

**GEOMEMBRANE REPAIR
CERTIFICATION DOCUMENTATION**

**SOUTHEAST COUNTY LANDFILL
HILLSBOROUGH COUNTY, FLORIDA**

11/8/94

Submitted to:

Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

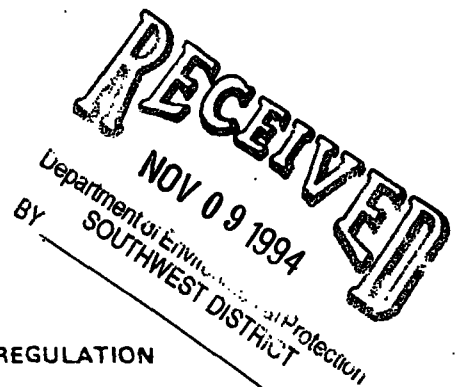
For:

Hillsborough County Department of Solid Waste
601 East Kennedy Boulevard
P.O. Box 1110
Tampa, Florida 33601

Submitted by:

SCS ENGINEERS
3012 U.S. Highway 301 North
Suite 700
Tampa, Florida 33619
(813) 621-0080

November 8, 1994
Job No. 0990018.35



STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
FOR APPLICATION TO OPERATE ONLY
RESOURCE RECOVERY AND MANAGEMENT FACILITY

CERTIFICATION OF CONSTRUCTION COMPLETION

DER Construction Permit No.: S029-158504 County: Hillsborough
Name of Project: Southeast Landfill
Name of Owner: Hillsborough County
Name of Engineer: SCS Engineers
Type of Project: CQA Monitoring of Geomembrane Repair

Cost: Estimated \$ 8,000 Actual \$ N/A
Site Design: Quantity: 2,200 ton/day Site Acreage: 162 Acres
Population: 573,013 Dumping Fee: \$ Varies Ton

Deviations from Plans and Application Approved by DER: None

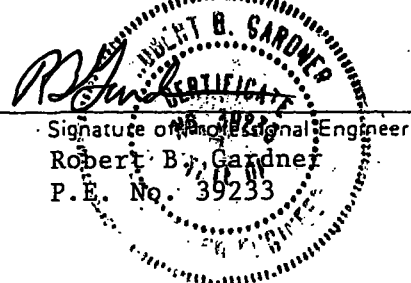
Water Monitoring Data Submitted to DER, Date: N/A
Address and Telephone No. of Site: 15960 County Road 672 (8 miles East of 301)
P.O. Box 997

Lithia, FL 33547, (Phone# 671-7707)

Name(s) of Site Supervisor: _____ Owner Rep: Matt Matthews Operator: Greg Walk, (WMI)
Date Site Inspection is requested: On-site CQA monitoring from October 4, 1994 - October 10, 1994

This is to certify that, with the exception of deviations noted above, the construction of the project has been completed in accordance with the plans authorized by Construction Permit No.: S029-158504 Dated: December 12, 1989

Date: November 8, 1994



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SECTION 1

EXECUTIVE SUMMARY

BACKGROUND

On May 31, 1994, approximately 200 feet of geomembrane liner in the northeast berm of Phase II at the Southeast County Landfill (SELF) was inadvertently damaged. The damage occurred during excavation of a trench for the leachate force main associated with the new leachate treatment facility.

Upon discovery of the damage, the Hillsborough County Department of Solid Waste (HCDSW) immediately ceased trenching operations. The Florida Department of Environmental Protection (FDEP) and the Hillsborough County Environmental Protection Commission (EPC) were advised immediately. SCS Engineers (SCS) and EPC inspected the trench, at the time of the incident, and there was no visible water or leachate present within the vicinity of the damaged geomembrane.

The trench was backfilled with clean soil to the elevation of the geomembrane, and a plastic sheet was placed over the damaged section of the liner to facilitate containment of infiltrating stormwater.

The purpose of this report is to present the results of the construction quality assurance (CQA) activities performed by SCS during the repair to the geomembrane liner. The report contains two sections:

- An executive summary of the repairs.
- Certification documentation as developed from the CQA field services.

SUMMARY OF REPAIRS

The activities involved in the repair of the geomembrane were documented as part of SCS's CQA services for the HCDSW. The observations and documentation presented in Section 2 discuss the quality of the repair work, which began on October 4, 1994 and concluded on October 10, 1994.

The geomembrane component of the SELF's liner system covers the sideslopes of the perimeter containment berm. The geomembrane used for the repair is a 3 ply, 36 mil reinforced chlorosulfonated polyethylene (CSPE), and is the same type that was originally installed at the SELF. The resin for the liner is manufactured by Dupont under the trade name Hypalon®, and is chemically inert to the corrosive nature of leachate found in municipal solid waste landfills. The test results of the seam surpassed industry standards for strength. The protective soil cover was installed over the geomembrane in the presence of the SCS CQA monitor.

The HCDSW has reported that the original permitted final capping system has been re-established for the area over the repaired geomembrane, including:

- A minimum of 12 inches of protective soil.
- A minimum of 18 inches of clay.
- Six inches of topsoil.
- A vegetative cover.

LEACHATE ASSESSMENT

Although there has been the potential for leachate seepage through the damaged geomembrane, observations by EPC, SCS, and HCDSW at the time the geomembrane was torn indicated that there was no leachate present in the vicinity of the trench. As a temporary repair to facilitate the containment of infiltrating stormwater, a plastic sheet and clean soil were placed over the damaged section of the liner.

Surface water which had accumulated on top of the trench backfill since the damage occurred was pumped onto the landfill surface above the trench area prior to excavation. The estimated volume of water removed was 3,000 gallons.

Water would continuously seep into the trench during the time the geomembrane was exposed for repair. The source for the water appeared to be from the subgrade, and would gain access into the trench by passing up through the hole in the geomembrane. The water was removed to provide a dry foundation for the geomembrane patch. An estimated 600 gallons were pumped from the trench during the time period that the repair work was performed. The water was managed as leachate and pumped into a fiberglass tank to be disposed of on the active working face of the SELF, in accordance with the SELF's leachate recirculation plan. After the geomembrane repair was completed, no water was observed seeping into the trench from below or from the sidewalls of the trench.

Pooled water on the geomembrane during the repair activities were observed to be at a lower elevation than the elevation of the damaged geomembrane. The as-built drawing for the geomembrane repair (Appendix A) indicates the tear to be at elevation 128 National Geodetic Vertical Datum (NGVD), and the highest recorded elevation in the leachate sump during the time period that the geomembrane was damaged is approximately 126 NGVD, reported on June 20, 1994.

CONCLUSIONS

- A plastic tarp and clean fill were used to cover the damaged geomembrane, isolating the area from the landfill to the maximum extent possible.
- Based on the observed leachate levels within the landfill, it would have been unlikely for leachate to reach the elevation of the damaged geomembrane. Therefore, SCS believes the water encountered in the trench during the repair work was from excess moisture in the subgrade soils and the soil backfill materials, and not leachate from the landfill.

- The repair to the geomembrane has re-established the integrity of the perimeter berm liner system.

SECTION 2

CONSTRUCTION QUALITY ASSURANCE DOCUMENTATION

INTRODUCTION

This section compiles and summarizes the CQA activities performed by SCS during the repair to the geomembrane liner in the northeast berm of Phase II at the SELF.

Excavation work was performed by Waste Management Inc. (WMI). The repair work on the geomembrane liner was conducted by Atlantic Lining Company (ALCO). SCS conducted the CQA services to certify the construction on behalf of the HCDSW.

CQA services provided by SCS included observation and documentation of the geomembrane installation (i.e., weather conditions, construction techniques, materials testing, repairs, and the development of as-built conditions). The collected data was recorded in daily logs and other forms, and is presented within this report.

The SELF is located on County Road 672, eight miles east of U.S. Highway 301, as shown in Figure 2-1. The location of the repair at the SELF, as shown in Figure 2-2, is at the northern perimeter of Phase II.

GEOMEMBRANE LINER MATERIAL

The geomembrane component of the liner system covers the sideslopes of the perimeter containment berm at the SELF. The geomembrane is a 3-ply, 36 mil reinforced chlorosulfonated polyethylene (CSPE). The resin for the liner is manufactured by Dupont under the trade name Hypalon[®].

The fabricator of the CSPE geomembrane for the repair is Burke Environmental Industries San Jose, California. Appendix B contains certification information by the manufacturer verifying the conformance tests conducted on the geomembrane used for the repair.

