CRA
Consulting Engineers

CONESTOGA-ROVERS & ASSOCIATES LIMITED
651 Colby Drive,
Waterloo, Ontario, Canada N2V 1C2
(519) 884-0510

November 7, 1988

Reference No. 2471

Mr. Lawrence W. Eastep, P.Eng., Manager
Permit Section, RCRA Unit
Division of Land Pollution Control
Illinois Environmental Protection Agency
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois
U.S.A 62794

Dear Mr. Eastep:

Re: Detrex Corporation Gold Shield Solvents
RCRA Part B Permit Application
ILD 074424938

On behalf of Detrex Corporation, please find enclosed the original and two (2) copies of the RCRA Part B Permit application for the Detrex Corporation Gold Shield Solvents facility located at 2537 LeMoyne Avenue in Melrose Park, Illinois.

Gold Shield Solvents specializes in the sale of halogenated solvents and cleaning equipment and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number ILD 074424938. The Standard Industrial Classification code (SIC Code) for the facility is 2869.

The hazardous waste operation at the Gold Shield Solvents facility in Melrose Park, Illinois consists of a hazardous waste container storage area. The container storage area is used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex solvent reclamation (recycling) facility or an off-site permitted treatment/disposal facility. As such, this Part B Application is submitted for the hazardous waste container storage area at the Gold Shield Solvents facility.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

PART B PERMIT APPLICATION

Detrex Corporation
Gold Shield Solvents
Melrose Park, Illinois

November 8, 1988

Ref. No. 2471

TABLE OF CONTENTS

INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Part B Permit Application (hereinafter "permit") is submitted by Detrex Corporation in response to the Illinois Environmental Protection Agency's (IEPA's) letter of request dated May 6, 1988 and received by Detrex on May 19, 1988.

Detrex Corporation Gold Shield Solvents specializes in the sale of halogenated solvents, cleaning equipment and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number ILD 074424938. The Standard Industrial Classification Code (SIC Code) for the facility is 2869. The facility is located at 2537 LeMoyne Avenue in Melrose Park, Illinois, and has operated at this location since 1974.

The hazardous waste operation at the Gold Shield Solvents facility in Melrose Park consists of a hazardous waste container storage area. The container storage area is used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex reclamation (recycling) facility or to an off-site permitted treatment/disposal facility. As such, this Permit Application is submitted for the hazardous waste container storage area at the Gold Shield Solvents facility.

LIST OF ATTACHMENTS

SECTION A

PART A APPLICATION

The information in this section is supplied in accordance with Illinois Administrative Rule 35 IAC Sections 702.123, 702.126(a) and (d), and 703.181.

The following attachments provide the information required in the Part A Permit Application.

Attachment A-1 provides the completed EPA Forms 1 and 3.

Attachment A-2 provides a scale drawing of the facility showing the location of all hazardous waste recovery and storage areas.

Attachment A-3 provides photographs of the facility.

This facility does not require any permits under the referenced programs.

Attachment A-4 provides a topographic map of the facility and the surrounding area.

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-R0175

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER: F I L D 0 7 4 4 2 4 9 3 8 3 0

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (*the area to the left of the label space lists the information that should appear*), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI (except VI-B which *must be completed regardless*). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)		X	
B. Does or will this facility (*either existing or proposed*) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)		X	
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)		X	
D. Is this a proposed facility (*other than those described in A or B above*) which will result in a discharge to waters of the U.S.? (FORM 2D)		X	
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)	X		X
F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)		X	
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)		X	
H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)		X	
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	
J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)		X	

III. NAME OF FACILITY

1 SKIP D E T R E X C O R P O R A T I O N

IV. FACILITY CONTACT

A. NAME & TITLE (*last, first, & title*)	B. PHONE (*area code & no.*)
2 J E F F E R Y P P H I L I P S BRANCH MANAGER	3 1 2 3 4 5 3 8 0 6

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

3 2 5 3 7 L E M O Y N E A V E.

B. CITY OR TOWN	C. STATE	D. ZIP CODE
4 M E L R O S E P A R K	I L	6 0 1 6 0

NOV 0 8 1988

U. S. EPA, REGION V

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

5 2537 LEMOYNE AVE

B. COUNTY NAME

COOK

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (*if known*)
6 MELROSE PARK	I L	6 0 1 6 0	0 3 1

A. FIRST	B. SECOND
7 2 8 6 9 (specify)	7 (specify)
C. THIRD	**D. FOURTH**
(specify)	7 specify.

VIII. OPERATOR INFORMATION

A. NAME	B. Is the name listed in Item VIII-A also the owner?
8 DETREX CORPORATION	☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other", specify.)	D. PHONE (area code & no.)
F = FEDERAL, S = STATE, P = PRIVATE, M = PUBLIC (other than federal or state), O = OTHER (specify) — P (specify)	A 3 1 3 3 5 8 5 8 0 0

E. STREET OR P.O. BOX
P O BOX 501

F. CITY OR TOWN	G. STATE	H. ZIP CODE	IX. INDIAN LAND
8 DETROIT	M I	4 8 2 3 2	Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water)	D. PSD (Air Emissions from Proposed Sources)
9 N	9 P
B. UIC (Underground Injection of Fluids)	**E. OTHER (specify)**
9 U	9 (specify)
C. RCRA (Hazardous Wastes)	**E. OTHER (specify)**
9 R	9 (specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

WAREHOUSE AND DISTRIBUTION OF HALOGENATED SOLVENTS

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
R. J. JONES, VICE PRESIDENT	Robert J. Jones	11-4-88

COMMENTS FOR OFFICIAL USE ONLY

C

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved OMB No. 158-S80004

FORM 3 RCRA

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

HAZARDOUS WASTE PERMIT APPLICATION

Consolidated Permits Program

(This information is required under Section 3005 of RCRA.)

I. EPA I.D. NUMBER

F I L D 0 7 4 4 2 4 9 3 8 3 1

FOR OFFICIAL USE ONLY

APPLICATION APPROVED	DATE RECEIVED (yr., mo., & day)	COMMENTS

II. FIRST OR REVISED APPLICATION

Place an "X" in the appropriate box in A or B below *(mark one box only)* to indicate whether this is the first application you are submitting for your facility or a revised application. If this is your first application and you already know your facility's EPA I.D. Number, or if this is a revised application, enter your facility's EPA I.D. Number in Item I above.

A. FIRST APPLICATION *(place an "X" below and provide the appropriate date)*

☐ 1. EXISTING FACILITY *(See instructions for definition of "existing" facility. Complete item below.)*

FOR EXISTING FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

	YR.	MO.	DAY
8	7 4	0 9	2 7

☐ 2. NEW FACILITY *(Complete item below.)*

FOR NEW FACILITIES, PROVIDE THE DATE (yr., mo., & day) OPERATION BEGAN OR IS EXPECTED TO BEGIN

YR.	MO.	DAY

B. REVISED APPLICATION *(place an "X" below and complete Item I above)*

☐ 1. FACILITY HAS INTERIM STATUS

☐ 2. FACILITY HAS A RCRA PERMIT

III. PROCESSES – CODES AND DESIGN CAPACITIES

A. PROCESS CODE – Enter the code from the list of process codes below that best describes each process to be used at the facility. Ten lines are provided for entering codes. If more lines are needed, enter the code(s) in the space provided. If a process will be used that is not included in the list of codes below, then describe the process *(including its design capacity)* in the space provided on the form *(Item III-C)*.

B. PROCESS DESIGN CAPACITY – For each code entered in column A enter the capacity of the process.

1. AMOUNT – Enter the amount.
2. UNIT OF MEASURE – For each amount entered in column B(1), enter the code from the list of unit measure codes below that describes the unit of measure used. Only the units of measure that are listed below should be used.

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Storage:		
CONTAINER *(barrel, drum, etc.)*	S01	GALLONS OR LITERS
TANK	S02	GALLONS OR LITERS
WASTE PILE	S03	CUBIC YARDS OR CUBIC METERS
SURFACE IMPOUNDMENT	S04	GALLONS OR LITERS
Disposal:		
INJECTION WELL	D79	GALLONS OR LITERS
LANDFILL	D80	ACRE-FEET *(the volume that would cover one acre to a depth of one foot)* OR HECTARE-METER
LAND APPLICATION	D81	ACRES OR HECTARES
OCEAN DISPOSAL	D82	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	D83	GALLONS OR LITERS

PROCESS	PROCESS CODE	APPROPRIATE UNITS OF MEASURE FOR PROCESS DESIGN CAPACITY
Treatment:		
TANK	T01	GALLONS PER DAY OR LITERS PER DAY
SURFACE IMPOUNDMENT	T02	GALLONS PER DAY OR LITERS PER DAY
INCINERATOR	T03	TONS PER HOUR OR METRIC TONS PER HOUR; GALLONS PER HOUR OR LITERS PER HOUR
OTHER *(Use for physical, chemical, thermal or biological treatment processes not occurring in tanks, surface impoundments or incinerators. Describe the processes in the space provided: Item III-C.)*	T04	GALLONS PER DAY OR LITERS PER DAY

UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE	UNIT OF MEASURE	UNIT OF MEASURE CODE
GALLONS	G	LITERS PER DAY	V	ACRE-FEET	A
LITERS	L	TONS PER HOUR	O	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	H
GALLONS PER DAY	U	LITERS PER HOUR	H		

EXAMPLE FOR COMPLETING ITEM III *(shown in line numbers X-1 and X-2 below)*: A facility has two storage tanks, one tank can hold 200 gallons and the other can hold 400 gallons. The facility also has an incinerator that can burn up to 20 gallons per hour.

C DUP

LINE NUMBER	A. PROCESS CODE (From list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY	LINE NUMBER	A. PROCESS CODE (From list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT	B. PROCESS DESIGN CAPACITY 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S 0 2	600	G		5				
X-2	T 0 3	20	E		6				
1	S 0 1	27,500	G		7				
2					8				
3					9				
4					10				

III. PROCESSES (continued)

C. SPACE FOR ADDITIONAL PROCESS CODES OR FOR DESCRIBING OTHER PROCESSES (code "T04"). FOR EACH PROCESS ENTERED HERE INCLUDE DESIGN CAPACITY.

IV. DESCRIPTION OF HAZARDOUS WASTES

A. EPA HAZARDOUS WASTE NUMBER – Enter the four-digit number from 40 CFR, Subpart D for each listed hazardous waste you will handle. If you handle hazardous wastes which are not listed in 40 CFR, Subpart D, enter the four-digit number(s) from 40 CFR, Subpart C that describes the characteristics and/or the toxic contaminants of those hazardous wastes.

B. ESTIMATED ANNUAL QUANTITY – For each listed waste entered in column A estimate the quantity of that waste that will be handled on an annual basis. For each characteristic or toxic contaminant entered in column A estimate the total annual quantity of all the non-listed waste(s) that will be handled which possess that characteristic or contaminant.

C. UNIT OF MEASURE – For each quantity entered in column B enter the unit of measure code. Units of measure which must be used and the appropriate codes are:

ENGLISH UNIT OF MEASURE	CODE	METRIC UNIT OF MEASURE	CODE
POUNDS	P	KILOGRAMS	K
TONS	T	METRIC TONS	M

[illegible]ility records use any other unit of measure for quantity, the units of measure must be converted into one of the required units of measure taking into [illegible]nt the appropriate density or specific gravity of the waste.

D. PROCESSES

1. PROCESS CODES:
   For listed hazardous wastes: For each listed hazardous waste entered in column A select the code(s) from the list of process codes contained in Item III to indicate how the waste will be stored, treated, and/or disposed of at the facility.
   For non-listed hazardous wastes: For each characteristic or toxic contaminant entered in column A, select the code(s) from the list of process codes contained in Item III to indicate all the processes that will be used to store, treat, and/or dispose of all the non-listed hazardous wastes that possess that characteristic or toxic contaminant.
   Note: Four spaces are provided for entering process codes. If more are needed: (1) Enter the first three as described above; (2) Enter "000" in the extreme right box of Item IV-D(1); and (3) Enter in the space provided on page 4, the line number and the additional code(s).

2. PROCESS DESCRIPTION: If a code is not listed for a process that will be used, describe the process in the space provided on the form.

NOTE: HAZARDOUS WASTES DESCRIBED BY MORE THAN ONE EPA HAZARDOUS WASTE NUMBER – Hazardous wastes that can be described by more than one EPA Hazardous Waste Number shall be described on the form as follows:

1. Select one of the EPA Hazardous Waste Numbers and enter it in column A. On the same line complete columns B, C, and D by estimating the total annual quantity of the waste and describing all the processes to be used to treat, store, and/or dispose of the waste.
2. In column A of the next line enter the other EPA Hazardous Waste Number that can be used to describe the waste. In column D(2) on that line enter "Included with above" and make no other entries on that line.
3. Repeat step 2 for each other EPA Hazardous Waste Number that can be used to describe the hazardous waste.

EXAMPLE FOR COMPLETING ITEM IV (shown in line numbers X-1, X-2, X-3, and X-4 below) – A facility will treat and dispose of an estimated 900 pounds per year of chrome shavings from leather tanning and finishing operation. In addition, the facility will treat and dispose of three non-listed wastes. Two wastes are corrosive only and there will be an estimated 200 pounds per year of each waste. The other waste is corrosive and ignitable and there will be an estimated 100 pounds per year of that waste. Treatment will be in an incinerator and disposal will be in a landfill.

LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)	D. PROCESSES 2. PROCESS DESCRIPTION (If a code is not entered in D(1))
X-1	K054	900	P	T03 D80	
X-2	D002	400	P	T03 D80	
X-3	D001	100	P	T03 D80	
X[illegible]	[illegible]002				included with above

 CONTINUE ON PAGE 3

E. USE THIS SPACE TO LIST ADDITIONAL PROCESS CODES FROM ITEM D(1) ON PAGE 3.

EPA I.D. NO. (enter from page 1)

F I L D 0 7 4 4 2 4 9 3 8 3 6

V. FACILITY DRAWING

All existing facilities must include in the space provided on page 5 a scale drawing of the facility *(see instructions for more detail)*.

VI. PHOTOGRAPHS

All existing facilities must include photographs *(aerial or ground-level)* that clearly delineate all existing structures; existing storage, treatment and disposal areas; and sites of future storage, treatment or disposal areas *(see instructions for more detail)*.

VII. FACILITY GEOGRAPHIC LOCATION

LATITUDE (degrees, minutes, & seconds)	LONGITUDE (degrees, minutes, & seconds)

VIII. FACILITY OWNER

☐ A. If the facility owner is also the facility operator as listed in Section VIII on Form 1, "General Information", place an "X" in the box to the left and skip to Section IX below.

B. If the facility owner is not the facility operator as listed in Section VIII on Form 1, complete the following items:

1. NAME OF FACILITY'S LEGAL OWNER	2. PHONE NO. (area code & no.)
E	

3. STREET OR P.O. BOX	4. CITY OR TOWN	5. ST.	6. ZIP CODE
F	G		

IX. OWNER CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
R. J. JONES, VICE PRESIDENT	Robert J. Jones	11-4-88

X. OPERATOR CERTIFICATION

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME (print or type)	B. SIGNATURE	C. DATE SIGNED
J. JONES, VICE PRESIDENT	Robert J. Jones	11-4-88

CONTINUE ON PAGE 5

Continued from page 2.
NOTE: Photocopy this page before completing if you have more than 26 wastes to list.

Form Approved OMB No. 158-S80004

EPA I.D. NUMBER (enter from page 1)	FOR OFFICIAL USE ONLY
W I L D 0 7 4 4 2 4 9 3 8 3 1	W DUP 2 DUP

IV. DESCRIPTION OF HAZARDOUS WASTES (continued)

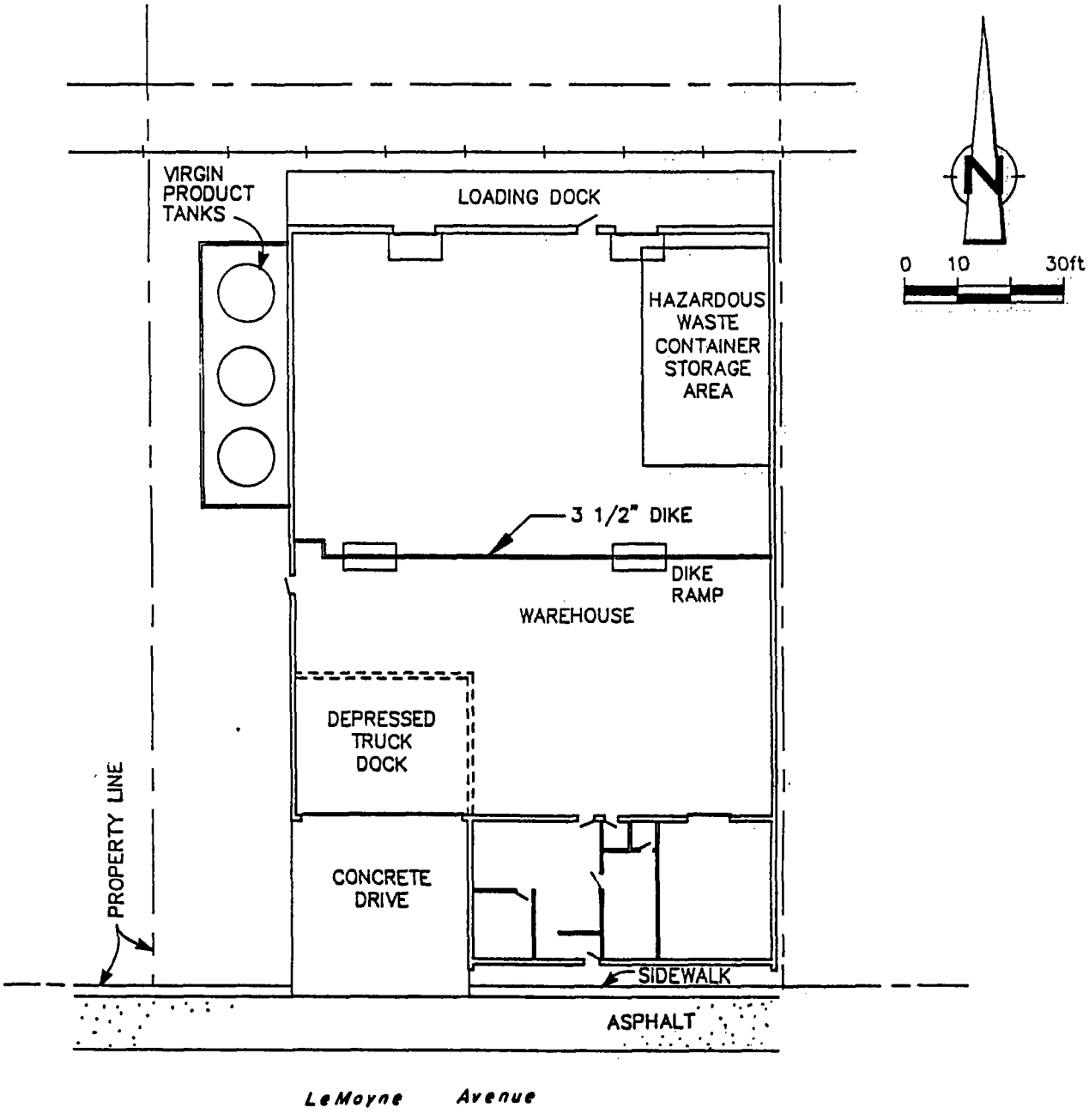
LINE NO.	A. EPA HAZARD. WASTE NO. (enter code)	B. ESTIMATED ANNUAL QUANTITY OF WASTE	C. UNIT OF MEASURE (enter code)	D. PROCESSES 1. PROCESS CODES (enter)				2. PROCESS DESCRIPTION (If a code is not entered in D(1))
1	F 0 0 1	1,186,000		S 0 1				
2	F 0 0 2	62,400		S 0 1				
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Continued from page 4.

V. FACILITY DRAWING (see page 4)

SEE ATTACHMENT A-2

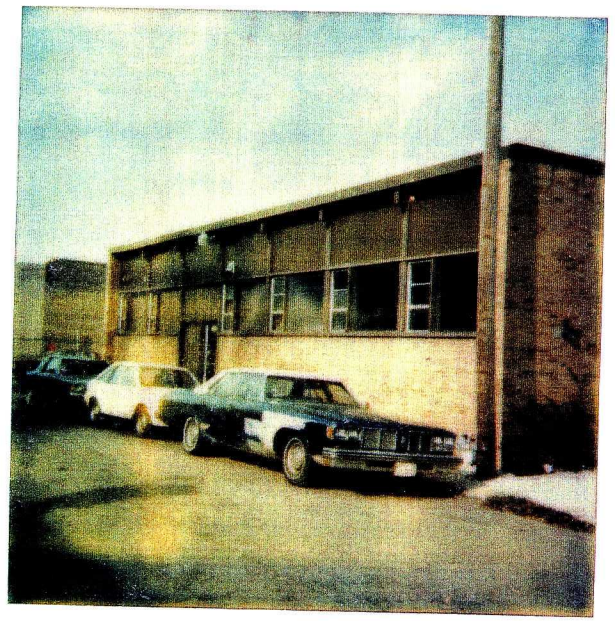
ATTACHMENT A-2



FACILITY PLAN
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

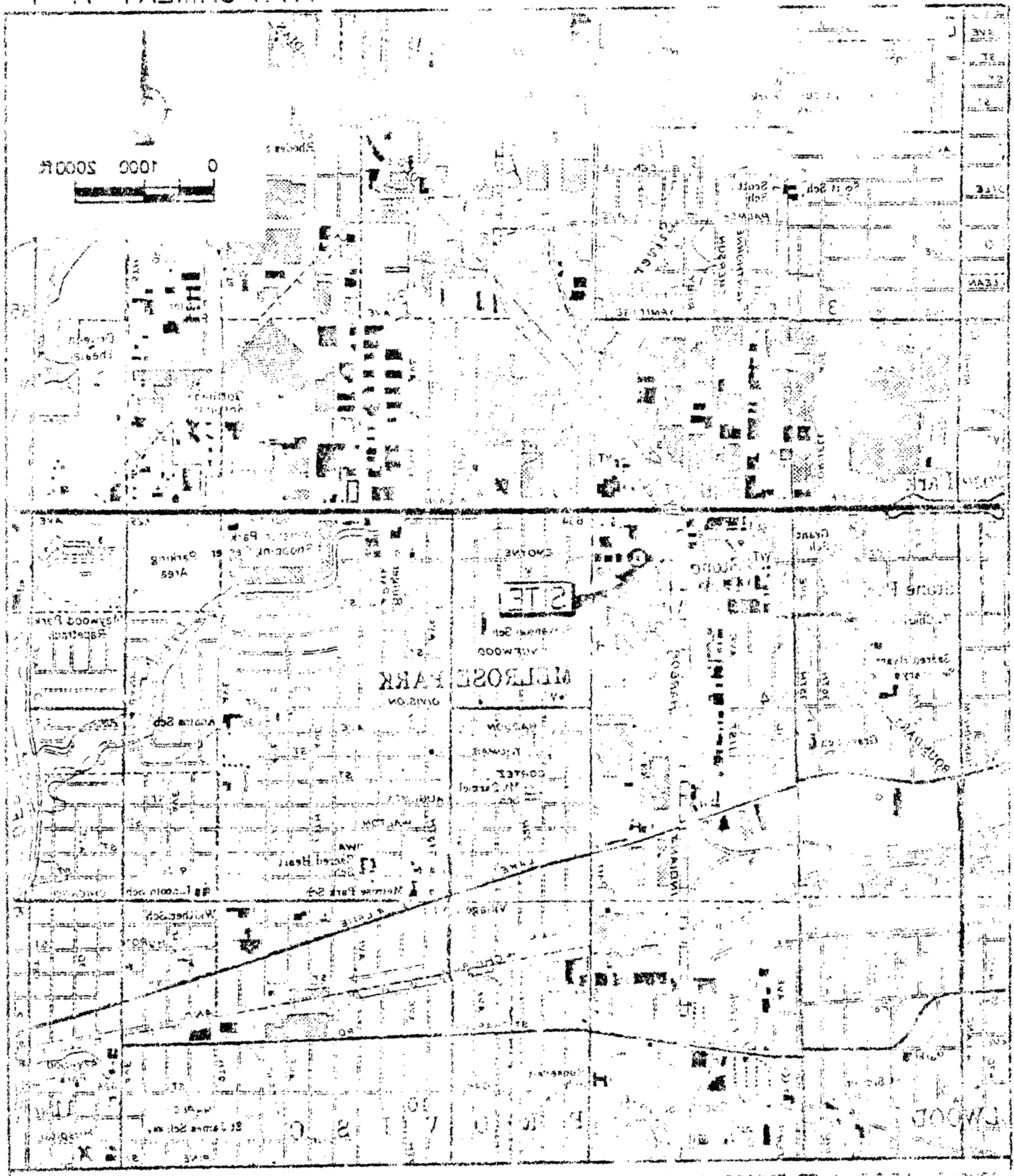


1. VIEW OF OUTSIDE OF FACILITY

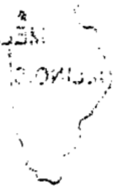
2. VIEW OF COVERED AND RAMPED LOADING/UNLOADING AREA

3. VIEW OF HAZARDOUS WASTE CONTAINER STORAGE AREA AND SECONDARY CONTAINMENT DIKING WITH AN ACCESS RAMP

ATTACHMENT A-4



SOURCE: U.S.G.S. [illegible]ER FOREST, ILL. QU[illegible]RANGLE MAP



SURROUNDING AREA
TOPOGRAPHIC MAP
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-[illegible]/10/88-C-F-0

ATTACHMENT A-4

SOURCE: U.S.G.S. RIVER FOREST, ILL. QUADRANGLE MAP

SURROUNDING AREA
TOPOGRAPHIC MAP
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0

SECTION B

FACILITY DESCRIPTION

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LIST OF ATTACHMENTS

SECTION B

FACILITY DESCRIPTION

SECTION B

FACILITY DESCRIPTION

This section of the RCRA Part B Permit Application provides a general description of the Detrex Corporation Gold Shield Solvents facility in Melrose Park, Illinois, as required by Illinois Rule 35. The applicable sections of the Illinois Regulations are referenced where appropriate.

B-1 GENERAL DESCRIPTION [35 IAC 703.183(a)]

This Part B Permit Application is submitted by Detrex Corporation, for the Gold Shield Solvents facility located on LeMoyne Avenue in Melrose Park, Illinois. The Gold Shield Solvents facility is a treatment, storage, disposal (TSD) facility, by definition, for halogenated hydrocarbon waste solvents.

Gold Shield Solvents is located in Cook County, Melrose Park, Illinois. The Street address is:

2537 LeMoyne Avenue
Melrose Park, Illinois, 60160

The principal contact person for this Application is:

Mr. C. U. Guy
Manager of Environmental Compliance
P.O. Box 1398
Ashtabula, Ohio 44004
(216) 997-6131

Gold Shield Solvents specializes in the sale of halogenated solvents, cleaning equipment, and the collection of solvent wastes generated in degreasing and other cleaning operations. The facility operates under EPA Identification Number ILD 074424938. The Standard Industrial Classification Code (SIC Code) for the facility is 2869.

The hazardous waste operation at the Gold Shield Solvents facility in Melrose Park, Illinois consists of a container storage area used for the storage of drummed solvent wastes prior to the transfer of these wastes to an off-site Detrex solvent reclamation (recycling) facility or to an off-site permitted treatment/disposal facility.

All wastes accepted at the Gold Shield Solvents facility are classified as F001 or F002 hazardous wastes under 40 CFR Part 261.

B-2 TOPOGRAPHIC MAP

B-2a General Requirements [35 IAC 703.183(s)]

The topographic mapping and other location information requirements are summarized on Table B-1 with the location within this permit application where the appropriate map/information is located. Provided as Attachment B-1 is a figure that locates the Gold Shield Solvents facility within the City of Melrose Park.

1) Topographic Map

Attachment B-2 provides a facility map with topographic elevations at a scale of 1"=20', of the Detrex property and the immediate vicinity. The topography of the surrounding area is illustrated on a portion of the United States Department of the Interior Geological Survey Quadrangle Map included as Attachment B-3.

2) Flood Control

As indicated in Section B-3b, the Detrex Gold Shield Solvents facility is not located in an area designated as a 100-year floodplain, as such, flood control structures/devices are not required.

3) Runoff Control

The topographic maps presented in Attachments B-2 and B-3 indicate the surface water drainage pattern around the facility. Flow is promoted away from the building in all areas except for the concrete driveway.

Runoff in the area of the concrete driveway and the receiving area is controlled by a catchbasin that discharges to the 18-inch diameter combined sewer in front of the facility. The driveway is sloped down toward the facility while the truck dock is sloped down from north to south to prevent runoff water from entering the facility. A catchbasin located in the driveway provides drainage.

4) Zoning

Provided in Attachment B-4 is a colour coded zoning map for Melrose Park where the Gold Shield Solvents facility is located. The entire area within approximately 500 feet of the Gold Shield Solvents facility is zoned as industrial: In the area from 500 feet to 1,000 feet from the facility in addition to industrially zoned land there is some light manufacturing land on the east side of 25th Avenue to the east of the facility and some 2-flat residential land east of the light manufacturing and also south west of the Gold Shield Solvents facility.

TABLE B-1

COMPARISON OF [illegible] MAP MODIFICATIONS

Item Required Specific Criteria	Section in Application (Attachment Item)
[illegible]	
[illegible]	B-2, B-3
[illegible]	B-4, B-5
[illegible]	B-1 [illegible]
[illegible]	B-6, B-7
[illegible]	B-8
[illegible]	B-1
[illegible]	B-2
[illegible]	B-3
[illegible]	B-4
[illegible]	B-5
[illegible]	B-6
[illegible]	B-7
[illegible]	B-8
[illegible]	B-1
[illegible]	B-2
[illegible]	B-3
[illegible]	B-4, B-7
[illegible]	B-5
[illegible]	B-6
[illegible]	B-7
[illegible]	B-8
[illegible]	B-1
[illegible]	B-2

TABLE B-1

LOCATION OF REQUIRED TOPOGRAPHIC MAP INFORMATION

	Items Required For Topographic Maps	Location In Application (Attachment Nos.)
1.	Topographic map extending 1,000 feet beyond facility	B-2, B-3
2.	Contour intervals	B-2, B-3
3.	Map scale and date	B-2, B-3, B-4, B-6, B-10
4.	100-year floodplain area	B-10
5.	Surface waters including intermittent streams	B-3
6.	Surrounding land uses	B-4
7.	Wind rose	B-5
8.	Orientation of the map	B-1, B-2, B-3, B-4, B-6, B-7, B-8, B-9, B-10,
9.	Legal boundaries of the facility	B-6
10.	Access control and internal roads	B-7
11.	Injection and withdrawal wells	N/A
12.	Buildings	B-6, B-7, B-9,
13.	Sewers	B-8
14.	Loading and Unloading Areas	B-7
15.	Fire Control Facilities	B-7
16.	Barriers for drainage and flood control	N/A
17.	Location of container storage area	B-9

[illegible] Rose

A copy of a wind rose, provided by the National Climatic Data Center in Asheville, North Carolina, for Chicago's O'Hare Airport is located in Attachment E-8. The wind rose indicates that the prevailing wind in the vicinity of the Cook Shield Solvents facility is from between west and south.

Legal Boundaries

A copy of a plat survey indicating the property boundaries of the lands leased by Petrex Corporation is provided in Attachment E-9.

Access and [illegible]

Attach[illegible] the access control is lost at the first [illegible]. The main focus waste management area is [illegible] will [illegible] a fence building [illegible] and will [illegible] security doors [illegible] around the facility as well. Access [illegible] [illegible] and [illegible]

Attach[illegible] E [illegible] Underground Wells

An [illegible] was sent to the Malone Park Engineering Department, [illegible] underground injection or withdrawal [illegible] within the vicinity of Malone Park. This [illegible] covers the area within a radius of 1,000 feet of the [illegible].

Sewers

Storm [illegible] Adjacent land is a pole locating the sewer [illegible] the Cook Shield Solvents facility. The only sewer present on Lundy's Avenue in front of the facility is an [illegible] stormwater [illegible] sewer which collects both industry and [illegible] water and flows to the east. The [illegible] the [illegible] driveway is connected to this [illegible] sewer. There are no process sewers utilized at this facility.

Loading [illegible] Docking Area

The loading and [illegible] area for the Cook Shield Solvents [illegible] is [illegible] on Attachment E-7. Trucks enter the [illegible] via [illegible] concrete driveway from Lundy Street which [illegible] directly [illegible] the loading/unloading area in the south west corner of the facility.

5) Wind Rose

A copy of a wind rose, provided by the National Climatic Data Center in Ashville, North Carolina, for Chicago's O'Hare Airport is provided in Attachment B-5. The wind rose indicates that the prevailing wind in the vicinity of the Gold Shield Solvents facility is from between west and south.

6) Legal Boundaries

A copy of a plat survey indicating the property boundaries of the lands leased by Detrex Corporation is provided in Attachment B-6.

7) Access Control

Attachment B-7 illustrates the access control devices at the facility. The hazardous waste management area is enclosed within a single building provided with security doors that are locked when the facility is unattended. Access is restricted to all but authorized persons.

8) Injection and Withdrawal Wells

As determined from the Melrose Park Engineering Department, there are no groundwater injection or withdrawal wells within the village of Melrose Park. This encompasses the area within a radius of 1,000 feet of the facility.

9) Sewers

Provided in Attachment B-8 is a figure locating the sewers near the Gold Shield Solvents facility. The only sewer present on LeMoyne Avenue in front of the facility is an 18-inch diameter combined sewer which collects both sanitary and storm waters and flows to the east. The catchbasin in the concrete driveway is connected to this combined sewer. There are no process sewers utilized at this facility.

10) Loading and Unloading Areas

The loading and unloading area for the Gold Shield Solvents facility is shown on Attachment B-7. Trucks enter the facility via the concrete driveway from LeMoyne Street which provides direct access to the loading/unloading area in the south west corner of the facility.

[illegible]

[illegible] Control

Site control is provided by the [illegible] located within [illegible] facility and by the local fire department. There is a fire hydrant [illegible] in front of the Gold Quality Products facility (see Att. Tabbed B-7).

(d) Hazardous Waste & Toxic Storage Area

Item 8d [illegible] Attachment B-4 is a figure detailing the location [illegible] the hazardous waste container storage area within [illegible] Gold Quality Products building.

[illegible] Use, Zoning, Permits for Land Disposal Facilities
Section [illegible] Subsections (a), (b), (c), (d)

[illegible] Groundwater Protection Ordinance [illegible] has never [illegible] a land disposal facility at the Gold Quality Products [illegible] Chicago Heights, Illinois.

11) Fire Control

Fire control is provided by fire extinguishers located within the facility and by the local fire department. There is a fire hydrant located directly in front of the Gold Shield Solvents facility (see Attachment B-7).

12) Hazardous Waste Container Storage Area

Provided in Attachment B-9 is a figure detailing the location of the hazardous waste container storage area within the Gold Shield Solvents building.

B-2b Additional Requirements for Land Disposal Facilities [35 IAC 703.184.184, 703.185(c) and (d)]

Detrex Corporation does not and has never had a land disposal facility at the Gold Shield Solvents facility in Melrose Park, Illinois.

B-3 FACILITY LOCATION [320 IAC 4.1-34-5(b)(11)]

B-3a Seismic Standard [35 IAC 724.118]

The Detrex Corporation, Gold Shield Solvents facility is located in Cook County, Melrose Park, Illinois.

There are no Illinois political jurisdictions designated as being located within a seismic area as identified under 40 CFR 264, Appendix VI (1985). As such, no information is required with regards to the seismic standard.

B-3b Floodplain Standard [35 IAC 703.184(c), 724.118(b)]

Attachment B-10 shows a portion of the Federal Insurance Administration (FIA) Flood Map for the Village of Melrose Park relative to the Gold Shield Solvents Facility. The FIA Flood Map indicates the facility is not located within a 100-year floodplain (i.e. it is located within Zone C: areas of minimal flooding).

B-3b(1) Demonstration of Compliance [35 IAC 703.184(d), 724.118(b)]

As described in Section B-3b above, the Gold Shield Solvents facility is not located within a 100-year floodplain. Thus, the facility is in compliance with floodplain requirements.

B-3b(1)(a) Flood Proofing and Flood Protection Measures [35 IAC 703.184(d)(1) and (d)(2)]

As described in Section B-3b above, the Gold Shield Solvents facility is not located within a 100-year floodplain. Thus, flood proofing and protection devices are not required.

B-3b(1)(b) Flood Plan [35 IAC 703.184(d)(3), 724.118(b)(1)(A)]

As described in Section B-3b above, the Gold Shield Solvents facility is not located within a 100-year floodplain. Thus, a flood plan is not required.

B-3b(2) Waiver for Land Storage and Disposal Facilities [35 IAC 724.118(b)(1)(B)]

Detrex Corporation does not and has never operated a Land Storage and Disposal Facility at the Gold Shield Solvents facility in Melrose Park, Illinois.

B-3b(3) Plan for Future Compliance with Floodplain Standard [35 IAC 703.184(e)]

As described in Section B-3b above, the Gold Shield Solvents facility is not located within a 100-year floodplain. Thus, a plan for future compliance is not required.

B-3c Other Location Requirements

Detrex Corporation does not and has never operated a land disposal facility of any type at the Gold Shield Solvents facility in Melrose Park, Illinois. Thus, there are no additional location requirements as per Section 21 of the Illinois Environmental Protection Act.

