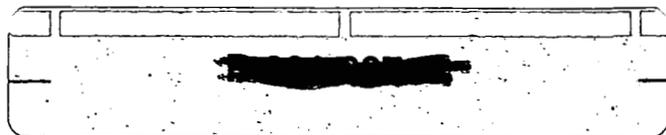


R-021-204.5

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**ENGINEERING PACKAGE EXPERIMENTAL
TREATMENT FACILITY REMOVAL ACTION 11
DECEMBER 3, 1991**

DOCUMENT DATE 12/03/91



3463

Engineering Package Experimental Treatment Facility Removal Action 11

Environmental Remedial Action Project
Fernald Environmental Management Project
Fernald, Ohio

DOE Contract No. DE-AC05-90OR21951
December 3, 1991
Revision No. 0

Operable Unit 1, Project Order 24



PARSONS

Fairfield Executive Center
6120 South Gilmore Road
Fairfield, Ohio 45014

Experimental Treatment Facility Removal Action 11

Engineering Package

PART I - Material Handling and Dismantlement Procedure

Exhibit A - Drawings

Exhibit B - Manufacturers' Literature

Exhibit C - Existing National Lead Organization, Inc. ETF Design Drawings

PART II - Post-Construction Sampling Location Plan

PART III - Cost Estimate

Engineering Package

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Part I

Material Handling
and
Dismantlement Procedure

PART I - Materials Handling and Dismantlement Procedure

OBJECTIVE

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The objective of these procedures is to assist site personnel in performing the removal of the Experimental Treatment Facility (ETF). Unforeseen site conditions could alter these procedures. These unexpected events shall be brought to the attention of the WEMCO field supervisor. The work area needs to be contained by physical constraints (i.e., liner, berms) and by separation of work zones. The intent of the containment is to remove and dismantle the ETF with minimal disturbance to the surrounding ground surface and to minimize waste spread caused by these removal actions.

REQUIREMENTS AND GENERAL INFORMATION

The Pit 5 Experimental Treatment Facility (ETF) was used to dewater sludge materials from Waste Pit 5. The design included a sand and gravel filter bed, approximately 2.5 feet deep. The filter bed rested on a plastic liner. At the perimeter of the bed are wood retaining walls, approximately 6 feet high (reference drawings in Exhibit C). Currently, a tarp has been placed over the materials inside the ETF to minimize the amount of materials being blown out of the facility. The tarpaulin cover is held in place with concrete blocks. The removal action to be conducted consists of dismantlement and disposal of the ETF. All work performed in the ETF removal shall be conducted in accordance with the Radiation Work Permit, the WEMCO Health and Safety Plan, and the Pit 5 ETF Health and Safety Plan. Waste material shall be packaged in a metal shipping container DOT Type A7A capable of overpacking 6 DOT 17H 55-gallon drums. These containers will be referred to as "shipping containers." All interim and RCRA storage areas for all containers will be determined by WEMCO.

I. REMOVAL PROCEDURES

This procedure describes material handling and dismantlement of the ETF in four phases, including site preparation, staging setup, waste removal, and demolition. Each phase is described below with references to drawings, manufacturers' literature and National Lead of Ohio (NLO) drawings listed in the exhibits. The NLO drawings in Exhibit C should be issued to the WEMCO field supervisor coordinating site activities. Prior to transporting shipping containers from interim storage, each container shall be packaged and prepared for shipping in accordance with FMPC-2089 Topical Manuals (The On-Site Transportation of Radioactive and Nonradioactive Hazardous Materials).

A. Site Preparation

Initially, the work area surrounding the ETF needs to be cleared of brush, small trees, and nearby obstacles. The "Pit 5 ETF Removal Action Work Plan" report by WEMCO, dated October 11, 1991, stated the procedure as follows:

PART I - Materials Handling and Dismantlement Procedure

- 1) Clear sufficient area surrounding the ETF structure. This shall be performed by using appropriate equipment such as pruning shears, weed cutters, hand saws and the like, to remove required vegetative growth.
- 2) The vegetation shall be surveyed for gross alpha and gross beta contamination, segregated, and placed into appropriate containers for final disposition as required by FMPC Site Policy and Procedure #720 "Control of Construction Waste", (FMPC-720).
- 3) Each container shall be closed and properly marked and labeled.
- 4) Containerized vegetation shall be stored until final disposition is determined.

Reference the Pit 5 ETF Health and Safety Plan for appropriate radiation surveys to be conducted and personal protective equipment required. These surveys and all vegetation and soil sampling will be the responsibility of WEMCO.

The vegetation shall be size reduced and contained in the shipping containers. The brush and small trees need to be cut flush to the ground surface. Interim and RCRA storage areas will be determined by WEMCO. All rocks and sharp objects in the staged liner area need to be removed. Do not remove ground vegetation such as grass.

Two storage sheds measuring 10 feet by 18 feet that exist in the area are not to be disturbed. An 8-foot by 10-foot wood flat along the road needs to be moved from the immediate area. A wood float platform also needs to be moved from the work area.

B. Staging Setup

Staging setup of the area around the ETF shall follow the procedures below:

- 1) Major equipment to be used in the staging setup shall include:
 - (a) Bobcat loader with 1/2 cy bucket
 - (b) A forklift inside the bermed area
 - (c) A forklift outside the bermed area
 - (d) Labor personnel with an assortment of shovels and hand tools
 - (e) A dewatering pump and associated hoses
 - (f) An approved transport tanker for hauling water retained inside ETF containment
 - (g) A transport tractor and trailer for movement of the shipping container
 - (h) Small package loader
 - (i) Appropriate personal protective clothing as per Pit 5, ETF Health and Safety Plan, Radiation Work Permit, and WEMCO Health and Safety Plan
 - (j) Dust control equipment (i.e., hoses, pump, tank, nozzles).

PART I - Materials Handling and Dismantlement Procedure

- 2) Install temporary wood bracing at the north end of the ETF structure. See the Pit 5 ETF "Site Plan and Details," Drawing 91X-5900-G-00005 for brace location and details.
- 3) Install liner and liner berm flap as shown on Drawing 91X-5900-G-00005 "Site Plan and Details."
 - (a) The north end wall braces and the wood stairs at north and south ends will be the first items removed from ETF. Place the liner around these structures. Notch and slit the liner at braces, and abut the liner to the stairs.
 - (b) All seams are to be sealed and glued using CVV adhesive. See Exhibit B.
 - (c) Allow ample flap for the berm.
- 4) Install a 14-foot by 20-foot section of Uni-Mat as indicated in Area "A" on Drawing 91X-5900-M-0002 "Material Handling and General Arrangement," and the plank and liner detail on Drawing 91X-5900-G-00005 "Civil-Site Plan and Details".
 - (a) Provide 4-foot by 20-foot wide access of Uni-Mat plank over liner and liner berm flap, as indicated in area "D" on drawing 91X-5900-M-00002 "Material Handling General Arrangement." Do not travel with equipment directly on liner.
- 5) Place two shipping containers on the Uni-Mat in area "A" on top of two 8-foot by 10-foot plastic liners. These two 8-foot by 10-foot strips will permit easy cleanup of spillage caused by loading of shipping containers. Keep shipping containers in center of sheets.
- 6) Install pipe bundles into liner flap to form the berm.
 - (a) Use 10-foot pipe bundle lengths. This permits sectional removal of the berm to allow for equipment access.
 - (b) The berm needs to be continuous, secured, and intact during periods of wet weather or during off shift hours. Any standing water within the berm area shall be pumped into a suitable tank and taken to the treatment plant or disposed of properly.
- 7) Remove wood stairs and platforms at north and south end of ETF, and the wood debris inside the ETF structure.
 - (a) Perform work with manual tools (i.e. hammer, sledges, pry bars, hand saws). Do not use power tools; they will generate dust. Reduce the size of the material being removed as necessary to fit into shipping containers.
 - (b) Hand dig, or use Bobcat loader, to pull posts out of ground.
 - (c) After stairs and platforms are removed, the 20 mil plastic liner should be placed over these areas. All liner seams shall be sealed with proper adhesive.
- 8) Remove north end wall of ETF.
 - (a) Use shovels to remove soil in front of the panels across the 20-foot length of the ETF. Place soil into shipping container.

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PART I - Materials Handling and Dismantlement Procedure

- (b) Remove the 2 by 12 wood brace at the top of the panels. Reduce the size of the material being removed and place in shipping container.
 - (c) Remove a 2 by 4 wood side brace. Will need to excavate at outer end to remove brace from ground. Be sure to pull out two steel anchor pins at outer end of brace.
 - (d) Place the Bobcat loader bucket next to panels.
 - (e) Remove wedge bolts from panel.
 - (f) Loosen bolts at the bottom wood piece attached to wall panel at ground level.
 - (g) Remove loader bucket and remove panel. Place panel into shipping container.
 - (h) If spillage occurs, immediately cleanup and place into shipping container. Separate and box sludge spillage separately, if possible.
 - (i) Repeat procedure, removing brace, and two panels (each separately). Be sure to keep liner next to panels to facilitate cleanup of spillage. Remove 10 panels across 20-foot width of north end of ETF. Be sure to check that temporary braces previously installed in Step 2 are snug and tight to panel. Keep all waste segregated by type (i.e. sludge, soil, wood panels, etc.) during removal.
- 9) After the end panels have been removed, install Uni-Mat into a 20-foot by 28-foot pattern as indicated by Area "B" on Drawing 91X-5900-M-0002 "Material Handling and General Arrangement," and by the plank detail on Drawing 91X-5900-G-00005 "Civil-Site Plan and Details." The Uni-Mat plank should cover all of staging area at this time.
- 10) Remove nuts from the ends of tension rods on east and west sides of the ETF structure. These nuts are located near the panel bottoms at ground level and are spaced at 4-foot on center throughout the ETF structure. During subsequent waste removal procedures, be careful not to push on these rods. These rods will need to be removed by excavating waste material around it and cutting rod into pieces (with a bolt cutter).

C. Waste Removal

- 1) Removal of the waste inside the ETF, and the remainder of the ETF's structure, will require at least the following major equipment present at site.
- (a) Bobcat loader with 1/2 cy bucket
 - (b) A forklift inside the bermed area
 - (c) A forklift outside the bermed area
 - (d) Labor personnel with an assortment of shovels and hand tools
 - (e) A dewatering pump and associated hoses
 - (f) An approved transport tanker for hauling water retained inside ETF containment
 - (g) A transport tractor and trailer for movement of the shipping containers.
 - (h) Small package loader
 - (i) Appropriate personal protective clothing as per Pit 5 ETF Health and Safety Plan, Radiation Work Permit, and WEMCO Health and Safety Plan

PART I - Materials Handling and Dismantlement Procedure

- (j) Dust control equipment (i.e., hoses, pump, tank, and nozzles)
- 2) During the removal, waste spread will be minimized by performing the following:
 - (a) Any equipment travel inside the ETF must be maintained on the wood mats, with a 20 mil plastic liner under the mats.
 - (b) Keep the 20 mil plastic liner in reasonable condition free of punctures and tears. Maintenance and repair will be necessary. Keep spare plastic liner, tape, and liner adhesive at the site. Repair liner immediately if any damage occurs.
 - (c) Follow proper sanitation procedures. Dirty equipment stays inside liner area. Clean equipment remains outside the liner area. Cover waste material inside of the ETF with plastic liner during rain and off-shift hours.
 - (d) When there is no water present and there is no rain threatening, the pipes inside the liner berm can be removed, where needed, to permit removal of properly sealed and labeled containers. Protect the liner berm flap from damage by placing wood mat and fabric over it. Take down as minimal amount of berm as possible. Be prepared to re-install the berm at any time. The berm is to be secured, continuous, and intact during rain and off-shift hours. The waste and exposed working face are to be covered with a plastic liner during rain and off-shift hours.
 - (e) Keep plastic liner as close to the working face of the excavation as possible. Clean up promptly any spillage of material on wood mats or liner. Spillage may occur. Prompt and immediate clean up will control tracking of waste by equipment tires and foot traffic.
 - (f) To minimize spillage, do not take fully heaped buckets of material and transport them to shipping container at top speed. Take half buckets and travel slowly.
 - (g) Do not remove the shipping container from liner area until box is sealed, labelled, decontaminated, and ready for transport to interim storage.
 - (h) Do not work under rainy conditions. Areas need to be secured with plastic and boxes closed during wet weather.
 - (i) If dusts become evident, suppress them by lightly misting local area with water, avoid water ponding and runoff.
 - (j) Any standing water within the berm area shall be pumped into a suitable tank adjacent to lined area and taken to treatment or disposed of properly. Work will not be performed under standing water conditions.
 - (k) Check load limits on shipping container prior to filling. Do not exceed capacity listed. (Note: 1-foot depth of soil in the shipping container will weigh approximately 2,900 pounds; 1-foot depth of wood will weigh approximately 1,100 pounds).

Reference the Pit 5 ETF Health and Safety Plan for appropriate radiation surveys to be conducted and personal protective equipment required. These surveys will be the responsibility of WEMCO.

PART I - Materials Handling and Dismantlement Procedure

- 3) The waste inside the ETF shall be removed in the following order.
- (a) Using a Bobcat loader with a 1/2 cy capacity or a small backhoe, remove the top 6 inches of sludge, on the north end, across the 20-foot length of the ETF, within the reach of the loader's bucket. Place this sludge into a shipping container and label the container. Note: Do not mix this sludge with other waste; it is to be used for future treatability studies.
 - (b) Remove approximately 27-inch depth of filter material, down to the existing plastic lining. The waste will include fly ash, sand, sand and gravel, pea gravel, and perforated plastic pipe. Wood pieces inside the ETF, that could not be reached earlier, would also be removed as encountered. Be careful not to pull on the steel tension rods, located just below the fly ash layer at 4 feet on center, approximately 12 inches from the top of the waste and filter material. Remove the plastic lining from the ETF. Remove the 3-inch sand layer below the plastic lining using flat shovels. Segregate the wastes into types, such as: sludge, rest of soil materials (mixed), plastic (pipe and sheets), and wood or steel debris. Remove all properly labelled, sealed, and decontaminated containers to interim storage.
 - (c) At north end of ETF, a 30-inch diameter, concrete pipe sump exists. This pipe is 30 inches below the ETF box. A 4-inch concrete slab is located at this depth. This sump and slab is to be removed. A backhoe will probably be necessary for removing the sump and pipe. The excavation around the sump needs to be kept to a minimum; a backhoe with a 12-inch wide bucket would be preferable. Backfill the sump excavation with clayey soil hauled to the site after the sump and slab removal is complete. Place the soil into excavation in 6-inch loose lifts. Compact each lift to 95 percent standard proctor (ASTM D 698).
 - (d) Repeat the procedure of Steps 1 and 2 using the Bobcat Loader until all the waste is removed. Slope the waste as indicated on Drawing 91X-5900-M-00002 "Material Handling General Arrangement" Note Number 6, to provide for equipment access. As the work progresses into the ETF structure, the 20 mil plastic liner and the wood mats need to be advanced to the working face of the excavation. If desired, the shipping container can be taken by forklift closer to the working face of the excavation as work progresses.
 - (e) Remove the electrical boxes from the side of the ETF. There is no electrical power feed present at the boxes; be sure to check this before removal.
 - (f) Remove the side walls and south wall of the ETF in the same manner as the north wall removal. Place debris into a shipping container.

D. Demobilization

Before equipment and materials can be removed from site area, they need to be properly cleaned and decontaminated, appropriately sampled or tested, and then materials removed or placed into a shipping container. Reference the Pit 5 ETF Health and Safety Plan for appropriate radiation surveys to be

PART I - Materials Handling and Dismantlement Procedure

conducted and personal protective equipment required. These surveys will be the responsibility of WEMCO.

