow rate (GPM/ft2)	108	103	101	97	96	125	125	125	125	125	107	13	
Permeability (cm/s)	0.29	0.27	0.27	0.26	0.25	0.28	0.28	0.28	0.28	0.28	0.26	0.03	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.44	110 min
	Flow rate (GPM/ft2)	107	
	Permeability (cm/s)	0.26	

MD Machine Direction
TD Transverse Direction

The testing herein 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.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

April 19, 2004

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

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:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2199-05-10
Material(s) Tested:	1 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Transmissivity (ASTM D 4716) - GC Peel (ASTM D 413, mod.) - GC Thickness (ASTM D 5199) - GN Mass Unit/Area (ASTM D 5261) - GN Density (ASTM D 1505) - GN Carbon Content (ASTM D 1603) - GN Wide Width Tensile (ASTM D 4595) - GN Mass Unit/Area (ASTM D 3776) - GT Puncture Strength (ASTM D 4833) - GT Apparent Opening Size (ASTM D 4751) - GT Permittivity (ASTM D 4491) - GT

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite
Sample Identification: 0400229
TRI Log #: E2199-05-10

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Hydraulic Transmissivity (ASTM D 4716)													
Compressive Load (psf):	15000												
Hydraulic Gradient:	0.1												
Seat Time (hours):	100												
Test Temperature (C)	20												
Direction Tested: machine direction													
Profile (Top to Bottom): Plate/Uniform Sand/Sample/60 mil Textured HDPE Geomembrane/Plate													
Permeant: Water													
	SPECIMEN 1			SPECIMEN 2			SPECIMEN 3						
Flow Rate/Unit Width (GPM/ft width)	0.74	0.74	0.74	0.94	0.95	0.95	0.90	0.92	0.89		0.87	0.09	
Hydraulic Transmissivity (m2/s)	1.5E-03	1.5E-03	1.5E-03	2.0E-03	2.0E-03	2.0E-03	1.9E-03	1.9E-03	1.8E-03		1.8E-03	1.8E-04	1.8E-3 min
Peel Strength (GRI GC7)													
A - MD Average peel strength (ppi)	2.3	0.7	1.9	0.7	1.5						1.4	0.6	1.0 min
A - MD Average peel strength (g/in)	1044	318	863	318	681						645	291	
B - MD Average peel strength (ppi)	1.8	2.6	0.4	0.6	2.6						1.6	0.9	1.0 min
B - MD Average peel strength (g/in)	817	1180	182	272	1180						726	430	
Note: A and B represent a randomly assigned top and bottom of the sample													
Wide Width Tensile Properties (ASTM D 4595)													
MD Max. Strength (lb/ft)	2484	2616	2448	2604	2256	2340					2458	130	2380 min
MD Elong. @ Max. Strength (%)	38	47	37	71	34	71					50	16	NA
Thickness (ASTM D 5199) - Geonet Component													
Thickness (inches)	0.321	0.338	0.325	0.339	0.332	0.349	0.336	0.341	0.339	0.329	0.335	0.008	0.275 min
											0.321	<< min.	
Mass/Unit Area (ASTM D 5261) - Geonet Component													
5 in diameter circle - mass (grams)	22.01	23.09	23.82	23.62	22.34	23.99	22.94	22.70	23.39	23.00			
Mass/unit area (lbs./1000 sq.ft)	357	374	386	383	362	389	372	368	379	373	374	10	270 min
Density (ASTM D 1505) - Geonet Component													
Density (g/cm3)	0.953	0.953	0.953								0.953	0.0000	0.940 min
Carbon Black Content (ASTM D 1603, modified) - Geonet Component													
% Carbon Black	2.68	2.63									2.66	0.02	2 - 3

MD Machine Direction
TD Transverse Direction

The testing herein 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.

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400229 TOP
TRI Log #: E2199-05-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.40	2.76	2.76	2.61	2.97	2.76	2.81	2.52	2.85	3.33			
Mass/Unit Area (oz/sq.yd)	5.58	6.42	6.42	6.07	6.91	6.42	6.54	5.86	6.63	7.75	6.46	0.56	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	91	73	80	82	98	105	95	125	105	104	97	14	90 min
	122	84	106	100	84								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.180	0.180	0.150	0.180	0.180						0.174	0.012	0.210 max
US Sieve No.	80	80	100	80	80						80		70 min

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400229 TOP
TRI Log #: E2199-05-10

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	6	7	8	9	10	MEAN	STD. DEV.	PROJ. SPEC.
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	90	90	90	90	90	81	81	81	81	81			
Time (s)	15	15	15	15	15	15	15	15	15	15			
Flow (L)	2.36	2.36	2.36	2.36	2.36	2.76	2.72	2.76	2.68	2.68			
Permittivity (s-1)	1.53	1.53	1.53	1.53	1.53	1.79	1.76	1.79	1.73	1.73			
Flow rate (GPM/ft2)	114	114	114	114	114	134	132	134	130	130			
Permeability (cm/s)	0.35	0.35	0.35	0.35	0.35	0.37	0.36	0.37	0.36	0.36			
Trial =>:	3					4							
Thickness (mils)	81	81	81	81	81	93	93	93	93	93			
Time (s)	15	15	15	15	15	15	15	15	15	15			
Flow (L)	2.52	2.52	2.52	2.48	2.52	2.20	2.24	2.24	2.24	2.20			
Permittivity (s-1)	1.63	1.63	1.63	1.61	1.63	1.42	1.45	1.45	1.45	1.42	1.59	0.12	
Flow rate (GPM/ft2)	122	122	122	120	122	107	108	108	108	107	119	9	
Permeability (cm/s)	0.34	0.34	0.34	0.33	0.34	0.34	0.34	0.34	0.34	0.34	0.35	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.59	110 min
	Flow rate (GPM/ft2)	119	
	Permeability (cm/s)	0.35	

MD Machine Direction
TD Transverse Direction

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GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400229 BOTTOM
TRI Log #: E2199-05-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Mass/Unit Area (ASTM D 3776, Option C)													
5" diameter circle (grams)	2.72	3.26	3.01	2.69	3.02	2.75	2.34	2.80	3.12	2.60			
Mass/Unit Area (oz/sq.yd)	6.33	7.58	7.00	6.26	7.02	6.40	5.44	6.51	7.26	6.05	6.58	0.60	6.0 min
Puncture Resistance (ASTM D 4833)													
Puncture Strength (lbs)	99	77	114	113	113	134	99	102	99	113	103	15	90 min
	80	78	96	114	115								
Apparent Opening Size (ASTM D 4751)													
Opening Size Diameter (mm)	0.125	0.180	0.180	0.150	0.180						0.163	0.022	0.210 max
US Sieve No.	120	80	80	100	80						80		70 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400229 BOTTOM
TRI Log #: E2199-05-10

Constant Head Permittivity (ASTM D 4491, 2 in Constant Head)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	20												
Correction Factor:	1												
Trial =>:	1					2							
Thickness (mils)	107	107	107	107	107	81	81	81	81	81			
Time (s)	15	15	15	15	15	13	13	13	13	13			
Flow (L)	2.04	2.00	2.04	2.04	2.04	2.24	2.24	2.24	2.24	2.24			
Permittivity (s-1)	1.32	1.29	1.32	1.32	1.32	1.67	1.67	1.67	1.67	1.67			
Flow rate (GPM/ft2)	99	97	99	99	99	125	125	125	125	125			
Permeability (cm/s)	0.36	0.35	0.36	0.36	0.36	0.34	0.34	0.34	0.34	0.34			
Trial =>:	3					4							
Thickness (mils)	94	94	94	94	94	82	82	82	82	82			
Time (s)	15	15	15	15	15	11	11	11	11	11			
Flow (L)	2.36	2.36	2.36	2.36	2.36	2.12	2.08	2.08	2.08	2.08			
Permittivity (s-1)	1.53	1.53	1.53	1.53	1.53	1.87	1.84	1.84	1.84	1.84	1.59	0.19	
Flow rate (GPM/ft2)	114	114	114	114	114	140	137	137	137	137	119	15	
Permeability (cm/s)	0.36	0.36	0.36	0.36	0.36	0.39	0.38	0.38	0.38	0.38	0.36	0.01	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	1.59	110 min
	Flow rate (GPM/ft2)	119	
	Permeability (cm/s)	0.36	

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

March 5, 2004

Mail To:

Tim Bauters
Tenax Corporation
4800 E. Monument St.
Baltimore, MD 21205

email: tbauters@us.tenax.com

Bill To:

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Dear Mr. Bauters:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2193-90-10
Material(s) Tested:	3 Tenax Nonwoven Geotextile(s)
Test(s) Requested:	Permittivity (ASTM D 4491)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Sam R. Allen
Vice President and Division Manager
Geosynthetic Services Division

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOTEXTILE TEST RESULTS

TRI Client: Tenax Corporation

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 Top
TRI Log #: E2193-90-10

Falling Head Permittivity (ASTM D 4491, 2 in opening)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Water Temp. (C):	23											
Correction Factor:	0.9306											
Trial =>:	1					2						
Thickness (mils)	84	84	84	84	84	75	75	75	75	75		
Time (s)	1.47	1.34	1.39	1.34	1.19	1.15	1.10	1.22	1.12	1.22		
Permittivity (s-1)	2.12	2.33	2.24	2.33	2.62	2.71	2.84	2.56	2.79	2.56		
Flow rate (GPM/ft2)	135	148	143	148	167	173	181	163	178	163		
Permeability (cm/s)	0.45	0.50	0.48	0.50	0.56	0.52	0.54	0.49	0.53	0.49		
Trial =>:	3					4						
Thickness (mils)	81	81	81	81	81	85	85	85	85	85		
Time (s)	1.28	1.31	1.24	1.35	1.14	1.41	1.38	1.42	1.31	1.37		
Permittivity (s-1)	2.44	2.38	2.52	2.31	2.74	2.21	2.26	2.20	2.38	2.28	2.44	0.21
Flow rate (GPM/ft2)	155	152	160	147	174	141	144	140	152	145	155.5	13.2
Permeability (cm/s)	0.50	0.49	0.52	0.48	0.56	0.48	0.49	0.47	0.51	0.49	0.50	0.03

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	2.27
	Flow rate (GPM/ft2)	145
	Permeability (cm/s)	0.47

The testing herein 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.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOTEXTILE TEST RESULTS

TRI Client: Tenax Corporation

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400007 Bottom
TRI Log #: E2193-90-10

Falling Head Permittivity (ASTM D 4491, 2 in opening)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Water Temp. (C):	23											
Correction Factor:	0.9306											
Trial =>:	1					2						
Thickness (mils)	93	93	93	93	93	78	78	78	78	78		
Time (s)	1.43	1.53	1.50	1.47	1.57	1.38	1.44	1.31	1.34	1.28		
Permittivity (s-1)	2.18	2.04	2.08	2.12	1.99	2.26	2.17	2.38	2.33	2.44		
Flow rate (GPM/ft2)	139	130	133	135	127	144	138	152	148	155		
Permeability (cm/s)	0.52	0.48	0.49	0.50	0.47	0.45	0.43	0.47	0.46	0.48		
Trial =>:	3					4						
Thickness (mils)	78	78	78	78	78	84	84	84	84	84		
Time (s)	1.37	1.34	1.31	1.28	1.22	1.03	1.09	1.30	1.15	1.10		
Permittivity (s-1)	2.28	2.33	2.38	2.44	2.56	3.03	2.86	2.40	2.71	2.84	2.39	0.28
Flow rate (GPM/ft2)	145	148	152	155	163	193	182	153	173	181	152.3	17.7
Permeability (cm/s)	0.45	0.46	0.47	0.48	0.51	0.65	0.61	0.51	0.58	0.61	0.50	0.06

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	2.22
	Flow rate (GPM/ft2)	142
	Permeability (cm/s)	0.47

The testing herein 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.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOTEXTILE TEST RESULTS

TRI Client: Tenax Corporation

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400039 Top
TRI Log #: E2193-90-10

Falling Head Permittivity (ASTM D 4491, 2 in opening)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.
	1	2	3	4	5	6	7	8	9	10		
Water Temp. (C):	23											
Correction Factor:	0.9306											
Trial =>:	1					2						
Thickness (mils)	82	82	82	82	82	85	85	85	85	85		
Time (s)	1.16	1.16	1.03	1.07	1.34	1.28	1.38	1.08	1.34	1.28		
Permittivity (s-1)	2.69	2.69	3.03	2.92	2.33	2.44	2.26	2.89	2.33	2.44		
Flow rate (GPM/ft2)	171	171	193	186	148	155	144	184	148	155		
Permeability (cm/s)	0.56	0.56	0.63	0.61	0.48	0.53	0.49	0.62	0.50	0.53		
Trial =>:	3					4						
hickness (mils)	80	80	80	80	80	97	97	97	97	97		
Time (s)	1.22	1.40	1.19	1.31	1.34	1.78	1.88	1.56	1.66	1.56		
Permittivity (s-1)	2.56	2.23	2.62	2.38	2.33	1.75	1.66	2.00	1.88	2.00	2.37	0.37
Flow rate (GPM/ft2)	163	142	167	152	148	112	106	127	120	127	151.1	23.6
Permeability (cm/s)	0.52	0.45	0.53	0.48	0.47	0.43	0.41	0.49	0.46	0.49	0.51	0.06

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	2.21
	Flow rate (GPM/ft2)	141
	Permeability (cm/s)	0.48

The testing herein 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.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

March 23, 2004

Mail To:

Tim Bauters
Tenax Corporation
4800 E. Monument St.
Baltimore, MD 21205

email: tbauters@us.tenax.com

Bill To:

<= Same

Dear Mr. Bauters:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2199-01-05
Material(s) Tested:	3 Tenax Double Sided Geocomposite(s)
Test(s) Requested:	Permittivity (ASTM D 4491) - GT Carbon Black Content (ASTM D 1603, mod.) - GN

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jarrett A. Nelson

Jarrett A. Nelson
Special Projects Manager
Geosynthetic Services Division

14 X 13 X 200
2600 ft.

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: Tenax Corporation
Project: Citrus County

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 Top
TRI Log #: E2199-01-05

Falling Head Permittivity (ASTM D 4491, 1 in opening)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	19												
Correction Factor:	1.025												
Trial =>:	1					2							
Thickness (mils)	70	70	70	70	70	82	82	82	82	82			
Time (s)	1.25	1.18	1.21	1.25	1.18	1.53	1.53	1.50	1.53	1.53			
Permittivity (s-1)	2.50	2.64	2.58	2.50	2.64	2.04	2.04	2.08	2.04	2.04			
Flow rate (GPM/ft2)	159	169	164	159	169	130	130	133	130	130			
Permeability (cm/s)	0.44	0.47	0.46	0.44	0.47	0.42	0.42	0.43	0.42	0.42			
Trial =>:	3					4							
Thickness (mils)	85	85	85	85	85	83	83	83	83	83			
Time (s)	1.68	1.62	1.59	1.68	1.65	1.59	1.59	1.59	1.56	1.59			
Permittivity (s-1)	1.86	1.93	1.96	1.86	1.89	1.96	1.96	1.96	2.00	1.96	2.12	0.27	
Flow rate (GPM/ft2)	118	123	125	118	121	125	125	125	127	125	135.2	17.1	
Permeability (cm/s)	0.40	0.42	0.42	0.40	0.41	0.41	0.41	0.41	0.42	0.41	0.43	0.02	

TEMPERATURE CORRECTED VALUES	Permittivity (s-1)	2.17	110 min
	Flow rate (GPM/ft2)	139	
	Permeability (cm/s)	0.44	

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOCOMPOSITE TEST RESULTS

TRI Client: Tenax Corporation
Project: Citrus County

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400077 Bottom
TRI Log #: E2199-01-05

Falling Head Permittivity (ASTM D 4491, 1 in opening)

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Water Temp. (C):	19												
Correction Factor:	1.025												
Trial =>:	1					2							
Thickness (mils)	86	86	86	86	86	75	75	75	75	75			
Time (s)	1.46	1.40	1.46	1.50	1.46	1.43	1.40	1.43	1.46	1.46			
Permittivity (s-1)	2.14	2.23	2.14	2.08	2.14	2.18	2.23	2.18	2.14	2.14			
Flow rate (GPM/ft2)	136	142	136	133	136	139	142	139	136	136			
Permeability (cm/s)	0.47	0.49	0.47	0.45	0.47	0.42	0.42	0.42	0.41	0.41			
Trial =>:	3					4							
Thickness (mils)	81	81	81	81	81	85	85	85	85	85			
Time (s)	1.56	1.46	1.43	1.40	1.46	1.50	1.46	1.43	1.46	1.43			
Permittivity (s-1)	2.00	2.14	2.18	2.23	2.14	2.08	2.14	2.18	2.14	2.18	2.15	0.05	
Flow rate (GPM/ft2)	127	136	139	142	136	133	136	139	136	139	137.0	3.4	
Permeability (cm/s)	0.41	0.44	0.45	0.46	0.44	0.45	0.46	0.47	0.46	0.47	0.45	0.02	
TEMPERATURE CORRECTED VALUES											Permittivity (s-1)	2.20	110 min
											Flow rate (GPM/ft2)	140	
											Permeability (cm/s)	0.46	

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GEOCOMPOSITE TEST RESULTS

TRI Client: Tenax Corporation
Project: Citrus County

Material: Tenax Double Sided Geocomposite - Geotextile Component
Sample Identification: 0400115 Bottom
TRI Log #: E2199-01-05

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Falling Head Permittivity (ASTM D 4491, 1 in opening)													
Water Temp. (C):	19												
Correction Factor:	1.025												
Trial =>:	1					2							
Thickness (mils)	85	85	85	85	85	69	69	69	69	69			
Time (s)	1.90	1.81	1.81	1.81	1.81	1.43	1.46	1.43	1.40	1.50			
Permittivity (s-1)	1.64	1.72	1.72	1.72	1.72	2.18	2.14	2.18	2.23	2.08			
Flow rate (GPM/ft2)	105	110	110	110	110	139	136	139	142	133			
Permeability (cm/s)	0.35	0.37	0.37	0.37	0.37	0.38	0.37	0.38	0.39	0.36			
Trial =>:	3					4							
Thickness (mils)	71	71	71	71	71	79	79	79	79	79			
Time (s)	1.31	1.25	1.28	1.25	1.31	1.59	1.62	1.53	1.62	1.59			
Permittivity (s-1)	2.38	2.50	2.44	2.50	2.38	1.96	1.93	2.04	1.93	1.96	2.07	0.27	
Flow rate (GPM/ft2)	152	159	155	159	152	125	123	130	123	125	131.8	17.3	
Permeability (cm/s)	0.43	0.45	0.44	0.45	0.43	0.39	0.39	0.41	0.39	0.39	0.40	0.03	
TEMPERATURE CORRECTED VALUES											Permittivity (s-1)	2.12	
											Flow rate (GPM/ft2)	135	110 min
											Permeability (cm/s)	0.41	

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GEOCOMPOSITE TEST RESULTS

TRI Client: Tenax Corporation
Project: Citrus County

Material: Tenax Double Sided Geocomposite - Geonet Component
Sample Identification: 0400153
TRI Log #: E2199-01-05

Carbon Black Content (ASTM D 1603, modified)					
% Carbon Black	2.65	2.61	2.63	0.02	2 - 3

MD Machine Direction
TD Transverse Direction

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GEOMEMBRANE CONFORMANCE

Geomembrane conformance

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

January 23, 2004

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

fax: 813-623-6757 - Sheila Carpenter
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

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:	Citrus County Landfill, Phase 2 Expansion
TRI Job Reference Number:	E2193-69-10
Material(s) Tested:	7 GSE 60 mil Textured HDPE Geomembrane(s)
Test(s) Requested:	Thickness (ASTM D 5994) Density (ASTM D 1505) Carbon Content (ASTM D 1603) Carbon Dispersion (ASTM D 3015) Tensile (ASTM D 638)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jarrett A. Nelson

Jarrett A. Nelson
Special Projects Manager
Geosynthetic Services Division

GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107951
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	72	64	70	68	70	71	71	74	65	65	69	3	60 avg
											64	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.48	2.46									2.47	0.01	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A1	A2	A1	A1	A1					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	166	170	171	178	167						170	4	126 min
TD Yield Strength (ppi)	178	166	164	182	172						172	7	126 min
MD Break Strength (ppi)	258	211	255	241	198						233	24	90 min
TD Break Strength (ppi)	129	189	207	244	200						194	37	90 min
MD Yield Elongation (%)	21	19	19	20	19						20	1	12 min
TD Yield Elongation (%)	16	16	14	17	15						16	1	12 min
MD Break Elongation (%)	684	545	643	611	483						593	71	100 min
TD Break Elongation (%)	416	553	596	681	586						567	86	100 min

MD Machine Direction
TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107962
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	72	66	65	68	71	67	70	67	67	67	68	2	60 avg
											65	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.55	2.55									2.55	0.00	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A2	A2	A1	A1	A1					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	177	181	168	178	159						173	8	126 min
TD Yield Strength (ppi)	157	167	163	178	159						165	7	126 min
MD Break Strength (ppi)	241	258	229	202	249						236	19	90 min
TD Break Strength (ppi)	177	195	188	201	191						190	8	90 min
MD Yield Elongation (%)	19	19	17	19	19						19	1	12 min
TD Yield Elongation (%)	17	16	16	16	14						16	1	12 min
MD Break Elongation (%)	615	646	584	479	648						594	62	100 min
TD Break Elongation (%)	509	560	538	535	560						540	19	100 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
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GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107967
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	67	65	70	71	71	68	70	68	64	72	69	3	60 avg
											64	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.52	2.54									2.53	0.01	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A2	A1	A2	A1	A1					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	174	165	176	165	162						168	6	126 min
TD Yield Strength (ppi)	177	166	165	166	175						170	5	126 min
MD Break Strength (ppi)	248	192	267	251	265						245	27	90 min
TD Break Strength (ppi)	245	207	226	186	229						219	20	90 min
MD Yield Elongation (%)	20	19	19	17	21						19	1	12 min
TD Yield Elongation (%)	16	16	16	16	16						16	0	12 min
MD Break Elongation (%)	631	495	669	643	681						624	67	100 min
TD Break Elongation (%)	653	590	664	518	650						615	55	100 min

MD Machine Direction
TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107977
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	65	74	68	75	66	76	69	68	70	69	70 65	4 << min.	60 avg 54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.945	0.945	0.945								0.945	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.51	2.53									2.52	0.01	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A1	A1	A1	A1	A1					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	171	161	165	168	153						164	6	126 min
TD Yield Strength (ppi)	170	171	169	177	175						172	3	126 min
MD Break Strength (ppi)	232	246	204	221	230						227	14	90 min
TD Break Strength (ppi)	181	209	147	142	214						179	30	90 min
MD Yield Elongation (%)	19	15	17	19	19						18	2	12 min
TD Yield Elongation (%)	16	15	15	16	14						15	1	12 min
MD Break Elongation (%)	589	650	538	559	648						597	46	100 min
TD Break Elongation (%)	495	606	426	416	611						511	84	100 min

MD Machine Direction
TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107986
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	66	68	66	69	72	70	65	69	72	67	68	2	60 avg
											65	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.945								0.946	0.0005	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.54	2.55									2.55	0.01	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A1	A1	A2	A1	A1					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	175	175	179	162	164						171	7	126 min
TD Yield Strength (ppi)	173	175	178	179	175						176	2	126 min
MD Break Strength (ppi)	271	257	262	220	245						251	18	90 min
TD Break Strength (ppi)	191	192	205	235	208						206	16	90 min
MD Yield Elongation (%)	19	19	19	19	19						19	0	12 min
TD Yield Elongation (%)	16	17	14	17	14						16	1	12 min
MD Break Elongation (%)	663	643	630	564	623						624	33	100 min
TD Break Elongation (%)	519	529	545	644	564						560	45	100 min

MD Machine Direction
TD Transverse Direction

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GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102107994
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	66	70	65	67	67	68	73	67	69	71	68	2	60 avg
											65	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.51	2.54									2.53	0.01	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A1	A1	A2	A2	A2					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	184	167	175	174	180						176	6	126 min
TD Yield Strength (ppi)	190	185	182	190	192						188	4	126 min
MD Break Strength (ppi)	240	228	196	208	224						219	15	90 min
TD Break Strength (ppi)	202	216	191	230	128						193	35	90 min
MD Yield Elongation (%)	19	19	17	19	17						18	1	12 min
TD Yield Elongation (%)	15	15	16	16	14						15	1	12 min
MD Break Elongation (%)	586	598	465	501	545						539	50	100 min
TD Break Elongation (%)	530	593	531	599	151						481	167	100 min

MD Machine Direction
TD Transverse Direction

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TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

GEOMEMBRANE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill, Phase 2 Expansion

Material: GSE 60 mil Textured HDPE Geomembrane
Sample Identification: 102108001
TRI Log #: E2193-69-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJ. SPEC.
	1	2	3	4	5	6	7	8	9	10			
Thickness (ASTM D 5994)													
Thickness (mils)	70	75	69	68	67	67	70	70	69	67	69	2	60 avg
											67	<< min.	54 min
Density (ASTM D 1505)													
Density (g/cm3)	0.946	0.946	0.946								0.946	0.000	0.940 min
Carbon Black Content (ASTM D 1603)													
% Carbon Black	2.54	2.54									2.54	0.00	2.0 to 3.0
Carbon Black Dispersion (ASTM D 3015)													
Rating	A1	A1	A2	A1	A2	A2					A1		NA
Tensile Properties (ASTM D 638)													
MD Yield Strength (ppi)	175	187	181	180	181						181	4	126 min
TD Yield Strength (ppi)	195	177	191	170	183						183	9	126 min
MD Break Strength (ppi)	218	277	264	233	226						244	23	90 min
TD Break Strength (ppi)	143	213	206	179	205						189	26	90 min
MD Yield Elongation (%)	20	17	19	17	17						18	1	12 min
TD Yield Elongation (%)	15	14	16	12	14						14	1	12 min
MD Break Elongation (%)	556	661	644	566	559						597	46	100 min
TD Break Elongation (%)	183	589	548	486	561						473	149	100 min

MD Machine Direction
TD Transverse Direction

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GEOGRID CONFORMANCE

conformance Geogrid

TRI/ENVIRONMENTAL, INC.
A Texas Research International Company

July 9, 2004

Mail To:

Ms. Sheila Carpenter-Van Dijk
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: scarpenter@scsengineers.com
email: ddupont@scsengineers.com - Dennis Dupont

Bill To:

<= Same

Dear Ms. Carpenter-Van Dijk:

Thank you for consulting TRI/Environmental, Inc. (TRI) for your geosynthetics testing needs. TRI is pleased to submit this final report for laboratory testing.

TRI Job Reference Number:	E2199-87-10
Material(s) Tested:	3 Tensar UX1700 Geogrid(s)
Test(s) Requested:	Open Area (COE Method) Carbon Black Content (ASTM D 4218) Single Rib Tensile Properties w/ Modulus (GRI GG1) Junction Strength (GRI GG2) Flexural Rigidity (ASTM D 1388)

If you have any questions or require any additional information, please call us at 1-800-880-8378.

Sincerely,

Jarrett A. Nelson

Jarrett A. Nelson
Special Projects Manager
Geosynthetic Services Division

GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 12
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJECT SPEC.
	1	2	3	4	5	6	7	8	9	10			
Junction/Node Strength (GRI GG2)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	966	882	743	917	940	941	960	917	866	876	901	62	
MD Maximum Strength (lb/ft)	13572	12392	10439	12884	13207	13221	13488	12884	12167	12308	12656	872	10,970 min
Single Rib Tensile Properties (GRI GG1)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	945	898	875	908	923	900	828	899	907	860	894	31	
MD Maximum Strength (lb/ft)	13277	12617	12294	12757	12968	12645	11633	12631	12743	12083	12565	439	11,900 min
MD Strength @ 5% Strain (lbs)	543	491	499	499	495	499	497	490	489	482	498	16	
MD Strength @ 5% Strain (lb/ft)	7629	6899	7011	7011	6955	7011	6983	6885	6870	6772	7003	222	5,100 min
MD Elongation at Maximum Strength (%)	9.97	9.92	9.66	10.0	10.5	9.92	8.97	10.2	10.2	10.6	10.0	0.4	NA
MD 2% Secant Modulus (lbs)	279	261	268	266	263	267	268	259	258	253	264	7	
MD 2% Secant Modulus (lb/ft)	195998	183352.5	188270	186865	184757.5	187567.5	188270	181948	181245	177733	185601	4773	161,000 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.50	2.56									2.53	0.03	0.5 min
Percent Open Area (COE Method)													
Open Area (%)	59.4										59.4		70 nom

TD - Transverse Direction MD - Machine Direction

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GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 12
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER				MEAN	STD	PROJECT SPEC.
	1	2	3	4			
MD - Specimen Length (cm) 152.4							
MD - Specimen Width (cm) 5.715							
MD - Specimen Mass - (g)	89.98	89.98	89.98	89.98			
MD - Specimen Mass/Unit Area (mg/cm2)	103.31	103.31	103.31	103.31			
MD (Side A up, Direction 1) Bending Length (cm)	38.10	71.12	44.13	69.22			
MD (Side A up, Direction 2) Bending Length (cm)	64.45	35.56	34.29	59.69			
MD (Side B up, Direction 1) Bending Length (cm)	39.37	66.99	67.31	45.09			
MD (Side B up, Direction 2) Bending Length (cm)	35.56	66.68	67.95	34.93			
Flexural Rigidity (Stiffness)							
MD (Side A up, Direction 1) Flexural Rigidity (mg - cm)	5713730	37163793	8880152	34256695			
MD (Side A up, Direction 2) Flexural Rigidity (mg - cm)	27660759	4645474	4165309	21970985			
MD (Side B up, Direction 1) Flexural Rigidity (mg - cm)	6304360	31061566	31505296	9467624			
MD (Side B up, Direction 2) Flexural Rigidity (mg - cm)	4645474	30622022	32405393	4401027	18731111	13206667	9000 min

MD Machine Direction
TD Transverse Direction

The testing herein 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.

GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 26
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJECT SPEC.
	1	2	3	4	5	6	7	8	9	10			
Junction/Node Strength (GRI GG2)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	866	904	932	892	946	839	961	933	942	899	911	37	
MD Maximum Strength (lb/ft)	12167	12701	13095	12533	13291	11788	13502	13109	13235	12631	12805	514	10,970 min
Single Rib Tensile Properties (GRI GG1)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	833	903	799	898	894	902	883	859	897	885	875	33	
MD Maximum Strength (lb/ft)	11704	12687	11226	12617	12561	12673	12406	12069	12603	12434	12298	463	11,900 min
MD Strength @ 5% Strain (lbs)	493	465	473	479	465	474	471	472	466	466	472	8	
MD Strength @ 5% Strain (lb/ft)	6927	6533	6646	6730	6533	6660	6618	6632	6547	6547	6637	115	5,100 min
MD Elongation at Maximum Strength (%)	8.96	10.5	8.92	10.5	10.7	10.2	9.97	9.81	10.3	10.1	10.0	0.6	NA
MD 2% Secant Modulus (lbs)	269	252	258	263	254	259	257	260	255	256	258	5	
MD 2% Secant Modulus (lb/ft)	188973	177030	181245	184758	178435	181948	180543	182650	179138	179840	181456	3266	161,000 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.58	2.58									2.58	0.00	0.5 min
Percent Open Area (COE Method)													
Open Area (%)	60.8										60.8		70 nom

TD - Transverse Direction MD - Machine Direction

The testing herein 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.

GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 26
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER				MEAN	STD	PROJECT SPEC.
	1	2	3	4			
MD - Specimen Length (cm) 152.4							
MD - Specimen Width (cm) 5.715							
MD - Specimen Mass - (g)	89.98	89.98	89.98	89.98			
MD - Specimen Mass/Unit Area (mg/cm2)	103.31	103.31	103.31	103.31			
MD (Side A up, Direction 1) Bending Length (cm)	69.85	70.49	56.77	61.60			
MD (Side A up, Direction 2) Bending Length (cm)	64.14	67.31	64.77	63.50			
MD (Side B up, Direction 1) Bending Length (cm)	33.66	41.91	46.36	34.93			
MD (Side B up, Direction 2) Bending Length (cm)	32.39	45.09	46.99	31.75			
Flexural Rigidity (Stiffness)							
MD (Side A up, Direction 1) Flexural Rigidity (mg - cm)	35208216	36177196	18900727	24142440			
MD (Side A up, Direction 2) Flexural Rigidity (mg - cm)	27253990	31505296	28071555	26452454			
MD (Side B up, Direction 1) Flexural Rigidity (mg - cm)	3938162	7604975	10290454	4401027			
MD (Side B up, Direction 2) Flexural Rigidity (mg - cm)	3508944	9467624	10719169	3306557	18553859	11881921	9000 min

MD Machine Direction
TD Transverse Direction

2

The testing herein 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.

GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 36
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER										MEAN	STD. DEV.	PROJECT SPEC.
	1	2	3	4	5	6	7	8	9	10			
Junction/Node Strength (GRI GG2)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	976	998	933	949	833	948	863	954	960	963	938	48	
MD Maximum Strength (lb/ft)	13713	14022	13109	13333	11704	13319	12125	13404	13488	13530	13175	678	10,970 min
Single Rib Tensile Properties (GRI GG1)													
Ribs/foot width:	14.05												
MD Maximum Strength (lbs)	854	884	873	921	919	880	928	910	927	926	902	26	
MD Maximum Strength (lb/ft)	11999	12420	12266	12940	12912	12364	13038	12786	13024	13010	12676	359	11,900 min
MD Strength @ 5% Strain (lbs)	477	483	481	491	490	486	482	477	482	458	481	9	
MD Strength @ 5% Strain (lb/ft)	6702	6786	6758	6899	6885	6828	6772	6702	6772	6435	6754	123	5,100 min
MD Elongation at Maximum Strength (%)	9.93	10.3	10.1	11.0	11.1	10.0	11.0	11.7	11.2	13.1	10.9	0.9	NA
MD 2% Secant Modulus (lbs)	256	258	258	264	269	262	259	254	257	251	259	5	
MD 2% Secant Modulus (lb/ft)	179840	181245	181245	185460	188973	184055	181948	178435	180543	176328	181807	3424	161,000 min
Carbon Black Content (ASTM D 4218)													
% Carbon Black	2.71	2.66									2.69	0.03	0.5 min
Percent Open Area (COE Method)													
Open Area (%)	60.4										60.4		70 nom

TD - Transverse Direction MD - Machine Direction

The testing herein 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.

GEOGRID TEST RESULTS

Client: SCS Engineers
Project: Citrus County Landfill

Material: Tensar UX1700 Geogrid
Sample Identification: 36
TRI Log #: E2199-87-10

PARAMETER	TEST REPLICATE NUMBER				MEAN	STD	PROJECT SPEC.
	1	2	3	4			
MD - Specimen Length (cm) 152.4							
MD - Specimen Width (cm) 5.715							
MD - Specimen Mass - (g)	89.98	89.98	89.98	89.98			
MD - Specimen Mass/Unit Area (mg/cm2)	103.31	103.31	103.31	103.31			
MD (Side A up, Direction 1) Bending Length (cm)	35.56	38.10	40.64	35.56			
MD (Side A up, Direction 2) Bending Length (cm)	61.91	60.33	62.23	36.83			
MD (Side B up, Direction 1) Bending Length (cm)	40.64	38.10	37.47	61.60			
MD (Side B up, Direction 2) Bending Length (cm)	34.93	36.83	39.37	62.23			
Flexural Rigidity (Stiffness)							
MD (Side A up, Direction 1) Flexural Rigidity (mg - cm)	4645474	5713730	6934352	4645474			
MD (Side A up, Direction 2) Flexural Rigidity (mg - cm)	24517705	22679672	24896838	5161191			
MD (Side B up, Direction 1) Flexural Rigidity (mg - cm)	6934352	5713730	5432778	24142440			
MD (Side B up, Direction 2) Flexural Rigidity (mg - cm)	4401027	5161191	6304360	24896838	10277934	7989671	9000 min

MD Machine Direction
TD Transverse Direction

The testing herein 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.

ATTACHMENT G

SUBBASE ACCEPTANCE FORMS

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

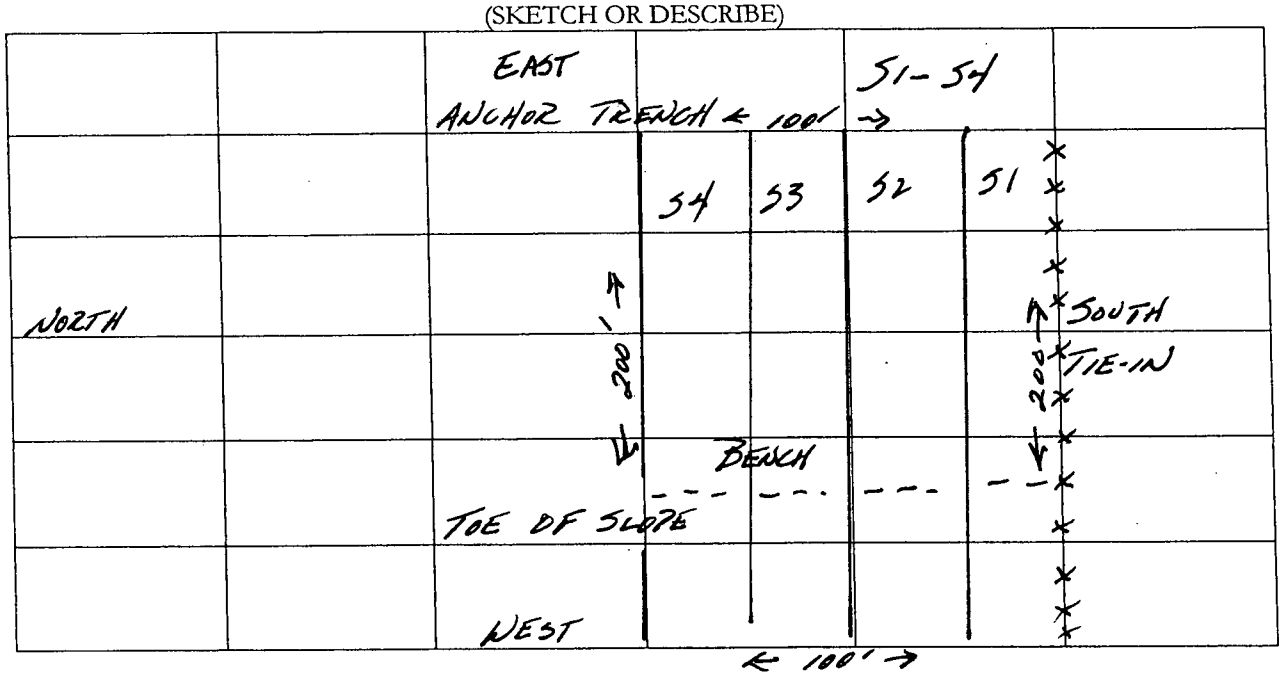
Installer: Comanco Environmental Corp.
Address: 7911 Professional Place
Tampa, Florida 33637

Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy
Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF Comanco Environmental
(Geosynthetic Installer)
DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE)



Acceptance of the soil surface for which the geomembrane will be placed is based upon visual observations. Acceptance of the subgrade surface considers that at the time the geomembrane is placed, the structure of the underlying soil surface, which is the responsibility of others, meets or exceeds the project specifications.

Tommy Herrmann	Superintendent
NAME	TITLE
SIGNATURE	12/6/04
	DATE

Certification received by SCS

Dennis G. DuPont	Resident Engineer
NAME	TITLE
SIGNATURE	12/6/04
	DATE

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

Installer: Comanco Environmental Corp.
Address: 7911 Professional Place, Tampa, Florida 33637

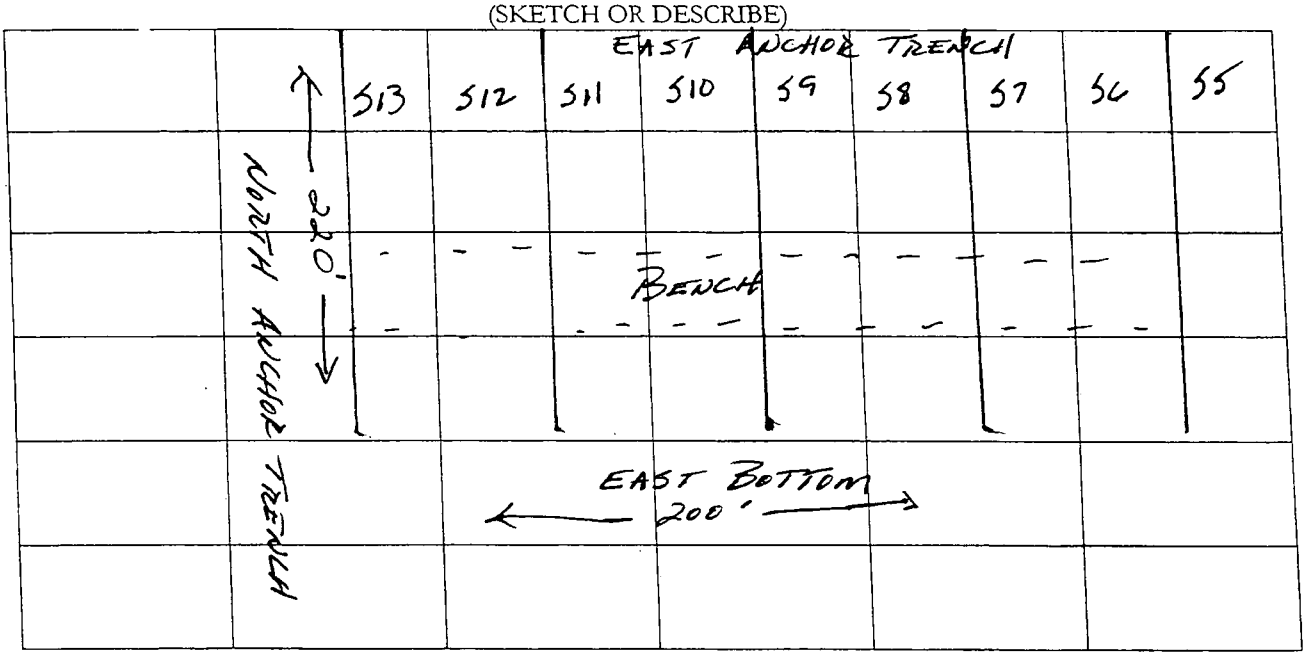
Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy, Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF COMANCO ENVIRONMENTAL (Geosynthetic Installer)

DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE)



Acceptance of the soil surface for which the geomembrane will be placed is based upon visual observations. Acceptance of the subgrade surface considers that at the time the geomembrane is placed, the structure of the underlying soil surface, which is the responsibility of others, meets or exceeds the project specifications.

TOMMY HERRMANN — NAME
SUPERINTENDENT — TITLE
SIGNATURE
12-07-04 — DATE

Certification received by SCS

Dennis G. DuPont — NAME
Resident Engineer — TITLE
SIGNATURE
~~12/6/04~~ 12/7/04 — DATE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
SOUTHWEST DISTRICT
TAMPA
JUL 06 2005

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

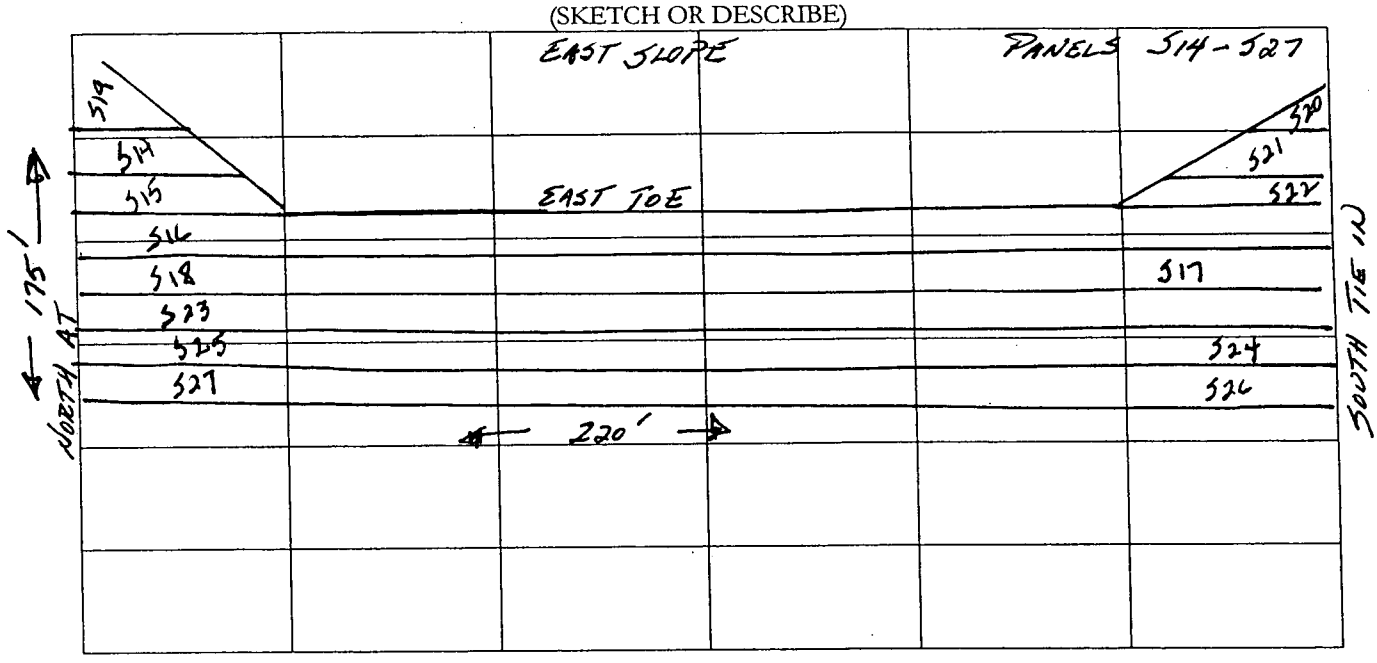
Installer: Comanco Environmental Corp.
Address: 7911 Professional Place, Tampa, Florida 33637

Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy, Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF Comanco (Geosynthetic Installer)
DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE)



Acceptance of the soil surface for which the geomembrane will be placed is based upon visual observations. Acceptance of the subgrade surface considers that at the time the geomembrane is placed, the structure of the underlying soil surface, which is the responsibility of others, meets or exceeds the project specifications.

Tommy Herrmann — NAME
SUPT — TITLE
SIGNATURE
12/8/04 — DATE

Certification received by SCS

Dennis G. DuPont — NAME
Resident Engineer — TITLE
SIGNATURE
12/8/04 — DATE

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

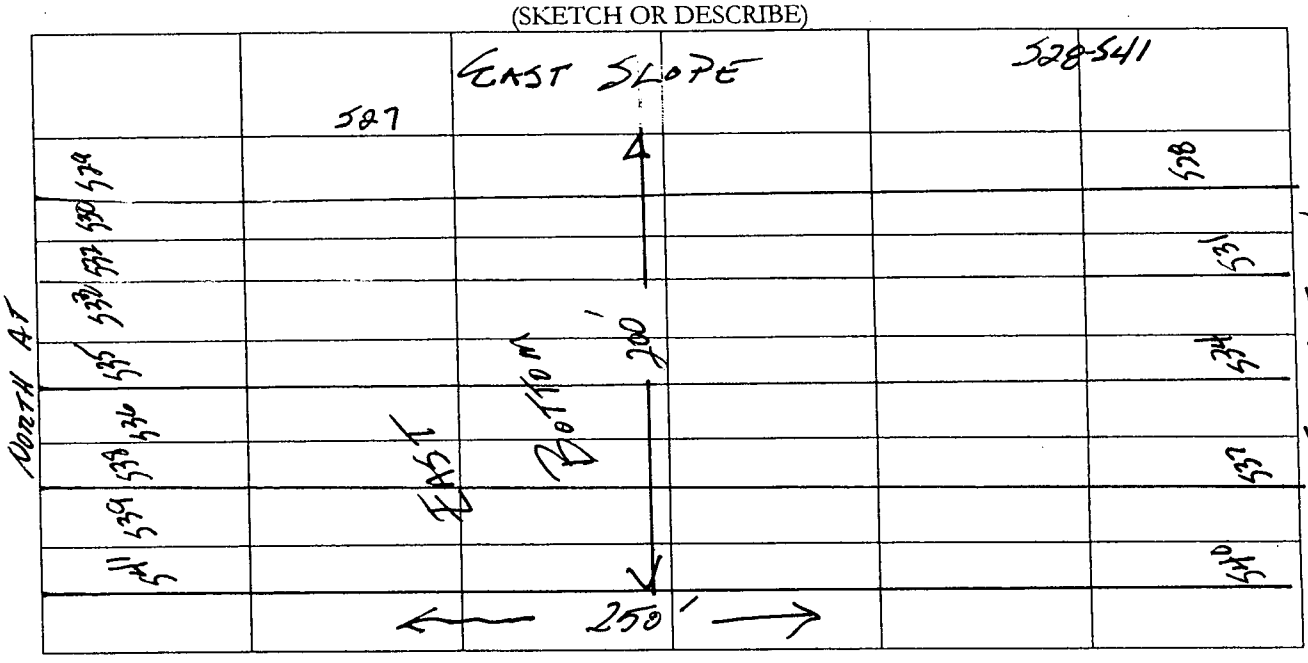
Installer: Comanco Environmental Corp.
Address: 7911 Professional Place
Tampa, Florida 33637

Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy
Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF COMANCO
(Geosynthetic Installer)
DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE)



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Tommy Herrman	SUPT
NAME	TITLE
	12/9/04
SIGNATURE	DATE

Certification received by SCS

Dennis G. DuPont	Resident Engineer
NAME	TITLE
	12/8/04
SIGNATURE	DATE

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

Installer: Comanco Environmental Corp.
Address: 7911 Professional Place, Tampa, Florida 33637

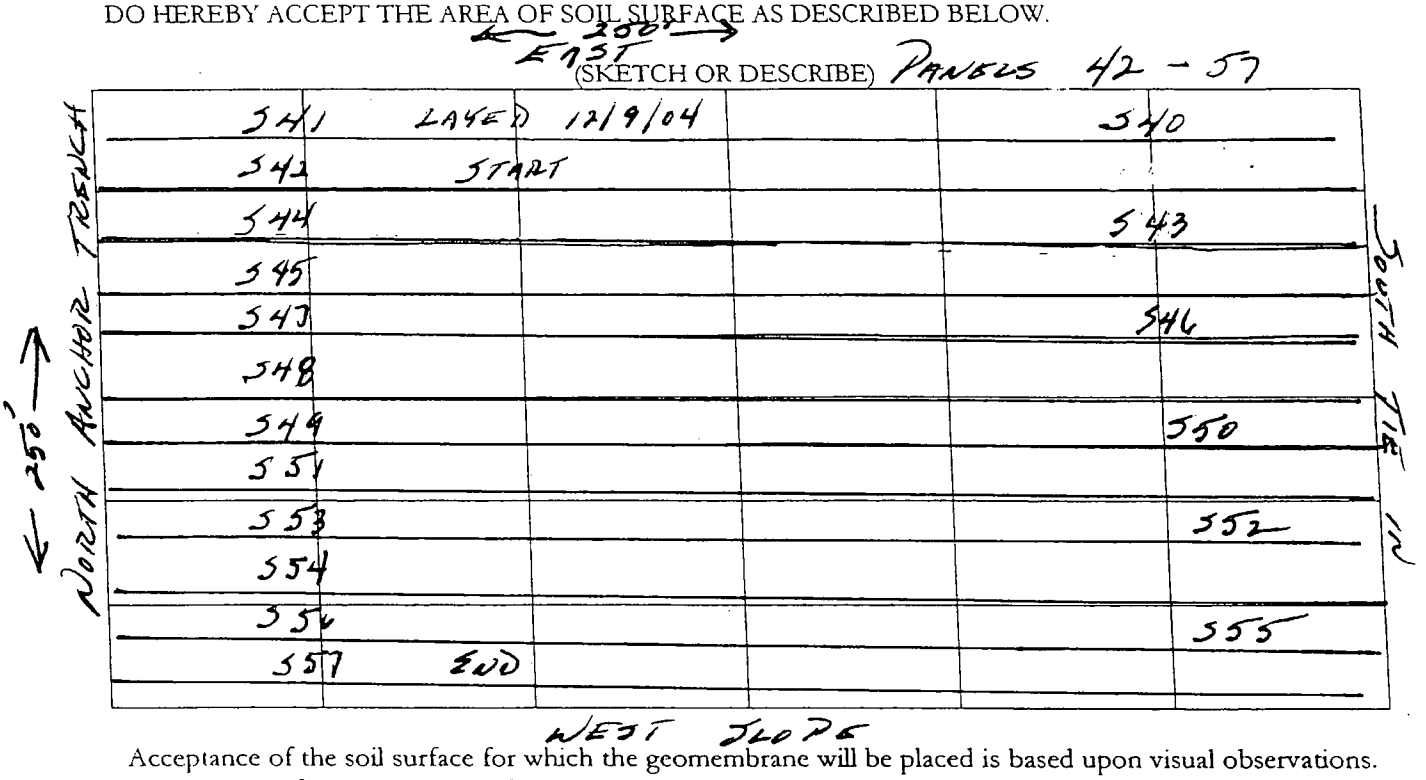
Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy, Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF COMANCO (Geosynthetic Installer)

DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE) PANELS 42 - 57



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Tommy Herrmann — NAME
Supt. — TITLE
SIGNATURE
12/13/04 — DATE

Certification received by SCS

Dennis G. DuPont — NAME
Resident Engineer — TITLE
SIGNATURE
12/13/04 — DATE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

Installer: Comanco Environmental Corp.
Address: 7911 Professional Place, Tampa, Florida 33637

Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy, Lecanto, Florida 34461

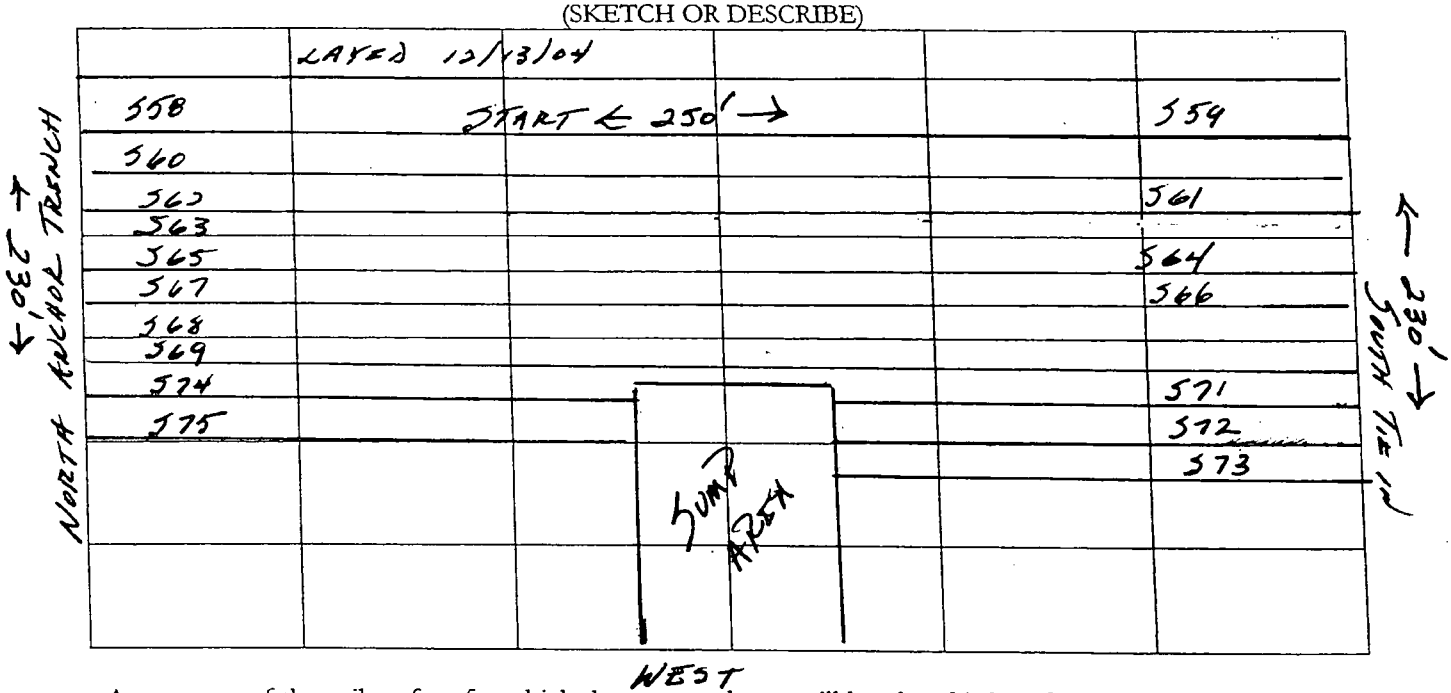
Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF _____ (Geosynthetic Installer)

DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

EAST

(SKETCH OR DESCRIBE)



WEST

Acceptance of the soil surface for which the geomembrane will be placed is based upon visual observations. Acceptance of the subgrade surface considers that at the time the geomembrane is placed, the structure of the underlying soil surface, which is the responsibility of others, meets or exceeds the project specifications.

TOMMY HERRMANN — NAME
SUPT. — TITLE
SIGNATURE
12/14/04 — DATE

Certification received by SCS

Dennis G. DuPont — NAME
Resident Engineer — TITLE
SIGNATURE
12/14/04 — DATE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

Installer: Comanco Environmental Corp.
Address: 7911 Professional Place
Tampa, Florida 33637

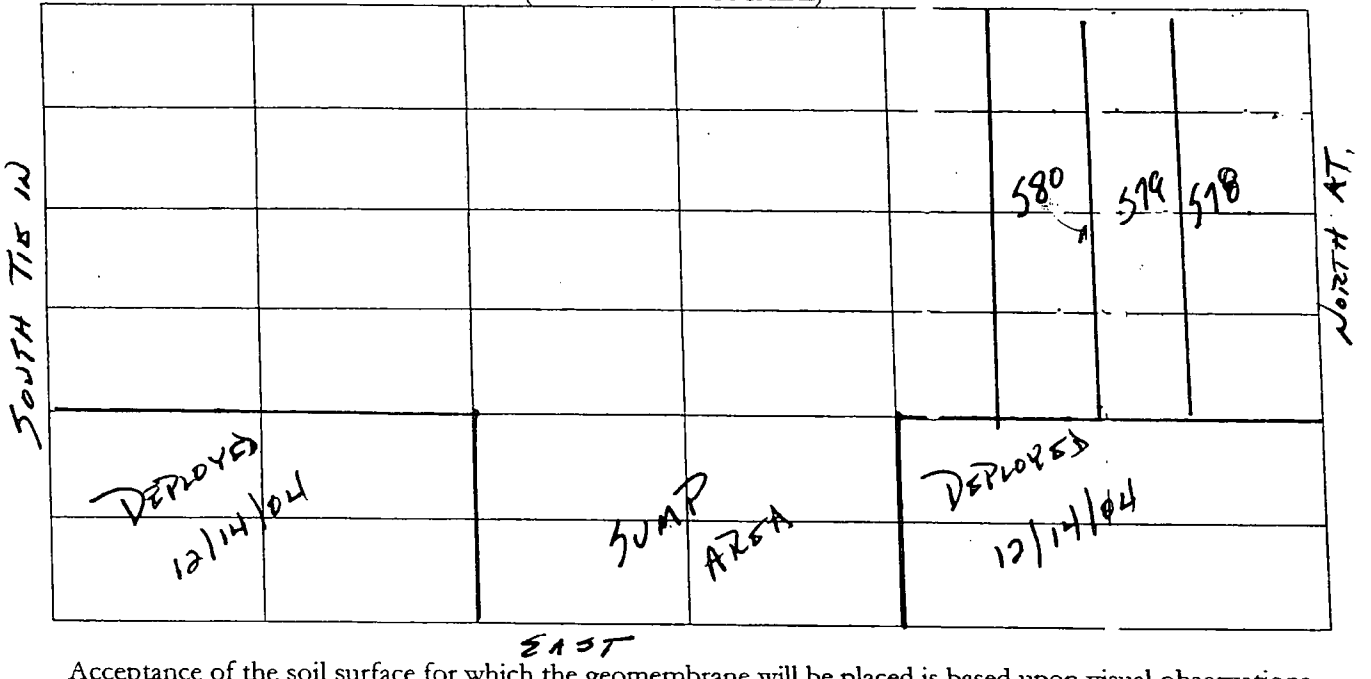
Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy
Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF _____
(Geosynthetic Installer)

DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

WEST SLOPE
(SKETCH OR DESCRIBE)



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TOMMY HERRMANN	SUPT
NAME	TITLE
SIGNATURE	12/13/04
	DATE

Certification received by SCS

Dennis G. DuPont	Resident Engineer
NAME	TITLE
SIGNATURE	12/15/04
	DATE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

SCS ENGINEERS

CERTIFICATE OF SUB-BASE ACCEPTANCE

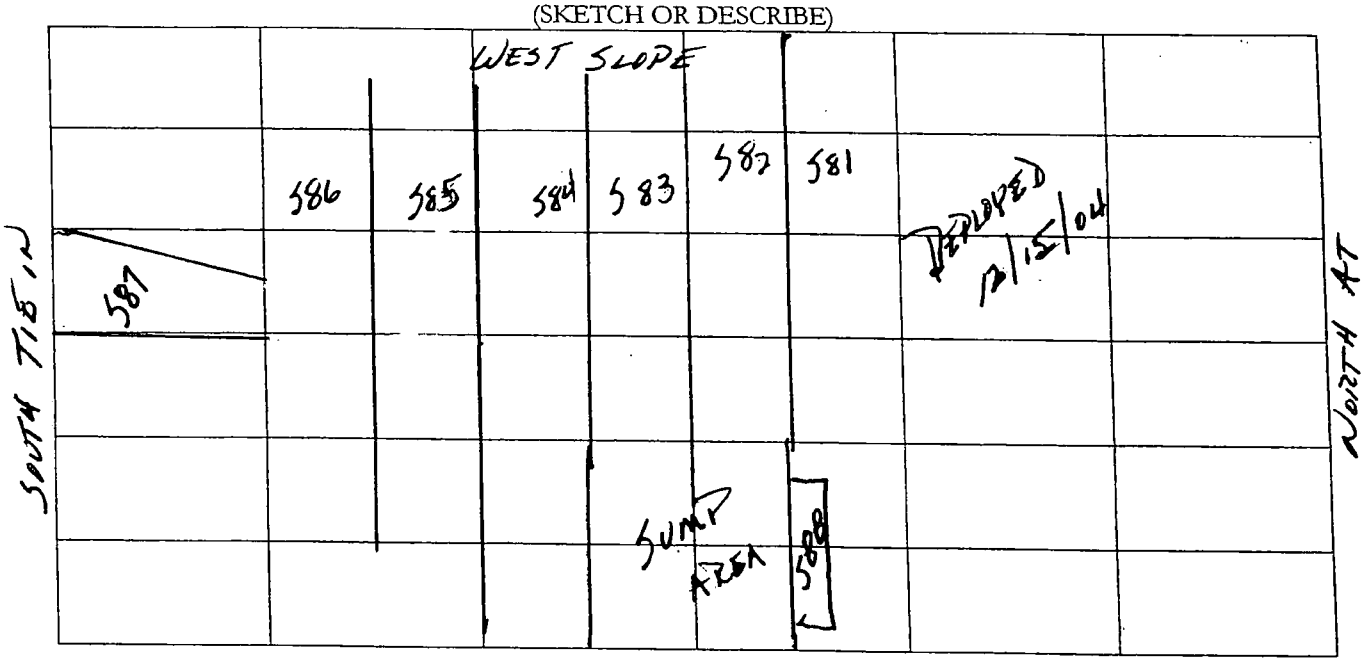
Installer: Comanco Environmental Corp.
Address: 7911 Professional Place
Tampa, Florida 33637

Project name: Phase 2 Expansion
Project location: 230 W. Gulf to Lake Hwy
Lecanto, Florida 34461

Owner: Citrus County

I, THE UNDERSIGNED, DULY AUTHORIZED REPRESENTATIVE OF Comanco
(Geosynthetic Installer)
DO HEREBY ACCEPT THE AREA OF SOIL SURFACE AS DESCRIBED BELOW.