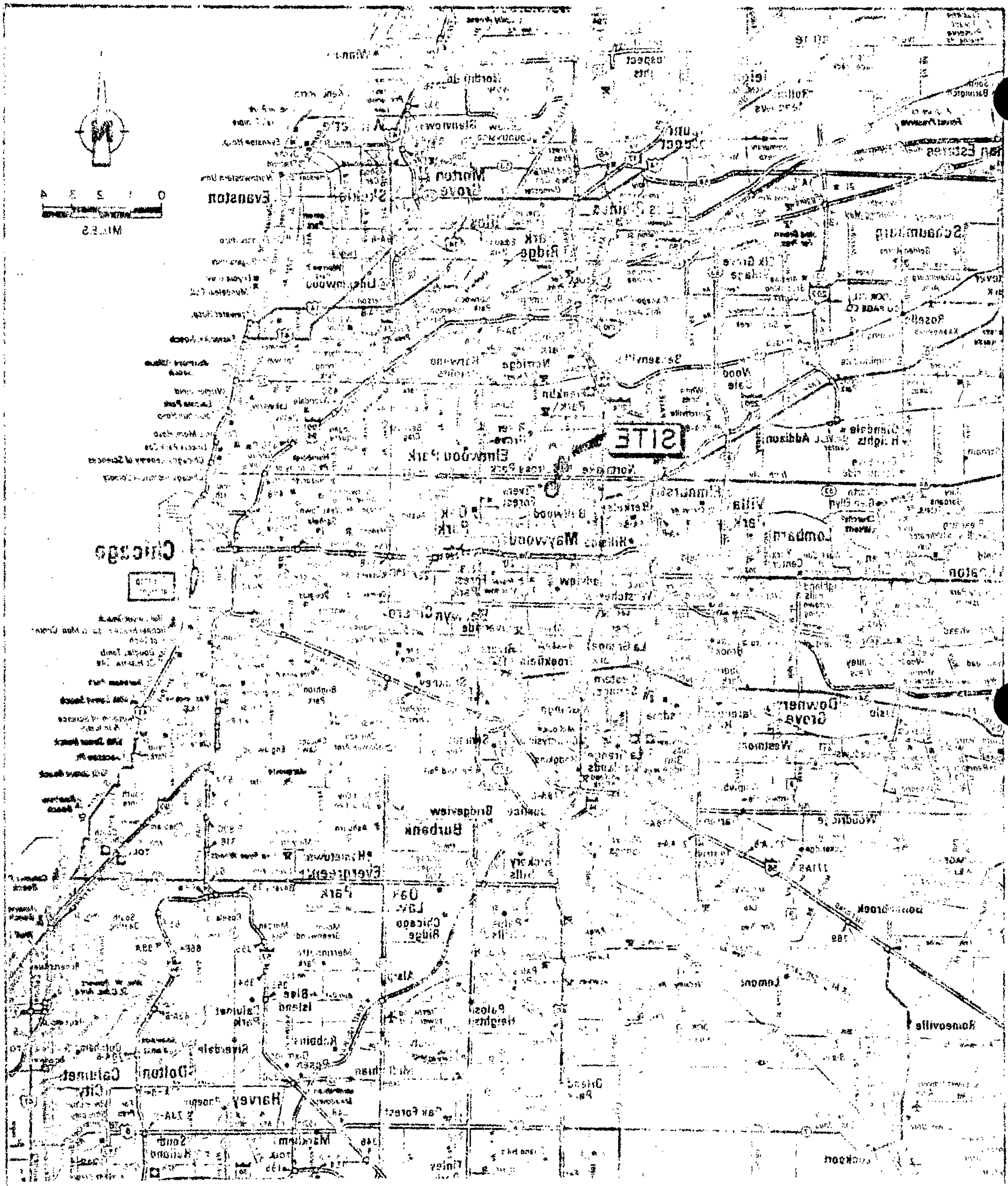
B-4 TRAFFIC INFORMATION [35 IAC 703.183(j)]

Attachment B-7 illustrates the traffic patterns at the Gold Shield Solvents facility. There is only one access point at the facility for vehicular traffic. Employees and visitors park off site.

All incoming and outgoing solvent wastes arrive and leave by truck. Typically, two trucks arrive per day transporting drummed hazardous wastes to the facility and two or three trucks per month transport waste from the facility to an off-site Detrex reclamation (recycling) facility or to an off-site permitted treatment/disposal facility.

The access driveway from LeMoyne Avenue is constructed of concrete. Historical traffic flow at the facility has not created any structural problems in the existing structures indicating the bearing capacity of the pavement is adequate.

ATTACHMENT B-1



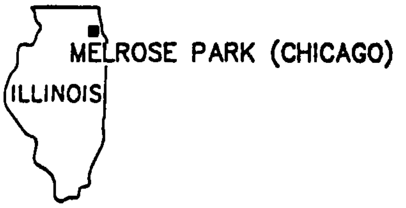
SOURCE: 1988 RAND McNALLY ROAD ATLAS

SITE LOCATION
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

ATTACHMENT B-1

SOURCE: 1988 RAND McNALLY ROAD ATLAS



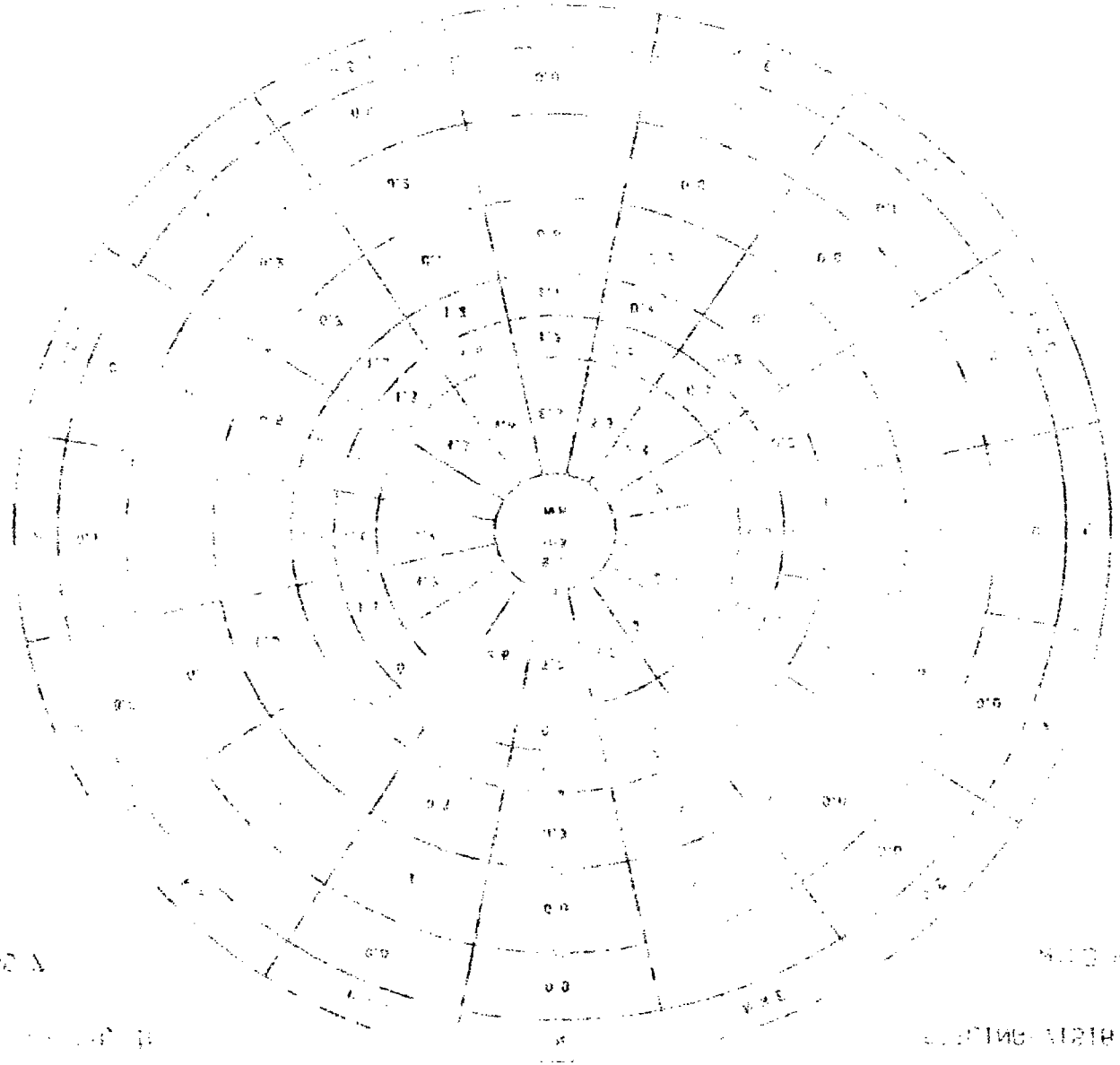
SITE LOCATION

Detrex Corporation

Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0

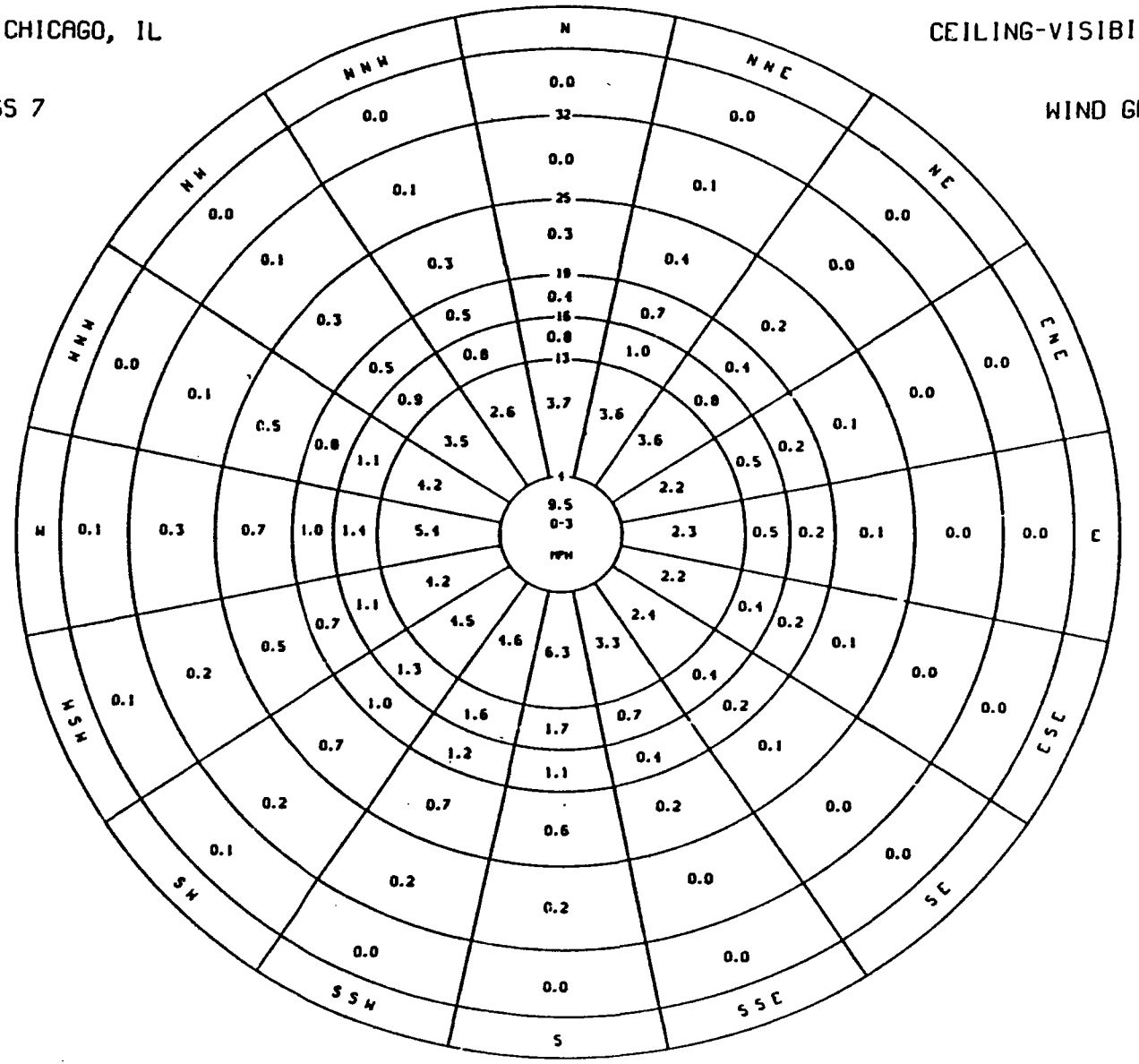


ORD CHICAGO, IL

CLASS 7

CEILING-VISIBILITY

WIND GRAPH

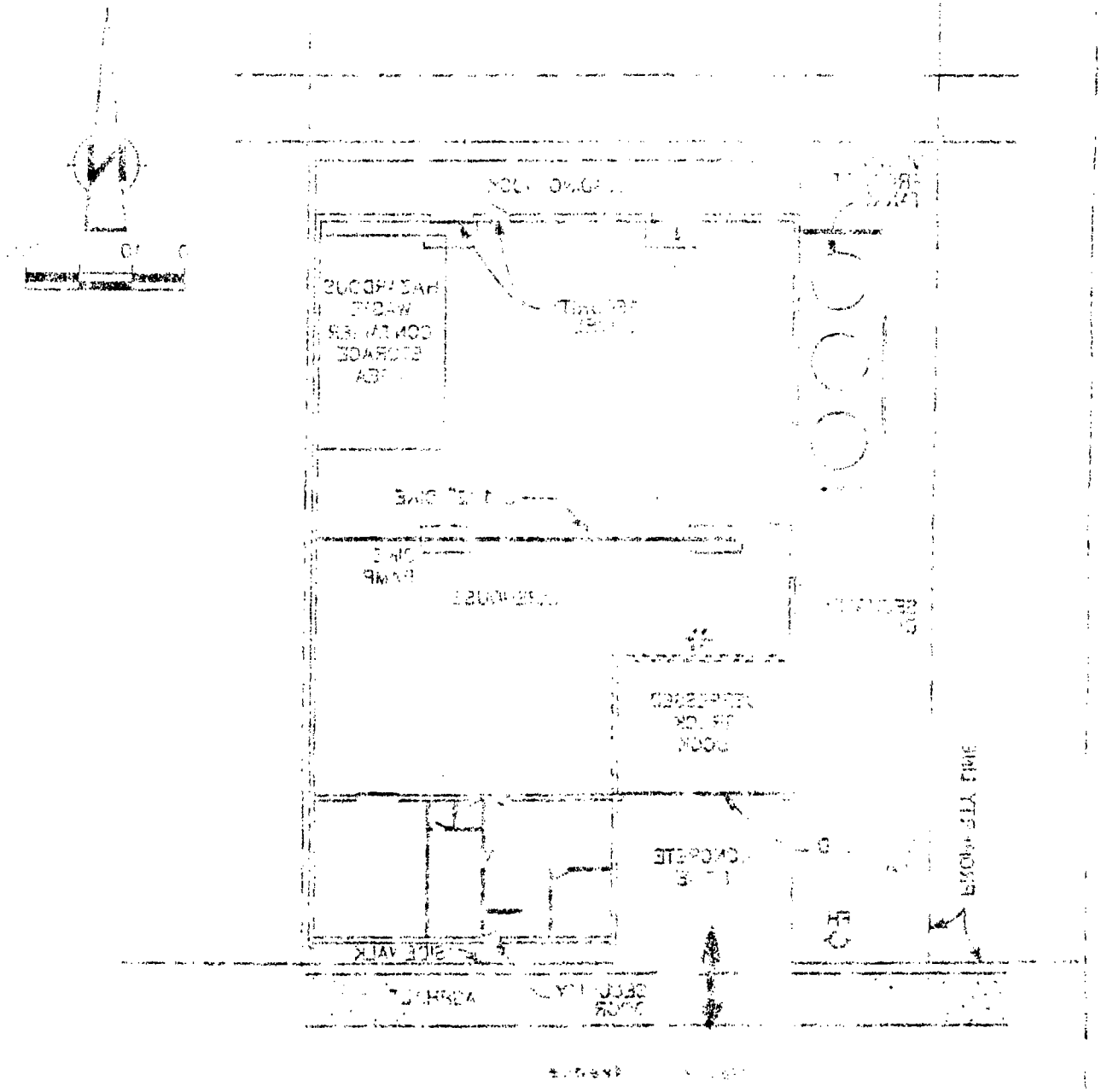


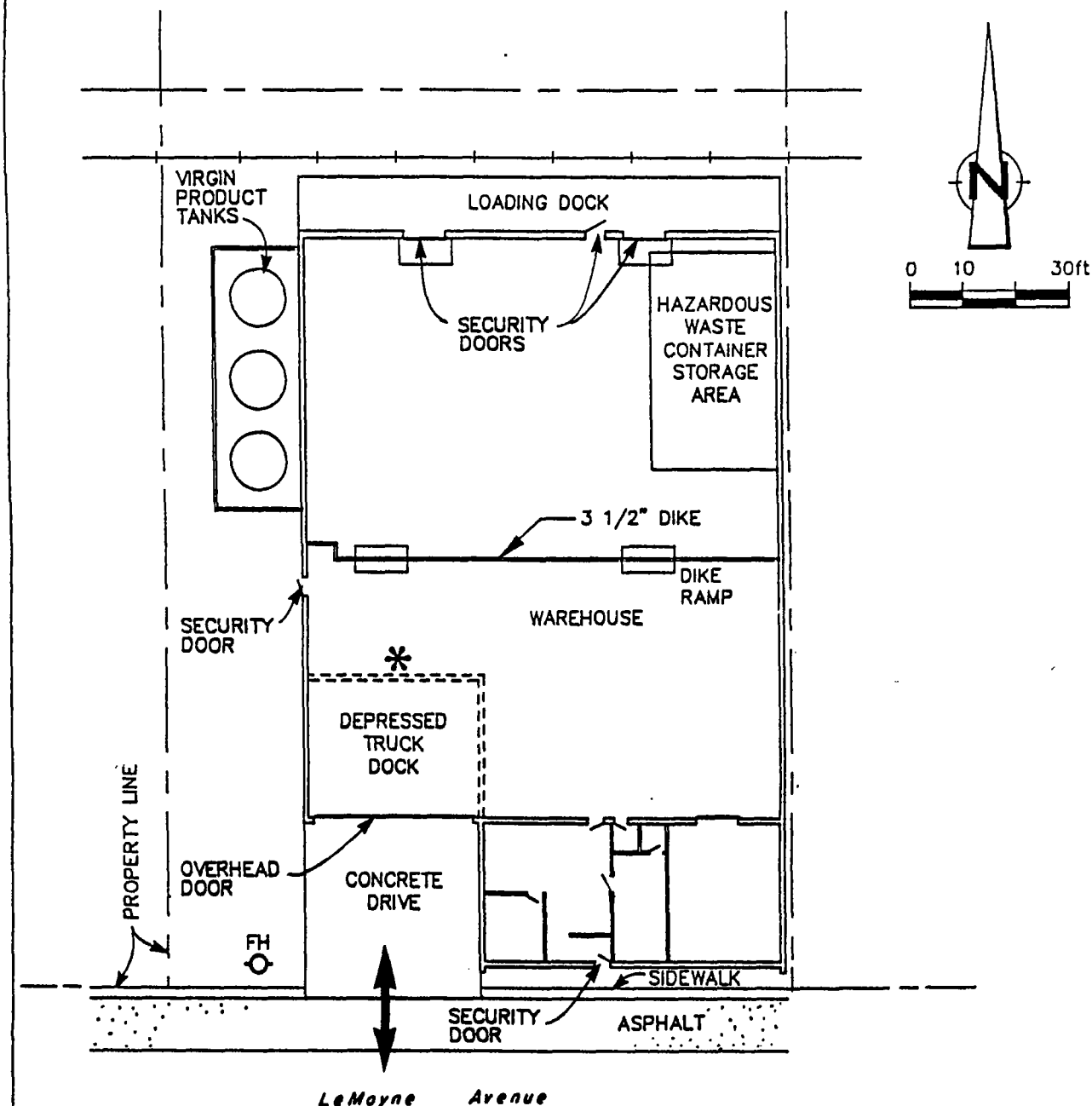
WIND ROSE
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/07/88-F-D-0

ATTACHMENT B-5





LEGEND

* CONTAINER LOADING/ UNLOADING AREA

TRAFFIC PATTERN

FIRE HYDRANT

NOTE: ALL DOORS REMAIN LOCKED WHEN THE FACILITY IS UNATTENDED

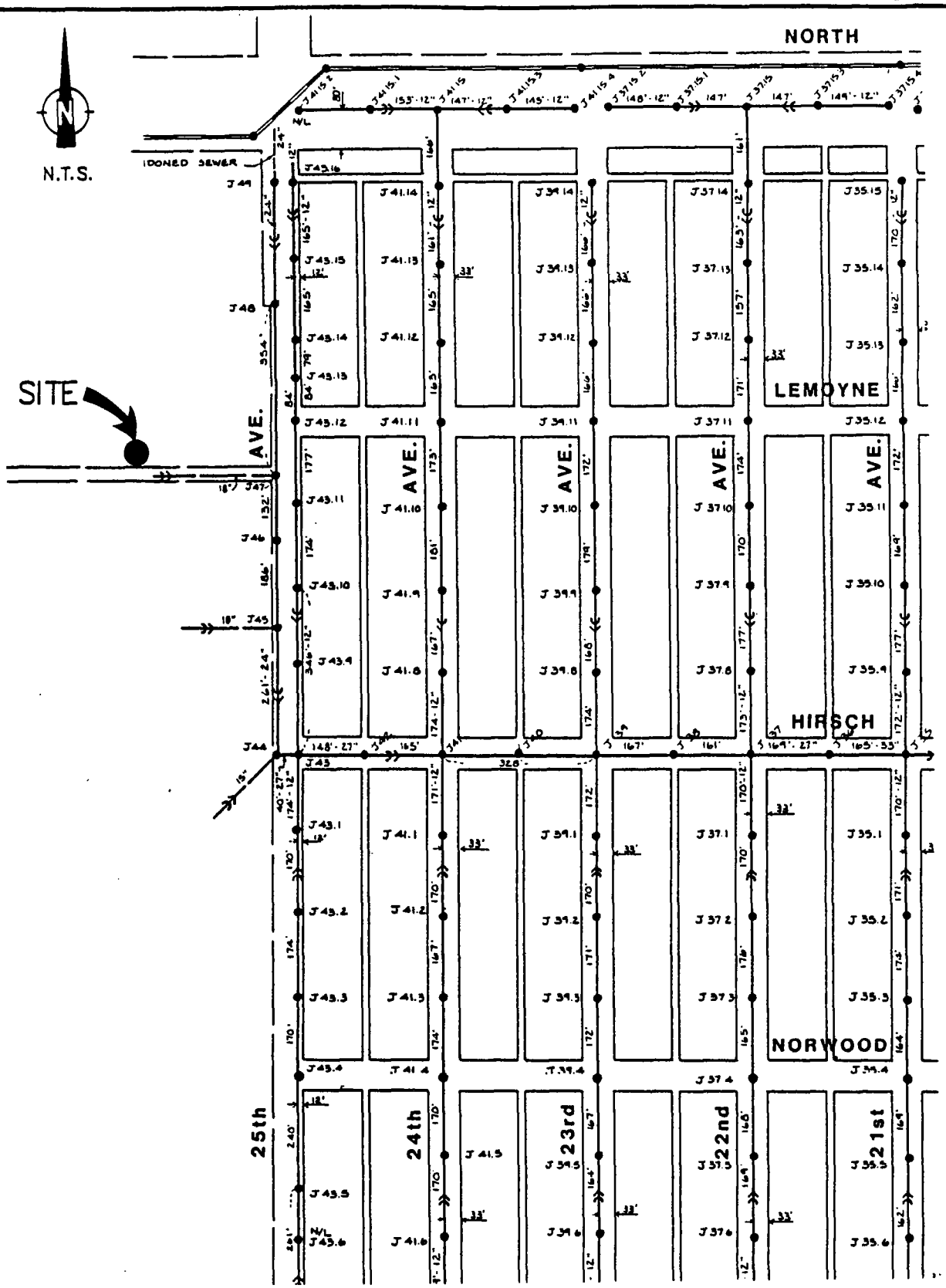
ACCESS CONTROL
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

SEWER LOCATIONS
Datrex Corporation
Coca Shield Solvents, Melrose Park

AFC

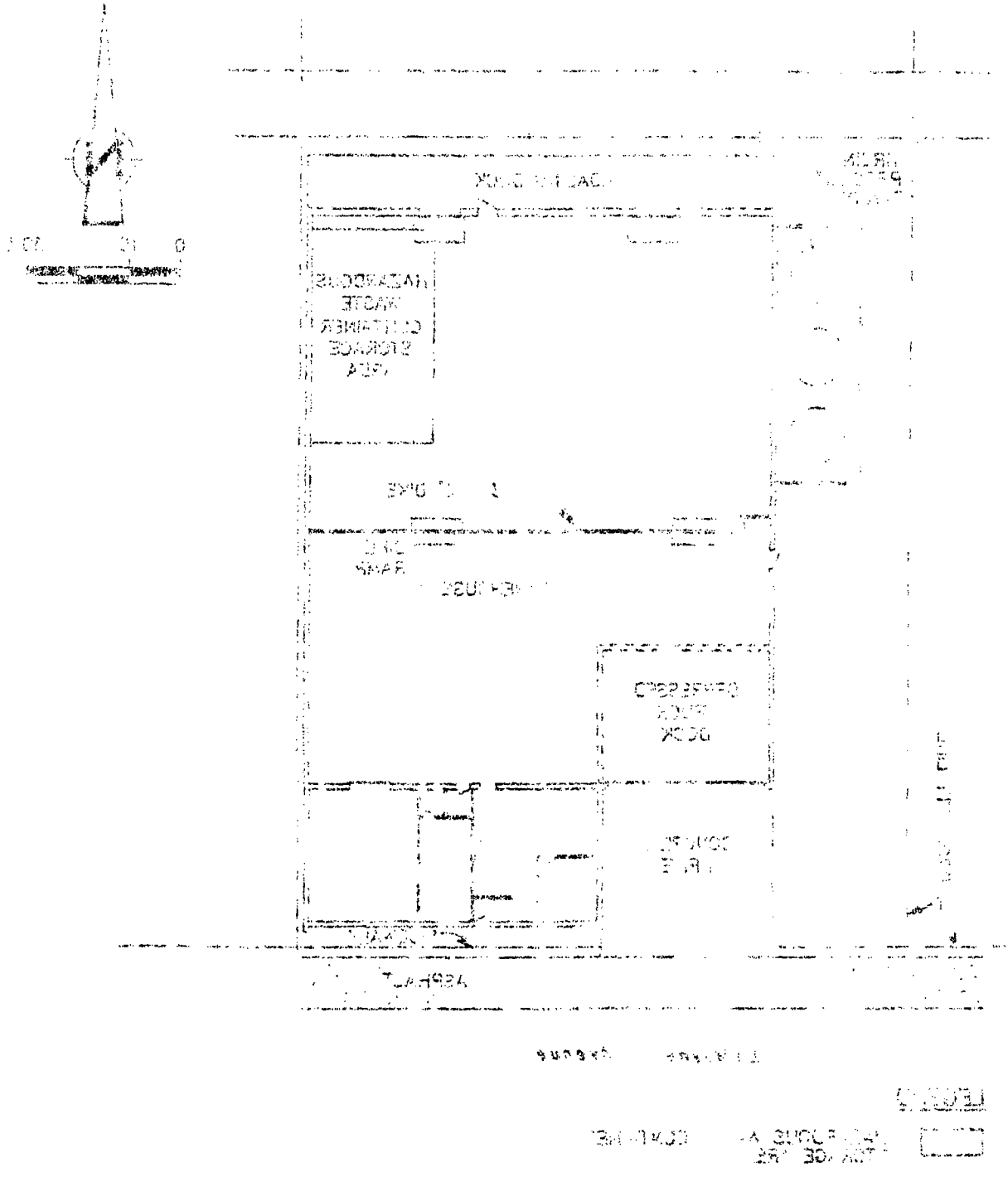


NOTE: SEWER IS STORM AND SANITARY COMBINED

SEWER LOCATIONS
Detrex Corporation
Gold Shield Solvents, Melrose Park

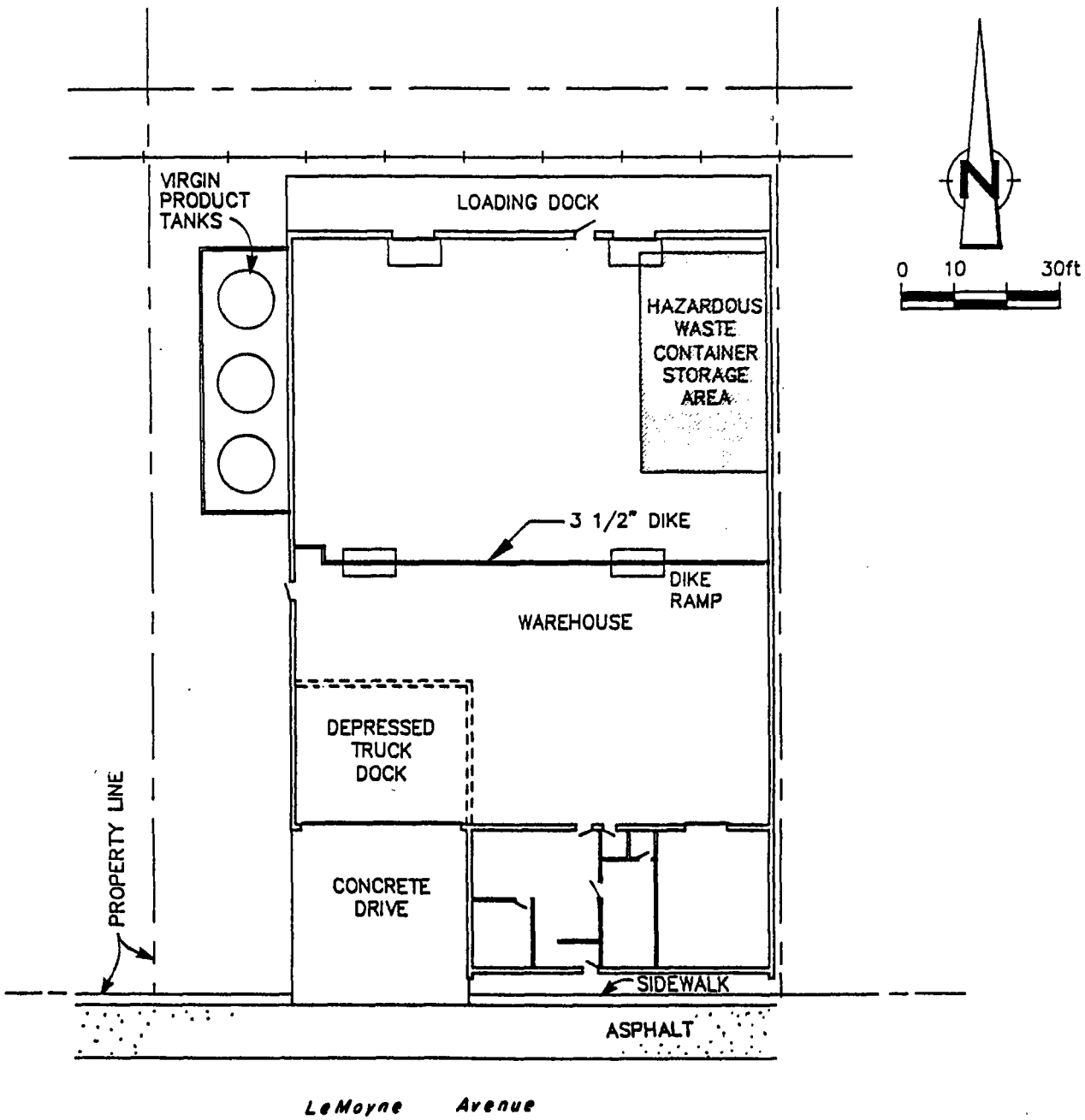
CRA

2471-19/10/88-3-F-0



HAZARDOUS WASTE CONTAINER STORAGE AREA

APO



LEGEND

HAZARDOUS WASTE CONTAINER STORAGE AREA

HAZARDOUS WASTE CONTAINER STORAGE AREA
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

SECTION C

WASTE CHARACTERISTICS

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SECTION C

WASTE CHARACTERISTICS

This section provides a description of the chemical and physical nature of the hazardous wastes managed in the container storage area at the Detrex Corporation Gold Shield Solvents facility located in Melrose Park, Illinois.

The Gold Shield Solvents facility in Melrose Park typically receives drummed halogenated hydrocarbon solvent wastes for reclamation (recycling) at an off-site Detrex reclamation (recycling) facility. Gold Shield Solvents also sells virgin solvents, consequently, personnel are familiar with the wastes that are received at the facility.

The information is provided pursuant to Illinois Rule 35 IAC. The applicable sections of the Illinois Regulations are referenced as appropriate.

C. CHEMICAL AND PHYSICAL ANALYSES OF LABORATORY TEST RESULTS

Provided in Table C-1 is a listing of the laboratory wastes which may be treated on site at the contractor's facility. In addition, a list of wastes which may be added to Table C-1 also for [illegible] for laboratory wastes [illegible] waste laboratory, is [illegible] chemically/chemotactic which [illegible] are as hazardous, the ETA process [illegible] and are [illegible] physical state.

Provided in Attachment [illegible] to this application are representative Material Safety Data Sheets [illegible] for each of the laboratory wastes listed in Table C-1. These sheets are [illegible] the physical properties of each waste [illegible] and solids. [illegible] handling in accordance with Illinois [illegible].

Provided in Attachment [illegible] are laboratory reports from a recent analysis of such [illegible] wastes received at the Peters facility. Each laboratory report presents [illegible] information including a [illegible] identification number [illegible] a sample or [illegible] composited. Identification and [illegible] sample [illegible]. The report summarizes the percentage of each [illegible] component in the volume portion of the waste sample, the [illegible] residue [illegible] and [illegible] percentage of [illegible] solvent in each sample. A copy of the corresponding laboratory [illegible] is provided with each laboratory report.

All incoming hazardous [illegible] stored at the facility are properly labeled to identify the drums contents. This allows personnel to easily identify each drum and [illegible] the appropriate incoming [illegible].

A final [illegible] review [illegible] is employed on manufactured [illegible] the customer will be notified [illegible] appropriate [illegible] to return the [illegible] to the [illegible] disposal facility. Unauthorized [illegible] will not be accepted by Clean Harbors.

The [illegible] is a [illegible] Solid Waste facility in 55-gallon [illegible] drums [illegible] storage area located within the [illegible] facility. Hazardous waste container storage [illegible] in accordance with 35 of the permit application.

C-1 CHEMICAL AND PHYSICAL ANALYSIS [35 IAC 703.183(b), 724.113(a)]

Provided in Table C-1 is a list of all hazardous wastes which may be received and stored in the container storage area. In addition to the list of wastes which may be stored at the facility, Table C-1 also provides, for each waste, its EPA hazardous waste identification number, the hazardous constituent/characteristic which designates the waste as hazardous, the EPA process code, and the waste's physical state.

Provided as Attachment C-1 to this application are representative Material Safety Data Sheets for each of the hazardous wastes listed in Table C-1: These sheets describe in detail the chemical and physical properties of each waste managed at Gold Shield Solvents to allow their safe handling in accordance with Illinois Rule 35.

Provided as Attachment C-2 are laboratory reports from a recent analysis of each type of hazardous waste received at the Detrex facility. Each laboratory report presents a sample identification including a facility identification number followed by a drum (or drums composited) identification and a unique laboratory sample identification number. The report summarizes the percentage of each identifiable solvent component in the volatile portion of the waste sample, the percentage non-volatile residue (N.V.R.) in each sample, and the percentage of recoverable product solvent in each sample. A copy of the corresponding laboratory chromatograph is provided with each laboratory report.

All drummed hazardous wastes stored at the facility are properly labeled to identify the drums contents. This allows personnel to easily identify each drum and to handle it in the appropriate manner.

If analytical results reveal that a customer has shipped an unauthorized drum or drums to the Gold Shield Solvents facility, the customer will be notified immediately and appropriate arrangements made to return the drum or transport it to a authorized treatment or disposal facility. Unauthorized drums will not be accepted by Gold Shield Solvents.

Hazardous wastes are received at the Gold Shield Solvents facility in 55-gallon drums. Drums are stored in a container storage area located within the facility before being transported off-site. The hazardous waste container storage area is described in detail in Section D of this permit application.

TABLE C-1

LIST OF HAZARDOUS WASTES

Hazaradous Waste	*EPA Hazardous Waste Number*	*Hazardous Constituent/Characteristic*	*EPA Process Code*	*Physical State*
1,1,1 Trichloroethane	F001	Toxic	S01	Liquid
Trichloroethylene	F001	Toxic	S01	Liquid
Methylene chloride	F001	Toxic	S01	Liquid
Perchloroethylene	F001	Toxic	S01	Liquid
Trichlorotrifluoroethane (Freon)	F001	Toxic	S01	Liquid
1,1,1 Trichloroethane	F002	Toxic	S01	Sludge*
Trichloroethylene	F002	Toxic	S01	Sludge*
Methylene chloride	F002	Toxic	S01	Sludge*
Perchloroethylene	F002	Toxic	S01	Sludge*
Trichlorotrifluoroethane (Freon)	F002	Toxic	S01	Sludge*

Note: *Represents a waste stream that has been partially distilled at the customer's degreasing operation facility.