The decontamination methods shall be in accordance with the Health and Safety Plan developed to supplement this removal action. All wastes that are generated during decontamination shall be containerized, sampled, and analyzed for final disposition. These containerized decontamination wastes will be handled as a hazardous waste and will be transported to a predetermined storage area. Decontamination needs to be performed on all equipment and tools used inside the liner berm, the sump pump and its hoses, and any other associated materials that can be cleaned and decontaminated.

Materials used in construction of staging area (i.e., wood Uni-Mats, pipe berm, liner, wood braces, steel stakes, polyester fabric) shall be size-reduced and handled as a waste. These materials shall be placed into shipping containers, sampled, labelled, and transported in accordance with site policies.

The depression created by the waste removal will be left intact until sampling is completed. Refer to Part II "Post Construction Sampling Location Plan" for details. The sampling of the area needs to be coordinated closely with the demolition activities, so that the depression created does not remain open for any period of time (i.e., less than 3 days). After sampling is completed, the depression shall be backfilled with an approved clayey soil that will be hauled to the site. The area will need to be tracked and graded to a smooth, draining, crowned surface. This surface should then be covered with a hay mulch to prevent surface erosion. In spring, the area should be fertilized and seeded for an appropriate vegetative cover. This cap will prevent ponding of water and surface erosion.

II. FIELD DAILY LOGS

A daily log of field operations performed during this demolition should be maintained by the field supervisor and should include at least the following:

- 1) Date and time of field operations
- 2) Weather conditions
- 3) Names of all personnel accessing the area and duration of access
- 4) Major equipment used
- 5) Brief description of work performed
- 6) Note presence of any water in area and what was done with it (i.e., pumped to tank for transport, etc.)
- 7) Note any maintenance and repairs performed on liner or equipment

PART I - Materials Handling and Dismantlement Procedure

- 8) Note that liner berm was continuous and braced at end of shift
- 9) Names of official visitors at site
- 10) Any abnormal or unforeseen conditions
- 11) Number of waste boxes used and where they are kept on site
- 12) Report signed and dated

III. REFERENCES

- 1) Pit 5 Experimental Treatment Facility (ETF) Removal Action Health and Safety Plan, Draft copy dated November 1991.
- 2) FMPC 2089 Topical Manual (The On Site Transportation of Radioactive and Non Radioactive Hazardous Materials)
- 3) FMPC Site Policy and Procedure Number 720 (Control of Construction Waste)
- 4) Pit 5 ETF Removal Action Work Plan (by WEMCO dated October 11, 1991)
- 5) Existing National Lead Organization, Inc. ETF Design Drawings, Listed in Exhibit C

IV. EXHIBITS

- Exhibit A - Drawings (Equipment Arrangement; Site Layout and Details)
- Exhibit B - Manufacturers' Literature
- Exhibit C - Existing National Lead Organization, Inc. ETF Design Drawings

PART I - Materials Handling and Dismantlement Procedure

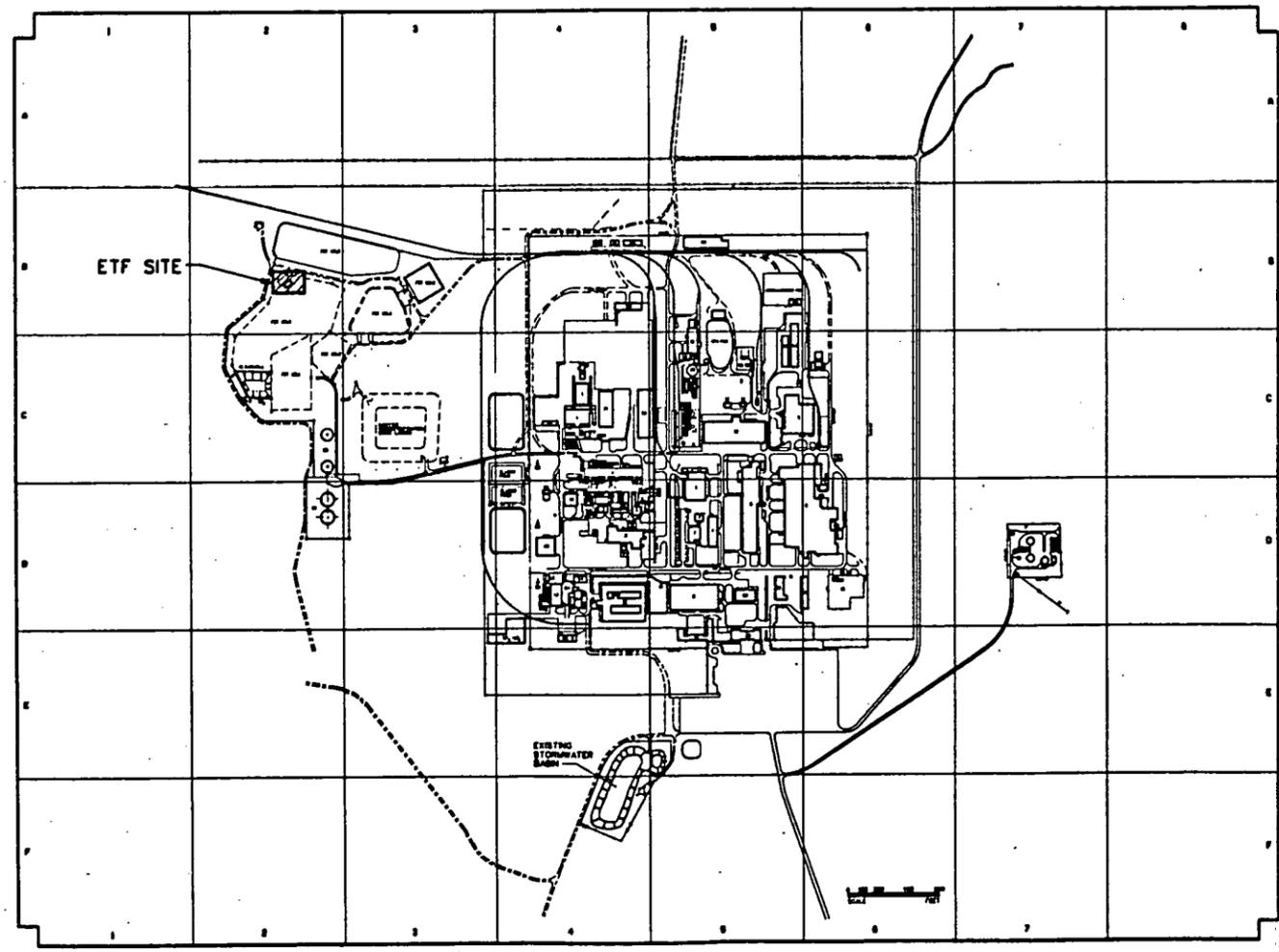
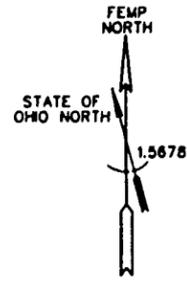
EXHIBIT A

DRAWINGS

Drawing No.	Sheet No.	Drawing Title	Rev.
91X-5900-X-00003	X0001	Cover Drawing	0
91X-5900-X-00004	X0002	Drawing Index	0
91X-5900-G-00005	G0001	Civil - Site Plan and Details -	0
91X-5900-M-00002	M0002	Material Handling - General Arrangement	0

UNITED STATES DEPARTMENT OF ENERGY FERNALD ENVIRONMENTAL MANAGEMENT PROJECT FEMP ERA PROJECT

OPERABLE UNIT 1 - PROJECT ORDER 24 EXPERIMENTAL TREATMENT FACILITY REMOVAL ACTION 11



PARSONS

The Ralph M. Parsons Company • Chas. T. Main, Inc. • Engineering-Science, Inc.

ARCHITECTS - ENGINEERS
FAIRFIELD, OHIO

D. Thompson Nov. 21, 1991 07:12:45

PART I - Materials Handling and Dismantlement Procedure

EXHIBIT B

MANUFACTURERS' LITERATURE

1. Herculite Fabric and Adhesive
2. Uni-Mat Road System
3. Shipping Container
4. TREVIRA Spunbond Polyester Geotextile

PART I - Materials Handling and Dismantlement Procedure

EXHIBIT B

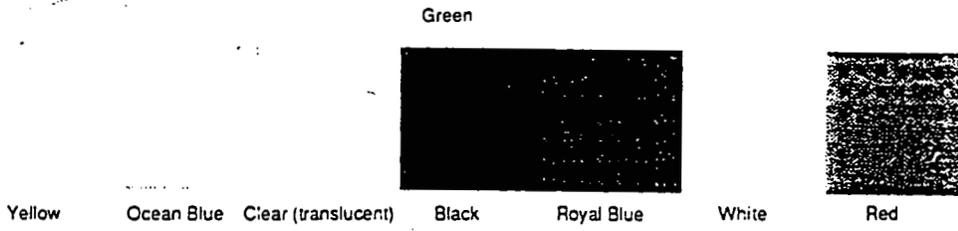
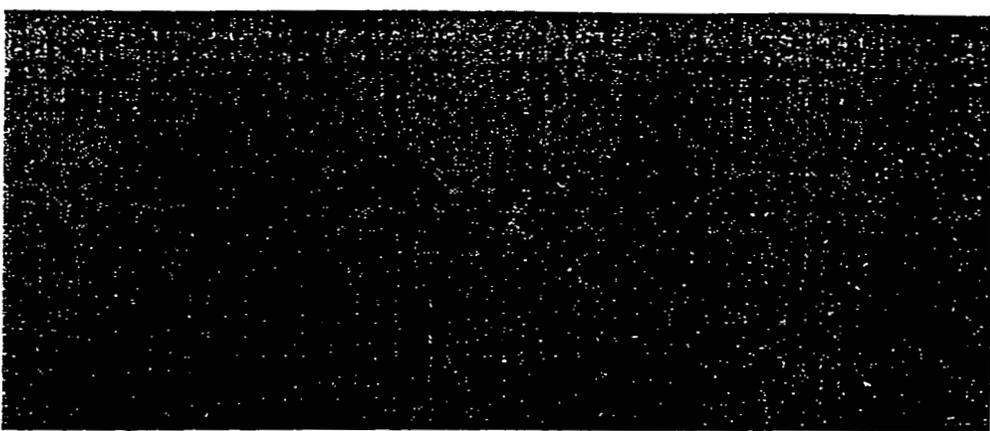
1. HERCULITE FABRIC AND ADHESIVE

Herculite® 3463

MEDIUM DUTY
SHRINK RESISTANT
LAMINATED FABRICS

60

- Flame Retardant
- Tear Resistant
- Impermeable
- All-Weather
- Abrasion Resistant
- Mildew/ Rot Resistant
- Ultraviolet Resistant
- Easy-To-Clean



TYPICAL APPLICATIONS

TYPICAL PERFORMANCE PROPERTIES (Average)

All Weather Covers	Fabric Weight	13.4 oz/sq. yd.	
Divider Curtains	Roll Length	75 yds.	
Equipment Covers	Roll Width	62 inches	
Field Covers	Roll Weight	113 lbs.	
Fumigation Blankets	Adhesion (peel)	32 lbs.	
General Purpose Covers		<u>Warp</u>	<u>Fill</u>
Gym Mats	Flame Retardance		
Sandblast Screens		Flame Time	0.4 sec. 0.7 sec.
Tackling Dummies		Char Length	4.0 inches 3.8 inches
Tailgate Curtains	Breaking Strength	230 lbs.	220 lbs.
Tarpaulins	Tear Resistance	70 lbs.	80 lbs.
Tent Walls	Hydrostatic Resistance	350 PSI	
Windbreakers			
And many, many more			

This information is offered for your general guidance and has been obtained by modern test methods. It is true and accurate to the best of our knowledge at time of printing. However, it should not be construed as specifications and is subject to revision as added knowledge and experience on this product are gained.



Herculite Products, Inc.

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Typical Performance Properties Chart

3463

TEST METHODS Fed. Std. 191 [Ⓞ]	GENERAL								MECHANICAL				ENVIRONMENTAL	
	ROLL WIDTH [Ⓞ]	ROLL LENGTH	ROLL WEIGHT	FABRIC WEIGHT	FABRIC THICKNESS	ADHESION (Peel Resistance)	BREAK STRENGTH	TEAR RESISTANCE	ABRASION RESISTANCE (To Zero Tensile)	WATER (HYDROSTATIC) RESISTANCE	AFTER WEATHERING [Ⓞ] 500 Hours Accelerated Weatherometer	FLAME RETARDANCE [Ⓞ]		
FABRIC STYLES [Ⓞ] [Ⓞ]	INCHES (Nom.)	YDS. = 15%	LBS. (Approx.)	OZ. PER SQ. YD. (Avg.)	MILS .001" (Avg.)	LBS. PER 2" (Avg.)	LBS. PER 1" (Avg.) Warp Fill	LBS. (Avg.) Warp Fill	CYCLES (Avg.)	P.S.I. (Avg.)	STRENGTH Loss % (Avg.)	SECONDS AFTER FLAME (Avg.)	SECONDS AFTER GLOW (Avg.)	INCHES CHAR. LENGTH (Avg.)
80 [Ⓞ] [Ⓞ]	50	50	85	18.5	27	32	307 303	100 108	25,000	460	3.0	1	0	2.4
L25-2 [Ⓞ]	62	50	100	18.0	26	40	252 237	76 82	25,000	365	3.0	1	0	2.7
60 [Ⓞ]	62	75	110	13.4	20	32	230 220	70 80	10,000	350	3.9	1	0	4.0
AQUA-TEX II [Ⓞ]	62	45	65	12.0	15	37	115 113	28 25	5,000	175	3.6	1	0	2.5
10W [Ⓞ]	62	100	115	10.6	15	41	110 100	31 36	4,500	160	3.6	1	0	4.1
20 [Ⓞ] [Ⓞ]	62	100	115	10.5	14	29	118 118	38 36	4,500	185	3.5	1	0	3.9
6 [Ⓞ] [Ⓞ] [Ⓞ]	54	100	65	6.5	10	27	86 79	32 31	800	140	5.0 [Ⓞ]	1 [Ⓞ]	0 [Ⓞ]	5.0 [Ⓞ]
COLOR-GUARD [Ⓞ] 10 [Ⓞ] [Ⓞ]	54	100	98	10.0	14	32	97 93	39 36	4,500	155	3.4	- [Ⓞ]	- [Ⓞ]	- [Ⓞ]
LECTROLITE [Ⓞ] [Ⓞ]	54	50	40 & 54	10.5	14	30	100 106	24 22	4,500	130	4.0	1	0	3.1

Footnotes

① MILITARY APPLICATIONS—Herculite 80, 20 and 6 fabrics respectively (not Clear styles) can be ordered to meet the requirements of MIL-C-43006, Types I, II, III, latest amendment. This specification was originally written with these fabrics as its model.

② ELECTRICALLY CONDUCTIVE: The ultimate in conductive fabric technology. Lectrolite fabrics are U.L. listed. Surface resistivity (face side) is 3.0×10^4 (ohms), typically. Meets requirements of NFPA Standard 99, Paragraph 3-3.6.2.7 and 3-3.6.3.

③ AFTER WEATHERING—Herculite 6 Clear (translucent) fabric was designed to solve interim or temporary outdoor protection problems. Opaque, pigmented Herculite 6 fabric styles are recommended for applications requiring extended outdoor use or constant exposure to sunlight.