(SKETCH OR DESCRIBE)



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Tommy Herrmann — NAME
Supt. — TITLE

SIGNATURE
12/16/04 — DATE

Certification received by SCS

Dennis G. DuPont — NAME
Resident Engineer — TITLE

SIGNATURE
12/16/04 — DATE

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

ATTACHMENT H

GEOMEMBRANE PANEL PLACEMENT LOGS

SCS ENGINEERS

SECONDARY

GEOMEMBRANE PLACEMENT LOG

SHEET 1 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/6/04 –

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	
S1	107962	~~164~~ 163.5	22'	60	E TO W	1:55	12/6 BEG PARTLY CLOUDY	3597
S2	107962	~~185~~ 186.5				2:06		4103
S3	107985	213				2:45		4686
S4	107985	~~235~~ 223.5				3:09		4917
S5	10 7960	~~228~~ 229.5				8:10	12/7 BEG PARTLY CLOUDY	5016 ~~4917~~
S6	107960	~~227~~ 222.5				8:25		4994 ~~4417~~
S7	107959	224				9:15		~~4928~~ ~~4417~~
S8	107959	~~224~~ 223.5				9:30		4917 ~~4450~~
S9	107992	225				9:43		4960 ~~4466~~
S10	107992	219.5				9:59		4829 ~~4934~~
S11	107966	199				10:45		~~4378~~ ~~4497~~
S12	107966	175	8'			3:25		3850 ~~1020~~
S13	107979	170	6'			4:00	1020	~~1038~~ 737
S14	107962	~~34~~ 33.5	22		N TO S	9:50	Begin 12/8 Sunny and clear	1155
S15	107985	~~55~~ 52.5	22			10:03		5951 ~~5962~~
S16	107961	270.5	22			10:12		4532 ~~4510~~
S17	107961	206	22			10:22		
S18	107962	63.5	22			10:30		1397
Page Total		3140 x 22 69080 + 1020						
Cumulative Total		~~70,100~~ 69101						69,957 ~~70052~~

PRINT NAME: Dennis G. DuPont ✓ DGD

SIGNATURE: KAD

SCS ENGINEERS

Secondary

GEOMEMBRANE PLACEMENT LOG

SHEET 2 of 5
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/8/04

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS
S19	107962	20	20 (15)	60mil	N-S	11:00	Sunny/clear / 150 A = 1/2 x 15 x 20 = 150
S20	107959	22	22 (22)	60mil	S-N	1:10	Sunny/clear A = 1/2 x 22 x 22 = ~~242~~ 242
S21	107959	33	22	60mil	S-N	1:20	726
S22	107966	51	22	60mil	S-N	1:30	1122
S23	107983	~~264~~ 266	22	60mil	N-S	2:00	5852
S24	107983	~~128~~ 119	22	60mil	S-N	2:07	2618
S25	107970	~~136~~ 137.5	22	60mil	N-S	2:15	3025
S26	107983	~~97~~ 110.5	22	60mil	S-N	2:22	2431
S27	107970	~~139~~ 153	22	60mil	N-S	2:30	3366
S28	107970	~~148~~ 197.5	22	60	N-S	7:35	366 12/9 SUNNY & CLEAR 4345 ~~4396~~
S29	107473	~~67~~ 66.5	22	60	N-S	7:50	1463
S30	107973	264	22	60	N-S	8:15	5808
S31	107973	165	22	60	N-S	8:30	3630
S32	107976	96	22	60	N-S	8:43	2112
S33	107976	~~258~~ 255.5	22	60	N-S	8:59	5621 ~~5676~~ ~~5665~~
S34	107976	140	22	60	N-S	9:10	3080
S35	107982	~~118~~ 117.5	22	60	N-S	9:20	2585
S36	107982	~~254~~ 255.5	22	60	N-S	12:35	5621
Page Total		53,797.					
Cumulative Total		123,754					~~53,797~~ ~~58663~~ ~~123,915~~ 123,754

PRINT NAME: Dennis G. DuPont

SIGNATURE: icp V by Ram

SCS ENGINEERS

Secondary

GEOMEMBRANE PLACEMENT LOG

SHEET 3 of 5
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/9/04

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS
537	107982	130	22	60	N TO S	1:05	2660 ~~2660~~
538	107989	127.5 ~~128~~	22	60	N TO S	1:20	2805
539	107989	255.5 ~~250~~	22	60	N TO S	1:40	5621
540	107~~989~~	77.5 ~~80~~	22	60	N TO S	1:55	1705
541	107974	17~~X~~6	22	60	N TO S	2:10	3872 ~~3872~~ ~~3784~~ 1839 ~~5467~~ END 12/9/04 51,018
542	107974	174.5 ~~340.5~~	22	60	N TO S	8:00	BEG 12/13/04
543	107934	69.5 ~~74~~	22	60	N TO S	8:15	1529
544	107965	176	22	60	N TO S	8:32	3872
545	107965	24~~3~~ 2/3	22	60	N TO S	8:48	5324
546	107965	~~90~~ 89.5	22	60	N TO S	9:00	1528
547	108002	170	22	60	N TO S	10:00	3740
548	108002	237.5 ~~238~~	22	60	N TO S	12:35	5225
549	108003	80.5	22	60	N TO S	12:50	1771
550	108002	156	22	60	N TO S	1:25	3432
551	108003	236	22	60	N TO S	1:45	5192
552	108003	89.5	22	60	N TO S	2:40	1969
553	108001	145	22	60	N TO S	3:00	3190
554	108001	233	22	60	N TO S	3:30	5126
Page Total		62,601					
Cumulative Total		186,355					~~62601~~ ~~124140~~ ~~186355~~ 186,355

PRINT NAME: Dennis G. DuPont

SIGNATURE: KP V by Ram

SCS ENGINEERS

SECONDARY

GEOMEMBRANE PLACEMENT LOG

SHEET 4 of 5
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/13 - 12/14

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	
555	108001	110.5	22	60	N TO S	4:10		2431
556	108004	121	22	60	N TO S	4:20		2662
557	108004	227.5 ~~229.5~~	22	60	N TO S	4:30	END 12/13/04 2520 x 22 = 55,440	~~5005~~ ~~5027~~ 3146
558	108004	143	22	60	N TO S	8:30		
559	107967	~~85~~ 84.5	22	60	N TO S	9:00	BEG 12/14/04	1859
560	107967	226.5 ~~225~~	22	60	N TO S	9:20		4983
561	107967	~~143~~	22	60	N TO S	9:40		3146
562	107951	80.5	22	60	N TO S	10:01		1771
563	107951	1 ~~220~~	22	60	N TO S	10:20		4862
564	107951	98.5 ~~99~~	22	60	N TO S	10:40		2167
565	107975	121.5 ~~122~~	22	60	N TO S	10:51		2673
566	107951	79.5 ~~80~~	22	60	N TO S	11:15		1749
567	107975	138.5	22	60	N TO S	1:00		3047
568	107975	216	22	60	N TO S	1:30		4752
569	107975	4 ~~212~~	22	60	N TO S	2:00	5' FROM SUMP	4708
570	107968	82	22	60	S TO N	2:10		1804
571	107968	~~79~~	22	60	S TO N	2:20		1738
572	107968	59.5 ~~60~~	22	60	N TO S	2:30		1309
573	107981	~~383~~	22	60	N TO S	2:45	44,968	~~1026~~ ~~1403~~
Page Total		55638 SF						~~55734~~
Cumulative Total		241,993 SF						~~243,792~~ 55,638 241,993

PRINT NAME: Dennis G. DuPont

SIGNATURE: KP V by Ram

SCS ENGINEERS

SECONDARY

GEOMEMBRANE PLACEMENT LOG

SHEET 5 of 5
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS
574	107981	79	22	60	N TO S	3:15	1738
575	107981	~~65~~ 66		60	N TO S	3:30	END 12/14/04 1452
576	107981	~~38~~ 42.5		60	W TO E	9:45	BEG 12/15 935
577	107992		30 / 22	60		10:10	330 A = 1/2 x 30 x 22 330
578	107981	121	14	60		10:20	1694 ~~2662~~
579	107987	144	22	60		10:35	3168
580	107987	~~170~~ 169.5		60		11:15	END 12/15/04 3729
581	107987	~~192~~		60		1:15	BEG 12/16/04 7 (200 / 100) 4272.5 ~~4948~~ ~~4273~~
582	107987	~~243~~ 241		60		9:00	5302
583	107990	240		60		9:30	5280
584	107990	184		60		9:45	4048 4084
~~585~~ 585	107994	~~162~~ 161.5		60		10:15	3553
586	107994	147.5	21	60		10:50	3097.5 ~~3000~~ ~~3245~~
587	107981	32	22	60	S TO N	11:20	1817 * 22 = 39,974 + 126 + 330 704
588	107987	18	6.5	60	W TO E	1:30	END (12/16/04) COMPLETE SECONDARY 117 ~~126~~
Page Total		39,420 SF					~~39,420~~
Cumulative Total		281,413 SF					~~46581~~ 281,413

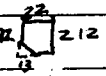
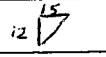
PRINT NAME: Dennis G. DuPont

SIGNATURE: ~~KK~~ ✓ by Ram

SCS ENGINEERS Primary

SHEET 1 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE PLACEMENT LOG

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS / Total
P1	107994	167	22	60	E to W	10:05	Sunny/clear 12/29/04 ✓ 3674
P2	107972	180.5	22'	60	E to W	10:15	3971
P3	107972	206	22'	60	E to W	11:30	 A=(22×212)-(½×13×20) 4532 ~~4534~~
P4	107955	211.5	22'	60	E to W	1:15	4653
P5	107955	210.5	22'	60	E to W	7:30	12/30/04 4631
P6	107954	210	22'	60	E to W	8:00	4620
P7	107954	210.5	22'	60	E to W	8:30	4631
P8	107999	211.5	22'	60	E to W	9:00	4653
P9	107999	213	22'	60	E to W	9:30	4686
P10	107984	213	21.5	60	E to W	10:10	4579.5
P11	107984	198	22'	60	E to W	10:40	4356
P12	107995	171	22'	60	E to W	11:10	3762
P13	107995	154.5	7'	60	E to W	1:40	1081.5 North Anchor Trench / North East Slope
P14	107984	6	15'	60	N to S	2:15	 Area = ½×15×12 = 90SF 90
P15	107995	25	22'	60	N to S	2:40	550
P16	107995	47	22'	60	N to S	3:05	1034
P17	107969	270.5	22	60	N to S	4:00	5951
P18	107984	59.5	22	60	N to S	4:35	1309
Page Total		~~62,766~~ 62,764					62764 ~~62,766~~
Cumulative Total		~~62,766~~ 62,764					~~62,766~~

PRINT NAME: Dennis G. DuPont / SCS

SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE PLACEMENT LOG

SHEET 2 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	Area
P19	107969	209.5	22	60	N to S	4:50	End 12/30/04	4609
P20	107980	267.5	22	60	N to S	8:15	Begin 12/31/04	5885
P21	107980	173	22	60	N to S	8:40		3806
P22	107997	93	22	60	N to S	9:00		2046
P23	107980	43	22	60	S to N	9:15		946
P24	107995	30	5	60	S to N	9:20		150
P25	107995	21	12	60	S to N	9:25	End 12/31/04	252
P26	107953	264	22	60	N to S	8:50	Begin 1/5/05	5808
P27	107953	165	21.5	60	S to N	9:05		3547.5
P29	107953	71	22	60	S to N	9:15	← Repeated	
P28	107957	96.5	21.5	60	N to S	9:25		2075
P29	107953	71	22	60	S to N	9:35		1562
P30	107953	189	22	60	N to S	9:50		4158
P31	107957	194.5	22	60	S to N	10:05		4279
P32	107999	63.5	22	60	N to S	10:30		1397
P33	108000	257	22	60	N to S	10:55		5654
P34	107972	85.5	22	60	N to S	12:50		1881
P35	108000	168	22	60	S to N	1:00		3696
Page Total		51751.5						51751.5 ✓
Cumulative Total		~~114,517.5~~ 114515						~~114,517.5~~

PRINT NAME: Dennis G. DuPont / SCV

SIGNATURE: Ron

SCS ENGINEERS primary

SHEET 3 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE PLACEMENT LOG

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	Area (SF)
P36	107056	176	22	60	N to S	1:40		3872
P37	108000	73.5	22	60	S to N	1:50		1617
P38	107956	248.5	22	60	N to S	2:00		5467
P39	107956	68	22	60	S to N	2:15		1496
P40	107977	180	22	60	N to S	2:30		3960
P41	107977	247.5	22	60	N to S	3:00		5445
P42	107958	190	22	60	N to S	3:15		4180 ~~4169~~
P43	107977	56	22	60	S to N	3:30		1232
P44	107958	243.5	22	60	N to S	4:15	End 1/5/05	5357
P45	107958	54	22	60	S to N	9:02	Begin 1/6/05	1188
P46	107986	190	22	60	N to S	9:05		4180
P47	107986	241.5	22	60	N to S	9:10		5313
P48	107986	61.5	22	60	S to N	9:25		1353
P49	107996	176	22	60	N to S	9:40		3872
P50	107996	235	22	60	N to S	9:50		5170
P51	107988	93	22	60	N to S	10:15		2046
P52	107990	59.5	22	60	N to S	10:30		1309
P53	107996	79	22	60	S to N	10:45		1738
Page Total		~~58784~~ 58795						~~58,784~~
Cumulative Total		~~173,301.5~~ 173,310						~~173,301.5~~

PRINT NAME: Dennis G. DuPont / SCV

SIGNATURE: [signature]

SCS ENGINEERS Primary

GEOMEMBRANE PLACEMENT LOG

SHEET 4 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS
P54	107988	229.5	22	60	N to S	11:15	5049
P55	107993	70.5	22	60	N to S	12:45	1551
P56	107988	157.5	22	60	S to N	1:00	3465
P57	107993	160	22	60	N to S	1:15	3520
P58	107954	66.5	22	60	S to N	1:35	End 1/6/05 1463
P59	107993	225.5	22	60	N to S	8:35	Begin 1/10/05 4961
P60	107948	224.5	22	60	N to S	9:10	4939
P61	107948	222	22	60	N to S	9:30	4884
P62	107949	73.5	22	60	N to S	10:15	1617
P63	107993	26	21.5	60	N to S	10:20	559
P64	107948	48	21	60	N to S	10:25	1008
P65	107955	71.5	21.5	60	S to N	10:30	1537
P66	107949	103.5	22	60	N to S	10:35	2277
P67	107993	49.5	22	60	N to S	10:45	1089
P68	107949	64.5	22	60	S to N	10:50	1419
P69	107949	216.5	22	60	N to S	11:05	4763
P70	107979	215	22	60	N to S	1:10	4730
P71	107950	101.5	22	60	N to S	1:25	2233
Page Total		51,064 SF ✓					~~51,064~~
Cumulative Total		~~224,365.5~~ SF 224,374					~~224,365.5~~

PRINT NAME: Dennis G. DuPont / SCV

SIGNATURE: Ronn

SCS ENGINEERS PY, nancy

SHEET 5 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE PLACEMENT LOG

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	Area
P72	107949	29	21.5	60	NtoS	1:30		623.5
P73	107979	82	21.5	60	StoN	1:35		1763
P74	107950	212.5	22	60	NtoS	1:55		4675
P75	107950	86	22	60	StoN	2:15	1892	~~1881~~
P76	107950	82.5	22	60	StoN	2:30		1815
P77	107963	71	22	60	StoN	4:10	56 22 80 A=(22×80)-(½×16×24)	1568
P78	107963	43.5	22	60	StoN	4:30		957
P79	107937	17	22	60	StoN	4:45	□ (almost). End 1/10/05	374
P80	107971	141.5	21.5	60	WtoE	10:00	Begin 1/3/05	3042
P81	107971	162	22	60	WtoE	10:15		3564
P82	107952	186.5	22	60	WtoE	10:25		4103
P83	107952	244	22	60	WtoE	3:40	196 22 250 A=(22×250)-(½×5×5)	~~5370~~ OK
P84	107998	249	22	60	WtoE	4:00	END 1/3/05	5478
P85	107998	196	22	60	WtoE	7:50	Begin 2/1/05	4312
P86	107964	174	22	60	WtoE	8:05		3829
P87	107964	152	22	60	WtoE	8:15		3344
P88	107964	137.5	15	60	WtoE	8:20		2062.5
P89	107963	89.5	22	60	NtoS	8:30		1969
Page Total		~~50729~~ SF 50,740						~~50729~~
Cumulative Total		~~274,0945~~ 275,114						~~274,0945~~

PRINT NAME: Dennis G. DuPont / SCV

SIGNATURE: Rann

SCS ENGINEERS

GEOMEMBRANE PLACEMENT LOG

SHEET 6 of 6
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

PANEL NO.	ROLL NO.	LENGTH	WIDTH	THICK-NESS	ORIENTATION	TIME	WEATHER/CONDITIONS/COMMENTS	Area
P90	107963	90	22	60	N to S	9:20	90 A=(90×22)−½(2×8)	1972
P91	107963	71	22	60	N to S	9:35		1562
P92	107963	46	22	60	N to S	10:00		1012
P93	107998	~~25.5~~	20	60	N to S	10:15	Total ~~279,150.5~~ SF	510
Page Total		5,056 SF ✓						~~5056~~
Cumulative Total		~~279,150.5~~ 280,170						~~279,150.5~~

PRINT NAME: Dennis G. DuPont / SCV

SIGNATURE: Row

ATTACHMENT I

GEOMEMBRANE SEAMING LOGS

SCS ENGINEERS

SECONDARY
GEOMEMBRANE SEAMING LOG

SHEET 1 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/6/04

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S1/S2	170	RZ	7543	F	3.5	2:20	80	770	PARTLY CLOUDY
S2/S3	203	JC	7540	F	3.0	2:55	80	770	
S3/S4	223	RZ	7543	F	3.5	3:28	80	770	END 12/6/04 SDS-1
S1/T1	157	PR	7517	E		9:00	75	375/500	BEG 12/7/04 PARTLY CLOUDY SDS-4
S4/S5	228	RZ	7543	F	3.5	1:40	83	770	
S5/S6	228	JC	7540	F	3.0	9:00	78	770	
S6/S7	226	RZ	7543	F	3.5	9:15	78	770	SDS-2
S7/S8	222	LM	7513	F	2.7	9:40	78	770	SDS-5
S8/S9	225	JC	7540	F	3.0	10:10	78	770	SDS-3
S9/S10	225	RZ	7543	F	3.5	10:30	78	770	
S10/S11	214	RZ	7543	F	3.5	11:25	80	770	
S11/S12	184	RZ	7543	F	3.5	3:30	80	770	
S12/S13	166	RZ	7543	F	3.5	4:40	80	770	END 12/7/04 SDS-8
S11/S14	20	RZ	7543	F	3.5	11:40	81	770	Begin 12/8/04
S12/S14	14	RZ	7543	F	3.5	11:40	81	770	
S22/S16	58	JC	7533	F	4.0	2:00	83	770	
S14/S15	47	RZ	7543	F	3.5	10:55	83	770	
S15/S10	13	RZ	7543	F	3.5	11:40	81	770	
S15/S16	58	RZ	7543	F	3.5	10:40	83	770	210 SDS-7
Page Total			2881 ✓						
Cumulative Total			2881 ✓						

PRINT NAME: Dennis G. DuPont ✓by DGD

SIGNATURE:

SCS ENGINEERS

SECONDARY

GEOMEMBRANE SEAMING LOG

SHEET 2 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/8 - 12/9

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S10|S16	21	RZ	7543	F	3.5	2:40	83°	770	
S9|S16	22	RZ	7543	F	3.5	2:40	83	770	
S8|S16	22	RZ	7543	F	3.5	2:40	83	770	
S7|S16	22	RZ	7543	F	3.5	2:40	83	770	
S6|S16	22	RZ	7543	F	3.5	2:40	83	770	
S5|S16	22	RZ	7543	F	3.5	2:40	83	770	
S4|S16	22	RZ	7543	F	3.5	2:40	83	770	
S3|S16	5	RZ	7543	F	3.5	2:40	83	770	
S16|S17	207	JC	7533	F	3.0	10:25	83	770	SDS 8
S17|S18	22	RZ	7543	F	3.5	10:25	83	770	
S16|S18	64	JC	7533	F	3.0	10:25	83	770	
S14|S19	20	RZ	7543	F	3.5	11:15	80	770	
S19|S12	18	RZ	7543	F	3.5	11:40	81	770	
S19|S13	7	RZ	7543	F	3.5	11:40	81	770	
S11|S15	14	RZ	7543	F	3.5	11:40	81	770	
S21|S2	27	JC	7533	F	4.0	2:50	81	770	
S22|S3	28	JC	7533	F	4.0	2:50	81	770	
S22|S21	44	JC	7533	F	4.0	2:15	81	770	
S21|S3	4	JC	7533	F	4.0	2:50	81	770	
Page Total			~~614~~ 613 ✓						
Cumulative Total			~~3495~~ 3494 ✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE:

SCS ENGINEERS

SECONDARY

GEOMEMBRANE SEAMING LOG

SHEET 3 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S21/S20	22	JC	7533	F	4.0	2:30	81	770	
S20/S2	6	JC	7533	F	4.0	2:50	81	770	
S20/S1	27	JC	7533	F	4.0	2:50	81	770	
✓ S20/T1	22	BR	7417	E		9:00	70	550/~~500~~	
✓ S21/T1	22	↓	0005	E		↓	↓	↓	
✓ S22/T1	22	↓	↓	E		↓	↓	↓	
✓ S16/T1	22	↓	↓	E		↓	↓	↓	
✓ S17/T1	22	↓	↓	E		↓	↓	↓	
S23/S17	205	JC	7533	F	4.0	3:15	75	770	
S23/S18	63	JC	7533	F	4.0	3:15	75	770	
S23/S24	128	JC	7533	F	4.0	4:30	75	770	
S23/S25	136	JC	7533	F	4.0	4:30	75	770	SDS-9
S24/S26	97	RZ	7536	F	3.5	4:25	75	770	
S24/S25	22	JC	7533	F	4.0	4:10	75	770	
S24/S27	13	RZ	7536	F	3.5	4:25	75	770	
S25/S27	139	RZ	7536	F	3.5	4:25	75	770	SDS-10
S26/S27	22	JC	7533	F	4.0	4:20	75	770	880 END 12/8/04
S27/S29	67	JC	7533	F	4.0	1:05	82	770	BEGIN 12/9/04
S27/S28	87	JC	7533	F	4.0	1:05	82	770	
Page Total			1144'						
Cumulative Total			~~4639~~ 4638						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE:

SCS ENGINEERS

Secondary

GEOMEMBRANE SEAMING LOG

SHEET 4 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/9/04

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
528/526	111	JC	7533	F	3.0	1:05	77	770	SDS-11
528/530	197	RZ	7536	F	3.5	9:20	77	770	
529/530	66	RZ	7536	F	3.5	9:20	77	770	
530/532	98	JC	7533	F	3.0	9:15	77	770	
530/531	167	JC	7533	F	3.0	9:15	77	770	
532/531	22	JC	7533	F	3.0	9:05	76	770	
528/529	22	JC	7533	F	3.0	8:40	76	770	
531/533	163	RZ	7536	F	3.5	10:20	78	770	SDS-12
532/533	94	JC	7533	F	3.0	10:20	78	770	
533/535	117	JC	7533	F	3.0	10:35	80	770	
533/534	141	JC	7533	F	3.0	10:35	80	770	
534/535	22	JC	7533	F	3.0	10:25	78	770	SDS 13
535/536	118	JC	7533	F	4.0	2:10	78	770	
534/536	139	JC	7533	F	4.0	2:10	78	770	
536/537	128	JC	7533	F	4.0	3:10	78	770	
536/538	126	JC	7533	F	4.0	3:10	78	770	
537/538	22	CU	7515	F	3.0	2:50	78	770	
538/539	129	RZ	7514	F	3.5	3:55	78	770	
537/539	139	RZ	7514	F	3.5	3:55	78	770	SDS 14
Page Total			2014 ✓						
Cumulative Total			66582			AT 174 TD			

PRINT NAME: Dennis G. DuPont ✓ by DGD

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SCS ENGINEERS

Secondary

GEOMEMBRANE SEAMING LOG

SHEET 5 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/9

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
539/541	179	JC	7553	F	3.0	4:29	80	770	12/9/04 CONT.
539/540	74	JC	7533	F	3.0	4:29	80	770	
540/541	22	LV	7515	F	3.0	4:25	80	770	7099 SDS 15
540/542	76	LV	7536	F	3.0	1:40	73	770	BEG 12/13/04
541/542	173	LV	753C	F	3.0	1:40	73	770	SDS-16
542/543	72	JC	7533	F	3.0	9:45	73	770	
542/544	176	JC	7533	F	3.0	9:45	73	770	SDS-17
543/544	22	RZ	7514	F	3.5	9:25	73	770	
543/545	67	RZ	7514	F	3.5	9:45	73	770	
544/545	176	RZ	7514	F	3.5	9:45	73	770	SDS-18
545/546	70	CV	7536	F	3.0	10:25	73	775	
545/547	171	CV	7536	F	3.0	10:25	73	775	
546/547	22	LV	7536	F	3.0	10:07	73	775	SDS-19
546/548	69	JC	7533	F	3.0	10:55	73	770	
547/548	47	JC	7533	F	3.0	10:55	73	770	
548/549	81	JC	7533	F	3.5	2:15	73	770	
547/548	172	RZ	7514	F	3.5	11:00	73	770	
950/548	154	JC	7533	F	3.0	2:15	73	770	SDS-20
548/550	22	JC	7533	F	3.5	2:05	73	770	
Page Total			~~1294~~ 1802						
Cumulative Total			~~8442~~ 8454						

PRINT NAME: Dennis G. DuPont V by DGD

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SHEET 6 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/13/04

Secondary

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S51/S49	80	RZ	7514	F	3.5	2:20	73	770	
S51/S50	156	RZ	7514	F	3.5	2:20	73	770	
S51/S52	91	JC	7533	F	3.5	3:25	70	770	
S51/S53	145	JC	7533	F	3.5	3:25	70	770	
S52/S53	22	JC	7533	F	3.5	3:15	70	770	
S52/S54	88	RZ	7514	F	3.5	3:35	70	770	
S53/S54	145	RZ	7514	F	3.5	3:35	70	770	SDS 21
S54/S55	112	LV	7536	F	3.0	4:20	69	775	
S54/S56	121	LV	7536	F	3.0	4:20	69	775	
S56/S55	22	LV	7536	F	3.0	4:00	69	775	SDS 22
S55/S57	109	JC	7533	F	3.5	4:40	68	770	
S56/S57	121	RZ	7514	F	3.5	4:55	68	770	END 12/13/04 1212 + 8847 = 10,059
S58 S57	143	RZ	7514	F	3.5	10:15	68	770	BEG 12/14/04
S57 S59	84	RZ	7514	F	3.5	10:15	60	770	
S58 S59	22	JC	7533	F	3.4	9:00	58	770	
S59 S60	85	RZ	7514	F	3.5	9:08	58	770	
S58 S60	143	RZ	7514	F	3.5	9:08	58	770	
S60 S61	144	JC	7533	F	3.4	9:15	58	770	
S60 S62	81	JC	7533	F	3.4	9:15	58	770	
Page Total			1914 ✓						
Cumulative Total			10364 10368		+ 318AT				

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GEOMEMBRANE SEAMING LOG

SHEET 7 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/14

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S62/S61	22	CV	7515	F	3.0	9:30	60	770	
S61/S63	142	CV	7515	F	3.0	9:50	60	770	
S62/S63	80	CV	7515	F	3.0	9:50	60	770	
S63/S64	99	JC	7533	F	3.4	11:02	68	770	
S63/S65	121	JC	7533	F	3.4	11:02	68	770	
S64/S65	22	RZ	7514	F	3.5	1:20	68	770	
S65/S67	122	JC	7533	F	3.5	1:45	68	770	
S67/S64	17	JC	7533	F	3.5	1:45	68	770	
S66/S64	81	JC	7533	F	3.5	1:45	68	770	
S66/S67	22	JC	7533	F	3.5	1:30	68	770	
S66/S68	78	CV	7525	F	3.0	2:15	66	760	
S67/S68	138	CV	7525	F	3.0	2:15	66	760	
S68/S69	216	RZ	7514	F	3.5	2:30	62	770	AT SUMP 1160
S69/S70	83	JC	7533	F	3.5	3:17	60	770	
S70/S71	81	JC	7533	F	3.5	3:17	58	770	
S71/S72	77	CV	7525	F	3.0	3:25	55	760	
S69/S73	85	JC	7533	F	3.5	3:17	60	770	
S73/S74	81	RZ	7514	F	3.5	4:10	55	770	
S74/S75	77	CV	7525	F	3.0	4:06	55	770	END 12/14/04
Page Total			1644 ✓						
Cumulative Total			12,005 12						

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8

SCS ENGINEERS

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GEOMEMBRANE SEAMING LOG

SHEET 8 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/16/04

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
S75/S76	55	JC	7533	F	3.3	10:00	50	770	
S76/S77	30	JC	7533	F	3.3	10:45	50	770	
S78/S77	19	JC	7533	F	3.3	3:35	50	770	
S78/S79	132	RZ	7514	F	3.5	10:40	50	770	
S79/S80	156	RZ	7514	F	3.5	11:15	50	770	
S79/S77	20	JC	7533	F	3.3	3:35	50	770	
S79/S76	14	JC	7533	F	3.3	3:35	50	770	
S80/S76	20	JC	7533	F	3.3	3:35	50	770	
S72/S87	42	JC	7533	F	3.3	11:15	65	770	
S80/81	183	JC	7533	F	3.5	4:00	65	770	BSG 12/16/04
S81/S82	200	JC	7533	F	3.4	10:05	65	770	
S82/S83	242	JC	7533	F	3.4	11:00	65	770	
S83/S.84	194	RZ	7514	F	3.5	3:25	65	770	
S84/S.85	174	JC	7533	F	3.5	11:50	65	770	
S85/S86	149	RZ	7514	F	3.5	2:00	65	770	
✓S86/T1	146	SA	7426	E		1:00	65	550/500	
S86/87	23	JC	7533	F	3.5	3:15	65	770	
S87/85	24	JC	7533	F	3.5	3:15	65	770	
85/77	8	JC	7533	F	3.5	3:15	65	770	
Page Total			1831 ✓						
Cumulative Total			13836 43						