C-1a [illegible] Spread of Waste [illegible]

[illegible]

C-1b [illegible] Land Ban [illegible] (2)

[illegible]

C-1c [illegible] [illegible] (3)

[illegible]

C-1d [illegible] Land [illegible]

[illegible]

C-1e [illegible] [illegible]
[illegible] [illegible]

[illegible]

C-1a Containerized Waste [35 IAC 703.201(b)(1)]

Hazardous solvent wastes are received in 55-gallon drums. These drums do contain free liquids. The drums are stored within a container storage area located within a totally enclosed building. Adequate secondary containment is provided by the building walls, internal diking, and diked doorways for the containerized wastes. Details of the containers and the container storage area are provided in Section D of this permit application.

C-1b Waste in Tank Systems [35 IAC 724.291(b)(2), 724.292(a)(2)]

Hazardous waste are not and never have been stored in tanks at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois, hence a permit for a storage tank is not requested.

C-1c Waste in Piles [35 IAC 724.350(c)(1) and (4)]

Hazardous wastes are not and never have been stored in waste piles at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for a waste pile is not requested.

C-1d Landfilled Wastes [35 IAC 724.414(c)]

Hazardous wastes are not and never have been landfilled at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for a landfill is not requested.

C-1e Wastes Incinerated and Wastes Used in Performance Tests [35 IAC 703.223(b)(1)]

Hazardous wastes are not and never have been burned during operations at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for an incinerator is not requested.

C-1f Wastes to be Land Treated
[35 IAC 703.206(b)(4), 724.371(a)(1) and (2), 724.376, Part 721 Appendix H]

Hazardous wastes are not and never have been land treated at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for a land treatment system is not requested.

C-2 WASTE ANALYSIS PLAN [35 IAC 703.183(c), 724.113(b) and (c)]

C-2a Parameters and Rationale [35 IAC 724.113(b)(1)]

Table C-2 lists the hazardous wastes which may be received and recycled at the Gold Shield Solvents facility, the analytical parameters that apply to each waste and the rationale for their selection.

Gold Shield Solvents specializes in the sale of halogenated solvents and cleaning equipment for degreasing operations, and the collection of solvent wastes generated in degreasing and other cleaning operations. All wastes accepted at the Gold Shield Solvents facility for the recycling operation are classified as F001 or F002 hazardous waste under Illinois Rule 35 IAC Part 721 Subpart D. As such, all wastes accepted at the facility are restricted wastes pursuant to Rule 35 IAC Part 728. The wastes do not meet the applicable treatment standards set forth in Rule 35 IAC Part 728 Subpart D. Gold Shield Solvents utilizes knowledge of the waste to determine if such wastes exceed applicable treatment standards.

Incoming wastes are analyzed for halogenated volatile organic parameters, as discussed in Section C-2d, to ensure that the waste has been properly manifested and labeled. A flash point test is conducted as necessary depending on results of initial volatile analysis. The solvent content of the wastes is determined strictly to ensure the waste is property processed (recycled).

In addition to the analytical waste characterization procedures, visual characterization of waste materials received at the facility are used to ensure acceptability of wastes. The Gold Shield Solvents facility has been in operation since 1974 and sells virgin solvents in addition to receiving spent solvent wastes for recycling. Hence, facility personnel are very familiar with the spent solvent wastes being received at the facility. During waste sampling, personnel are able to make a visual characterization (i.e. color, clarity phases) of waste materials. Olfactory evidence may also be used to identify a change in waste stream characterization.

C-2b Test Methods [35 IAC 724.113(b)(2)]

The solvent content of the wastes is determined on site using a specific gravity method developed by Gold Shield Solvents. The procedure for this method is described in the laboratory Quality Assurance Project Plan (QAPP) provided in Attachment C-3.

TABLE C-2

PARAMETERS AND RATIONALE FOR THEIR SELECTION

Hazardous Waste	*Parameter*	*Rationale**
F001	1,1,1 Trichloroethane Trichloroethylene Methylene Chloride Perchloroethylene Trichlorotrifluoroethane	Listed toxic waste (F001)
	Solvent Content (%)	Process Knowledge
F002	1,1,1 Trichloroethane Trichloroethylene Methylene Chloride Perchloroethylene Trichlorotrifluoroethane	Listed toxic waste (F002)
	Solvent Content (%)	Process Knowledge

NOTE: * There is no reason to believe that these wastes will contain any other toxic constituents in significant concentration.

The solvent wastes are analyzed for the halogenated volatile organics according to a test method developed by Detrex laboratory personnel. This procedure is also described in the QAPP provided in Attachment C-3.

If the flammable portion of the waste sample exceeds 10 percent by volume, the distillate portion of the waste sample is further tested for ignitability (flash point) using the Pensky-Marten Cup Method (SW-846, Third Edition, Method 1010).

A copy of the laboratory Quality Assurance Project Plan (QAPP) is provided in Attachment C-3. This document describes all laboratory procedures and related quality control/quality assurance procedures followed by Detrex Corporation laboratory personnel to ensure the reliability of analytical results.

C-2c Sampling Methods [35 IAC 724.113(b)(3), 40 CFR 261 - Appendix I]

The collection of drummed concentrated waste samples is conducted by facility personnel. Sampling procedures are described in detail in Section 5.0 of the QAPP provided in Attachment C-3. Sample handling procedures including chain-of-custody, are described in Section 6.0 of the QAPP.

C-2d Frequency of Analyses [35 IAC 724.113(b)(4)]

C-2d(1) New Customer Procedure

Before any hazardous waste material is accepted from a new customer for shipment to the Gold Shield Solvents facility in Melrose Park, the waste is sampled and assessed to ensure its characterization is acceptable to the off-site Detrex Gold Shield Solvents recovery (recycling) operation in Detroit. In addition to sampling, an effort is made to document the generation process of waste to further characterize its composition.

The waste is sampled as per the sampling method presented in Section C-2c and the QAPP. A preliminary assessment of the waste sample will be made by running a specific gravity test to determine the approximate solvent content. The sample is then sent to the Detrex

C-2f Additional Requirements for Ignitable, Reactive or Incompatible Wastes [35 IAC 724.113(b)(6),724.117]

Gold Shield Solvents facility does not accept ignitable, reactive or incompatible waste at the hazardous waste container storage area; hence, the additional waste analysis requirements are not applicable.

C-2g Waste Analysis Requirements for Land Disposal Ban [35 IAC 728.150]

Gold Shield Solvents stores containerized (i.e. 55-gallon drums) spent solvent wastes within a hazardous waste container storage area. The solvent wastes are classified as F001 or F002 hazardous wastes under 35 IAC Part 721 Subpart D. The classification of these wastes is based on Detrex's knowledge of the waste generation processes.

The F001 and F002 spent solvent wastes are prohibited from Land Disposal per 35 IAC 728.130(a). These wastes are stored within a hazardous waste container storage area in DOT-approved 55-gallon drums. Further information on the container storage area and the containers is provided in Section D of this permit application. All drums are appropriately labeled including contents and date of accumulation. In accordance with Section F of this permit application, all drums are inspected daily to ensure proper labeling including date of accumulation.

Drums are stored within the container storage area until such a time that a complete shipment is ready for transportation and the receiving facility is ready to accept the water for reclamation. Typically, wastes would not be stored at the facility for a period of more than one year.

Material Safety Data Sheet

MSD 8208.20

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: 1,1,1-trichloroethane; methylchloroform CAS No. 71-55-6	Trade Name and Synonyms: PERM-ETHANE ® DG
Chemical Family: Halogenated Hydrocarbons	Formula: CH_3CCl_3
DOT Shipping Name: 1,1,1-trichloroethane	DOT Hazard Class: ORM-A I. D. Number: UN 2831

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg:	Vapor Density (Air=1):	Specific Gravity (H_2O=1):	pH of Solutions:
165.4°F	4.54	1.300-1.320 @ 25°/25°C	6.0 to 7.5
Freezing/Melting Point:	**Solubility (Weight % in Water):**	**Bulk Density:**	**Volume % Volatile:**
-49°F -45°C	Negligible	10.80-10.97 lbs/gal @25°C	Essentially 100
Vapor Pressure:	**Evaporation Rate**	**Heat of Solution:**	**Appearance and Odor:**
@25°C = 135mmHg	(ethyl ether = 1):0.35	Not Applicable	Clear, colorless liquid - ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
1,1,1-trichloroethane (Stabilized)	100	See Sections 4 & 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used)	Flammable Limits in Air (% by Volume)	Extinguishing Media:
None when tested in accordance with DOT requirements.	LEL: 7% UEL: 15% See Below	water, dry chemical or carbon dioxide

Special Fire Fighting Procedures: Fire fighters should wear a NIOSH/MSHA-approved pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene. Use water only in degreasers when aluminum reaction occurs.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7-15% by volume. Decomposition or burning can produce hydrogen chloride or possibly traces of phosgene. Also see Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC_{50} Inhalation (rat) 8,000 ppm/7 hours	Inhalation: Toxic
LD_{50} Dermal (rabbit) 15g/kg (2)	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD_{50} Ingestion (rat) 10-12g/kg (See Section 5)	Ingestion: Not significantly toxic
Fish, LC_{50} (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data:

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Permissible Exposure Limits (TLV):

350 ppm - 8-hour time-weighted average (TWA) - OSHA 29CFR 1910.1000 (May 28, 1975).

Acute

Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory system, dizziness, nausea, lightheadedness, headache, loss of coordination and equilibrium, unconsciousness and, if exposed to high concentrations in confined or poorly ventilated areas, even death. Depression of the circulatory system has been reported as a result of overexposure to 1,1,1-trichloroethane. The heart may be sensitized by overexposure and ventricular arrhythmia may be induced by epinephrine administration.

Liquid splashed in the eyes can result in disconfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic

Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. 1,1,1-trichloroethane has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that 1,1,1-trichloroethane causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink large quantities of water, DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following 1,1,1-trichloroethane overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to 1,1,1-trichloroethane.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur.	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid):
Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be re-processed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act as well as any other relevant federal, state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposure, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Dilution (General) or Local Exhaust - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof Goggles

Gloves: polyethylene, neoprene or polyvinyl alcohol

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined areas.
- 1,1,1-trichloroethane vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with 1,1,1-trichloroethane.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component.
- Caution should be taken not to use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See Detrex Form SoL 8208.21 attached.)

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to 1,1,1-trichloroethane below OSHA permissible limits (8-hour TWA 350 ppm). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industry Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1980
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (1,1,1-trichloroethane) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state and local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.19

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: Trichloroethylene; trichloroethene CAS No.: 79-01-6	Trade Name and Synonyms: PERM-A-CLOR® NA, Trichlor, Trichlorethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $CHCl = CCl_2$
DOT Shipping Name: trichloroethylene	DOT Hazard Class: ORM-A UN1710 (RQ 1000#/454kg)

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg: 188°F	Vapor Density (Air=1): 4.54	Specific Gravity (H_2O=1): (20°/20°C) 1.465	pH of Solutions: 6.7 to 7.5
Freezing/Melting Point: -123.5°F -86.4°C	Solubility (Weight % in Water): 0.11 @ 25°C	Bulk Density: @ 20°C 12.2 lbs./gal.	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 57.8mmHg	Evaporation Rate (ethyl ether=1): 0.28	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Trichloroethylene (Stabilized)	100	See Sections 4 and 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements. (See Below)	Flammable Limits in Air (% by Volume) See Below LEL: 12.5% UEL: 90%	Extinguishing Media: Water, dry chemicals or carbon dioxide.

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high-intensity source of heat. This can occur at concentrations of approximately 12.5% and above by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene.

Also see Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref. (1),(2)	Classification (Poison, Irritant, Etc.)
LCLo Inhalation (rat) - 8,000 ppm/4 hour	Inhalation: Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritant to skin; eye irritant.
LD_{50} Ingestion (rat) - 4,900 - 7,000 mg/kg	Ingestion: Slightly to moderately toxic
Fish, LC_{50} (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data: Unconfirmed data' exists which indicate that trichloroethylene by ingestion may be more toxic to humans than indicated by the available animal data. Such unconfirmed data report poisonings at doses as low as 50 mg/kg.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4 (Cont'd) - Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 2-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Acute: Irritant and central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and, if exposed at high concentrations in confined or poorly ventilated areas, even death. Fatalities following severe acute exposure at high concentrations have been attributed to ventricular fibrillation resulting in cardiac failures.[3]

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that Trichloroethylene causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician .

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following trichloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to trichloroethylene.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed.
See Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.[7] Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal of hazardous waste.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use "buddy system", also use harness and lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof goggles.

Gloves: Polyethylene, neoprene or polyvinyl alcohol.

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

Do not use in poorly ventilated or confined spaces.

- Trichloroethylene vapors are heavier than air and will collect in low areas. Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with trichloroethylene
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to trichloroethylene in work area at or below OSHA permissible exposure limits (8-hour TWA - 100 ppm; ceiling - 200 ppm; maximum peak - 300 ppm, 5 minutes in every 2 hours). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Matabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments:

As this solvent (trichloroethylene) is used primarily to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.23

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date:	Edition:
Chemical Name and Synonyms: Methylene Chloride; dichloromethane CAS No.: 75-09-2	Trade Name and Synonyms: Methylene Chloride
Chemical Family: Halogenated Hydrocarbons	Formula: CH_2Cl_2
DOT Shipping Name: Methylene Chloride	DOT Hazard Class: ORM-A - UN 1593

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg: 103.6°F (39.8°C)	Vapor Density (Air=1): @ 20°C = 2.93	Specific Gravity (H_2O=1): 1.32	pH of Solutions: Neutral
Freezing/Melting Point: -142.1°F (-96.7°C)	Solubility (Weight % in Water): 2g/100 ml	Bulk Density: @ 20°C 11.15 lbs./gal.	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 349 mmHg	Evaporation Rate (ethyl ether = 1): 0.71	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Methylene Chloride (Stabilized)	100	See Sections 4 and 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements.	Flammable Limits in Air (% by Volume) See Below LEL: 12% UEL: 19%	Extinguishing Media: For fires involving methylene chloride, use water, dry chemicals or CO_2.

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA-approved, self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a poorly ventilated area can be ignited upon contact with a spark, flame or high intensity source of heat. This can occur at concentrations between 12% and 19% by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene. Also see Detrex warning letter form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): 500ppm (TWA) See Section 4 (Cont'd) next page

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC_{50} Inhalation LCLo (guinea pig) 5,000ppm/2hrs. TCLo*(human) 500ppm/8hrs.	Inhalation: Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritating to skin: eye irritant.
LD_{50} Ingestion - (rat) - 2.136mg/kg	Ingestion: Slightly toxic
Fish. LC_{50} (Lethal Concentration) Not determined	Aquatic:

Human Exposure Information/Data:

* Lowest published toxic concentration.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4 (cont'd) - Permissible Exposure Limit

Current OSHA permissible exposure limits (29CFR 1910.1000) are 500 ppm (8-hour TWA); 500-1,000 ppm period excursions are allowed providing TWA is at or below 500 ppm; 1,000-2,000 ppm excursions allowed only for maximum of five minutes in any 2-hour period -- 2,000 ppm maximum allowable concentration (must not be exceeded).

*NIOSH recommends that the TWA exposure limit for methylene chloride is 75 ppm. In the absence of occupational exposure to carbon monoxide (CO) above a TWA of 9 ppm up to a 10-hour workday, occupational exposure to methylene chloride shall be controlled so that workers are not exposed to methylene chloride in excess of 75 ppm (261 mg/cu m) determined as a TWA for up to a 10-hour workday, 40-hour workweek. In the presence of exposure to CO in the work environment at more than 9 ppm as a TWA for up to a 10-hour workday, exposure limits of CO or methylene or both shall be reduced to satisfy the relationship:

$$\frac{C(CO)}{L(CO)} + \frac{C(CH_2Cl_2)}{L(CH_2Cl_2)} \leq 1$$

where: $C(CO)$ = TWA exposure concentration of CO, ppm

$L(CO)$ = the recommended TWA exposure limit of CO = 35 ppm

$C(CH_2Cl_2)$ = TWA exposure concentration of methylene chloride, ppm

$L(CH_2Cl_2)$ = the recommended TWA exposure limit of methylene chloride = 75 ppm

Occupational exposure shall be controlled so that workers are not exposed to methylene chloride above a peak concentration of 500 ppm (1,740 mg/cu m) as determined by a 15-minute sampling period.

Employees working with methylene chloride should be aware of this hazard. This toxic effect is "additive" in nature with the risk being greater for smokers, who generally have higher levels of carboxyhemoglobin. Employees with a history of cardiovascular disease should not be allowed to work with methylene chloide unless approved by a physician.

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Effects of Overexposure *

Acute: Inhalation effect is primarily narcosis. Principal symptoms may be headache, dizziness, nausea, tingling or numbness of the extremities, senses of fullness in the head, sense of warmth, stupor or dullness, lethargy and drunkeness. Exposure to very high concentrations may lead to unconsciousness or even death in confined or poorly ventilated areas.

Chronic: Several chronic inhalation studies reported by NIOSH revealed that test animals exposed to methylene chloride concentrations as high as 10,000 ppm, showed slight liver and kidney changes. The results of these studies indicate that prolonged exposure limits may result in liver and kidney damage.

Chronic inhalation studies, cosponsored by several methylene chloride producers, were recently completed on rats. The results of these studies were reported to have revealed a mathematically significant increase in malignant salivary gland tumors in the group of male rats from the study's highest exposure level (3,500 ppm).

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Research has recently shown that methylene chloride is metabolized by the body to carbon monoxide.[4] Further, the amount of carbon monoxide formed is directly related to the amount of methylene chloride absorbed and can be sufficient to produce a substantial stress on the cardiovascular system through the elevation of the level of carboxyhemoglobin (COHb) -- the product formed by the combination of carbon monoxide and the blood's hemoglobin thus effectively reducing the amount of hemoglobin available for the transport of oxygen throughout the body.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following methylene chloride overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to methylene chloride.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below).

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection. (Use the "buddy system" and wear a safety harness with lifeline). In other circumstances involving potentional overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof goggles

Gloves: Polyethylene, neoprene or polyvinyl alcohol.

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Methylene chloride vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with methylene chloride.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- Caution should be taken not use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See form Sol. 8208.21 attached.)

Other Precautions:

AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long -term overexposure may cause liver/kidney damage.

- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to methylene chloride below OSHA permissible exposure limits (8-hour TWA - 500ppm; ceiling - 1,000ppm; maximum peak - 2,000ppm, 5 minutes in any 2 hours).
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (methylene chloride) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

Methylene chloride is also used extensively in industry as a solvent, thinner, paint stripper, etc. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with applicable federal, state and local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.22

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: Perchloroethylene; tetrachloroethylene CAS No.: 127-18-4	Trade Name and Synonyms: DETREX PERK, Perchlor, Perchloroethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $CCl_2=CCl_2$
DOT Shipping Name: Tetrachloroethylene	DOT Hazard Class: ORM-A-UN1897

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg:	Vapor Density (Air=1):	Specific Gravity (H_2O=1):	pH of Solutions:
250°F 121°C	5.83	(20°/20°C) 1.6	6.8 to 8.4
Freezing/Melting Point:	**Solubility (Weight % in Water):**	**Bulk Density:**	**Volume % Volatile:**
-8.2°F -22.3°C	@25°C 0.015%	13.6 lbs./gal. @ 20°C	Essentially 100
Vapor Pressure:	**Evaporation Rate**	**Heat of Solution:**	**Appearance and Odor:**
@ 20°C = 14.2mmHg	(ethyl ether=1): 0.09	Not Applicable	Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Perchloroethylene (Stabilized)	100	See Sections 4 & 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used)	Flammable Limits in Air (% by Volume)	Extinguishing Media:
None	None LEL: UEL:	For fires involving perchloroethylene, use water, dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Fire fighters should wear pressure-demand self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Perchloroethylene involved in fires can decompose to hydrogen chloride and possible traces of phosgene. See Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref.(1)	Classification (Poison, Irritant, Etc.)
LCLoInhalation (rat) 4,000 ppm (4 hours)	Inhalation: Moderately Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD_{50} Ingestion (rabbit) - 5,000 mg/kg	Ingestion: Slightly Toxic
Fish, LC_{50} (Lethal Concentration) 96hr. TLM 100-10 ppm	Aquatic: Toxic

Human Exposure Information/Data: Unconfirmed data' exists which indicate that perchloroethylene by ingestion may be more toxic to humans than indicated by the available data. Such unconfirmed data report poisonings at doses as low as 500 mg/kg.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4(Cont'd)- Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 3-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Acute: Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and if exposed to high concentrations in confined or poorly ventilated areas, even death.

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Perchloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that perchloroethylene causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulstions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following perchloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by over-exposure to perchloroethylene.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arc.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Also see Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper repiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method:

Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below applicable exposure limits.

Eye Protection: Splashproof goggles	**Gloves:** Polyethylene, neoprene or polyvinyl

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Perchloroethylene vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with perchloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit exployee exposure to perchloroethylene below OSHA permissible exposure limit (8-hour TWA - 100 ppm; ceiling 200 ppm; maximum peak 300 ppm, 5 minutes in any 3 hours). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effectos of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
5. Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (perchloroethylene) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U. S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or any other applicable federal, state or local regulatory guidelines.

Perchloroethylene is also used extensively in the commercial drycleaning industry. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with all applicable federal, state and local regulatory guidelines.

DU PONT

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

Name:
Freon® TF Solvent
Freon® PCA

Chemical Family:
Halogenated Hydrocarbon

Synonyms:
Trichlorotrifluoroethane
R-113, FC-113

Formula:
CCl_2FCClF_2

CAS Name:
Ethane, 1,1,2-Trichloro-1,2,2-Trifluoro

CAS Registry No.
76-13-1

Manufacturer/Distributor:
E. I. du Pont de Nemours & Co. (Inc.)

Medical Emergency Phone:
(800) 441-3637

Address:
Freon® Products Division
Wilmington, DE 19898

Transportation Emergency Phone:
CHEMTREC (800) 424-9300

PHYSICAL DATA

Boiling Point(°F): 117.6

Percent Volatile by Volume: 100%

Density: 1.57 g/cc @/77°F

Vapor Pressure: 334mm Hg @/77°F

Vapor Density (Air = 1): 6.5

Solubility in H_2O: 0.02% by wt. @ 77°F

pH Information: Neutral

Evaporation Rate (CCl_4 = 1): 0.1

Form: Liquid

Appearance: Clear

Color: Colorless

Odor: Slight Ethereal Odor

HAZARDOUS COMPONENTS

Material(s):
Trichlorotrifluoroethane

Approximate % :
100

HAZARDOUS REACTIVITY

Stability:
Material is stable. However, avoid open flames and high temperatures.

Incompatibility:
Alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition:
This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids - possible carbonyl halides.

Polymerization:
Will not occur

FIRE AND EXPLOSION DATA

Flash Point:
None

Method:
TOC

Autoignition Temperature:
Not Determined

Flammable Limits in Air, % by Vol.
Lower: Nonflammable
Upper: Nonflammable

Autodecomposition Temperature:
Not Determined

Fire and Explosion:
Drums may rupture under fire conditions. Decomposition may occur.

Extinguishing Media:
Nonflammable

Special Fire Fighting Instructions:
Self-contained breathing apparatus (SCBA) may be required if drums rupture and contents are spilled under fire conditions.

HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. LC 50 Rats 52,000 ppm/4 hrs.

Note: In screening studies with experimental animals, exposure at approximately 5000 ppm (v/v) and above, followed by a large intravenous epinephrine challenge, has induced serious cardiac irregularities.

Skin: Not a corrosive or irritant after single contact; however, repeated liquid contact can cause defatting of the skin resulting in irritation. This material is poorly absorbed through the skin (Rabbit ALD >11,000 mg/kg).

Eye: Liquid contact can cause discomfort, usually no extended effect.

Oral: Although oral toxicity is low [LD 50 Rat 43000 mg/kg], ingestion of FC-113 is to be avoided.

Exposure Limits:

PEL (OSHA)	1,000 ppm
TLV® TWA (ACGIH)	1,000 ppm

Safety Precautions:
Avoid breathing vapors and prolonged skin exposure. Use only in well ventilated area.

First Aid:

Inhalation: Remove to fresh air, call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

Note to Physician: Because of a possible increased risk of eliciting cardiac dysrythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening emergencies.

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: Flush with water. Get medical attention if irritation is present.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary. Do not induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the intestinal tract.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Hazards: Inhalation Section.

Other Health Hazards:

Freon® 113 is not listed as a carcinogen by IARC, NTP or OSHA. Based on animal studies and human experiences this fluorocarbon poses no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity, or teratogenicity when occupational exposures are below its TLV®.

PROTECTION INFORMATION

Generally Applicable Control Measures:

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment:

Butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal manufacturing conditions no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill occurs.

DISPOSAL INFORMATION

Spill, Leak or Release:
Ventilate area. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Comply with federal, state and local regulations on reporting releases.

Waste Disposal: Comply with federal, state and local regulations. Remove to a permitted waste disposal facility. EPA Hazardous Waste Nos. F001 and F002 may apply to waste materials.

SHIPPING INFORMATION

Domestic - Other Than Air (DOT)

Proper Shipping Name	Not Regulated

International Water or Air (IMO/ICAO)

Proper Shipping Name	Not Regulated

Other Information

Shipping Containers	Drums, tank trucks, tank cars
Storage Conditions	Clean, dry area. Do not heat above 125°F.

Date Revised: 10/85
Person responsible: T. D. Armstrong, C&P Dept., Freon® Products Lab, Chestnut Run, Bldg. 711, Wilmington, DE 19898 (302) 999-3847 or (302) 999-4338.

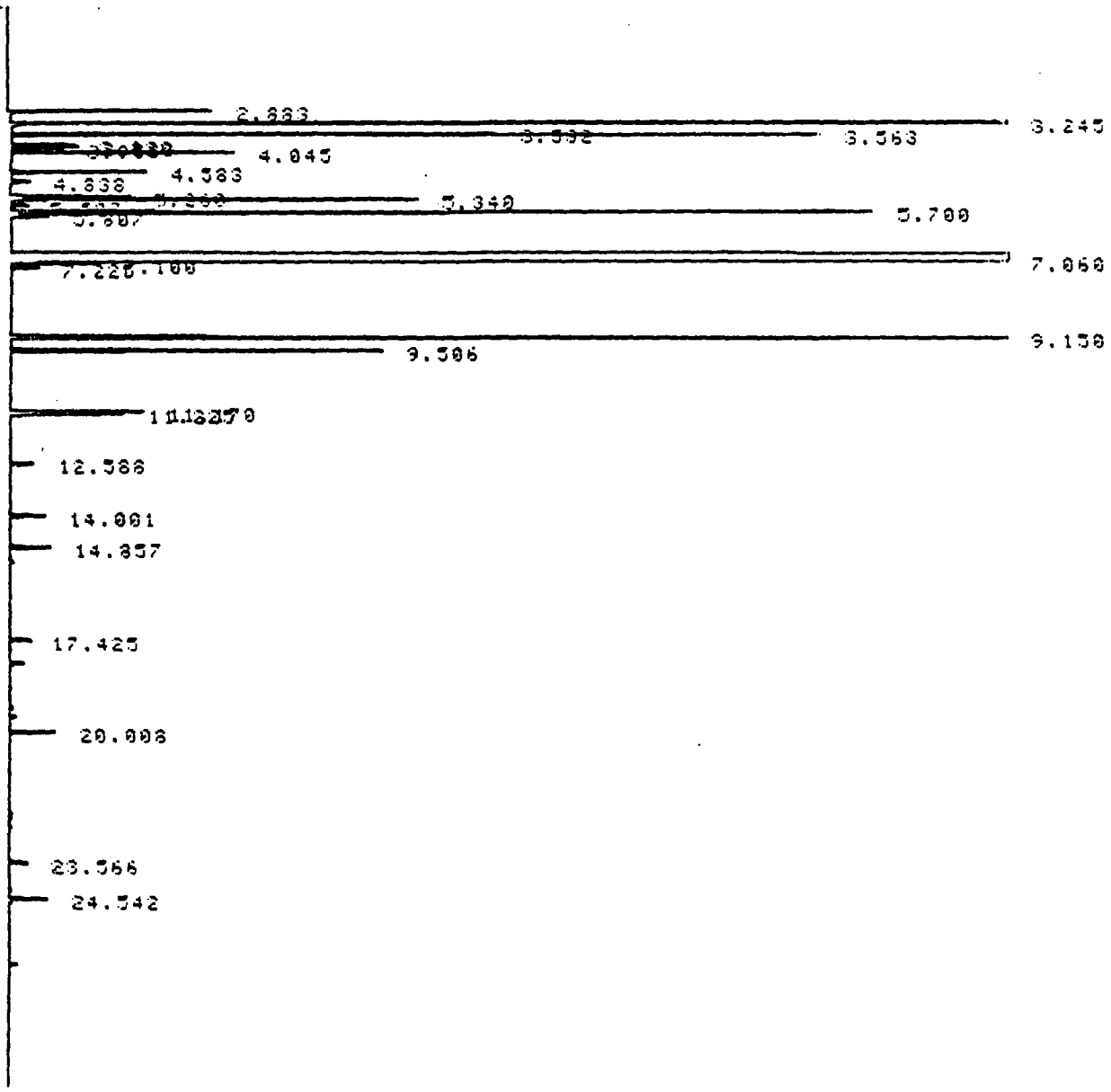
DUPONT

Branch 11 Quarry. Ashtabula Ohio

I.D.	Methl	Isop.	TF	MeCl2	Butylene Oxide	2-Butyl Alc	Dioxolane	1-1-	TCE	1,4 Dioxane	Perc	CHO	N.V. R%	Notes	% Recov
11-3508-3513 5494 ✓									97.7				34.9		63-6
11-3488 5495 ✓		.72				.63	1.5	79.9	2.1	.66			36.7	HIGH H_2O ETOH 12.6	61-(
11-3493-35 5496 ✓					.49	1.7	1.9	88.6	1.7	2.8			26.1	MEBK .76	71-:

RUN # 130 NOV 11, 1989 12:17:39

START



STOP

11-3488.

RUN# 130 NOV 11, 1989 12:17:39

SAMPLE NAME: 5495 SAMPLE# 34

NVP 36.7%

Run 61-63%
High H_2O

AREA%

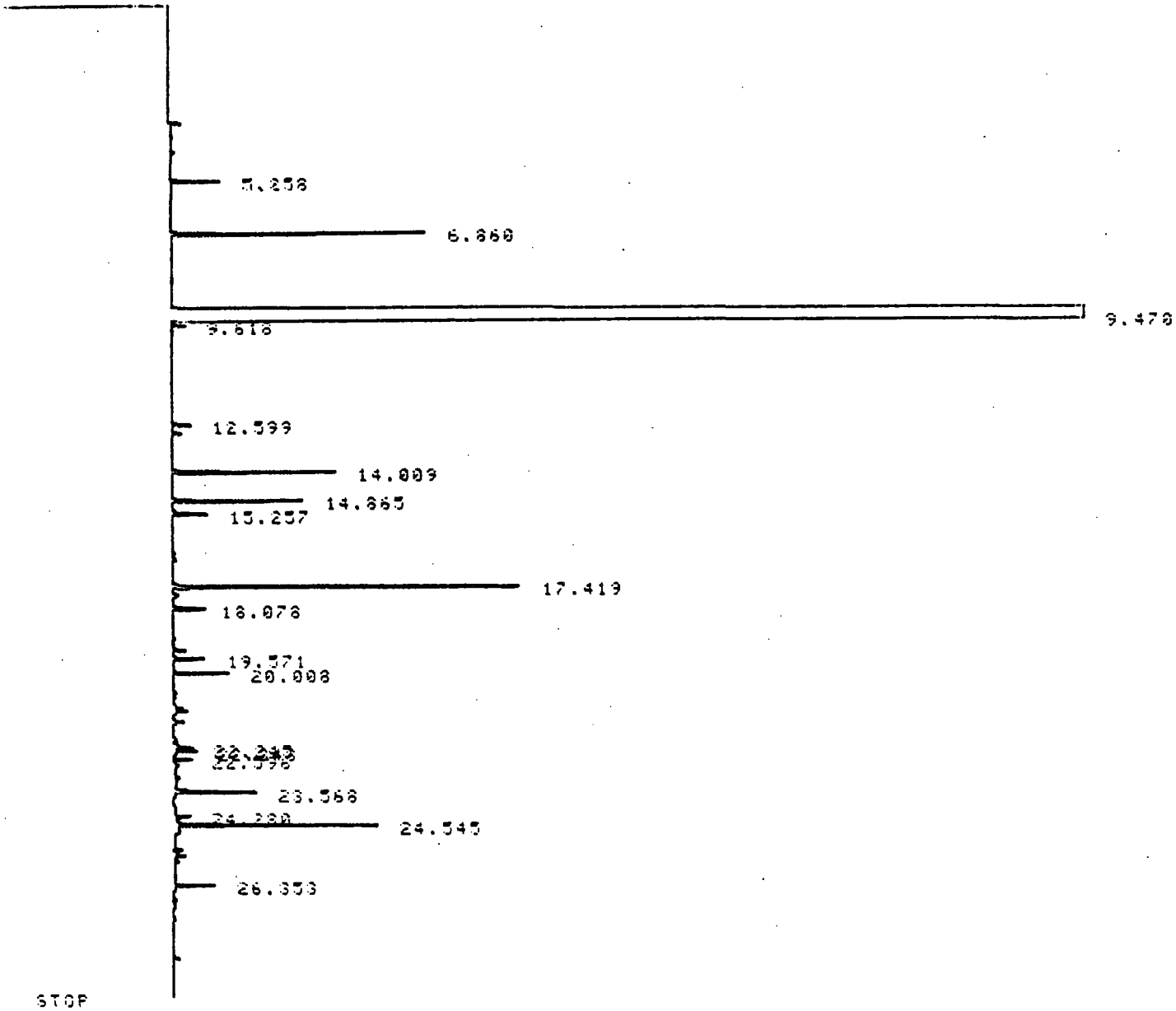
RT	AREA	TYPE	WIDTH	AREA%	
2.883	31517	PB	.021	.17093	
3.245	2335832	PB	.029	12.66805	EtOH
3.532	73789	PV	.021	.40018	
3.563	134050	VB	.023	.72700	Iso
4.045	43116	PB	.026	.23383	
4.583	33475	PB	.033	.18155	
5.260	36143	PV	.040	.19602	
5.340	116608	VB	.039	.63241	nBuAc
5.700	282112	PV	.045	1.52999	Dioxolane
7.060	14743624	PV	.130	79.95934	1-1-1
9.150	402112	PB	.046	2.18080	TCE
9.506	121817	PB	.044	.66066	1,4 Diox
11.170	42730	BV	.043	.23174	
[illegible]	[illegible]	VB	.050	.22695	

Branch 11 Ashtabula OH.

I.D.	Methanol	Isop.	TF	MeCl2	Butylene Oxide	2-Butyl Alc	Dioxolane	1-1-1	TCE	1,4 Dioxane	Perc	CHO	N.V. R%	Notes	% Recov
11-3508-3513 5494 ✓									97.7				34.9		63-6
11-3488 5495 ✓		.72				.63	1.5	79.9	2.1	.66			36.7	HIGH H_2O ETOH 12.6	61-[illegible]
11-3493-35 5496 ✓					.49	1.7	1.9	88.6	1.7	2.8			26.1	MEBK .76	71-[illegible]

RUN # 129 NOV 11, 1989 11:40:56

START



STOP

11-3508-3513

RUN# 129 NOV 11, 1989 11:40:56

SAMPLE NAME: 5494 SAMPLE# 33 Rec ~ 63-65%

NVR 34.9%

AREA%

RT	AREA	TYPE	WIDTH	AREA%
6.860	102068	PB	.049	.49814
9.470	20022960	PB	.194	97.70253 TCE
14.009	63716	PB	.048	.31090
14.865	53835	PB	.050	.25781
17.419	142093	BB	.051	.69335
20.008	23136	PB	.050	.11289
23.568	25061	VB	.037	.12229
24.545	61921	VB	.038	.30214

TOTAL AREA=2.0494E+07

MUL FACTOR=1.0000E+00

Branch: 11 Mixed

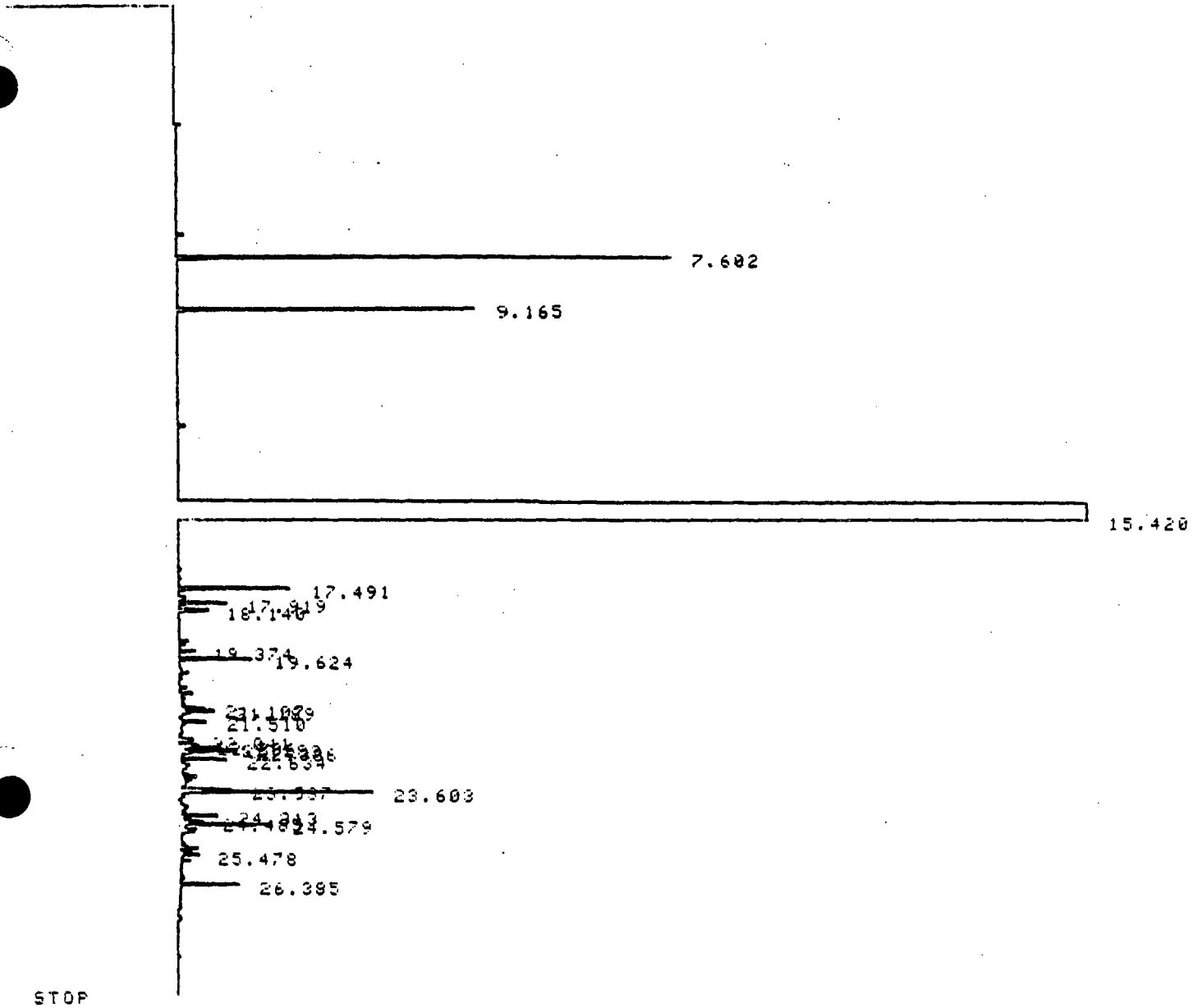
HEIREX CORP.
Ashtabula OH.