④ NON-STANDARD ROLL WIDTHS—Check for availability. Many styles are available in 54", 62" and 72" widths. Production minimums may apply.

⑤ FLAME RETARDANCE—Color-Guard 10 and Herculite 6 Clear (translucent) fabrics are not flame retardant. They are considered slow burning and pass the requirements of the Federal Flammability Act as tested by Commercial Standard CS-192-53. The requirements stipulate that the rate of burning shall not exceed 1.2 inches per second.

⑥ CAUTION—Color-Guard 10 fabric: Fluorescent pigments fade under continuous exposure to sunlight. Herculite pre-tests its fluorescent fabrics to assure the maximum possible color stability.

⑦ TESTING... is conducted in strict accordance with Federal Standard No. 191 Textile Test methods, unless otherwise indicated.

⑧ CHECK FOR AVAILABILITY—Stock quantities on certain Herculite Fabric styles may fluctuate as they are based on consumer demand and production overruns.

⑨ SPECIALTY FABRICS—Information covering other Herculite laminated fabrics (Staph-Chek healthcare fabrics, Bantex banner fabrics, etc.) is available.

This list may not cover your fabric of interest. Please ask us for more information.

QLL 9305, on the Qualified Laboratory List, has been assigned to the Herculite Laboratory by the U.S. Government Defense Personnel Support Center (DPSC). The Laboratory is periodically examined and approved by the Defense Supply Agency for condition and accuracy of test apparatus, personnel competence and reliability in reporting test data.

This information is offered for your general guidance and has been obtained by modern test-methods. It is true and accurate to the best of our knowledge at time of printing. However the values listed in this chart are averages and should not be construed as specification. This information is subject to revision as added knowledge and experience are gained.



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 FAX: (717) 764-5211

CONFIDENTIAL
 PRICE LIST PL-5
 EFFECTIVE JAN. 21, 1991

3463

STYLE	STOCK COLORS	WEIGHT OZ PER SQ. YD.	ROLL GOODS					
			PRICE PER LINEAR YARD			FABRIC WIDTH (MIN.)	STD. ROLL ±15%	APPROX. ROLL WEIGHT
			LESS THAN 500 YARDS	500 YARDS AND OVER	1500 YARDS AND OVER			
80	Gray, Yellow, Green, White, Red, Olive Drab, Black, Navy Blue	18.5	5.36	4.94	4.57	50"	50 yds.	85 lbs.
L25-2	Royal Blue, Yellow, Red, White, Sherwood Green, True Blue, Clear (translucent), Tan, Navy Blue, Black, Brown	18.0	5.88	5.46	5.07	62"	50 yds.	100 lbs.
60	Royal Blue, Green, White, Red, Black, Clear (translucent), Yellow, Light Blue	13.5	4.14	3.85	3.56	62"	75 yds.	110 lbs.
Aqua-Tex® II	White/White, Blue/Blue, Ivory/Ivory, White/Gray, Nautical Blue/Nautical Blue, White/Blue, White/Tawny, Ivory/Blue, Ivory/Tawny, Tawny/Tawny	12.0	4.72	4.32	4.01	62"	45 yds.	65 lbs.
20	Green, Ocean Blue, Yellow, White, Red, Olive Drab, Gray, Navy Blue	10.5	3.57	3.30	3.06	54"	100 yds.	100 lbs.
10W	Green, White, Ocean Blue, Royal Blue, Tan, Red, Yellow, Black, Brown	10.5	3.75	3.47	3.23	62"	100 yds.	115 lbs.
6	Green, White, Yellow, Clear (translucent)	6.5	2.68	2.49	2.31	54"	100 yds.	63 lbs.
Color-Guard® 10	High Visibility Red	10.0	3.57	3.31	3.06	54"	100 yds.	98 lbs.

NON-STANDARD WIDTHS

Wider or narrower than those listed can be produced to meet special requirements. Consult Herculite or your Herculite fabric representative for availability of styles, colors and widths not listed.

ROLL GOODS

50 yd. rolls may consist of two pieces, 75 yd. and 100 yd. rolls may consist of three pieces, no length being less than 7 yds. Defects in roll will be flagged on the outer edge with a 1/4 yd. allowance made for each major defect.

UNIT PRICE/YD. - Total yardage of all grades of roll goods ordered will determine category of price per linear yard.

WIDTHS - Narrower or wider than standard:

- A. Slicing of standard width rolls available at \$20 per roll. Additional lead time will apply.
- B. Production quantities of narrower or wider than standard widths - price available upon request.

PACKAGING - Double-wrapped for safe shipment in extra-heavy kraft paper and bound with reinforced tape.

PUT-UP - 2" I.D. Cores

AVAILABILITY - From stock for immediate shipment in most cases.

MILITARY SPECIFICATION FABRICS

HERCULITE fabric styles 80, 20, and 6 respectively can be ordered to meet the requirements of Mil-C-43006, Types I, II, and III, latest amendment. Please specify when ordering.

All orders for military specifications should state: "For Mil-C-43006, Type, Color, Alternate Color and Quantity." Only those fabrics certified as military quality should be used for this purpose. Add \$2.50 for each "Certificate of Compliance" and add 5% (\$25.00 minimum charge per test) for "Certificate of Compliance" requiring a laboratory test report. Special quotation available for fabrics made to meet requirements of Mil-C-43006 only.

All Prices: F.O.B. Plant, York, Pa Terms: 1/2 % 10 days, net 30 days.

CVV® ADHESIVE

UNIT PRICE - Total number of cases ordered determines unit price

"CVV" Units	No. of Units Per Case	Cost/Unit 1-5 Cases	Cost/Unit Over 5 Cases	Approx. Pounds Per Case
QUARTS	12	4.75	4.50	27
GALLONS	4	14.75	14.25	34

CVV® ADHESIVE AVAILABILITY - Generally from stock for immediate shipment.
FREIGHT CLASSIFICATION - Bulk shipment as "Flammable Materials." Not accepted in air mail or overseas mail. UPS and other carriers may apply \$5.00 hazardous materials handling fee per package to ship CVV.

FABRICATING GUIDE

FOR HERCULITE BRAND INDUSTRIAL AND MARINE FABRICS

3463

INTRODUCTION

The suggestions made in this brochure are for your general guidance only. Special situations may arise requiring variations from the suggested fabricating techniques. Remember, in fabricating products made with Herculite brand fabrics, or any other fabrics, there is no substitute for experience, good craftsmanship and practical judgement.

1. PREPARING THE PATTERN-ALLOW FOR CONTRACTION

Before measuring any fabric, allow it to remain flat for at least a half hour. This gives the fabric a chance to "relax" from its rolled condition and allows you to make more exact measurements before cutting. This is particularly important in making products that require a precise fit.

All matter contracts and expands with changes in temperature. Most materials expand with heat and contract with cold. Man-made synthetic fabrics (Nylon, Dacron, Vinyl, etc.) react just the opposite. They contract with heat, expand with cold. As with all synthetic materials Herculite fabrics will contract when temperatures rise, and will expand when temperatures fall. Therefore, when you measure panels at room temperatures, add a minimum allowance of 3% to your measurements to compensate for the contraction of the material at higher mid-day temperatures.

2. CUTTING THE FABRIC

When cutting more than one ply of Herculite, use fabric clamps or metal weights to keep the layers of fabric from sliding out of position.

Note: The "face" or surface side of Herculite fabrics is the smooth side. You can actually feel the inner nylon or polyester fibers through the vinyl on the rough or under side. Herculite fabric roll goods are edge printed to indicate the "face" or surface side of the fabric. For maximum service life be sure the smooth side faces the source of maximum abrasion.

3. STITCHING

While Herculite fabrics require no more than the conventional sewing methods commonly employed throughout the trade, the following sewing techniques should be observed. Stitching should be a minimum of 1/2" from the raw edge.

A. Straight Seams. For maximum strength we recommend the full interlocking type seam (figure A), using a 5/8 inch or 1-1/2 centimeter gauge, double-needle machine, set no more than 5 to 6 stitches per 1-inch or 2-1/2 centimeters. A full lap seam folder is a valuable attachment.

B. Curved Seams. Single needle machine. (A compound feed or walking foot is especially desirable to eliminate puckers.) Stitch plain seams with

no more than 5 to 6 stitches per 1-inch or 2-1/2 centimeters. (Figure B). Fold over and top stitch with no more than 5 to 6 stitches per 1-inch or 2-1/2 centimeters (Figure C).

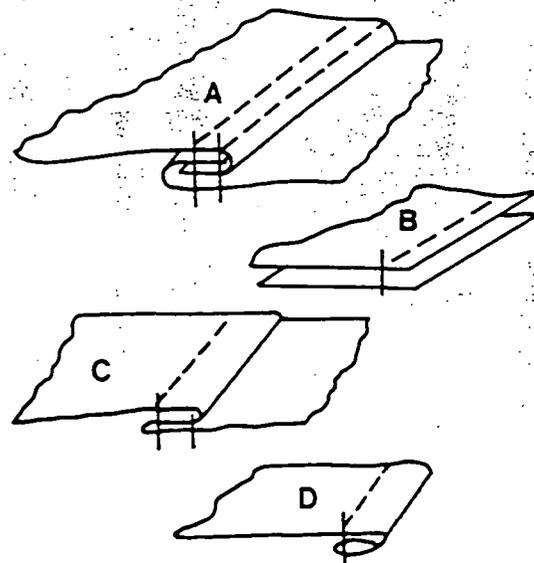
C. Hemming. The hem is sewn in the same manner as on other materials, but it is recommended that at least three plies of material be used (Figure D) — no more than 5 to 6 stitches per 1-inch or 2-1/2 centimeters.

D. Waterproofing Sewn Seams. All Herculite brand fabrics, with the exception of Microvent[®], are impermeable and permanently waterproof by nature of their 3-ply, vinyl/fiber construction. Where waterproof seams are necessary, use a seam sealant to fill in all needle holes. Two (2) coats are recommended. Here's how to do it:

1. Lay seam flat on a smooth surface, face side down so that the reverse or underside of the seam is facing up.

2. Apply a thin stream of seam sealant directly upon the stitch line. Because seam sealants generally tend to darken when exposed to direct sunlight be sure to apply the sealant to the underside of the cover that will face away from the sun.

3. With a clean cloth, or finger, wipe the length of the stitch line, pressing the sealant into the thread holes. Be certain that the sealant is applied on all needle holes between all folds. Before folding the fabric, make sure the sealant is thoroughly dry. As an added precaution, apply talcum powder to the sealed areas. If folded wet, the sealant may stick to a covering surface and damage it.



4. INSTALLING GROMMETS AND FASTENERS

Spur toothed, rolled rim grommets are recommended. Washer type grommets have a tendency to slide on the fabric and pull out. The grommets should be installed through at least two plies of heavyweight Herculite fabrics, 13 ounces per square yard (440 grams per square meter) and heavier, and at least three plies of all Herculite medium weight to lightweight fabrics. Grommets should be mounted between the stitch lines of the hem, leaving at least 1/8 inch or 1/3 centimeter from the grommet edges to the stitch line. Where additional strength is needed, webbing strap-type reinforcing is sewn within the hem. For excessive strain, rope reinforcement should be sewn into the outer portion of the hem.

5. CHAFING STRIPS

The abrasion resistance of Herculite fabrics is far superior to that of canvas and other conventional fabrics. However, where heavy chafing or abrasion is expected to occur, we recommend that a patch or chafing strip of Herculite fabric be sewn or cemented to the vulnerable area.

6. WHEN TO SEW, CEMENT, OR ELECTRONICALLY WELD

A. Sewing. Sewing is the least costly method of fabrication. We recommend that seams be sewn (1) where the protective covering does not have to be absolutely waterproof (e.g. pool covers, welding curtains, etc.); and (2) where the seam is not exposed flat to the elements (e.g. the vertical walls of a tent).

B. Cementing. Cementing or the use of adhesives, is recommended where waterproof, air-tight seams are necessary (e.g. patches; chafing strips; complex closures such as tank liner bottoms; curved compound seams such as irregular shaped tank liners and waterproof clothing). Cementing is also recommended for surfaces that lie flat and are exposed to the elements.

CVV® Vinyl Adhesive

CVV adhesive from Herculite has no equal for effectively patching, sealing, bonding, seaming, uniting large membranes and liners, waterproofing or fabricating a wide variety of products. It is also excellent for small punctures, cuts and abrasions. CVV adhesive is packaged in quart (.946 liter) and gallon (3.79 liter) containers and 1-1/2 oz. (44.4 ml) collapsible tubes.

Patch Kit Idea

A tube of CVV adhesive plus two or three pieces of Herculite fabric of the same grade and color as a customer's tarpaulin or cover makes a handy and useful "Patch Kit" which can be sold at a profit. Note: On every tarpaulin, many fabricators make a special pocket into which they insert a patch kit. They report that customers are glad to pay for this added convenience.

C. RF (Radio Frequency) Welding — Where waterproof or air-tight seams are desired RF welding is recommended. With RF welding heat is generated uniformly throughout the fabric thickness avoiding fabric degradation. Special contour welding bars may be used for unique shapes. A 3/4" width bar is recommended for optimum results. Following the recommendations of the welding machine manufacturer are important to success with this type seam. Herculite fabrics may also be hot air welded.

Fabricating Tip:

In many cases it is practical to use all three fabricating techniques: Electronic welding, cementing and sewing. For instance, the cover of a truck might be an electronically welded wide-width sheet; hems, straps, and fittings-sewn; and side closures-cemented. The particular technique you select depends as much on your own craftsmanship and practical judgement as the nature of the covering job itself.

7. CLEANING HERCULITE COVERS

Herculite coverings can be cleaned quickly and easily. In many cases just soap and water will do the job. For hard to clean spots use saddle soap in cake form. Apply with a fine bristle brush using circular motion. Be sure to raise a substantial lather. Next, rinse down with clear water. For very dirty covers, two applications of saddle soap are generally sufficient to clean thoroughly. Herculite fabrics are mildew resistant and will not rot. Tarpaulins can be left to dry in the open air, or simply sponge off the surface and store them away.

8. TECHNICAL ASSISTANCE

Herculite fabrics are backed by many years of laboratory and in-service testing. The Herculite sales and research staff is always ready to work with you on special problems and to make recommendations on any phase of your project ... fabric style selection, design or method of fabrication.

Fabricating techniques, recommendations and other information set forth in this guide have been gathered from successful usages reported by Herculite fabricators. Herculite Products, Inc. makes no warranty, expressed or implied, as to fitness of use or results to be obtained. The use of this information shall be solely in the judgement of and at the risk of the user.

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HERCULITE PRODUCTS, INC.

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(212) 691-7550
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CVV[®] ADHESIVE

FACT SHEET & FABRICATING GUIDE

THE VINYL ADHESIVE THAT REALLY WORKS

For use with HERCULITE brand fabrics including
 HERCULITE[®] Industrial and Marine fabrics
 BANTEX[®] Banner fabrics
 COLOR-GUARD[®] Safety fabrics
 STAPH-CHEK[®] Hospital and Institutional fabrics
 HERCULEX[®] fabrics
 ANSTAT[®] Antistatic fabrics
 And many other bondable plastic and non-plastic materials.

1. INTRODUCTION

CVV adhesive comes closest to being the universal adhesive. Unlike other vinyl adhesives, it not only coats the surfaces to be bonded, but penetrates them, and chemically fuses the materials to form a super strong, permanent, waterproof bond. A major advantage of this general purpose adhesive is its ability to be used wet or in a dry or solvent reactivated system. It dries transparent.