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SCS ENGINEERS

secondary

GEOMEMBRANE SEAMING LOG

SHEET 9 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
584/572	29	JC	7533	F	3.5	3:15	65	770	
583/571	22	RZ	7514	F	3.5	3:15	65	770	
583/570	22	RZ	7514	F	3.5	3:15	65	770	
583/569	22	JC	7533	F	3.5	3:40	60	770	
582/569	22	JC	7533	F	3.5	3:40	60	770	
581/588	6	RZ	7514	F	3.5	4:30	60	770	
588/574	18	RZ	7514	F	3.5	4:20	60	770	
581/575	17	RZ	7514	F	3.5	4:30	60	770	
581/574	7	RZ	7514	F	3.5	4:30	60	770	
588/573	7	RZ	7514	F	3.5	4:20	60	770	
588/582	18	RZ	7514	F	3.5	4:15	60	770	388
Page Total			~~388~~ 190 ✓						
Cumulative Total			~~14224~~ 14414						

033

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: [signature]

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SECONDARY

GEOMEMBRANE SEAMING LOG

SHEET 10 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/13 - 12/14/04

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
✓ 517/T1	22	BR	7417	E		9:00	70	550/500	12/9/04
✓ 524/T1	22	BR	0005	E		9:00			12/13/04
✓ 526/T1	22		0005	E					
✓ 528/T1	22		0005	E					
✓ 530/T1	22		0005						
✓ 531/T1	22		0005						
✓ 533/T1	22		0005						
✓ 534/T1	22		0005						
✓ 536/T1	22		0005			9:10			12/14/04
✓ 537/T1	22		0005						
✓ 539/T1	22		0005						
✓ 540/T1	22		0005						
✓ 542/T1	22		0005						
✓ 543/T1	22		0005						
✓ 545/T1	22		0005						
✓ 546/T1	22		0005						12/15/04
✓ 548/T1	22		7417						
✓ 550/T1	22		7417						
✓ 551/T1	22		7417						
		Page Total	418 ✓						
		Cumulative Total	14642 A51						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: [signature]

SCS ENGINEERS

SECONDARY

GEOMEMBRANE SEAMING LOG

SHEET 11 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/15 - 12/16/04

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
551/T1	22	BR	7417	E		9:10	70	500/550	12/15/BR
552/T1	22								
554/T1	22								
555/T1	22								
557/T1	22								
558/T1	22								
560/T1	22								
563/T1	22								
564/T1	22								
566/T1	22								
568/T1	22	SA	7417			9:00	70		12/16/04
569/T1	22								
570/T1	22								
571/T1	22								
572/T1	22								
587/T1	22								
* 523/T1	22	BR	0005	E		900	70	500/550	12/10/05
* 561/T1	22	BR	7417	E		9:10	70	500/550	12/15/05
Page Total			352						1
Cumulative Total			14,451 + 352 AT = 14803 ÷ 500 = 29.6 or 30						

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

PRINT NAME: Dennis G. DuPont

SIGNATURE: KD

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GEOMEMBRANE SEAMING LOG

SHEET 1 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P1|P2	169	JC	7533	F	3.5	10:55	70	770	12/29/04
P2|P3	192	JC	7536	F	3.6	2:50	70	770	
P3|P4	212	JC	7536	F	3.6	3:40	70	770	
P1|T1	20	RZ	7525	F	3.5	4:00	70	770	
P1|T1	109	JC	7536	F	3.6	4:35	70	770	Last Seam on 12/29/04
P5|P6	210	RZ	7533	F	3.5	9:20	65	770	12/30/04
P6|P7	210	JC	7536	F	3.5	9:20	65	770	
P7|P8	211	RZ	7533	F	3.5	10:25	70	770	
P8|P9	212	JC	7536	F	3.5	10:20	70	770	
P9|P10	214	CV	7525	F	3.5	10:55	70	770	
P10|11	212	JC	7536	F	3.5	11:17	70	770	
P11|12	184	RZ	7533	F	3.5	11:20	70	770	
P12|13	158	RZ	7533	F	3.5	2:00	75	770	
P4|P5	211	JC	7536	F	3.4	3:00	75	770	
P13|P14	10	RZ	7533	F	3.5	3:35	70	770	
P14|P15	12	RZ	7533	F	3.5	3:15	70	770	
P15|P16	37	RZ	7533	F	3.5	2:55	70	770	
P12|P15	24	RZ	7533	F	3.5	3:35	70	770	
P11|P15	8	RZ	7533	F	3.5	3:35	70	770	
Page Total			2615✓						
Cumulative Total			2615✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

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SHEET 2 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P11/P16	26	RZ	7533	F	3.5	3:35	70	770	
P14/P12	10	RZ	7533	F	3.5	3:35	70	770	
P13/P14	10	RZ	7533	F	3.5	3:35	70	770	
P17/P18	60	RZ	7533	F	3.5	4:48	70	770	
P3/P17	9	JC	7536	F	3.4	4:20	70	770	
P4/P17	22	JC	7536	F	3.4	4:20	70	770	
P5/P17	22	JC	7536	F	3.4	4:20	70	770	
P6/P17	22	JC	7536	F	3.4	4:20	70	770	
P7/P17	22	JC	7536	F	3.4	4:20	70	770	
P8/P17	22	JC	7536	F	3.4	4:20	70	770	
P9/P17	22	JC	7536	F	3.4	4:20	70	770	
P10/P17	21	JC	7536	F	3.4	4:20	70	770	
P16/P17	57	JC	7536	F	3.4	4:20	70	770	
P17/P19	209	RZ	7533	F	3.5	4:48	70	770	
P18/P19	22	JC	7535	F	3.4	5:00	70	770	End 12/30/04
P19/P20	210	JC	7536	F	3.4	9:50	65	770	Begin 12/31/04
P18/P20	59	JC	7536	F	3.4	9:50	65	770	
P20/21	173	RZ	7533	F	3.5	10:05	65	770	
P20/22	93	RZ	7533	F	3.5	10:05	65	770	
Page Total			1091 ✓						
Cumulative Total			3706 ✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

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SHEET 3 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P21/P22	22	RZ	7533	F	3.5	9:55	70	770	
P23/P17	53	JC	7536	F	3.4	11:10	70	770	
P23/P24	33	RZ	7533	F	3.5	11:15	70	770	
P24/P25	27	RZ	7533	F	3.5	11:25	70	770	
P2/P25	16	JC	7536	F	3.4	11:40	70	770	
P2/P24	7	JC	7536	F	3.4	11:40	70	770	
P2/P23	10	JC	7536	F	3.4	11:40	70	770	
P3/P23	21	JC	7536	F	3.4	11:40	70	770	End 12/31/04
✓P1/T1	36	SA	7426	E		1:30	70	500	Extrusion weld
P22/P26	93	JC	7523	F	3.5	12:50	80	770	Begin 1/5/05
P21/P26	173	JC	7523	F	3.5	12:50	80	770	
P26/28	96	RZ	7533	F	3.5	10:18	70	770	
P26/27	166	RZ	7533	F	3.5	10:18	70	770	
P27/P28	271	JC	7523	F	3.5	10:00	70	770	
P27/P29	72	JC	7523	F	3.5	10:15	70	770	
P31/P32	22	JC	7523	F	3.5	11:15	70	770	
P30/P29	22	EP	0005	F	3.5	10:12	70	770	
P30/P27	92	JC	7523	F	3.5	10:15	70	770	
Page Total			982✓						
Cumulative Total			4688✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

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SHEET 4 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P30/P28	97	JC	7523	F	3.5	10:15	70	770	
P31/P29	70	EP	0005	F	3.5	10:30	70	770	
P31/P30	125	EP	0005	F	3.5	10:30	70	770	
P32/30	64	EP	0005	F	3.5	10:30	70	770	
P32/33	63	RZ	7533	F	3.5	12:50	75	770	
P33/31	194	RZ	7533	F	3.5	12:50	75	770	
P33/34	86	EP	0005	F	3.5	12:57	75	770	
P33/35	171	EP	0005	F	3.5	12:57	75	770	
P34/35	22	EP	0005	F	3.5	1:45	75	770	
P34/36	85	JC	7523	F	3.5	2:18	75	770	
P35/36	91	JC	7523	F	3.5	2:18	75	770	
P35/37	74	JC	7523	F	3.5	2:18	75	770	
P36/37	22	RZ	7533	F	3.5	2:22	75	770	
P36/38	176	RZ	7533	F	3.5	2:32	75	770	
P37/38	73	RZ	7533	F	3.5	2:32	75	770	
P38/39	69	EP	0005	F	3.5	3:00	75	770	
P38/40	179	EP	0005	F	3.5	3:00	75	770	
P39/40	22	EP	0005	F	3.5	2:45	75	770	
P40/41	181	JC	7523	F	3.5	3:45	75	770	
Page Total			1864 ✓						
Cumulative Total			6,552 ✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: [signature]

SCS ENGINEERS Primary

SHEET 5 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P39|41	67	JC	7523	F	3.5	3:45	70	770	
P41|43	57	RZ	7533	F	3.5	4:15	70	770	
P41|42	190	RZ	7533	F	3.5	4:15	70	770	
P42|43	22	RZ	7533	F	3.5	4:05	70	770	
P42|44	189	EP	0005	F	3.5	4:30	70	770	
P43|44	55	EP	0005	F	3.5	4:30	70	770	End 1|5|05
P25|T1	12	SA	7426	E		2:30	75	500	Date: 1|3|05
P24|T1	5	SA	7426	E		2:30	75	500	1|3|05
P23|T1	22	SA	7426	E		4:25	70	500	1|3|05
P17|T1	22	SA	7426	E		4:25	70	500	1|3|05
P20|T1	22	SA	7426	E		3:45	75	500	1|5|05
P21|T1	22	SA	7426	E		3:45	75	500	1|5|05
P26|T1	22	SA	7426	E		3:45	75	500	1|5|05
P44|45	55	EP	0005	F		10:05	70	770	Begin 1|6|05
P44|46	188	EP	0005	F	3.5	10:05	70	770	
P45|46	22	EP	0005	F	3.5	9:40	70	770	
P46|47	192	RZ	7533	F	3.5	9:40	65	770	
P45|47	53	RZ	7533	F	3.5	9:40	65	770	
P47|49	17.5	JC	7523	F	3.4	10:20	65	770	
Page Total			1392 ✓						
Cumulative Total			7944 ✓						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE SEAMING LOG

SHEET 6 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P47/48	63	JC	T523	F	3.4	10:20	65	770	
P48/49	22	JC	T523	F	3.4	10:05	65	770	
P49/50	177	RZ	T533	F	3.5	10:50	65	770	
P48/50	60	RZ	T533	F	3.5	10:50	65	770	
P51/50	93	EP	0005	F	3.5	1:25	70	770	
P52/50	60	EP	0005	F	3.5	1:25	70	770	
P53/50	80	EP	0005	F	3.5	1:25	70	770	
P51/52	22	EP	0005	F	3.5	11:17	65	770	
P52/53	22	JC	T523	F	3.4	11:17	65	770	
P52/54	59	RZ	T533	F	3.5	1:18	70	770	
P51/54	93	RZ	T533	F	3.5	1:18	70	770	
P53/54	78	RZ	T533	F	3.5	1:18	70	770	
P54/56	158	JC	T523	F	3.5	2:13	70	770	
P54/55	71	JC	T523	F	3.5	2:13	70	770	
P55/56	22	JC	T523	F	3.5	1:55	70	770	
P55/57	70	RZ	T533	F	3.5	2:40	70	770	
P56/57	89	RZ	T533	F	3.5	2:40	70	770	
P56/58	68	RZ	T533	F	3.5	2:40	70	770	
P57/58	22	RZ	T533	F	3.5	2:30	70	770	
Page Total			1329 ✓ FT						
Cumulative Total			9,273 ✓ FT						

PRINT NAME: Dennis G. DuPont ✓ hh DGD

SIGNATURE: R am

SCS ENGINEERS primary

SHEET 7 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P27/T1	22	SA	7417	E		12:40	70	550	
P29/T1	22	SA	7417	E		12:50	70	550	
P31/T1	22	SA	7417	E		1:00	70	550	
P33/T1	22	SA	7417	E		1:10	70	550	
P35/T1	22	SA	7417	E		2:30	70	550	
P37/T1	22	SA	7417	E		2:45	70	550	
P38/T1	22	SA	7417	E		3:00	70	550	
P39/T1	22	SA	7417	E		3:15	70	550	
P41/T1	22	SA	7417	E		3:30	70	550	
P43/T1	22	SA	7417	E		3:45	70	550	
P44/T1	22	SA	7417	E		4:15	70	550	
P45/T1	22	SA	7417	E		4:45	70	550	
P47/T1	22	SA	7417	E		5:05	70	550	
P48/T1	22	SA	7417	E		9:35	65	550	
P50/T1	22	SA	7417	E		9:50	65	550	
P53/T1	22	SA	7417	E		10:15	65	550	
P54/T1	22	SA	7417	E		12:45	65	550	
P56/T1	22	SA	7417	E		1:00	65	550	
P58/T1	22	SA	7417	E		1:10	65	550	END 1/7/05
Page Total			418 ✓FL						
Cumulative Total			9,691 ✓FL						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE SEAMING LOG

SHEET 9 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P59/60	225	RZ	7533	F	3.5	9:58	65	770	Begin 1/10/05
P60/61	224	EP	0005	F	3.5	10:15	65	770	
P61/62	73	JC	7523	F	3.5	11:20	65	770	
P61/63	26	JC	7523	F	3.5	10:45	65	770	
P61/64	49	JC	7523	F	3.5	11:10	65	770	
P61/65	72	JC	7523	F	3.5	10:45	65	770	
P62/63	22	JC	7523	F	3.5	10:35	65	770	
P63/64	21	JC	7523	F	3.5	10:20	65	770	
P64/65	21	JC	7523	F	3.5	10:10	65	770	
P62/66	74	RZ	7533	F	3.5	11:28	70	770	
P63/66	26	RZ	7533	F	3.5	11:00	70	770	
P64/66	3	RZ	7533	F	3.5	11:00	70	770	
P64/67	44	RZ	7533	F	3.5	11:00	70	770	
P65/67	5	RZ	7533	F	3.5	11:00	70	770	
P65/68	66	RZ	7533	F	3.5	11:00	70	770	
P66/67	22	EP	0005	F	3.5	11:20	70	770	
P67/68	22	EP	0005	F	3.5	11:12	70	770	
P58/59	65	JC	7523	F	4.5	1:30	75	770	
P57/59	161	JC	7523	F	4.5	1:45	75	770	
Page Total			1,221 ✓						
Cumulative Total			10,912 ✓						

PRINT NAME: Dennis G. DuPont ✓ bh DGD

SIGNATURE: Ran

SCS ENGINEERS Primary

SHEET 9 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P66/69	104	EP	0005	F	3.5	2:00	75	770	
P67/69	50	EP	0005	F	3.5	1:45	75	770	
P68/69	63	EP	0005	F	3.5	1:30	75	770	
P69/70	216	RZ	7533	F	3.5	1:48	75	770	
P70/71	102	JC	7523	F	4.5	3:15	7	770	
P70/72	29	JC	7523	F	4.5	3:10	75	770	
P72/73	21	JC	7523	F	4.5	2:35	75	770	
P70/73	83	JC	7523	F	4.5	2:55	75	770	
P71/72	22	EP	0005	F	3.5	2:45	75	770	
P73/74	81	EP	0005	F	3.5	3:17	75	770	
P72/74	29	EP	0005	F	3.5	3:35	75	770	
P71/74	101	EP	0005	F	3.5	3:40	75	770	
P74/75	86	RZ	7533	F	3.5	3:15	75	770	
P75/76	85	RZ	7533	F	3.5	3:48	75	770	
P76/77	80	JC	7523	F	4.5	4:18	75	770	
P77/78	56	EP	0005	F	3.5	4:37	75	770	
P78/79	31	JC	7523	F	3.5	4:30	75	770	End 1/10 05
✓P59/T1	22	SA	7426	E		3:25	75	550	Begin 1/12 05
✓P60/T1	22	SA	7426	E		3:30	75	550	
Page Total			1283 ✓ FT						
Cumulative Total			12,195 ✓ FT						

PRINT NAME: Dennis G. DuPont ✓ by DGD

SIGNATURE: Rom

SCS ENGINEERS Primary

GEOMEMBRANE SEAMING LOG

SHEET 10 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P61/T1	22	SA	7426	E		3:35	75	550	
P65/T1	22	SA	7426	E		3:45	75	550	
P68/T1	22	SA	7426	E		4:00	75	550	
P69/T1	22	SA	7426	E		4:15	75	550	
P70/T1	22	SA	7426	E		4:30	75	550	
P73/T1	22	SA	7426	E		4:45	75	550	End 1/12/05
P74/T1	22	SA	7417	E		2:30	75	550	Begin 1/13/05
P75/T1	22	SA	7417	E		2:55	75	550	
P76/T1	22	SA	7417	E		3:05	75	550	
P77/T1	22	SA	7417	E		3:15	75	550	
P78/T1	22	SA	7417	E		3:30	75	550	
P79/T1	22	SA	7417	E		3:45	75	550	End 1/13/05
P80/81	149	JC	7523	F	3.5	10:25	50	770	Begin 1/3/05
P81/82	175	GM	7533	F	4.4	10:39	50	770	
P77/82	22	CV	75-05	F	4.0	11:06	55	770	
P78/82	9	CV	75-05	F	4.0	11:09	55	770	
P78/81	20	CV	75-05	F	4.0	11:12	55	770	
P79/81	12	CV	75-05	F	4.0	11:18	55	770	
P79/80	25	CV	75-05	F	4.0	11:25	55	770	
Page Total			676						
Cumulative Total			12,871						

PRINT NAME: Dennis G. DuPont

SIGNATURE: Rayn

SCS ENGINEERS Primary

GEOMEMBRANE SEAMING LOG

SHEET 11 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 1/31/05

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P80/T1	130	JC	7523	F	3.5	1:00	60	770	
P82/83	198	JC	7523	F	3.6	4:00	65	770	
P77/83	6	CV	75-05	F	4.0	4:00	65	770	
P76/83	22	CV	75-05	F	4.0	4:00	65	770	
P75/83	22	CV	75-05	F	4.0	4:00	65	770	
P83/84	250	CV	75-05	F	4.0	4:33	65	770	END 1/31/05
P85/86	153	GM	7533	F	4.4	8:15	60	770	Begin 2/1/05
P86/87	162	JC	7523	F	3.6	8:35	60	770	
P87/88	142	JC	7523	F	3.6	9:35	60	770	
P74/83	17	CV	75-05	F	4.0	5:09	65	770	Seam on 1/31/05
P74/84	22	CV	75-05	F	4.0	5:05	65	770	Seam on 1/31/05
P84/85	206	JC	7523	F	3.6	10:20	65	770	
P89/74	89	GM	7533	F	4.4	9:20	65	770	
P84/89	22	CV	75-05	F	4.0	10:51	65	770	
P89/90	90	CV	75-05	F	4.0	9:35	65	770	
P90/91	82	GM	7533	F	4.4	9:47	65	770	
P91/92	60	CV	75-05	F	4.0	10:03	65	770	
P92/93	32	GM	7533	F	4.4	10:24	65	770	
P84/90	20	CV	75-05	F	4.0	10:51	65	770	
Page Total			1,725						
Cumulative Total			14,596						

PRINT NAME: Dennis G. DuPont

SIGNATURE: Raw

SCS ENGINEERS Primary

SHEET 12 of 12
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE SEAMING LOG

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP (deg. F)	WEATHER/CONDITIONS/COMMENTS
P85/86	33	JC	7523	F	3.6	9:15	65	770	
P88/93	19	GM	7533	F	4.4	10:43	65	770	
P87/93	19	GM	7533	F	4.4	10:54	70	770	
P87/92	12	GM	7533	F	4.4	10:59	70	770	
P86/92	21	GM	7533	F	4.4	11:02	70	770	
P91/86	10	GM	7533	F	4.4	11:07	70	770	
P91/85	22	GM	7533	F	4.4	11:10	70	770	End 2/1/05
Page Total			136						
Cumulative Total			14732 ÷ 500 = 29.4						A total of 31 destructive samples were taken

PRINT NAME: Dennis G. DuPont

SIGNATURE: Dan

ADDENDUM

SCS ENGINEERS

GEOMEMBRANE SEAMING LOG

PRIMARY

SHEET 1A of 3
PROJECT TITLE Citrus county phase2 expansion
PROJECT NO. 09199056.02
DATE 1/3/05 – 1/6/05

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP	WEATHER/CONDITIONS/COMMENTS
P1/T1	36'	SA	7436	E		1:30	68	500/460	BEG 1/3/05
P25/T1	12					1:30			
P24/T1	6					130			
P23/T1	22					1:30			
P17/T1	20					2:45			
✓P19/T1	5	SA	7417			3:45	67	505/500	1/5/05
P30/T1	22					3:45			
P21/T1	22					3:45			
P26/T1	22					3:45			
P27/T1	4'					3:45			
P27/T1	17	SA	7417			12:40	65	550/525	1/6/05
P29/T1	22								
P31/T1	22								
P33/T1	22								
P35/T1	22		7417						
P37/T1	22								
P38/T1	22								
P39/T1	22								
P41/T1	22								
P43/T1	22					3:45			
P44/T	22								

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

PRINT NAME: Dennis G. Dupont

SIGNATURE:

AL Dunn

SCS ENGINEERS

GEOMEMBRANE SEAMING LOG

PRIMARY

SHEET 24 of 32
PROJECT TITLE Citrus county phase2 expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP	WEATHER/CONDITIONS/COMMENTS
P45/T1	22	SA	7417	E		4:40	72		
P47/T1	22					9:20		550/500	1/7/05
P48/T1	22					9:40			
P50/T1	22					9:55			
P53/T1	22					10:15			
P54/T1	22					12:45			
P56/T1	22					1:00			
P58/T1	17					3:20	74	550/500	1/12/05
P58/T1	6								
P59/T1	22								
P60/T1	22								
P61/T1	22								
P65/T1	22								
P68/T1	22								
P69/T1	22					4:00			
P70/T1	22					4:30			
P73/T1	22					4:45			
P74/T1	22		7417			2:30	70	500/550	1/13/05
P75/T1	22					2:55			
P76/T1	22					3:05			
P77/T1	22					3:45			

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

PRINT NAME: Dennis G. Dupont

SIGNATURE:

Al Dunn

SCS ENGINEERS

GEOMEMBRANE SEAMING LOG

Primary

SHEET 31 of 3

PROJECT TITLE Citrus county phase2 expansion

PROJECT NO. 09199056.02

DATE

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP	WEATHER/CONDITIONS/COMMENTS
P78/T1	22	5A	7417	E		3:45	70	500/550	1/13/05
P79/T1	22	1	1	1		1	1	1	
P80/T1	147	JC	7523	F	3.5	10:00	70	770	1/31/05

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

PRINT NAME: Dennis G. Dupont

SIGNATURE:

ADDENDUM

SCS E. INEERS

GEOMEMBRANE SEAMING LOG

PRIMARY

SHEET 1A of 1

PROJECT TITLE Citrus county phase2 expansion

PROJECT NO. 09199056.02

DATE 1/3/05 - 1/6/05

SEAM NO.	LENGTH OR SIZE	TECH. ID	MACH. NO.	WELD TYPE	SPEED SET	TIME	AIR TEMP (deg. F)	MACH. TEMP	WEATHER/CONDITIONS/COMMENTS
P19/T1	22	SA	7426	E		4:25	70	500/550	1/3/05
P51/T1	22	SA	7417	E		10:15	65	560/550	1/6/05 P53/T1 TYPO ON ORIGINAL

RECEIVED
JUL 21 2005
Southwest District Tampa

PRINT NAME: Dennis G. Dupont

SIGNATURE:

ATTACHMENT J

GEOMEMBRANE TRIAL WELD LOGS

SCS ENGINEERS

TRIAL WELD LOG SECONDARY

SHEET 1 of 3
PROJECT TITLE Citrus County Landfill Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/6/04 –

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
12/6	1:25	RZ	7543	80			770	3.5	118/116	117/117	118/123	119/121	123/124	166	164	162	160/167	P
	1:40	LM	7513	80			770	3.0	123/121	122/124	122/124	128/123	127/127	162	164	167	167/169	P
	1:40	JC	7540	80			770	3.0	121/123	125/119	119/126	127/120	123/125	166	168	162	167/161	P
12/7	8:00	LM	7513	75			770	3.0	128/121	121/127	INCURSION							F
	8:10	RZ	7543	75			770	3.5	133/134	133/136	136/134	129/130	129/134	175	181	173	177/185	P
	8:10	JC	7540	75			770	3.0	132/132	128/126	116/123	125/128	124/132	176	181	173	177/185	P
OK	8:00	BC	7517	75	500	375°			119	123	124	119	121	174	171	177	168/179	P
	9:15	LM	7513	80			770	2.7	123/128	130/131	128/133	135/133	129/134	176	181	179	177/174	P
	1:20	RZ	7543	80			770	3.5	119/126	123/133	137/133	128/133	129/127	165	171	159	163/166	P
	1:30	BR	7417	80	500	375°			119	118	123	124	125	162	160	166	168/167	P
	2:40	EP	7426	80	445	390			123	121	124	119	116	160	159	164	166/162	P
12/8	9:00	JC	7533	80			770	3.0	132/125	133/127	121/128	120/124	131/131	183	181	174	177/178	P
	8:40	BR	7430	80	500	350			118	119	121	119	123	174	171	167	166/164	P
	9:05	RZ	7543	80			770	3.5	128/136	133/128	123/124	131/133	127/129	173	169	167	171/164	P
	1:20	RZ	7543	83			770	3.5	134/131	128/136	133/131	139/137	131/137	166	165	163	167/161	P
	1:25	JC	7533	83			770	4.0	122/120	124/129	119/115	120/124	124/119	167	170	161	171/166	P
	1:20	BR	7430	83	500	375			118	121	119	123	116	156	159	161	157/155	P
	2:55	RZ	7536	83			770	3.5	127/126	124/128	117/126	126/136	124/128	169	163	168	172/176	P
12/9	8:08	JC	7533	75			770	3.0	127/136	133/133	134/133	137/134	132/136	188	186	189	178/182	P
	8:20	RZ	7536	75			770	3.5	136/137	133/136	132/137	132	PEEL					F
	9:00	RZ	7536	75			770	3.5	137/136	134/133	134/139	137/139	133/135	166	171	168	165/167	P
OK	9:50	BR	7430	78	500	375			120	119	123	121	119	174	171	163	167/172	P
	12:45	RZ	7536	80			770	4.0	123/127	129/125	131/127	PEEL						F

PRINT NAME: Dennis G. DuPont

SIGNATURE:

SCS ENGINEERS

SECONDARY

TRIAL WELD LOG

SHEET 2 of 3

PROJECT TITLE Citrus County Landfill Phase 2 Expansion

PROJECT NO. 09199056.02

DATE 12/9 - 12/14

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
12/9	12:50	JC	7533	80			770	4.0	124/135	129/129	134/135	130/136	135/133	177	171	173	176/179	P
	1:00	BR	7430	80	500	375			119	118	118	119	118	170	177	174	173/180	P
	1:50	CV	7515	80			770	3.0	121/150	137/135	136/136	134/138	139/132	664	167	169	166/171	P
	1:50	RZ	75200014	80			770	3.5	126/132	130/134	127/121	124/124	136/140	162	158	163	166/160	P
12/10	7:50	CV	7417	75	520	400			128/	120	127	120	123	165	162	171	167/169	P
	8:10	RZ	7426	75	460	330			123	117	116	125	119	166	169	171	170/174	P
	8:15	BR	7430005	75	500	400			124	127	124	121	119	163	167	166	161/158	P
12/13	8:55	RZ	75200014	80			770	3.5	135/137	139/137	140/138	135/141	144/145	189	193	191	186/188	P
	9:05	JC	7533	80			770	3.0	144/142	146/144	141/144	146/142	139/141	173	178	183	179/185	P
	9:05	CV	7536	80			770	3.0	146/141	137/143	144/137	138/140	140/144	182	189	179	177/183	P
	9:20	BR	0005	80	500	400			119	126	122	120	121	188	183	181	178/186	P
	1:10	RZ	7514	80			770	3.5	141/141	144/141	140/147	133/135	138/139	163	165	169	162/166	P
	11:20	CV	7536	80			775	3.0	133/140	140/137	141/139	140/139	137/135	175	178	169	171/174	P
	1:00	JC	7533	80			770	3.5	137/141	140/144	147/144	137/140	139/146	175	173	166	162/170	P
	1:00	BR	0005		500	400			124	121	127	119	122	167	171	170	161/167	P
	3:45	CV	7536				775	3.0	145/148	143/135	144/142	137/141	138/137	161	166	163	159/167	P
12/14	8:40	JC	7573	70			770	3.4	145/142	143/142	146/145	144/141	144/146	183	179	181	186/184	P
	8:45	RZ	7514	70			770	3.5	148/145	144/145	141/142	147/141	144/142	184	186	177	183/179	P
	9:46	CV	7513	70			770	3.5	144/146	143/148	143/144	143/147	145/143	183	183	184	181/186	P
	9:15	BR	0005	75	500	450			129	122	119	125	116	188	184	179	187/185	P
	1:00	RZ	7514	80			770	3.5	149/141	144/139	144/147	144/143	143/145	179	181	176	183/184	P
	1:05	JC	7573	80			770	3.5	132/138	144/145	135/144	143/146	144/139	177	184	181	173/180	P
	1:10	BR	0005	80	500	450			128	126	123	121	124/	183	169	167	171/164	

PRINT NAME: Dennis G. DuPont

SIGNATURE: KAD

SCS ENGINEERS

SECONDARY

TRIAL WELD LOG

SHEET 3 of 3
PROJECT TITLE Citrus County Landfill Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
12/15	8:30	RZ	7514	55			770	3.0	131/137	146/140	148/138	144/145	148/146	184	179	186	181/184	P
	8:40	JC	7533	55			770	3.3	147/145	148/144	143/144	147/148	144/145	186	181	188	183/188	P
	10:00	BR	7417	55	550	520			121	123	119	119	118	163	191	164	166/177	P
	2:20	RZ		55	460	330			131	122	132	133	131	168	177	164	166/177	P
	2:35	JC	7533	55			770	3.3	133/131	132/130	134/134	137/131	127/135	180	183	178	184/186	P
1/16	8:10	RZ	0014	60			770	3.5	141/144	143/140	138/141	141/137	138/141	199	193	191	197/200	P
	8:15	BR	7417	60	550	520			116	119	121	116	121	193	198	190	197/198	P
	8:38	SA	7426	60	550	500			113	124	131	129	130	199	193	191	198/198	P
	8:30	JC	7533	60			770	3.4	141/138	144/142	145/140	144/144	141/143	197	204	194	198/193	P
	1:50	BR	7417	65	500	520			129	122	119	118	123	168	170	161	167/164	P
	1:15	JC	7533	65			770	3.5	119/117	127/119	129/124	123/129	118/119	168	170	168	167/169	P
	1:35	RZ	0014	65			770	3.5	128/127	133/137	137/134	133/135	131/123	164	163	170	166/171	P
2/17	12:30	SA	7416	60	550	500			124	121	122	123	124	160	155	167	158/161	P
1/17	12:50	BR	7417	65	550	500			130	128	123	121	125	164	166	160	171/167	P
	8:35	BR	7417		550	500			127	120	119	120	121	160	155	170	168/166	P
	9:15	RZ	0014	60			770	3.5	120/116	123/121	130/125	127/131	130/125	157	160	154	161/163	P
2/20	8:10	BR	7417	40	520	500			134	131	129	133	124	182	188	191	183/182	P
1/20	12:45	BR	7417	50	520	500			117	126	121	123	129	175	176	181	177/179	P
	REPAIR		7/1/05		FOR	SDS	#16	AA										
1/1	8:11	AO	7410	83°	530	400			129	129	123	124	145	165	165	164	164	P