Date: 10.9.89 Analysts:

I.D.	Methl %	Isop.	TF	Me Cl2	Butylene Oxide	2-Butyl Alc	Dioxolane	1-1-1	TCE	1,4 Dioxane	Perc	CHO	N.V. R%	Notes	Recov
11-3123-3128 5005								.55	97.6				15.2		82-
11-3139-3140 5006									96.0				51.	TRACE H_2O TOL .53	46-
11-3206 5007									98.8				4.1		93-
11-3101-3120 5008						.94					97.4		6.3		91-
11-3121-3122 5009						1.8	1.9	85.3	2.2	3.6			45.9	TRACE H_2O MLBK 2.0 BC .75	52-
11-3129-3130 5010			2.7			1.2		65.1	3.0	12.0	1.2		61.4	HIGH H_2O MLBK 5.2 TOL .68 BC 3.2 ? 1.0	36-
11-3131-3137 5011					1.51	9.2	.67	86.4	2.8	.24			16.2	TOL 3.1	81-

RUN # 270 OCT 7, 1989 21:55:26

START



STOP

11-3101-3120

RUN# 270 OCT 7, 1989 21:55:26

SAMPLE NAME: 5008 SAMPLE# 1

NVR 6.3%

Rec ~ 91-93%

AREA%

RT	AREA	TYPE	WIDTH	AREA%	
7.602	178942	PB	.045	.94577	t-Butyl Alc
9.165	115365	PB	.048	.60975	
15.420	18438576	PB	.286	97.45466	perc
17.491	48567	BB	.053	.25669	
19.624	30796	PB	.050	.16277	
22.386	21944	VV	.048	.11598	
23.603	58583	VB	.038	.30963	
24.579	27398	VV	.038	.14481	

TOTAL AREA=1.8920E+07

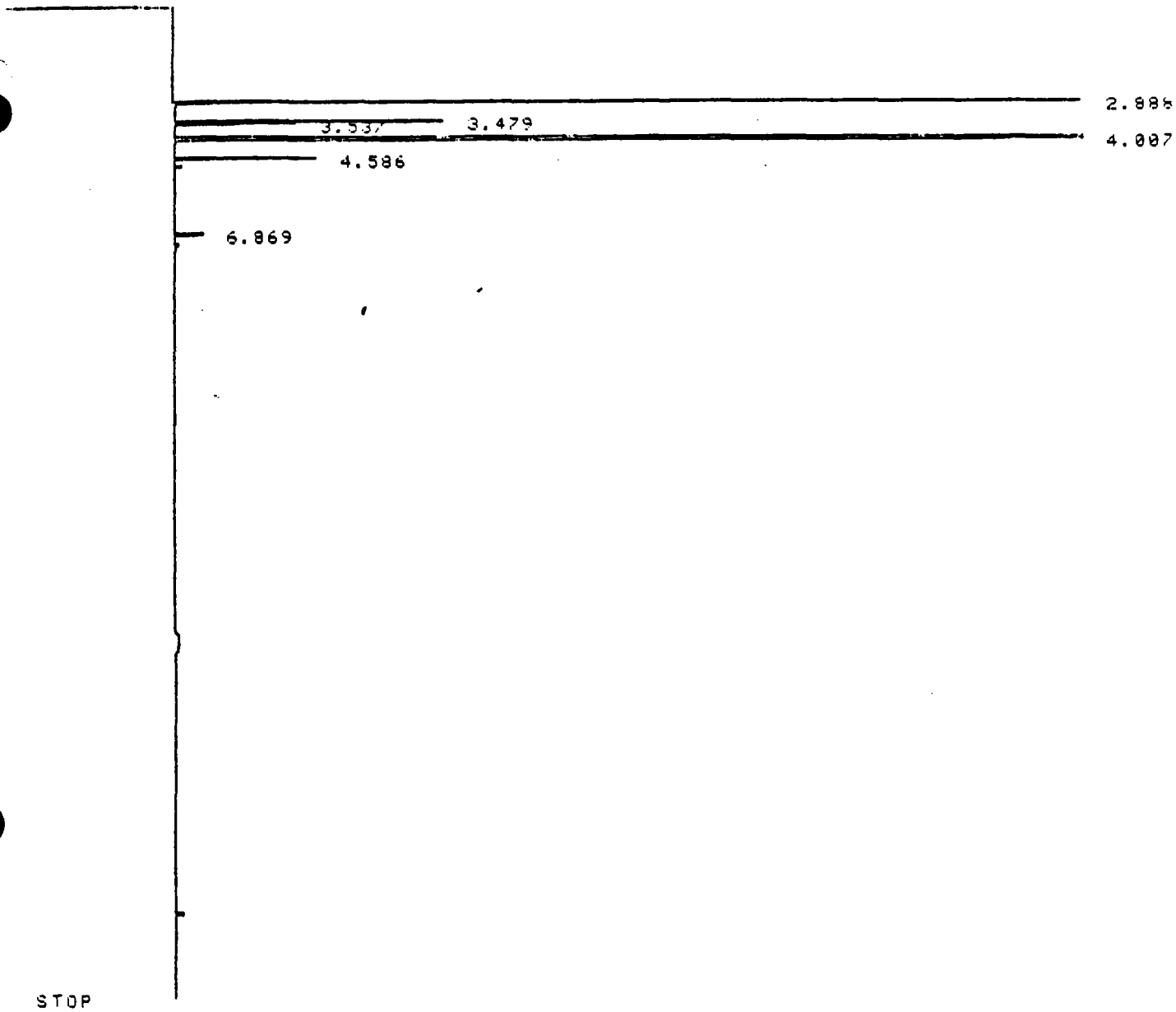
MUL FACTOR=1.0000E+00

Branch 11 Group Ashtabula OH. Date 11-1-89 Analysis

I.D.	Methyl	Isop.	TF	Me Cl2	Butylene Oxide	2-Butyl Alc	Dioxolane	1-1-1	TCE	1,4 Dioxane	Perc	CHO	N.V.R%	Notes	% Recov
11-3360-3361 5318								88.0					.28	? 1.0 ? 2.1 ? 2.3 TOL 1.5 MEK 2.2 ? 1.2	97-99
11-3384 5319					.82	1.4	.93	89.2	1.9	4.1			3.4		94-9
11-3406-3413 5320					1.3			90.8		5.2			12.7	TRACE H_2O	85-8
11-3424-3428 5321					.88			94.3		4.3			28.1		69-7
11-3354-3359 5323											91.3		39.2	MOD H_2O 4% MINSPIRITS	58-60
11-3414-3420 5324			91.8					3.5					5.4	HIGH H_2O 1.5% MINSPIRITS	92-9
11-3421-3423 5325	No Recovery														
11-3481 5326	*1.3		97.8										7.0		90-92

RUN # 554 OCT 31, 1989 17:35:34

START



STOP

11-3481

RUN# 554 OCT 31, 1989 17:35:34

SAMPLE NAME: 5326 SAMPLE# 10

Recn 90-922

NVR 7.0 %

AREA%

RT	AREA	TYPE	WIDTH	AREA%
2.888	169064	PB	.019	1.33591 Meth
3.479	44739	PV	.020	.35352
3.537	21822	VB	.022	.17243
4.007	12386952	PB	.042	97.87910 TF
4.586	32784	PB	.028	.25905

TOTAL AREA=1.2655E+07

MUL FACTOR=1.0000E+00

LABORATORY QUALITY ASSURANCE PROJECT PLAN

SOLVENT RECLAMATION PROGRAM
DETREX SOLVENT DIVISION LABORATORY

prepared for:

Detrex Corporation
Ashtabula, Ohio

JUNE 1990

REF. NO. 3467(1)

CONESTOGA-ROVERS & ASSOCIATES

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APPENDIX A
CONTENTS

LIST OF ACRONYMS AND SHORT FORMS

Detrex	-	Detrex Corporation Solvents Division
FID	-	Flame Ionization Detector
GC	-	Gas Chromatograph
MDL	-	Method Detection Limit
QA	-	Quality Assurance
QAMS	-	Quality Assurance Management Staff
QAO	-	Quality Assurance Officer
QAPP	-	Quality Assurance Project Plan
QC	-	Quality Control
USEPA	-	United States Environmental Protection Agency

1.0 INTRODUCTION

This Laboratory Quality Assurance Project Plan (QAPP) presents the policies, organization, objectives and specific quality assurance (QA) and quality control (QC) objectives designed to achieve the specific data quality goals associated with the Solvent Reclamation Program at the Detrex Solvent Division Laboratory in Ashtabula, Ohio. The purpose of the QAPP is to ensure that the sample results are accurate, precise and representative of the spent solvents analyzed at the Solvent Division Laboratory.

2.0 PROJECT DESCRIPTION AND OVERVIEW

Detrex Solvent Division specializes in the sale of halogenated solvents and cleaning equipment for degreasing operations and the reclamation (recycling) of solvents from spent solvents generated from degreasing operations. Incoming samples of spent solvents are analyzed in order to determine the recoverable halogenated solvent content solely for processing purposes and to ensure that the waste materials are properly labeled and manifested for shipping purposes.

Before any hazardous waste material is accepted from a new customer, the waste is sampled and assessed to ensure its characterization is acceptable to the recovery (recycling) operation. In addition to sampling, an effort is made to document the generation process of the waste to further characterize its composition.

The waste is sampled and a preliminary assessment of the waste sample is made by running a specific gravity test to determine the approximate solvent content. The sample is then sent to the Detrex Solvent Division laboratory for analysis.

Regardless of whether or not Detrex accepts the waste for processing, all of the foregoing knowledge, including laboratory results, is kept in the customer's file for future reference and comparison with future shipments, if they become a regular customer.

For regular customers, Detrex generally picks up the waste drums with its own truck. This allows the driver to inspect the drums prior to delivering them to the facility to ensure they are properly labeled and manifested and that the drums are in good condition for shipping.

Upon receipt at the facility, each drum is sampled and analyzed for specific gravity to determine the solvent content of the drum. In addition, during sampling, observations are made and recorded pertaining to abnormal solid content, an odor that is not a halogenated solvent characteristic odor, and whether it is an aqueous solution rather than oil/solvent mixture. A sample is then sent to the Division laboratory for chemical analyses.

2.1 TARGET COMPOUNDS

Target compounds for analysis will vary with the degreasing process that generated the spent solvents. Generally, a specific degreasing process will employ a specific solvent(s) in the operation. Consequently, the major constituents of the spent solvent samples are generally known prior to analysis and the analyses are performed for confirmatory and processing purposes. The target compounds for the spent solvents analyses are:

Compound	*Required Detection Limits*
1,1,1-Trichloroethane	0.5 %
Perchloroethylene	0.5 %
Trichloroethylene	0.5 %
Trichlorotrifluoroethane (freon)	0.5 %

Other analyses that are performed are, percent solvent content, stabilizer components content and percent non-volatile residue (NVR).

2.2 DATA USAGE

The principle usage of data is to confirm the identification of the major constituents of the spent solvents and determine the percentage of recoverable solvent. This information is used for processing and transportation purposes.

3.0 PROJECT DESCRIPTION AND RESPONSIBILITY

Figure 3.1 presents the key staff organization for the QAPP. A summary of each of the key personnel responsibilities is presented below:

R. J. Jones - Project Manager, Detrex Corporation Solvents Division

-general overview of the project to ensure that the objectives are met

-overall responsibility for the solvent reclamation project

M. Tepatti - Operations Manger Detrex Corporation Solvents Division

-general overview of the project operations

-responsible for the branch personnel sampling operations

Constance R. Dana - Laboratory Manager, Detrex Corporation Solvents Division

-routine assessment of measurement systems for precision and accuracy

-data reduction, validation and reporting

-development of QA/QC reports to management

-coordinate and schedule laboratory analyses

-supervise in-house chain-of-custody

-review calculations

-prepare and approve analytical reports

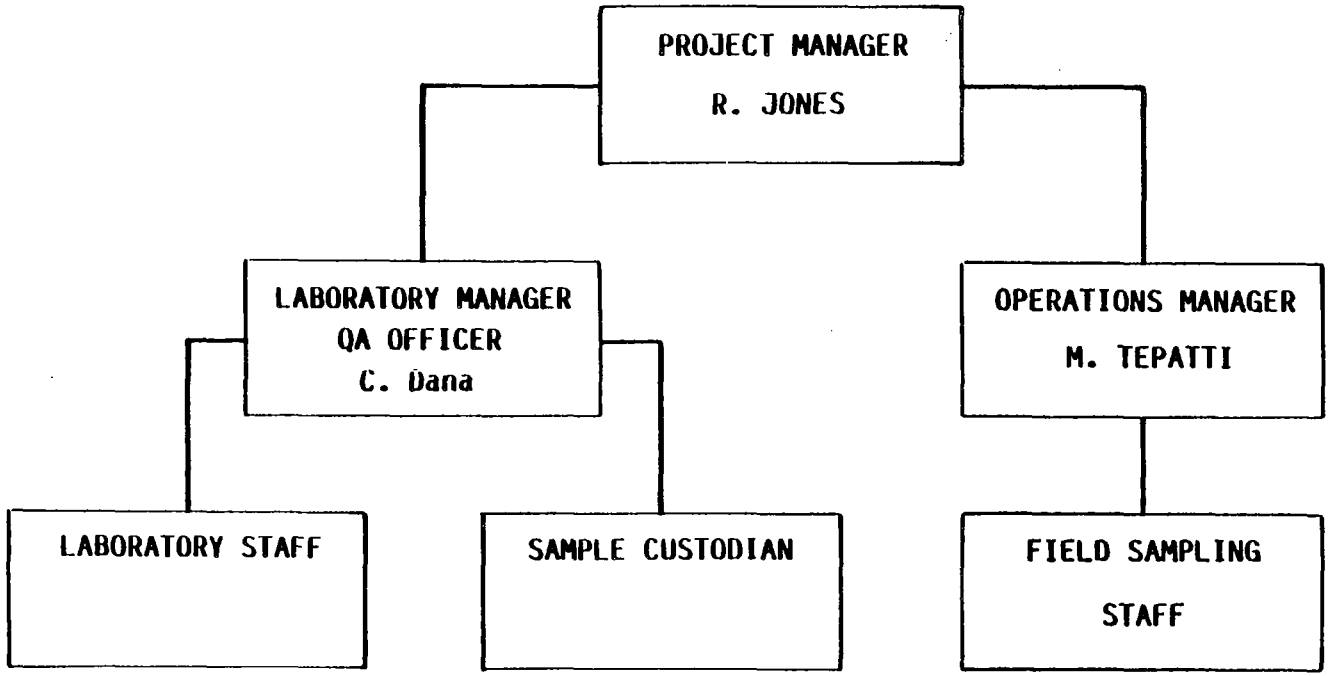

figure 3.1

STAFF ORGANIZATION
DETREX CORPORATION
SOLVENTS DIVISION
Ashtabula, Ohio

CRA

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-also serves as Quality Assurance Officer with the following responsibilities:

- overview laboratory quality assurance
- overview QA/QC documentation
- conduct detailed data review
- implement laboratory corrective actions, as required
- prepare laboratory Standard Operating Procedures (SOPs)
- approve the QAPP

Gilbert Rood - Laboratory Chemist

-sample extraction and instrumental analysis
-instrument maintenance and calibration
-standard preparation and documentation
-data reduction and calculations
-preparation of reagents
-wet chemical analytical determinations

Kathleen Smith - Chemical Technician

-sample extraction and instrumental analysis
-instrument maintenance and calibration
-standard preparation and documentation
-data reduction and calculations
-preparation of reagents
-wet chemical analytical determinations

Phyllis Rocco - Laboratory Assistant

-Designated as Sample Custodian with the following responsibilities:

-receipt and inspection of incoming samples

-signs appropriate documents

-verifies correctness of chain-of-custody documentation

-assignment of job and sample identification

-maintenance of sample logbook

-controls and monitors access/storage of samples and extracts

Branch Personnel

-serves as field sampling personnel with the following responsibilities:

-collection of representative samples

-sample labeling and chain-of-custody implementation

-decontamination of sampling equipment

-performance of % solvent field determination

4.0 QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT OF DATA IN TERMS OF PRECISION, ACCURACY, COMPLETENESS, REPRESENTATIVENESS

The overall QA objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analyses and reporting that will provide accurate data. Specific procedures to be used for sampling, chain-of-custody, calibration, laboratory analysis, reporting, quality control, audits, preventative maintenance and corrective actions are presented in subsequent sections of this QAPP. The purpose of this section, is to address the objectives of accuracy, precision, completeness, representativeness and comparability.

4.1 LEVEL OF QA EFFORT

Containerized spent solvent sampling is conducted to document the identification of the spent solvent and to obtain a field estimate of the percentage of recoverable solvent in the spent solvent/oil mixture. Samples are submitted to the laboratory to confirm the solvent type and for analysis of the recoverable solvent fraction of the spent solvent/oil mixture.

Sample analysis are performed following the SOPs as provided in Appendix A. The levels of laboratory QC effort for the analyses are specified in the applicable SOPs provided in Appendix A.

4.2 ACCURACY, PRECISION AND SENSITIVITY OF ANALYSES

The QA objectives for precision, accuracy and sensitivity are to achieve the QC acceptance criteria for the analytical procedures. The precision and accuracy guideline requirements are specified in the SOPs as provided in Appendix A.

Precision and accuracy for the halogenated solvent and NVR determinations will be determined by using duplicate samples and spiked samples, respectively.

For duplicate sample analysis, at least one duplicate sample will be analyzed at a frequency of 1% of all samples, or one per day, whichever is more frequent. The relative percent difference (RPD) for each detected analyte will be calculated for use during data assessment and validation. An advisory limit of 30% for RPD will be used for detected analytes above the detection limit. RPD will not be calculated for non-detected analytes.

For reagent blank analyses, at least one reagent blank will be processed and analyzed for 1% of all samples analyzed, or one per day, whichever is more frequent. The concentration for each component will be calculated for later use during data assessment and validation.

The matrix spike sample analysis is used to provide information on the effect of the sample matrix on the distillation procedure.

Matrix spike samples will be analyzed at a frequency of 1% of all samples, or one per week, whichever is more frequent. The individual component percent recoveries (%R) will be calculated and reported. The acceptance criteria for matrix spike samples are outlined in applicable SOPs presented in Appendix A.

Blank spike sample analysis is used to provide information on the accuracy of the method. Blank spike samples will be analyzed at a frequency of 1% of all samples, or one per week, whichever is more frequent. The individual component %R will be calculated and reported. The acceptance criteria for blank spike samples are outlined in applicable SOPs presented in Appendix A.

4.3 COMPLETENESS, REPRESENTATIVENESS AND COMPARABILITY

It is expected that all analyses performed by the applicable SOPs will provide data meeting QC acceptance criteria for 80 percent of all samples analyzed. Any reason for variances will be documented. Corrective action procedures used to maximize the number of usable analyses are outlined in Section 14.0 of the QAPP.

The sampling procedure to be used ensures that representative samples of the containerized spent solvents will be obtained. Comparability of laboratory analyses will be ensured by the use of consistent units of concentration and standard operating procedures.

4.4 FIELD MEASUREMENTS

Measurement of the percent solvent in the spent solvent/oil mixture is conducted in the field. This measurement is taken to determine the following:

-approximate solvent content of drum contents
-aqueous vs. organic liquid
-halogenated vs. non-halogenated solvent

The percent solvent determination is a screening procedure based on the specific gravity of the liquid sample. The procedure employs the use of a set of pre-calibrated hydrometers and the SOP is presented in Appendix A.

5.0 SAMPLING PROCEDURES

This section describes in detail the procedures that is be followed for sampling the drums of spent organic solvents.

5.1 SAFETY CONSIDERATIONS

-proper ventilation and dermal protection is provided for the sampling operation

-any built-up pressure within a drum is slowly released by gently cracking the bung

5.2 SAMPLING EQUIPMENT

Materials and equipment required for sampling are as follows:

1) 1 oz. narrow-mouth glass bottle with polyethylene-lined closure

2) sample label

3) 4-foot by 3/4 inch ID sampling thief

4) bung wrench

5) clean solvent of the same type as the spent solvent waste being sampled

6) packing slip or chain-of-custody form

5.3 DRUM SAMPLING

5.3.1 Discrete Liquid Concentrated Waste Samples

The following procedure shall be adhered to during the sampling of individual drums.

1) Remove bung.

2) Insert thief to the bottom of the drum or until a solid layer is encountered. About one foot of glass thief should extend above the drum.

3) Allow the waste in the drum to reach its natural level in the thief.

4) Cap the top of the thief with gloved thumb.

5) Carefully remove the thief from the drum and insert the uncapped end in a graduated beaker.

6) Release the thumb and allow glass thief to drain completely into the beaker.

7) Pour a portion of the waste sample directly from beaker to sample container or to graduated cylinder for composite samples.

8) Replace the drum bung.

5.3.2 Composite Liquid Concentrated Waste Samples

Due to the nature of degreasing operations, numerous drums of spent solvents may be generated from the same process with the same general characteristics (oil/solvent mixture). Consequently, composites of these concentrated waste samples may be produced to determine the average characteristics of the drum lot. It should be noted that the samples obtained are concentrated (percentage levels) organic solvents and any volatilization that may occur during the compositing procedure will be insignificant in comparison to the total concentration of organic solvents.

The following procedure shall be adhered to during composite sampling of drummed waste.

1) Obtain a sample from each drum in a lot from one customer (10 drums maximum) of a particular solvent waste (i.e., TCE) in the manner described in Section 5.3.1.

2) Place each sample into a graduated cylinder, flask or beaker.

3) Thoroughly mix the composite sample.

4) Draw from the composite two 1 ounce (fl.) samples and label accordingly.

5) Transfer one 1 ounce sample to the laboratory and retain the other sample for future reference.

6) Use a portion of the remaining composite to determine percent solvent content via the Specific Gravity Method.

5.3.3 Equipment Decontamination

The glass thief is decontaminated between each set of drum samples that are collected from a similar waste type. Decontamination consists of rinsing the glass thief with pure solvent of the same type as the solvent waste that is to be sampled.

5.4 SAMPLE HANDLING AND PRESERVATION TECHNIQUE

The following sections describe the sample handling techniques used in the project.

5.4.1 Sample Containers, Preservatives and Holding Times

Sample containers, preservatives and holding times are presented in Table 5.1.

5.4.2 Sample Labeling and Documentation

The following protocols are employed during the sampling procedure:

1) Samples are labeled with the branch identification number, unique drum number(s), solvent type and sampling date.

2) A packing slip with branch identification, date shipped, drum numbers, solvent type, customer, analysis requested and percent solvent from field determination is completed for each shipment.

3) The samples are packaged, sealed and delivered to the laboratory by common carrier at a minimum frequency of once per week.

4) Section 6.0 details the chain-of-custody procedure for the samples.

TABLE 5.1

SAMPLE CONTAINERS, PRESERVATION TECHNIQUES AND HOLDING TIMES FOR CONCENTRATED WASTE SAMPLES

Parameters	*Container*	*Preservative*	*Holding Time*
Volatile Organics	1 oz. glass with polyethylene-lined closure	none	14 days

6.0 SAMPLE CUSTODY AND DOCUMENT CONTROL

This section details the procedures and protocols which are followed for the transport of samples to the laboratory.

6.1 CHAIN-OF-CUSTODY

Currently, the packing list enclosed with the samples serves as the chain-of-custody document. This list is faxed to the laboratory prior to shipment. This list is checked against the sample container labels when it reaches the lab, the sample receiver assigns job and ID numbers, initials and dates the list and returns a copy to the facility. This procedure ensures proper sample identification is maintained throughout sampling and analysis.

A formal chain-of-custody document is currently under development, a draft copy of which is presented as Figure 6.1.

6.2 SAMPLE DOCUMENTATION AND STORAGE IN THE LABORATORY

Sample receipt and log-in procedures are presented in the associated SOP in Appendix A.

FIGURE 6.1

DETREX CORPORATION
SOLVENTS DIVISION

1100 N. State Rd. P. O. Box 1398
Ashtabula, OH 44004

FAX: (216)992-2904

TELEPHONE: LAB
(216)997-6131
EXT. 207/217

REQUEST FOR LABORATORY ANALYSIS

GENERATOR SUPPLIED INFORMATION (MUST BE COMPLETED)

Company Name: _____ EPA ID No.: _____

_____ Salesman: _____

Address: _____ Comments: _____

_____ _____

Phone No.: (___) _____

_____ *RETURN* or *DISPOSE* of samples
Submitted by: Date

PROJECT NAME OR NUMBER _____ NUMBER OF SAMPLES _____

SAMPLE TYPE(S) _____

HAZARD CLASS _____

ANALYSIS(SES) REQUESTED _____

PLEASE LIST SAMPLE IDENTIFICATION NUMBERS ON REVERSE SIDE
(Column No. 2)

CHAIN OF CUSTODY

Relinquished By: Name	Date	Time	Received By: Name	Date	Time

FOR LABORATORY USE ONLY

Generator ID _____ Work Order No. _____

Sample results reported by: _____ Date _____ Time _____
Sample results reported to: _____
Sample results recorded: _____
Laboratory Book No. Page No.

Office Use LAB ID NO.	GENERATOR ID NO.	SAMPLE TYPE	ANALYSIS REQUESTED	COMMENTS

6.3 STORAGE OF SAMPLES

Upon completion of each job, all associated samples are packaged together and stored for a maximum period of 90 days prior to disposal.

6.4 SAMPLE DOCUMENTATION

Upon completion of analysis, a file for each job is assembled containing the following information:

-sample identification documents
-packing list/chain-of-custody forms
-raw data
-calculation
-originals of chromatograms
-originals of reports issued

7.0 CALIBRATION PROCEDURES AND FREQUENCY

The procedures indicated below are performed for all samples delivered to the laboratory for analysis. Specific procedures are presented in the applicable SOPs in Appendix A.

In general, the instruments are calibrated each day of sample analysis or the continuing calibration is verified using check standards. All calibration records are maintained by the laboratory for future reference.

7.1 LABORATORY INSTRUMENT CALIBRATION

7.1.1 Gas Chromatograph

Prior to analysis, the GC is calibrated as specified in the SOP in Appendix A.

7.1.2 Precision Balance

The balance is initially calibrated at the factory and checked on a monthly basis. If the results of the periodic checks indicate a deviation from the expected value by more than 1%, recalibration by a certified technician must occur prior to use. The balance is cleaned and recalibrated by a certified technician at least yearly.

7.2 FIELD INSTRUMENT CALIBRATION

7.2.1 Hydrometers

No calibration of hydrometers is possible. However, inspection of equipment integrity occurs with each use. Should cracks or other defects be noted, the equipment will be replaced.

8.0 ANALYTICAL PROCEDURES

This section presents the analytical methods which are used by the laboratory to complete all required analyses.

8.1 HALOGENATED ORGANIC ANALYSIS

The method used for analysis is a modification of Methods 8010 and 8015 for Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846, 3rd edition, November 1986 (SW-846). The SOP is presented in Appendix A.

8.2 DETECTION LIMITS

Specific detections are highly matrix dependent. The detection limits for the analyses are presented in the SOPs in Appendix A.

9.0 DATA REDUCTION, VALIDATION AND REPORTING

Analytical data reduction and validation is performed under the direction of the laboratory QA officer (QAO). The QAO is responsible for assessing the data quality based on the QC results generated during the batch analyses. Figure 9.1 illustrates analytical data flow through the laboratory. Data reduction validation and reporting is conducted as detailed in the following steps:

-Raw data produced and checked by the responsible analyst is turned over for independent review by another analyst.

-The laboratory manager reviews the data for attainment of quality control criteria presented in the reference SOP.

-Upon completion of all reviews and acceptance of the raw data by the laboratory manager, a report is generated.

-The report and all supporting documentation is inspected by the QAO. Reanalysis of samples due to QC failure is determined and conducted.

-The final report is generated and signed by the laboratory manager.

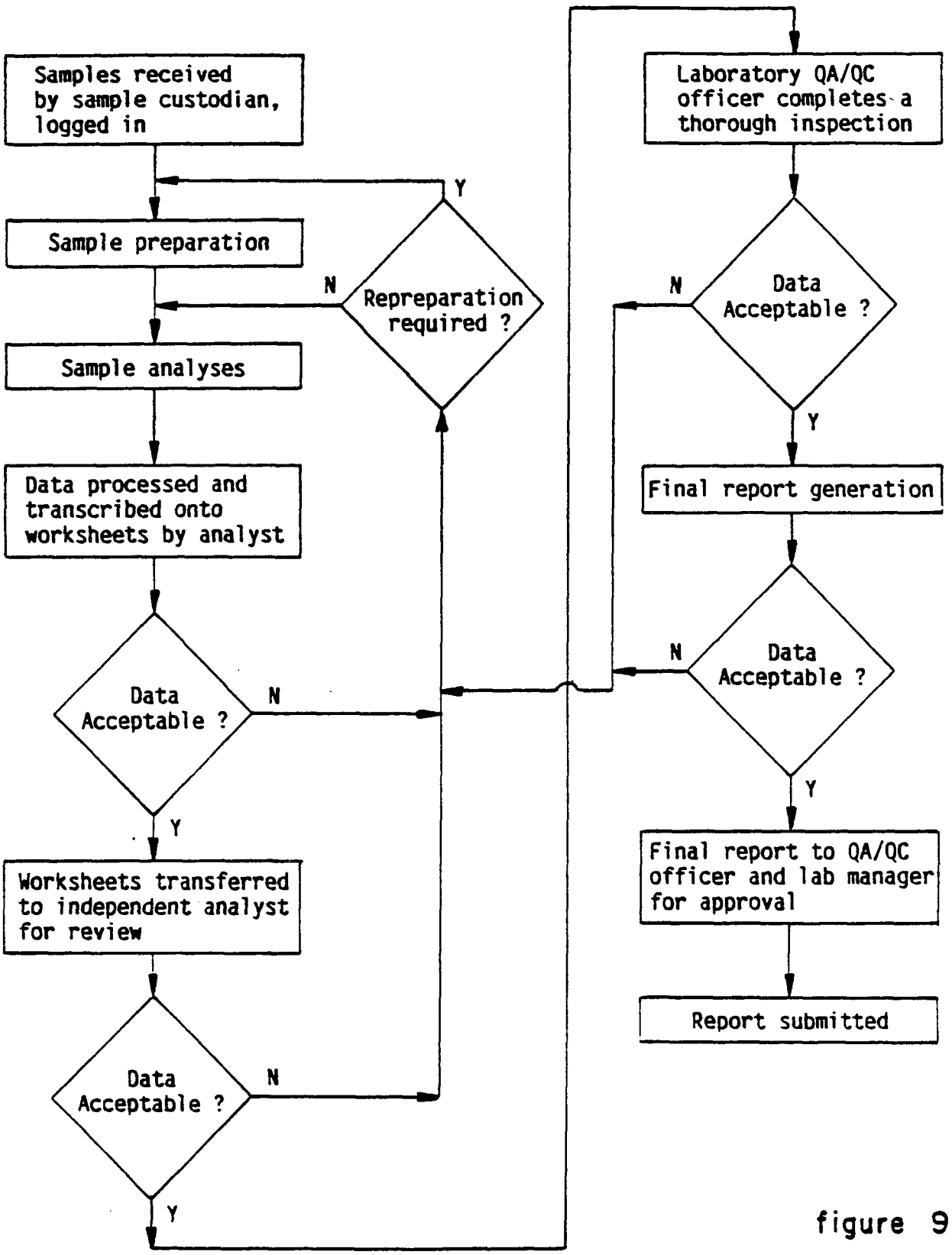


figure 9.1

ANALYTICAL DATA FLOW
DETREX CORPORATION
SOLVENTS DIVISION
Ashtabula, Ohio

CRA

3467-5/17/90

10.0 INTERNAL QUALITY CONTROL CHECKS AND FREQUENCY

The following sections present the internal quality control checks and frequency which are employed for field and laboratory measurements.

10.1 FIELD QC

Data generated from the field determination of % solvent by specific gravity is used for for estimating purposes only and is not reported. No substantial quality control procedures are employed for this determination.

10.2 LABORATORY QC

Specific procedures related to internal laboratory QC samples (matrix spike, blank spikes, reagent blanks, duplicates) are detailed in the following subsections.

10.2.1 Reagent Blanks

A reagent blank will be analyzed at a frequency of 1%, or one per day, whichever is more frequent. The reagent blank, an aliquot of analyte-free solvent (chlorobenzene) will be carried through the entire analytical procedure.

10.2.2 Matrix Spikes

A matrix spike sample consisting of a sample fortified with a known concentration of analyte will be analyzed at a frequency of 1% or one per week, whichever is more frequent. Acceptance criteria and representative compounds are identified in the SOP presented in Appendix A. The results of the matrix spike samples are used to assess the accuracy of the method in a specific matrix.

10.2.3 Blank Spike Samples

A blank spike sample consisting of a synthetic matrix (oil/solvent mixture) fortified with all halogenated compounds of interest is analyzed at a frequency of 1% or one per week, whichever is more frequent. Acceptance criteria for these samples are presented in the applicable SOPs. The results of the blank spike are used to assess the accuracy of the method on a generic matrix typical of the spent solvent/oil mixture samples.

10.2.4 Duplicate Sample Analysis

Duplicate sample analysis are performed at a frequency of 1% or one per day, whichever is more frequent. This QC measure is performed to assess the analytical precision of the method and is applicable to the method as all samples will contain measurable concentrations of analyte(s).

11.0 PERFORMANCE AND SYSTEM AUDITS AND FREQUENCY

For the purpose of internal evaluation, data from the project is evaluated on a continuing basis by the QAO over the duration of the project.

System audits are qualitative evaluations of all components of laboratory quality control measurement systems and are used to determine if the measurement systems are being used appropriately. The audits are conducted before the systems are operational and during the project. Such audits typically involve a comparison of the activities given the QA/QC plan described herein with activities actually performed.

The performance audit is a quantitative evaluation of the measurement systems used for a monitoring program. It requires testing the measurement systems with samples of known composition to evaluate precision and accuracy. The performance audit is accomplished by the review and statistual evaluation of QC sample results and is conducted and initiated by the QAO.

12.0 PREVENTIVE MAINTENANCE

Critical to the performance and minimization of downtime of all equipment, whether it be measurement or support, is proper maintenance. Preventive maintenance is performed as recommended by the manufacturer of the respective equipment. This maintenance will consist of, but is not limited to, the following minimum procedures at the specified time intervals.

12.1 PRECISION BALANCE

The balance will be cleaned and calibrated on a yearly basis by a certified technician., or more frequently should the need arise.

12.2. GAS CHROMATOGRAPH

Routine maintenance of the gas chromatograph includes daily checks of gas inventory, changes of septa as required by instrument performance, or at least weekly. Changes of injection port liners and clipping of the front end of the capillary column is performed as necessary. A maintenance contract with provisions for routine preventive maintenance visits is also maintained on the instrument.

13.0 SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

13.1 QA MEASUREMENT QUALITY INDICATORS

13.1.1 Precision

Precision is assessed by comparing the analytical results between duplicate samples.

13.1.2 Accuracy

Accuracy is assessed by comparing a set of analytical results to the accepted or "true" values that would be expected. In general, matrix spike samples, duplicate samples and calibration check sample recoveries are used to assess accuracy.