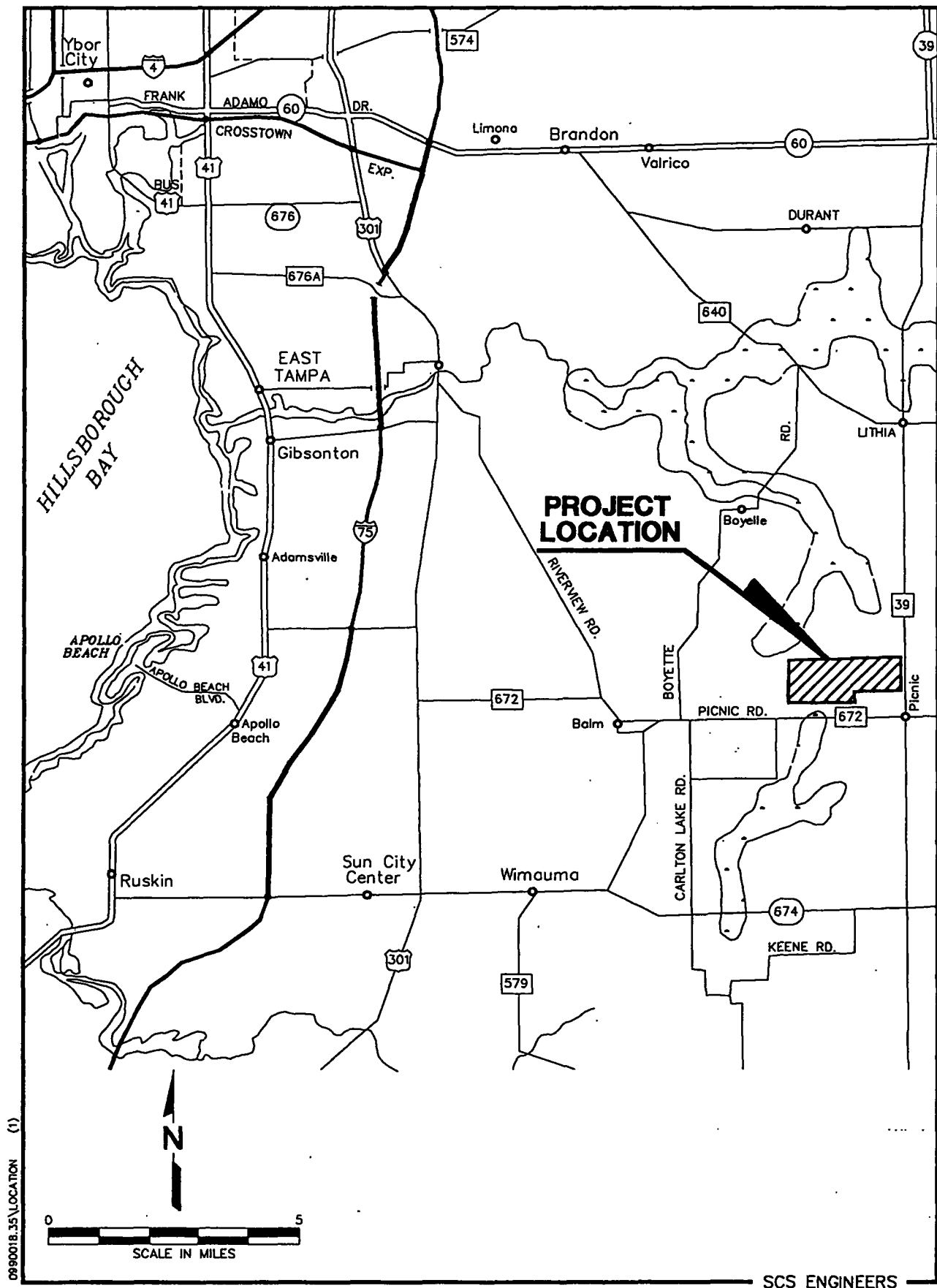


Figure 2-1. Site Location Map.

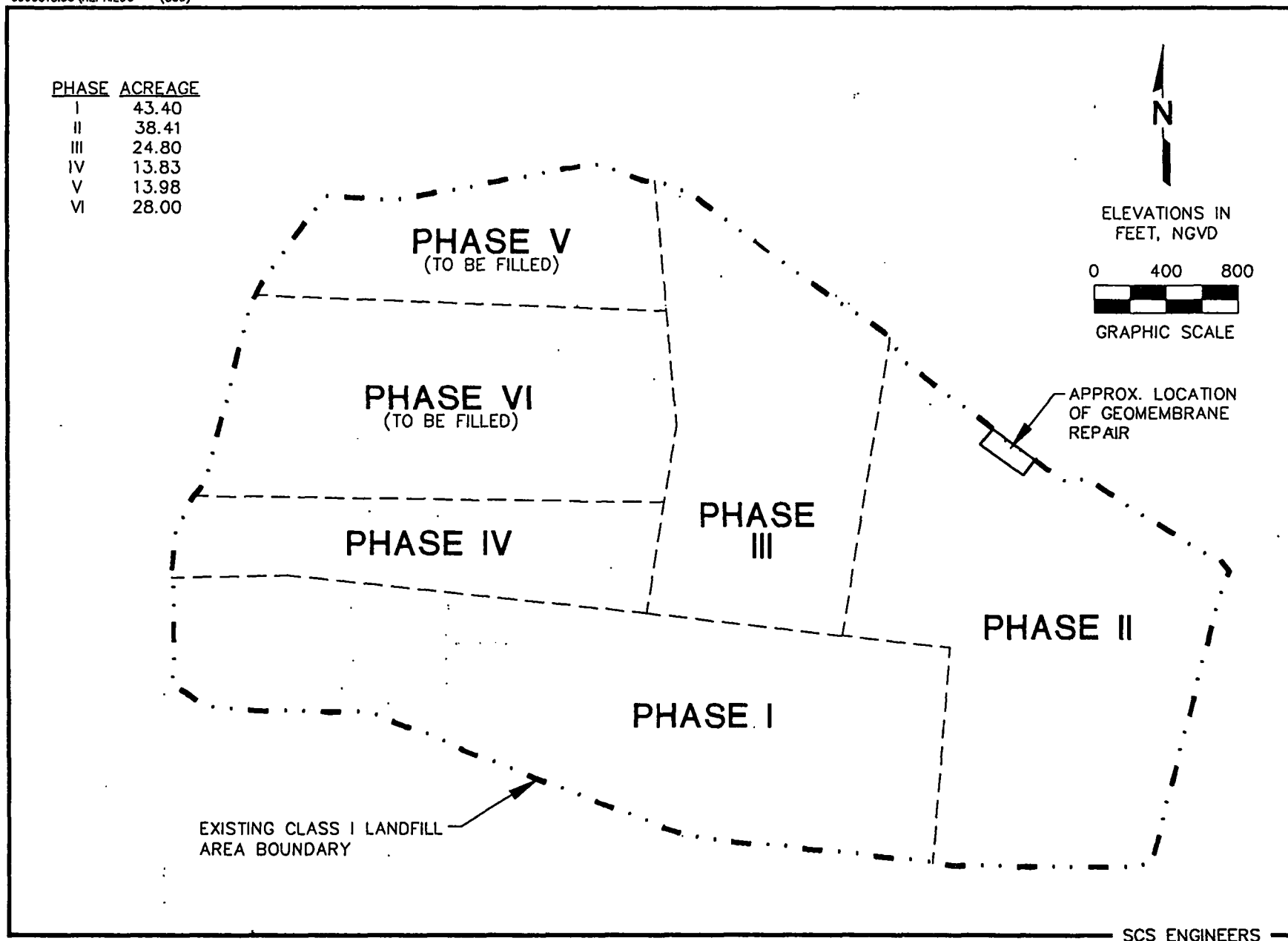


Figure 2-2. Repair Location Map.

FIELD OPERATIONS

The activities surrounding the geomembrane repair were recorded on Daily Field Reports (Appendix C). The reports were signed and dated at the end of each day by the SCS CQA Monitor, and included general information (i.e., weather conditions, activities, time) pertinent to the work conducted that day.

The following operations were visually observed and documented as part of the SCS CQA services:

Weather Conditions

Excavation began on October 4, 1994. Installation of the geomembrane began on October 7, 1994 and ended on October 9, 1994. The repaired geomembrane was covered with soil on October 10, 1994. The ambient air temperature ranged from approximately 72°F in the mornings to 95°F in the afternoons. No measurable amount of rainfall occurred at the site during the time period that the work was performed. The weather was considered exceptionally good for the geomembrane installation.

Excavation

WMI began clearing the vegetation from the vicinity of the trench on October 4, 1994. Approximately 3,000 gallons of water which had accumulated on top of the trench backfill was pumped onto the landfill surface above the excavation. For the remainder of the project, all other liquids that accumulated in the trench were managed as leachate by being pumped into a fiberglass tank and disposed of on the active cell of the SELF, in accordance with the SELF's leachate recirculation plan.

After the trench was pumped dry, several feet of overlying soil needed to be removed to expose the geomembrane for repairs. Appropriate care was taken during the excavation activities by WMI's equipment operator and foreman to minimize further damage to the in-place geomembrane. The operator of a track mounted backhoe was guided by a WMI

foreman. Since the damaged geomembrane had been backfilled with soil, the foreman would search for the geomembrane after a small amount of the soil was removed. The foreman would carefully locate the liner with a square tipped shovel, and then guide the operator to within a few inches of the geomembrane. After a portion of the soil was removed by the backhoe, laborers removed the remaining soil with square tipped shovels. The in-place geomembrane was exposed approximately 2 feet to each side of the damaged liner, and swept clean.

Appendix D contains a record of the WMI personnel, ALCO personnel, and local labor that were involved in the excavation and subsequent geomembrane repair.