The suggestions made in this brochure are for your general guidance only. Special situations may arise that may require variations from the suggested techniques. Remember, in fabricating or repairing HERCULITE fabrics or any other bondable materials there is no substitute for good craftsmanship and practical judgment.

A. USES UNLIMITED:

CVV adhesive is ideal for cementing HERCULITE fabrics to themselves and to many other surfaces. It is equally effective with a wide variety of plastics and other materials (refer to Bonding Chart for a complete listing). CVV adhesive has no equal for effectively bonding, seaming, uniting membranes and liners, waterproofing, patching or sealing pin holes. It is recommended for chafing strips, curved compound seams such as irregular shaped tank liners and waterproof clothing and complex closures such as tank liner bottoms. It is also excellent for repairing covers of all types, including vinyl mattress ticking, tarpaulins, air supported and inflatable structures, vinyl upholstery, pool covers and liners, and vinyl furniture.

CVV adhesive is prescribed for repairing hospital and institutional products such as mattresses and cubicle curtains made with STAPH-CHEK fabrics or other HERCULITE brand fabrics and is excellent for fabricating and sealing envelope type foam insert mattresses.

B. TOOLS AND MATERIALS SUGGESTED FOR USE IN FABRICATING, REPAIRING, ETC.

1. Metal weights (2) or other relatively small but heavy objects to prevent shifting of fabric and to insure uniformity of seams.
2. Plastic Dispenser Bottle: The "squeeze-plastic" type used as a mustard or ketchup container. Spout opening of @ 1/4".

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3. Methyl Ethyl Ketone (MEK): For use in Dry or Solvent Reactivation Method and also for thinning CVV adhesive if necessary. Methyl Ethyl Ketone is a common solvent and is generally available from chemical distributors. Consult your Yellow Pages under Chemicals - Manufacturers and Distributors. It is also available from hardware stores and retail paint dealers under various commercial trade names.

4. Hardwood wallpaper roller, about 1" wide.

5. Miscellaneous: Scissors, Masking Tape, Ruler, Razor Blades, Hacksaw Blade, Mineral Spirits (for cleaning), Waxed Paper, Talcum Powder, Absorbent Cotton.

C. SHELF LIFE:

Approximately two (2) years in a sealed, filled container. For optimum shelf life store at temperatures 60-80°F.

D. SPECIAL PRECAUTION:

Flammable! Keep away from heat and open flame! Use adequate ventilation! Do not smoke when working with CVV adhesive!

E. ICC SHIPPING CLASSIFICATION:

Adhesive Cements, NOIBN, Flammable Liquid. Not accepted in air mail or overseas mail.

F. PACKAGING:

CVV adhesive is available in
 QUARTS - Bulk packaging: 12 units per case
 GALLONS - Bulk packaging: 4 units per case
 1 1/2 oz. COLLAPSIBLE TUBES - Bulk packaging: 144 Units (1 Gross) Per Case

2. GENERAL DIRECTIONS:

A. CLEANING: Surfaces to be bonded should be clean, thoroughly dry and free from oils, greases and other contaminants. If cleaning is necessary, use Toluol or Mineral Spirits (Sub-Turpentine - NOT Gum Turpentine), only on areas to be bonded.

For that spotless finished product ... HERCULITE fabrics can be cleaned quickly and easily. Most soils or

sponging or wiping with neutral soap suds and lukewarm water. For hard to clean spots, use standard liquid household/vinyl cleaners and/or a soft bristle brush. Pre-soak if needed. **DO NOT USE HARSH CLEANERS OR DETERGENTS.**

Another recommended cleaning method for larger surfaces is to use saddle soap in cake form. Apply with a fine bristle brush using circular motion. Be sure to raise a substantial lather. Next, rinse down with clear water. For very dirty covers, two applications of saddle soap are generally sufficient to clean thoroughly.

Covers made with HERCULITE fabrics can be left to dry in the open air without being affected by mildew or rot. Simply sponge off the surface, and store.

- B. THINNING:** Use adhesive as received and stir well before applying. Keep container closed as much as possible to prevent thickening through evaporation of solvent. If thickening should occur after use, thin **ONLY** to original consistency by adding small amount of Methyl Ethyl Ketone (MEK).

3. WET AND DRY METHODS

A. DRY METHOD (SOLVENT REACTIVATION METHOD) – FOR RAPID PRODUCTION

1. Apply CVV adhesive to both seam surfaces. The adhesive coating should be uniform and cover the entire area to be bonded. A rigid serrated tool, such as a section of a hacksaw blade, will assist to evenly distribute the adhesive. Refer to section 4B-1 for determining wet thickness of adhesive.
2. Instead of immediately joining the seams, the fabrics may be put aside allowing adhesive to dry for later bonding at your convenience. After drying, materials may be stored, still not joined, for several years.
3. When you wish to bond the seams, lightly moisten a wad of absorbent cotton with MEK and apply a light coat to both of the CVV adhesive coated surfaces. Do not allow the reactivated CVV adhesive to dry! Join the seams and press with roller immediately. A hardwood wallpaper roller, about 1" wide, is recommended to firmly press down the cemented seams.

Δ *If the moistened area dries before you are ready to continue, you can reactivate it with more MEK.*

Within five minutes, a safe handling bond is reached. Allow to set for a minimum period of 24 hours for optimum bond.

The dry or solvent reactivation method is particularly useful in fabricating compound curves.

B. WET METHOD – FOR IMMEDIATE BONDING

While the Dry or Solvent Reactivation Method of bonding with CVV adhesive is recommended for rapid or production type applications, there are many instances where immediate bonding is preferable:

1. Apply CVV adhesive to both seam surfaces as indicated in A1 of the Dry Method. Immediately join the surfaces to be bonded. Uniting the coated surfaces when the adhesive is too dry can result in an inadequate bond.
2. Press area firmly with roller or round bar to insure proper contact to other surfaces. Wipe up excess adhesive immediately with toluol or mineral spirits.

Although CVV adhesive may set initially in one half hour, do not pull against the seams for at least two hours! A relatively strong bond is obtained after 24 hours, with an optimum bond resulting in 72 hours. Care in handling permits grommeting or hemming to be performed safely after that time, but avoid pulling against the seams.

3. Units should be allowed to dry completely before stacking or folding to prevent blocking (sticking). Units stored before they are completely cured should be

papers to reduce surface tackiness.

Δ *Drying time for CVV adhesive can be significantly affected by environmental factors such as temperature and humidity. These factors should be taken into consideration and compensated for whenever possible.*

4. WIDE WIDTH SHEETS

A. ELECTRONICALLY WELDED SHEETS – rectangular or squared, are recommended for applications where waterproof, air-tight seams are necessary. Tarpaulins can be turned out by hemming the edges and installing grommets, if required. If welding equipment is not available and time does not permit placing order for sheets with electronically welded seams from the factory, the use of CVV adhesive is recommended for making wide width sheets.

B. CEMENTED WIDE WIDTH SHEETS: To seam two or more sections of HERCULITE fabric together, employ at least one-inch overlap. Either the Wet or Dry methods may be employed, but, in either case, the adhesive must be applied to both surfaces.

Δ *The "face" side of HERCULITE fabrics is the smooth side. You can actually feel the inner mesh through the vinyl on the rough side. HERCULITE fabric roll goods are edgeprinted to indicate the "face" or surface side of the fabric. For maximum service life be sure the smooth side faces the sun or the source of abrasion – whichever is the greater continuing service hazard.*

1. Estimating Required Adhesive

Measure the total length of seams to be made and estimate the required quantity of CVV adhesive from Coverage Chart. Each seam is assumed to be one inch wide, requiring a two-inch laydown of CVV adhesive. As a general guide, the wet thickness of the adhesive should approximate the thickness of the fabric used. In the absence of a film thickness gauge (Micrometer) a rule of thumb approach may be used to determine approximate fabric thickness. For example: HERCULITE 6 or STAPH-CHEK 6 fabrics average 10 mils thickness, HERCULITE 20 or STAPH-CHEK 20 fabrics average 14 mils, and HERCULITE 80 fabric averages 27 mils. The HERCULITE fabric Typical Properties Chart (HE-TM-11) may also be consulted for the approximate thickness of standard grades.

Another rule of thumb approach to determining wet thickness of the applied adhesive is to think in general terms: light applications or relatively thin films for lightweight fabrics, medium applications for fabrics of intermediate thickness and heavier applications for heavy or thicker grades.

COVERAGE CHART – CVV ADHESIVE

Measure the total length of seams to be made. Estimate the required quantity of CVV adhesive from chart below. Each seam is assumed to be one inch wide, requiring a two-inch laydown of adhesive, or double the 1" coverage.

Application based on fabric thickness and two (2) 1" width seams		One Quart	One Gallon
L I G H T	10 Mils	240 linear ft. or 20 sq. ft.	960 linear ft. or 80 sq. ft.
	12 - 17 Mils	165 linear ft. or 14 sq. ft.	660 linear ft. or 55 sq. ft.
M E D I U M	23 - 30 Mils	96 linear ft. or 8 sq. ft.	384 linear ft. or 32 sq. ft.

One Mil equals .001 inch or 1/1000 of an inch

any doubt exists, use wax paper between the layers of folded seams to prevent blocking or adhering, which would damage both the seam and the fabric. Before using this method, experiment with scrap material until the proper result is attained.

△ *In applying CVV adhesive or any other compatible sealant to any vinyl surface avoid a constant back and forth brushing action. This may result in premature drying of the adhesive, causing an uneven spread and/or film separation. In addition, the surface of the fabric may be damaged by over-exposure to the solvents contained in the adhesive.*

B. STRIP METHOD: Still another method of waterproofing sewn seams is to apply CVV adhesive to a strip of the HERCULITE brand fabric or other fabric, cut to the same length as the length of seam to be sealed, and wide enough to cover the stitch lines and any overlapping folds. CVV adhesive should be applied also to the stitch lines and overlapping folds in an area that extends approximately ¼" beyond entire area over which fabric strip is to be placed. After the CVV adhesive has dried on both surfaces, moisten the treated areas with Methyl Ethyl Ketone and press the strip firmly over seam and folds. This provides a permanent, waterproof seal. Refer to section 3A Dry Method for additional information.

A simpler variation of this method is to apply adhesive only to the underside of the fabric strip. Immediately join the coated strip to the area being covered and press firmly in place.

C. SEALING DOUBLE STITCHED SEAMS:

1. For best results transfer CVV adhesive into a squeeze type plastic mustard or ketchup container having a pointed tip. The CVV adhesive is squeezed into one end of the double needle seam between the fabrics, and between the thread lines.
2. Next, the roller is used to press the adhesive forward through the double needled line for the length of the sewn seam. A small amount of experimentation on waste fabrics will show the amount of CVV adhesive required in the seam to give any desired length of sealed seam. Maintain a firm pressure on the roller to squeeze the CVV adhesive throughout the length of the seam. This also allows the adhesive to ooze through and seal the needle holes. In the event the amount of adhesive used is insufficient to cover the entire seam, repeat the procedure from the opening on the other end.

Remember: The sealant is also a bonding agent. Should an error occur at both ends, the fabric can be

length of the seam, to accept the nozzle and infusion of additional adhesive. The pressed down cut or cuts will be sealed by the adhesive present within the seam.

6. GENERAL REPAIRS

A. REPAIRING TEARS, CUTS, PUNCTURES

1. Clean and dry area around damage. Refer to section 2A General Directions - Cleaning.
2. Cut patch to overlap damaged area approximately 1" all around, rounding off corners. Position patch and trace outline of area it will cover.
3. With applicator (stiff brush, knife or hacksaw blade) spread light coat of CVV adhesive over and ¼" beyond entire area to be patched. Do not apply a heavy coat.
4. Spread light to moderate coat on one side of patch. Again, do not apply heavy coat, especially to lighter weight fabrics. CVV adhesive contains solvents that will soften vinyl surfaces.
5. Apply patch immediately and firmly press in place. Smooth with roller, bottle, can, etc. to remove air bubbles. Until dry, don't fold or let fabric touch other materials. Optimum drying time may vary from 1 to 24 hours. To reduce tackiness around patch, sprinkle with talcum powder.

B. SEALING PINHOLES, ABRADED AREAS:

1. Hold the fabric up to the light. Mark areas where light penetrates.
2. Clean and dry area to be sealed.
3. Spread moderate coat of CVV adhesive over pinhole with applicator, blade, brush or finger. Apply on underside of cover to preserve appearance. Remember that CVV adhesive is a light amber color that darkens when exposed to sun's rays. No patch is needed. Don't fold or allow fabric to touch other materials until dry.

7. PATCH KITS:

A tube of CVV adhesive plus one or two pieces of HERCULITE fabric of the same grade and color of the cover fabric, along with a copy of these instructions, makes a handy and useful, on-site, convenient "Patch Kit." CVV adhesive patch kits can be put together in the field by combining these materials or they can be ordered complete from Herculite or your HERCULITE fabrics dealer. Additional copies of the CVV Adhesive Fabricating Guide and Fact Sheet (J-20) are available on request.

△ *Many fabricators install a special pocket directly on the covers they make, into which they insert an easily accessible patch kit for convenient use by their customers.*

8. TECHNICAL ASSISTANCE

Technical assistance, product use bulletins, and laboratory facilities are available for fabrication, applications, and custom engineered fabric guidance. Our Technical Service Department will be happy to work with you and make recommendations on any phase of your project . . . material selection, design, or method of fabrication.

CVV adhesive is just one of a large family of guaranteed, durable products that includes the world famous HERCULITE industrial, marine and institutional fabrics. The Herculite Corp., manufacturers of CVV adhesive, has a superior protective fabric to economically meet every need.

For complete information contact your HERCULITE fabrics dealer or call or write: Customer Service Manager.

QLL 9305, on the Qualified Laboratory List, has been assigned to the Herculite Laboratory by the U.S. Government Defense Personnel Support Center (DPSC). The Laboratory is periodically examined and approved by the Defense Supply Agency for condition and accuracy of test apparatus, personnel competence and reliability in reporting test data.



handles like silk — wears like steel mesh!

IMPORTANT: There are so many bondable plastic and non-plastic materials, and so many variances among these materials, that the only way to be sure that CVV adhesive is right for your particular needs is to test it!

The information contained in this bulletin is believed to be reliable. It is offered in good faith and intended for use as a general guide. Herculite makes no guarantee of results and assumes no obligation or liability whatsoever in connection with the use of this information. This bulletin, including any statements concerning the possible use of our products, is not a license to operate under, or intended to suggest infringement of, any existing patents.

HERCULITE PRODUCTS, INC. 1107 BROADWAY, NEW YORK, NEW YORK 10012 6



PROJECT NO. _____ DATE: 8/2/90
SUBJECT: MATERIAL SAFETY DATA SHEET
MSDS: HERCULITE

3463

LABORATORY REPORT

I. PRODUCT IDENTIFICATION

Trade name: Herculite®
Description: Laminated Vinyl-Synthetic Fabric
Manufacturer: Herculite Products, Inc.
Address: P.O. Box 786, York, Pa. 17405
Phone: 717-764-1191; 1-800-772-0036

II. INGREDIENTS

The precise composition of this product is proprietary. While several of its components could be considered hazardous in pure form, none is significantly hazardous as compounded, due to dilution, encapsulation, etc. Under conditions of combustion, toxic gases, including hydrogen chloride and phthalic anhydride, are generated (Nylon-containing styles generate small amounts of hydrogen cyanide in combustion). Barium (Ba), Cadmium (Cd) and Zinc (Zn) are present in very low concentrations (of the order of 500 ppm). Various pigment systems contain lead chromate yellow and molybdate orange. Low concentrations (less than 5%) of aluminum and antimony oxides are present as flame retardants.