13.2 STATISTICAL EVALUATIONS

In examination of data and determination of its precision and accuracy, standard statistical formulae will be used. Among these are the following:

1) Mean of Measurements Generated by Each Sample Parameter (X)

$$X = \left(\frac{1}{N}\right)\left[\sum_{i=1}^{N} (X_i)\right]$$

where N = number of measurements
X_i = value of the measurement

2) Standard Deviation of a Series of Individual Determination(s)

$$s = \sqrt{\frac{\sum_{i=1}^{N} X_i^2 - \frac{\left(\sum_{i=1}^{N} X_i\right)^2}{N}}{N-1}}$$

where N = number of measurements
X_i = value of the measurement

3) Percent Relative Standard Deviation (% RSD)

$$\%RSD = \left(\frac{s}{\bar{x}}\right) \quad 100$$

s = standard deviation for a series of individual measurements
$\bar{x}$ = mean of the measurements

4) Percent Recovery

Percent recovery of spikes will be used to establish analytical accuracy and will be evaluated as follows:

$$\text{Matrix Spike Recovery} = \left(\frac{A-B}{C}\right) 100$$

where:

A = the analyte concentration determined experimentally from the spiked sample;

B = the background level determined by a separate analysis of the unspiked sample; and

C = the amount of the spike added.

5) Relative Percent Difference (RPD)

$$RPD = \frac{\left(\frac{X_1 - X_2}{X_1 + X_2}\right)}{2} 100$$

where:

X_1 = first value, (i.e., MS value)

X_2 = second value, (i.e., MSD value)

14.0 CORRECTIVE ACTION

The need for corrective action may be identified by system or performance audits or by standard QC procedures. The essential steps in the corrective action system will be:

- Checking the predetermined limits for data acceptability beyond which corrective action is required;

- Identifying and defining problems;

- Assigning responsibility for investigating the problem;

- Investigating and determining the cause of the problem;

- Determination of a corrective action to eliminate the problem (this may include reanalyses or resampling and analyses);

- Assigning and accepting responsibility for implementing the corrective action;

- Implementing the corrective action and evaluating the effectiveness;

- Verifying that the corrective action has eliminated the problem; and

- Documenting the corrective action taken.

For each measurement system, the QAO will be responsible for initiating the corrective action and the laboratory manager will be responsible for implementing the corrective action. The corrective action taken will depend upon the QA/QC criteria that did not meet the necessary criteria, and may range from qualifying the data to resampling. Corrective actions are further defined in the SOPs presented in Appendix A.

15.0 QUALITY ASSURANCE REPORT TO MANAGEMENT

Management will receive reports on the performance of the measurement system and the data quality at regular internals.

Minimally, these reports will include:

- Assessment of measurement quality indicators, i.e., data accuracy, precision and completeness;
- Results of system audits; and
- QA problems and recommended solutions.

The project QAO will be responsible within the organizational structure for preparing these periodic reports.

APPENDIX A
STANDARD OPERATING PROCEDURES

CONTENTS

STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEDURE FOR GLASSWARE CLEANING

STANDARD OPERATING PROCEDURE FOR GLASSWARE CLEANING

1.0 SCOPE AND APPLICATION

The following describes the procedure for cleaning glassware. The procedure is applicable to glassware used in processing spent solvent samples.

2.0 SUMMARY OF METHOD

Glassware is subjected to a solvent rinse, detergent wash, tap water rinse, deionized water rinse and allowed to air dry.

3.0 APPARATUS AND REAGENTS

3.1 Deionized Water - ASTM Type II

3.2 Detergent - Baxter Micro - All purpose laboratory cleaner

3.3 Mixed Solvent - Halogenated mixed reclaimed solvent

3.4 Brushes - Assorted flask and tube brushes

4.0 PROCEDURE

4.1 Remove oily residue by rinsing glassware with mixed solvent. Collect waste and allow to drain.

Note: This step is unnecessary for glassware not used for spent solvent mixtures.

4.2 Add detergent/water mixture and scrub vigorously to remove any remaining debris.

4.3 Drain and rinse thoroughly with tap water. Drain to remove excess tap water.

4.4 Rinse at least three times with deionized water. Water should sheet off glassware with a minimum of water droplets remaining on the inside surfaces. If not, repeat procedure.

4.5 Drain and allow to air dry prior to reuse.

STANDARD OPERATING PROCEDURE FOR SAMPLE RECEIPT AND LOG IN

STANDARD OPERATING PROCEDURE FOR SAMPLE RECEIPT AND LOG IN

1.0 SCOPE AND APPLICATION

The following describes the procedure for sample receipt and log in for the solvent reclamation program.

2.0 SUMMARY OF METHOD

Following collection, the samples are transported to the laboratory accompanied by chain-of-custody documentation. The samples are assigned a unique job number and unique sample numbers. All pertinent information is recorded in a bound, consecutively page-numbered logbook and scheduled for analysis.

3.0 PROCEDURE

3.1 Samples are delivered to the laboratory by means of common carrier and transferred to the sample custodian.

3.2 The sample custodian opens the package and removes the samples and associated chain-of-custody documentation. Any evidence of tampering with the sample package is recorded on the chain-of-custody document.

3.3 The contents of the package is compared against the chain-of-custody document and any discrepancies are noted.

3.4 The sample custodian assigns a unique job number and unique sample numbers to the samples.

3.5 The chain-of-custody document is completed and the job, sample numbers, and associated information is recorded in the sample log book.

3.6 An analytical request form is completed and the samples and copies of associated paperwork from each job is placed in a basket. The container is tagged with the job number and transferred to the appropriate analyst for analysis.

3.7 All original documentation is bound in a permanent book.

3.8 Upon completion of analysis, all samples from a job are stored together with the job tag for 90 days prior to disposal.

4.0 FORMS

Copies of forms and log books used during sample receipt and log in are attached for reference.

4-9-90
J-0111 7645-02-0585 - American Precision - Freon - - R4B -

4-9-90
J-0112
7649-03-0234 - Mag Products - 111
7650-03-0235 - Fan Rite - 111
7651-03-0236 - Electral - 111
7652-03-0237 - Turgeon & Sons - 111
7653-03-0238 - Caran Precision - 111

4-9-90
J-0113
7654-04-3105-3106 - TCE Great Neck Saw
7655-04-3106-3108 - Park-Gibson Tube Inc
7656-04-3109 - DG - Union Broach
7657-04-3110-3114 - TCE Instrument Spec
7658-04-3115-3120 - Manley Div KSG
7659-04-3117 - DG Manley Div KSG
7660-04-3121-3126 - TCE Textron Lycoming

4-9-90
J-0113
7661-04-3127-3130 - TCE Textron Lycoming
7662-04-3131 - TCE - Textron Lycoming
7663-04-3132 - TCE - Textron Lycoming

J-0114
7664-13 - Aluminx - 111 -
7665 13 - C-X17 - TT - Smithkline Beckman Corp

4-10-90
J-0115
7666-11-46552 - TRI - Liquid Waste Removal
7667-11-46553 - TRI - Liquid Waste Removal
7668-11-46549-4550 - TRI - US Engineering
7669-11-4556-4555 - TRI - Brookside Corp
7670-11-4564-4561 - Freon - Kingston Technical
7671-11-4562-4563 - Park - Hoking MFG
7672-11-4571-4571 - Park - Hoking MFG
7673-11-4555-4557 - TRI - EMC Corp.

4-10-90

PACKING LIST

5-16-90

BRANCH 08-NC SALESMAN WATSON DATE SHIPPED 5/15 DATE RECVD ↑

J0210

LABEL	Drum Nos.	Type Solv.	Drums No.	Sampled Total Wt.	Customer	% Solvent Est.	Lab
8210	2371-2380	1-1-1	10	4508	CONBRACO-P	45	
8211	2381-2385	1-1-1	5	2189	"	66	
8212	2432-2439	TRI	8	3891	R. BOSCH	52	
8213	2440-2447	TRI	8	3176	"	48	
8214	2448-2457	FREON	10	6166	"	93	
8215	2458-2467	FREON	10	4945	"	90	
8216	2468-2477	FREON	10	6098	"	96	
8217	2478	FREON	1	394	"	94	

Richard,

Results will be faxed to you by 1700 hrs. on 5-18-90

Phyllis

DETREX CORPORATION
SOLVENTS DIVISION

1100 N. State Rd. P. O. Box 1398
Ashtabula, OH 44004

FAX: (216)992-2904

TELEPHONE: LAB
(216)997-6131
EXT. 207/217

REQUEST FOR LABORATORY ANALYSIS

GENERATOR SUPPLIED INFORMATION (MUST BE COMPLETED)

Company Name: _____ EPA ID No.: _____

_____ Salesman: _____

Address: _____ Comments: _____

_____ _____

Phone No.: ( ) _____

_____ *RETURN* or *DISPOSE* of samples
Submitted by: Date

PROJECT NAME OR NUMBER _____ NUMBER OF SAMPLES _____

SAMPLE TYPE(S) _____

HAZARD CLASS _____

ANALYSIS(SES) REQUESTED _____

PLEASE LIST SAMPLE IDENTIFICATION NUMBERS ON REVERSE SIDE
(Column No. 2)

CHAIN OF CUSTODY

Relinquished By: Name	Date	Time	Received By: Name	Date	Time

FOR LABORATORY USE ONLY

Generator ID _____ Work Order No. _____

Sample results reported by: _____ Date _____ Time _____
Sample results reported to: _____
Sample results recorded: _____
Laboratory Book No. Page No.

Office Use LAB ID NO.	GENERATOR ID NO.	SAMPLE TYPE	ANALYSIS REQUESTED	COMMENTS

DETERMINATION OF SOLVENT CONTENT IN SPENT SOLVENTS FROM DEGREASING OPERATIONS USING SPECIFIC GRAVITY METHOD

DETERMINATION OF SOLVENT CONTENT IN SPENT SOLVENTS FROM DEGREASING OPERATIONS USING SPECIFIC GRAVITY METHOD

PROCEDURE

Collect sample using the Glass Thief.

1. Transfer sample to a container of sufficient size to allow for mixing.

2. Shake container for at least 30 seconds.

3. Place the thermometer and a hydrometer in the hydrometer jar.

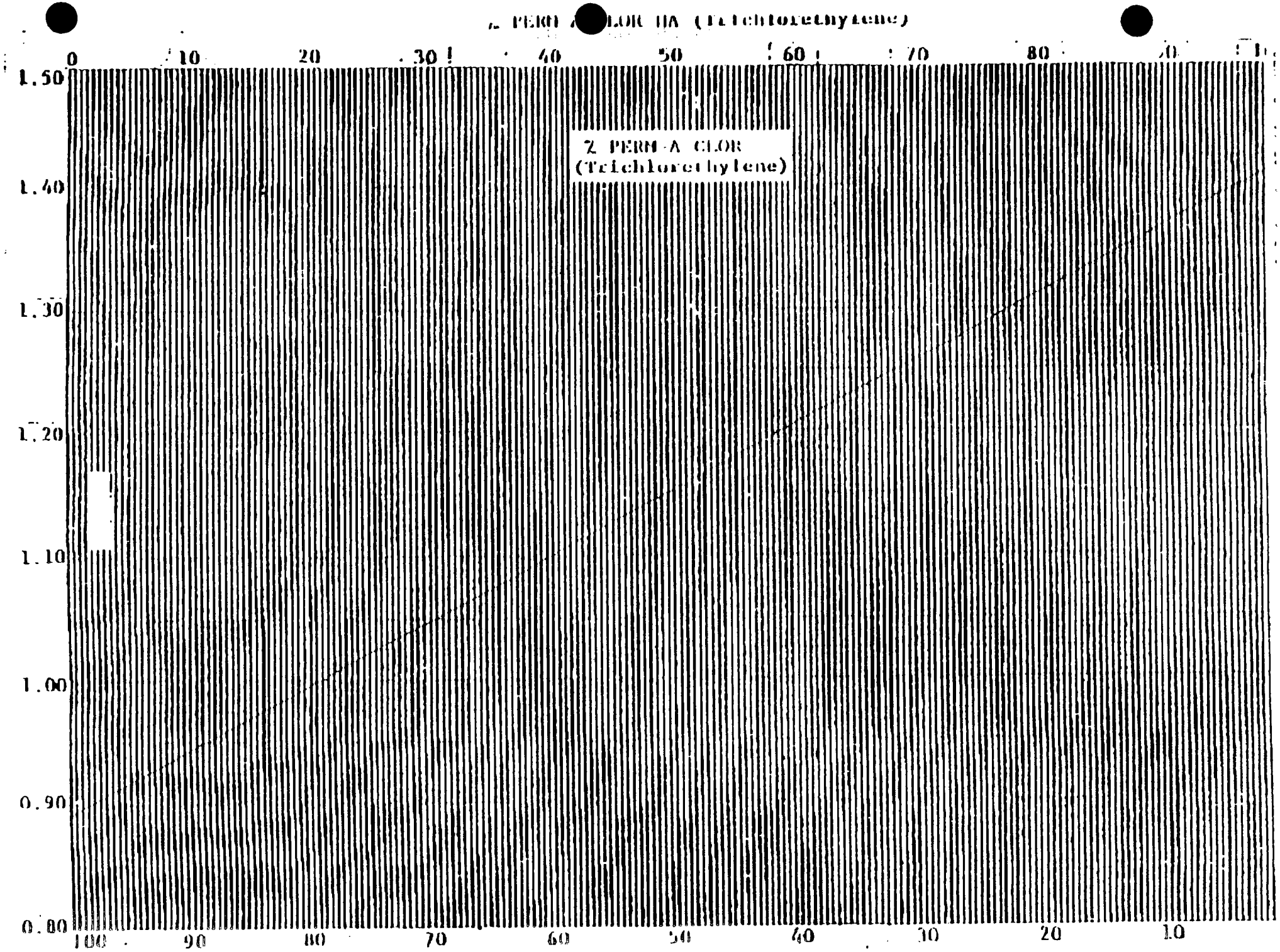
4. Fill the hydrometer jar to within one inch of the top with the mixture to be tested.

5. If the hydrometer reads off-scale, replace it with a higher or lower range hydrometer as required.

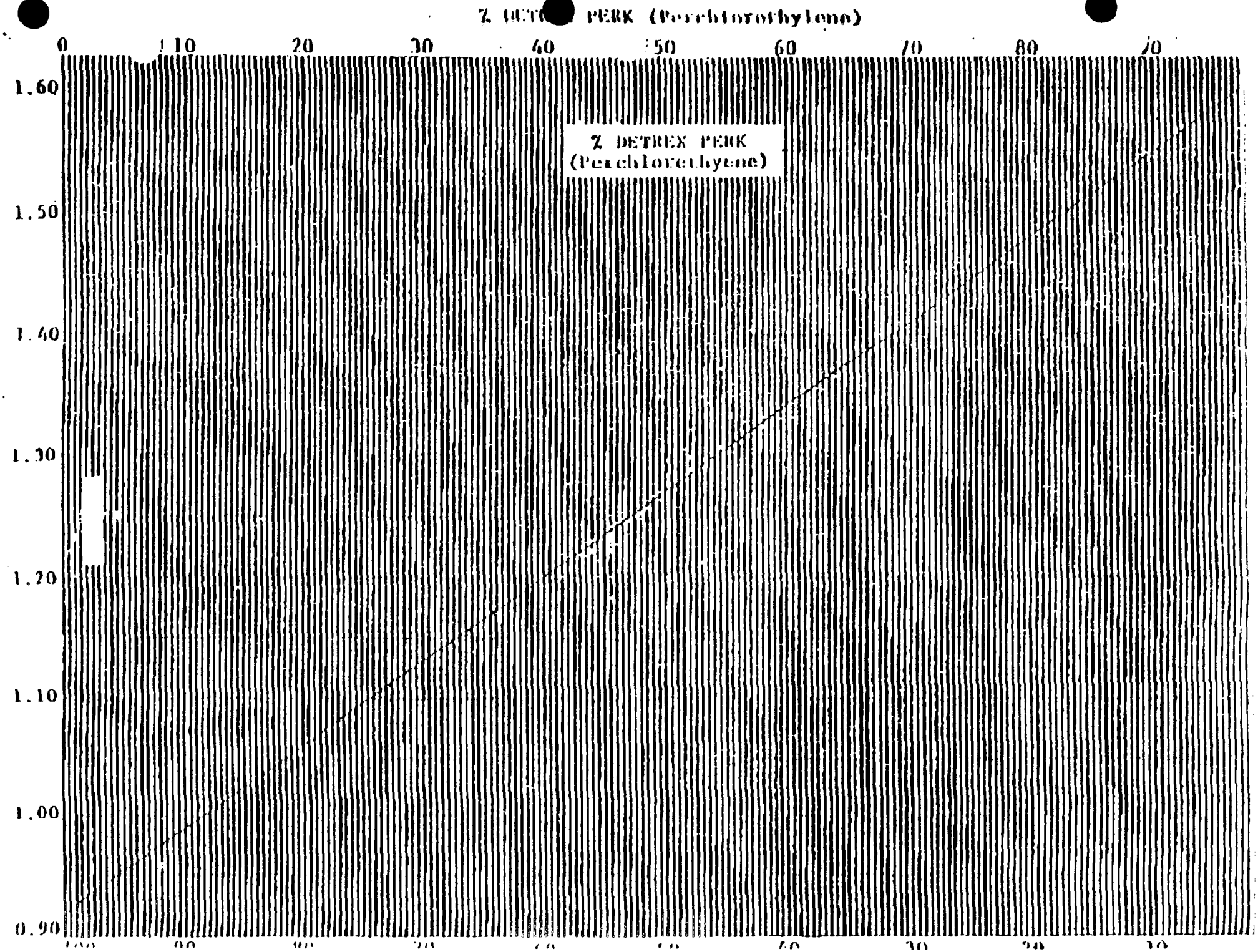
6. Read the hydrometer to the nearest 0.01 SpG Unit.

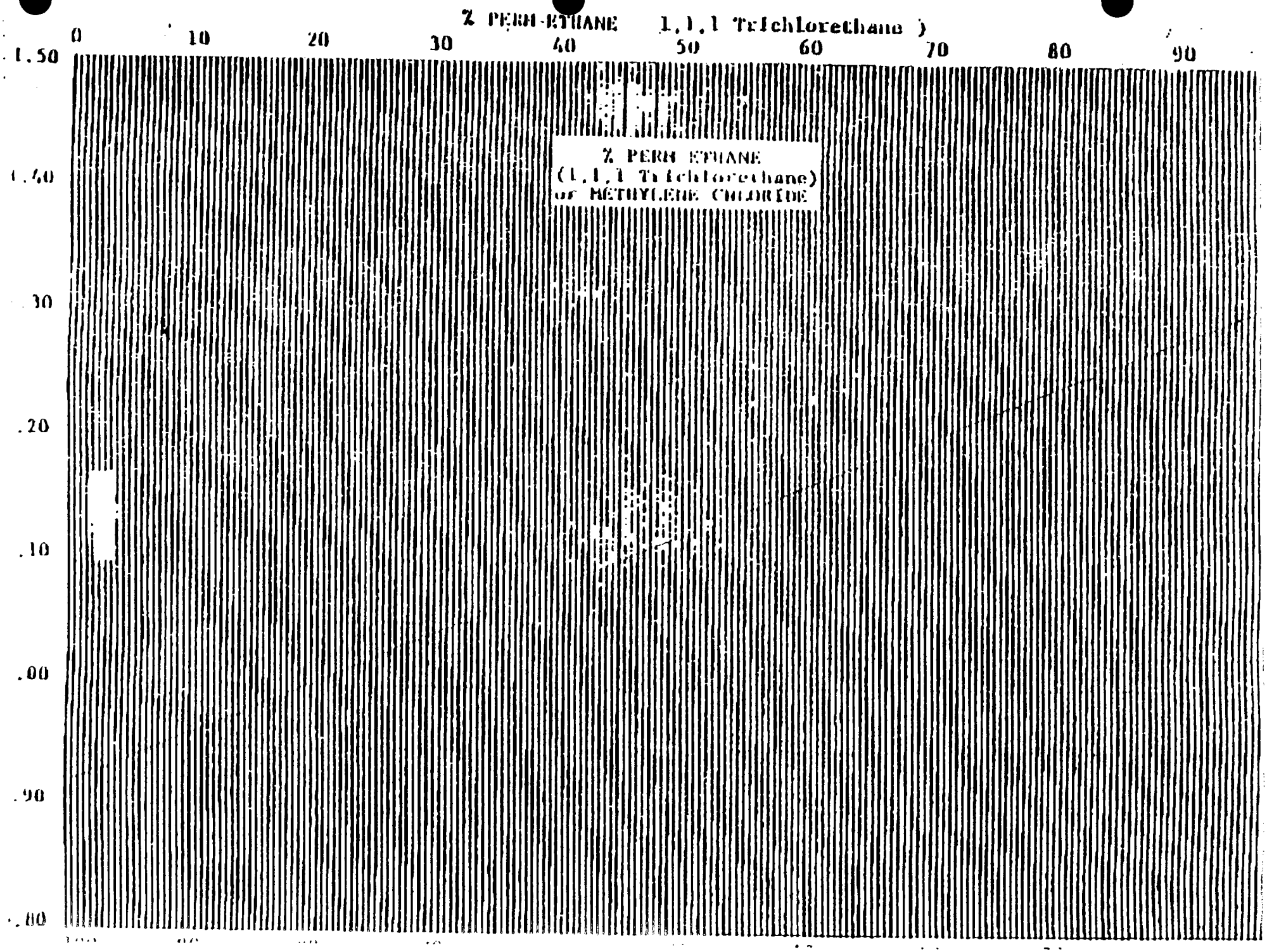
7. Using the attached Solvent-Oil Mixture vs. Gravity Graph or Chart, for the appropriate solvent type, determine the weight percent oil.

8. The solvent concentration is read directly from the graph.

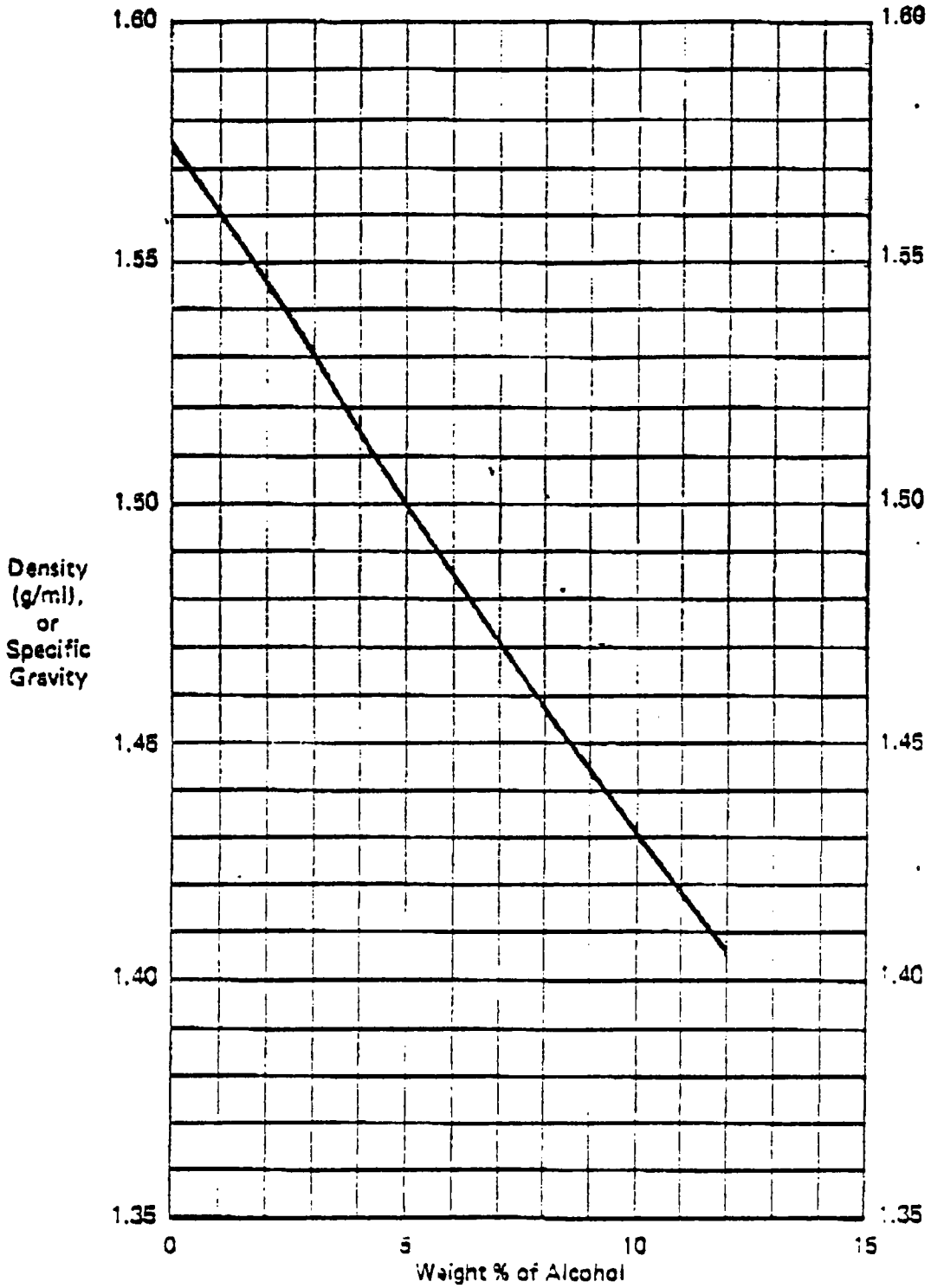

% PERM-A CLOR
(Trichloroethylene)
0
10
20
30
40
50
60
70
80
1.50
1.40
1.30
1.20
1.10
1.00
0.90
0.80
100
90
80
70
60
50
40
30
20
10

AIL


% DETREX PERK (Perchlorethylene)
0
10
20
30
40
50
60
70
80
90
1.60
1.50
1.40
1.30
1.20
1.10
1.00
0.90
% DETREX PERK
(Perchlorethylene)


% PERH-ETHANE 1,1,1 Trichlorethane)
0
10
20
30
40
50
60
70
80
90
1.50
1.40
30
.20
.10
.00
.90
.80
% PERH ETHANE
(1,1,1 Trichlorethane)
or METHYLENE CHLORIDE

DENSITY/SPECIFIC GRAVITY OF MIXTURES OF "FREON" TF WITH METHANOL OR SDA-30 ETHANOL AT 70°F (21.1°C)



E. I. du Pont de Nemours & Co. (Inc.) • "Freon" Products Division • Wilmington, Delaware 19898

E-09975, 1M, 11/83

Printed in U.S.A.

STANDARD OPERATING PROCEDURES FOR THE EXTRACTION OF SPENT SOLVENTS

STANDARD OPERATING PROCEDURES FOR THE EXTRACTION OF SPENT SOLVENTS

1.0 Scope

This method describes a sampling preparation procedure for the determination of halogenated solvents in a spent halogenated solvent oil mixture.

2.0 Summary of Method

A sample of spent halogenated solvent waste is weighed in a tared, flat bottom flask. The flask is connected to a rotary vacuum evaporator and the solvent is vacuum distilled from the mixture, the weight of residue is determined, and the total non-volatile percentage calculated.

3.0 Apparatus and Materials

3.1 Rotary vacuum evaporator with heating bath.

3.2 250 m*l* flat or round bottom flasks:

3.3 Precision Balance: capable of measuring to .005 $\pm$ 001 g.

3.4 Vacuum Apparatus: water aspirator.

4.0 Procedure

Preheat water bath to 90°C. Pour approximately 30 m*l* of sample into a tared flat bottom flask, weigh and record initial weight. Attach flask to rotary vacuum evaporator, apply vacuum, lower flask into water bath and roto-evaporate solvent from solvent-oil sample until condensate ceases flowing from the condensor. Remove flask from evaporator, dry, reweigh and record. Remove (pour) distillate from receiving flask into clean sample container and store for analysis.

5.0 Determination of % Non-Volatile Residue

The calculation of % non-volatile residue is as follows:

$$\frac{R}{S} \times 100 = \% \text{ NV}$$

R=Mass of residue after roto-evaporation

S=Mass of waste solvent before roto-evaporation

6.0 The solvent is subsequently analyzed for individual halogenated solvents by gas chromatography.

STANDARD OPERATING PROCEDURES FOR THE DETERMINATION OF SOLVENTS IN SPENT SOLVENTS BY GAS CHROMATOGRAPHY

STANDARD OPERATING PROCEDURES FOR THE DETERMINATION OF SOLVENTS IN SPENT SOLVENTS BY GAS CHROMATOGRAPHY

1.0 SCOPE

1.1 This method is used for the determination of recoverable halogenated and non-halogenated solvents in spent solvent oil mixtures. Applicable analytes and their respective retention times are presented in Table 1.

1.2 The range of concentration determined by this method is 0.5 to 100% and is applicable only to concentrated organic matrices.

1.3 This method is based upon a gas chromatographic/flame ionization detection (GC/FID) procedure.

2.0 SUMMARY OF METHOD

2.1 Prior to analysis, the samples are prepared for gas chromatography using the extraction procedure for waste solvent.

2.2 An aliquot of the extract is introduced into the gas chromatograph by direct injection. The solvents are separated by a capillary column and detected by a flame ionization detector.

3.0 INTERFERENCES

3.1 Potential interferences from the waste mixture are effectively reduced or removed by the vacuum distillation extraction procedure.

TABLE 1
RETENTION TIMES FOR ORGANIC SOLVENTS

Compound	*Retention Time (minutes)*[1]
Methanol	2.83
Ethanol	3.16
Acetone	3.46
2-Propanol	3.51
t-Butyl alcohol	3.77
Freon	3.91
Methylene chloride	3.99
Nitromethane	4.45
Butylene oxide	5.19
Methylethylketone	5.22
sec-Butyl alcohol	5.32
Dioxolane	5.63
1,1,1-Trichloroethane	6.76
n-Butyl alcohol	7.69
Trichloroethylene	9.01
1,4-Dioxane	9.43
Methylisobutyl ketone	11.0
Toluene	12.4
Perchloroethylene	14.8

[1]Retention times are approximate and for illustration purposes only. Daily operating conditions will affect actual retention times.

4.0 APPARATUS AND MATERIALS

4.1 Gas Chromatograph - Hewlett-Packard HP 5890 with Model 7673A autosampler and Model 3396 integrating recorder.

4.2 Column - Hewlett-Packard Ultra 2 (cross linked 5% phenyl methyl silicone gum) 50 meter x 0.32 mm ID with 0.52 µm film thickness

4.3 Detector - Flame Ionization Detector

4.4 Volumetric flasks - 10 ml Class A

4.5 Precision Balance - Capable of weighing 0.05 ± 0.01g

4.6 Pastuer Pipettes - 5 3/4" glass disposable

5.0 REAGENTS

5.1 Solvents - Chlorobenzene (ACS grade minimum with no interfering impurities)

5.2 Calibration Standards

Due to the high concentration range of this method, calibration standards may be prepared directly from the neat solvents.

5.2.1 Halogenated Solvents

ACS grade (99%+) solvents with no interfering peaks:

1,1,1-Trichloroethane

Trichloroethylene (trichloroethene)

Perchloroethylene (tetrachloroethene)

1,1,2-Trichloro-1,2,2-trifluoroethane (freon 113)

Methylene chloride

5.2.2 Non-Halogenated Solvents

ACS grade (99%+) solvents with no interfering peaks:

Methanol	n-Butyl alcohol
Ethanol	1,4-Dioxane
Acetone	Methylisobutyl ketone
2-Propanol	Toluene
t-Butyl alcohol	Methyl ethyl ketone
Nitromethane	
Butylene oxide	
sec-Butyl alcohol	
dioxolane	

5.2.3 Preparation of Standards

Calibration standards of the solvents are prepared at three concentration levels by weighing the appropriate mass of solvent in a tared 10 m*l* volumetric flask and diluting to the mark with

chlorobenzene. Mixed standards may be prepared for the dilute standards. The procedure is:

-a clean, dry 10 m*l* volumetric flask is filled approximately half full with chlorobenzene. Allow the flask to stand approximately 10 minutes of until the wetted surfaces have dryed. Weigh the flask to the nearest 0.001 g.

-Using a Pastuer pipette, transfer the appropriate mass of solvent to the flask ensuring that the drops fall directly into the chlorobenzene without contacting the neck of the flask.

-Reweigh, dilute to the mark, stopper and mix by inverting the flask at least six times.

-Calculate the concentration in weight/volume percent from the net gain in weight. Correct for compound purity if purity is less than 98%.

-Repeat procedures for remainder of standards. For less concentrated standards, multiple compounds may be added.

-Transfer standards to the appropriate vials and cap with teflon lined closures.

6.0 SAMPLE COLLECTION, PRESERVATION AND HANDLING

Sampling procedures are outlined in section 5.0 of the QAPP

7.0 PROCEDURE

7.1 Extraction

The procedure for sample extraction presented in the Standard Operating Procedures.

7.2 Gas Chromatography Conditions

Initial oven temperature and holding time	35° - 6 minutes
Oven temperature program 1	4°C/minute
Second oven temperature and holding time	90°C - 0 minutes
Oven temperature program 2	10°C/minutes
Final oven temperature and holding time	180°C - 1 minute

Injector temperature	200°C
Detector temperature	250°C
Injector: Split-split ratio	1:100
Sample volume	1.0 µl
Carrier gas	Helium at 180 psi
Detector gas	Hydrogen at 18 psi Air at 45 psi

7.3 Calibration

7.3.1 External Standard Calibration Procedure

7.3.1.1 For each analyte of interest, prepare calibration standards at a minimum of three concentration levels by the procedure described in section 5.2.3.

7.3.1.2 Inject each calibration standard using the autosampler. Tabulate peak area response against the amount of injected for each compound of the standard. This ratio of area to amount injected is termed the calibration factor and is defined as:

$$\text{Calibration factor} = \frac{\text{Total Area of Peak}}{\text{\% component}}$$

If the percent relative standard deviation (%RSD) of the calibration factors is less than 20% over the working range, linearity throughout the origin is assumed and the average calibration factor may be used. If the %RSD is greater than 20%, then a calibration curve is calculated using linear regression analysis. The minimum acceptable correlation coefficient is 0.975.

7.3.1.3 The working calibration curve or calibration factor must be verified each working day by the inspection of one or more calibration standards. If the response for any analyte varies from the predicted response by more than $\pm$ 15%, a new calibration curve must be established for that analyte.

$$\% \text{ difference} = \frac{C_1 - C_2}{C_1} \times 100$$

Where:

C_1 = Expected concentration
C_2 = Determined concentration

7.4 Gas Chromatographic Analysis

7.4.1 Inject 1.0 μl of the sample extract using the autosampler. If the response exceeds the linear range of the system, dilute the extract and reanalyze.

7.4.2 Calibrate the system (or confirm calibration) prior to conducting any analyses. A midlevel standard must also be injected at specific frequencies and at the end of the analytical batch. The determined concentration must be within ± 15% difference as compared to the expected concentration. If this criteria is exceeded, inspect the GC system to determine the cause and perform the necessary maintenance to correct the problem before recalibrating the system. All samples that were analyzed after the standard that exceeded the criteria are out of control and must be reanalyzed after the corrective action is taken.

7.4.3 Establish daily retention times for each analyte. Use absolute retention times for each analyte from the daily check standard as the midpoint for that day.

7.4.3.1 Tentative identification of an analyte occurs when a peak from a sample extract falls within the daily retention time. No confirmation is necessary for the major degreasing solvents that are routinely determined. Compounds that are less frequently encountered will require an additional analytical technique for identification, if required. Tentative identification is done more positively by spiking the sample with the suspected constituent and noting an increase in peak height. Sample would be sent to Detrex's RTI Lab in Detroit for positive ID, if necessary.

7.4.3.2 Validation of GC System Quantitative Performance

The midpoint calibration standard is used to evaluate this criterion. If any of the standards are outside of the daily retention time window, the system is out of control and corrective action will be necessary.

7.4.4 Sequence of Analysis

After the system has been calibrated and daily retention time calculated, the following sequence of analysis takes place:

1) Blank
2) 30 samples
3) Matrix Spike

4) Blank Spike

5) Duplicate

6) Calibration Check Standard(s)

7) Blank

8) 30 Samples

7.5 System Maintenance

These corrective actions may be required to remedy problems associated with poor response, shifting retention times, ghost peaks and unstable baselines.

7.5.1 System Bake-Out - To remedy problems associated with rising baselines and ghosts peaks, the chromatography system is baked out. This entails raising the oven temperature to the column conditioning temperature for two hours.

7.5.2 Septum Change - Unstable retention times and poor response may be attributed to a leaking injection port septum. Change septum per the maintenance manual guidelines.

7.5.3 Capillary Column maintenance - Ghost peaks and reduced response may be caused by dirty injection port inserts and front-end column contamination. Replace column insert with a clean-deactivated insert. Also, clipping the first few inches to a foot of the column may be necessary to remedy the problem.

7.5.4 Detector Maintenance-Reduced response may be caused by a dirty detector. Cool detector and clean as recommended in the maintenance manual. Recalibration of the system may be required after cleaning the detector.

7.6 Calculations

The concentration of each analyte in the sample is determined by calculating the peak response using the calibration factor or calibration curve determined in Step 7.3.1. The concentration of a specific analyte is calculated as follows:

$$\text{Concentration (\% wt/vol)} = \frac{Ax}{cf} \times D$$

where: Ax = Response for analyte in sample area units
cf = Calibration Factor - area units per unit concentrations
A = Dilution Factor (if any)

8.0 QUALITY CONTROL

8.1 Reagent Blanks - To demonstrate that the analytical system is not introducing analytes or interferences, reagent blanks consisting of chlorobenzene are processed with the samples. The blanks are carried completely through the extraction and measurement steps and are analyzed at a frequency of 1% of all samples or one per day; whichever is more frequent.