Subgrade Preparation

After the excavation activities were complete, the subgrade for the new geomembrane was prepared. Standing water was pumped into the storage tank, and wet soils were replaced with dry sand. The volume of water pumped out of the trench, into the storage tank and disposed of on-site is estimated to be 600 gallons. The surface was raked by WMI personnel to provide a level foundation for the geomembrane with no abrupt changes in grade. The subgrade surface acceptance form is in Appendix E.

Geomembrane Deployment

ALCO arrived at the site on October 7, 1994. After reviewing the damaged geomembrane, ALCO decided to install multiple patches using similar geomembrane material for the repair. The geomembrane could be more accurately positioned by repairing the tear with multiple patches instead of a single strip; allowing control for adequate seam overlap and the ability to keep the overlap clean during seaming.

Three geomembrane patches were removed from a roll measuring 300 feet by 5 feet, and ranged in length from 53 feet to 74 feet. Each patch was prepared, seamed and installed, beginning at the west end of the trench. The patches were inspected by the

SCS CQA Monitor prior to installation. Areas that were identified as needing repairs were labeled, recorded in the logs, repaired and tested.

Each patch was assigned an identification number. The SCS CQA Monitor recorded the following information for each patch:

- Location and length of the panel.
- Date of installation.
- Panel number (identification code).
- Repair location.

Adequate slack in the deployed geomembrane was allowed for contraction and expansion of the material. Wrinkles were avoided by correctly placing the patch.

Approximately 894 square feet of geomembrane was installed for the repair. Appendix F contains the panel placement log.

Geomembrane Seam Construction

ALCO prepared the patch for seaming by cleaning the edges with xylene before applying an initial coat of adhesive. While the patch was being prepared, the in-place geomembrane was also being cleaned and coated with an initial layer of adhesive. When the adhesive dried, the patch was placed into the trench. Each patch was aligned to maintain a minimum overlap of 6 inches around the entire perimeter.

Both surfaces of the geomembrane were coated with adhesive, as recommended by the adhesive manufacturer. The initial coat required a minimum drying time of 1 hour. Excess moisture and dirt were removed from the area to be seamed immediately prior to the application of the second coat of adhesive. The second coat, applied to a 6-inch area, was allowed to dry until tacky. The seams were then bonded together with the assistance of a 4-inch wide stainless steel hand-held roller. The rolling action distributed the adhesive and removed trapped air bubbles. A wood board was placed directly under

the seam to enhance contact and provide for a firm base for which to bond the seam. The board was removed for the final 2 feet of seam in the project.

Any portion of the seam which was found damaged or inadequate was repaired by either applying additional adhesive, or patching. At the end of each patch, the threads from the reinforcing scrim were exposed. The exposed edge was sealed to prevent wicking by distributing an excess amount of adhesive.

Additional patches were used for small repairs, such as holes or rips. Patches consisted of excess material with all corners rounded. All patches were fabricated to cover a minimum of 6 inches beyond the edges of the area being repaired.

Observation activities by the SCS CQA Monitor during field seaming (Appendix G) included:

- Weather conditions.
- Inspect and approve seam surfaces to be free from dirt and moisture.
- Label and document the locations of all seam repairs.

The adhesive used in the repair at the SELF is manufactured by Electro Chemical Engineering and Manufacturing Company. Further information on the adhesive is in Appendix H.

Seam Repairs

Each repair was inspected by the SCS CQA Monitor and documented. Locations for the seams and repairs are found in the as-built drawing (Appendix A).

Seam Testing

Destructive --

To minimize the impact on the integrity of the geomembrane, no destructive samples were removed from the seams. Instead of cutting a sample of the seam, a sacrificial portion of the in-place geomembrane was removed in an area that would eventually be completely covered over by the new geomembrane patch. The old geomembrane was prepared and bonded to a portion of new geomembrane by using similar seaming procedures for the repair activities. An additional sample comprised of new geomembrane bonded to new geomembrane was prepared as a control seam.

The samples were mailed to the SCS office in Reston, Virginia, where a calibrated tensiometer (Multi-Test 500, as manufactured by Wegener) was used to test the seam strength. SCS performed two tests, shear to determine strength (ASTM D751) and peel to determine adhesion (ASTM D413).

Five specimens, each a 1.0 inch wide strip, were sampled to develop a more accurate and representative value. Documentation of the laboratory tests are in Appendix I, and the results are discussed in a later section of this report.

Non-Destructive --

The entire length of each field seam, including patches, were tested in a non-destructive manner using air-lancing at 50-60 pounds per square inch directed perpendicular to the edge of the field seam. Areas needing repair were identified when air passing across a seam would expand or vibrate the geomembrane. In the areas that indicated a problem, bonding was completed by cleaning the geomembrane surfaces, adding adhesive, re-rolling the seam, and re-testing. There were no seams where the entire width failed.

All non-destructive tests were observed and documented by the SCS CQA Monitor. Documentation of the non-destructive tests are in Appendix J.

Geomembrane Acceptance

Upon completing installation, repair, and testing activities for the geomembrane, a comprehensive checklist was reviewed by a representative of ALCO and the SCS CQA Monitor. The checklist is in Appendix K.

Empty containers for the materials used to bond the geomembrane (i.e., xylene, adhesive, catalyst) and scrap geomembrane were placed into garbage bags by WMI and properly disposed at the SELF.

Protective Cover

The HCDSW has reported that the original permitted final capping system has been re-established for the area over the repaired geomembrane, including:

- A minimum of 12 inches of protective soil.
- A minimum of 18 inches of clay.
- Six inches of topsoil.
- A vegetative cover.

The SCS CQA Monitor observed the placement of the initial soil over the geomembrane. The protective soil was not allowed to have objects that may potentially damage the geomembrane (i.e., sticks, rocks, shells, refuse). The source of the protective soil was from on-site stockpiles.

TEST RESULTS

The laboratory results for the peel and shear tests conducted on the two geomembrane samples are reported in Appendix I. Table 2-1 contains a summary of the laboratory results, along with industry standards and manufacturer values for CSPE geomembrane.

TABLE 2-1. GEOMEMBRANE SEAM DATA

Value	Industry ¹	Manufacturer ²	New to New	New to Old
Bonded Seam Strength (ppi ³)	160 (factory) or FTB ⁴	265	FTB at 135	FTB at 143
Adhesion (ppi)	7 or FTB	9	FTB at 36	8.5

Notes:

- 1 Taken from National Sanitation Foundation (NSF) Standard Number 54, "Flexible Membrane Liners", Table 7A, 1993.
- 2 As provided by Burke Industries and contained in Appendix B.
- 3 ppi = pounds per inch.
- 4 Film-Tear Bond. A condition where seam remains intact while the bonded sheet fails.

For the sample where the new geomembrane was bonded to the old geomembrane, the tests indicate that the seam integrity remained intact while undergoing shear stresses. The samples eventually failed due to the geomembrane separating in the plane of the scrim, a condition known as film-tear bond (FTB). FTB is an acceptable condition for verifying seam strength integrity. The tested seam samples exceeded the industry standards, as compiled in NSF Standard Number 54, for the adhesion between the surfaces within multiple ply geomembranes.

Although this project did not have specific requirements for seaming strength (i.e., permit conditions or technical specifications), the tests indicate that the seam is acceptable due to exceeding industry and manufacturer standards.

AS-BUILT DRAWING

Appendix A contains information depicting the location of the installed geomembrane patches, including horizontal and vertical control. Incidental penetrations through the geomembrane occurring from the process of exposing the liner were documented for repair, and are identified in the as-built drawing.

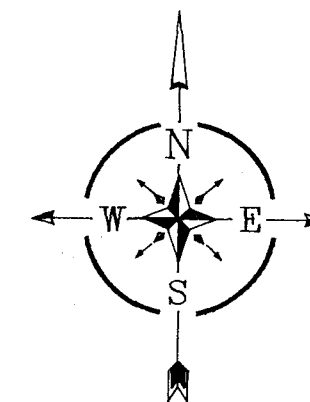
The geomembrane repair was surveyed at the completion of the repair work.