III. PHYSICAL DATA

Boiling point: >500°F
Melting point: (approx.) 370°F
Specific gravity: (approx.) 1.25
Vapor pressure: (392°F): >1.1 mmHg
Vapor density: > 10 (Air = 1)
Solubility in H₂O: .005 (% by weight)
% Volatiles by volume: (approx.) 25 (High temp. only)
Evaporation rate: (approx.) 0 @ room temp. (butyl acetate = 1)
Appearance and odor: laminated vinyl-synthetic fabric; little or no odor.

IV. FIRE AND EXPLOSION DATA

Flash point: 450°F C.O.C.
Autoignition temp.: 520°F
Extinguishing media: water, CO₂, chemical.
Special fire fighting procedures:
Unusual fire and explosion hazard: releases HCl and HCN gases (HCN in nylon styles only) when burned. No explosion hazard.

V. HEALTH HAZARD INFORMATION

The only significant hazards from this product arise under conditions of combustion or elevated temperatures (approximately 250°F and above), due to evolution of gases and vapors, including hydrogen chloride, phthalic anhydride, oxides of carbon, and minute amounts of vapor-phase heavy metals, including cadmium, antimony, lead, chromium, molybdenum, and barium. Nylon-containing styles evolve hydrogen cyanide, individual sensitivities of an allergic nature cannot be predicted. In case of exposure to combustion gases, remove to fresh air, flush eyes and accessible mucous membranes with water, and consult physician if difficulty in breathing or burning sensation in chest is experienced.

VI. REACTIVITY DATA

Product is stable at normal use temperature, but may liberate HCl gas at temperatures from 250°F to 400°F depending on exposure time. Liberates HCl and HCN (HCN in nylon styles only) under pyrolysis conditions. Hazardous polymerization will not occur.

VII. SPILL OR LEAK PROCEDURES

No spill or leak hazard. Scrap can be landfilled. Consult local and federal regulations.

VIII. SPECIAL PROTECTION INFORMATION

No special protection except under conditions of fire or elevated temperatures (250°F for more than a few minutes). Under such conditions, eye, skin, and respiratory protection is advised.

IX. TRANSPORTATION DATA

National Motor Freight Classification (NMFC) 49210, Class 65.

X. SPECIAL PRECAUTIONS

Temperature range for storage: -40°F to 150°F.

XI. DISCLAIMER

The information provided herein is true and accurate to the best of our knowledge. Although compiled by competent technical personnel, no guarantee or warranty is herein expressed or implied, as to the completeness or correctness thereof. Since the exact conditions of use of our products are beyond our control, any liability with regard to such use is hereby disclaimed. Nothing herein is to be taken as advising the infringement of any patent, or violation of any legal statute.



Larry D. Rinehart
Technical Director

CVV[®] ADHESIVE

PROJECT NO. _____ DATE: 8/2/90
 SUBJECT: MATERIAL SAFETY DATA SHEET
 MSDS CVV ADHESIVE

3463



MSDS LABORATORY REPORT

MANUFACTURER: HERCULITE PRODUCTS, INC.
 ABERDEEN RD
 EMIGSVILLE, PA 17318

TRANSPORTATION EMERGENCIES: IN PENNSYLVANIA: 800-732-3600
 ELSEWHERE: 800-732-8733

PRODUCT IDENTIFICATION

Product name: CVV ADHESIVE[®]
 Synonyms: N/A
 Generic name: Vinyl solution cement
 Chemical family: Organic solvents/polymeric resins
 DOT proper shipping name: Cement liquid
 ID number: NA1133
 DOT hazard classification: Flammable liquid

SECTION I	COMPONENTS	EXPOSURE LIMIT/UNITS	AGENCY	TYPE
HAZARDOUS COMPONENTS				
	Acetone (dimethyl ketone) CAS# 67-64-1	1000 PPM 750 PPM	OSHA ACGIH	TWA TWA
	Toluene CAS# 108-88-3	100 PPM 150 PPM	OSHA OSHA	TWA STEL

Both components listed above are subject to reporting under SARA 313 and 40 CFR 372.

OTHER COMPONENTS

Polyvinyl chloride N/A
 Nitrile rubber N/A

SECTION II EMERGENCY AND FIRST AID PROCEDURES (HAVE PHYSICIAN CALL LOS ANGELES POISON INFORMATION CENTER (24 HOURS) 1-800-356-3129)

EYE CONTACT: Move victim into fresh air. If irritation or redness develops, flush eyes with clean water and call physician. For direct contact, hold eyelids apart and flush the affected eye(s) with clean water for at least 15 minutes. Call physician.

SKIN CONTACT: Remove contaminated shoes and clothing. Cleanse affected areas thoroughly with mild soap and water. If irritation or redness develops and persists, call physician.

INHALATION (BREATHING): If symptoms develop (see section III), move victim away from source of exposure and into fresh air. If symptoms persist, call physician immediately. If victim is not breathing, begin artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel and physician should be consulted.

INGESTION (SWALLOWING): One component (Toluene) is a potential aspiration hazard. If swallowed, seek emergency medical attention. If victim is drowsy or unconscious, place on the left side with the head down and do

not give anything by mouth. Because of potential toxicity, if victim is conscious and alert, vomiting should be induced for ingestion of large amounts (more than 8 oz. for an adult), preferably with syrup of ipecac under direction of poison control center. If possible do not leave victim unattended.

NOTE TO PHYSICIANS: Exposure to high concentrations of component solvent (Toluene) in enclosed spaces or by deliberate abuse may be associated with cardiac arrhythmias. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to this material.

SECTION III HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT: Solvent components are eye irritants. Direct contact with liquid or exposure to vapor or mists may cause stinging, tearing, redness and swelling.

SKIN CONTACT: May cause mild skin irritation. Prolonged or repeated contact may cause redness, burning, drying and cracking of the skin contact may result in skin absorption but symptoms of toxicity are not anticipated by this route alone under normal conditions of use. Persons with pre-existing skin disorders may be more susceptible to effects of this material.

INGESTION (SWALLOWING): While this material has a low degree of toxicity, ingestion of excessive quantities may cause irritation of the digestive tract and signs of nervous system depression (e.g. headache, drowsiness, dizziness, loss of coordination and fatigue). **ASPIRATION HAZARD** – this material can enter lungs during swallowing or vomiting and cause lung inflammation and damage.

COMMENTS: This material has not been identified as a carcinogen by NTP, IARC or OSHA. Intentional misuse by deliberate inhalation of Toluene has been shown to cause liver, kidney and brain damage. Exposure to high concentrations of Toluene can cause irreversible changes in the genetic material DNA. The human health consequences of these changes are not fully understood. Persons with pre-existing heart disorders may be more susceptible to irregular heartbeats (arrhythmias) if exposed to high concentrations of Toluene (see Section II). Toluene also causes fetal damage in laboratory animal studies. The relevance of these findings to humans is uncertain. Repeated and prolonged occupational exposure to solvents has been associated with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling this product may be harmful or fatal.

SECTION IV SPECIAL PROTECTION INFORMATION

VENTILATION: Ventilation practices should be adequate to maintain airborne concentrations below the established exposure limits (see Section I). Where explosive mixtures may be present, electrical systems safe for such locations must be used.

RESPIRATORY PROTECTION: The use of respiratory protection is advised if concentrations exceed the established exposure limits (see Section I). Depending on the airborne concentration use a respirator or gas mask with appropriate cartridges and canisters (NIOSH approved) or supplied air equipment.

PROTECTIVE GLOVES: Use of gloves impermeable to solvent components is advised to prevent skin contact, possible irritation, and absorption.

EYE PROTECTION: Approved eye protection to safeguard against potential eye contact, irritation or injury is recommended.

OTHER PROTECTIVE EQUIPMENT: Source of clean water should be available in work area for flushing eyes and skin. Impervious clothing should be worn as needed.

SECTION V REACTIVITY DATA

STABILITY: Stable under normal conditions of storage and handling.

CONDITIONS TO AVOID: Avoid all possible sources of ignition (see Sections VII and VIII).

INCOMPATIBILITY: This product is incompatible with strong acids or bases, oxidizing agents, alkali metals, elemental halogens and certain amines.

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HAZARDOUS DECOMPOSITION PRODUCTS: Combustion may yield carbon monoxide and/or carbon dioxide, hydrogen chloride and hydrogen cyanide. Do not breathe smoke or fumes. Wear appropriate protective equipment.

HAZARDOUS POLYMERIZATION: Will not occur.

POLYMERIZATION CONDITIONS TO AVOID: None known.

SECTION VI SPILL AND LEAK PROCEDURES: TRANSPORTATION SPILLS:

CALL 1-800-732-3600 INSIDE PENNSYLVANIA
CALL 1-800-732-8733 OUTSIDE PENNSYLVANIA

PRECAUTIONS IN CASE OF RELEASE OR SPILL: Flammable. Keep all sources of ignition and hot metal surfaces away from spill/release. Stay upwind and away from spill/release. Isolate hazard area and limit entry to emergency crew. Wear appropriate protective equipment including respiratory protection as conditions warrant (see Section IV). Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems and natural waterways. Dike spill for later recovery or disposal. Absorb into appropriate absorbant if possible. Notify fire authorities and appropriate federal, state and local agencies. Use water sparingly to reduce disposal requirements. Immediate clean-up of any spill is recommended. If spill is in excess of EPA-reportable quantity, notify the National Response Center at once (800-424-8802).

EPA REPORTABLE QUANTITY:

Toluene 1000 lbs., equivalent to 2900 lbs. CVV Adhesive
Acetone 5000 lbs., equivalent to 14,300 lbs. CVV Adhesive

SECTION VII STORAGE AND SPECIAL PRECAUTIONS

Keep container(s) tightly closed. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces and all sources of ignition. Post area "NO SMOKING OR OPEN FLAME." Bond and ground all equipment when transferring from one vessel to another. Store only in approved containers. Keep away from incompatible materials (see Section V). Use of explosion-proof equipment is recommended and may be required (see appropriate fire codes). Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes. Respiratory protection is advised when concentrations exceed exposure limits (see Sections I and IV). Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Follow good personal hygiene practices. "Empty" containers contain residue and can be dangerous. Do not pressurize, cut weld, braze solder, drill, grind or expose such containers to heat, flame, sparks or other sources of ignition: explosion hazard. Containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations.

SECTION VIII FIRE AND EXPLOSION HAZARD DATA

NFPA Hazard Class		HMIS Hazard Class	
Health	2	Health	2*
Flammability	3	Flammability	3
Reactivity	0	Reactivity	0

Ranking: 0=Least

4=Extreme

*=Chronic effects

Flash point 39°F (TCC)
Lower explosive limit 1.0 (% vol.)
Upper explosive limit 12.8 (%vol.)

EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, Halon, foam or water spray. Water may be ineffective.
UNUSUAL FIRE AND EXPLOSION HAZARDS: This material is flammable and may be ignited by heat, sparks, flame, or other sources of ignition. Vapors may travel considerable distance to source of ignition where they may ignite, flashback, or explode. Vapors are heavier than air and may accumulate in low areas. Containers may explode in heat of fire. Resin components may liberate hydrogen chloride and/or hydrogen cyanide while burning.
SPECIAL FIRE FIGHTING PROCEDURES: Wear appropriate protective equipment including respiratory protection as conditions warrant. Remove undamaged containers from fire area if it can be done without risk. Water spray may be useful in minimizing or dispersing vapors, and cooling equipment exposed to heat and flame. Avoid spreading burning liquid with water spray.

SECTION IX PHYSICAL DATA

Approx. boiling point
175° - 230°F

Vapor density (air=1)
2.5-3.2

% volatile
70

Evaporation rate
(N-Butyl Acetate=1)

Vapor pressure (mm Hg)
24-70

Water solubility
<30%

Appearance: Clear viscous liquid
Odor: Characteristic

SECTION X PRECAUTIONARY WARNING

WARNING! Flammable. Causes eye irritation, aspiration hazard if swallowed: can enter lungs and cause damage. Keep away from heat, sparks, flames, or other sources of ignition (e.g. static electricity, pilot lights or mechanical/electrical equipment). Avoid contact with eyes. Do not taste or swallow. Wash thoroughly after handling.
FIRST AID: Danger -- aspiration hazard. Vomiting may need to be induced, depending on amount swallowed. Call physician. If victim is unconscious do not give anything by mouth. In case of eye contact, immediately flush eyes with water for 15 minutes. Call physician. In case of skin contact, flush skin with plenty of water. Note to physicians: epinephrine and other sympathomimetic drugs should be used cautiously, if at all. If used, observe for development of cardiac arrhythmias.

SECTION XI DOCUMENTARY INFORMATION

ISSUE DATE: 6-15-90

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES: The information in this document is believed to be correct as of the date issued. However, no warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or implied regarding the accuracy or completeness of this information or this product. The safety of this product, or the hazards related to its use. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

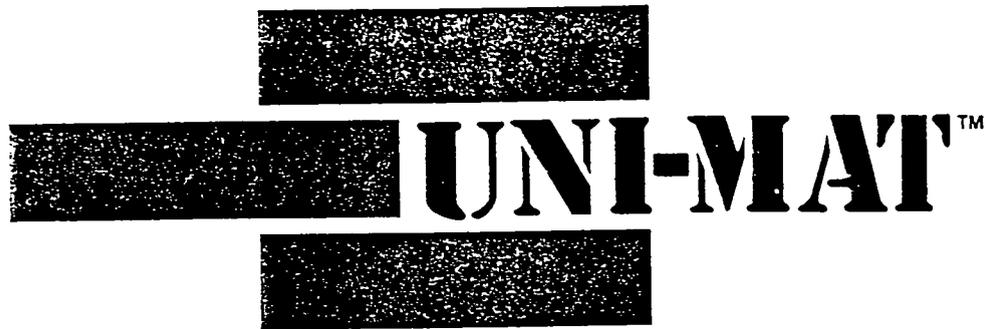


LARRY D. RINEHART
TECHNICAL DIRECTOR

PART I - Materials Handling and Dismantlement Procedure

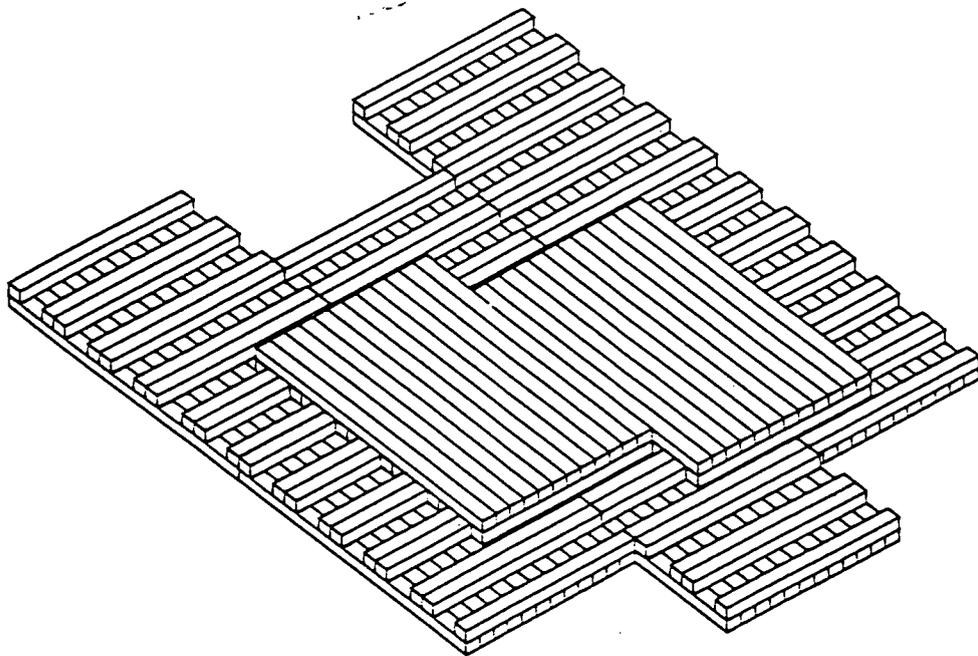
EXHIBIT B

2. UNI-MAT ROAD SYSTEM



Uni-Mat International, Inc.