PRINT NAME: Dennis G. DuPont

SIGNATURE: Dennis G. DuPont

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS Primary

TRIAL WELD LOG

SHEET 1 of 3
PROJECT TITLE Citrus County Landfill Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
2/29	10:30	JC	7533	65			770	3.5	128/131	126/120	122/125	125/124	123/120	167	169	171	166/169	P
	1:00	JC	7533	75			770	3.8	125/131	126/123	124/119	128/133	125/131	163	159	161	167/165	P
	2:45	JC	7536	70			770	3.6	121/128	135/142	135/136	132/133	137/138	177	171	173	168/170	P
	3:30	RZ	7525	70			770	3.5	135/141	141/137	139/138	141/144	137/146	165	167	170	166/164	P
12/30	8:00	RZ	7533	60			770	3.5	137/143	146/141	146/145	144/143	148/147	199	200	197	210/205	P
	8:10	JC	7536	60			770	3.5	143/144	144/147	143/148	145/140	144/146	198	203	199	190/201	P
	10:25	CV	7525	70			770	3.8	137/133	139/133	136/140	134/130	131/136	182	183	188	186/188	P
	1:30	RZ	7533	75			770	3.5	126/131	122/126	128/136	128/135	134/137	170	168	171	169/163	P
	2:40	JC	7536	70			770	3.4	138/130	139/131	126/139	137/135	139/137	174	169	173	171/177	P
2/31	9:00	RZ	7533	65			770	3.5	140/141	141/146	145/144	142/144	148/146	175	177	183	180/186	P
	9:10	JC	7536	65			770	3.4	138/146	144/139	143/144	138/143	144/145	173	179	173	177/181	P
1/3/05	8:30	SA	7426	65	500	460			127	123	125	119	122	180	183	177	186/181	P
	1:00	SA	7426	75	500	460			121	127	119	123	125	177	169	174	179/180	P
1/4/05	8:30	SA	7426	60	500	480			126	121	123	129	127	181	177	184	180/188	P
	1:00	SA	7426	70	500	460			132	129	131	119	130	172	178	176	171/177	P
1/5/05	8:50	SA	7417	65	525	500			119	120	131	122	131	185	184	175	179/188	P
	9:25	RZ	7533	70			760	3.5	120/126	130/133	131/133	127/134	130/127	176	181	177	173/170	P
	9:25	JC	7523	70			770	3.5	129/131	126/129	132/127	127/131	133/135	178	181	167	180/177	P
	9:40	EP	0005	70			770	3.5	130/136	133/138	137/139	132/137	134/136	182	172	183	175/171	P
	2:00	JC	7523	80			770	3.5	124/130	130/121	130/134	128/133	132/127	162	163	166	167/170	P
	2:05	RZ	7533	80			770	3.5	123/130	133/131	127/135	124/124	122/130	158	167	161	166/158	P
	2:10	EP	0005	80			770	3.5	133/133	126/133	135/130	132/133	128/129	167	168	163	170/169	P
	2:00	SA	7417	80	525	500			128	129	123	126	131	169	171	166	168/170	P

PRINT NAME: Dennis G. DuPont

SIGNATURE: Rami

SCS ENGINEERS Primary

TRIAL WELD LOG

SHEET 2 of 3
PROJECT TITLE Citrus County Landfill Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
1/6/05	8:30	RZ	7533	65			770	3.5	133/136	131/138	131/137	133/139	138/138	181	186	191	180/184	P
	8:35	EP	0005	65			770	3.5	135/134	142/141	145/144	137/139	140/142	188	191	183	188/191	P
	8:45	JC	7523	65			770	3.4	141/143	143/142	144/141	139/140	142/144	190	181	188	179/184	P
	11:50	SA	7417	65	550	500			132	135	133	130	127	167	171	177	170/168	P
	12:45	RZ	7533	65			770	3.5	125/130	128/130	127/129	131/134	133/137	168	177	171	168/175	P
	1:00	EP	0005	65			770	3.5	135/130	134/133	135/133	131/139	141/138	171	177	168	167/173	P
	1:15	JC	7523	65			770	3.5	131/133	127/129	123/127	134/133	137/140	168	173	170	179/181	P
1/7/05	8:15	SA	7417	65	550	500			121	122	122	119	120	188	180	184	188/182	P
1/10/05	9:30	RZ	7533	65			770	3.5	133/134	138/132	140/138	133/143	144/143	177	180	183	179/182	P
	9:25	EP	0005	65			770	3.5	138/137	140/138	129/131	128/131	140/144	184	183	180	177/189	P
	9:35	JC	7523	65			770	3.5	177/143	148/151	139/141	147/141	143/144	174	177	181	169/177	P
	12:50	RZ	7533	75			770	3.5	138/143	138/134	127/127	131/129	128/133	166	170	173	168/171	P
	12:55	EP	0005	75			770	3.5	128/131	133/129	137/130	126/131	127/128	174	163	166	171/165	P
	1:00	JC	7523	75			770	3.5	129/137	136/135	127/133	129/131	121/133	168	169	173	165/167	P
	1:00	SA	7417	75	550	500			130	133	129	127	133	167	167	174	171/178	P
1/11/05	9:20	RZ	7405	60	450	440			123	124	129	129	117	188	183	179	177/174	P
	8:45	SA	7417	60	550	500			127	128	131	129	127	182	188	191	179/184	P
	1:00	RZ	7405	65	450	440			138	125	133	123	133	177	169	171	179/176	P
	1:10	SA	7417	65	550	500			137	135	131	129	134	170	167	173	180/181	P
1/12/05	9:40	SA	7426	65	550	500			127	131	133	131	133	176	179	171	168/168	P
	1:00	SA	7426	70	550	500			125	129	122	128	123	183	171	188	181/186	P
1/31/05	9:40	JC	7523	55			770	3.5	133/136	134/137	136/136	131/132	136/141	195	188	193	184/189	P
1/31/05	10:00	GM	7533	55			770	4.4	144/144	136/142	144/139	141/146	145/147	184	183	189	191/188	P

PRINT NAME: Dennis G. DuPont

SIGNATURE: Ram

SCS ENGINEERS Primary

TRIAL WELD LOG

SHEET 3 of 3
PROJECT TITLE Citrus County Landfill Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

	TIME	TECH I.D.	MACH. I.D.	AMB. TEMP	EXTRUSION WELDS		FUSION WELDS		PEEL					SHEAR				P/F
					BARREL TEMP.	PREHEAT TEMP.	WEDGE TEMP	WEDGE SPEED										
1/31/05	10:20	CV	75-05	55			770	4.0	145/145	143/144	149/146	147/147	144/146	199	197	188	191/190	P
	2:35	JC	T523	60			770	3.6	143/137	141/143	135/137	139/143	146/148	185	188	174	183/182	P
	2:30	CV	75-05	60			770	4.0	132/144	140/143	139/145	148/148	139/142	164	167	171	160/166	P
	1:45	RM	7417	60	480	540			139	129	119	129	124	174	181	179	188/185	P
2/1/05	7:55	GM	7533	60			770	4.4	133/134	143/141	137/133	140/139	141/143	193	197	183	186/190	P
	8:00	JC	7523	60			770	3.6	142/140	144/146	142/141	138/143	144/147	193	188	191	190/189	P
	8:25	CV	75-05	60			770	4.0	144/141	147/144	141/138	139/133	142/140	188	188	191	193/198	P
	12:45	RM	7415		500	450			126	124	122	128	127	188	183	177	181/187	P
	1:20	CV	74-3005		500	480			123	128	123	127	121	184	181	176	173/176	P
2/5/05	12:30	SA	7426	65	550	500			119	123	121	118	125	188	183	189	191/186	P

PRINT NAME: Dennis G. DuPont

SIGNATURE:

ATTACHMENT K

GEOMEMBRANE NON-DESTRUCTIVE TEST LOGS

SCS ENGINEERS

SECONDARY

NON-DESTRUCTIVE TEST LOG

SHEET 1 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/7 - 12/10/04

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	AIR TEST TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
✓ S1/T1	JV								P	12/10/04
S1/S2	LM	30	30	0	2:19	2:24	5	P		BEG 12/7
S1/S2	LM	30	30	0	2:18	2:23	5	P		
S2/S3	LM	31	30	1	3:08	3:15	5	P		
S3/S4	LM	30	30	0	2:21	2:26	5	P		
S4/S5	LM	31	30	1	7:53	7:58	5	P		12/8
S5/S6	LM	30	30	0	2:22	2:27	5	P		
S6/S7	LM	30	30	0	2:22	2:27	5	P		
S7/S8	LM	31	31	0	2:23	2:28	5	P		
S8/S9	LM	30	30	0	2:39	2:44	5	P		
S9/S10	LM	30	30	0	2:40	2:45	5	P		
S10/S11	LM	31	31	0	3:12	3:17	5	P		
S11/S12	LM	30	30	0	7:59	8:04	5	P		12/8
S12/S13	SV	31	30	1	8:10	8:15	5	P		
S12/S13	SV	30	29	1	8:16	8:21	5	P		
S12/S13	SV	30	30	0	8:22	8:27	5	P		
S16/S22	BR	30	30	0	4:43	4:48	5	P		
S22/S3	BR	30	30	0	4:45	4:50	5	P		
S21/S2	BR	31	30	0	4:25	4:30	5	P		
S20/S2	BR	30	30	0	4:41	4:46	5	P		
S20/S1	BR	30	30	0	4:09	4:14	5	P		
S20/S1	BR	30	30	0	4:20	4:25	5	P		
S20/S21	BR	30	30	0	4:31	4:36	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: [signature]

SCS ENGINEERS

SECONDARY

NON-DESTRUCTIVE TEST LOG

SHEET 2 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/8/04

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
S21/S22	BR	30	30	0	4:33	4:38	5	P		12/9
S16/S22	BR	30	30	0	4:33	4:48	5	P		
S16/S4	BR	30	30	0	4:52	4:57	5	P		
S16/S5	BR	30	30	0	4:54	4:59	5	P		
S16/S6	BR	30	30	0	4:56	5:01	5	P		
S16/S7	BR	30	30	0	5:01	5:06	5	P		
S16/S8	BR	30	30	0	5:09	5:14	5	P		
S16/S9	BR	30	29	1	5:10	5:15	5	P		12/8 EOD
S16/S10	BR	30	29	1	7:42	7:47	5	P		BEG 12/9
S16/S15	BR	30	30	0	8:18	8:23	5	P		
S10/S15	BR	30	30	0	8:16	8:21	5	P		
S10/S15	BR	30	30	0	7:40	7:45	5	P		
S11/S15	BR	30	30	0	7:45	7:50	5	P		
S11/S14	BR	30	30	0	7:46	7:51	5	P		
S12/S14	BR	30	30	0	7:58	8:03	5	P		
S14/S19	BR	30	30	0	8:01	8:06	5	P		
S19/S20	BR	30	30	0	8:01	806	5	P		
S19/S13	BR	30	30	0	8:23	8:28	5	P		
S16/S18	BR	30	30	0	8:28	8:33	5	P		
S17/S18	BR	30	30	0	8:29	8:34	5	P		
S17/S16	BR	30	30	0	9:11	9:16	5	P		
S17/S23	BR	30	30	0	9:10	9:15	5	P		
S23/S18	BR	30	30	0	8:36	8:41	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE:

SCS ENGINEERS

SECONDARY NON-DESTRUCTIVE TEST LOG

SHEET 3 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/10/04

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
523/525	BR	30	30	0	8:38	8:43	5	P		
523/524	BR	30	30	0	9:08	9:13	5	P		
524/525	BR	30	30	0	8:41	8:46	5	P		
524/526	BR	30	30	0	9:03	9:08	5	P		
526/527	BR	30	30	0	8:53	8:58	5	P		
524/527	BR	30	30	0	8:57	9:02	5	P		
525/527	BR	30	30	0	8:40	8:45	5	P		12/10/04
527/529	BR	31	30	1	9:45	9:50	5	P		
528/527	BR	30	30	0	8:53	8:58	5	P		
528/526	CM	30	30	0	8:50	8:55	5	P		
528/529	CM	30	30	0	8:55	9:00	5	P		
529/530	CM	30	30	0	4:46	4:51	5	P		
528/530	CM	30	30	0	8:53	8:58	5	P		
530/531	CM	30	30	0	9:02	9:07	5	P		
530/532	CM	30	30	0	9:51	9:56	5	P		
531/532	CM	30	30	0	9:05	9:10	5	P		
532/533	CM	30	29	1	9:53	9:53	5	P		
531/533	CM	30	30	0	9:04	9:09	5	P		
533/534	CM	30	31	0	9:10	9:15	5	P		
534/535	CM	30	30	0	9:12	9:17	5	P		
534/536	CM	30	29	0	9:13	9:18	5	P		
535/536	CM	31	30	0	10:00	10:05	5	P		
536/537	CM	30	30	1	9:18	9:23	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: [signature]

SCS ENGINEERS

NON-DESTRUCTIVE TEST LOG (SECONDARY)

SHEET 4 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
S36/S38	CM	30	29	1	10:06	10:11	5	P		12/14/04
S37/S38	CM	31	31	0	9:21	9:26	5	P		
S38/S39	LM	30	30	0	10:07	10:12	5	P		
S37/S39	LM	31	30	1	9:20	9:25	5	P		
S39/S40	CM	30	29	1	9:29	9:34	5	P		
S41/S39	LM	31	30	1	10:13	10:18	5	P		
S40/S41	CM	30	30	0	9:30	9:35	5	P		
S40/S42	BN	30	30	0	9:53	9:58	5	P		
S41/S42	BN	31	30	0	3:20	3:25	5	P		12/15/04
S41/S42	↓	30	30	0	3:10	3:15	5	P		
S43/S42	BN	30	30	0	9:29	9:34	5	P		12/14/04
S43/S44	LM	30	30	0	3:22	3:27	5	P		
S42/S44	LM	30	29	1	3:23	3:28	5	P		12/15/04
S43/S45	BN	30	30	0	9:30	9:35	5	P		
S44/S45	LM	31	30	0	3:27	3:32	5	P		
S45/S46	BN	30	30	0.	9:35	9:40	5	P		
S45/S47	BN	30	29	1	3:30	3:35	5	P		
S46/S48	BN	30	30	0	9:37	9:42	5	P		
S46/S47	LM	31	30	1	3:35	3:40	5	P		
S47/S48	LM	31	30	1	3:39	3:44	5	P		
S48/S50	BN	30	30	0	9:40	9:45	5	P		
S48/S49	LM	31	30	1	3:55	4:00	5	P		
S49/S50	LM	31	31	0	3:57	4:02	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: KP

SCS ENGINEERS

secondary

NON-DESTRUCTIVE TEST LOG

SHEET 5 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	END	DROP	AIR TEST TIME START	END	DURATION	P/F	VACUUM BOX P/F	COMMENTS
S50/S51	BN	30	30	0	9:44	9:49	5	P		12/14/04
S49/S51		31	30	1	3:58	4:03	5	P		12/15/04
S51/S52		30	30	0	9:42	9:47	5	P		12/14/04
S51/S53		31	30	1	4:06	4:11	5	P		12/15/04
S52/S53		30	30	0	4:08	4:13	5	P		↓
S52/S54		30	30	0	8:14	8:19	5	P		12/15/04
S53/S54		30	29	1	4:09	4:14	5	P		↓
S54/S55		30	30	0	8:19	8:21	5	P		12/14/04
S54/S56		31	30	0	4:24	4:29	5	P		12/15/04
S55/S56		30	30	0	4:25	4:30	5			↓
S55/S57		30	30	0	8:20	8:25	5	P		12/14/04
S57/S58		30	30	0	8:27	8:27	5	P		↓
S56/S57		31	30	1	4:26	4:31	5	P		12/15/04
S58/S59		30	30	0	4:40	4:45	5	P		↓
S58/S60		30	30	0	8:23	8:28	5	P		12/14/04
S59/S60		31	30	1	4:39	4:44	5	P		12/15/04
S60/S61		30	29	1	8:26	8:31	5	P		12/14/04
S60/S62		31	30	1	4:49	4:54	5	P		12/15/04
S62/S61		30	30	0	4:51	4:56	5	P		↓
S61/S63		30	29	1	8:34	8:39	5	P		12/14/04
S62/S63		30	29	1	4:50	4:56	5	P		12/15/04
S63/S64		30	30	0	8:36	8:41	5	P		12/14/04
S63/S65		30	30	0	5:00	5:05	5	P		12/15/04

PRINT NAME: Dennis G. DuPont

SIGNATURE:

SCS ENGINEERS

NON-DESTRUCTIVE TEST LOG (Secondary)

SHEET 6 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
S64/S65	BN	30	30	0	5:01	5:06	5	P		
S64/S66	BN	30	30	0	3:03	3:08	5	P		
S65/S67	BN	30	30	0	5:00	5:05	5	P		
S64/S67	BN	30	30	0	8:40	8:45	5	P		
S66/S68	BN	30	30	0	3:05	3:10	5	P		
S67/S68	LM	31	30	1	8:40	8:45	5	P		
S67/S66	LM	30	30	0	8:41	8:46	5	P		
S68/S69	LM	31	30	1	8:25	8:30	5	P		
S69/S70	LM	31	30	1	7:58	8:03	5	P		
S70/S71	LM	30	30	0	8:10	8:15	5	P		
S71/S72	LM	30	29	1	8:07	8:12	5	P		Test Performed on 12/17/04
S69/S73	LM	31	30	1	8:50	8:55	5	P		
S73/S74	LM	31	30	1	9:05	9:10	5	P		
S74/S75	LM	31	30	1	9:25	9:30	5	P		
S75/S76	LM	30	30	0	9:25	9:30	5	P		
S77/S76	LM	30	30	0	9:33	9:37	4	P		
S77/S78	LM	31	30	1	9:36	9:41	5	P		
S78/S79	LM	30	29	1	1:30	1:35	5	P		
S57/S59	LM	31	30	1	4:37	4:42	5	P		12/15/04
S79/S80	LM	30	29	1	1:36	1:41	5	P		12/17/04
S80/S81	LM	31	30	1	10:08	10:13	5	P		↓
S81/S82	LM	31	30	1	11:10	11:15	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: KP/Ram

SCS ENGINEERS

Secondary

NON-DESTRUCTIVE TEST LOG

SHEET 7 of 8
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	END	DROP	AIR TEST TIME START	END	DURATION	P/F	VACUUM BOX P/F	COMMENTS
S82/S83	LM	32	31	1	1:47	1:52	5	P		
S83/S84	LM	30	30	0	10:46	10:51	5	P		
S84/S85	LM	31	30	1	2:05	2:10	5	P		
S85/S86	LM	31	30	1	2:06	2:11	5	P		
S86/S87	LM	30	30	0	8:22	8:27	5	P		
S87/S72	LM	30	30	0	8:18	8:23	5	P		
S85/S71	LM	30	29	1	10:55	11:00	5	P		
S85/S72	LM	31	30	1	10:45	10:50	5	P		
S84/S72	LM	31	30	1	10:44	10:49	5	P		
S83/S71	LM	31	31	0	10:41	10:46	5	P		
S83/S70	LM	30	29	1	10:40	10:45	5	P		12/17/04 (Test Performed)
S83/S69	LM	30	29	1	10:35	10:40	5	P		
S82/S69	LM	31	30	1	10:34	10:39	5	P		
S82/S73	LM	30	30	0	8:58	9:03	5	P		
S82/S88	LM	30	29	1	9:19	9:24	5	P		
S88/S73	LM	30	30	0	9:09	9:14	5	P		
S74/S88	LM	30	30	0	9:15	9:20	5	P		
S88/S81	LM	30	30	0	9:16	9:21	5	P		
S74/S81	LM	30	30	0	10:31	10:36	5	P		
S75/S81	LM	30	30	0	10:05	10:10	5	P		
S75/S80	LM	30	30	0	10:26	10:31	5	P		
S76/S80	LM	31	30	1	10:54	10:59	5	P		
S76/S79	LM	30	30	0	9:51	9:56	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: ICP / Raw

SCS ENG. EERS Secondary

NON-DESTRUCTIVE TEST LOG

SHE 8 of 8
PROJ. TITLE
PROJECT NO.
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	END	DROP	AIR TEST TIME START	END	DURATION	P/F	VACUUM BOX P/F	COMMENTS
S77/S79	LM	30	30	0	9:50	9:55	5	P		
CAP AT S1/[illegible]	JC	30	30	0	7:35	7:40	5	P		
CAP AT S3/[illegible]	JC	31	30	1	12:53	12:58	5	P		
CAP AT S5/[illegible]	JC	31	31	0	12:54	12:59	5	P		
CAP AT S43/41	LM	31	30	1	9:21	9:26	5	P		
CAP AT S43/41	LM	31	30	1	9:21	9:26	5	P		
CAP AT S42/41	LM	30	29	1	9:22	9:27	5	P		
CAP AT S42/41	LM	31	31	0	9:22	9:27	5	P		
CAP AT S42/41	LM	30	29	1	9:14	9:19	5	P		
CAP AT S42/41	LM	31	30	1	9:13	9:18	5	P		
CAP AT S42/41	LM	30	29	1	9:07	9:12	5	P		
AP AT S42/41	LM	31	30	1	9:07	9:12	5	P		
AP AT S42/41	LM	31	30	1	9:06	9:11	5	P		
AP AT S42/41	LM	31	30	1	9:06	9:11	5	P		
AP AT S42/41	LM	30	29	1	8:59	9:04	5	P		
AP AT S42/41	LM	30	30	0	8:59	9:04	5	P		
AP AT S42/41	LM	30	30	0	8:58	9:03	5	P		
AP AT S42/41	LM	31	30	0	8:58	9:03	5	P		
AP AT S42/41	LM	31	30	1	2:03	2:08	5	P		
S83/84	LM									

PRINT NAME:

SIGNATURE: KP/Rowe

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 1 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/31/04

SEAM NO.	TECH I.D.	AIR TEST						P/F	VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME					
		START	END	DROP	START	END	DURATION			
P1/T1	JA	30	28	2	10:58	11:03	5	P		12/31/04 start
P1/T1	JA	30	30	0	10:53	10:58	5	P		
P1/T1	JA	30	30	0	11:18	11:23	5	P		
P1/P2	JA	30	30	0	11:30	11:35	5	P		
P2/P3	JA	30	30	0	11:23	11:28	5	P		
P3/P4	JA	30	29	1	10:39	10:44	5	P		
P4/P5	JA	30	30	0	11:45	11:50	5	P		
P4/P5	JA	30	30	0	11:33	11:38	5	P		
P3/P4	JA	30	30	0	10:25	10:30	5	P		12/31/04 End
P1/P25	JA	30	29	1	8:30	8:35	5	P		1/3/05 start
P2/P25	JA	30	30	0	8:33	8:38	5	P		
P25/P24	JA	30	30	0	8:38	8:43	5	P		
P2/P24	JA	30	30	0	8:50	8:55	5	P		
P24/P23	JA	30	30	0	8:59	9:04	5	P		
P2/P23	JA	30	30	0	8:56	9:01	5	P		
P2/P3	JA	30	30	0	9:04	9:09	5	P		
P3/P23	JA	30	29	1	9:10	9:15	5	P		
P17/P23	JA	30	30	0	9:26	9:31	5	P		
P17/P23	JA	30	30	0	9:34	9:39	5	P		
P3/P17	JA	30	30	0	9:20	9:25	5	P		
P4/P17	JA	30	29	1	9:25	9:30	5	P		
P5/P17	JA	30	30	0	9:44	9:49	5	P		
P6/17	JA	30	30	0	9:46	9:51	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Raw

SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 2 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P7/17	JA	30	30	0	9:48	9:53	5	P		
P8/P17	JA	30	30	0	9:50	9:55	5	P		
P9/P17	JA	30	30	0	9:57	10:03	5	P		
P10/P17	JA	30	29	1	10:01	10:06	5	P		
P11/P16	JA	30	29	1	10:12	10:17	5	P		
P11/P15	JA	30	30	0	10:15	10:20	5	P		
P15/P16	JA	30	30	0	10:08	10:13	5	P		
P12/P15	JA	30	30	0	10:17	10:22	5	P		
P14/P15	JA	30	30	0	10:25	10:30	5	P		
P12/P14	JA	30	30	0	10:27	10:32	5	P		
P16/P17	JA	30	30	0	10:06	10:11	5	P		
P5/P6	JA	30	30	0	10:37	10:42	5	P		
P6/P7	JA	30	30	0	10:40	10:45	5	P		
P7/P8	JA	30	30	0	10:44	10:49	5	P		
P8/P9	JA	30	29	1	10:47	10:52	5	P		
P9/P10	JA	30	30	0	11:05	11:10	5	P		
P9/P10	JA	30	30	0	10:59	11:04	5	P		
P10/11	JA	30	29	1	11:07	11:12	5	P		
P11/12	JA	30	30	0	11:16	11:21	5	P		
P12/13	JA	30	30	0	11:20	11:25	5	P		
P13/14	JA	30	30	0	11:22	11:27	5	P		
P16/17	JA	30	30	0	12:30	12:35	5	P		
P17/18	JA	30	30	0	12:34	12:39	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Raw

SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 3 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P18/19	JA	30	30	0	12:40	12:45	5	P		
P17/19	JA	30	30	0	1:03	1:10	5	P		
P18/20	JA	30	30	0	12:45	12:50	5	P		
P19/20	JA	30	30	0	1:07	1:12	5	P		
P20/21	JA	30	30	0	1:09	1:14	5	P		
R20/22	JA	30	30	0	12:47	12:52	5	P		
P21/22	JA	30	30	0	12:52	12:57	5	P		1/3/05 End
P27/29	CV	31	31	0	8:46	8:51	5	P		1/6/05 start
P29/30	CV	31	31	0	8:45	8:50	5	P		
P27/30	CV	31	31	0	8:47	8:52	5	P		
P29/31	CV	31	31	0	9:01	9:06	5	P		
P30/32	CV	30	30	0	8:55	9:00	5	P		
P29/31	CV	30	30	0	9:03	9:08	5	P		
P28/27	CV	30	30	0	9:19	9:24	5	P		
P26/27	CV	30	30	0	9:36	9:41	5	P		
P26/28	CV	30	29	1	9:20	9:25	5	P		
P21/26	CV	30	30	0	9:29	9:34	5	P		
P22/26	CV	31	31	0	9:31	9:36	5	P		
P28/30	CV	31	31	0	9:22	9:27	5	P		1/6/05 End
P32/30	CV	30	30	0	8:10	8:15	5	P		1/7/05 Begin
P30/31	CV	30	30	0	8:55	9:00	5	P		
P31/29	CV	31	31	0	9:01	9:06	5	P		
P31/P32	JA	30	30	0	8:05	8:10	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Raw

SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 4 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P32/33	JA	30	30	0	7:58	8:03	5	P		
P31/33	JA	30	30	0	7:57	8:02	5	P		
P33/34	JA	30	30	0	8:23	8:28	5	P		
P34/35	JA	30	30	0	8:17	8:22	5	P		
P33/35	JA	30	30	0	8:16	8:21	5	P		
P35/37	JA	30	30	0	8:37	8:42	5	P		
P36/37	JA	30	30	0	8:38	8:43	5	P		
P35/36	JA	30	30	0	8:30	8:35	5	P		
P34/36	JA	30	30	0	8:31	8:36	5	P		
P36/38	JA	30	30	0	8:47	8:52	5	P		
P37/38	JA	30	30	0	8:46	8:51	5	P		
P38/39	JA	30	30	0	8:58	9:03	5	P		
P38/40	JA	30	30	0	9:15	9:21	5	P		
P39/40	JA	30	30	0	9:14	9:19	5	P		
P39/41	JA	30	30	0	9:25	9:30	5	P		
P40/41	JA	30	30	0	4:53	4:58	5	P		
P41/42	JA	30	30	0	5:06	5:11	5	P		
P42/43	JA	30	30	0	9:30	9:35	5	P		
P41/43	JA	30	30	0	9:28	9:33	5	P		
P43/44	JA	30	30	0	9:31	9:36	5	P		
P42/44	JA	30	30	0	4:53	4:58	5	P		
P44/45	JA	30	30	0	9:39	9:44	5	P		
P45/46	JA	30	29	1	9:42	9:47	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Ronw

SCS ENGINEERS primary

NON-DESTRUCTIVE TEST LOG

SHEET 5 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P44/46	JA	30	30	0	4:51	4:56	5	P		
P45/47	JA	30	30	0	9:45	9:50	5	P		
P46/47	JA	30	30	0	4:49	4:54	5	P		
P47/48	JA	30	30	0	9:59	10:04	5	P		
P48/49	JA	30	30	0	9:51	9:56	5	P		
P47/49	JA	30	30	0	4:43	4:48	5	P		
P47/48	JA	30	30	0	10:03	10:08	5	P		
P38/39	JA	30	30	0	9:13	9:18	5	P		
P37/38	JA	30	30	0	9:05	9:10	5	P		
P48/50	JA	30	30	0	10:09	10:14	5	P		
P49/50	JA	30	30	0	4:43	4:48	5	P		
P50/53	JA	30	30	0	3:36	3:41	5	P		
P50/52	JA	30	30	0	3:44	3:49	5	P		
P52/53	JA	30	30	0	3:50	3:55	5	P		
P52/53	JA	30	29	0	3:53	3:58	5	P		
P53/54	JA	30	30	0	3:59	4:04	5	P		
P52/54	JA	30	30	0	4:00	4:05	5	P		
P56/58	JA	30	29	1	4:03	4:08	5	P		
P57/58	JA	30	30	0	4:05	4:10	5	P		
P54/56	JA	30	30	0	4:07	4:12	5	P		
P55/56	JA	30	30	0	4:10	4:15	5	P		
P54/55	JA	30	30	0	4:35	4:40	5	P		
P55/57	JA	30	30	0	4:31	4:36	5	P		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Raw

SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 6 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P56/57	JA	30	30	0	4:23	4:28	5	P		
P54/51	JA	30	30	0	4:39	4:44	5	P		
P51/52	JA	30	30	0	4:40	4:45	5	P		
P51/50	JA	30	30	0	4:42	4:47	5	P		
P41/42	JA	30	30	0	5:06	5:11	5	P		End 1/7/05
P58/59	JA	30	29	1	9:21	9:26	5	P		Begin 1/1/05
P57/59	JA	30	30	0	9:02	9:07	5	P		
P60/61	JA	30	30	0	9:50	9:55	5	P		
P60/61	JA	30	30	0	9:50	9:55	5	P		
P59/60	JA	30	30	0	9:15	9:20	5	P		
P61/65	JA	30	30	0	9:25	9:30	5	P		
P64/65	JA	30	30	0	9:31	9:36	5	P		
P61/64	JA	30	30	0	9:26	9:31	5	P		
P65/68	JA	30	30	0	9:39	9:44	5	P		
P67/68	JA	30	29	1	9:54	9:59	5	P		
P64/67	JA	30	30	0	9:38	9:43	5	P		
P68/69	JA	30	30	0	9:44	9:49	5	P		
P67/69	JA	30	30	0	10:02	10:07	5	P		
P70/73	JA	30	30	0	10:04	10:09	5	P		
P72/73	JA	30	30	0	10:06	10:11	5	P		
P70/72	JA	30	30	0	10:05	10:10	5	P		
P73/74	JA	30	30	0	10:24	10:29	5	P		
P72/74	JA	30	30	0	10:20	10:25	5	P		