CONSTRUCTION PHOTOGRAPHS

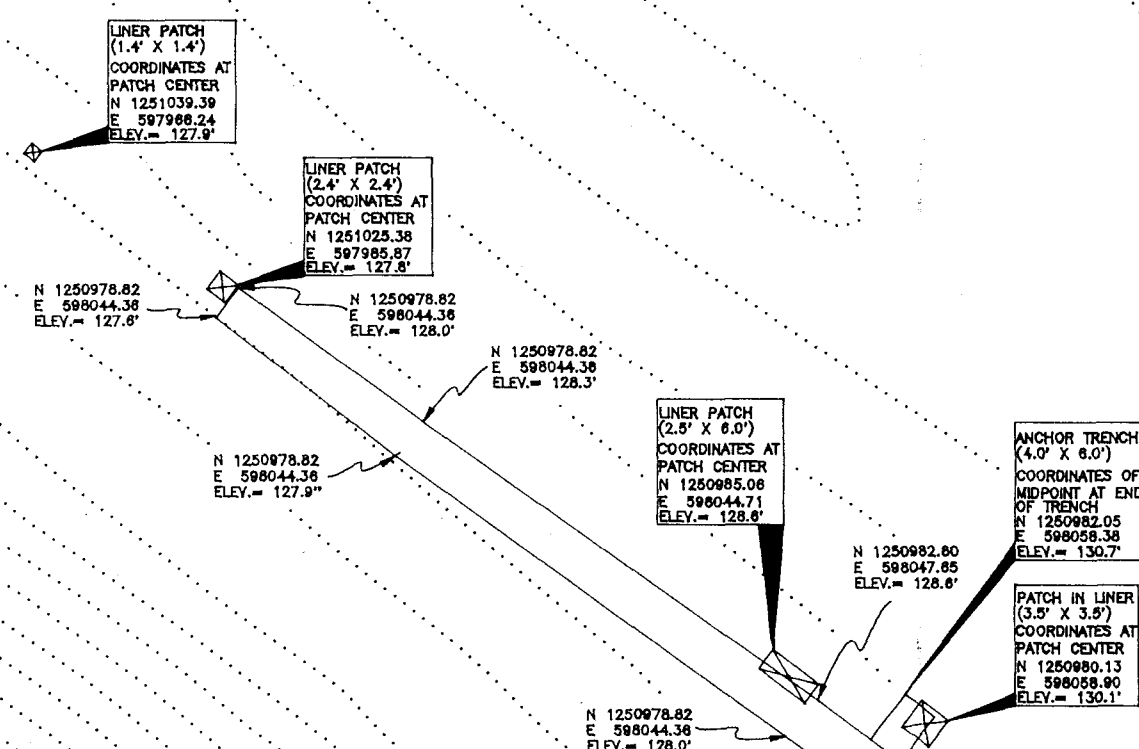
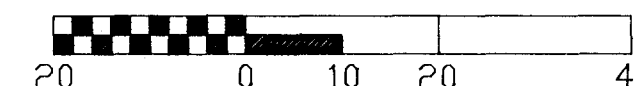
The tasks performed for the repair of the damaged geomembrane were recorded by photographs taken periodically by the SCS CQA Monitor. The photographs in Appendix L show representative events of the geomembrane installation.

APPENDIX A
AS-BUILT DRAWING

1086331



1" = 20'



LEACHATE LINER REPAIR AREA

LEGEND:

F. = FOUND
 S. = SET
 I.P. = IRON PIPE
 I.R. = IRON ROD
 C.I.P. = IRON PIPE & CAP
 C.I.R. = IRON ROD & CAP
 C.M. = CONCRETE MONUMENT
 N & D = NAIL AND DISC
 P.K.N. = P.K. NAIL
 R.R.S. = RAILROAD SPIKE
 (P) = PLAT DIMENSION
 (F) = FIELD MEASUREMENT
 (D) = DEED CALL

SURVEYOR'S NOTES:

1. REPRODUCTIONS OF THIS SKETCH ARE NOT VALID UNLESS SIGNED AND EMBOSSED WITH THE SURVEYOR'S SEAL.
2. THE HORIZONTAL COORDINATE SYSTEM REFERENCED HEREON HAS BEEN BASED ON AN NAD 1983 STATE PLANE COORDINATE SYSTEM FOR THE FLORIDA WEST ZONE IN FEET, WHILE THE VERTICAL COORDINATE SYSTEM REFERENCED HEREON HAS BEEN BASED ON AN NGVD 1929 IN FEET.
3. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF AN ABSTRACT OF TITLE, THEREFORE THE UNDERSIGNED MAKES NO GUARANTEES AS TO THE ACTUAL SIZE, LOCATION OR EXISTENCE OF EASEMENTS, RIGHTS-OF-WAY, SETBACK LINES, AGREEMENTS, RESERVATIONS OR OTHER SIMILAR MATTERS.
4. NO ATTEMPT WAS MADE TO DETERMINE THE LOCATION OF UNDERGROUND FEATURES, OR UTILITIES IN THIS SURVEY.
5. THIS SURVEY WAS PREPARED EXPRESSLY FOR THE ENTITIES NAMED. NO OTHER PERSON OR ENTITY IS ENTITLED TO RELY UPON THIS SURVEY FOR ANY PURPOSE WHATSOEVER WITHOUT THE EXPRESS WRITTEN CONSENT OF HOLLINGSWORTH & ASSOCIATES, INC.
6. THE CONTOUR INFORMATION ON THIS SURVEY WAS OBTAINED FROM THE AERIAL MAPS COMPILED 3/9/94 BY AIR SURVEY CORPORATION.

DRAWN BY: D.D.
 DATE: 10/09/94
 CHECKED BY: R.F.K.
 DATE: 10/10/94
 FIELD CREW: R.F.K., D.L.
 F.B./PG. H121/53

THIS DRAWING IS CERTIFIED
 TO: SOUTHEAST LANDFILL
 HILLSBOROUGH COUNTY



REVISIONS

HOLLINGSWORTH & ASSOCIATES, INC.
 SURVEYING AND MAPPING

1001 E. BAKER STREET SUITE 303
 PLANT CITY, FL 33566
 TELEPHONE: (813) 754-3639 Fax (813) 754-3230

AS-BUILT SURVEY FOR:

S.E. LANDFILL

I HEREBY CERTIFY THIS PLAT TO MEET
 OR EXCEED THE MINIMUM STANDARD
 REQUIREMENTS OF CHAPTER 61G17-6
 OF THE FLORIDA ADMINISTRATIVE CODE.



SHEET
 1 of 1
 JOB NO.
 2002
 DWG. NO.
 ACAD FILE
 2002LF.DWG
 POINTCAD FILE

APPENDIX B
GEOMEMBRANE MANUFACTURER CERTIFICATION

FROM

10.13.1994 16:01

P. 1



**Atlanta Lining Co.
12 Saddlebrook Rd.
Robbinsville, NJ 08691**

**October 13, 1994
Fax 609-448-7576**

Re: Rust Environmental

To Whom It may concern,

This letter is to certify that Burke M-283 36 mil Hypalon and/or M-284 45 mil Hypalon meet or exceed all physical specifications as set forth in NSF Standard 54. In addition, please find a copy of NSF 61 certifying Burke's Hypalon for containment of potable water.

If you have questions, please call 800-669-7010 ext. 447.

Regards,


**Bradley Roades
Technical Engineer**

**CC: D. Bartlett
S. Roades**

FROM

10.13.1994 16:29

P. 2



Burke Industries

2250 South Tenth Street ■ San Jose, California 95112 ■ Phone: (408) 297-3500 ■ Fax: (408) 280-0699

Frank Taylor
Atlantic Lining Co. Inc.
12 Saddlebrook RD.
Robbinsville, NJ 08691

REFERENCE: Sales Order # 2609
Hypalon membrane purchased for a job at
South East Landfill
County Road # 672
Lithia, FL 33547

CERTIFICATION OF 36 MIL HYPALON MEMBRANE

Mr. Taylor,

Burke Industries hereby certifies that our Hypalon membrane, M-283, complies to the physical requirements as stated in our M-283 spec. The following data was obtained from material manufactured previously by Burke and identically chemical in composition.

Physical Properties

Required Obtained

Thickness, mil.	.034"	.036"
Thickness over scrim, min.	.011"	.013"
Tensile Strength		
Fabric strength, min.	200 lbs.	240 lbs.
Rubber strength, min.	150 lbs.	225 lbs.
Elongation		
Fabric Elongation, min.	15%	20%
Rubber Elongation, min.	30%	106%
Tear Propagation, min.	80 lbs.	88 lbs.
Hydrostatic Resistance, min.	250 psi	444 psi
Puncture Resistance, typical	240 lbs	245 lbs
Bonded Seam Strength, min.	160 lbs	265 lbs
Ply Adhesion, min.	7 lbs	9 lbs
Ozone Resistance	No Cracks	Pass
Low Temperature Bend @ -40F	pass	pass @ -45F

Certified by:


Michael Villalta
Product/Process Engineer

APPENDIX C
DAILY FIELD REPORT

SCS ENGINEERS <h2 style="text-align: center; margin: 0;">DAILY FIELD REPORT</h2>	SHEET <u>1</u> of <u>7</u> PROJECT TITLE: <u>SELF - HYDRAULIC REPAIR</u> PROJECT NO: <u>0990018.35</u> DATE: <u>OCTOBER 4, 1994 (TUES)</u>
TEMPERATURE: <u>MIN: 72 MAX: 89</u> WEATHER/WIND: _____ LOCATION: _____	REPORT NO: _____ OWNER: <u>HILLS. CNTY</u> CONTRACTOR: <u>WMI / ALCO</u>
<div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 08:40 </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 8:40 ARRIVED ON SITE. MET W/ MATT MATTHEWS </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 9:00 VISITED REPAIR LOCATION. TRUCK MOUNTED </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> BACK-HOE REMOVING VEGETATION. </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 9:30 DEWATERING TRENCH W/ PUMPS. NO EXCAVATING. </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 11:30 LUNCH - CALLED KRAUS & HAMILTON. </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 2:00 EXCAVATION IN 1 AREA TO ESTABLISH </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> LOCATION OF THE LINE. ANCHOR TRENCH </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> BEAM LOCATED AT WEST END. COVERED </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> W/ TIRES FOR PROTECTION. FIRST </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> DETERMINED LINE LOCATION IN 3 SPOTS. </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> REMAINDER OF DAY WAS USED TO </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> REMOVE CLAY CAP ON THE SOUTH END </div> <div style="border: 1px solid black; margin-bottom: 5px; padding: 2px;"> 5:15 DEPARTED SITE </div>	