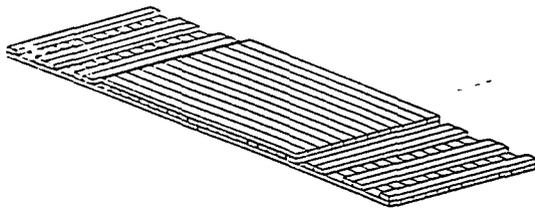
Road Systems ★ Temporary or Permanent Construction Sites ★ Drill Sites



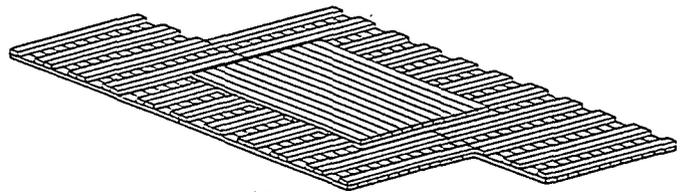
***With Uni-Mat™
the location is paved.***

Illustration of Uni-Mat Interlocking Patterns and Mat Requirement Equations

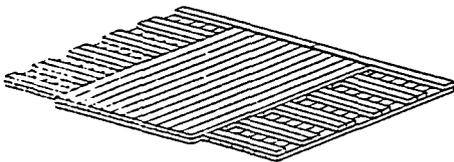
The following diagrams illustrate various interlocking patterns that are expandable for specific area requirements by continuing the pattern throughout. If, for example, pattern No. 4 (below) is chosen for a twelve foot wide road, one would add mats to the end in the same pattern until the desired length is attained. Should a twenty-four foot wide road be required pattern No. 6 would be modified to two full mats (inside bottom) and two 1/2 mats (outside bottom) and three full mats on top, always maintaining the staggered pattern as illustrated. Should a larger area be required (ie., construction sites, drilling locations, etc.) pattern No. 6 would be expanded for the length and breadth of the area. Mat dimensions are 8' x 14' on full mats and 4' x 14' on half mats. In the equations for computing mat requirements, UMR indicates **Uni-Mat** requirement and L = length of road. In computing **Uni-Mat** requirements for larger areas the equation is $(L \times \text{width} \div 112) \times 2$.



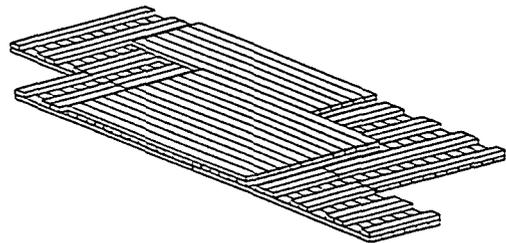
1. Eight foot wide roadway with 8' base.
Uni-Mat requirement equation is $UMR = (L \div 14) \times 2$



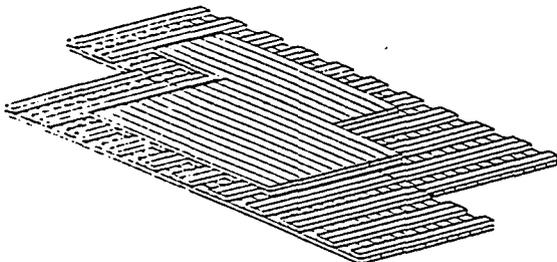
2. Eight foot wide roadway with 16' base for maximum weight displacement. $UMR = (L \div 14) \times 3$



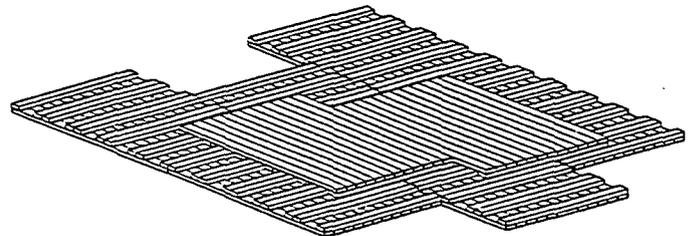
3. 12' 10" wide horizontal pattern with 14' base. $UMR = (L \div 8) \times 2$



4. 12' Wide with 12' base utilizing 1/2 mats top and bottom. $UMR = (L \div 14) \times 3$



5. 12' wide with 16' base utilizing 1/2 mats top (for additional weight displacement). $UMR = (L \div 14) \times 3.5$



6. 16' wide with 24' base (Maximum weight displacement). $UMR = (L \div 14) \times 5$



System Specifications

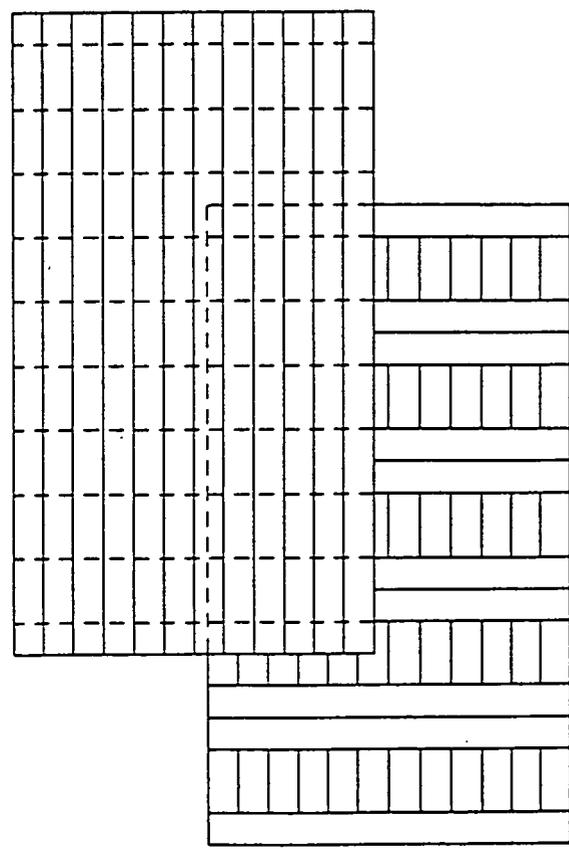
	Single Uni-Mat 1-1/2 Ply	Double Uni-Mat 3 Ply
Dimensions:	8' x 14' x 4"	8' x 14' x 6"
Weight:	1200 to 1400 lbs.	2400 to 2800 lbs.
Lumber:	12 - 2" x 8" x 14' 10 - 2" x 8" x 8'	24 - 2" x 8" x 14' 20 - 2" x 8" x 8'

Engineering Data:
Oak Lumber

Compression (psi)					
Prop Limit	Ultimate Strength	Modulus of Elasticity	Modulus of Rupture	Parallel to Grain Max. Crushing Strength	Perpendicular to Grain Fiber Stress @ Prop Limit
4300	7100	1.6 x 10 ⁶	15,200	7440	1070

These values are suggested based on a reasonable safety factor and may vary with geographical source, seasoning, water content and so forth.

**Uni-Mat
Layout Diagram**



Now Let's Talk About SAFETY

Prevention of costly and possibly tragic lost time accidents to personnel and equipment is a topic of monumental importance we feel should be emphasized to our customers.

The concept of a prefabricated interlocking, weight disbursing mat system as patented by **Uni-Mat** was developed with safety as the primary consideration.

We urge you to strongly consider the following safety factors when choosing a temporary road or mat system for your next project.

- *Does the system you are considering interlock to prevent hazardous shifting and tipping of the work surface?*

Unlike old style crane or laminated mats **Uni-Mat's** system interlocks to provide a safe and stable surface.

- *Is installing the system labor intensive thereby multiplying the exposure to injury?*

Unlike old style board roads that require extensive man hours dedicated to unloading, stacking, handling, assembling, maintaining, tearing down, restacking and hauling away lumber and nails, the **Uni-Mat** system requires only two laborers and a forklift operator for the average project.

- *Will the system tolerate heavy loads over soft or marshy terrain without the danger of excessive settling or sinking?*

Uni-Mat's patented interlocking and weight disbursing concept eliminates common seams, provides a work area that is consistently stable on low ground pressure areas, and is maintenance free.

- *Will the work site be free of nails, boards or other hazardous debris when the system is dismantled and removed?*

With **Uni-Mat** the prefabricated units are removed quickly and completely. No piles of loose boards with protruding or loose nails to invite accidents.

- *Is there a danger of injury as a result of tripping over exposed cable loops or lifting bolts?*

The **Uni-Mat** system has eliminated these accidents waiting to happen.

- *Will the system you are considering help protect underground installations?*

The load dispersion feature unique to the **Uni-Mat** system helps prevent concentrated loads when crossing sensitive underground installations such as pipelines, water mains and tunnels.

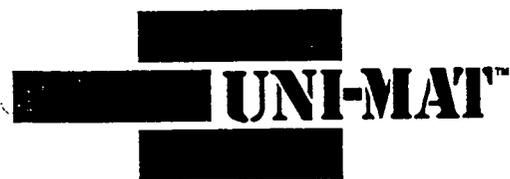
To Be Safe Specify Uni-Mat.

Uni-Mat Uses In The Construction Field

- Stable, safe road systems that support heavy haul loads and continuous traffic flow of machinery, equipment and personnel.
- Inventory control areas and protection of equipment, material and rolling stock from weather, soil and elements.
- Portable stable foundation areas for portable buildings, job shops and storage areas.
- Removable support foundation areas for heavy lift equipment (cranes, cherry pickers, manlifts, etc.).
- Walkways, parking areas and foundation areas for portable offices, hygiene areas and temporary assembly areas.
- Giant pallet application for movement of components or equipment to assembly areas.
- Storage points with built in dunnage contact points.
- Shoring for earth works.
- Protective support for crossing subterrain items such as pipelines, water mains, culverts, cables, etc.
- Bridge or critical low load - crossing spreaders that promote even distribution of heavy loads to main column supports, pillars or piles.

Advantages of Uni-Mat System Over Other Methods

- Patented, prefabricated mats greatly reduce installation and removal time. Minimal labor requirements help reduce costs and significantly reduce accident exposure.
- Uni-Mats interlock and lay in pattern that disperses weight of heavy loads.
- 1.5 ply design reduces weight of individual Uni-Mats making them easier to handle than old style mats.
- Versatility of Uni-Mats simplifies layout patterns.
- 8' x 14' mats permit easy shipment by truck, rail, barge or ship. Orderly stacking arrangement eases loading and off loading.
- Permatizing option is simple and cost effective.
- Provides a smooth, even and stable road or work surface eliminating the need to follow board tracks or the hazardous and equipment damaging shifting, sinking and tipping inherent with old style mats.



Uni-Mat International, Inc.

503 Martin • P.O Box 925367 • Houston, Texas 77292-5367
Phone (713) 697 3585 • Toll Free 1-800-445-7850 (North America, Puerto Rico,
Hawaii, U.S. Virgin Islands) • Fax (713) 697-1227

PART I - Materials Handling and Dismantlement Procedure

EXHIBIT B

3. SHIPPING CONTAINER

6 DRUM OVERPACK (12 GA) CONTAINER

3463



DIMENSIONS (INCHES)	INTERIOR	EXTERIOR
HEIGHT	38	42 7/8
WIDTH	52	52 15/16
LENGTH	76	76 15/16

SECTION 1.5

DESCRIPTION

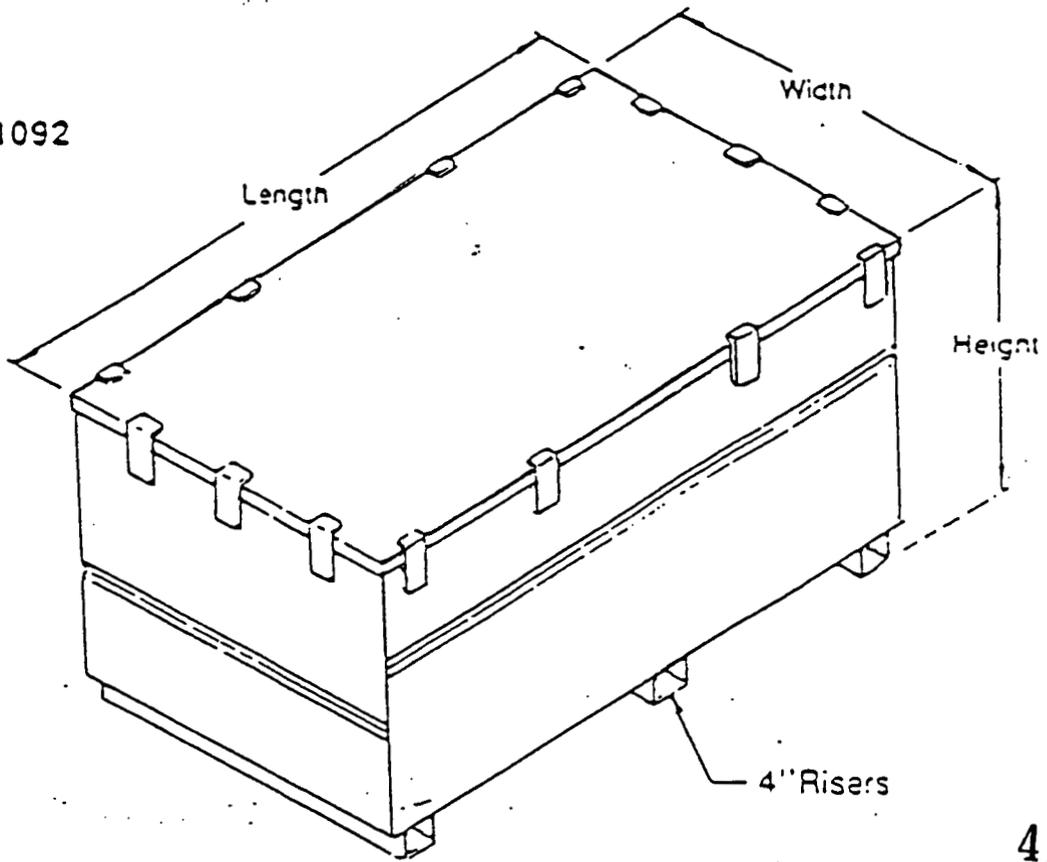
- Classification - Strong Tight Container
- Package Type - Container
- Capacity - 87 cu. ft.
- Material - 12 ga. ASTM A569 low carbon hot rolled steel
- Gross wt. (empty) - 660 lbs.
- Payload - 6,000 lbs.
- Max. loaded wt. - 6,660 lbs.
- Shielding - Optional

*NOTE: 87 FT³ INSIDE
102 FT³ BURNAL*

ADDITIONAL INFORMATION

- Meets strong tight container requirements for LSA material.
- Exclusive "seal-loc" positive closure system to preclude inadvertent opening.
- Final protective finish to meet customer requirements.

U.S. PATENT NO. 4371092



6 DRUM OVERPACK (12 GA) CONTAINER

PART I - Materials Handling and Dismantlement Procedure

EXHIBIT B

4. TREVIRA SPUNBOND POLYESTER GEOTEXTILE

Trevira® Spunbond nonwoven engineering products are highly needed fabrics with excellent tensile properties, high filtration potential and outstanding permeability.