8.2 Accuracy Control

8.2.1 Matrix Spikes Samples - to demonstrate that the sample matrix is not affecting the accuracy of the measurement, matrix spike samples are analyzed. These samples consist of a sample aliquot that has been fortified with a known amount of analyte. The results are expressed as percent recovery (%R) of added analyte and are calculated by:

$$\%R = \frac{SSR-SR}{SA} \times 100$$

where SSR = Spike Sample result
SR = Sample result
SA = Spike added

Matrix spike samples are processed and analyzed at a frequency of one per week, whichever is more frequent. Due to the nature of the samples, only a specific sub set of analytes will be spiked into the sample.

8.2.2 Blank Spike Samples - To demonstrate the efficiency of the extraction and analytical procedures, blank spike samples are analyzed. These samples consist of an artificial matrix that is spiked with a known amount of all analytes of interest. The results are expressed as percent recovery (%R) of added analyte and are calculated by

$$\%R = \frac{BSR - BR}{SA} \times 100$$

where BSR = Blank Spike Result
BR = Blank result
SA = Spike added

Blank spike samples are processed and analyzed at a frequency of one per week.

8.3 Precision Control

To demonstrate the repeatability of the extraction and analytical procedures, duplicate sample analyses are performed. Due to the fact that there will be detectable analytes in every sample, this type of precision control is preferable to matrix spike, matrix spike duplicate analysis. Equal aliquots of a sample are processed and analyzed. The results are expressed as relative percent difference and are calculated by:

$$\frac{|SR_1 - SR_2|}{\frac{SR_1 - SR_2}{2}} \times 100$$

Duplicate samples are analyzed at a frequency of 1% of all samples or one per day, whichever is more frequent. RPD is calculated for %NVR and for detectable analytes.

where: SR_1 = sample result 1
SR_2 = sample result 2

8.4 Control Limits and Corrective Actions

8.4.1 Reagent Blanks

Reagent blanks should be free from interfering peaks and analytes of interest. Should there be evidence of contamination, the following should be investigated to locate and eliminate the source.

-Purity of solvent used for blank
-Cleanliness of glassware
-Use of lubricating grease on distillation apparatus
-Adequate rinsing of GC syringe
-Carryover from previous sample analysis
-Contaminated GC system

If the problem is determined to be isolated only to the reagent blank (in the case of carryover) no corrective action is required. Should the problem be determined to be systematic, re-extraction and analysis of the samples associated with the reagent blank must take place. Documentation of corrective actions taken is recorded in a bound laboratory notebook.

8.4.2 Matrix Spike Samples

Recovery limits for spike compounds are listed below:

1,1,1-Trichloroethane	75-125%
-Trichloroethylene	75-125%
-Freon	65-125%
-Methylene chloride	75-125%
-2 Butyl Alcohol	75-125%
-n Butyl Alcohol	75-125%
-Methylisobutyl ketone	75-125%
-Methanol	75-125%
-Acetone	75-125%
-Methylethyl ketone	75-125%

Should recovery limits be outside the acceptance criteria, the following should be investigated or conducted:

-Re-analysis of the matrix spike sample

-Evaluation of results of sample analysis. Concentrated samples may cause the.spiked sample to be outside the linear range of the instrument. Dilute and re-analyze.

-Sample homogeneity

-Loss of instrument calibration - analyze a check standard for calibration verification

Should re-analysis of the matrix spike sample still indicate an out-of-control situation, a new sample will be chosen for matrix spike analysis. If analysis still yields out-of-control results, a thorough investigation must be conducted and the finding documentated. All samples processed from the last in-control point must be reprocessed and re-analyzed.

Should results of matrix spike sample analysis indicate an isolated problem associated with the blank spike sample, re-extraction and re-analysis is not required. In all other cases, re-extraction and re-analysis from the last in-control sample must occur.

8.4.3 Blank Spike Samples - Recovery limits for blank spike compounds are listed below:

1,1,1-Trichloroethane	75-125%
Trichloroethylene	75-125%
Perchloroethylene	75-125%
Freon	65-125%
Methylene chloride	75-125%

Should the above recovery limits be exceeded, the following should be investigated or conducted:

-Re-analysis of the blank spike sample
-Contamination of distillation due to loss of vacuum or inappropriate bath temperature

-Loss of calibration of GC. A check standard should be analyzed.

8.4.4 Replicate sample analysis - RPD limits for NVR and detected compounds are 30%. Should this criterion be violated, the following should be investigated or conducted.

-Re-analysis of samples
-Contamination of distillation and GC systems
-Homogeneity of sample matrix
-Inefficient distillations

Should re-analysis of samples not elicit in-control results, a new sample from the batch will be chosen for replicate analysis. If the results of the new replicates still indicate an out-of-control situation, a thorough investigation must be conducted and the findings documented. All samples processed from the last in-control point must be re-extracted and re-analyzed.

9.0 METHOD PERFORMANCE

At this time, the performance of the method is still being evaluated.

10.0 REFERENCES

1) Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, EPA SW-846 Methods 8000, 8010 and 8015.

2) 1989 Annual Book of ASTM Standards, ASTM Volume 15.05 Methods D 3742 and D-3447, Volume 14.01.

William M. Moore Jr.
6245 Atkins Road
Troy, Michigan 48098
(313) 879-8817

Education/Training

Emergency Response Training Technician Level, EPA Region IV, Bowling Green, Kentucky, 1990 (Scheduled July 23-27)
Emergency Response Training, Bowling Green State Vocational School, 1989

University Of Toledo, Toledo Ohio
Hazardous Materials Chemistry, 1989

Western Kentucky University, Bowling Green, Kentucky
Certified Hazardous Materials Manager Training
1989

Oklahoma State University, Stillwater Oklahoma, Environmental Audits- Preparation and Evaluation, 1988

Liberty Mutual Insurance Company, Hopkinton, Massachusetts, Hazard Communication and Chemical Control 1985

Liberty Mutual Insurance Company, Hopkinton, Massachusetts, Environmental Health Institute, 1986

Western Kentucky University, Bowling Green, Kentucky
M.A. Business Administration, 1974

Western Kentucky University, Bowling Green, Kentucky
B.S. Industrial/Mechanical Engineering Technology, 1974

Experience

March 1990 to Present — Detrex Corporation
Corporate Risk Management
Southfield, Michigan

Manager Environmental Compliance

Responsible for the Environmental matters of the entire Corporation. Responsible for training division personnel according to OSHA and EPA standards. Assist in completing required EPA and OSHA reports. Assist in day to day decisions concerning environmental and other corporate matters. Evaluate other areas of Risk Management.

June
to March 1990

Detrex Corporation
Equipment Manufacturing Division
Bowling Green, Kentucky

Chief Engineer
Electronic & Environmental
Engineering
Departmental Manager

Responsible for the total implementation of all EPA and OSHA regulations for this facility. Wrote and implemented the following programs for the Bowling Green facility and the California Facility:

- -Hearing Conservation Program
- -Employee Right to Know Training
- -Hazardous Waste Training
- -Facility Contingency Plan
- -Design and implemented Hazardous waste process flow
- -File and monitor KPDES Discharge for State permit
- -Manage Hazardous Waste Storage sight
- -Designed training for OSHA 1910.120 Standards

Responsible for completing all reports for EPA and OSHA agencies that concern our facility.

Responsible for supervising design of Electronic Cleaning equipment. Evaluating design criteria to make sure equipment met current EPA emission criteria as well as OSHA regulations, IE. noise, safety guards, etc.

January 1984
to March 1984

Gordan Smith Compressors
Temporary Position

February 1979
to January 1984

Consultant

ENGINEER

Consulting work with various industries dealing with design specifications of tools and related components.

August 1974
Feb. 1979

Kentucky Dept. of Industrial
and Vocational Education

COORDINATOR- INDUSTRIAL TRAINING PROGRAMS

Worked with industry within a ten county area in setting

up specific training programs. Assisted Engineering Departments in determining required skills needed for productive employees. Recommended implementation of equipment modification for increase in productivity. Evaluated existing employees using various time study methods to determine productivity for the purpose of additional training or changes in production process.

Organizations

President Emeritus; South Central Kentucky Association of Environmental Managers

Senior Member; Society of Manufacturing Engineers

Member; Certified Environmental Trainers

Personal

Married: Kathleen Moore

Children: Jana Moore 8 years old
Health: Above average
Activities: Snow Skiing, Scuba Diving, Flying, Instrumental Director Northfield Hills Baptist Church

ATTACHMENT I-4

FINANCIAL ASSURANCE MECHANISM AND LIABILITY INSURANCE

DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111

TWX 810-224-4756

TELEPHONE:
(313)358-5800

May 23, 1990 (Revised)

Rec'd CRA

MAY 30 1990

Commissioner
Department of Environmental Management
Indiana State Board of Health
P. O. Box 1964
Indianapolis, IN 46206-1964

Re: EPA IND 085616837
Financial Assurances

Gentlemen:

Enclosed please find the following:

1) A revised letter signed by our chief financial officer

Should there be any questions, please call.

Very truly yours,

W. G. Robrecht
Safety & Loss Prev. Administrator

WGR/smb
Encl.

cc: M. J. Tepatti
S. Miles

DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111

TWX 810-224-4756

TELEPHONE:
(313) 358-5800

May 23, 1990 (Revised)

Commissioner
Department of Environmental Management
Indiana State Board of Health
P. O. Box 1964
Indianapolis, IN 46206-1964

Gentlemen:

I am the chief financial officer of Detrex Corporation, P. O. Box 5111, Southfield, MI 48086. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability and closure coverage as specified in 320 IAC 4.1-22 or 320 IAC 4.1-47.

The owner or operator identified above is the owner or operator of the following facilities for which liability coverage is being demonstrated through the financial test specified in 320 IAC 4.1-22 or 320 IAC 4.1-47: See Appendix A.

1. The owner or operator identified above owns or operates the following facilities for which financial assurance for closure or post-closure care is demonstrated through the financial test specified in 320 IAC 4.1-22 or 320 IAC 4.1-47. The current closure and/or post-closure cost estimates covered by the test are shown for each facility: See Appendix B.

2. The owner or operator identified above guarantees, through the corporate guarantee specified in 320 IAC 4.1-22 or 320 IAC 4.1-47, the closure and post-closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility: None.

3. This firm, as owner or operator or guarantor, is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test specified in 320 IAC 4.1-47. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility: None.

4. The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurances for closure or, if a disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: None.

This owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this owner or operator ends on December 31.

The figures for the following items marked with an asterisk (*) are derived from this owner's or operator's independently audited, year-end financial statements for the latest completed fiscal year, ended December 31, 1989.

ALTERNATIVE I

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates listed above)	$ 826,167
2.	Amount of annual aggregate liability coverage to be demonstrated	$ 2,000,000
3.	Sum of lines 1 and 2	$ 2,826,167
*4.	Total liabilities (if any portion of your closure or post-closure cost estimates is included in your total liabilities, you may deduct that portion from this line and add that amount to lines 5 and 6)	$24,622,955
*5.	Tangible net worth	$39,095,776
*6.	Net worth	$39,779,348
*7.	Current assets	$39,072,900
*8.	Current liabilities	$17,592,247
*9.	Net working capital (line 7 minus line 8)	$21,480,653
*10.	The sum of net income plus depreciation, depletion, and amortization	$ 2,653,283
*11.	Total assets in U.S. (required only if less than 90% of assets located in the U.S.)	$ N/A

		Yes	No
12.	Is line 5 at least $10 million?	X	
13.	Is line 5 at least 6 times line 3?	X	
14.	Is line 9 at least 6 times line 3?	X	

		Yes	No
*15.	Are at least 90% of assets located in the U.S.? If not, complete line 16	X	
16.	Is line 11 at least 6 times line 3?	N/A	
17.	Is line 4 divided by line 6 less than 2.0?	X	
18.	Is line 10 divided by line 4 greater than 0.1?	X	
19.	Is line 7 divided by line 8 greater than 1.5?	X	

I hereby certify that the wording of this letter is identical to the wording specified in 320 IAC 4.1-24-32 as such regulations were constituted on the date shown immediately below.

Very truly yours,

C. B. Stockmeyer, Jr.
President & Treasurer

May 23, 1990

/smb

APPENDIX "A"

CTD 01 016 0870
Gold Shield Division
260 Chapel Road
So. Windsor, CT 06074

NJD 04 731 8043
Gold Shield Division
835 Industrial Highway
Unit No. 1
Cinnaminson, NJ 08077

NCD 04 977 3245
Gold Shield Division
P. O. Box 5274
Charlotte, NC 28225

MID 09 160 5972
Gold Shield Division
12886 Eaton Avenue
Detroit, MI 48227

MID 02 090 6764
Gold Shield Division
312 Ellsworth Ave., S.W.
Grand Rapids, MI 49503

OHD 08 015 8702
Gold Shield Division
1410 Chardon Rd.
Euclid, OH 44117

IND 08 561 6837
Gold Shield Division
2263 Distributors Drive
Indianapolis, IN 46241

OHD 00 416 5924
General Chemicals Division
North State Rd.
Ashtabula, OH 44004

TXD 98 062 6154
Gold Shield Division
322 International Parkway
Arlington, TX 76011

ILD 07 442 4938
Gold Shield Division
2537 LeMoyne Avenue
Melrose Park, IL 60160

APPENDIX "B"

	Closure Amount	Post-Closure Amount	Closure and Post-Closure Amounts
NCD 04 977 3245 Gold Shield Division P. O. Box 5274 Charlotte, NC 28206	$ 32,162	$ 0	$ 32,162
OHD 08 015 8702 Gold Shield Division 1410 Chardon Rd. Euclid, OH 44117	89,450	0	89,450
IND 08 561 6837 Gold Shield Division 2263 Distributors Drive Indianapolis, IN 46241	268,000	0	268,000
OHD 00 416 5924 General Chemicals Division North State Road Ashtabula, OH 44004	44,769	0	44,769
TXD 98 062 6154 Gold Shield Division 322 International Parkway Arlington, TX 76011	185,091	0	185,091
CAD 02 016 1642 Gold Shield Division 3027 Fruitland Avenue Los Angeles, CA 90058	142,760	0	142,760
CTD 01 016 8870 Gold Shield Division 260 Chapel Road So. Windsor, CT 06074	24,680	0	24,680
ILD 07 442 4938 Gold Shield Division 2537 LeMoyne Avenue Melrose Park, IL 60160	39,255	0	39,255
	$826,167		$826,167

Material Safety Data Sheet

MSD 8208.20

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: 1,1,1-trichloroethane; methylchloroform CAS No. 71-55-6	Trade Name and Synonyms: PERM-ETHANE ® DG
Chemical Family: Halogenated Hydrocarbons	Formula: CH_3CCl_3
DOT Shipping Name: 1,1,1-trichloroethane	DOT Hazard Class: ORM-A I. D. Number: UN 2831

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg:	Vapor Density (Air=1):	Specific Gravity (H_2O=1):	pH of Solutions:
165.4°F	4.54	1.300-1.320 @ 25°/25°C	6.0 to 7.5
Freezing/Melting Point: -49°F -45°C	Solubility (Weight % in Water): Negligible	Bulk Density: 10.80-10.97 lbs/gal @25°C	Volume % Volatile: Essentially 100
Vapor Pressure: @25°C = 135mmHg	Evaporation Rate (ethyl ether = 1):0.35	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid - ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
1,1,1-trichloroethane (Stabilized)	100	See Sections 4 & 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used)	Flammable Limits in Air (% by Volume)	Extinguishing Media:
None when tested in accordance with DOT requirements.	LEL: 7% UEL: 15% See Below	water, dry chemical or carbon dioxide

Special Fire Fighting Procedures: Fire fighters should wear a NIOSH/MSHA-approved pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene. Use water only in degreasers when aluminum reaction occurs.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame, or high intensity source of heat. This can occur at concentrations ranging between 7-15% by volume. Decomposition or burning can produce hydrogen chloride or possibly traces of phosgene. Also see Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC_{50} Inhalation (rat) 8,000 ppm/7 hours	Inhalation: Toxic
LD_{50} Dermal (rabbit) 15g/kg(2)	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD_{50} Ingestion (rat) 10-12g/kg (See Section 5)	Ingestion: Not significantly toxic
Fish, LC_{50} (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data:

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Permissible Exposure Limits (TLV):

350 ppm - 8-hour time-weighted average (TWA) - OSHA 29CFR 1910.1000 (May 28, 1975).

Acute

Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory system, dizziness, nausea, lightheadedness, headache, loss of coordination and equilibrium, unconsciousness and, if exposed to high concentrations in confined or poorly ventilated areas, even death. Depression of the circulatory system has been reported as a result of overexposure to 1,1,1-trichloroethane. The heart may be sensitized by overexposure and ventricular arrhythmia may be induced by epinephrine administration.

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic

Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. 1,1,1-trichloroethane has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that 1,1,1-trichloroethane causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink large quantities of water, DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following 1,1,1-trichloroethane overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to 1,1,1-trichloroethane.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur.	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid):
Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be re-processed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act as well as any other relevant federal, state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposure, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Dilution (General) or Local Exhaust - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof Goggles

Gloves: polyethylene, neoprene or polyvinyl alcohol

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined areas.
- 1,1,1-trichloroethane vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with 1,1,1-trichloroethane.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- A chlorinated solvent used as a flashpoint suppressant must be added in sufficient quantity or the resultant mixture may have a flashpoint lower than the flammable component.
- Caution should be taken not to use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See Detrex Form SoL 8208.21 attached.)

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to 1,1,1-trichloroethane below OSHA permissible limits (8-hour TWA 350 ppm). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK, OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industry Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1980
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (1,1,1-trichloroethane) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state and local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.19

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: Trichloroethylene; trichloroethene CAS No.: 79-01-6	Trade Name and Synonyms: PERM-A-CLOR® NA, Trichlor, Trichlorethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $CHCl = CCl_2$
DOT Shipping Name: trichloroethylene	DOT Hazard Class: ORM-A UN1710 (RQ 1000#/454kg)

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg: 188°F	Vapor Density (Air=1): 4.54	Specific Gravity (H_2O=1): (20°/20°C) 1.465	pH of Solutions: 6.7 to 7.5
Freezing/Melting Point: -123.5°F -86.4°C	Solubility (Weight % in Water): 0.11 @ 25°C	Bulk Density: @ 20°C 12.2 lbs./gal.	Volume % Volatile: Essentially 100
Vapor Pressure: @ 20°C = 57.8mmHg	Evaporation Rate (ethyl ether=1): 0.28	Heat of Solution: Not Applicable	Appearance and Odor: Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Trichloroethylene (Stabilized)	100	See Sections 4 and 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used) None when tested in accordance with DOT requirements. (See Below)	Flammable Limits in Air (% by Volume) See Below LEL: 12.5% UEL: 90%	Extinguishing Media: Water, dry chemicals or carbon dioxide.

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA pressure-demand, self-contained breathing apparatus for possible exposure to hydrogen chloride and possibly traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a confined or poorly ventilated area can be ignited upon contact with a spark, flame or high-intensity source of heat. This can occur at concentrations of approximately 12.5% and above by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene.

Also see Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref. (1),(2)	Classification (Poison, Irritant, Etc.)
LCLoInhalation (rat) - 8,000 ppm/4 hour	Inhalation: Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritant to skin; eye irritant.
LD_{50} Ingestion (rat) - 4,900 - 7,000 mg/kg	Ingestion: Slightly to moderately toxic
Fish, LC_{50} (Lethal Concentration) Not Determined	Aquatic:

Human Exposure Information/Data: Unconfirmed data' exists which indicate that trichloroethylene by ingestion may be more toxic to humans than indicated by the available animal data. Such unconfirmed data report poisonings at doses as low as 50 mg/kg.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4 (Cont'd) - Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 2-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Acute: Irritant and central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and, if exposed at high concentrations in confined or poorly ventilated areas, even death. Fatalities following severe acute exposure at high concentrations have been attributed to ventricular fibrillation resulting in cardiac failures.[3]

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Trichloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that Trichloroethylene causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician .

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following trichloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to trichloroethylene.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed.
See Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.[7] Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal of hazardous waste.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use "buddy system", also use harness and lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof goggles.

Gloves: Polyethylene, neoprene or polyvinyl alcohol

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

Do not use in poorly ventilated or confined spaces.

- Trichloroethylene vapors are heavier than air and will collect in low areas. Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with trichloroethylene
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to trichloroethylene in work area at or below OSHA permissible exposure limits (8-hour TWA - 100 ppm; ceiling - 200 ppm; maximum peak - 300 ppm, 5 minutes in every 2 hours). Observance of lower limits (outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F. A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Matabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments:

As this solvent (trichloroethylene) is used primarily to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.23

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 801,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date:	Edition:
Chemical Name and Synonyms: Methylene Chloride; dichloromethane CAS No.: 75-09-2	Trade Name and Synonyms: Methylene Chloride
Chemical Family: Halogenated Hydrocarbons	Formula: CH_2Cl_2
DOT Shipping Name: Methylene Chloride	DOT Hazard Class: ORM-A - UN 1593

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg:	Vapor Density (Air=1):	Specific Gravity (H_2O=1):	pH of Solutions:
103.6°F (39.8°C)	@ 20°C = 2.93	1.32	Neutral
Freezing/Melting Point:	**Solubility (Weight % in Water):**	**Bulk Density:**	**Volume % Volatile:**
-142.1°F (-96.7°C)	2g/100 ml	@ 20°C 11.15 lbs./gal.	Essentially 100
Vapor Pressure:	**Evaporation Rate**	**Heat of Solution:**	**Appearance and Odor:**
@ 20°C = 349 mmHg	(ethyl ether = 1): 0.71	Not Applicable	Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Methylene Chloride (Stabilized)	100	See Sections 4 and 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used)	Flammable Limits in Air (% by Volume)	Extinguishing Media:
None when tested in accordance with DOT requirements.	See Below LEL: 12% UEL: 19%	For fires involving methylene chloride, use water, dry chemicals or CO_2.

Special Fire Fighting Procedures: Fire fighters should wear NIOSH/MSHA-approved, self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Vapors concentrated in a poorly ventilated area can be ignited upon contact with a spark, flame or high intensity source of heat. This can occur at concentrations between 12% and 19% by volume. Decomposition or burning can produce hydrogen chloride and possibly traces of phosgene. Also see Detrex warning letter form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): 500ppm (TWA) See Section 4 (Cont'd) next page

Toxicity Data	Classification (Poison, Irritant, Etc.)
LC_{50} Inhalation LCLo (guinea pig) 5,000ppm/2hrs. TCLo*(human) 500ppm/8hrs.	Inhalation: Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritating to skin; eye irritant.
LD_{50} Ingestion - (rat) = 2.136mg/kg	Ingestion: Slightly toxic
Fish. LC_{50} (Lethal Concentration) Not determined	Aquatic:

Human Exposure Information/Data:

* Lowest published toxic concentration.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4 (cont'd) - Permissible Exposure Limit

Current OSHA permissible exposure limits (29CFR 1910.1000) are 500 ppm (8-hour TWA); 500-1,000 ppm period excursions are allowed providing TWA is at or below 500 ppm; 1,000-2,000 ppm excursions allowed only for maximum of five minutes in any 2-hour period -- 2,000 ppm maximum allowable concentration (must not be exceeded).

*NIOSH recommends that the TWA exposure limit for methylene chloride is 75 ppm. In the absence of occupational exposure to carbon monoxide (CO) above a TWA of 9 ppm up to a 10-hour workday, occupational exposure to methylene chloride shall be controlled so that workers are not exposed to methylene chloride in excess of 75 ppm (261 mg/cu m) determined as a TWA for up to a 10-hour workday, 40-hour workweek. In the presence of exposure to CO in the work environment at more than 9 ppm as a TWA for up to a 10-hour workday, exposure limits of CO or methylene or both shall be reduced to satisfy the relationship:

$$\frac{C(CO)}{L(CO)} + \frac{C(CH_2Cl_2)}{L(CH_2Cl_2)} \leq 1$$

where: $C(CO)$ = TWA exposure concentration of CO, ppm

$L(CO)$ = the recommended TWA exposure limit of CO = 35 ppm

$C(CH_2Cl_2)$ = TWA exposure concentration of methylene chloride, ppm

$L(CH_2Cl_2)$ = the recommended TWA exposure limit of methylene chloride = 75 ppm

Occupational exposure shall be controlled so that workers are not exposed to methylene chloride above a peak concentration of 500 ppm (1,740 mg/cu m) as determined by a 15-minute sampling period.

Employees working with methylene chloride should be aware of this hazard. This toxic effect is "additive" in nature with the risk being greater for smokers, who generally have higher levels of carboxyhemoglobin. Employees with a history of cardiovascular disease should not be allowed to work with methylene chloide unless approved by a physician.

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Effects of Overexposure*

Acute: Inhalation effect is primarily narcosis. Principal symptoms may be headache, dizziness, nausea, tingling or numbness of the extremities, senses of fullness in the head, sense of warmth, stupor or dullness, lethargy and drunkeness. Exposure to very high concentrations may lead to unconsciousness or even death in confined or poorly ventilated areas.

Chronic: Several chronic inhalation studies reported by NIOSH revealed that test animals exposed to methylene chloride concentrations as high as 10,000 ppm, showed slight liver and kidney changes. The results of these studies indicate that prolonged exposure limits may result in liver and kidney damage.

Chronic inhalation studies, cosponsored by several methylene chloride producers, were recently completed on rats. The results of these studies were reported to have revealed a mathematically significant increase in malignant salivary gland tumors in the group of male rats from the study's highest exposure level (3,500 ppm).

Liquid splashed in the eyes can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Research has recently shown that methylene chloride is metabolized by the body to carbon monoxide.[4] Further, the amount of carbon monoxide formed is directly related to the amount of methylene chloride absorbed and can be sufficient to produce a substantial stress on the cardiovascular system through the elevation of the level of carboxyhemoglobin (COHb) -- the product formed by the combination of carbon monoxide and the blood's hemoglobin thus effectively reducing the amount of hemoglobin available for the transport of oxygen throughout the body.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulsions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following methylene chloride overexposure. Increased sensitivity of the heart to adrenalin may be caused by overexposure to methylene chloride.

SECTION 6 - REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arcs.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Avoid contact with aluminum, magnesium, zinc and alloys thereof under high pressures. See Detrex warning letter Form Sol. 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 - SPILL OR LEAK PROCEDURES (See Detrex Forms Sol. 8208.14 and Sol. 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below).

Waste Disposal Method: Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection. (Use the "buddy system" and wear a safety harness with lifeline). In other circumstances involving potentional overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below permissible exposure limits.

Eye Protection: Splashproof goggles | **Gloves:** Polyethylene, neoprene or polyvinyl alcohol.

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Methylene chloride vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with methylene chloride.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage, and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.
- Caution should be taken not use in pressurized or totally enclosed system of light metal construction such as aluminum, magnesium, zinc or alloys thereof. Example, paint or adhesive spray system. (See form Sol. 8208.21 attached.)

Other Precautions:

AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long -term overexposure may cause liver/kidney damage.

- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit employee exposure to methylene chloride below OSHA permissible exposure limits (8-hour TWA - 500ppm; ceiling - 1,000ppm; maximum peak - 2,000ppm, 5 minutes in any 2 hours).
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.

References:

1. NIOSH Registry of Toxic Effects of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N.I. Sax, 1979
4. Industrial Toxicology, Hamilton and Hardy, 1974
5. Toxicity and Metabolisms of Industrial Solvents, Browning, 1965
6. Toxicology, the Basic Science of Poisons, Casarett and Doull, 1975
7. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
8. EPA Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (methylene chloride) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U.S. Environmental Protection Agency OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or all other applicable federal, state or local regulatory guidelines.

Methylene chloride is also used extensively in industry as a solvent, thinner, paint stripper, etc. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with applicable federal, state and local regulatory guidelines.

Material Safety Data Sheet

MSD 8208.22

DETREX CHEMICAL INDUSTRIES, INC.
P.O. BOX 501,
DETROIT, MICHIGAN 48232

Approved by U.S. Dept. of Labor as "Essentially similar" to Form OSHA-20

Date: August, 1982	Edition: First
Chemical Name and Synonyms: Perchloroethylene; tetrachloroethylene CAS No.: 127-18-4	Trade Name and Synonyms: DETREX PERK, Perchlor, Perchloroethylene
Chemical Family: Halogenated Hydrocarbons	Formula: $CCl_2=CCl_2$
DOT Shipping Name: Tetrachloroethylene	DOT Hazard Class: ORM-A-UN1897

SECTION 1 · PHYSICAL DATA

Boiling Point @ 760 mm Hg:	Vapor Density (Air=1):	Specific Gravity (H_2O=1):	pH of Solutions:
250°F 121°C	5.83	(20°/20°C) 1.6	6.8 to 8.4
Freezing/Melting Point:	**Solubility (Weight % in Water):**	**Bulk Density:**	**Volume % Volatile:**
-8.2°F -22.3°C	@25°C 0.015%	13.6 lbs./gal. @ 20°C	Essentially 100
Vapor Pressure:	**Evaporation Rate**	**Heat of Solution:**	**Appearance and Odor:**
@ 20°C = 14.2mmHg	(ethyl ether=1): 0.09	Not Applicable	Clear, colorless liquid with ether-like odor.

SECTION 2 · HAZARDOUS INGREDIENTS

	%	Hazard Data
Perchloroethylene (Stabilized)	100	See Sections 4 & 5

SECTION 3 · FIRE AND EXPLOSION HAZARD DATA

Flash Point °F (Method Used)	Flammable Limits in Air (% by Volume)	Extinguishing Media:
None	None LEL: UEL:	For fires involving perchloroethylene, use water, dry chemical or carbon dioxide.

Special Fire Fighting Procedures: Fire fighters should wear pressure-demand self-contained breathing apparatus for possible exposure to hydrogen chloride and possible traces of phosgene.

Unusual Fire and Explosion Hazards: Perchloroethylene involved in fires can decompose to hydrogen chloride and possible traces of phosgene. See Detrex warning letter Form SoL 8208.21 attached.

SECTION 4 · HEALTH HAZARD DATA

Permissible Exposure Limits (TLV): See Section 5

Toxicity Data Ref.(1)	Classification (Poison, Irritant, Etc.)
LCLoInhalation (rat) 4,000 ppm (4 hours)	Inhalation: Moderately Toxic
LD_{50} Dermal	Skin/Eye: Liquid mildly irritating to skin; eye irritant
LD_{50} Ingestion (rabbit) - 5,000 mg/kg	Ingestion: Slightly Toxic
Fish, LC_{50} (Lethal Concentration) 96hr. TLM 100-10 ppm	Aquatic: Toxic

Human Exposure Information/Data: Unconfirmed data' exists which indicate that perchloroethylene by ingestion may be more toxic to humans than indicated by the available data. Such unconfirmed data report poisonings at doses as low as 500 mg/kg.

24-HOUR EMERGENCY ASSISTANCE: (313) 358-5800

Section 4(Cont'd)- Permissible Exposure Limits

Current OSHA permissible exposure limits (29CFR 1910.1000) are 100 ppm (8-hour TWA); 100-200 ppm periodic excursions are allowed providing 8-hour TWA is at or below 100 ppm; 200-300 ppm excursions allowed only for maximum of 5 minutes in any 3-hour period; 300 ppm maximum allowable concentration (must not be exceeded).

SECTION 5 · EFFECTS OF OVEREXPOSURE

This section covers effects of overexposure for inhalation, eye/skin contact, ingestion and other types of overexposure information in the order of the most hazardous and the most likely route of overexposure.

Acute: Primarily a central nervous system depressant. Inhalation can cause irritation of the respiratory tract, dizziness, nausea, headache, loss of coordination and equilibrium, unconsciousness and if exposed to high concentrations in confined or poorly ventilated areas, even death.

Liquid splashed in the eye can result in discomfort, pain and irritation. Prolonged or repeated contact with liquid on the skin can cause irritation and dermatitis. The problem may be accentuated by liquid becoming trapped against the skin by contaminated clothing and shoes. Skin absorption can occur.

Chronic: Prolonged exposure above the OSHA permissible exposure limits may result in liver and kidney damage. Perchloroethylene has been extensively studied for cancer both in the U.S. and Europe by government, industry and academia. There is no documented evidence that perchloroethylene causes an increased cancer incidence in humans.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

Eye or Skin Contact: Flush eyes and skin with plenty of water (soap and water for skin) for at least 15 minutes, while removing contaminated clothing and shoes. If irritation occurs, consult a physician.

Ingestion: If conscious, drink a quart of water. DO NOT induce vomiting. Take immediately to a hospital or physician. If unconscious, or in convulstions, take immediately to a hospital or physician. DO NOT give anything by mouth to an unconscious person.

Notes to Physician (Including Antidotes): NEVER administer adrenalin following perchloroethylene overexposure. Increased sensitivity of the heart to adrenalin may be caused by over-exposure to perchloroethylene.

SECTION 6 · REACTIVITY DATA

Stability: Stable	**Conditions to Avoid:** Avoid open flames, hot glowing surfaces or electric arc.
Hazardous Polymerization: Will not occur	**Conditions to Avoid:** None

Incompatibility (Materials to Avoid): Avoid contamination with caustic soda, caustic potash or oxidizing materials. Shock sensitive explosives may be formed. Also see Detrex warning letter Form SoL 8208.21 attached.

Hazardous Decomposition Products: Hydrogen chloride and possibly traces of phosgene.

SECTION 7 · SPILL OR LEAK PROCEDURES (See Detrex Forms SoL 8208.14 and SoL 8208.15 attached)

Steps to be Taken if Material is Spilled or Released: Immediately evacuate the area and provide maximum ventilation. Unprotected personnel should move upwind of spill. Only personnel equipped with proper repiratory and skin/eye protection should be permitted in area. Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover or absorb spilled material on sawdust or vermiculite and sweep into closed containers for disposal. After all visible traces have been removed, thoroughly wet vacuum the area. DO NOT flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc., as necessary and place in closed containers for disposal. (See Below)

Waste Disposal Method:

Contaminated sawdust, vermiculite or porous surface must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility. Care must be taken when using or disposing of chemical materials and/or their containers to prevent environmental contamination. It is your duty to dispose of the chemical materials and/or their containers in accordance with the Clean Air Act, the Clean Water Act, the Resource Conservation and Recovery Act and all relevant state or local laws/regulations regarding disposal.

SECTION 8 · SPECIAL PROTECTION INFORMATION

Respiratory Protection: For emergencies or working in confined areas, wear self-contained breathing apparatus or supplied air respiratory protection (use the "buddy system" and wear a safety harness with a lifeline). In other circumstances involving potential overexposures, use NIOSH/MSHA-approved organic vapor respirator. (Observe limitations directed by manufacturer.) Respiratory protection program must be in accordance with 29CFR 1910.134.

Ventilation (Type): Mechanical (General) - Sufficient to maintain workplace concentration below OSHA's exposure limits.

Eye Protection: Splasher of goggles	**Gloves:** Polyethylene, neoprene or polyvinyl

Other Protective Equipment: Safety shower and eye-wash fountain in immediate area. Personnel protective clothing and use of equipment must be in accordance with 29CFR 1910.133 and 29CFR 1910.132.

SECTION 9 · SPECIAL PRECAUTIONS

Precautions to be Taken During Handling and Storing:

- Do not use in poorly ventilated or confined spaces.
- Perchloroethylene vapors are heavier than air and will collect in low areas.
- Keep container closed when not in use.
- Do not store in open, unlabeled or mislabeled containers.
- Liquid oxygen or other strong oxidants may form explosive mixtures with perchloroethylene.
- This material or its vapors when in contact with flames, hot glowing surfaces or electric arcs can decompose to form hydrogen chloride gas and traces of phosgene.
- AVOID CONTAMINATION OF WATER SUPPLIES: Handling, storage and use procedures must be carefully monitored to avoid spills or leaks. Any spill or leak has the potential to cause underground water contamination which may, if sufficiently severe, render a drinking water source unfit for human consumption. Contamination that does occur cannot be easily corrected.

Other Precautions:

- AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. High vapor concentrations can cause dizziness, unconsciousness or death. Long-term overexposure may cause liver/kidney injury.
- USE ONLY WITH ADEQUATE VENTILATION. Ventilation must be sufficient to limit exployee exposure to perchloroethylene below OSHA permissible exposure limit (8-hour TWA - 100 ppm; ceiling 200 ppm; maximum peak 300 ppm, 5 minutes in any 3 hours). Observance of lower limits outlined in Section 4) is advisable.
- AVOID CONTACT WITH EYES. Will cause irritation and pain.
- AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. May cause irritation or dermatitis.
- DO NOT TAKE INTERNALLY. Swallowing may cause injury or death.
- DO NOT EAT, DRINK OR SMOKE IN WORK AREAS.

References:

1. NIOSH Registry of Toxic Effectos of Chemical Substances, 1978
2. Industrial Hygiene and Toxicology, Volume II, Second Edition, F.A. Patty, 1963
3. Dangerous Properties of Industrial Materials, Fifth Edition, N. I. Sax, 1979
4. Federal Register, 45FR Hazardous Waste Management Systems Part III, Identification and Listing of Hazardous Wastes, Page 33084, May 19, 1980
5. Science Advisory Board, Subcommittee on Airborne Carcinogens, September, 1980

Comments: As this solvent (perchloroethylene) is used to clean and/or degrease a wide variety of metal and plastic parts, it should always be used in conjunction with properly designed and fully controlled solvent vapor degreasing equipment that is in compliance with the U. S. Environmental Protection Agency, OAQPS Guidelines, "Control of Volatile Organic Emissions from Solvent Metal Cleaning", and/or any other applicable federal, state or local regulatory guidelines.