CC: _____ PRINT NAME: KARL SCHMIT
 _____ SIGNATURE: Karl Schmit

SCS ENGINEERS <h2 style="text-align: center; margin: 0;">DAILY FIELD REPORT</h2>	SHEET <u>2 of 7</u> PROJECT TITLE: <u>SELF - HYALON REPAIR</u> PROJECT NO: <u>09A0018.35 L.C. 85</u> DATE: <u>OCTOBER 5, 1994 (W)</u>
TEMPERATURE: <u>MIN: 72 MAX: 87°F</u> WEATHER/WIND: _____ LOCATION: _____	REPORT NO: _____ OWNER: <u>HILLS. CNTY</u> CONTRACTOR: <u>WMI / MCO</u>
<div style="border: 1px solid black; min-height: 150px; margin-top: 10px;"> <p>8:30 ARRIVED AT SCS OFFICE & COLLECTED PAPERWORK</p> <p>9:00 MTG W/ KRAUS & GREENWALDER (WMI) & LUKE (RUST) OVER PHONE. DISCUSSED TESTS, WARRANTY</p> <p>9:45 ARRIVED @ SITE - CLAY LAYER REMOVED. WATERS THAT SEEPED INTO TRENCH DURING THE EVENING WERE PUMPED OUT AND STORED IN A FIBERGLASS TANK FOR DISPOSAL.</p> <p>11:00 EXCAVATION BEGAN</p> <p>11:40 LUNCH</p> <p>12:45 BRIAN ARRIVED (RUST) LINER EXPOSURE ACTIVITIES BEGAN. I spoke to MAT, GREG & BRIAN ON ISSUES CONCERNING EXPOSED REFUSE, GAS DAILY COVER. MADE A GENERAL ANNOUNCEMENT PROHIBITING PROHIBITING SMOKING.</p> <p>2:30 CALLED KRAUS RE: SEAM WARRANTY ISSUE. CAN'T DO TOO MUCH W/ IT. SPEAK TO GREG ABOUT INFO ON TESTS, GIVE ETC.</p> <p>3:45 DISCUSSED SEAMING, GLUE & WARRANTY W/ GREG, BRIAN & MAT.</p> <p>5:30 DEPARTED SITE</p> </div>	

CC: _____ PRINT NAME: KARL SCHMIT
 _____ SIGNATURE: Karl Schmit

SCS ENGINEERS <h2 style="text-align: center; margin: 0;">DAILY FIELD REPORT</h2>	SHEET <u>3</u> of <u>7</u> PROJECT TITLE: <u>SELF - HYDRAULIC REPAIR</u> PROJECT NO: <u>099001R.35</u> DATE: <u>OCTOBER 6, 1994 (THURS.)</u>
TEMPERATURE: <u>MIN: 70 MAX: 85</u> WEATHER/WIND: <u>CLEAR, LT. WIND</u> LOCATION: _____	REPORT NO: _____ OWNER: <u>HILLS. CNTY</u> CONTRACTOR: <u>WMI/ALCO</u>
<div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 8:30 ARRIVED ON SITE. REPAIRED WATER IS PUMPED OUT, EXCAVATION BEGINNING, WMI & RUST IN TRENCH </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 9:00 M. MATTHEWS VISITED </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 11:15 EXCAVATION ON NORTH SIDE BEGINS </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 12:00 LUNCH </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 1:00 EXCAVATION ON NORTH SIDE CONTINUES </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 1:15 SIDESLOPE TENDING BACKHOE </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 2:00 BEGAN PUMPING W/ MUD HOG (RENTED PUMP) CONTINUED CLEANING NORTH SIDE OF SLOPES W/ HAND - EQUIPMENT. </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 2:30 LAST HAND TOOLS STOPPED </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 3:00 SHARLE FROM WMI-ORLANDO VISITED PUMPING OUT GUMPS W/ PUMP </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 3:30 </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 4:00 DIGGING TRENCH WESTWARD FOR CLAY CAP INSTALLATION </div> <div style="border-bottom: 1px solid black; margin-bottom: 5px;"> 4:30 DEPARTED SITE FOR OFFICE </div>	

CC: _____ PRINT NAME: KARE SCHMIT
 _____ SIGNATURE: Kare Schmit

SCS ENGINEERS <h2 style="text-align: center;">DAILY FIELD REPORT</h2>	SHEET <u>4</u> of <u>7</u> PROJECT TITLE: <u>SELF - HYDRAULIC REPAIR</u> PROJECT NO: <u>09 90018.35</u> DATE: <u>OCTOBER 7, 1994 (FRI)</u>
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TEMPERATURE: <u>MIN: 72 MAX: 85</u> WEATHER/WIND: _____ LOCATION: _____	REPORT NO: _____ OWNER: <u>HILLS. CNTY</u> CONTRACTOR: <u>WMI / ALCO</u>
---	--

8:00	CALLED MAT MATHEWS FROM SCS OFFICE. HE TOLD ME THAT THE LINER GUYS ARE ON-SITE, AND THAT NO SEAMING WILL BEGIN UNTIL I ARRIVE
8:40	ARRIVED AT SITE - STAKE BASELINE
9:00	MET GARY FROM ALCO (ATLANTIC LINING COMPANY). ALCO NEEDS THE S. SIDE PULLED BACK. GARY EXPLAINED THE GLUE IS A CONTACT - TYPE, AND NEEDS 1-HOUR DRYING PRIOR TO SEAMING. HE WANTS TO TRY 100' PATCHES. HE WANTS ME TO SEE FRANK ABOUT LETTER, RESUME & GLUE DATA.
10:00	PAUL SCHIPPER & RON COPE (EPC) ARRIVE PAUL ASKED ABOUT STORMWATER & LEACHATE. J.J. WAS AT TRENCH DURING EPC'S VISIT
10:50	GREG WALSH ARRIVED AFTER EPC DEPARTED
11:00	I CALLED KEN RE: EPC'S VISIT
12:00	RECEIVED DESTRUCTIVE SAMPLE FOR TESTING OLD MAT'L CUT OUT OF NEST END TEAR WHERE IT WAS SMALL.
12:15	LUNCH BREAK
1:00	IN THE TRENCH MEASURING 74' FOR INSULATION OF FIRST PATCH. MAT MATHEWS ARRIVED
1:52	FOUND HOLE IN FACTORY SEAM @ STA 80.
2:35	PLACED / POSITION PATCH NO. 1, APPLYING 2ND COAT.
4:15	COMPLETED FIRST S. SEAM ON PATCH 1.
4:30	APPLIED FIRST COAT TO N. SEAM OF PATCH 1. IT WILL SET / DRY OVERNIGHT.
4:50	LINING DONE
5:00	DEPARTED SITE

CC: _____ PRINT NAME: KARL SCHMIT
 _____ SIGNATURE: Karl Schmit

SCS ENGINEERS

DAILY FIELD REPORT

SHEET

5 of 7

PROJECT TITLE: SELF - NYMPHON REPAIR

PROJECT NO: 0990018.35

DATE: OCTOBER 8, 1994 (SAT)

TEMPERATURE: MIN: 75 MAX: 88

REPORT NO:

WEATHER/WIND:

OWNER:

HILLS. CNTY

LOCATION:

CONTRACTOR:

WMI / ALCO

8:15 ARRIVED ON SITE
 DE-WATERING TRENCH @ EAST END
 WEST END IS DRY
 ALCO PREP'ING PATCH NO. 2 w/ 1ST COAT
 8:30 MAT MATTHEW VISITED

10:00 BRIAN ARRIVED. FINISHED COAT #1 ON
 N. SIDE OF PATCH 1.

10:30 FIRST COAT ON S. SIDE OF PATCH 2 ON THE
 BOTTOM PIECE
 GLUE TYPE = NO. 571 EL-CHEM.

11:15 BEGAN N. SEAM ON PATCH 1

11:45 KRAV'S CALLED. HE SPOKE TO BOB I.

12:00 LUNCH

1:00 DRYING EAST END

1:30 LAYING PATCH 2

2:20 SEAM ON S. SIDE OF #2 COMPLETE

2:50 NEW SHEET = 35.2 MILS
 PATCH #3 = ~~125~~ 125-135°F } MAT BROUGHT A TEMP.
 OLD = 106 NEW = 111°F } & MICROMETER.
 103 112

AIR = 97°F (WALL) IN THE SUN. } BY EXTER
 88 IN THE SHADE } POCKET
 THERM.

3:00 PREP'ING PATCH #3.

3:20 PREP'ING S. SIDE OF BOTTOM PART FOR PATCH 3.

4:00 BEGAN PREP'ING N. SIDE OF PATCH 2 w/ 1ST COAT

4:30 LABORERS DEPARTED.