Trevira® Spunbond Type 11 products are 100% continuous filament polyester nonwoven needlepunched engineering fabrics. They deliver a combination of advantages unmatched by any other spunbonded geotextiles. They're resistant to freeze-thaw, soil chemicals and ultraviolet light exposure.

Trevira® Spunbond nonwoven engineering fabrics offer excellent performance where the requirement is tensile reinforcement, planar flow, filtration, or separation. They are ideal for roadways, railbeds, drainage systems, pondliners, retaining walls. And much more.



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The information contained herein is offered free of charge, and is, to our best knowledge, true and accurate; however, all recommendations or suggestions are made without guarantee, since the conditions of use are beyond our control. There is no expressed warranty and no implied warranty of merchantability or of fitness for purpose of the product or products described herein. In submitting this information, no liability is assumed or license or other rights implied given with respect to any existing or pending patent, patent applications or trademarks. The observance of all legal regulations and patents is the responsibility of the user.

TYPICAL PHYSICAL PROPERTIES OF TREVIRA® TYPE 11 PRODUCTS

Fabric Property	Unit	Test Method	1112	1114	1120	1125	1135	1145	1155
Fabric Weight	oz/yd ²	ASTM D-3776	3.5	4.2	6.0	7.5	10.5	13.5	16.5
Thickness, t	mils	ASTM D-1777	60	70	95	115	150	175	215
Grab Strength (MD/CD) ¹⁾	lbs	ASTM D-4632	120/95	150/115	230/180	305/235	420/350	500/425	650/750
Grab Elongation (MD/CD) ¹⁾	%	ASTM D-4632	65/75	65/70	65/75	65/75	65/75	70/75	70/75
Trapezoid Tear Strength (MD/CD) ¹⁾	lbs	ASTM D-4533	50/40	55/50	80/75	105/90	145/130	185/170	215/190
Puncture Resistance	lbs	ASTM D-4833	55	65	100	115	160	180	230
Mullen Burst Strength	psi	ASTM D-3786	195	230	345	400	590	750	900
Water Flow Rate	gpm/ft ²	ASTM D-4481	200	200	180	150	120	90	75
Permittivity, ψ	sec ⁻¹	ASTM D-4491	2.71	2.71	2.44	2.04	1.63	1.22	1.02
Permeability, k	cm/sec	$k = \psi t$	.41	.48	.59	.59	.62	.54	.56
AOS	Sieve Size	ASTM D-4751	70-100 .210-.149	70-100 .210-.149	70-100 .210-.149	70-100 .210-.149	70-120 .210-.125	100-120 .149-.125	120-170 .125-.088
Standard Roll Widths ²⁾	ft		12.5 and 15.0						
Standard Roll Length ²⁾	ft		400	400	300	300	300	300	300

¹⁾MD = Machine Direction, CD = Cross Machine Direction.

²⁾Other width and length rolls are available upon request.

MINIMUM AVERAGE ROLL VALUES (WEAKEST PRINCIPAL DIRECTION) OF TREVIRA® TYPE 11 PRODUCTS

Fabric Property	Unit	Test Method	1112	1114	1120	1125	1135	1145	1155
Fabric Weight	oz/yd ²	ASTM D-3776	3.3	4.0	5.7	7.1	10.0	13.0	16.0
Thickness, t	mils	ASTM D-1777	50	55	80	95	130	155	200
Grab Strength	lbs	ASTM D-4632	80	100	160	210	300	375	500
Grab Elongation	%	ASTM D-4632	50	50	50	50	50	50	50
Trapezoid Tear Strength	lbs	ASTM D-4533	30	40	60	75	100	130	160
Puncture Resistance	lbs	ASTM D-4833	40	45	80	95	130	155	195
Mullen Burst Strength	psi	ASTM D-3786	170	190	305	360	530	700	825
Water Flow Rate	gpm/ft ²	ASTM D-4491	150	150	130	100	80	60	40
Permittivity, ψ	sec ⁻¹	ASTM D-4491	2.03	2.03	1.76	1.36	1.08	0.81	0.54
Permeability, k	cm/sec	$k = \psi t$	.26	.28	.36	.33	.36	.32	.28
AOS ²⁾	Sieve Size mm	ASTM D-4751							

¹⁾Insufficient testing has been performed to statistically establish "minimum average values" at the time of this printing. Please contact your Trevira Distributor or Hoechst Celanese for additional information.

PART I - Materials Handling and Dismantlement Procedure

EXHIBIT C

EXISTING NATIONAL LEAD ORGANIZATION, INC. ETF DESIGN DRAWINGS

(These five existing drawings are available at the WEMCO site, and are to be issued to the construction supervisor coordinating the ETF Removal Work)

<u>Drawing</u>	<u>Title</u>
40A-5500-X-00001	Plans and Elevations
40A-5500-X-00002	Sections and Details
40A-5500-X-00003	Sections and Details
40A-5500-X-00004	Platforms and Walkway
40A-5500-X-00005	Electrical

Engineering Package

Part III

Cost Estimate

Engineering Package

Part II

Post Construction Sampling Location Plan

**EXPERIMENTAL TREATMENT FACILITY REMOVAL ACTION
OU-1, P.O. #24
PART II - POST CONSTRUCTION SAMPLING LOCATION PLAN**

Introduction

The Pit 5 Experimental Treatment Facility Removal Action Work Plan (ETF Work Plan) submitted to the USEPA and Ohio EPA on October 11, 1991, identifies the requirement to perform post construction sampling and analyzing soils beneath and in the vicinity of the ETF. Section 5 of the ETF Work Plan states that these samples will be collected at several locations to a maximum depth of six inches and will be analyzed for FEMP RI/FS radionuclides and 1,1,1-Trichloroethane (TCA). The ETF Work Plan further states that the final sampling locations will be identified on a site map. The purpose of this document is to locate and justify these final sampling locations.

The overall objective of the sampling effort is to determine the approximate level of contamination (if any) in the surface soils at the site of the ETF. The ETF is located on the cover of Pit 3 in an established waste management area with documented contamination. Therefore, this sampling effort is not intended to characterize in detail the contamination in this area; rather, it is intended to assess the impact of the ETF on the immediate area. The area of concern will be further addressed as part of the final remediation of Pit 3. The ETF Work Plan also recognizes that the sampling results may indicate that additional sampling is necessary.

To meet these objectives, an approach of stratified random sampling as outlined in USEPA's Test Methods for Evaluating Solid Waste (SW-846) has been developed. Two strata have been defined:

- 1) The area beneath the ETF, and
- 2) The area adjacent to the ETF.

Sampling locations for Strata 1 and 2 have been randomly selected from defined grids constructed over the respective areas. To supplement the random sampling, additional samples will be collected of stained or otherwise suspect soils (if necessary).

The approach of random sampling is recognized by SW-846 as the appropriate method to characterize unknown areas. Stratified sampling has been chosen so that samples are collected from each of the defined strata because each may represent different levels of contamination. Simple random sampling could conceivably locate samples exclusively in Strata 1 or 2, and there is a desire to obtain samples from both. Additional stained soil samples will supplement this approach by collecting samples based on field findings. By utilizing this approach, the sampling objectives can be met.

Sampling Number and Locations

The number of samples has been determined from a method outlined in SW-846. This method makes use of existing analytical data combined with applicable approximate regulatory threshold levels to come

up with a recommended number of samples for each constituent of concern. The equation also utilizes a Student "T" factor based on degrees of freedom and a two tailed confidence interval and a probability of 0.20. This confidence interval, corresponding to the 90% level, has been selected by SW-846 as a necessary level of precision and accuracy for this type of sampling.

Table 1 shows the results of these equations for six of the principle constituents of concern. Regulatory thresholds were estimated as 30 pCi/g for total Uranium, and 5 pCi/g for the other radionuclides (Radium 226, Radium 228, Thorium 230, Thorium 232) based on generic guidelines from DOE 5400.5. Except for Uranium, these values are not critical in these equations. Constituent values were tabulated from surface soil analytical results from the OU-1 RI/FS. These surface soil samples were scattered around the OU-1 units and provide the best picture available of the distribution of radionuclide contamination in OU-1. There were no recorded results for TCA, so they were not included in this analysis.

These results show that the critical number of samples based on this existing data is 1.9 or 2, determined through the analysis on total Uranium (see Table 1 for sample calculation). By increasing this number by a factor of 100% or 2, a sample number of 4 is arrived at. SW-846 suggests that a higher number of samples should be used than calculated to add conservatism to the results, and to aid in follow up confirmation calculations (see below). Four samples would be collected from each strata (beneath the ETF and adjacent to the ETF). Stained soils would be sampled as needed to define areas of stained soil with a maximum of four samples.

Sample locations are shown on Sketch 00199. A three-by-three foot grid was set up over Strata 1 and 2. This size grid was chosen to obtain a reasonable level of resolution over a relatively small area. Four random numbers were generated for each strata to select appropriate cells for sampling (see Sketch 00199). Each cell was given a unique number and random numbers were selected by a computer program over the applicable range to select these numbers (see Table 2). Samples will be collected from the center foot square of each selected cell.

Field Procedures

Prior to demolition of the ETF, steel stakes will be driven into the soil close to the four corners of the ETF as shown on Sketch 00199. Ties will be established to each stake to structures that will be fixed in the field. After demolition, the grid will be laid out to determine the appropriate sampling locations and each location will be staked. Sampling and analysis will be conducted in accordance with the RI/FS QAPP and the ETF Work Plan.

Data Reduction and Analysis

The results will be analyzed for each strata and over both strata in accordance with SW-846. These equations will determine if the original hypothesis was valid in determining the number of samples, (which is one reason additional samples were taken), and will determine the mean and confidence interval of the results. Based on these results, additional sampling may be recommended, if necessary, to meet the objectives. Recommendations should be made based on sampling results and the calculations related to the analysis of data obtained.

TABLE 1
DETERMINATION OF NUMBER OF SAMPLES FOR THE ETF REMOVAL ACTION

PART I SAMPLE NO.	OU 1 SURFACE SOIL SAMPLING RESULTS (FROM OU1 RI/FS)				
	TOTAL URANIUM CONC. (pCi/g)	RADIUM 226 CONC. (pCi/g)	RADIUM 228 CONC. (pCi/g)	THORIUM 230 CONC. (pCi/g)	THORIUM 232 CONC. (pCi/g)
05409	7.8	0.3	1.1	1.0	0.8
05125		0.4	0.8	2.1	0.7
05126		0.5	0.9	2.0	0.8
05620	17.0	0.8	0.9	1.6	0.7
05621	19.0	0.8	1.0	2.8	1.2
05629	29.0	0.7	0.9	2.7	0.9
05632	21.0	0.8	1.0	1.8	0.9
05635	62.0	0.9	1.1	6.1	1.1
05638	30.0	1.0	1.3	4.2	1.4
05674	41.0	1.2	1.8	2.9	1.3
05420	3.0	0.8	0.5	1.5	0.6
05423	11.0	0.6	0.5	3.4	0.6
05435	13.0	0.8	0.6	2.0	0.8
05438	14.0	1.0	1.2	1.4	0.8
05441	14.0	1.1	1.0	1.6	0.7
05447	15.0	1.0	0.9	2.5	1.1
05490	1.0	0.4	0.5	0.8	0.6
05493	2.0	0.7	0.6	1.4	0.8
05496	9.0	0.6	0.6	1.1	0.6
06040	11.0	0.7	0.5	1.1	0.6
06043	8.0	0.6	0.6	1.4	0.6
06046	14.0	1.2	1.1	1.8	0.8
06049	3.0	1.0	0.8	1.5	0.6

MEAN=	16.4	0.8	0.9	2.1	0.8
SD=	14.1	0.2	0.3	1.2	0.2
VARIANCE=	197.6	0.1	0.1	1.4	0.1
N=	21.0	23.0	23.0	23.0	23.0
RT=	30.0	5.0	5.0	5.0	5.0

ETF REMOVAL ACTION - SAMPLING GRID ANALYSIS

PART II DETERMINATION OF NUMBER OF SAMPLES

BASIC EQUATION (FROM SW-846)

$$n = \frac{(T.20^2)(S^2)}{\text{DELTA}^2}$$

WHERE

- n = # OF SAMPLES NEEDED
- T.20² = STUDENT T FACTOR @.20
- S² = VARIANCE
- DELTA = RT - MEAN
- RT = REGULATORY THRESHOLD

SAMPLE EQUATION FOR TOTAL URANIUM

$$n = \frac{(1.325^2)(197.6)}{(30 - 16.4)^2} = 1.9$$

CALCULATIONS FOR ALL CONSTITUENTS

	TOTAL URANIUM	RADIUM 226	RADIUM 228	THORIUM 230	THORIUM 232
MEAN =	16.4	0.8	0.9	2.1	0.8
SD =	14.1	0.2	0.3	1.2	0.2
S ² =	197.6	0.1	0.1	1.4	0.1
N =	21	23	23	23	23
RT =	30.0	5.0	5.0	5.0	5.0
T.20 =	1.325	1.321	1.321	1.321	1.321
T.20 ²	1.756	1.745	1.745	1.745	1.745
DELTA =	13.581	4.222	4.122	2.883	4.174
DELTA ² =	184.442	17.823	16.989	8.309	17.422

NUMBER OF SAMPLES	1.88	0.01	0.01	0.29	0.01
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NOTES: THE DETECTION LIMIT WAS USED FOR ANALYTICAL VALUES SHOWN AS LESS THAN THE DETECTION LIMIT.