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SIGNATURE: R an

SCS ENGINEERS

Primary

NON-DESTRUCTIVE TEST LOG

SHEET 7 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST						P/F	VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME					
		START	END	DROP	START	END	DURATION			
P74/75	JA	30	30	0	10:26	10:31	5	P		
P75/76	JA	30	29	1	10:29	10:34	5	P		
P76/77	JA	30	29	1	10:38	10:43	5	P		
P77/P78	JA	30	30	0	10:43	10:48	5	P		
P78/79	JA	30	30	0	10:50	10:55	5	P		
P71/74	JA	30	30	0	10:59	11:04	5	P		
P71/72	JA	30	30	0	11:01	11:06	5	P		
P71/70	JA	30	30	0	11:03	11:08	5	P		
P69/70	JA	30	30	0	11:10	11:15	5	P		
P66/69	JA	30	30	0	11:15	11:20	5	P		
P66/69	JA	30	30	0	11:15	11:20	5	P		
P66/69	JA	30	30	0	12:55	1:00	5	P		
P66/69	JA	30	30	0	1:02	1:07	5	P		
P66/69	JA	30	30	0	11:04	11:09	5	P		
P66/69	JA	30	30	0	11:05	11:10	5	P		
P66/67	JA	30	30	0	1:07	1:12	5	P		
P63/66	JA	30	30	0	1:09	1:14	5	P		
P63/64	JA	30	29	1	1:05	1:10	5	P		
P62/63	JA	30	30	0	1:04	1:09	5	P		
P62/66	JA	30	30	0	1:11	1:16	5	P		
P63/61	JA	30	30	0	1:13	1:18	5	P		
P62/6	JA	30	30	0	2:30	2:35	5	P		
P42/44	JA	30	30	0	2:30	2:35	5	P		
P42/44	JA	30	30	0						

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SIGNATURE: Dan

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NON-DESTRUCTIVE TEST LOG

SHEET 8 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	END	DROP	AIR TEST TIME START	END	DURATION	P/F	VACUUM BOX P/F	COMMENTS
P79/80	LM	40	40	0	1:53	1:58	5	P		Start 1/31/05
P79/80	LM	30	29	1	1:50	1:55	5	P		
P81/79	LM	30	30	0	1:48	1:53	5	P		
P81/78	LM	31	30	1	1:40	1:45	5	P		
P82/78	LM	30	30	0	1:39	1:44	5	P		
P82/77	LM	31	30	1	1:37	1:42	5	P		
P81/82	LM	31	30	1	1:41	1:56	5	P		
P80/81	LM	31	30	1	1:49	1:54	5	P		
P81/82	LM	31	30	1	2:02	2:07	5	P		End 1/31/05
P88/93	JA	30	30	0	1:32	1:37	5	P		Start 2/1/05
P87/88	JA	30	30	0	1:33	1:38	5	P		
P87/93	JA	30	30	0	1:27	1:32	5	P		
P92/93	JA	30	30	0	1:26	1:31	5	P		
P87/92	JA	30	29	1	1:23	1:28	5	P		
P86/87	JA	30	29	1	1:21	1:26	5	P		
P86/92	JA	30	30	0	1:16	1:21	5	P		
P91/92	JA	30	30	0	1:11	1:16	5	P		
P91/86	JA	30	30	0	1:13	1:18	5	P		
P85/86	JA	30	30	0	1:12	1:17	5	P		
P85/91	JA	30	29	1	1:04	1:09	5	P		
P85/91	JA	30	30	0	1:02	1:07	5	P		
P84/85	JA	30	30	0	12:43	12:48	5	P		
P84/90	JA	30	30	0	12:52	12:57	5	P		

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SCS ENGINEERS Primary

NON-DESTRUCTIVE TEST LOG

SHEET 9 of 9
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST							VACUUM BOX P/F	COMMENTS
		PRESSURE (psi)			TIME			P/F		
		START	END	DROP	START	END	DURATION			
P91/90	JA	30	30	0	1:01	1:06	5	P		
P89/90	JA	30	29	1	12:45	12:50	5	P		
P89/84	JA	30	30	0	12:56	1:01	5	P		
P89/74	JA	30	30	0	12:58	1:03	5	P		
P84/74	JA	30	30	0	11:12	11:17	5	P		
P84/83	JA	30	30	0	11:13	11:18	5	P		
P83/74	JA	30	30	0	11:10	11:15	5	P		
P83/75	JA	30	30	0	11:05	11:10	5	P		
P83/76	JA	30	30	0	11:03	11:08	5	P		
P83/77	JA	30	29	1	11:01	11:06	5	P		
P82/83	JA	30	30	0	2:01	2:06	5	P		
P83/84	JA	30	30	0	1:57	2:02	5	P		END 2hlos

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ADENDUM

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NON-DESTRUCTIVE TEST LOG

PRIMARY

SHEET 1A of 2
PROJECT TITLE Citrus County Phase II Expansion
PROJECT NO. 09199056.02
DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
P1/T1	JC								P	START ALL TIE IN SEAMS V-BOX 1/11/05
P05/T1									P	1/11/05
P34/T1									P	1/13/05
P32/T1									P	1/13/05
P17/T1									P	1/13/05
P19/T1									P	1/13/05
P30/T1									P	
P31/T1									P	
P26/T1									P	
P27/T1									P	
P22/T1									P	
P29/T1									P	
P31/T1									P	
P33/T1									P	
P35/T1									P	
P37/T1									P	
P38/T1									P	
P24/T1									P	
P41/T1									P	1/13/05
P43/T1									P	
P44/T1									P	
P45/T1									P	1/13/05
P47/T1										

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SIGNATURE:

D.E.P.
JUL 21 2005
Southwest District Tampa

Pond Dam

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NON-DESTRUCTIVE TEST LOG

Primary

SHEET 2A of 2

PROJECT TITLE Citrus County Phase II Expansion

PROJECT NO. 09199056.02

DATE

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
P48/T1	JC								P	All TIC in Soap V Box 1/13/05
P50/T1									P	
P51/T1									P	
P54/T1									P	
P56/T1									P	
P58/T1									P	1/13/05
P55/T1									P	
P59/T1									P	
P60/T1									P	
P61/T1									P	
P65/T1									P	
P68/T1									P	
P69/T1									P	1/13/05
P70/T1									P	
P73/T1									P	
P74/T1									P	
P75/T1									P	
P76/T1									P	
P77/T1									P	
P78/T1									P	2/2/05
P79/T1										2/2/05
P80/T1	JC	31	30	1	1:49	1:50	5	P		

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NON-DESTRUCTIVE TEST LOG

SHEET 1A of 3
PROJECT TITLE Citrus County Phase II Expansion
PROJECT NO. 09199056.02
DATE 12/10/04 – 12/17/04

Addendum Secondary

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	TIME START	TIME END	TIME DURATION	P/F	VACUUM BOX P/F	COMMENTS
S1/T1	JH								?	CAP AT S1 AND TIE-IN EXTRUDED
S1/T1		30	30	0	7:35	7:40	5	P	P	OTHER SIDE OF CAP AT S1 AND TIE-IN FILLED 12/10/04
S20/T1										12/17/04
S21/T1										12/10/04
S22/T1										12/17/04
S16/T1										
S17/T1	GR									
S23/T1										
S24/T1										
S26/T1										
S28/T1										
S30/T1										
S31/T1										
S33/T1										
S34/T1										
S36/T1										
S37/T1										
S39/T1										
S40/T1										
S42/T1										
S43/T1										
S45/T1										
S46/T1										

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SIGNATURE:

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS

NON-DESTRUCTIVE TEST LOG

SHEET 2A of 3
PROJECT TITLE Citrus County Phase II Expansion
PROJECT NO. 09199056.02
DATE 12/17/04 - 12/21/04

ADDENDUM SECOND24

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	PRESSURE (psi) END	PRESSURE (psi) DROP	AIR TEST TIME START	TIME END	TIME DURATION	AIR TEST P/F	VACUUM BOX P/F	COMMENTS
S48/T1	JC								P	12/17/04
S50/T1										12/17/04
S51/T1										12/17/04
S52/T1										12/20/04
S54/T1										
S55/T1										
S57/T1										
S58/T1										
S60/T1										
S61/T1										
S63/T1										
S64/T1										
S66/T1										
S68/T1										
S69/T1										
S70/T1										
S71/T1										
S72/T1										
S87/T1										
S86/T1										
S11/S12	JC	30	30	0	1:10	1:15				
S11/S12	JC	30	30	0	1:10	1:15				

C
12/21/04

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SIGNATURE:

U.S.E.P.A.
JUL 21 2005
Southwest District Tampa

ADENDUM Secondary

SCS ENG[illegible]ERS

SHE[illegible] 8A of 9

PROJ[illegible] TITLE

PROJECT NO.

DATE

NON-DESTRUCTIVE TEST LOG

SEAM NO.	TECH I.D.	AIR TEST PRESSURE (psi) START	END	DROP	AIR TEST TIME START	END	DURATION	P/F	VACUUM BOX P/F	COMMENTS
S77/S79	LM	30	30	0	9:50	9:55	5	P		12/16/04
CAP AT S1/[illegible]	JC	30	30	0	7:35	7:40	5	P		12/9/04
CAP AT S3/8	JC	31	30	1	12:53	12:58	5	P		12/17/04
CAP AT S5/[illegible]	JC	31	31	0	12:54	12:59	5	P		↓
CAP AT S42/41	LM	31	30	1	9:21	9:26	5	P		12/21/04
CAP AT S42/41	LM	31	30	1	9:21	9:26	5	P		↓
CAP AT S42/41	LM	30	29	1	9:22	9:27	5	P		↓
CAP AT 42/41	LM	31	31	0	9:22	9:27	5	P		↓
CAP AT S42/41	LM	30	29	1	9:14	9:19	5	P		12/21/04
AP AT S42/41	LM	31	30	1	9:13	9:18	5	P		↓
AP AT S42/41	LM	30	29	1	9:07	9:12	5	P		↓
P AT S42/41	LM	31	30	1	9:07	9:12	5	P		↓
P AT S42/41	LM	31	30	1	9:06	9:11	5	P		↓
P AT S42/41	LM	31	30	1	9:06	9:11	5	P		↓
P AT S42/41	LM	30	29	1	8:59	9:04	5	P		↓
P AT S42/41	LM	30	30	0	8:59	9:04	5	P		↓
P AT S42/41	LM	30	30	0	8:58	9:05	5	P		↓
IP AT S42/41	LM	31	30	0	8:58	9:03	5	P		↓
IP AT S42/41	LM	31	30	1	2:03	2:08	5	P		12/16/04
S83/84	LM									

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ATTACHMENT L

GEOMEMBRANE REPAIR LOGS

SCS ENGINEERS

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GEOMEMBRANE REPAIR LOG

SHEET 1 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/7 –

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/8/04	RS-1	S1/S2	165W	BO	2'x2'	BR	7430	12/10/04	JV	
12/8/04	RS-2	S1/S2	157'W	BO	18"x18"	BR	7430			
12/7/04	RS-3	S1	156W/9S	D	1'x1'	BR	7417			
12/7/04	RS-4	S1	146W/12S	D	18"x18"	BR	7417			
12/7/04	RS-5	S1	139'W/12'S	D	18"x18"	BR	7417			
12/7/04	RS-6	S1	130'W/12'S	D	1'x1'	BR	7417			
12/9/04	RS-7	S1/T1	0 to 144'W	FS	144'x3'	BR	7417			
12/7/04	RS-8	S3/S4	150'W	SDS#1	18"x60"	EP	7426			
12/7/04	RS-9	S3	143W/2S	SI	48"x48"	EP	7426			
12/7/04	RS-10	S3	142W/8S	SI	24"x24"	EP	7426			
12/8/04	RS-11	S7/S8	140 W	SDS#5	30"x7'	BR	7430			
12/10/04	RS-12	S9/S8	10'W	SDS#3	24"x60	BR	7430			
12/8/04	RS-13	S12/S13	145 W	SDS#6	2'x12'	BR	7430			SDS#6
12/10/04	RS-14	S6/S7	210 W	SDS#2	24"x48"	BR	0005			
12/10/04	RS-15	S1/S20/T1	T	T	18"x18"	BR	0005	12/10/04		
12/7/04	RS-16	S1	150W 10N	D	12"x12"	BR	7417	12/10/04	JV	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
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GEOMEMBRANE REPAIR LOG

SHEET 2 of 66
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/8/04 – 12/10/04

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/10/04	RS-17	S20/S1	9's	D	18"X18"	BR	0005	12/10/04	JV	
12/10/04	RS-18	S20/S1, S2	T	T	24"X24"	BR	0005	12/10/04	JV	
12/8/04	RS-19	S20, S2, S21	T	T	24"X24"	RZ	7426	12/10/04	JV	
12/8/04	RS-20	S21, S20, S2, S3	T	T	24"X60	RZ	7426	12/10/04	JV	
12/8/04	RS-21	S1, S2	160W	BO	24"X24"	BR	0005	12/10/04	JV	
12/8/04	RS-22	S1, S2	155W	D	24"X24"	BR	0005	12/10/04	JV	
12/10/04	RS-23	S5, S6, S16	T	T	18"X18"	RZ	7426	12/10/04	JV	
12/10/04	RS-24	S6, S7, S16	T	T	18"X18	RZ	7426	12/10/04	JV	
12/10/04	RS-25	S7, 8, S16	T	T	18"X18	RZ	7426	12/10/04	JS	
12/10/04	RS-26	S8, 9, S15	T	T	18"X18	RZ	7426	12/10/04	JS	
12/10/04	RS-27	S9, S10, S16	T	T	18"X18	RV	7417	12/10/04	JS	
12/10/04	RS-28	S10, S15, S10	T	T	36"X48	CV	7417	12/10/04	JS	
12/10/04	RS-29	S15, S11, S10	T	T	18"X18"	CV	7417	12/10/04	JS	
12/10/04	RS-30	S11, S10	200'W	LAP	2"X18'	CV	7417	12/10/04	JS	
12/10/04	RS-31	S15, S14, S11	T	T	24"X24"	CV	7417	12/10/04	JS	
12/10/04	RS-32	S14, S11, S12	T	T	18"X18"	CV	7417	12/10/04	JS	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE:

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GEOMEMBRANE REPAIR LOG

SHEET 3 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/12/04

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/10/04	RS-33	S14, S13, S12	T	T	18"X18	CV	7417	12/10/04	JV	
12/10/04	RS-34	S12, 13, 10	T	T	18"X18"	CV	7417	12/10/04	JV	
12/10/04	RS-35	S13, 19	AT	IO	10'x2'	CV	7417	12/10/04		
12/10/04	RS-36	S15, 16	20'N	BO	2'x2'	CV	7417	12/10/04		
12/10/04	RS-37	S16, 18, 17	T	T	18"X18"	CV	7417	12/10/04	JV	
12/10/04	RS-38	S23, 18, 17	T	T	18"X18"	CV	7417	12/10/04	JV	
12/10/04	RS-39	S23, 25, 24	T	T	18"x24"	RZ	7426	12/10/04	JV	
12/10/04	RS-40	S27, 25, 24	T	T	18"x 36"	RZ	7426	12/10/04	JV	
12/10/04	RS-41	S25, 26, 27	T	T	18"X 36"	RZ	7426	12/10/04	JV	
12/10/04	RS-42	S15, 16	48'S	SDS 7	24"x72"	CV	7417	12/10/04	JV	
OK 12/10/04	RS-43	S16, 17 *	140'S	SDS 8	24"x60"	RZ	7426	12/10/04	JV	
12/10/04	RS-44	S25, 23	170N	SDS 9	24"x 60"	RZ	7426	12/10/04	JV	
see RS9 OK 12/10/04	RS-45	S25, 27	54'N	SDS10	24"x 60	RZ	7426	12/10/04	JV	
12/10/04	RS-46	S1, T1 047	100'E	SDS4-1	24"x60	BR	7417	12/10/04	JV	
12/7/04	RS-47	S1/T1	140W	D	24"x24"	BR	7417	12/10/04	JV	
12/10/04	RS-48	S20/T1	10W	D	24"x24"	BR	0005	12/10/04	JV	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: KAD

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS

Secondary

GEOMEMBRANE REPAIR LOG

SHEET 4 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/10/04

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/10/04	RS-49	S20 /T1	5'W	S1	2'x2'	BR	004	12/10/04	JV	
12/10/04	RS-50	S20,21 /T1	T	T	2'x2'	BR	004	12/10/04	JV	
12/10/04	RS-51	S21/T1	3'W	S1	2'x2'	BR	004	12/10/04	JV	
12/10/04	RS-52	S21/T1	5'W	S1	2'x2'	BR	004	12/10/04	JV	
12/10/04	RS-53	S21,22,T1	T	T	2'x2'	BR	004	12/10/04	JV	
12/10/04	RS-54	S22/T1	5'W	D	12"x12"	BR	004	12/10/04	JV	
12/10/04	RS-55	S22/T1	9'W	D	12"x12"	BR	004	12/10/04	JV	
12/10/04	RS-56	S22,16,T1	T	T	12"x12"	BR	004	12/10/04	JV	
12/10/04	RS-57	S16,T1	12'W	D	12"x12"	BR	004	12/10/04	JV	
12/10/04	RS-58	S16,17,T1	T	T	12"x12"	BR	004	12/10/04	JV	
12/10/04	RS-59	S27,25	80S	SDS 10	24"x60"	RZ	7426	12/10/04	JV	
12/10/04	RS-60	S27,28,29	T	T	30"x50"	RZ	7426	12/10/04	JV	
12/10/04	RS-61	S26,27,29	T	T	24"x24"	LV	7417	12/10/04	JV	
12/10/04	RS-62	S28,26	79'N	SDS 11	24"x60	LV	7417	12/10/04	JV	
12/10/04	RS-63	S28,29,30	T	T	24x24	RZ	7426	12/10/04	JV	
12/10/04	RS-64	S30,30,31	T	T	24"x24"	RZ	7426	12/10/04	JV	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: [signature]

SCS ENGINEERS

Secondary

GEOMEMBRANE REPAIR LOG

SHEET 5 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/10/04

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/10/04	RS-65	S 33,31	80 N	SDS12	24" x 60"	RZ	7426	12/10/04	JV	
	RS-66	S 32,33,31	T	T	24" x 24"	RZ	7426	12/10/04	JV	
	RS-67	S35, 33, 34	T	T	24" x 24"	RZ	7426	12/10/04	JV	
	RS-68	S34, 35, 36	T	T	24" x 60"	RZ	7426	12/10/04	JV	
12/10/04	RS-69	S34, 35	10' E	SDS13	24" x 60	RZ	7426	12/10/04	JV	
12/10/04	RS-70	S36	65' @ 12' W	D	18" x 18"	RZ	7426	12/10/04	JV	
12/10/04	RS-71	S36,37,38	T	T	24" x 24	RR	0005	12/10/04	JV	
12/10/04	RS-72	S37,39	84 N	SDS14	24" x 60	RR	0005	12/10/04	JV	
12/10/04	RS-73	S37,38,39	T	T	24" x 24	RR	0005	12/10/04	JV	
12/10/04	RS-74	S39,40,41	T	T	24" x 24"	RR	005	12/10/04	JV	
12/10/04	RS-75	S40,41	10' W	SDS15	24" x 60"	RZ	7426	12/10/04	JV	
	RS-76	S1 / S2	ANCHOR TR.	EXT	6' x 6'	BR	0005	12/10/04	JV	
	RS-77	S3,4	8' E	BO	3' x 3'	BR	0005	12/10/04	JV	
	RS-78	S4,5	4' E	BO	6' x 3	BR	0005	12/10/04	JV	
12/10/04	RS-79	S 12, 13	150' E	BO	6 x 2	BR	0005	12/10/04	JV	
12/15/04	RS-80	S40,40,41	T	T	24" x 36	RZ	7426	12/17/04	GR	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE:

SCS ENGINEERS

Secondary

GEOMEMBRANE REPAIR LOG

SHEET 6 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/15/04	RS 81	S 41/42	10'N	BO	24"x48"	RZ	7426	12/17/04	GR	
12/15/04	RS82	S42,43,44	T	T	24"x24"	RZ	7426			
12/15/04	RS83	S43,44,45	T	T	24"x24	RZ	7426			
12/16/04	RS84	S45,46,47	T	T	36"x36"	BR	7417			
12/16/04	RS85	S46,48,47	T	T	36"x36"	BR	7417			
12/16/04	RS86	S47,48	75'N	WS	2x2	BR	7417	12/17/04	GR	
12/16/04	RS87	S48,49,50	T	T	2x2	BR	7417			
12/16/04	RS88	S49/50,51	T	T	2x2	BR	7417			
12/13/04	RS89	S49	2'N12'E	D	2x2	BR	7417			
12/13/04	RS90	S49	9'N12'E	D	2x2	BR	7417			
12/13/04	RS91	S49	18'N12'E	D	2x2	BR	7417	12/17/04	GR	
12/13/04	RS92	S49	24'N12'E	D	2x2	BR	7417			
12/13/04	RS93	S49	6'N1'W	D	2x2	BR	7417			
12/13/04	RS94	S49	12'N1'W	D	2x2	BR	7417			
12/13/04	RS95	S52,51,53	T	T	2x2	BR	7417	12/17/04	GR	
12/13/04	RS96	S52,54,53	T	T	2x2	BR	7417			

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: KP

SCS ENGINEERS

secondary

GEOMEMBRANE REPAIR LOG

SHEET 7 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/16/04	RS97	554, 556, 55	T	T	2x2	BR	7417	12/17/04	GR	
12/16/04	RS98	554	195	D	1x1	BR	7417	↓	↓	
12/17	RS99	557, 56, 55		SDS22	24x72	BR	7417	↓	↓	
12/13/04	RS 100	517/T1	8'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 101	517/23/T1	T	T	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 102	523	11'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 103	523, 24, T1	T	T	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 104	524, T1	18'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 105	524, 26, T1	T	T	2x2	BR	00065	12/17/04	GR	
12/13/04	RS 106	527, T1	12'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 107	528, T1, 26	T	T	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 108	528, T1	12'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 109	528, 30, T1	T	T	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 110	530, T1	12'W	D	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 111	530, 31, T1	T	T	2x2	BR	0065	12/17/04	GR	
12/13/04	RS 112	531, T1	12'W	D	2x2	BR	0065	12/17/04	GR	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: DP

SCS ENGINEERS

secondary

GEOMEMBRANE REPAIR LOG

SHEET 8 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/13/04	RS113	531,33,T1	T	T	2x2	BR	0005	12/17/04	GR	
12/13/04	RS114	533, T1	12' W	T	2x2	BR	0005	12/17/04	GR	
12/13/04	RS115	533,34,T1	T	T	2x2	BR	0005	12/17/04	GR	
12/13/04	RS116	534, T1	12' W	T	2x2	BR	0005	12/17/04	GR	
12/13/04	RS117	534,36,T1	T	T	2x2	BR	0005	12/17/04	GR	
12/13/04	RS118	541,42	75' S	SDS16	5'x2'	RR	7514	↓	↓	
12/15/04	RS119	542,43,44	T	SDS17	8'x3'	RR	7426			
12/16/04	RS120	544,45	75' S	SDS18	24"x5'	BR	7417			
12/13/04	RS121	545,47	220' S	SDS16B	24"x6'	BR	7417			
12/16/04	RS122	546,47	75' N	SDS19	24"x5'	BR	7417			
12/16/04	RS123	548,50	12' S	SDS20	5'x2'	BR	7417			
12/16/04	RS124	553,54	24' N	SDS21	5'x2'	BR	7417			SDS 21
12/17/04	RS125	555,57,56	T	SDS22	5'x2'	BR	7417			
12/17/04	RS126	557,58,59	T	T	2'x2'	BR	7417			
12/17/04	RS127	558,59,60	T	T	3'x3'	BR	7417			
12/17/04	RS128	558,59	T	WC	20'	BR	7417			Extrusion weld

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: DGDuPont

SCS ENGINEERS

secondary

GEOMEMBRANE REPAIR LOG

SHEET 9 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/17/04	RS129	S60, 61, 62	T	T	2'x2'	BR	7417	12/20/04	CV	
12/17/04	RS130	S61, 62, 63	T	T	24"x36"	BR	7417			
12/17/04	RS131	S63, 64, 65	T	T	12"x36"	BR	7533			
12/17/04	RS132	S64, 65, 67	T	T	2'x2'	BR	7417			
12/17/04	RS133	S66, 64, 67	T	T	2'x2'	BR	7417			
12/17/04	RS134	S64, 67	12' S	BO	2'	BR	7417			2 ft linear extrusion weld
12/17/04	RS135	S66, 67, 68	T	T	3'x3'	BR	7417			
12/21/04	RS136	S87, 86, 85	T	T	24"x24"	BR	7417	12/21/04	CV	
12/21/04	RS137	S72, 87, 85	T	T	24"x24"	BR	7417			
12/21/04	RS138	S85, 84, 72	T	T	24"x24"	BR	7417			
12/17/04	RS139	S83, 84, 72, 71	T	T	3'x2'	SA	7426	12/21/04	CV	
12/17/04	RS140	S70 S71, 83	T	T	3'x2'	SA	7426	12/21/04	CV	
12/17/04	RS141	S69, 70, 83	T	T	5'x2'	SA	7426	12/21/04	CV	
12/17/04	RS142	S82, 83, 69	T	T	3'x3'	SA	7426	12/21/04	CV	
12/17/04	RS143	S82, 73, 69	T	T	3'x2'	SA	7426	12/21/04	CV	
12/17/04	RS144	S82, 73	9' W	BO	2'x1'	SA	7426	12/21/04	CV	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
ID	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: DGP/Rom

BEST AVAILABLE COPY

SCS ENGINEERS

Secondary

GEOMEMBRANE REPAIR LOG

SHEET 10 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/14/04	RS145	S82,88,73	T	T	24" x 36"	BA	7417	12/20/04	CU	
12/17/04	RS146	S82,81,88	T	T	48"x48"	SA	1704	12/21/04	L.M	
12/17/04	RS147	S81,88,74	T	T	24"x24"	SA	1704	12/21/04	L.M.	
12/17/04	RS148	S74,S75,81	T	T	24"x24"	SA	1704	12/21/04	LM	
12/17/04	RS149	S88,80,75	T	T	24"x24	SA	1704			
12/20/04	RS150	S75,S76,80	T	T	24"x24	BR	7417			
12/20/04	RS151	S80,79,76	T	T	24"x24"	BR	7417			
12/20/04	RS152	S79,77,76	T	T	24"x24"	BR	7417			
12/20/04	RS153	S79,78,77	T	T	24"x24"	BR	7417			
12/20/04	RS154	S78,77,AT	OS	EXT	24"x60"	BR	7417			
12/21/04	RS155	S80,81	25W	BO	24"x24"	BR	7417			
12/17/04	RS156	S74,73,88	T	T	24"x24"	SA	7426	12/20/04	CU	
12/17/04	RS157	S71/S72	30'N	BO	4'x4'	BR	7417	12/20/04	CU	
12/17/04	RS158	S64/S66	10'S	BO	4'x2'	BR	7417	12/20/04		
12/14/04	RS159	S36,37,T1	T	T	2'x2'	BR	0005	12/17/04	GR	
12/14/04	RS160	S37,T1	9'W	D	2'x2'	BR	0005	12/17/04	GR	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE:

SCS ENGINEERS

GEOMEMBRANE REPAIR LOG (secondary)

SHEET 11 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/14/04	RS-161	S37,S39,T1	T	T	18"x18"	BR	0005	12/17/04	GR	
12/14/04	RS-162	S39,T1	3' W	D	4'x1'	BR	0005	12/17/04	GR	
12/14/04	RS163	S39,S40,T1	T	T	18"x12"	BR	0005	12/17/04	GR	
12/14/04	RS164	S40,S42,T1	T	T	2'x2'	BR	0005	12/17/04	GR	
12/15/04	RS165	S42,S43,T1	T	D	18"x18"	BR	7417	12/17/04	GR	No patch, seams are "T" extrusion welded like "T"
12/15/04	RS166	S43,45,T1	T	D	18"x18"	BR	7417	12/17/04	GR	—See above comment—
12/15/04	RS167	S45,T1	21' W	D	2'x2'	BR	7417	12/17/04	GR	
12/15/04	RS168	S46,48,T1	T	D	18"x18"	BR	7417	12/17/04	GR	No Patch, Seams are extrusion welded like "T"
12/15/04	RS169	S48,50,T1	T	D	18"x18"	BR	7417	12/17/04	GR	—See comment above—
12/15/04	RS170	S50,T1	9' W	D	12"x12"	BR	7417	12/17/04	GR	
12/15/04	RS171	S50,51,T1	T	D	18"x18"	BR	7417	12/17/04	GR	No Patch, Extrusion welded like "T"
12/15/04	RS172	S51,52,T1	T	T	18"x12"	BR	7417	12/20/04	CV	
12/15/04	RS173	S52,T1	6' W	DS	12'x1'	BR	7417	↓	↓	Destruct Sample S-DS-23
12/15/04	RS174	S52,54,T1	T	D	18"x18"	BR	7417			No Patch, Extrusion weld like "T"
12/15/04	RS175	S54,55,T1	T	T	2'x2'	BR	7417			
12/15/04	RS176	S55,57,T1	T	D	18"x18"	BR	7417			No Patch, extrusion weld like "T"

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: KP/RAW

SCS ENGINEERS

GEOMEMBRANE REPAIR LOG (Secondary)

SHEET 12 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/17/04	RS177	S57, 58, T1	T	D	18"x18"	BR	7417	12/20/04	CV	No patch, Extrusion weld like "T"
12/16/04	RS178	S58, T1	15'W	D	2'x2'	BR	7417			
12/17/04	RS179	S58, 60, T1	T	D	18"x18"	BR	7417			No Patch, Extrusion weld like "T"
12/17/04	RS180	S60, 61, T1	T	D	18"x18"	BR	7417			- See above Comment -
12/16/04	RS181	S61, 63, T1	T	D	2'x2'	BR	7417			
12/16/04	RS182	S63, T1	5'W	D	2'x8'	BR	7417			
	RS183	S63, 64, T1	T	D	18"x18"	BR	7417			Extrusion weld like "T" No Patch
12/16/04	RS184	S64, T1	20'W	D	1'x2'	BR	7417			
12/16/04	RS185	S66, T1	3'W	D	2'x1'	BR	7417			
12/16/04	RS186	S66, 68, T1	T	D	18"x18"	BR	7417			Extrusion weld like "T"
12/16/04	RS187	S68, 69, T1	T	D	2'x2'	SA	7426			
12/16/04	RS188	S69, 70, T1	T	D	18"x18"	SA	7426			Extrusion weld like "T"
12/16/04	RS189	S70, 71, T1	T	D	1' radius	SA	7426			circular patch 1' radius
12/16/04	RS190	S71, 72, T1	T	D	18"x18"	SA	7426			Extrusion weld like "T"
12/16/04	RS191	S72, T1	6'W	D	9'x1'	SA	7426			
12/16/04	RS192	S72, 87, T1	T	D	4'x18"	SA	7426			T1 - Tie in on South

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: [signature]