5:30 CAP 3 SHEET TEMP = 88°F IN SHADE

5:32 PATCH GLUED

5:40 END PIECE GLUED.

6:30 DEPARTING SITE

CC:

PRINT NAME:

Karl Schmitt

SIGNATURE:

Karl Schmitt

SCS ENGINEERS

DAILY FIELD REPORT

SHEET

6 of 7

PROJECT TITLE: SELF-HYPALON REPAIR

PROJECT NO: 0990018.35

DATE: OCTOBER 9, 1994 (SUN)

TEMPERATURE: MIN: 75 MAX: 88

REPORT NO: _____

WEATHER/WIND: _____

OWNER: _____

LOCATION: _____

CONTRACTOR: _____

HILLS. CNTY

NMI / MCO

8:00 ARRIVED ON-SITE.

PREP/DRYING SEAMS. NOT A BIT OF
WATER IN THE AREAS BEING SEAMED.HYPALON ON WATER FOUNDATION ALONG THE
SOUTH OF THE TRENCH.

8:30 PREP N. SIDE OF PATCH #2 W/ 15' COAT OF GLUE

10:00 EXCAVATED ALLEGED ANCHOR TRENCH TO DETERMINE ACTUAL

10:30 SEAMED #1 to #2 END SEAM TRENCH.

11:15 PATCH @ 0+98 BEING SEAMED.

11:30 BEGAN N. SEAM ON PATCH 2.

12:02 END FOR LUNCH

12:53 AIR TEMP (BEHIND CLOUD = 84°F IN SUN = 89°)

SUNGT TEMP (NEW) = 122°F IN SUN

OLD = 100°F

1:13 BEGAN SEAMING AGAIN ON N. #2.

1:23 END OF SEAM CAP 2 - NORTH

2:06 BEGINNING N. SEAM OF CAP 3.

3:15 FINISHED PATCH 3 - N. SEAM.

3:40 AIR LAYING BEGAN.

5:20 GAS RAN OUT ON COMPRESSOR

SEAMT ALL END-CUTS

6:13 COMPLETED ALL REPAIRS, PATCHES, ETC

PAPERWORK EXCHANGE

7:00 DEPARTED SITE - HEAVY RAIN ON DRIVE HOME

CC: _____

PRINT NAME: _____

KARL SCHMIT

SIGNATURE: _____

Karl Schmit

APPENDIX D
ON-SITE PERSONNEL LOG

SHEET 1 OF 1

PROJECT NO.: 0990018.3/5

CQA MANAGER: KARL SCHMIT

Table 1

[illegible]

APPENDIX E
SUBGRADE PREPARATION ACCEPTANCE FORM

ALCO**ATLANTIC LINING CO., INC.**

12 Saddlebrook Road
Robbinsville, NJ 08691
Tel (609) 448-6868
Fax (609) 448-7575

SUBGRADE PREPARATION ACCEPTANCE

TO: _____

PROJECT: _____

S.E. LANDFILL REPAIR

SUBJECT: _____

APPROVAL OF SUBGRADE PREPARATION

Gentlemen:

The undersigned Atlantic Lining Co., Inc. representative has inspected the subgrade preparation on the above referenced project. The subgrade surface appeared to be firm, smooth, and free of all sharp rocks or other sharp objects, vegetation or stubble that could puncture the liner. The subgrade surface preparation was found to be acceptable for placement of Atlantic Lining Co., Inc. membrane liner. This acceptance is based on visual observation only; it does not address subbase compaction.

Signed:

Anthony B. Detillo
Authorized ALCO RepresentativeSuperintendent
Title10/9/94
Date

Acknowledged:

Kare A. Schmit
Authorized Project RepresentativeCQA MANAGER - SCS ENGINEERS
Title10/9/94
Date

APPENDIX F
PANEL PLACEMENT LOG

SCS ENGINEERS

PANEL PLACEMENT LOG

[illegible]

SHEET 1 of 1
PROJECT TITLE: SELF - HYDRAON REPAIR
PROJECT NO: 0990018.35
DATE: _____

DATE: _____

COMMENTS

CAP NO. 1

CAP NO. 2

CAP No. 3

Wave Section

Kare Schindler

APPENDIX G
SEAMING LOG

SCS ENGINEERS

SEAMING LOG

SLOE

DATE _____

SHEET

(of (

PROJECT TITLE:

SELF - HYALURON REPAIR

PROJECT NO:

0990018.35

DATE:

[illegible]

PRINT NAME: KARL SCHMIT

SIGNATURE: Law Schia

APPENDIX H
ADHESIVE DATA SHEET

- Adhesive Material (3 pages)
- Catalyst Material (3 pages)

10/04/94 14:41 010 805 2583

JACK WEAKNECHT

0005

ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMAUS, PENNSYLVANIA 18049

MATERIAL SAFETY DATA SHEET

U/A = UNASSIGNED
N/A = NOT APPLICABLE
N/E = NOT ESTABLISHED

PAGE 1 of 3

SECTION 1: GENERAL INFORMATION

ELECTRO CHEMICAL ENGINEERING & MFG. CO.
750 BROAD STREET
EMMAUS, PA 18049-0509

PREPARED BY: JWW DATE: 10-21-91

TELEPHONE: 215 - 965-9061 EMERGENCY TELEPHONE NUMBER: 800 - 424-9300
FAX: 215 - 965-2595

PRODUCT NAME: EL-CHEM #571 ADHESIVE.

CHEMICAL FAMILY: CHLOROPRENE IN TRICHLOROETHYLENE.
-----SECTION 2: HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS:	ACGIH TLV	CAS #
CHLOROPRENE.	N/A	126-99-8
TRICHLOROETHYLENE.	100 PPM (1982)	79-01-6

-----SECTION 3: SHIPPING INFORMATION

PROPER SHIPPING NAME: TRICHLOROETHYLENE.
I.D. NO.: UN-1710

-----SECTION 4: PHYSICAL DATA

BOILING POINT: 188 DEG. F.
VAPOR PRESSURE (MM HG): 100
VAPOR DENSITY (AIR =1): 4.53
SPECIFIC GRAVITY (H2O-1): 1.4
MELTING POINT: N/A
EVAPORATION RATE (BUTYL ACETATE =1): 620
SOLUBILITY IN WATER: 11%
APPEARANCE AND ODOR: BLACK LIQUID WITH TRICLENE ODOR.
VISCOSITY KU: 133

10-04-94 14:41 610 965 2595

JACK WEAKNECHT

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ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMANUS, PENNSYLVANIA 18049

#571 ADHESIVE

PAGE 2 OF 3

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE.

FLAMMABLE LIMITS: LEL: 7.9%

UEL: N/E

EXTINGUISHING MEDIA: DRY CHEMICAL, CO2, FOAM.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR SELF-CONTAINED BREATHING
APPARATUS.

UNUSUAL FIRE AND EXPLOSION HAZARDS: NONE.

SECTION 6: REACTIVITY DATA

STABILITY: STABLE

MATERIALS TO AVOID: STRONG OXIDIZERS & HOT SURFACES.

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: HCL, PHOSGENE & CHLORINE
COMPOUNDS.

HAZARDOUS POLYMERIZATION: SHOULD NOT OCCUR.

CONDITIONS TO AVOID: NONE IF USED PROPERLY. HOT SURFACES FOR INSTANCE.

SECTION 7: HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: INHALATION.

EFFECT OF OVEREXPOSURE:

EYES: IRRITATION.

SKIN: DEGREASING.

INHALATION: IRRITATION OF RESPIRATORY TRACT.

CHRONIC: NARCOTIC OR ALCOHOL INEBRIATION EFFECT. DIZZINESS &
UNCONSCIOUSNESS.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: RESPIRATORY CONDITIONS.

FIRST AID:

EYES: FLUSH WITH WATER. GET MEDICAL ATTENTION.

SKIN: WASH WITH WATER AND SOAP. GET MEDICAL ATTENTION.

INHALATION: IN CASE OF INTOXIFICATION/UNCONSCIOUSNESS, TAKE AFFECTED
PERSON OUTDOORS AND GIVE ARTIFICIAL RESPIRATION IF
NECESSARY. GET MEDICAL ATTENTION.

10/04/94 14:42 0810 865 2595

JACK WEAKNECHT

0007

ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMAUS, PENNSYLVANIA 18049

571 ADHESIVE

PAGE 3 OF 3

SECTION 8: PRECAUTIONS FOR SAFE HANDLING AND USE-----
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ABSORB SPILLED

MATERIAL AND PLACE IN CONTAINER FOR DISPOSAL.

WASTE DISPOSAL METHOD: IN ACCORDANCE WITH APPLICABLE LOCAL, STATE &
FEDERAL ENVIRONMENTAL REGULATIONS.PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NONE UNDER NORMAL
CONDITIONS.OTHER PRECAUTIONS: FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF
CHILDREN.-----
SECTION 9: CONTROL MEASURES-----
RESPIRATORY PROTECTION: ORGANIC VAPOR MASK.

VENTILATION:

LOCAL EXHAUST: KEEP BELOW TLV LIMIT.

SPECIAL: NONE.

MECHANICAL (GENERAL): YES.