Perchloroethylene is also used extensively in the commercial drycleaning of clothes. It should always be used in conjunction with properly designed and fully controlled equipment that is in compliance with all applicable federal, state and local guidelines.

DU PONT

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

Name:
Freon® TF Solvent
Freon® PCA

Chemical Family:
Halogenated Hydrocarbon

Synonyms:
Trichlorotrifluoroethane
R-113, FC-113

Formula:
CCl_2FCClF_2

CAS Name:
Ethane, 1,1,2-Trichloro-1,2,2-Trifluoro

CAS Registry No.
76-13-1

Manufacturer/Distributor:
E. I. du Pont de Nemours & Co. (Inc.)

Medical Emergency Phone:
(800) 441-3637

Address:
Freon® Products Division
Wilmington, DE 19898

Transportation Emergency Phone:
CHEMTREC (800) 424-9300

PHYSICAL DATA

Boiling Point(°F):	117.6	Percent Volatile by Volume:	100%
Density:	1.57 g/cc @/77°F	Vapor Pressure:	334mm Hg @/77°F
Vapor Density (Air = 1):	6.5	Solubility in H_2O:	0.02% by wt. @ 77°F
pH Information:	Neutral	Evaporation Rate (CCl_4 = 1):	0.1
Form: Liquid		Appearance:	Clear
Color: Colorless		Odor:	Slight Ethereal Odor

HAZARDOUS COMPONENTS

Material(s):	Approximate % :
Trichlorotrifluoroethane	100

HAZARDOUS REACTIVITY

Stability:
Material is stable. However, avoid open flames and high temperatures.

Incompatibility:
Alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition:
This compound can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids - possible carbonyl halides.

Polymerization:
Will not occur

FIRE AND EXPLOSION DATA

Flash Point:
None

Method:
TOC

Autoignition Temperature:
Not Determined

Flammable Limits in Air, % by Vol.
Lower: Nonflammable
Upper: Nonflammable

Autodecomposition Temperature:
Not Determined

Fire and Explosion:
Drums may rupture under fire conditions. Decomposition may occur.

Extinguishing Media:
Nonflammable

Special Fire Fighting Instructions:
Self-contained breathing apparatus (SCBA) may be required if drums rupture and contents are spilled under fire conditions.

HEALTH HAZARD INFORMATION

Principal Health Hazards:

Inhalation: Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, and may lead to narcosis, cardiac irregularities, unconsciousness or death. LC 50 Rats 52,000 ppm/4 hrs.

Note: In screening studies with experimental animals, exposure at approximately 5000 ppm (v/v) and above, followed by a large intravenous epinephrine challenge, has induced serious cardiac irregularities.

Skin: Not a corrosive or irritant after single contact; however, repeated liquid contact can cause defatting of the skin resulting in irritation. This material is poorly absorbed through the skin (Rabbit ALD >11,000 mg/kg).

Eye: Liquid contact can cause discomfort, usually no extended effect.

Oral: Although oral toxicity is low [LD 50 Rat 43000 mg/kg], ingestion of FC-113 is to be avoided.

Exposure Limits:

PEL (OSHA)	1,000 ppm
TLV® TWA (ACGIH)	1,000 ppm

Safety Precautions:
Avoid breathing vapors and prolonged skin exposure. Use only in well ventilated area.

First Aid:

Inhalation: Remove to fresh air, call a physician. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Do not give epinephrine or similar drugs.

Note to Physician: Because of a possible increased risk of eliciting cardiac dysrythmias, catecholamine drugs, such as epinephrine, should be considered only as a last resort in life threatening emergencies.

Eye: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: Flush with water. Get medical attention if irritation is present.

Oral: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. However, consult a physician if necessary. Do not induce vomiting as the hazard of aspirating the material into the lungs is a greater hazard than allowing it to progress through the intestinal tract.

Medical Conditions Possibly Aggravated by Exposure:

Cardiovascular Disease: See Principal Hazards: Inhalation Section.

Other Health Hazards:

Freon® 113 is not listed as a carcinogen by IARC, NTP or OSHA. Based on animal studies and human experiences this fluorocarbon poses no hazard to man relative to systemic toxicity, carcinogenicity, mutagenicity, or teratogenicity when occupational exposures are below its TLV®.

PROTECTION INFORMATION

Generally Applicable Control Measures:

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low places.

Personal Protective Equipment:

Butyl gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal manufacturing conditions no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large spill occurs.

DISPOSAL INFORMATION

Spill, Leak or Release:
Ventilate area. Do not flush into sewers. Dike spill. Collect on absorbent material and transfer to steel drums for recovery or disposal. Comply with federal, state and local regulations on reporting releases.

Waste Disposal: Comply with federal, state and local regulations. Remove to a permitted waste disposal facility. EPA Hazardous Waste Nos. F001 and F002 may apply to waste materials.

SHIPPING INFORMATION

Domestic - Other Than Air (DOT)

Proper Shipping Name	Not Regulated

International Water or Air (IMO/ICAO)

Proper Shipping Name	Not Regulated

Other Information

Shipping Containers	Drums, tank trucks, tank cars
Storage Conditions	Clean, dry area. Do not heat above 125°F.

Date Revised: 10/85
Person responsible: T. D. Armstrong, C&P Dept., Freon® Products Lab, Chestnut Run, Bldg. 711, Wilmington, DE 19898 (302) 999-3847 or (302) 999-4338.

DUPONT

Date: 08/11/88
Revision: 88-0
Attachment: C-2

Determination of Solvent Content Using Specific Gravity Method

Procedure

Collect sample using the Glass Thief or Alternate Device

1. Transfer sample to a container of sufficient size to allow for mixing.

2. Shake container.

3. Place the thermometer and a hydrometer in the hydrometer jar.

4. Fill the hydrometer jar to within one inch of the top with the mixture to be tested.

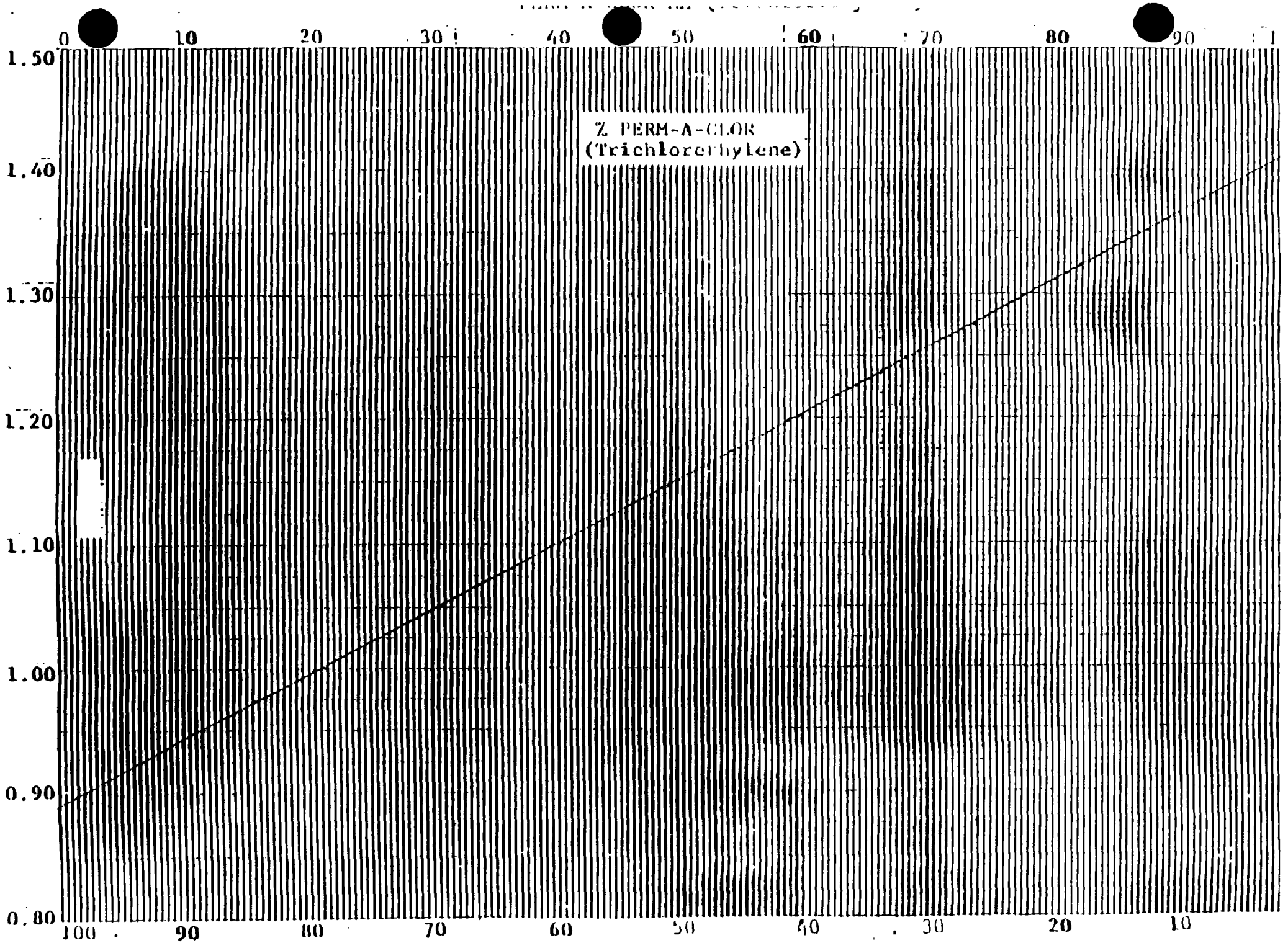
5. If the hydrometer reads off-scale, replace it with a higher or lower range hydrometer as required.

6. Read the hydrometer to the nearest 0.10 SpG Unit.

7. Using the attached Solvent-oil Mixture vs. SPECIFIC Gravity Chart, determine the weight per cent oil.

8. The solvent content is calculated as follows:

   WEIGHT PER CENT SOLVENT = 100% - WEIGHT PER CENT OIL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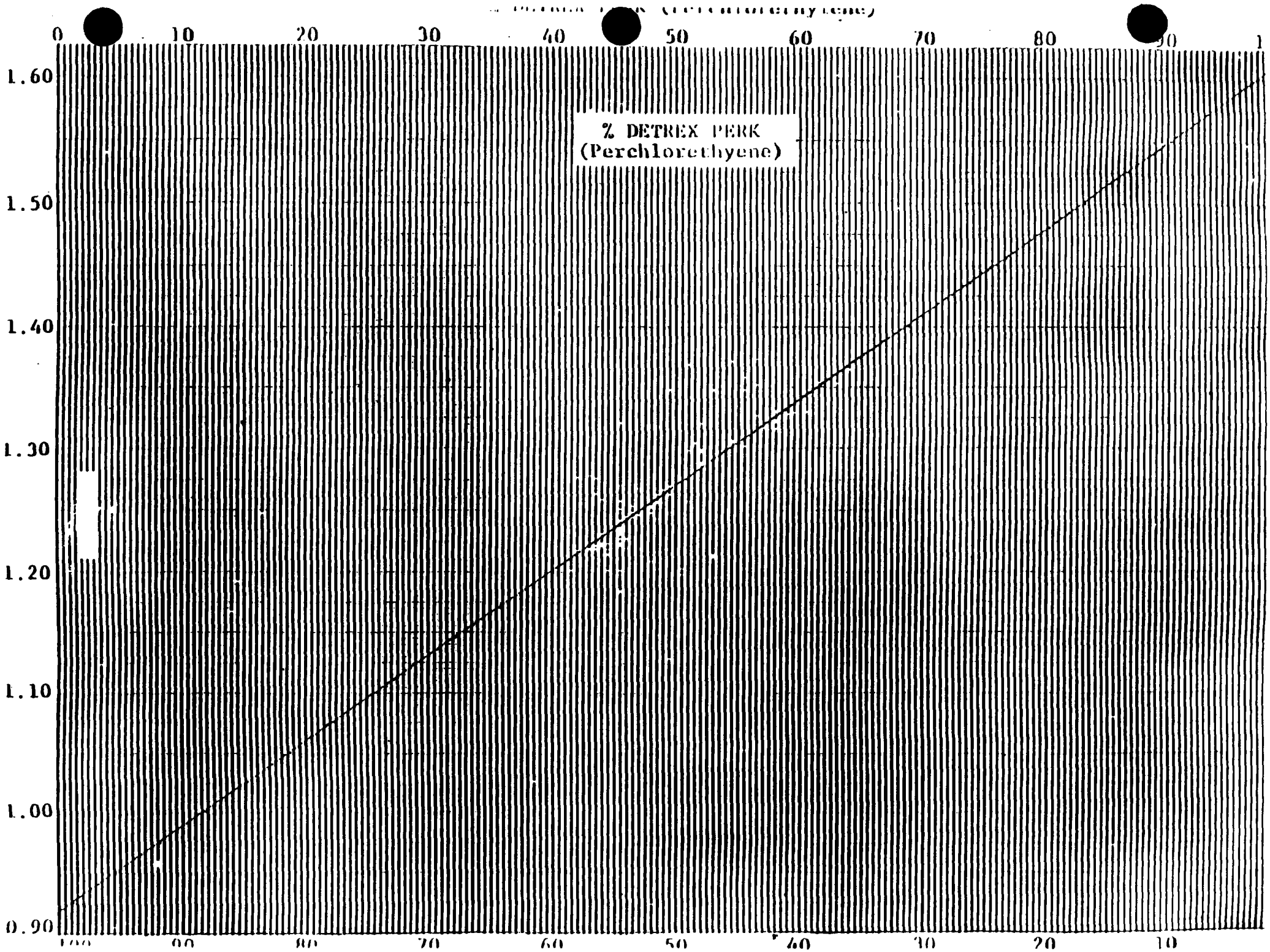
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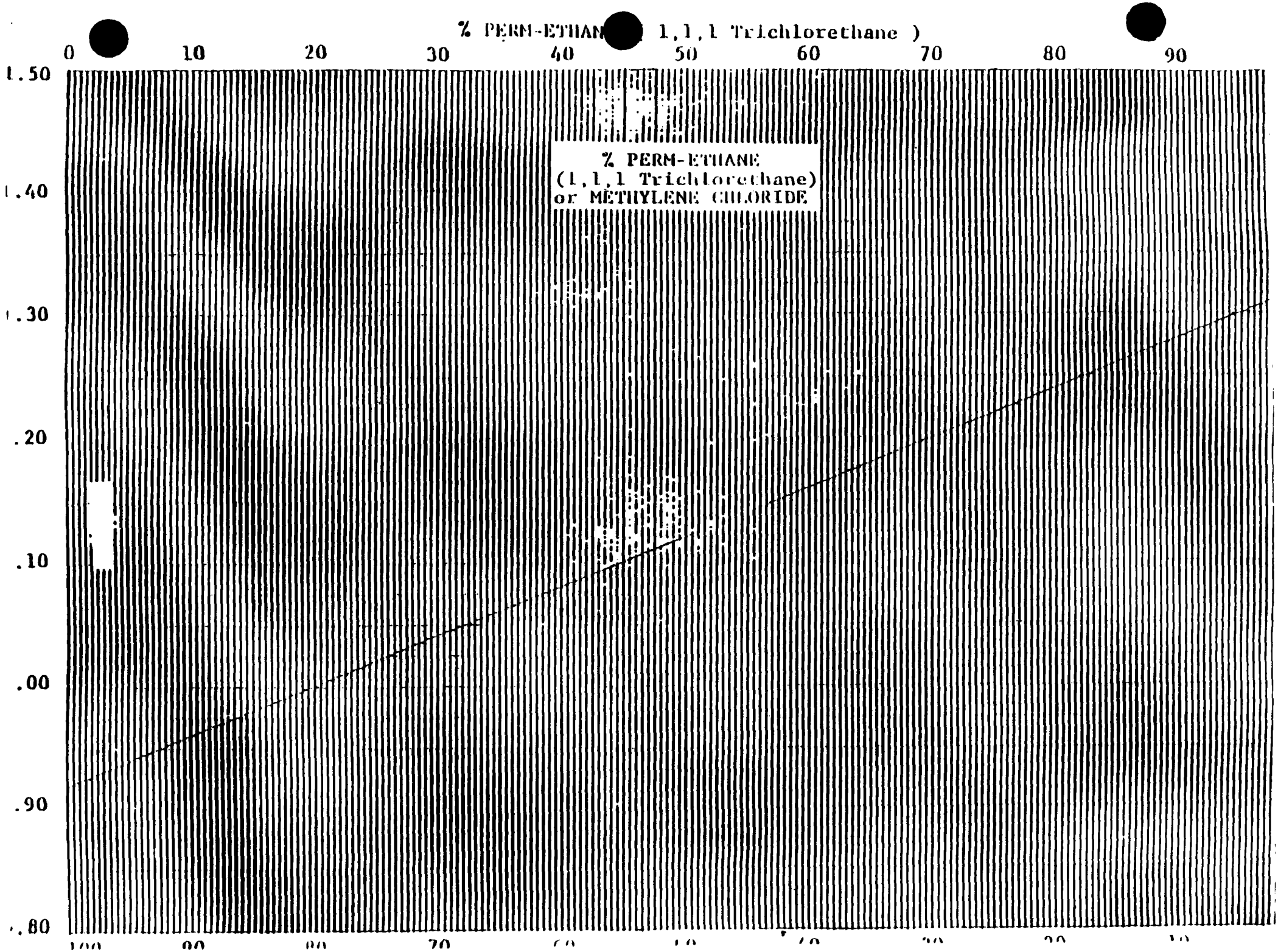
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% PERM-ETHANE
(1,1,1 Trichlorethane)
or METHYLENE CHLORIDE

Date: 08/11/88
Revision: 88-0
Attachment: C-2

Composite Sample Collection Procedure

1) Obtain a sample from each drum in a lot (15 drums maximum) of a particular solvent waste (i.e. TCE waste) using a glass thief or alternate device. Place each sample into a graduated cylinder, flask or beaker.

2) Thoroughly mix the composite sample.

3) Draw from the composite one 4 ounce (fl.) sample and label accordingly.

4) Send the 4 ounce sample to the Detroit, Michigan or Ashtabula, Ohio laboratory.

5) Use a portion of the remaining composite to determine solvent content via the Specific Gravity Method.

TABLE OF CONTENTS

Date: 06/02/92
Revision: 92-2

ATTACHMENT D-3

SECONDARY CONTAINMENT SYSTEM CAPACITY

A) <u>POSITIVE VOLUME</u>

Secondary Containment Area	=	30'4" x 76'6" + 29'4" x 85'0"
	=	4813.83 square feet x 6" high
	=	2,406.9 cubic feet
	=	18,005 gallons

B) <u>NEGATIVE VOLUMES</u>

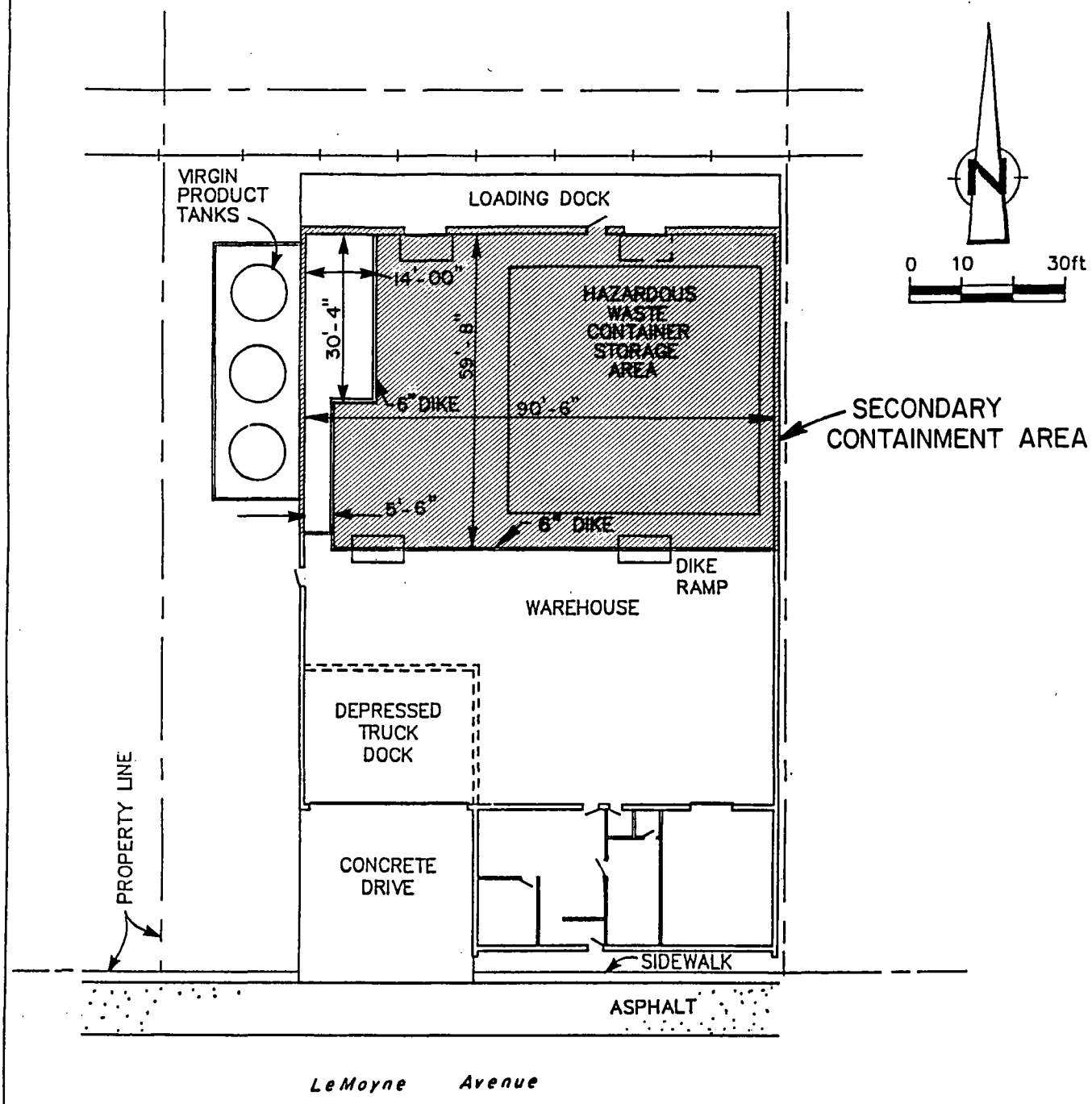
Drums on Floor	Product & Empty	=	300 drums (maximum)
Volume per Drum		=	$\pi \times r^2 \times h$
		=	$\pi \times (11")^2 \times 6"$ high
		=	2,280.8 cubic inches per drum
		=	9.87 gallons per drum
		=	2,961 gallons

Hazardous Waste Drums (assume entire area covered by wooden pallets is a negative volume)

Volume per Pallet (84 pallets maximum)	=	4' x 4' x 6" high
	=	8.0 cubic feet per pallet
	=	59.8 gallons per pallet
	=	5,023 gallons
Miscellaneous Volumes (i.e. equipment, ramps)	=	assume 10% of total volume
	=	1,800 gallons

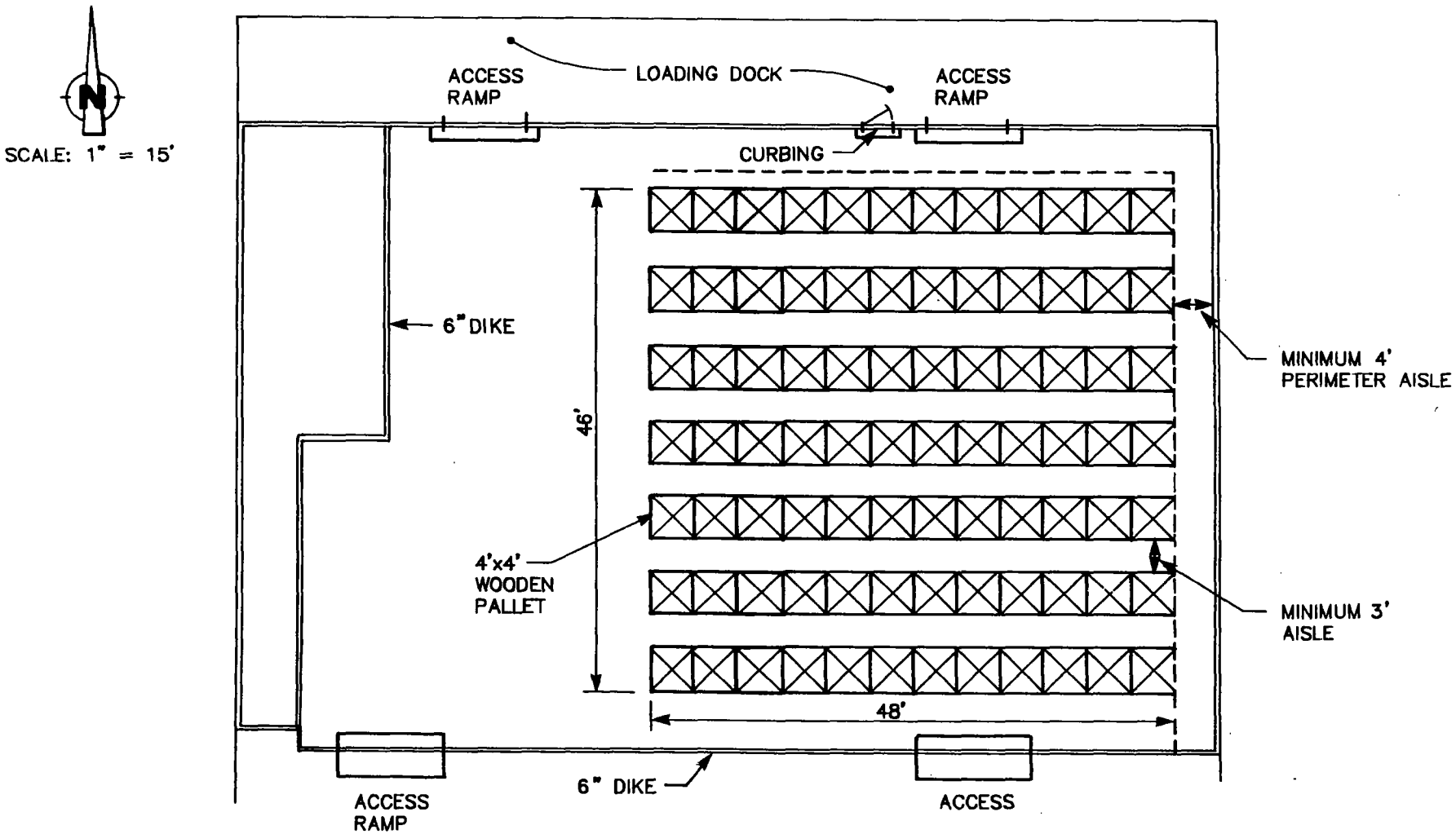
TOTAL SECONDARY CONTAINMENT CAPACITY = <u>8,221 gallons</u>

Note: Assuming entire pallet as a negative volume is overly conservative.



SECONDARY CONTAINMENT SYSTEM
Detrex Corporation
Melrose Park, Illinois Facility

CRA



TYPICAL CONTAINER ARRANGEMENT
Detrex Corporation
Melrose Park, Illinois Facility

CRA

DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR METAL BARRELS, DRUMS, KEGS, CASES, TRUNKS AND BOXES

(49 CFR PART 178)

Section	Description
178.80	Specification 5: steel barrels or drums
178.81	Specification 5A: steel barrels or drums
178.82	Specification 5B: steel barrels or drums
178.83	Specification 5C: steel barrels or drums
178.88	Specification 5K: nickel barrels or drums
178.89	Specification 5L: steel barrels or drums
178.90	Specification 5M: monel drums
178.92	Specification 5P: lagged steel drums
178.98	Specification 6B; steel barrels or drums
178.99	Specification 6C: steel barrels or drums
178.100	Specification 6J: steel barrels or drums
178.115	Specification 17C: steel drums
178.116	Specification 17E: steel drums
178.117	Specification 17F: steel drums
178.118	Specification 17H: steel drums
178.120	Specification 20PF: phenolicfoam insulated metal overpack
178.121	Specification 21PF: fire and shock resistant, phenolic-foam insulated, metal overpack
178.130	Specification 37K: steel drums
178.131	Specification 37A: steel drums
178.132	Specification 37B: steel drums
178.135	Specification 37C: steel drums
178.137	Specification 37D: steel drum. Non-reusable container.

DEPARTMENT OF TRANSPORTATION SPECIFICATIONS FOR PORTABLE TANKS

(49 CFR PART 178)

Section	*Description*
178.245	Specification 51: steel portable tanks
178.251	General design and construction requirement applicable to specifications 56 (§ 178.252) 57 portable tanks (§ 178.253)
178.252	Specification 56: metal portable tank
178.253	Specification 57: metal portable tank
178.255	Specification 60: steel portable tanks
178.270	Specification IM 101 and IM 102: steel portable tanks; general design and construction requirements
178.271	Specification IM 101: steel portable tanks
178.272	Specification IM 102: steel portable tanks

SECTION D

PROCESS INFORMATION

This section provides specific process information for the hazardous waste container storage area at the Gold Shield Solvents facility in Melrose Park, Illinois. The details are provided pursuant to Illinois Rule 35. The applicable section(s) of the Illinois Regulations are referenced as appropriate.

A hazardous waste container storage area is used to store wastes prior to transfer off-site. The entire operation is located within an enclosed building.

Hazardous wastes are received at the Gold Shield Solvents facility in 55-gallon drums. Upon receipt all drums are transferred to an appropriate area in the hazardous waste container storage area.

A facility plan is presented in Attachment D-1. This figure locates the hazardous waste container storage area within the Gold Shield Solvents building.

D-1 CONTAINERS

Hazardous wastes that are received at the Detrex temporary storage facility in 55-gallon drums are placed in a container storage area prior to transport off-site. Each drum in the hazardous waste container storage area is labeled (see sample label in Attachment D-2) according to its contents and manifest information. The location of the container storage area is shown in Attachment D-1.

Additional container storage areas are present in the facility, however, only virgin solvent products and empty drums are stored in these areas. Product drum labels are completely different to distinguish between product and waste drums.

D-1a Containers with Free Liquids

D-1a(1) Description of Containers [35 IAC 724.271, 724.272]

Virgin solvent is sold by Detrex Gold Shield Solvents to customers in new 55-gallon drums meeting the requirements of U.S. Department of Transport Specification No. 17E (DOT 17E). When the solvent is returned to Detrex in waste form, it is usually returned in the original drum in which the virgin material was shipped. In any case, it must be returned in a drum which meets the following requirements:

1) Not have any leaks;

2) Not have excessive corrosion or rust build-up which could, upon handling, become a leak;

3) Not be excessively dented such that the usable drum volume is less than 55-gallons;

4) Be properly sealed with suitable bung; and

5) Be properly labeled, manifested and accompanied with proper notification if necessary.

Since Detrex Gold Shield Solvents delivers virgin solvents to customers in its own trucks, it is common practice to pick up the waste material at the same time. Gold Shield Solvents truck drivers are able to check each drum to see that the criteria outlined above are met. Drums not meeting this criteria are not accepted.

If waste drums are received at the Gold Shield Solvents facility by other than Detrex's truck, the drums are inspected upon arrival, to ensure their conformance with the above listed requirements.

All of the halogenated solvent wastes stored at the Gold Shield Solvents facility are compatible with the steel drum material.

While stored at the Detrex facility, all hazardous waste containers are properly labeled.

D-1a(2) Container Management Practices
[35 IAC 724.273]

To ensure that no spillage of hazardous waste material occurs in shipment from a customer facility, all drums must meet the requirements specified previously in Section D-1a(1). The drums remain tightly sealed during storage in the container storage area and are opened only when the waste material is to be tested.

The drums are stored in the vertical position and are situated in rows with adequate aisle space to allow for inspection. If necessary, drums are stacked up to three layers high. The maximum hazardous waste inventory at the facility is 500 drums (27,500 gallons).

Drums are transferred within the building by a forklift with a drum handling attachment. Hand drum trucks may also be used to transport drums short distances.

There are no ignitable, reactive or incompatible hazardous wastes handled at this facility .

The following procedures are followed whenever Detrex is receiving and/or hauling hazardous wastes:

1) Detrex transports only properly manifested and labeled shipments that are accompanied with proper notification, if necessary, and meet the container condition requirements outlined in Section D-1a(1), of hazardous waste to its solvent recovery operation;

2) Only F001 and F002 wastes are accepted;

3) The manifest is signed and dated. One copy of the signed manifest is given immediately to the transporter, if other than Detrex, one copy is returned to the waste generater within 30 days, and one copy is retained at the facility for a period of at least 3 years;

4) Shipments are recorded in the Customer Hazardous Waste Shipment Ledger upon receipt at the facility;

5) A sample is taken from each container, per the waste analysis plan in Section C, for analysis;

6) Containers are stored in the properly designated, secured area. After analysis and the data is available, the waste material is shipped out for reclamation (recycling) at an off-site Detrex facility or to an off-site permitted treatment/disposal facility, as appropriate.

D-1a(3) Secondary Containment System Design and Operation [35 IAC 703.201(a)(1), 724.275(a) and (d)]

All containerized hazardous wastes are placed in the designated hazardous waste container storage area at the north end of the facility after being received on site. The container storage area is located with an enclosed building. The building floor, including the container storage area, is constructed of concrete.

A 6-inch concrete dike is provided, as shown in Attachment D-1, to provide adequate secondary containment for the hazardous waste container storage area within the north half of the warehouse area. Concrete access ramps are provided at two locations of this dike and at the two doorways on the north wall of the building to provide access for equipment (i.e. forklift) while maintaining secondary containment.

The concrete access ramps are at minimum 6 inches high.

D-1a(3)(a) Requirements for the Base or Liner to Contain Liquids [35 IAC 724.275(a)(1)]

The building floor, including the container storage area, is constructed of concrete with a concrete dike to provide secondary containment in the container storage area. The concrete is coated with ICO-SUPERGUARD coating which provides an essentially impervious coating for the contained wastes as well as being compatible with each type of waste stored in the facility. There are no expansion or control joints in the floor slab and the surface is free of cracks and gaps. All doorways are diked with concrete ramps to maintain secondary containment while allowing for easy movement of equipment. The container storage area diking, and diked doorways are located on Attachment D-1. There are no floor drains or other such openings in the secondary containment area.

The sealant has been applied in accordance with the manufacturers instructions. The specifications of the selected sealant are provided in Attachment D-5.

This facility was originally constructed as an industrial building. Assuming a conservatively low design of a 5-inch thick, non-reinforced concrete floor slab for the facility, the modulus of rupture (M.R.) for such a slab is approximately 579 psi. The total factored wheel load based on conservatively high use and weight load of the existing forklift is 402.5 psi. This provides a factor of safety for the assumed concrete floor slab of 1.44. This indicates that at a minimum design standard, the existing floor slab is adequate. This fact is further illustrated since the slab has performed without structured problems for at least 15 years.

D-1a(3)(b) Containment System Drainage [35 IAC 703.201(a)(2), 724.275(b)(2)]

The containers within the container storage area are placed on wooden pallets to elevate them off the concrete floor. Containers are also provided with adequate aisle space to allow for routine inspection. If an inspector discovers the presence of liquid, clean-up will be conducted. If necessary, the forklift can be used to move containers in order to complete the necessary clean-up.

D-1a(3)(c) Containment System Capacity
[35 IAC 703.201(a)(3), 724.275(b)(3)]

The very conservative estimate of the total capacity of the secondary containment system at the facility is approximately 8,221 gallons (Attachment D-3a provides the calculations, Attachment D-3b provides a facility drawing showing the dimensions and Attachment D-3c shows the arrangement of the containers within the container storage area). The maximum volume of containerized hazardous waste stored at the facility is 27,500 gallons (based on 500 drums at 55-gallons per drum).

Pursuant to the regulations [35 1AC 724.275(b)(3)], the containment system must have sufficient capacity to contain ten percent (10%) of the volume of containers or the volume of the largest container, whichever is greater. Thus, adequate containment is provided by the secondary containment system for the container storage area.

D-1a(3)(d) Control of Run-on [35 IAC 703.201(a)(4), 724.275(b)(4)]

Run-on into the containment system for the container storage area is eliminated by the building structure. All precipitation is controlled outside of the facility and drainage is promoted away from the building in all areas except the concrete driveway. In this area drainage is toward the facility, however, it is controlled via a catchbasin that discharges to the 18-inch diameter combined sewer on LeMoyne Avenue in front of the facility. The catchbasin is covered by an 18-inch round drainage lid. The catchbasin is provided with a standard sump below the invert of the direct discharge line to the LeMoyne Avenue sewer.

During unloading/loading operations within the truck dock (see Attachment D-1), care is taken to prevent contaminated liquid from discharging to the sewer system from the catchbasin in the event of a spill. During all container unloading/loading operations, a 4-foot x 4-foot square by 1/4-inch thick polypropylene pad is placed over the catchbasin and absorbent socking placed around it. The polypropylene pad and absorbent material prevents liquids from entering the catchbasin in the event of a spill. Additional absorbent material is also readily available to soak up any spilled liquids if required.