SCS ENGINEERS secondary

GEOMEMBRANE REPAIR LOG

SHEET 13 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/17/04	RS193	S86, 87, T1	T	D	18"x18"	BR	7426	12/21/04		Extrusion weld like T
	RS194	S57 ~~58~~ 55	57' S	DS	3'x1'	BR	7417	12/20/04	CV	SDS24
	RS195	S60 S61	56' S	DS	4'x1'	BR	7417	12/20/04	CV	SDS25
	RS196	S62 S63	25' N	DS	4'x1'	BR	7417	12/20/04	CV	SDS26
12/19/04	RS197	S66 S68	9' S	DS	4'x1'	BR	7417	12/20/04	CV	SDS27
12/21/04	RS198	S69 S70		DS	24x60	BR	7417	12/21/04	CV	SDS28 (sample not taken)
12/15/04	RS199	S79 S80	9' W	DS	4'x1'	RZ	0014	12/21/04	CV	SDS29
12/21/04	RS200	S87 S72	8' N	DS	4'x1'	BR	7417	12/21/04	LM	SDS30
	RS201	S82 S83	146' E	SDS31	24x60	BR	7417	12/21/04	CV	SDS31 (sample not taken)
	RS202	S61 S63	9' S	D	4'x1'	BR	7417	12/20/04	CV	
	RS203	S38	13' N	D	2'x2'	BR	0005	12/17/04	G.R	
12/17/04	RS204	S27	70' S	D	2x2	BR	0005	12/17/04	GR	
12/17/04	RS205	S16	40' N	D	2x2	BR	0005	12/17/04	GR	
12/19/04	RS206	S7/S8	100' E	CAP	112'x2'	RZ	0014	12/19/04	LM	
12/19/04	RS207	S7/S8/CS2	100' E	CAP	2x2	RZ	0014	12/17/04	LM	
12/19/04	RS208	S7/S8	140' E	CAP	4x2	RZ	0014	12/21/04	LM	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: DGP/Rom

REVISED

SCS ENGINEERS

GEOMEMBRANE REPAIR LOG

secondary

SHEET 14 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/17/04	RS 209	57/8	145' W	FS	4' x 2'	BR	7417	12/17/04	GR	CAP STRIP
12/17/04	RS 210	57/8	200' W	FS	4' x 2'	BR	7417	12/17/04	GR	CAP STRIP
12/14/04	RS 211	S37/T1	6' E	D	18" x 18"	ST	0005	12/17/04	GR	
12/17/04	RS 212	S37/39	5' N	BO	2' x 2'	SI	0005	12/17/04	GR	5' N LOCATION FROM Anchor trench
	RS 213	S62	3' N	D	2 x 2	BR	7417	12/20/04	AU	
	RS 214	S62	8' N	D	2 x 2	BR	7417	12/20/04	AU	
	RS 215	S62	12' N	D	2 x 2	BR	7417	12/20/04	AU	
	RS 216	S62	17' N	D	2 x 2	BR	7417	12/20/04	AU	
	RS 217	S62	22' N	D	2 x 2	BR	7417	12/20/04	AU	
	RS 218	S80/81	West Anchor Trench	IO	6 x 2	SA	7426	12/17/04	GR	Anchor trench (west)
	RS 219	S 7/8 *	8' W OF RS209	CAP	6 x 2	BR	0005	12/17/04	GR	SDS 5A *
	RS 219		T	HT	4' x 7'	BR	7417	12/17/04	GR	Patch due to Burn in cover soil caused cardical indag
12/20/04	RS 220	S15/11/10		DS	4' x 2'	BR	7417	12/20/04	CV	SDS 16A
12/20/04	RS 221	S41/S42	75' S	D	3' x 2'	BR	7417	12/20/04	CV	
12/20/04	RS 222	S40/42	30' S	D	4' x 2'	BR	7417	12/20/04	CV	
12/20/04	RS 223	S40/42	3' S	D	4' x 2'	BR	7417	12/20/04	CV	
12/20/04	RS 224	S41/42	10' N	D	4' x 2'	BR	7417	12/20/04	CV	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE:

D.E.P.
JUL 21 2005
Southwest District Tampa

SCS ENGINEERS secondary

SHEET 15 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

GEOMEMBRANE REPAIR LOG

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/20/04	R225	541/42	25' N	D	3'x1'	BR	7417	12/20/04	CV	
12/20/04	R226	541/42	52' N	D	3'x1'	BR	7412	12/20/04	CV	
12/20/04	R227	541/42	79' N	D	3'x1'	BR	7417	12/20/04	CV	
12/20/04	R228	541/42	100' N	D	4'x1'	BR	7417	12/20/04	CV	
12/20/04	R229	541/42	120' N	D	3'x1'	BR	7417	12/20/04	CV	
12/20/04	R230	541	50' S 10' E	SI	2'x2'	BR	7417	12/20/04	CV	
12/20/04	R231	547,548	80' N	BO	2'x2'	BR	7417	12/20/04	CV	
12/16/04	R232	547/548	47/48/ Anchor trench	IO	6'x2'	BR	7417	12/20/04	CV	
12/20/04	R233	541/42	41/42 N Anchor	IO	4'x4'	BR	7417	12/20/04	CV	North Anchor trench 541/542
12/20/04	R234	575/BO	10' E	BO	24"x24"	BR	7417	12/21/04	LM	
12/21/04	R235	577	10' AT ON	D	24"x24"	BR	7417	12/21/04	LM	
12/21/04	R236	577/76	0' AT NAT	EXT	8'x3'	BR	7417	12/21/04	LM	
12/17/04	R237	581	3' W	D	2'x2	SA	7426	12/21/04	LM	
12/21/04	R238	584,583	174 E	BO	3'x3	BR	7417	12/21/04	LM	
12/16/04	R239	586	130 E 4' N	D	2'x2'	SA	7426	12/21/04	LM	
12/16/04	R240	586/T1	120 E	D	2'x2'	SA	7426	12/21/04	LM	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: [signature]

SCS ENGINEERS Secondary

GEOMEMBRANE REPAIR LOG

SHEET 16 of 16
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 12/16/04 - 12/21/04

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
12/16/04	RS41	S86/T1	180'E	D	24'X 5'	SA	7426	12/21/04	LM	
12/16/04	RS42	S86/T1	125'E	W	12'X12'	SA	7426	12/21/04	LM	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: [signature]

SCS ENGINEERS

ADENDUM SECONDARY

GEOMEMBRANE REPAIR LOG

SHEET 1A of 1

PROJECT TITLE Citrus County Phase II Expansion

PROJECT NO. 09199056.02

DATE 7/1/05

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
7/1/05	SR1	545, 47	5' SOUTH	SDS16AA	24" x 5"	AO	7410	7/1/05	AO	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	ES	-EXTRUDER BURN	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	TT	-TRIAL TACK BURN	SO	-SHARP OBJECT		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

PRINT NAME: Dennis G. Dupont

SIGNATURE:

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 1 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/3/05	R-1	P1/T1	36' E	PTC	3' x 2'	SA	7426	1/11/05	JC	
1/3/05	R2	P1/T1	52' E	PTC	3' x 2'	SA	7426	1/11/05	JC	
1/3/05	R3	P1/T1	65' E	DS-1	9' x 3'	SA	7426	1/11/05	JC	
1/5/05	R4	P1/T1	0' W	D	3' x 3'	SA	7426	1/11/05	JC	Location of East Anchor Trench
1/3/05	R5	P1/P2/P25	T	T	3' x 3'	SA	7426	1/11/05	JC	
1/3/05	R6	P2/P25/P24	T	T	3' x 3'	SA	7426	1/11/05	JC	
1/3/05	R7	P2/P23/P24	T	T	3' x 2'	SA	7426	1/11/05	JC	
1/4/05	R8	P2/P23/P3	T	T	3' x 3'	SA	7426	1/11/05	JC	
1/4/05	R9	P17/P3/P23	T	T	3' x 3'	SA	7426	1/11/05	JC	
1/4/05	R10	P3/P4/P17	T	T	2' x 2'	SA	7426	1/11/05	JC	
1/5/05	R11	P3/P4	43' E	PDS-2	6' x 2'	SA	7417	1/11/05	JC	PDS-2
1/5/05	R12	P3/P4	56' E	PTC	3' x 2'	SA	7417	1/11/05	JC	
1/5/05	R13	P4/P3/Anchor Trench	0' W	PTC	3' x 3'	SA	7417	1/11/05	JC	
1/5/05	R14	P4/P5/Anchor Trench	0' W	PTC	3' x 3'	SA	7417	1/11/05	JC	
1/5/05	R15	P4/P5	148' W	PTC	3' x 3'	SA	7417	1/11/05	JC	
1/5/05	R16	P4/5	130' W	PTC	3' x 3'	SA	7417	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Ran

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 2 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/4/05	R17	P4/5/17	T	T	2'x2'	SA	7426	1/11/05	JC	
1/4/05	R18	P5/6/17	T	T	2'x2'	SA	7426	1/11/05	JC	
1/5/05	R19	P4/P5	6' W	D	2'x2'	SA	7417	1/11/05	JC	
1/5/05	R20	P5/P6	0' W	PTC	3'x3'	SA	7417	1/11/05	JC	
1/4/05	R21	P6/P7/P17	T	T	3'x3'	SA	7426	1/11/05	JC	
1/4/05	R22	P7/P8/P17	T	T	2'x2'	SA	7426	1/11/05	JC	
1/5/05	R23	P7/P8	PDS-3	DS	4'x2'	SA	7417	1/11/05	JC	122' West from Anchor Trench
1/4/05	R24	P8/9/17	T	T	2'x2'	SA	7426	1/11/05	JC	
1/4/05	R25	P9/10/17	T	T	3'x3'	SA	7426	1/11/05	JC	
1/4/05	R26	P9/P10	40' E	DS	4'x2'	SA	7426	1/11/05	JC	PDS-4
1/5/05	R27	P9/P10	135' E	PTC	3'x3'	SA	7417	1/11/05	JC	
1/5/05	R28	P10/11	0' W	BO	2'x2'	SA	7417	1/11/05	JC	Located at East Anchor Trench
1/4/05	R29	P11/12	16' E	DS	5'x2'	SA	7426	1/11/05	JC	PDS-5
1/4/05	R30	P13/14	0' S	PTC	3'x3'	SA	7426	1/13/05	JC	Located at North Anchor trench
1/4/05	R31	P12/13/14	T	T	2'x2'	SA	7426	1/11/05	JC	
1/4/05	R32	P12/13/15	T	T	2'x2'	SA	7426	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: [signature]

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 3 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/4/05	R33	P11/12/15	T	T	2'x2'	SA	7426	1/11/05	JC	
1/4/05	R34	P11/15/16	T	T	2'x2'	SA	7426	1/11/05	JC	
1/4/05	R35	P10/11/16/17	T	T	4'x3'	SA	T426	1/11/05	JC	
1/4/05	R36	P17/18/19	T	T	3'x3'	SA	T426	1/11/05	JC	
1/4/05	R37	P16/17	5'S	BO	3'x3'	SA	7426	1/11/05	JC	
1/4/05	R38	P18/19/20	T	T	3'x3'	SA	T426	1/11/05	JC	
1/4/05	R39	P20/21/22	T	T	3'x3'	SA	T426	1/11/05	JC	
1/3/05	R45	P1/25/T	T	T	2'x1'	SA	7426	1/11/05	JC	
1/4/05	R40	P6	35, 3'E	D	18"x18"	SA	7426	1/11/05	JC	Located 3'E from P17 and 3'S from P7
1/4/05	R41	P17/P19	8'S	DS	6'x2'	SA	T426	1/11/05	JC	PDS-6
1/4/05	R42	P19/P20	26'S	DS	6'x2'	SA	T426	1/11/05	JC	PDS-7
1/4/05	R43	P21/P22	6'E	DS	6'x2'	SA	T426	1/11/05	JC	PDS-8
1/5/05	R44	P2/P3	35'E	PTC	4'x2'	SA	7417	1/11/05	JC	
1/3/05	R46	P25/24/T1	T	T	1'x1'	SA	7417	1/13/05	JC	
1/3/05	R47	P23/17/T1	T	T	1'x1'	SA	7426	1/13/05	JC	
1/13/05	R48	P19/T1	3'E	IO	22'x2"	SA	7426	1/13/05	JC	Extrusion tie in to existing liner in phase 1

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 4 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/5/05	R49	P20	3'N, 10'W	C	2'x2'	SA	7417	1/13/05	JC	
1/5/05	R50	P20	2'N, 4'E	C	2'x3'	SA	7417	1/13/05	JC	
1/6/05	R51	P27/T1	8'E	IO	8'x 18"	SA	7417	1/13/05	JC	
1/6/05	R52	P29/T1	5'W	IO	9'x18"	SA	7417	1/13/05	JC	
1/6/05	R53	P29/31/T1	T	T	2'x2'	SA	7417	1/13/05	JC	
1/7/05	R54	P31/T1	8'W	DS	5'x1'	SA	7417	1/13/05	JC	PDS-15
1/6/05	R55	P35/37/T1	T	T	2'x2'	SA	7417	1/13/05	JC	
1/6/05	R56	P39/41/T1	T	T	2'x1'	SA	7417	1/13/05	JC	
1/6/05	R57	P43/T1	1'W	IO	2'x1'	SA	7417	1/13/05	JC	
1/10/05	R58	P21/22/26	T	PTC	2'x2'	SA	7417	1/11/05	JC	
1/10/05	R59	P21/26	96'S	BO	3'x3'	SA	7417	1/11/05	JC	
1/10/05	R60	P26/27/28	T	PTC	4'x4'	SA	7417	1/11/05	JC	
1/11/05	R61	P27/28/30	T	PTC	3'x3'	RZ	7405	1/11/05	JC	
1/10/05	R62	P27/29/30	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/10/05	R63	P27/29	8'S	DS	6'x2'	SA	7417	1/11/05	JC	PDS-9
1/10/05	R64	P29/31	15'N	BO	4'x2'	SA	7417	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Dennis G. DuPont

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 5 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/10/05	R65	P29/30/31	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/11/05	R66	P30/31/32	T	T	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R67	P31/32/33	T	PTC	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R68	P32/33	7'N	DS	7'x2'	RZ	7405	1/11/05	JC	PDS-10
1/11/05	R69	P33/34/35	T	PTC	4'x4'	RZ	7405	1/11/05	JC	
1/11/05	R70	P34/35/36	T	PTC	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R71	P35/36	21'S	DS	7'x2'	RZ	7405	1/11/05	JC	PDS-11
1/10/05	R72	P35/36/37	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/10/05	R73	P37/38	27'S	PTC	3'x3'	SA	7417	1/11/05	JC	
1/7/05	R74	P36/37/38	T	PTC	4'x2'	SA	7417	1/11/05	JC	
1/7/05	R75	P38/39/40	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/10/05	R76	P38/39	24'S	DS	7'x2'	SA	7417	1/11/05	JC	PDS-12
1/10/05	R77	P38/39	50'S	D	6'x2'	SA	7417	1/11/05	JC	
1/7/05	R78	P39/40/41	T	T	2'x3'	SA	7417	1/11/05	JC	
1/11/05	R79	P41/42	22'S	DS	6'x2'	RZ	7405	1/11/05	JC	PDS-13
1/7/05	R80	P41/42/43	T	T	3'x3'	SA	7417	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 6 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/7/05	R81	P43/44	6' S	DS	8'x2'	SA	7417	1/11/05	JC	PDS-14
1/7/05	R82	P42/43/44	T	PTC	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R83	P42/44	80' S	BO	2'x3'	RZ	7405	1/11/05	JC	
1/7/05	R84	P44/45/46	T	PTC	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R85	P45/46/47	T	T	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R86	P47/48/49	T	T	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R87	P47/48	39' S	PTC	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R88	P48/49/50	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/11/05	R89	P50/51/52	T	PTC	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R90	P50/52/53	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/11/05	R91	P52/53/54	T	PTC	3'x3'	SA	7417	1/11/05	JC	
1/11/05	R92	P51/52/54	T	PTC	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R93	P54/55/56	T	T	3'x3'	RZ	7405	1/11/05	JC	
1/11/05	R94	P56/57/58	T	T	3'x3'	SA	7417	1/11/05	JC	
1/11/05	R95	P55/56/57	T	T	2'x2'	RZ	7405	1/11/05	JC	
1/7/05	R132	P58	2'N,10'E	D	2'x5'	SA	7417	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Ram

SCS ENGINEERS primary

GEOMEMBRANE REPAIR LOG

SHEET 7 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/7/05	R130	P58	12'E, 7'N	D	2'x2'	SA	7417	1/11/05	JC	
1/7/05	R131	P58	8'E, 5'N	D	2'x2'	SA	7417	1/11/05	JC	
1/7/05	R129	P58	12'E, 9'N	D	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R100	P58/59/57	T	T	3'x3'	SA	7417	1/11/05	JC	Begin 1/11/05
1/11/05	R101	P60/61	48' N	PTC	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R102	P60/61	86' N	DS	6'x2'	SA	7417	1/11/05	JC	PDS-20
1/11/05	R103	P61/65/64	T	PTC	4'x2'	SA	7417	1/11/05	JC	
1/11/05	R104	P61/63/64	T	PTC	3'x2'	SA	7417	1/11/05	JC	
1/11/05	R105	P61/62/63	T	PTC	2'x2'	RZ	7405	1/11/05	JC	
1/11/05	R106	P62/63/66	T	PTC	4'x2'	RZ	7405	1/11/05	JC	
1/11/05	R107	P62/66/67/64	T	PTC	6'x2'	SA	7417	1/11/05	JC	
1/11/05	R108	P64/67/65	T	PTC	3'x18"	SA	7417	1/11/05	JC	
1/11/05	R109	P65/68/67	T	PTC	6'x18"	SA	7417	1/11/05	JC	
1/11/05	R110	P65/68	22' S	DS	6'x2'	SA	7417	1/11/05	JC	PDS-21
1/11/05	R111	P67/68/69	T	PTC	2'x2'	SA	7417	1/11/05	JC	
1/11/05	R112	P66/67/69	T	PTC	2'x2'	SA	7417	1/11/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Dennis G. DuPont

SCS ENGINEERS primary

SHEET 8 of 11

PROJECT TITLE Citrus County Phase 2 Expansion

PROJECT NO. 09199056.02

DATE

GEOMEMBRANE REPAIR LOG

DATE REPAIRED	REPAIR NO.	SEAM / PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/11/05	R113	P66/69	68' N	D	8'x18"	RZ	7405	1/11/05	JC	
1/11/05	R114	P66/69	96' N	D	4'x18"	RZ	7405	1/11/05	JC	
1/11/05	R115	P70/72/73	T	PTC	18"x12"	SA	7417	1/11/05	JC	
1/11/05	R116	P70/71/72	T	PTC	3'x2'	SA	7417	1/11/05	JC	
1/11/05	R117	P71/70	43' N	DS	7'x2'	SA	7417	1/11/05	JC	PDS-22
1/11/05	R118	P72/73/74	T	PTC	3'x2'	SA	7417	1/11/05	JC	
1/11/05	R119	P71/74	1' N	DS	7'x2'	SA	7417	1/11/05	JC	PDS-23
1/11/05	R120	P75/76	19' S	DS	7'x2'	SA	7417	1/11/05	JC	PDS-24
1/11/05	R121	P66/69	48' N	PTC	4'x2'	RZ	7405	1/11/05	JC	
1/11/05	R122	P42/44	65' S	WC	7'x2'	RZ	7405	1/11/05	JC	
1/11/05	R96	P46/47	55' S	DS	7'x18"	RZ	7405	1/11/05	JC	PDS-16
1/11/05	R97	P48/50	10' S	DS	7'x18"	SA	7417	1/11/05	JC	PDS-17
1/11/05	R98	P51/52	5' E	DS	7'x2'	RZ	7405	1/11/05	JC	PDS-18
1/11/05	R99	P55/57	12' N	DS	7'x2'	RZ	7405	1/11/05	JC	PDS 19
1/12/05	R123	P31/T1	0' N	DS	4'x18"	SA	7426	1/13/05	JC	PDS-15A (Retest)
1/12/05	R124	P31/T1	0' N	C	3'x2'	SA	7426	1/12/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont

SIGNATURE: Ron

SCS ENGINEERS

Primary

GEOMEMBRANE REPAIR LOG

SHEET 9 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
1/12/05	R125	P58/59/T1	T	T	2' x 6"	SA	7426	1/13/05	JC	
1/12/05	R126	P68/69/T1	T	T	2' x 1'	SA	7426	1/13/05	JC	
1/12/05	R127	P70/T1	1'W	I	2 x 2	SA	7426	1/13/05	JC	
1/12/05	R128	S19/T1	3'E	SI	2 x 2	SA	7426	1/13/05	JC	
1/11/05	R133	P30/32	1'S	PTC	1' x 1'	RZ	7405	1/11/05	JC	
1/11/05	R134	P26/28	1'S	PTC	1' x 1'	RZ	7405	1/11/05	JC	
1/31/05	R135	P82/P77/P78	T	T	18" x 3'	RM	7417	2/2/05	JC	
1/31/05	R136	P78/81/82	T	T	5' x 18"	RM	7417	2/2/05	JC	
1/31/05	R137	P78/79/81	T	T	3' x 18"	RM	7417	2/2/05	JC	
1/31/05	R138	P79/80/81	T	T	18" x 4'	RM	7417	2/2/05	JC	
1/31/05	R139	P79/80	2'N	PTC	18" x 24"	RM	7417	2/2/05	JC	
1/31/05	R140	P80/T1/P79	T	T	4' x 3'	RM	7417	2/2/05	JC	
1/31/05	R141	P80/T1	23'W	DS	18" x 5'	RM	7417	2/2/05	JC	PDS-25
1/31/05	R142	P81/82	120'W	PTC	2' x 3'	RM	7417	2/2/05	JC	
1/31/05	R143	P81/82	66'W	DS	18" x 5'	RM	7417	2/2/05	JC	PDS-26 End 1/31/05
2/1/05	R144	P74/89	N, Anchor Trench	SS	5' x 18"	RM	7417	2/2/05	JC	Begin 2/1/05

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Dan

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 10 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 2/1/05

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
2/1/05	R145	P74/89/84	T	T	1'x2'	RM	7417	2/2/05	JC	
2/1/05	R146	P74/83/84	T	T	1'x2'	RM	7417	2/2/05	JC	
2/1/05	R147	P74/75/83	T	T	3'x3'	RM	7417	2/2/05	JC	
2/1/05	R148	P75/76/83	T	T	2'x1'	RM	7417	2/2/05	JC	
2/1/05	R149	P76/77/83	T	T	2'x2'	RM	7417	2/2/05	JC	
2/1/05	R150	P77/82/83	T	T	4'x18"	RM	7417	2/2/05	JC	
2/1/05	R151	P83/84	77W	FB	4'x2'	RM	7417	2/2/05	JC	
2/1/05	R152	P89/90/84	T	T	2'x1'	RM	7417	2/2/05	JC	
2/1/05	R153	P89/90	10'N	DS	18"x7'	RM	7417	2/2/05	JC	DS-31
2/1/05	R154	P84/85/90	T	DS	18"x10'	RM	7417	2/2/05	JC	DS-27
2/1/05	R155	P85/90/91	T	T	18"x12"	RM	7417	2/2/05	JC	
2/1/05	R156	P91/85	8'N	PTC	2'x1'	RM	7417	2/2/05	JC	
2/1/05	R157	P85/86/91	T	T	2'x1'	RM	7417	2/2/05	JC	
2/1/05	R158	P86/91/92	T	DS	8'x1'	RM	7417	2/2/05	JC	PDS-30
2/1/05	R159	P86/89/92	T	T	2'x1'	RM	7417	2/2/05	JC	
2/1/05	R160	P92/93/87	T	T	2'x1'	RM	7417	2/2/05	JC	

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Ram

SCS ENGINEERS Primary

GEOMEMBRANE REPAIR LOG

SHEET 11 of 11
PROJECT TITLE Citrus County Phase 2 Expansion
PROJECT NO. 09199056.02
DATE 2/1/05

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
2/1/05	R161	P87/88/93	T	T	18" x 12"	RM	7417	2/2/05	JC	
2/1/05	R162	P88/93	0' N	PTC	18" x 5'	RM	7417	2/2/05	JC	North Anchor Trench
2/1/05	R163	P87/88	31' E	DS	1' x 7'	SA	7426	2/2/05	JC	PDS 29
2/1/05	R164	P85/86	30' E	DS	18" x 6'	SA	7426	2/2/05	JC	PDS 28
2/1/05	R165	P84	0'E,E'S	BS	4' x 8'	SA	7426	2/2/05	JC	West Anchor Trench End 2/1/05
2/4/05	R166	P40	60'S	D	4' x 4'	SA	7426	2/4/05	JC	
2/4/05	R167	P40	15'S 10'W	D	5' x 4'	SA	7426	2/4/05	JC	
2/4/05	R168	P40	25'S 8'W	D	4' x 4'	SA	7426	2/4/05	JC	
2/4/05	R169	P40	15'S 10'W	D	5' x 4'	SA	7426	2/4/05	JC	(Two Patches)

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. DuPont
SIGNATURE: Dan

SCS ENGINEERS

ADENDUM PRIMARY

GEOMEMBRANE REPAIR LOG

SHEET 1A of 1

PROJECT TITLE Citrus County Phase II Expansion

PROJECT NO. 09199056.02

DATE 7/1/05

DATE REPAIRED	REPAIR NO.	SEAM /PANEL ID	LOCATION	DEFECT CODE	SIZE OF REPAIR	TECH ID	MACHINE NO.	DATE TESTED	TESTED BY	COMMENTS
7/1/05	PR1	P47,49	AT, ATR	REPAIR FOR SDS	2X25'	AO	7410	7/1/05	AO	ACROSS 47,49 TOP SOUTH OF

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

JUL 06 2005

SOUTHWEST DISTRICT TAMPA

DEFECT CODES:

AD	-ANIMAL RELATED DAMAGE	DS	-DESTRUCTIVE SAMPLE	IO	-INSUFFICIENT OVERLAP	SS	-START/STOP
B	-UNDISPERSED RESIN BEAD	EE	-EARTHWK EQUIP DAMAGE	LB	-LEISTER BURN	SSI	-SOIL SURFACE IRREGULARITY
BO	-BURN OUT	EXT	-EXTENSION	MOT	-MACHINE OFF TRACK	T	-MULTIPLE PANEL INTERSECTION
BS	-BOOT SKIRT	FB	-FUSION WELDER BURN	N	-NODULE	VL	-VACUUM TEST LEAK
C	-COUPON	FD	-FACTORY DAMAGE	PTC	-PRESSURE TEST CUT	WC	-WRINKLE CUT
CO	-CHANGE OF OVERLAP	FM	-FISH MOUTH	SI	-SUBGRADE IRREGULARITY	WR	-WRINKLE
CR	-CREASE	FS	-FAILED SEAM	SL	-SLAG ON TEXTURED SHEET	WS	-WELDER RESTART
D	-INSTALLATION DAMAGE	HT	-HEAT TACK BURN	SO	-SHARP OBJECT		

PRINT NAME: Dennis G. Dupont

SIGNATURE:

ATTACHMENT M

GEOMEMBRANE DESTRUCTIVE TEST LOGS

SCS ENGINEERS

DESTRUCTIVE TEST LOG

SECONDARY

SHEET 1 of 2

PROJECT TITLE: Citrus County Landfill Phase 2 Expansion

PROJECT NO: 09199056.02

DATE: 12/6/04 – 7/1/05

SAMPLE NO.	SEAM I.D.	MACHINE NO.	WELD TYPE	DATE SEAMED	DATE SAMPLED	TEST STATUS PASS/FAIL INSTALLER	SCS	ARCH	COMMENTS
SDS-1	53/54	7543	F	12/6/04	12/8/04	P	P		
SDS-2	56/57	7543	F	12/7/04	12/8/04	P	P		
SDS-3	58/59	7540	F	12/7/04	12/8/04	P	P		
SDS-4	51/T1	7517	E	12/7/04	12/7/04	F			
SDS-5	57/58	7513	F	12/7/04	12/8/04	P	F		
SDS-6	512/513	7543	F	12/7/04	12/8/04	P	P		
SDS-7	515/516	7543	F	12/8/04	12/9/04	P	P		
SDS-8	516/517	7553	F	12/8/04	12/7/04	P	P		
SDS-9	523/525	7553	F	12/8/04	12/13/04	P	P		
SDS-10	525/527	7536	F	12/8/04	12/13/04	P	P		
SDS-4-1	51/T1	7417	E	12/9/04	12/9/04	P	P		
SDS-11	526/528	7533	F	12/9/04	12/13/04	P	P		
SDS-12	531/533	7536	F	12/7/04	12/13/04	P	P		
SDS-13	534/535	7533	F	12/9/04	12/13/04	P	P		
SDS-14	537/539	7536	F	12/8/04	12/13/04	P	P		
SDS-15	540/541	7515	F	12/8/04	12/13/04	P	P		
SDS-16	541/542	7536	F	12/13/04	12/13/04	F			FAILED IN FIELD
SDS-17	542/544	7533	F	12/13/04		P	P		
SDS-18	544/545	7514	F	12/13/04		P	P		
SDS-19	546/547	7536	F	12/13/04		P	P		
SDS-20	550/548	7533	F	12/13/04		P	P		
SDS 21	553/554	7514	F	12/13/04		P	P		
SDS 22	556/555	7536	F	12/13/04	↓	P	P		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

PRINT NAME: Dennis G. DuPont

SIGNATURE:

SCS ENGINEERS

DESTRUCTIVE TEST LOG

SECONDARY

SHEET 2 of 2

PROJECT TITLE: Citrus County Landfill Phase 2 Expansion

PROJECT NO: 09199056.02

DATE: 12/6/04 - 2/1/05

SAMPLE NO.	SEAM I.D.	MACHINE NO.	WELD TYPE	DATE SEAMED	DATE SAMPLED	TEST STATUS PASS/FAIL INSTALLER	SCS	ARCH	COMMENTS
SDS-23	553/TI	7417	E	12/16/04	12/21/04	P	P		
SDS16B	545/47	7536	F	12/13/04	12/13/04	P	P		
SDS 24	558/557	7514	F	12/14/04	12/21/04	P	P		
SDS 25	560/561	7533	F	12/14/04		P	P		
SDS 26	562/563	7515	F	12/14/04		P	P		
SDS 27	566/568	7525	F	12/14/04		P	P		
SDS 28	569/570	7533	F	12/14/04		P	P		
SDS 29	579/580	7514	F	12/15/04		P	P		
SDS 30	587/572	7533	F	12/15/04		P	P		
SDS 31	582/583	7514	F	12/16/04	↓	P	P		sample from cap strip
SDS16A	542/541	7514	F	12/17/04	12/21/04	P	P		Sample from cap strip
SDS 5-A	57/58/CS2	7514	F	12/17/04	12/21/04	P	P		
SDS 5-B	57/58	7514	F	12/17/04	12/21/04	P	P		
SDS16AA	545/47	7410	F	2/1/05	6/30/05	P	P		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

PRINT NAME: Dennis G. DuPont

SIGNATURE:

SCS ENGINEERS Primary

DESTRUCTIVE TEST LOG

SHEET: 1 of 2

PROJECT TITLE: Citrus County Landfill Phase 2 Expansion

PROJECT NO: 09199056.02

DATE: 12/29/04 - 1/11/05

SAMPLE NO.	SEAM I.D.	MACHINE NO.	WELD TYPE	DATE SEAMED	DATE SAMPLED	TEST STATUS PASS/FAIL			COMMENTS
						INSTALLER	SCS	ARCH	
PDS-1	P1 / T1	7536	F	12/29/04	12/30/04	P	P		
PDS-2	P3 / P4	7536	F	12/29/04	12/30/04	P	P		
PDS-3	P7 / P8	7533	F	12/30/04	12/30/04	P	P		
PDS-4	P9 / P10	7525	F	12/30/04	12/30/04	P	P		
PDS-5	P11 / P12	7533	F	12/30/04	12/31/04	P	P		
PDS-6	P17 / P19	7533	F	12/30/04	1/4/05	P	P		
PDS-7	P19 / P20	7536	F	12/31/04	1/4/05	P	P		
PDS-8	P21 / P22	7533	F	12/31/04	1/4/05	P	P		
PDS-9	P27 / P29	7523	F	1/5/05	1/6/05	P	P		
PDS-10	P32 / P33	7533	F	1/5/05	1/6/05	P	P		
PDS-11	P35/36	7523	F	1/5/05	1/6/05	P	P		
PDS-12	P38/39	0005	F	1/5/05	1/6/05	P	P		
PDS-13	P41/42	7533	F	1/5/05	1/6/05	P	P		
PDS-14	P43/44	0005	F	1/5/05	1/6/05	P	P		
PDS-15	P31 / T1	7417	E	1/6/05	1/6/05	P	F		
PDS-16	P46/47	7533	F	1/6/05	1/11/05	P	P		
PDS-17	P48/50	7533	F	1/6/05	1/11/05	P	P		
PDS-18	P51/52	0005	F	1/6/05	1/11/05	P	P		
PDS-19	P55/57	7533	F	1/6/05	1/11/05	P	P		
PDS-20	P60/61	0005	F	1/10/05	1/11/05	P	P		
PDS-21	P65/68	7533	F	1/10/05	1/11/05	P	P		
PDS-22	P70/71	7523	F	1/10/05	1/11/05	P	P		
PDS-23	P71/74	0005	F	1/10/05	1/11/05	P	P		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT
TAMPA

PRINT NAME: Dennis G. DuPont

SIGNATURE: Ram

SCS ENGINEERS primary

DESTRUCTIVE TEST LOG

SHEET: 2 of 2

PROJECT TITLE: Citrus County Landfill Phase 2 Expansion

PROJECT NO: 09199056.02

DATE: 1/10/05 – 2/1/05

SAMPLE NO.	SEAM I.D.	MACHINE NO.	WELD TYPE	DATE SEAMED	DATE SAMPLED	TEST STATUS PASS/FAIL INSTALLER	SCS	ARCH	COMMENTS
PDS-24	P75/76	7533	F	1/10/05	1/11/05	P	P		Sent for Retest
PDS-15A	P3/T1	7417	F	1/6/05	1/12/05	P	P		
PDS-25	P80/T1	7523	F	1/3/05	2/1/05	P	P		
PDS-26	P81/82	7533	F	1/3/05	2/1/05	P	P		
PDS-27	P84/85	7523	F	2/1/05	2/1/05	P	P		
PDS-28	P85/86	7535	F	2/1/05	2/1/05	P	P		
PDS-29	P87/88	7553	F	2/1/05	2/1/05	P	P		
PDS-30	P91/92	75-05	F	2/1/05	2/1/05	P	P		
PDS-31	P89/90	75-05	F	2/1/05	2/1/05	P	P		

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

PRINT NAME: Dennis G. DuPont

SIGNATURE: Dennis

LETTER OF TRANSMITTAL

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619-2242

813 621-0080
FAX 813 623-6757

SCS ENGINEERS

TRI

DATE 12/8/04

JOB NO. 04199056.02

ATTENTION CHRIS PEREZ

Re: DESTRUCTIVE SAMPLES SECONDARY FOR CITRUS CO. L.F. PHASE II EXPANSION

WE ARE SENDING YOU

☐ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change order

the following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1	12/8/04	SDS 1, 2, 3, 5 & 6 ✓

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 ____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS results returned 12-9-04

COPY TO FILE

SIGNED: _____

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE December 9, 2004

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1	12/09/04	SDS 7 & 8, 4-1

THESE ARE TRANSMITTED as check below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ Copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ Copies distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ Corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 20 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

Results returned 12-10-04

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE December 13, 2004

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ *Under separate cover via* _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1 each	12/13/04	SDS 9 through 15, ~~5-B~~

THESE ARE TRANSMITTED as check below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ Copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ Copies distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ Corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 20 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

results returned 12-14-04

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE December 16, 2004

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1 each	12/16/04	SDS 16-B, 17 through 22

THESE ARE TRANSMITTED as check below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ Copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ Copies distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ Corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 20 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

results returned 12-17-04

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE December 20, 2004

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ *Specifications* ☐ _____

COPIES	DATE	DESCRIPTION
1 each	12/20/04	SDS 23 through 31
1 each	12/20/04	SDS 5A, SDS 5B, SDS 16A

THESE ARE TRANSMITTED as check below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ Copies for approval

☒ For your use ☐ Approved as noted ☐ Submit _____ Copies distribution

☐ As requested ☐ Returned for corrections ☐ Return _____ Corrected prints

☐ For review and comment ☐ _____

☐ *FOR BIDS DUE* _____ *20* _____ ☐ *PRINTS RETURNED AFTER LOAN TO US*

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

results returned 12-21-04

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

December 9, 2004

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com
fax: 813-623-6757 - Sheila Carpenter
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2213-97-10
Material(s) Tested:	5 Heat Fusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2213-97-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
	Sample ID: **SDS-1**						
	Weld: **Heat Fusion Weld**						
Side A	Peel Strength (ppi)	153	151	152	155	159	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)	137	133	136	139	128	Peel B: 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 Strength (ppi)	179	180	182	182	182	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
	Sample ID: **SDS-2**						
	Weld: ***Heat Fusion Weld***						
Side A	Peel Strength (ppi)	131	148	129	142	137	Peel A: 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	
Side B	Peel Strength (ppi)	151	135	147	139	142	Peel B: 143
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)	184	186	187	186	183	Shear: 185
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2213-97-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-3**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	133	137	139	131	135	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)	153	144	132	137	143	Peel B: 142
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)	179	180	177	180	179	Shear: 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-5**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	130	104	139	133	139	Peel A: 129
Side A	Peel Incursion (%)	20	50	<10	<10	<10	
Side A	Peel Locus of Failure Code	AD-BRK	AD-BRK	SE	SE	SE	
Side A	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
Side B	Peel Strength (ppi)	114	112	120	133	112	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)	178	177	177	178	177	Shear: 177
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill Phase II Expansion

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2213-97-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5		MEAN
	Sample ID: **SDS-6**							
	Weld: **Heat Fusion Weld**							
Side A	Peel Strength (ppi)	129	135	134	121	121	✓	Peel A: 128
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)	125	124	128	137	124	✓	Peel B: 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 Strength (ppi)	174	174	172	176	174	✓	Shear: 174
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

TRI / Environmental, Inc.
A Texas Research International Company

December 10, 2004

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com
email: scarpenter@scsengineers.com
fax: 813-623-6757 - Sheila Carpenter
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2213-99-02
Material(s) Tested:	2 Heat Fusion Weld(s) 1 Single Extrusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2213-99-02

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-4-1**						
Weld:	**Single Extrusion**						
							Peel
Peel Strength (ppi)		122	159	145	146	162	147
Peel Incursion (%)		<10	<10	<10	<10	<10	
Peel Locus of Failure Code		SIP	SE	SIP	SE	SE	
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB	
							Shear
Shear Strength (ppi)		192	188	190	190	197	191
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	
Sample ID:	**SDS-7**						
Weld:	**Heat Fusion Weld**						
							Peel A
Side A: Peel Strength (ppi)		140	141	137	149	148	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)		150	148	146	144	140	146
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)		192	190	189	194	192	191
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2213-99-02

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-8**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	148	142	145	154	138	Peel A: 145
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)	136	142	145	143	147	Peel B: 143
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)	188	194	191	193	191	Shear: 191
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

December 14, 2004

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com
email: scarpenter@scsengineers.com
fax: 813-623-6757 - Sheila Carpenter
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-02-07
Material(s) Tested:	7 Heat Fusion Weld(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,

Sam R. Allen

Sam Allen
Vice president and Division 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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-02-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**DS-9**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	150	158	138	137	151	Peel A: 147
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)	140	133	134	137	140	Peel B: 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 Strength (ppi)	185	185	181	178	182	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**DS-10**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	145	153	155	152	157	Peel A: 152
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	115	134	134	138	Peel B: 131
Side B	Peel Incursion (%)	<10	<10	<10	<10	<10	
Side B	Peel Locus of Failure Code	SE	SIP	SE	SE	SE	
Side B	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	179	187	190	174	188	Shear: 184
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-02-07

		TEST REPLICATE NUMBER					
PARAMETER		**1**	**2**	**3**	**4**	**5**	**MEAN**
Sample ID:	**DS-11**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	136	139	141	143	143	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)	139	99	127	138	134	Peel B: 127
	Peel Incursion (%)	<10	<10	<10	<10	<10	
	Peel Locus of Failure Code	SIP	SIP	SIP	SE	SE	
	Peel NSF Failure Code	FTB	FTB	FTB	FTB	FTB	
	Shear Strength (ppi)	178	184	184	180	186	Shear: 182
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**DS-12**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	152	148	142	150	148	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)	142	138	140	141	138	Peel B: 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	
	Shear Strength (ppi)	182	182	181	182	179	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-02-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**DS-13**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	151	142	156	154	158	Peel A: 152
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)	141	137	144	146	137	Peel B: 141
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)	173	173	169	163	168	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**DS-14**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	149	144	149	147	144	Peel A: 147
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)	133	136	134	134	136	Peel B: 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 Strength (ppi)	190	192	192	183	193	Shear: 190
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-02-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**DS-15**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	149	143	159	153	167	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)	161	144	165	165	167	Peel B: 160
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)	179	176	183	174	181	Shear: 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

December 17, 2004

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com
email: scarpenter@scsengineers.com
fax: 813-623-6757 - Sheila Carpenter
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-05-08
Material(s) Tested:	7 Heat Fusion Weld(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,

Sam R. Allen

Sam Allen
Vice president and Division Manager
Geosynthetic Services Division
www.GeosyntheticTesting.com

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

TRI / Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2217-05-08

		TEST REPLICATE NUMBER					
PARAMETER		**1**	**2**	**3**	**4**	**5**	**MEAN**
Sample ID:	**SDS-16B**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	154	112	122	137	130	Peel A: 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	
Side B	Peel Strength (ppi)	132	138	130	131	137	Peel B: 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	
	Shear Strength (ppi)	177	185	185	185	189	Shear: 184
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-17**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	136	137	137	139	135	Peel A: 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	
Side B	Peel Strength (ppi)	127	130	132	143	144	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)	171	184	185	186	181	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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SDS-16

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-05-08

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-18**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	143	139	140	137	143	Peel A: 140
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)	146	144	146	133	137	Peel B: 141
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)	188	190	190	189	177	Shear: 187
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-19**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	151	159	164	159	156	Peel A: 158
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)	147	138	142	143	151	Peel B: 144
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)	163	170	168	172	170	Shear: 169
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-05-08

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-20**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	148	133	141	145	150	Peel A: 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	
Side B	Peel Strength (ppi)	146	141	141	144	141	Peel B: 143
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)	185	185	189	171	190	Shear: 184
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-21**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	141	136	136	141	139	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)	146	132	132	141	148	Peel B: 140
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)	191	187	185	188	187	Shear: 188
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-05-08

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-22**						
Weld:	**Heat Fusion Weld**						
Side A	Peel Strength (ppi)	171	151	159	152	160	Peel A: 159
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)	148	135	145	138	135	Peel B: 140
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)	178	173	172	169	165	Shear: 171
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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December 21, 2004

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-09-03
Material(s) Tested:	11 Heat Fusion Weld(s) 1 Single Extrusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

		TEST REPLICATE NUMBER					
PARAMETER		**1**	**2**	**3**	**4**	**5**	**MEAN**
Sample ID:	**SDS-5A**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	141	139	139	144	151	Peel A: 143
	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	134	157	147	151	Peel B: 147
	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)	187	184	183	182	185	Shear: 184
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-5B**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	138	142	154	137	139	Peel A: 142
	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	126	146	140	137	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)	182	185	179	181	177	Shear: 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5		MEAN
Sample ID:	**SDS-16A**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	131	131	138	144	135	✓	Peel A 136
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)	146	139	143	148	153	✓	Peel B 146
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	186	185	187	188	✓	Shear 186
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	***SDS-23***							
Weld:	**Single Extrusion**							
	Peel Strength (ppi)	113	98	126	115	114	✓	Peel 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)	183	184	190	179	181	✓	Shear 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5		MEAN
Sample ID:	**SDS-24**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	151	140	146	147	144	✓	Peel A 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		
Side B	Peel Strength (ppi)	149	147	139	144	143	✓	Peel B 144
	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	184	183	181	182	✓	Shear 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	***SDS-25***							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	144	141	141	146	143	✓	Peel A 143
	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	132	141	137	131	✓	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)	182	185	184	181	183	✓	Shear 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-26**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	149	162	159	155	168	Peel A: 159
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)	134	134	134	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)	177	180	181	179	179	Shear: 179
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	**SDS-27**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	149	144	130	145	143	Peel A: 142
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	122	137	135	155	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)	187	188	185	169	188	Shear: 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5		MEAN
Sample ID:	**SDS-28**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	140	144	147	154	145	✓	Peel A 146
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)	140	159	141	142	144	✓	Peel B 145
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)	190	185	187	188	188	✓	Shear 188
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	***SDS-29***							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	154	118	140	143	149	✓	Peel A 141
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)	136	130	144	147	158	✓	Peel B 143
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)	180	185	181	177	182	✓	Shear 181
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-09-03

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN
Sample ID:	**SDS-30**						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	151	122	145	143	143	Peel A: 141
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)	138	134	141	123	147	Peel B: 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 Strength (ppi)	181	187	180	181	188	Shear: 183
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	
Sample ID:	***SDS-31***						
Weld:	**Heat Fusion**						
Side A	Peel Strength (ppi)	138	142	138	140	139	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)	145	143	148	137	141	Peel B: 143
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)	186	189	189	174	185	Shear: 185
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50	

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TRI / Environmental, Inc.
A Texas Research International Company

July 1, 2005

Secondary liner

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scsengineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2231-70-07
Material(s) Tested:	1 Heat Fusion Weld(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

TRI / Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2231-70-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**SDS-16AA**							
Weld:	**Heat Fusion**							
							Peel A	
Side A	Peel Strength (ppi)	145	144	144	152	147	146	88 min
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)	130	129	137	135	133	133	88 min
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)	181	178	179	179	178	179	120 min
	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.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
JUL 06 2005
SOUTHWEST DISTRICT TAMPA

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE January 3, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

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1 each	1/03/05	PDS 1 through 5

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☐ FOR BIDS DUE _____ 20 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE January 4, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ *Specifications* ☐ _____

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☐ *FOR BIDS DUE* _____ 20 _____ ☐ *PRINTS RETURNED AFTER LOAN TO US*

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Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

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Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE January 7, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1 each	1/07/05	PDS 9 through 15

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☐ *FOR BIDS DUE* _____ 20 _____ ☐ *PRINTS RETURNED AFTER LOAN TO US*

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE January 11, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
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Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE January 12, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
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☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 20 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

Environmental Consultants

3012 U.S. Highway 301 North
Suite 700
Tampa, FL 33619

Cell 813-220-1923
352-249-1270
FAX 352-249-1271

SCS ENGINEERS

TO Chris Perez or Melissa

TRI

9063 Bee Caves Road

Austin, TX 78733 – 6201

DATE February 1, 2005

JOB NO. 09199056.02

ATTENTION Chris Perez or Melissa Hunter

Re: Citrus County Landfill Phase 2 Expansion

Destructive Samples for Secondary

WE ARE SENDING YOU

☒ Attached ☐ Under separate cover via _____

☐ Shop drawings ☐ Prints

☐ Copy of letter ☐ Change Order

☐ The following items: ☐ Plans ☐ Samples

☐ Specifications ☐ _____

COPIES	DATE	DESCRIPTION
1 each	2/1/05	PDS 25 through 31

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REMARKS Please E-mail results to Dennis DuPont – ddupont@scsengineers.com and Sheila Carpenter-Van Dijk – scarpenter@scsengineers.com

Hard copy to SCS Engineers, 3012 U.S. Highway North, Suite 700, Tampa, FL 33619-2242

COPY TO File

SIGNED: Dennis G. DuPont / Kurt Peterson

If enclosures are not as noted, kindly notify us at once.

January 4, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

Bill To:

<= Same (Job #: 09199056.02)

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-13-09
Material(s) Tested:	5 Heat Fusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2217-13-09

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-1**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	147	153	148	153	145	Peel A: 149	88 min
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)	143	141	147	151	149	Peel B: 146	88 min
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)	194	188	194	193	196	Shear: 193	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	***PDS-2***							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	129	132	138	138	132	Peel A: 134	88 min
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)	156	120	143	137	146	Peel B: 140	88 min
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	173	172	174	175	Shear: 174	120 min
	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.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers
Project: Citrus County Landfill Phase II Expansion

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2217-13-09

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
	Sample ID: **PDS-3**							
	Weld: **Heat Fusion**							
Side A	Peel Strength (ppi)	150	141	149	149	151	Peel A 148	88 min
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	138	141	153	144	Peel B 142	88 min
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	177	178	181	179	Shear 180	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
	Sample ID: **PDS-4**							
	Weld: **Heat Fusion**							
Side A	Peel Strength (ppi)	163	150	150	150	153	Peel A 153	88 min
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)	139	143	142	142	140	Peel B 141	88 min
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)	184	184	182	185	186	Shear 184	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-13-09

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
	Sample ID: **PDS-5**							
	Weld: **Heat Fusion**							
Side A	Peel Strength (ppi)	163	153	156	149	165	Peel A 157	88 min
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)	147	142	144	143	142	Peel B 144	88 min
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)	179	176	176	178	178	Shear 177	120 min
	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.

GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

January 5, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scs.engineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-14-07
Material(s) Tested:	3 Heat Fusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-14-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-6**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	147	136	148	144	138	Peel A: 143	88 min
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)	150	152	126	135	139	Peel B: 140	88 min
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)	188	188	189	188	188	Shear: 188	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-7**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	130	133	144	130	131	Peel A: 134	88 min
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	141	135	146	143	Peel B: 142	88 min
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)	180	180	182	182	181	Shear: 181	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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GeosyntheticTesting.com
9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY *Peel and Shear* (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-14-07

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-8**							
Weld:	**Heat Fusion**							
							Peel A	
Side A	Peel Strength (ppi)	155	163	155	163	163	160	88 min
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)	146	149	144	150	145	147	88 min
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)	163	169	168	165	169	167	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

January 10, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scsengineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-15-10
Material(s) Tested:	6 Heat Fusion Weld(s) 1 Single Extrusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-15-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-9**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	149	146	146	151	148	Peel A: 148	88 min
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	143	141	140	136	Peel B: 138	88 min
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	177	184	181	183	Shear: 181	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-10**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	141	151	139	154	144	Peel A: 146	88 min
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)	148	160	136	155	141	Peel B: 148	88 min
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)	180	179	180	182	181	Shear: 180	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-15-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-11**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	144	130	134	133	115	Peel A: 131	88 min
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)	138	144	137	146	137	Peel B: 140	88 min
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)	180	178	181	180	178	Shear: 179	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-12**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	143	143	143	144	143	Peel A: 143	88 min
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)	149	137	152	160	162	Peel B: 152	88 min
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	177	177	180	177	Shear: 178	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-15-10

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-13**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	156	137	161	162	158	Peel A: 155	88 min
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)	155	139	148	140	147	Peel B: 146	88 min
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)	179	181	181	181	178	Shear: 180	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-14**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	150	155	145	152	148	Peel A: 150	88 min
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)	155	141	138	144	138	Peel B: 143	88 min
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)	185	185	184	186	182	Shear: 184	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

TRI / Environmental, Inc.
A Texas Research International Company

DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-15-10

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-15**							
Weld:	**Single Extrusion**							
							Peel	
Peel Strength (ppi)		153	141	160	138	161	151	78 min
Peel Incursion (%)		<10	30	<10	50	<10		
Peel Locus of Failure Code		SE	AD-BRK	SE	AD-BRK	SE		
Peel NSF Failure Code		FTB	FTB	FTB	FTB	FTB		
							Shear	
Shear Strength (ppi)		173	178	176	180	176	177	120 min
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

January 12, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scsengineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-18-01
Material(s) Tested:	9 Heat Fusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-18-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-16**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	149	146	150	141	147	Peel A: 147	88 min
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)	131	139	140	143	141	Peel B: 139	88 min
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	173	169	172	Shear: 171	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-17**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	153	135	147	141	154	Peel A: 146	88 min
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)	143	135	134	137	138	Peel B: 137	88 min
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)	179	179	177	176	179	Shear: 178	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-18-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-18**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	155	140	139	149	145	Peel A: 146	88 min
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)	145	140	138	145	142	Peel B: 142	88 min
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)	166	167	162	161	164	Shear: 164	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-19**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	150	142	143	141	156	Peel A: 146	88 min
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)	140	137	137	138	137	Peel B: 138	88 min
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)	180	173	177	177	178	Shear: 177	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-18-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-20**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	142	141	145	148	141	Peel A: 143	88 min
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)	142	143	142	144	136	Peel B: 141	88 min
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)	185	186	182	190	187	Shear: 186	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-21**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	147	131	143	139	146	Peel A: 141	88 min
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	141	134	130	131	Peel B: 134	88 min
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)	182	181	183	184	184	Shear: 183	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE
SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)
TRI Log #: E2217-18-01

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-22**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	149	126	144	124	123	Peel A: 133	88 min
	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	137	140	127	134	Peel B: 137	88 min
	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)	175	173	174	174	171	Shear: 173	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-23**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	147	146	147	150	148	Peel A: 148	88 min
	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)	144	132	148	139	140	Peel B: 141	88 min
	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	175	176	173	177	Shear: 176	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-18-01

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-24**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	143	140	139	142	144	Peel A: 142	88 min
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)	139	138	141	137	145	Peel B: 140	88 min
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	175	173	176	173	Shear: 175	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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9063 Bee Caves Road / Austin, TX 78733 / 512 263 2101 / fax: 512 263 2558

TRI / Environmental, Inc.
A Texas Research International Company

January 13, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

Bill To:

<= Same (Job #: 09199056.02)

email: kpeterson@scsengineers.com
email: ddupont@scsengineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-19-09
Material(s) Tested:	1 Single Extrusion Weld(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: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

***SAME DAY Peel and Shear* (ASTM D 6392/GRI GM19/D 4437/NSF 54)**

TRI Log #: E2217-19-09

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-15A**							
Weld:	**Single Extrusion**							
							Peel	
Peel Strength (ppi)		151	132	137	142	120	136	78 min
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)		182	178	182	179	185	181	120 min
Shear Elongation @ Break (%)		>50	>50	>50	>50	>50		

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February 2, 2005

Mail To:

Mr. Kurt Peterson
SCS Engineers
3012 U.S. Highway 301 North, Ste. 700
Tampa, FL 33619

email: kpeterson@scsengineers.com
email: ddupont@scsengineers.com - Dennis DuPont
email: scarpenter@scsengineers.com - Sheila Carpenter-Van Dijk
fax: 813-623-6757 - Sheila Carpenter-Van Dijk
site fax: 352-249-1271 - Dennis Dupont

Bill To:

<= Same (Job #: 09199056.02)

Dear Mr. Peterson:

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:	**Citrus County Landfill - Phase II Expansion**
TRI Job Reference Number:	E2217-30-06
Material(s) Tested:	7 Heat Fusion Weld(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
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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-30-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-25**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	133	132	135	137	134	Peel A: 134	88 min
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)	133	132	134	136	126	Peel B: 132	88 min
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)	175	172	171	177	174	Shear: 174	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-26**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	141	152	153	154	147	Peel A: 149	88 min
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)	136	139	143	139	126	Peel B: 137	88 min
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	180	180	179	182	Shear: 181	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-30-06

	PARAMETER	TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-27**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	146	137	124	141	126	Peel A: 135	88 min
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)	147	124	148	144	136	Peel B: 140	88 min
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)	179	179	180	177	179	Shear: 179	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-28**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	149	140	148	139	143	Peel A: 144	88 min
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)	142	142	138	138	146	Peel B: 141	88 min
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)	186	185	187	189	189	Shear: 187	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

SAME DAY Peel and Shear (ASTM D 6392/GRI GM19/D 4437/NSF 54)

TRI Log #: E2217-30-06

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-29**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	145	136	155	144	153	Peel A: 147	88 min
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)	147	144	145	147	151	Peel B: 147	88 min
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	180	181	182	180	Shear: 181	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		
Sample ID:	**PDS-30**							
Weld:	**Heat Fusion**							
Side A	Peel Strength (ppi)	143	148	139	145	140	Peel A: 143	88 min
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)	154	143	138	138	141	Peel B: 143	88 min
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)	184	182	182	183	182	Shear: 183	120 min
	Shear Elongation @ Break (%)	>50	>50	>50	>50	>50		

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DESTRUCTIVE SEAM QUALITY ASSURANCE TEST RESULTS

TRI Client: SCS Engineers

Project: Citrus County Landfill Phase II Expansion

Material: HDPE

***SAME DAY Peel and Shear* (ASTM D 6392/GRI GM19/D 4437/NSF 54)**

TRI Log #: E2217-30-06

PARAMETER		TEST REPLICATE NUMBER 1	2	3	4	5	MEAN	PROJ. SPEC.
Sample ID:	**PDS-31**							
Weld:	**Heat Fusion**							
Side A							Peel A	
Peel Strength (ppi)		146	149	131	144	147	143	88 min
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)		139	141	139	140	127	137	88 min
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)		183	182	181	184	182	182	120 min
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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ATTACHMENT N

PROTECTIVE SAND COVER

psi Information To Build On
Engineering • Consulting • Testing

October 16, 2003

Mr. Ken Pitts
Advance Construction
400 Neal Road
Cantonment, Florida 35233

RE: Citrus County Central Land Fill – Select Sand Testing Results
Citrus County, Florida
PSI Report No. 390-30102

Dear Mr. Pitts:

This letter forwards the results of the laboratory soils testing performed on the select sand samples collected by our office from the on site stockpiles for the Citrus County Central Landfill in Citrus County, Florida. The laboratory testing was performed to verify that the soil specimens collected met/exceeded project specifications for select sand material. The table shows the results of the laboratory soils tests as well as the corresponding project specifications.

Sample Location (Description)	Permeability	Wash #200 (ASTM D-1140)	Dry Density (lbs/ft^3)
Stockpiled on site material – new cell (White fine SAND)	7.0×10^{-3}	6.0%	104.7
Stockpiled on site material – new cell (Yellow Fine SAND)	7.9×10^{-3}	6.0%	101.5
Project Specifications	$> 1 \times 10^{-3}$	2 %	≥ 90% STD.

Based on the project specifications noted above and the results of the laboratory soil testing, the soil samples submitted do meet project specifications for the permeability rate of $>1 \times 10^{-3}$, however the percent fines exceed the project specifications of 2%.

Should you have any questions or require additional information, please do not hesitate to call our office.

Respectfully Submitted,
Professional Service Industries, Inc.

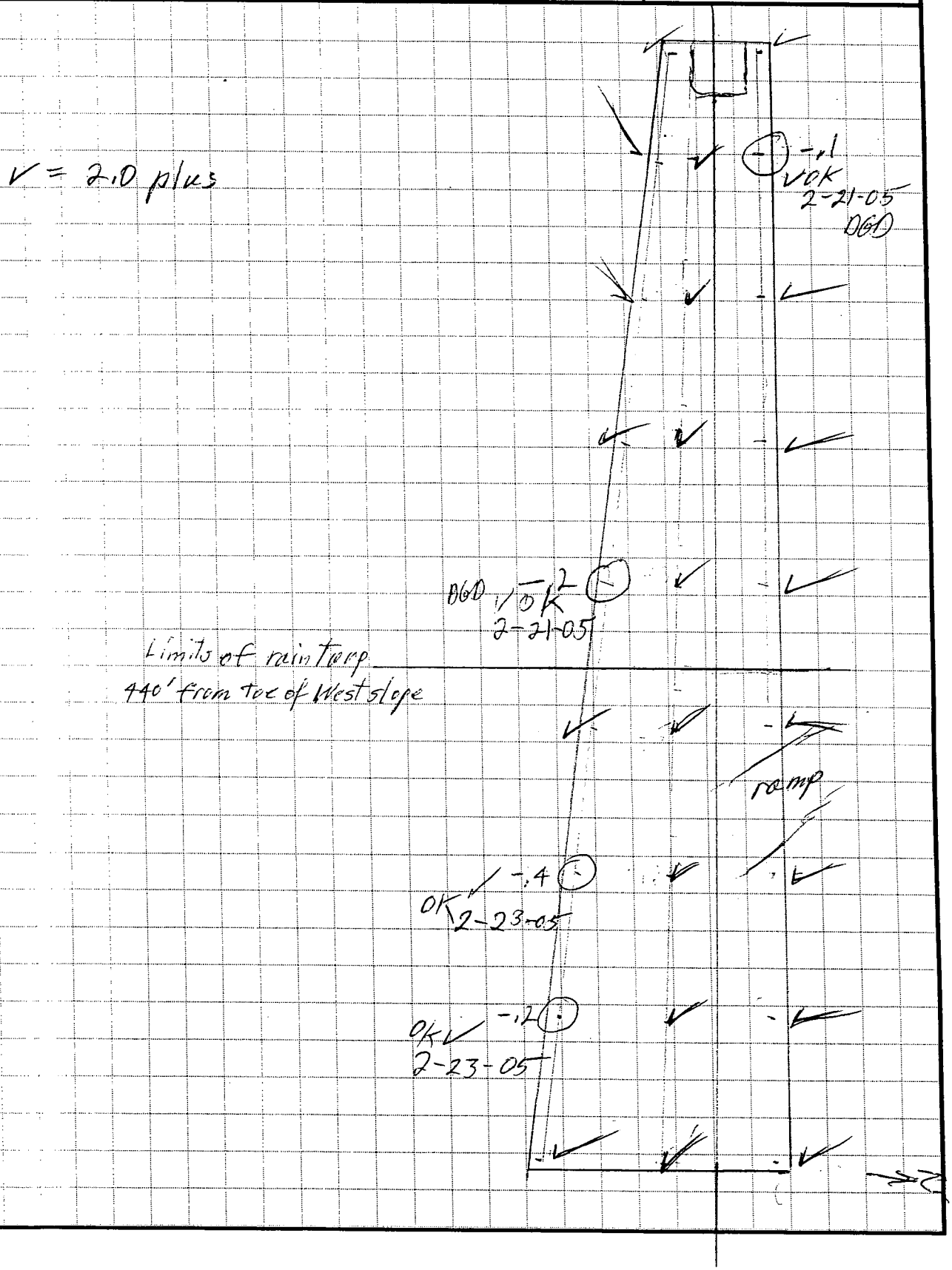
Sent w/o signature to avoid delay

Amanda S. Pereira
Branch Manager

John M. Pulsifer, P.E.
Executive Vice President
FL Registration No. 36154

SCS ENGINEERS

(9)

SHEET _____ OF _____

CLIENT	PROJECT	JOB NUMBER
Citrus County	Phase 2 Expansion	04199056.02
SUBJECT	BY	DATE
depth check 2' select sand	DGD	2-20-05
	CHECKED	DATE