OTHER:

PROTECTIVE GLOVES: PLASTIC OR RUBBER.

EYE PROTECTION: SAFETY GOGGLES.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: SAFETY SHOWER, EYE BATH, AND
PROTECTIVE CLOTHING.WORK/HYGIENIC PRACTICES: CUSTOMARY PERSONAL HYGIENE & GOOD
HOUSE KEEPING SHOULD BE OBSERVED WHEN HANDLING AND APPLYING.-----
THIS INFORMATION IS FURNISHED SOLELY FOR THE PURPOSE OF DISCLOSURE
REGARDING TOXICITY AND FIRE HAZARDS AND SHALL NOT BE USED OR RELIED
UPON BY ANY PERSON FOR ANY OTHER PURPOSE.THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE.
HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS
ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR
MISUSE ARE BEYOND OUR CONTROL, ELECTRO CHEMICAL MAKES NO WARRANTY,
EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR
CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS
ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF
THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

10-04-94 14:39

2610 965 2595

JACK WEAKNECHT

0002

ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMAUS, PENNSYLVANIA 18049

MATERIAL SAFETY DATA SHEET

PAGE 1 of 3

U/A = UNASSIGNED
N/A = NOT APPLICABLE
N/E = NOT ESTABLISHED

SECTION 1: GENERAL INFORMATION

ELECTRO CHEMICAL ENGINEERING & MFG. CO.
750 BROAD STREET
EMMAUS, PA 18049-0509

PREPARED BY: JWW DATE: 9-10-91

TELEPHONE: 215 - 965-9061 EMERGENCY TELEPHONE NUMBER: 800 - 424-9300
FAX: 215 - 965-2595

PRODUCT NAME: EL-CHEM #571 ADHESIVE CATALYST.

CHEMICAL FAMILY: TRIPHENYLMETHANETRIISOCYANATE IN METHYLENE CHLORIDE.

SECTION 2: HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS:	ACGIH TLV	CAS #
TRIPHENYLMETHANETRIISOCYANATE.	N/A	U/A
METHYLENE CHLORIDE.	500 PPM	75-09-2

SECTION 3: SHIPPING INFORMATION

PROPER SHIPPING NAME: DICHLOROMETHANE.
I.D. NO.: UN-1593

SECTION 4: PHYSICAL DATA

BOILING POINT: 104 DEG. F.
VAPOR PRESSURE (MM HG): 76.9
VAPOR DENSITY (AIR =1): 4.45
SPECIFIC GRAVITY (H2O-1): 1.335
MELTING POINT: N/A
EVAPORATION RATE (CARBON TETRA CHLORIDE=1): 1.45
SOLUBILITY IN WATER: SLIGHT.
APPEARANCE AND ODOR: BROWN WITH SOLVENT ODOR.

10-04-84 14:40 810 985 2385

JACK WEAKNECHT

0003

ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMANUS, PENNSYLVANIA 18049

#571 ADHESIVE CATALYST

PAGE 2 OF 3

SECTION 5: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE
FLAMMABLE LIMITS: LEL: 15.5 UEL: 66.4
EXTINGUISHING MEDIA: N/A
SPECIAL FIRE FIGHTING PROCEDURES: N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS: AUTO IGNITION TEMP. 1224 DEG. F.

SECTION 6: REACTIVITY DATA

STABILITY: STABLE.
MATERIALS TO AVOID: STRONG OXIDIZER.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: HCL, PHOSGENE, & CHLORINE COMPOUNDS.

HAZARDOUS POLYMERIZATION: SHOULD NOT OCCUR.
CONDITIONS TO AVOID: NONE IF USED PROPERLY. HOT SURFACES FOR INSTANCE.

SECTION 7: HEALTH HAZARD DATA

PRIMARY ROUTE(S) OF ENTRY: INHALATION.

EFFECT OF OVEREXPOSURE:

EYES: IRRITATION.
SKIN: DEGREASING.
INHALATION: IRRITATION OF RESPIRATORY TRACT.
CHRONIC: NARCOTIC OR ALCOHOL INEBRIATION EFFECT. DIZZINESS & UNCONSCIOUSNESS.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: RESPIRATORY CONDITIONS.

FIRST AID:

EYES: FLUSH WITH WATER. GET MEDICAL ATTENTION.
SKIN: WASH WITH WATER & SOAP, GET MEDICAL ATTENTION.
INHALATION: IN CASE OF INTOXICATION/UNCONSCIOUSNESS, TAKE AFFECTED PERSON OUTDOORS AND GIVE ARTIFICIAL RESPIRATION IF NECESSARY. GET MEDICAL ATTENTION.

10/04/04 14:40 810 965 2585

JACK WEAKNECHT

0004

ELECTRO CHEMICAL ENGINEERING & MFG. CO., EMMANUS, PENNSYLVANIA 18049

#571 ADHESIVE CATALYST

PAGE 3 OF 3

SECTION 8: PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: ABSORB SPILLED MATERIAL AND PLACE IN CONTAINER FOR DISPOSAL.

WASTE DISPOSAL METHOD: IN ACCORDANCE WITH LOCAL, STATE & FEDERAL REGULATIONS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: NONE UNDER NORMAL CONDITIONS.

OTHER PRECAUTIONS: FOR INDUSTRIAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.

SECTION 9: CONTROL MEASURES

RESPIRATORY PROTECTION: ORGANIC VAPOR MASK.

VENTILATION: KEEP BELOW TLV LIMIT.

LOCAL EXHAUST: YES.

SPECIAL: NONE.

MECHANICAL (GENERAL): YES.

OTHER:

PROTECTIVE GLOVES: PLASTIC OR RUBBER.

EYE PROTECTION: SAFETY GOGGLES.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: SAFETY SHOWER, EYE BATH, AND BODY COVERING CLOTHING.

WORK/HYGIENIC PRACTICES: CUSTOMARY PERSONAL HYGIENE & GOOD HOUSE-KEEPING SHOULD BE OBSERVED WHEN HANDLING & APPLYING.

THIS INFORMATION IS FURNISHED SOLELY FOR THE PURPOSE OF DISCLOSURE REGARDING TOXICITY AND FIRE HAZARDS AND SHALL NOT BE USED OR RELIED UPON BY ANY PERSON FOR ANY OTHER PURPOSE.

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, ELECTRO CHEMICAL MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

APPENDIX I
SEAM DESTRUCTIVE LOG

SCS ENGINEERS

DESTRUCTIVE SEAM TEST ASTM D 4437

SHEET

1 of 1

PROJECT TITLE: SELF - HYPRON REPAIR

PROJECT NO: 0990018,35

DATE: OCTOBER 11, 1994

		SHEAR TEST						PEEL TEST											
		COUPON NO.	GRIP	MAX	ELONG.	LOCUS	COUPON	COUPON NO.	GRIP	MAX TENSION		SEAM SEPARATION		LOCUS OF FAILURE		COUPON	SAMPLE		
			SEP	TENSION	AT	OF	PASS		SEP	INNER	OUTER	INNER	OUTER	INNER	OUTER	PASS			
			(INCHES)	(PPI)	BREAK	FAILURE	OR FAIL		(INCHES)	TRACK	TRACK	TRACK	TRACK	TRACK	TRACK	OR FAIL	OR FAIL		
SAMPLE NO. <u>OLD/NEW</u>	THICKNESS (Avg of 5) (MIL) <u>34 TOP (OLD)</u> <u>39 BOTTOM (NEW)</u>	1	1	158	>100	BT		1	1	9.1	/	/	/	/	/	/	F		
		2	1	155	>100	BT		2	1	9.3	/	/	/	/	/	/	F		
		3	1	143	>100	BT		3	1	7.9	NA	/	/	/	/	/	F		
		4	1	148	>100	BT		4	1	8.3	/	/	/	/	/	/	F		
		5	1	111	>100	BT		5	1	8.0	/	/	/	/	/	/	F		
SEAM TYPE	WELD TYPE	MEAN						MEAN											
SMO/SMO																			
SMO/TEX																			
TEX/SMO	EXTRUSION	S.D.						S.D.											
TEX/TEX	FUSION	Locus of failure for all peels was in plane of bond (Non-FTB)																	