Table 2. Random Numbers

3463

Strata 1 with 112 cells

75
3
12
52

Strata 2 with 174 cells

25
123
88
131

49

51

PARSONS

3463

PROJECT NO. : OU-1, PO-24
 FILE NO.: FINAL ESTIMATE
 CLIENT: FEMP/WEMCO

PART III
 ESTIMATE SUMMARY

SHEET: 1
 DATE: 11-21-91
 ESTD. BY: B.P. GRIGSBY
 CHKD. BY: H. MILLIRON
 PIT 5 ETF

PROJECT TITLE: PIT 5 EXPERIMENTAL TREATMENT FACILITY
 REMOVAL ACTION

LOCATION:

PRIME	ITEM	DESCRIPTION	MAT'L \$	LABOR \$	SUBCONTR/ CONSTR EQ	TOTAL \$
1000		LAND & LAND RIGHT	0	0	0	0
2000	*	IMPROVEMENTS TO LAND	14,000	25,300	11,600	50,900
3000		NEW BUILDINGS & ADDITIONS	0	0	0	0
4000		BUILDING MODIFICATIONS	0	0	0	0
5000		OTHER STRUCTURES	0	0	0	0
6000		SPECIAL FACILITIES	0	0	0	0
7000		UTILITIES	0	0	0	0
8000		STANDARD EQUIPMENT	0	0	0	0
ROUNDED SUBTOTAL			14,000	25,300	11,600	50,900
JOB CONDITION FACTORS				15,800		15,800
INDIRECTS				6,600		6,600
HEALTH PHYSICS				7,200		7,200
ROUNDED SUBTOTAL			14,000	54,900	11,600	80,500
CERCLA			0	3,200	0	3,200
BOND			0	0	0	0
GEN CONTR MARK-UP			0	0	0	0
SUB OH & P			0	0	0	0
ROUNDED SUBTOTAL			14,000	58,100	11,600	83,700
CONSTR. MGMT.						20,088
ROUNDED SUBTOTAL						103,788
FSAR (SAFETY RPT)						0
SOILS & MATERIALS TESTING					16,000	16,000
PROJ. MGMT. - WEMCO						6,696
ENGINEERING			41,700	Title III	6,000	47,700
ROUNDED SUBTOTAL						174,184
SALES TAX						1,400
DECONTAM & DISPOSAL			56,000	80 bxs	3,600	59,600
ROUNDED SUBTOTAL						235,200
ESCALATION (FY92/3-FY92/4)						0
ROUNDED SUBTOTAL						235,200
CONTINGENCY						23,500
TOTAL ESTIMATED COST						258,700

FINAL FOR
 AUTHORIZATION

PARSONS

PROJECT TITLE: PIT 5 EXPERIMENTAL TREATMENT FACILITY
 PROJECT NUMBER: OU-1, PO-24
 CLIENT: DOE/WEMCO
 FILE NUMBER: FINAL ESTIMATE
 LOCATION: PIT 5 (ETF)

DATE: 11-21-91
 SHEET NO: 1
 ESTD BY: B.P. GRIGSBY
 CHKD BY: H. MILLIRON

BASIS OF ESTIMATE:

SITE VISIT....	[]	WRITTEN SCOPE.	[X]	VENDOR QUOTES.	[]	PREVIOUS ESTS.	[]
SKETCH.....	[]	VERBAL SCOPE...	[X]	SPECS.....	[X]	LEAD DISCIPL....	[]
NO DWGS....	[4]	PRELIM DWGS....	[]	EQUIP. LIST.....	[]	GEN. INFO.....	[X]
CWID.....	[]	CFC DWGS.....	[X]	GREEN SHT.....	[]	OTHER.....	[]

SCOPE:

THE PIT 5 ETF REMOVAL ACTION CONSISTS OF THE REMOVAL, CONTAINERIZATION AND ON-SITE STORAGE OF THE WASTE MATERIALS WITHIN THE ETF AND THE ETF STRUCTURE ITSELF. THESE MATERIALS WILL BE REMOVED AND PLACED INTO METAL SIX-PAK BOXES AND TRANSPORTED TO A DESIGNATED ON-SITE STORAGE AREA. THE VEGETATION WILL BE CONTAINERIZED AND SAMPLED TO DETERMINE FINAL DISPOSITION. AFTER VEGETATION AND BRUSH IS REMOVED, A 20 MIL HERCULITE PROTECTIVE SURFACE LINER AND FLEX PIPE BERM WILL BE INSTALLED TO PROTECT THE AREA FROM SPILLAGE AND STORM WATER RUN OFF. A DOUBLE WOOD UNI-MAT WORK PLATFORM PLACED ON TWO LAYERS OF 16.5 OZ GEOTEXTILE WILL BE INSTALLED OVER THE HERCULITE SHEETING AT THE LOADING AREA TO SUPPORT THE LOADING EQUIPMENT AND CONTAINERS. THE ESTIMATE IS BASED ON THE PIT 5 (ETF) SCOPE DATED 10-18-91 AND DRAWINGS 91X-5900-M-00002, 3, 4 AND 91X-5900-G-00005 DATED 11-14-91, ALL REVISION 'A'.

ASSUMPTIONS AND NOTES:

IT IS ASSUMED THAT ALL WORK WILL BE PERFORMED BY RUST DIRECT HIRE FORCES. THE DOUBLE UNI-MAT WORK PLATFORM MATERIAL WILL BE FURNISHED BY WEMCO FROM EXISTING STOCK.

HEALTH PHYSICS:

FUNDS ARE INCLUDED AT \$7,200 FOR LOST TIME DRESS OUT IN TYVEK SUITS, MOVEMENT RESTRICTION AND LOST TIME ENTERING AND LEAVING A CONTAMINATED AREA FOR A CREW OF TEN WORKMEN. FUNDS FOR PERSONAL PROTECTIVE CLOTHING ARE INCLUDED IN THE ESTIMATE DETAIL AT \$4,145.

CERCLA:

FUNDS ARE INCLUDED IN THE SUMMARY IN THE AMOUNT OF \$3,200 TO COVER THE COST OF ANNUAL 8 HOUR REFRESHER TRAINING AND BIOASSAY TESTING FOR A CREW OF TEN WORKMEN.

PERFORMANCE AND PAYMENT BOND:

FUNDS FOR A BOND ARE NOT INCLUDED. THIS WORK WILL BE PERFORMED BY RUST DIRECT HIRE FORCES.

FSAR (SAFETY REPORT):

FUNDS FOR A FINAL SAFETY ASSESSMENT REPORT ARE NOT INCLUDED. FUNDS FOR A SAFETY ANALYSIS ARE INCLUDED IN THE ENGINEERING BUDGET.

SOILS AND MATERIALS TESTING:

AN ALLOWANCE OF \$16,000 IS INCLUDED IN THE SUMMARY FOR POST CONSTRUCTION SOIL SAMPLING AND TESTING AT 12 SITE LOCATIONS AND CONTAINER CONTENT SAMPLING AND TESTING FOR 80 CONTAINERS.

ENGINEERING:

PARSONS TITLE I AND TITLE II ENGINEERING COST IS INCLUDED AT \$41,700 AND TITLE III ENGINEERING COST IS INCLUDED AT \$6,000. BOTH ARE BASED ON TASK ANALYSIS BY THE OPERABLE UNIT MANAGER.

PARSONS

PROJECT TITLE: PIT 5 EXPERIMENTAL TREATMENT FACILITY
 PROJECT NUMBER: OU-1, PO-24
 CLIENT: DOE/WEMCO
 FILE NUMBER: FINAL ESTIMATE
 LOCATION: PIT 5 (ETF)

DATE: 11-21-91
 SHEET NO: 2
 ESTD BY: B.P. GRIGSBY
 CHKD BY: H. MILLIRON

BASIS OF ESTIMATE:

DECONTAMINATION & DISPOSAL:

IT IS ESTIMATED THAT 80 METAL SIX-PAK CONTAINERS WILL BE USED AT A COST OF \$700 EACH FOR A TOTAL OF \$56,000. THE COST OF FILLING, LOADING AND TRANSPORTING THE CONTAINERS TO AN ON-SITE LOCATION IS INCLUDED IN THE ESTIMATE DETAIL. FUNDS FOR DECONTAMINATION OF MISC. STEEL, TOOLS AND CONSTRUCTION EQUIPMENT IS INCLUDED IN THE SUMMARY AT \$3,600.

ESCALATION:

FUNDS FOR ESCALATION COSTS ARE NOT INCLUDED, DUE TO THE SHORT TIME PERIOD SCHEDULED FROM THE ESTIMATE DATE TO THE PROJECT START AND COMPLETION.

CONTINGENCY:

A CONTINGENCY IS APPLIED AT 10% IN THE SUMMARY BASED ON THE PROJECT DOCUMENTS AND AVAILABLE INFORMATION.

GENERAL:

DOLLAR AMOUNTS IN THE SUMMARY ARE ROUNDED TO THE NEAREST HUNDRED.

<u>JOB CONDITION FACTORS (%) or (\$)</u>		<u>INDIRECT COSTS (%) or (\$)</u>	
HEIGHT/BELOW GRADE	0.0%	SMALL TOOLS	2.0%
WEATHER	2.0%	SCAFFOLDING	0.0%
HAZARDOUS FUMES/DUSTS	52.5%	CLEAN-UP	4.0%
JOB CONGESTION	0.0%	TEMPORARY FACILITIES/SERV.	4.0%
CRAMPED WORKING AREA	0.0%	MAINTAINING PRODUCTION	0.0%
CRAFT INTERFERENCE	0.0%	CHG. ORDERS ALLOWANCE	0.0%
ABNORMAL CLEAN-UP	0.0%	WELDER QUALIFICATION	0.0%
STRINGENT TESTING & INSPECT.	0.0%	FIELD SUPERVISION	6.0%
TIGHT SCHEDULE	0.0%	PREMIUM TIME	0.0%
NON-PROD. TIME	8.0%	SURVEYS, TESTS, GEOLOG. STUDY	0.0%
TOTAL	62.5%	TOTAL	16.0%

CLIENT : FEMP/WEMCO
 LOCATION : PIT 5 ETF
 ACCURACY:
 DATE : 11-21-91

PERSONAL PROTECTION

JOB NUMBER : OU-1, PO-24
 PREPARED BY : B.P. GRIGSBY
 PROJECT TITLE : PIT 5 - ETF, REMOVAL ACTION
 DURATION : 3 WK
 CREW SIZE : 10

DESCRIPTION	QUANTITY	UNIT	TOTAL COST		MATERIAL			LABOR			CONSTRUCTION EQUIPT		
			UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	MANHOUR/UNIT	TOTAL MANHOUR	WAGE RATE	UNIT COST	TOTAL COST		
TYVEK SUITS (4*10*15*.25)	300	EA	3.40	\$1,020	3.40	\$1,020	0.00	0	25.19	0.00	0.00	\$0	\$0
MSA MASKS (10*1*1)	10	EA	75.00	\$750	75.00	\$750	0.00	0	25.19	0.00	0.00	\$0	\$0
CARTRIDGES FOR MASKS (4*10*15*.25)	150	CRT	1.00	\$150	1.00	\$150	0.00	0	25.19	0.00	0.00	\$0	\$0
GLOVES (4*10*15*.25)	150	EA	8.00	\$1,200	8.00	\$1,200	0.00	0	25.19	0.00	0.00	\$0	\$0
RUBBER BOOTS (10*1*1)	10	EA	50.00	\$500	50.00	\$500	0.00	0	25.19	0.00	0.00	\$0	\$0
CLEANING OF MASKS (10*3*35*.5)	525	LT	1.00	\$525	1.00	\$525	0.00	0	25.19	0.00	0.00	\$0	\$0
DRUMS - disposal of suits, gloves, haul & stor	0	LT	1.00	\$0	1.00	\$0	0.00	0	25.19	0.00	0.00	\$0	\$0
PERSONNEL DECON. TRAILERS W/WW STC	0	EA	1.00	\$0	1.00	\$0	0.00	0	25.19	0.00	0.00	\$0	\$0
PUMP STORAGE TANKS WEEKLY	0	LT	1.00	\$0	1.00	\$0	0.00	0	25.19	0.00	0.00	\$0	\$0

TOTAL - PERSONAL PROTECTION \$4,145

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56

P A R S O N S
F E M P

PIT 5 EXPERIMENTAL TREATMENT FACILITY
OU-1, PO-24

DESCRIPTION: FINAL ESTIMATE

DOCUMENT: SCOPE OF 10-18-91

ESTIMATOR: B.P. GRIGSBY

BID DATE:

JOB SIZE:

RATE TABLE: FEMP

REPORT: (DETAIL

FINAL FOR
AUTHORIZATION

COST DESCRIPTION CODE	QTY	UM	MATERIAL			LABOR			CONSTR. EQUIP.			ENG'D. EQUIP.			TOTAL COST
			UNIT COST	TOTAL COST	HOURS/ UNIT	TOTAL HOURS	CREW RATE	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST		
1.2.6.1.															
CONT															
21.000 SITE PREPARATION															
21.108 Clearing	1	LS.		24.00		24	22.61	542.64	50.00	50	50.00			593	
2000 Clearing brush by hand bag and place in 2 containers															
22.000 EARTHWORK															
22.238 Exc.bik. bnk msrl.	82	CY.		.50		41	27.69	13.85	4.50	369	4.50			1,504	
2000 Ex bl, frn end ldr whi .75 cy remove 24" of filter material and load in 52 containers															
2000 Perf. drain pipe 4" dia. demo. remove, reduce size, bag,	190	LF.		.06		11	22.61	1.36	.50	95	.50			353	
2000 place 22 cf in containers exc.bik.grd.30", 1/2 cy remove surface residue material from E/F and load in 13 containers	20	CY.		.20		4	27.69	5.54	4.50	90	4.50			301	
2000 Geotextile spun bond poly 16.5 oz, place 2 layers under Uni-Mat at work area	2,000	SF.		.01	760	10	22.61	.11	.05	100	.05			1,086	
2000 Protective wood mat demo Removeal, size reduction to 4'x 6' and place in containers	2,000	SF.		.05	100	100	25.53	1.28	.16	320	.16			2,973	
2000 Const. equipment, fuel & maint all for 30 days, 1-1/2cy loader, 2-6,000 lb forklifts	1	LS.		40.00	1,000	40	27.69	1,107.60	8,000.00	8,000	8,000.00			10,108	
2000 1-water haul & 1-water pump truck Remove geotextile poly cut, bag & place in containers	2,000	SF.		.01		20	22.61	.23	45.2	452				452	
2000 Place, spread and grade earth in containers	102	CY.		.50		51	22.61	11.31	1,153	1,153				1,153	
2000 Poly plastic sheet 6 mil demo. remove, bag, and place in containers	1,800	SF.		.03		7	22.61	.09	.03	54	.03			217	
2000 Protective mat at work area two layer wood Uni-Mat material by WEMCO - load, haul and place	2,000	SF.		.03		60	22.61	.68	.25	500	.25			1,857	
22.255 Hauling															
2000 Earth fill at excav areas	40	CY.		.05	340	2	27.69	1.30	2.50	100	2.50			495	
2000 Hand excav 6" E/F filter sand and place in loader bucket for loading in containers	20	CY.		1.00		20	22.61	22.61	45.2	452				492	

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ADDRESS:
ESTIMATOR: B.P. GILGIBBY

00-1, PO-24
SCOPE OF 10-18-91

DATE: 11-21-91
TIME: 2:24 pm

ENG'D. EQUIP.

CUNSTR. EQUIP.

LABOR

MATERIAL

COST DESCRIPTION CODE	QTY	UM	MATERIAL		LABOR		CUNSTR. EQUIP.		ENG'D. EQUIP.		TOTAL COST	TOTAL COST	TOTAL COST
			UNIT COST	TOTAL COST	TOTAL HOURS	CREW RATE	UNIT COST	TOTAL COST	UNIT COST	TOTAL COST			
1.2.6.1.													
CONT													
29.000 LANDSCAPING													
29.308 Seeding	3	MSF.	4.98	15	.15	22.61	3.48	3.13	9				35
2000 Sprinkler, 4W/m, comm, frct, sprdr													
71.000 WTRPRE&DAMPFRNG													
71.100 Sheet waterproofing													
2000 Surface liner weights	120	EA.	1.25	150	.08	22.61	1.81	.50	60				427
2000 Liner adhesive	15	GL.	25.00	375	2.00	22.61	45.22						1,053
2000 Liner joint tape	10	RL.	10.00	100									100
2000 Temp wall bracing	30	BF.	.45	14	.20	25.53	5.11						167
2 new and 2 relocated braces													
2000 Protective surface liner	5,800	SF.	.36	2,088	.01	22.61	.23	.03	145				3,544
20 mil Herculite sheeting													
at work area and berm cover													
2000 Steel curb stakes 2" Flat x 3/8"	100	EA.	6.50	650	.12	25.53	3.06	1.00	100				1,056
and stake puller													
2000 Tarp cover for ETF protection	1	LS.	450.00	450	80.00	22.61	1,808.60						2,259
at oil hours and week ends													
2000 Flex plastic pipe 12" dia	850	LF.	4.30	3,655	.03	22.61	.68						4,232
band 3 together for berm													
2000 Berm backer board 2"x 8"	373	BF.	.45	168	.03	25.53	.64						406
place, remove, cut up													
and place in containers													
GRAND TOTALS	1.2.6.1.		14,010	1,032			25,777	11,556					50,843
			14,010	1,032			25,777	11,556					50,843

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58/60