LOCUS OF FAILURE: BT = BREAK AT TOP SHEETING, FTB

AT = FAILURE OF ADHESION FOR EXTRUSION WELD (DELAMINATE FROM TOP), NON FTB

AD = ADHESION FAILURE FOR FUSION WELD, NON FTB

AB = FAILURE IN ADHESION FOR EXTRUSION WELD (DELAMINATE FROM BOTTOM), NON FTB

BB = BREAK AT BOTTOM OF SHEETING, FTB

ABBREVIATIONS: SMO = SMOOTH LINER

TEX = TEXTURED LINER

PPI = POUNDS PER INCH

PRINT NAME: Jerry R. Keene

SEP = SEPARATION

FTB = FILM TEAR BOND

S.D. = STANDARD DEVIATION

SIGNATURE: Jerry R. Keene

SCS ENGINEERS

DESTRUCTIVE SEAM TEST ASTM D 4437

SHEET

1 of 1

PROJECT TITLE: SELF - HYPRON REPAIR

PROJECT NO: 0990018.35

DATE: OCTOBER 11, 1994

		SHEAR TEST						PEEL TEST											
		COUPON NO.	GRIP	MAX	ELONG.	LOCUS	COUPON	COUPON NO.	GRIP	MAX TENSION		SEAM SEPARATION		LOCUS OF FAILURE		COUPON	SAMPLE		
			SEP	TENSION	AT	OF	PASS		SEP	INNER	OUTER	INNER	OUTER	INNER	OUTER	PASS			
			(INCHES)	(PPI)	BREAK	FAILURE	OR FAIL		(INCHES)	TRACK	TRACK	TRACK	TRACK	TRACK	TRACK	OR FAIL	OR FAIL		
SAMPLE NO. <u>New/Now</u>	THICKNESS (MIL) <u>39</u> TOP <u>39</u> BOTTOM	1	1	112	7100	BT		1	1	30	/	/	/	/	/	/	P		
		2	1	144	7100	BT		2	1	37	/	/	NA	NA	/	/	P		
		3	1	173	7100	BT		3	1	39	NA	/	/	NA	/	/	P		
		4	1	127	7100	BT		4	1	40	/	/	/	/	/	/	P		
		5	1	120	7100	BT		5	1	35	/	/	/	/	/	/	P		
SEAM TYPE SMO/SMO SMO/TEX TEX/SMO <input checked="" type="checkbox"/> TEX/TEX	WELD TYPE EXTRUSION <input checked="" type="checkbox"/> FUSION	MEAN						MEAN											
		S.D.						S.D.											
LOCUS of failure for all peels was in plane of scrim (FTB)																			

LOCUS OF FAILURE: BT = BREAK AT TOP SHEETING, FTB

AT = FAILURE OF ADHESION FOR EXTRUSION WELD (DELAMINATE FROM TOP), NON FTB

AD = ADHESION FAILURE FOR FUSION WELD, NON FTB

AB = FAILURE IN ADHESION FOR EXTRUSION WELD (DELAMINATE FROM BOTTOM), NON FTB

BB = BREAK AT BOTTOM OF SHEETING, FTB

ABBREVIATIONS: SMO = SMOOTH LINER

TEX = TEXTURED LINER

PPI = POUNDS PER INCH

PRINT NAME: Terry R. Keane

SEP = SEPARATION

FTB = FILM TEAR BOND

S.D. = STANDARD DEVIATION

SIGNATURE: Jerry R. Keane

APPENDIX J
NON-DESTRUCTIVE TESTING LOG

APPENDIX K
GEOMEMBRANE APPROVAL CHECKLIST

ALCO**ATLANTIC LINING CO., INC.**12 Saddlebrook Road
Robbinsville, NJ 08691COMPLETION DATE 10/9/94 Tel (609) 448-6868PROJECT HYALON REPAIR Fax (609) 448-7575LOCATION SELF - HILLS. COUNTY, FL

JOB # _____

POST JOB SIGN-OFF AND ACCEPTANCE CHECKLIST

CONTRACTOR: _____

S.E. LANDFILL REPAIR

This document serves as verification that the Atlantic Lining Co., Inc. Superintendent and a representative of the owner, contractor or engineer have inspected the completed liner installation and accepted the project as complete. Please acknowledge the completion of the following items by initialing each one.

SUP./REP.

1 ✓

1. Seams, attachments and penetration seals are in conformance with the specification documents. Verify the acceptability of details utilized during the liner installation.

1 ✓

2. Completion of all required seam sampling and testing.

1 ✓

3. Completion of all liner repairs or corrections.

1 ✓

4. Change orders, extra work orders, backcharges and arrangements for use of labor or equipment have been documented and authorized by all parties. Any subsequent undocumented requests for the above will not be accepted by either party.

1 ✓

5. Information and measurements necessary to complete daily field reports, "as-built" shop drawings, or pay-area calculation has been compiled.

Comments: SCS OBSERVED HYALON INSTALLATION & REPAIRS OVER
3 DAYS.

Anthony B. DiTillo
Authorized ALCO Representative

Karl A. Schmitz
Authorized Project Representative

Superintendent
Title

CQA MANAGER - SCS ENGINEERS
Title

10/9/94
Date Signed

10/9/94
Date Signed

Initial each item above; Attach and submit one copy with final daily report.
Furnish one copy to authorized project representative.

APPENDIX L
CONSTRUCTION PHOTOGRAPHS

Photo No. 1



Date: October 4, 1994 Location: Southeast County Landfill
Description: Dewatering anchor trench previous to excavation activities (looking west)

Photo No. 2



Date: October 4, 1994 Location: Southeast County Landfill
Description: After the vegetation was cleared from the vicinity, the clay cap was removed

Photo No. 3



Date: October 5, 1994 Location: Southeast County Landfill
Description: After excavating with a backhoe, hand tools were used to expose the liner

Photo No. 4



Date: October 7, 1994 Location: Southeast County Landfill
Description: Pumping water into a tank for disposal

Photo No. 5



Date: October 8, 1994 Location: Southeast County Landfill
Description: The subgrade for the patch is prepared

Photo No. 6



Date: October 7, 1994 Location: Southeast County Landfill
Description: Patch being prepared for placement and seaming with first coat of adhesive

Photo No. 7



Date: October 7, 1994 Location: Southeast County Landfill
Description: In-place geomembrane is cleaned and prepared with first coat of adhesive

Photo No. 8



Date: October 7, 1994 Location: Southeast County Landfill
Description: Patch is carefully positioned (NOTE: tank for water disposal standing by)

Photo No. 9



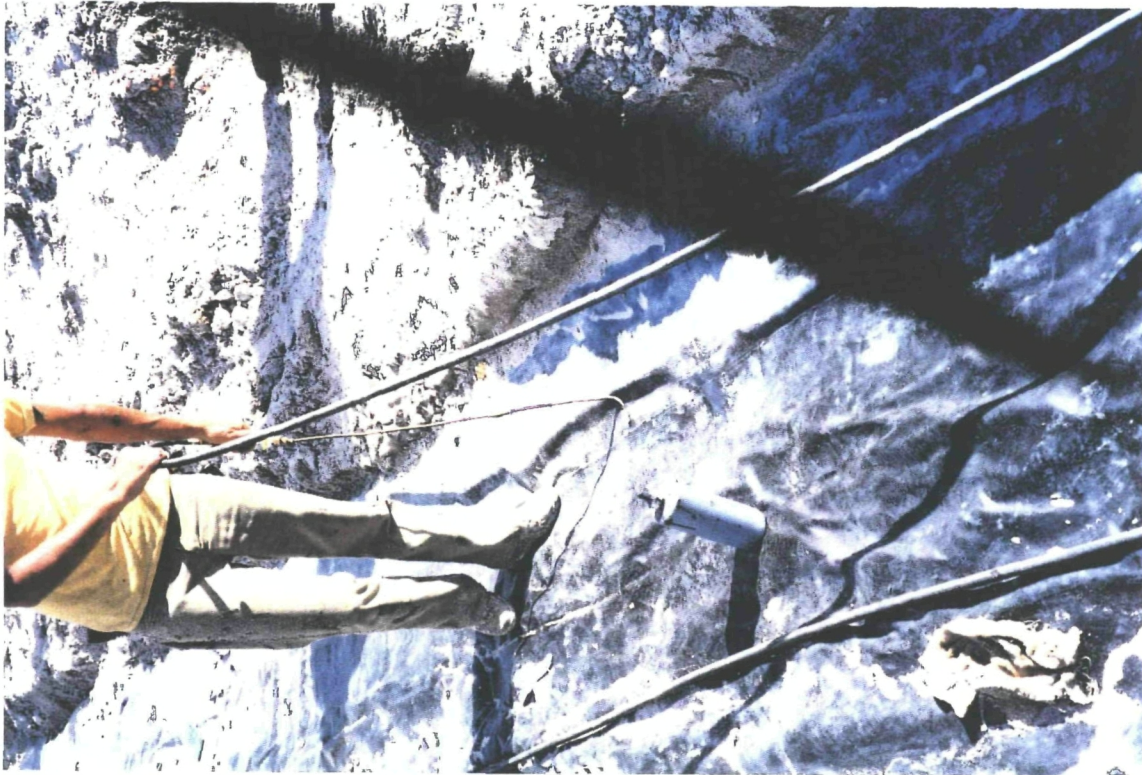
Date: October 7, 1994 Location: Southeast County Landfill
Description: The seam area receives a second coat of adhesive prior to bonding

Photo No. 10



Date: October 9 1994 Location: Southeast County Landfill
Description: Geomembrane is bonded together and rolled

Photo No. 11



Date: October 9, 1994 Location: Southeast County Landfill
Description: Non-destructive test on seams with high-pressure air

Photo No. 12



Date: October 9 1994 Location: Southeast County Landfill
Description: The complete geomembrane repair (looking west)

Photo No. 13



Date: October 10, 1994 Location: Southeast County Landfill
Description: Protective soil is initially placed in a 12 inch lift

Photo No. 14



Date: October 10, 1994 Location: Southeast County Landfill
Description: After protective cover is placed, the capping system is reestablished