D-2 TANK SYSTEMS [35 IAC 703.202]

Detrex Corporation does not and has never utilized tanks for hazardous waste storage at the Gold Shield Solvents facility in Melrose Park, Illinois. Hence, a permit for storage tanks is not requested.

D-3 WASTE PILES [35 IAC 703.204]

Detrex Corporation does not and has never had a hazardous waste pile at the Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for a waste pile is not requested.

D-4 SURFACE IMPOUNDMENTS [35 IAC 703.203]

Detrex Corporation does not and has never had a hazardous waste surface impoundment at the Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for a surface impoundment is not requested.

D-5 INCINERATORS [35 IAC 703.205]

Detrex Corporation does not and has never had a hazardous waste incinerator at the Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for an incinerator is not requested.

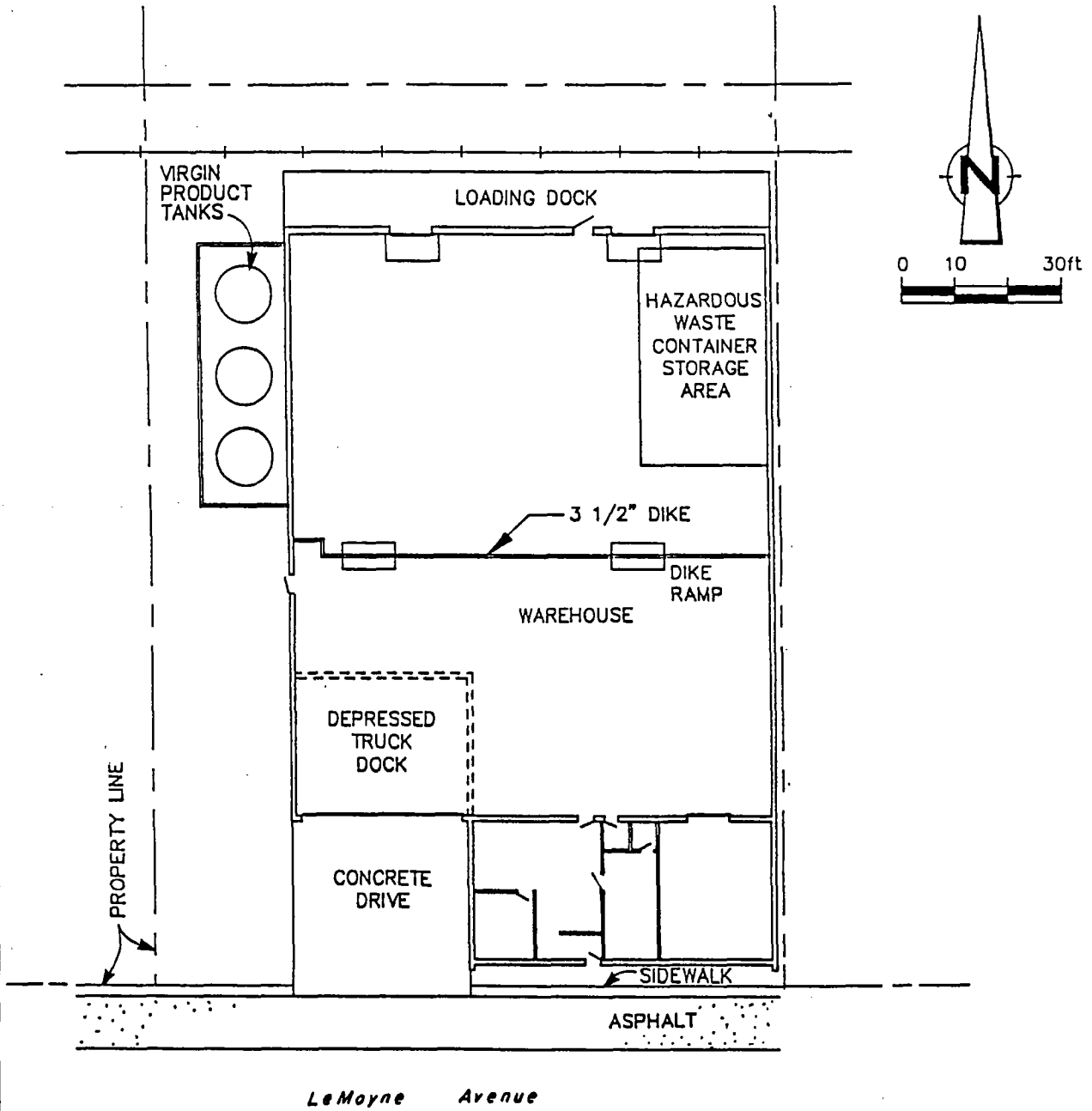
D-6 LANDFILLS [35 IAC 703.207]

Detrex Corporation does not and has never had a hazardous waste landfill at the Gold Shield Solvent facility in Melrose Park, Illinois; hence, a permit for a landfill is not requested.

D-7 LAND TREATMENT [35 IAC 703.206]

Detrex Corporation does not and has never had a hazardous waste land treatment operation at the Gold Shield Solvents facility in Melrose Park, Illinois; hence, a permit for land treatment is not requested.

ATTACHMENT D-1



FACILITY PLAN
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

Yellow background and border

Red background and lettering

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE, OR
PUBLIC SAFETY AUTHORITY, OR THE
U.S. ENVIRONMENTAL PROTECTION AGENCY

PROPER D.O.T.
SHIPPING NAME _____ UN OR NA# _____

GENERATOR INFORMATION:

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

EPA ID NO. _____ EPA WASTE NO. _____

ACCUMULATION START DATE _____ MANIFEST DOCUMENT NO. _____

HANDLE WITH CARE!

CONTAINS HAZARDOUS OR TOXIC WASTES

STYLE WM-5

Red lettering

Balance of lettering is black

HAZARDOUS WASTE DRUM LABEL
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/07/88-3-F-0

ATTACHMENT D-3

SECONDARY CONTAINMENT SYSTEM CAPACITY

A) POSITIVE VOLUME

Secondary Containment Area	= 90.5' x 59.7'
	= 5402.85 square feet x 3 1/2" high
	= 1575.8 cubic feet
	= 11,788 gallons

B) NEGATIVE VOLUMES

Drums on Floor	1) Waste	= 500/3 layers = 167
	2) Product & Empty	= 300 (maximum)
	TOTAL	= 467 drums
Volume per Drum		= $\pi \times r^2 \times h$
		= $\pi \times (11")^2 \times 3\ 1/2"$ high
		= 1,330.5 cubic inches per drum
		= 5.76 gallons per drum
		= 2,690 gallons
Miscellaneous Volumes		= assume 5% of total volume
		= 590 gallons

TOTAL SECONDARY CONTAINMENT CAPACITY = 8,508 gallons

SECTION E

GROUNDWATER MONITORING

Detrex Corporation does not and has never had a surface impoundment, waste pile, land treatment unit or landfill. Therefore, the requirements of 35 IAC 703.185 and 724.190(b) are not applicable.

The hazardous waste container storage area, for which this Part B Permit is being applied for, is located inside a totally enclosed building. The building provides protection from precipitation and run-on into the container storage area. The building floor, which encompasses the container storage area, is constructed of concrete with concrete diking to provide secondary containment. All doorways are diked with concrete ramps. There are no floor drains or other such openings in the secondary containment area. To this point there has been no release of hazardous waste constituents to the environment from the solid waste management units at the Gold Shield Solvents facility. Gold Shield Solvents will continue to operate and maintain the secondary containment area to prevent hazardous waste or hazardous waste constituents from escaping into the environment in a manner that could directly or indirectly impact the groundwater.

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SECTION F

PROCEDURES TO PREVENT HAZARDS

This section of this RCRA Part B Permit Application provides a description of the procedures implemented at the Detrex Corporation Solvents facility to prevent the possibility of a hazard from occurring.

This information is provided pursuant to Illinois Rule 35. The applicable sections of the Illinois Regulations are referenced as appropriate.

F-1 SECURITY [35 IAC 703.183(d), 724.114]

F-1a Security Procedures and Equipment [35 IAC 703.183(d), 724.114]

F-1a(1) 24-Hour Surveillance System [35 IAC 703.183(a)]

A 24-hour electronic surveillance system is present at the Detrex Gold Shield Solvents facility in Melrose Park, Illinois.

The surveillance system consists of the following:

- One four zone alarm control panel;
- One 30 watt indoor electronic siren;
- One central station alarm transmitter;
- One touch pad set station;
- One entry delay warning sounder;
- Contact one front door;
- One ultra sonic motion detector in office; and
- One infrared photo electric eye across rear wall (east to west)

F-1a(2)(a) Barrier [35 IAC 724.114(b)(2)(4)]

The entire hazardous waste treatment operation and storage area is located within a single-story concrete block building. The building is provided with security doors which are kept locked at all times when the facility is unattended. The security procedures prevent the entry of unauthorized persons or livestock into the active portion of the hazardous waste handling area. Security precautions are illustrated in Attachment F-1.

F-1a(2)(b) Means to Control Entry [35 IAC 724.114(b)(2)(B)]

As described above, the entire hazardous waste handling area is contained within a single building. The entrances to the building are controlled by security doors which are kept locked when the facility is unattended and an electronic surveillance system is present to prevent access to the active portions of the facility at all times to all except authorized persons.

F-1a(3) Warning Signs [35 IAC 724.114]

Warning signs are posted on the outside wall of the building wherever an access door is located. The signs are legible from a distance of 25 feet and have the following wording:

"Danger - Unauthorized Personnel Keep Out".

F-1b Waiver [35 IAC 724.114(a)]

Detrex Corporation does not request a waiver from the security procedures and equipment requirements of the permit application for the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2 INSPECTION SCHEDULE [35 IAC 703.183(e), 724.115]

F-2a General Inspection Requirements [35 IAC 703.183(e), 724.115(a) and 724.113]

Gold Shield Solvents conducts regular inspections of the hazardous waste container storage area for leaking containers and for deterioration of containers and the containment system that could cause or lead to the release of hazardous waste constituents to the environment or threaten human health.

The hazardous waste container storage area is contained within a single 'warehouse' type building. This allows an almost continual check by on-site staff and rapid detection and response to any problems.

F-2a(1) Types of Problems [35 IAC 724.115(b)(3)]

Attachment F-2 presents the typical schedule for inspecting security, emergency equipment and the hazardous waste container storage area. Types of problems normally encountered with each inspection item are included. Copies of the inspection schedule are kept on file at the facility at all times.

F-2a(2) Frequency of Inspection [35 IAC 724.115(b)(4)]

Attachment F-2 also includes the frequency of inspection for each item.

F-2a(3) Remedial Action

Inspections may reveal problems of three types. The first type of problem involves the need for non-emergency maintenance. In this situation, qualified personnel will take the necessary actions as soon as possible to preclude further damage and reduce the potential for emergency repairs. The inspector will note in the inspection log when such action should be taken and verify the status on the next regularly scheduled inspection.

The second type of problem involves a non-emergency release of hazardous waste that is discovered during inspection. In this situation, appropriate remedial action will be taken immediately and documented in the inspection log. At a minimum, daily inspections will be made until the remedial action is completed.

The third type of problem involves the discovery of a release or the potential for the release of hazardous constituents to the environment in sufficient quantities to constitute an emergency. If this occurs, the Contingency Plan (included as Section G of this permit application) will be implemented. The Contingency Plan provides a detailed description of the remedial action appropriate for this situation.

F2a(4) Inspection Log

Provided in Attachment F-3 are typical daily and weekly inspection records. These are completed by the inspector at the conclusion of each routine inspection. Each inspection record is kept on file in an inspection log for a minimum of three years.

F-2b Specific Process Inspection Requirements

F-2b(1) Container Inspection [724.274]

The Gold Shield Solvents containers and container storage area are inspected on a daily basis as indicated in the hazardous waste inspection schedule presented in Attachment F-2. The containment structure is inspected at minimum weekly.

F-2b(2) Tank System Inspection [724.294(a) and (b)]

Detrex Corporation does not operate a hazardous waste storage tank at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(3) Waste Pile Liner Inspection for Exemption from Groundwater Protection Requirement [35 IAC 703.204(d), 724.353(a)(3)]

Detrex Corporation does not and has never had a waste pile at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(4) Waste Pile Inspection [35 IAC 724.354(b)]

Detrex Corporation does not and has never had a waste pile at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(5) Surface Impoundment Inspection [35 IAC 724.326(b) and (c)]

Detrex Corporation does not and has never had a surface impoundment at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(6) Incinerator Inspection [35 IAC 724.447]

Detrex Corporation does not and has never had an incinerator at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(7) Landfill Inspection [35 IAC 724.403(b)]

Detrex Corporation does not and has never had a landfill at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-2b(8) Land Treatment Facility Inspection [35 IAC 724.373(g)]

Detrex Corporation does not and has never had a land treatment facility at the Gold Shield Solvents facility in Melrose Park, Illinois.

F-3 PREPAREDNESS AND PREVENTION

The applicant does not wish to request a waiver of the preparedness and prevention requirements of the permit application. These requirements are also addressed in the contingency plan found in Section G of this application.

Melrose Park Fire Department (MPFD) and Police Officials are familiar with the hazardous waste management operation and with the contingency plan for the facility. A copy of the contingency plan will be kept in the facility office at all times.

F-3a Equipment Requirements [35 IAC 703.183, 724.132]

F-3a(1) Internal/External Communications [35 IAC 724.132(a) and (b)]

There is a telephone located within the hazardous waste treatment area. This telephone can be actuated internally as a public address (P.A.) system to warn employees of potential hazards and externally to alert local emergency response teams (e.g., fire, ambulance, police).

F-3a(2) Emergency Equipment [35 IAC 724.132(c)]

Attachment F-4 to this permit application presents the location of all emergency and safety equipment within the Gold Shield Solvents facility. This equipment includes:

1) Absorbent Material
2) First-Aid Kit
3) Safety Shower
4) Eye Wash Station
5) Self Contained Breathing Apparatus
6) Respirator
7) Fire Extinguishers
8) Telephone/P.A.

All emergency and safety equipment is routinely inspected and tested in accordance with the inspection schedule presented in Section F-2 to ensure its proper operation in time of emergency.

F-3a(3) Water for Fire Control
[35 IAC 724.132(d)]

The nearest fire hydrant to the facility is located on LeMoyne Avenue directly in front of the facility.

F-3b Aisle Space Requirement [35 IAC 724.135]

The aisle space requirement is met by maintaining a minimum of 2-foot aisles in the hazardous waste container storage area. This allows detection of spill material and the unobstructed movement of personnel, fire protection equipment, spill control equipment, and material handling equipment.

F-4 PREVENTIVE PROCEDURES, STRUCTURES AND EQUIPMENT [35 IAC 703.183(h)]

F-4a Unloading Operations [35 IAC 703.183(h)(1)]

Hazardous waste loading/unloading operations, associated with the container storage area, consists of forklift or hand drum truck movement of drums to and from the container storage area. The forklift is equipped with a special drum handling attachment.

The unloading of hazardous waste occurs at the depressed truck dock in the receiving area on the south-west corner of the facility. The delivery truck backs up to the raised loading/unloading area. This area is entirely within the building structure. The drums are loaded/unloaded using a forklift or hand drum truck and transferred to the container storage area.

All loading/unloading operations are conducted under the supervision of Detrex personnel and the area is inspected at the conclusion of unloading operations to ensure that no spillage has occurred.

F-4b Runoff [35 IAC 703.183(h)(2)]

The hazardous waste storage and treatment areas are located within an enclosed building. This prevents accumulation of run-on waters in the hazardous waste handling areas. As indicated in Section B of this permit application, the area immediately surrounding the warehouse is sloped away from the building except for the concrete driveway. The driveway slopes down toward the facility to a catchbasin which discharges to the 18-inch diameter combined sewer in front of the facility.

During all loading/unloading operations, a 4-foot x 4-foot square by 1/4-inch thick polypropylene pad is placed over the catchbasin cover and an absorbent sock placed around it. This pad and absorbent material prevents potentially spilled liquids from entering the sewer.

F-4c Water Supplies [35 IAC 703.183(h)(3)]

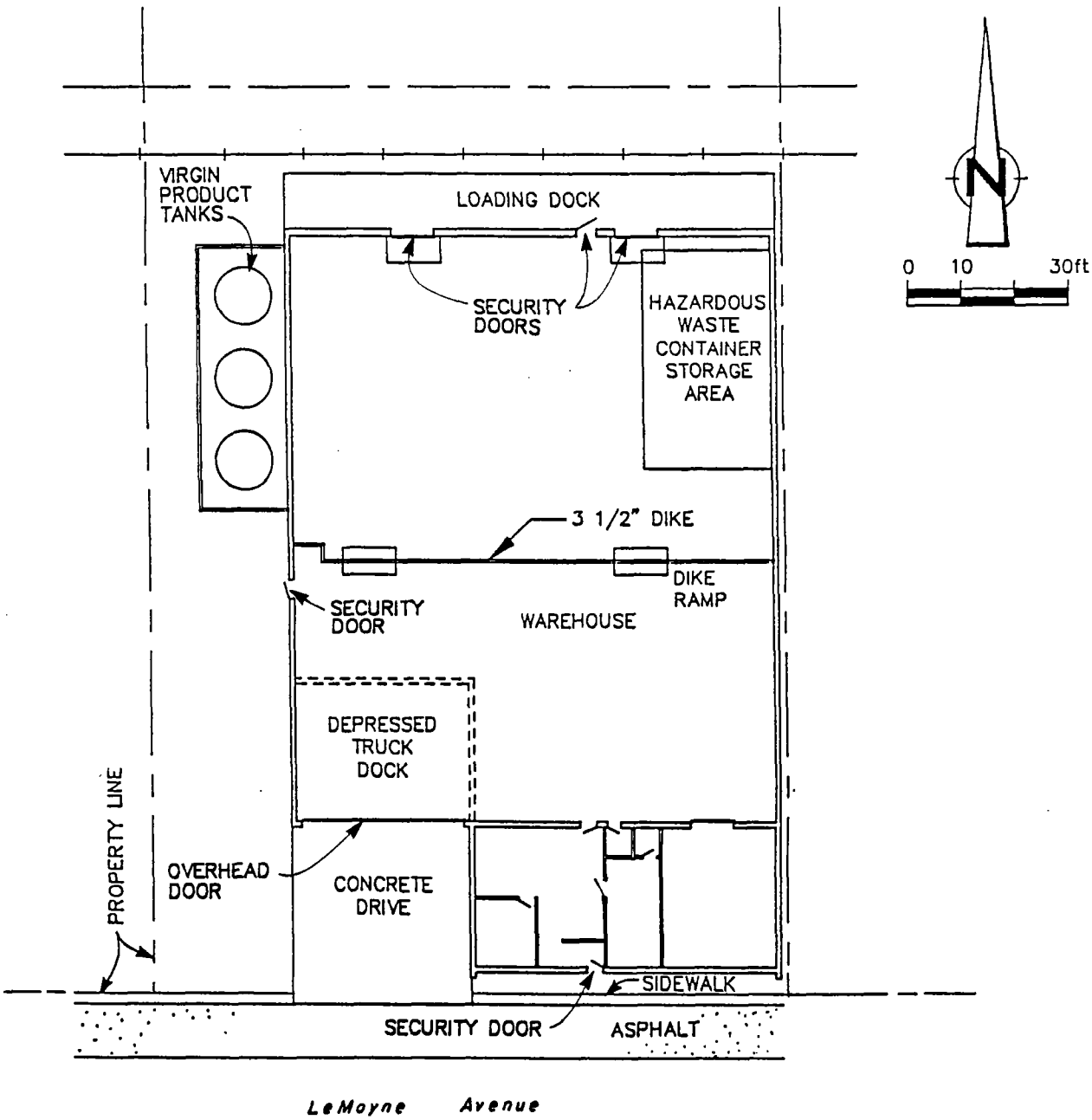
Groundwater contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground. The container storage area is contained within an enclosed building structure that is provided with adequate secondary containment.

F-4e Personnel Protection Equipment
[35 IAC 703.183(h)(5)]

The personnel protection equipment provided at the facility is listed in Section F-3a(2). Section G-5 of the Contingency Plan describes the equipment and its capabilities and locations in the facility. The proper use of the appropriate equipment is explained during personnel training procedures as described in Section H of this permit application.

F-5 MANAGEMENT OF IGNITABLE, REACTIVE, AND INCOMPATIBLE WASTES

There are no ignitable, reactive, or incompatible wastes stored in the container storage area; hence, a permit for the handling of ignitable, reactive, and incompatible wastes is not requested.



NOTE:

1. ALL DOORS REMAIN LOCKED WHEN FACILITY IS UNATTENDED
2. DUPAGE ELECTRONIC SECURITY SYSTEM ALSO PRESENT

SECURITY PRECAUTIONS
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

ATTACHMENT F-2

HAZARDOUS WASTE INSPECTION SCHEDULE

ITEMS	TYPE OF PROBLEM	INSPECTION FREQUENCY
Container storage area	-Leaking drums -Drum bungs secure	Daily
Secondary containment area	-Presence of liquid -Cracks,joints	Weekly
Loading/Unloading area	-Obstructions -Presence of liquid	Daily (when in use)
Absorbent material	-Adequate supply	Weekly
Doors	-Open freely -Locks function	Daily
Alarm system	-Functions	Daily
Fire extinguishers	-Available -Loss of pressure	Weekly
Self-contained breathing apparatus	-Loss of pressure in tank	Weekly
Respirator	-Available	Weekly
Eye wash station/ Safety shower	-Functions -Scale or rust in water	Weekly
First aid kit	-Available -Adequate supplies	Weekly

DETREX CORPORATION
GOLD SHIELD SOLVENTS
HAZARDOUS WASTE DAILY INSPECTION RECORD

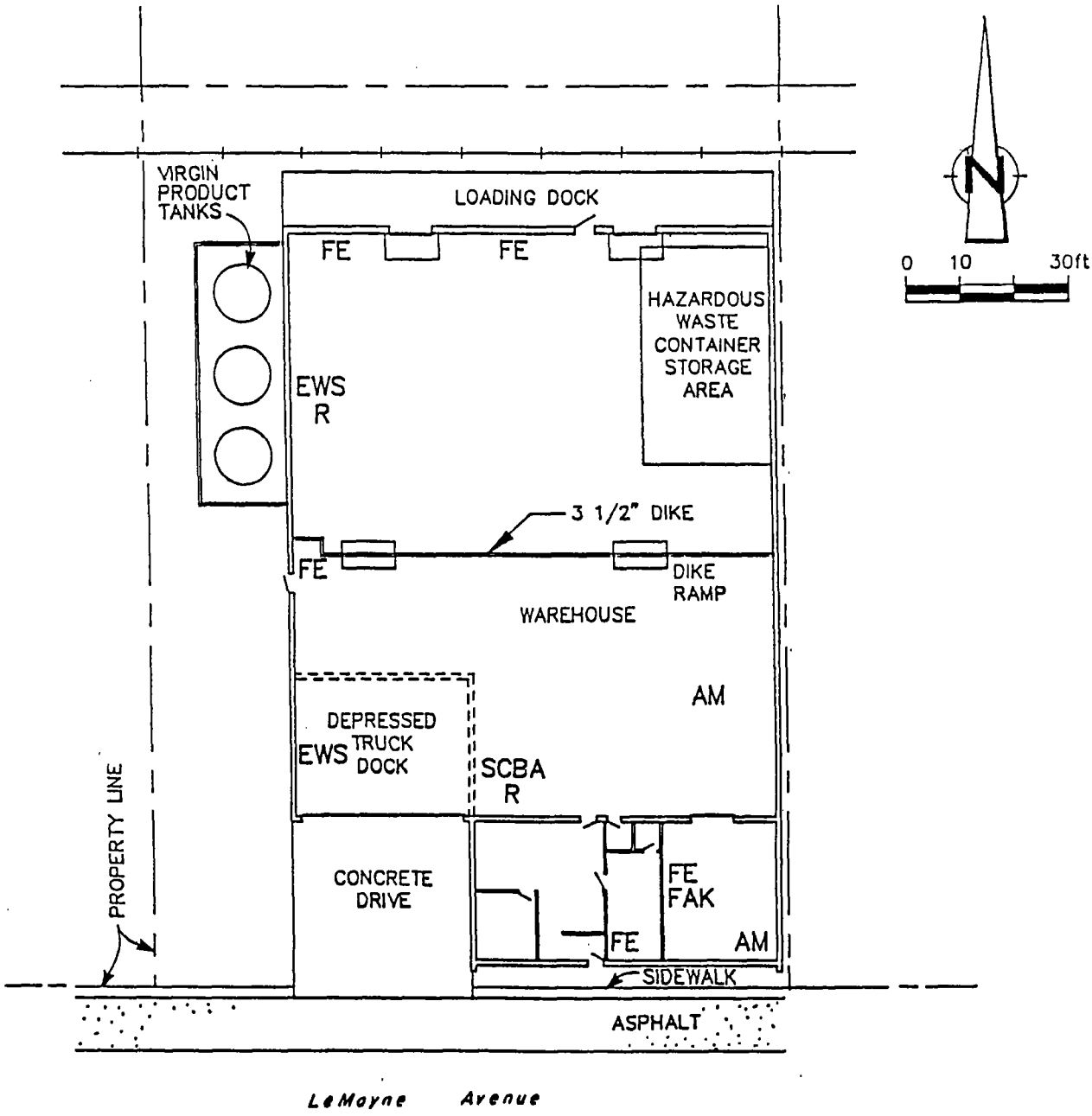
WEEK OF:_____

INSPECTION ITEM	TYPE OF PROBLEM	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
CONTAINER STORAGE AREA	-Leaking Drums -Drum Bungs Secure					
LOADING/UNLOADING AREA	-Obstructions -Presence of liquid					
DOORS	-Open Freely -Locks Function					
ALARM SYSTEM	-Functions Properly					
COMMENTS CONCERNING POTENTIAL PROBLEMS						
	INSPECTED BY:					
	TIME:					

DETREX CORPORATION
GOLD SHIELD SOLVENTS
HAZARDOUS WASTE WEEKLY INSPECTION RECORD

INSPECTION ITEM	TYPE OF PROBLEM	COMMENT
SECONDARY CONTAINMENT AREA	-Presence of Liquid -Cracks and Joints	
ABSORBENT MATERIAL	-Adequate Supply	
FIRE EXTINGISHERS	-Available -Loss of Pressure	
SELF-CONTAINED BREATHING APPARATUS	-Loss of Pressure in Tank	
RESPIRATOR	-Available	
EYE WASH STATION/ SAFETY SHOWER	-Functions -Scale or Rust in Water	
FIRST AID KIT	-Available -Adequate Supplies	

INSPECTED BY: _____
DATE: _____
TIME: _____



LEGEND

AM – ABSORBENT MATERIAL
EWS – EYE WASH STATION
FAK – FIRST AID KIT
FE – FIRE EXTINGUISHER
SCBA – SELF CONTAINED BREATHING APPARATUS
R – RESPIRATOR

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

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SECTION G

CONTINGENCY PLAN

This contingency plan has been prepared for the Detrex Corporation Gold Shield Solvents facility in Melrose Park, Illinois. The contingency plan was designed to minimize hazards to human health or the environment and describe the actions facility personnel will take in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water at the facility.

The information is provided pursuant to Illinois Rule 35 IAC 703.183(g), 724.150 through 724.156, 724.152(b). The applicable section(s) of the Illinois regulations are referenced as appropriate.

G-1 GENERAL INFORMATION

This contingency plan is provided for Detrex Corporation's facility located at:

2537 LeMoyne Avenue
Melrose Park, Illinois
U.S.A. 60160

This facility is a warehouse for virgin halogenated hydrocarbon solvents and a hazardous waste container storage area for solvent waste. The facility is classified as a treatment, storage, disposal (TSD) facility and operates under EPA identification number ILD 07442938.

This contingency plan contains emergency provisions to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents.

G-2 EMERGENCY COORDINATORS
[35 IAC 724.152(d), 724.155]

If an imminent or actual emergency is discovered, the Emergency Coordinator (either on the facility premises or on call) will be immediately notified. The primary Emergency Coordinator will be contacted first; if he is not available, the alternate will be contacted. The primary Emergency Coordinator and the alternate are listed on Table G-1 with their job titles, contact numbers, and home addresses.

The employee who discovers an imminent or actual emergency shall take responsibility for notifying the Emergency Coordinator or the alternate. At least one of the designated Emergency Coordinators will either be at the facility or on call and available to come to the facility to respond to an emergency seven (7) days per week.

The Emergency Coordinator is thoroughly familiar with all aspects of the contingency plan, all operations and activities at the facility, the location and characteristics of wastes handled, the locations of all records within the facility, and the facility layout. The Emergency Coordinator or the designated alternate has the authority to commit the resources necessary to implement the contingency plan. The Emergency Coordinator coordinates and directs all response efforts and personnel.

In the event that the Melrose Park Fire Department (MPFD) responds to an emergency at the facility, the MPFD Supervisor assumes the duties and authorities of the Emergency Coordinator. The MPFD Supervisor and the Emergency Coordinator then act together to coordinate and direct the response effort. The plant Emergency Coordinator's principal authority is to effectively provide the MPFD Supervisor with comprehensive and detailed information concerning plant operations and the location and characteristics of materials handled.

A listing of the emergency response agencies and organizations which may be called upon to provide emergency assistance at the facility is provided in Table G-2 with their appropriate contact numbers.

At present, the local Police and Fire Departments and the local Hospital have a copy of the contingency plan.

TABLE G-1

EMERGENCY COORDINATORS

Name	Job Title	Work Phone	Home Phone	Home Address
Primary				
Jeffrey P. Phillips	Branch Manager	(312) 345-3806 345-3807	(815) 459-6916	566 Somerset Lane Crystal Lake, Il. 60014
Alternate				
Mrs. Donna Cook	Secretary	(312) 345-3806 345-3807	(312) 562-0199	221 East Whitehall Northlake, Il. 60164

TABLE G-2

EMERGENCY RESPONSE AGENCIES/ORGANIZATIONS

NAME	PHONE NUMBER
Police Department	911 or 344-2124
Fire Department	911 or 344-2121
Gottlieb Health Services	(312) 451-4060
Franklin Park Industrial Clinic	(312) 455-3670
Emergency Response Centre	800-424-8802
Detrex Corporation - Risk Management Group (Detroit, Mi.)	(313) 358-5800
State EPA	(217) 782-3637
Melrose Park Environmental Control Board	(312) 344-1210
Illinois Emergency Services and Disaster Agency	(217) 782-4268
Emergency Cleanup of Spill: Waste Management Company	(312) 396-1050 (312) 841-8600 (312) 654-8800

G-3 IMPLEMENTATION [35 IAC 724.152(a), 724.156(d)]

The provisions of this contingency plan must be carried out immediately whenever there is an imminent or actual incident such as fire, explosion, or release of hazardous waste or hazardous waste constituents which could adversely threaten human health or the environment. Minor leaks of spills in the hazardous waste container storage area would not normally trigger the implementation of the Contingency Plan, but would be managed by the Emergency Coordinator or his alternate. This section of the Contingency Plan offers the Emergency Coordinator guidelines to evaluate the need to implement the Contingency Plan.

The Contingency Plan will be implemented in the following situations:

A. Fire and/or Explosion

1. A fire causes the release of toxic fumes.

2. The fire spreads and could possibly ignite materials at other locations on site or could cause heat-induced explosions.

3. The fire could possibly spread to off-site areas.

4. Contamination could spread from the use of water or water and chemical fire suppressants external to the facility.

5. An explosion has occurred or an imminent danger exists that an explosion could occur at the facility.

B. Spill or Material Release

1. The spill results in the release of toxic liquids representing a health hazard.

2. The spill is major (several drums) and could result in soil contamination and/or groundwater pollution.

G-4 EMERGENCY RESPONSE PROCEDURES

G-4a Notification [35 IAC 724.156(a)]

In the event that the contingency plan is implemented in response to an imminent or actual emergency situation, the acting Emergency Coordinator will notify the appropriate State or local agencies with designated response roles (see Table G-2).

When notifying response agencies, the Emergency Coordinator will be prepared to furnish the following information:

a) Name and telephone number of reporter;
b) Name and address of facility;
c) Time and type of incident (e.g. release, fire);
d) Name and quantity of material(s) involved and to what extent;
e) The extent of injuries, if any; and,
f) The possible hazards to human health, or the environment, outside the facility.

G-4b Identification of Hazardous Materials [35 IAC 724.156(b)]

In the event of an emergency situation, the Emergency Coordinator or his alternate will be contacted immediately. Upon notification, the Emergency Coordinator will take the necessary steps to immediately identify the character, exact source, amount and areal extent of any released materials.

The Emergency Coordinator and his alternate are familiar with the characteristics of all hazardous wastes handled at the Gold Shield Solvent facility and have access to the appropriate waste characterization information kept on file in the office. They also have access to the "Waste Inventory Ledger" which contains up-to-date information on the inventory of hazardous wastes at the facility.

G-4c Assessment [35 IAC 724.156(c) and (d)]

Upon discovery or notification of an emergency situation, the Emergency Coordinator will assess possible hazards to human health or the environment that may result from the release, fire or explosion. This assessment shall consider both direct and indirect effects of the release, fire, or explosion, including the effects of any toxic, irritating, or asphyxiating gases that are generated,

or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat-induced explosions.

The procedure for assessing possible hazards includes:

1. Identification of hazardous properties of the materials involved or by-products thereof.

2. Determination of threat to human health or the environment, both on site and off site.

3. Assess any environmental conditions (e.g. windspeed and direction) that may contribute to the seriousness of the hazard.

4. Determine the readiness and availability of response equipment, both on site and off site.

Specific Assessment of Possible Hazards to Human Health or the Environment

1. Emergencies which result in a spill or release of hazardous material which cannot be controlled by plant employees but will be contained by the secondary containment system shall not be deemed a hazard to Human Health or the Environment.

2. Emergencies which result in a spill or release of hazardous material which cannot be controlled by plant employees or the secondary containment system but does not reach storm drains, ponds, creeks, rivers or other bodies of water which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which are used for human consumption shall be considered a hazard to the environment but not necessarily to human health.

3. Emergencies which satisfy the criteria in 2 above and may possibly reach storm drains, ponds, creeks, rivers or other bodies of water which are used for irrigation of food crops or can otherwise enter aquifers or reservoirs which in turn are used for human consumption shall be considered a hazard to the environment and to human health.

If the Emergency Coordinator determines that the release, fire, or explosion could threaten human health or the environment outside the boundaries of the facility, he will procede with the notification procedures detailed in Section G-4a of this Contingency Plan.

G-4d Control Procedures [35 IAC 724.152(a)]

Potential accidents are classified into two general areas:

1) Fire and/or explosion involving hazardous waste or hazardous waste constituents; and

2) Accidental release in a liquid form of hazardous waste or hazardous waste constituent.

Fire and/or Explosion

The hazardous waste management operational areas are accessible by fire-fighting and other emergency equipment. Response procedures in the event of a fire and/or explosion will be as follows:

1) Plant personnel will notify the office via telephone or personal communication.

2) The Emergency Coordinator will be notified.

3) If a fire is minor, facility fire-fighting equipment such as fire extinguishers would be used to extinguish the fire.

4) If a fire is major and/or an explosion is major, the local fire department will be contacted immediately.

5) Any operating units such as air conditioners, heat systems, fans, etc., would be shut down immediately.

6) In the event that Step 3 fails to control the fire, Steps 4 and 5 will be implemented and all employees will immediately vacate the premise. Personnel will meet and be accounted for in front of the facility.

7) The Emergency Coordinator has the authority to direct other necessary actions as required.

8) An "all clear" signal will be given by the Emergency Coordinator when the fire and/or explosion has been extinguished and the personnel's safety is no longer endangered.

9) After a fire and/or explosion has been extinguished, clean-up procedures will commence. All emergency equipment used must be replaced, repaired, recharged or otherwise be in good operating condition and placed in the appropriate location before normal operations resume.

Accidental Release, Liquid

If an accidental release of liquid occurs which cannot be controlled with absorbent material, the following steps will be taken:

1) Plant personnel will notify the office via telephone or by personal communication.

2) The Emergency Coordinator will be notified.

3) The exact source and type of release of hazardous waste or hazardous waste constituent will be determined.

4) All pump(s) contributing to the release will be shut off.

5) Any section(s) of pipe contributing to the release will be isolated by closing the appropriate valves.

6) If the discharge is from a drum, the drum will be turned to orient the leak towards the top.

7) A temporary dike of absorbent material will be placed around the discharge area.

8) Ceiling fans will be activated and all doors to the outside will be opened.

9) Plant personnel will be evacuated from building, if deemed necessary. Personnel will meet and be accounted for in front of the facility.

10) Clean-up procedures, which may include notification of a spill clean-up firm, furnishing the clean-up crew with physical and/or chemical properties of waste and amount of waste released, shall be implemented.

a) Clean-up of released waste from containers: The waste will be collected via use of absorbent material for small spills. The contaminated material will then be placed in open top steel drums and transported off site to a permitted treatment/disposal facility. For large spills, the waste will be collected with a pump and placed in steel drums for reclamation. The balance shall be cleaned up with absorbent material as stated above.

b) Decontamination: Following cleanup with absorbent material, the affected area of the secondary containment area will be swept and all sweepings will be drummed. The pad may be subsequently decontaminated by steam cleaning. Any wash water generated will be collected in drums. All drummed sweepings and/or wash water will be transported off site for treatment/disposal at a permitted facility.

c) Clean-up of contaminated soil: Should the spill or release occur outside the secondary containment area (i.e. external to the building), cleanup will be accomplished by a firm specializing in such procedures. All visually contaminated soils, where practical, will be excavated and disposed as appropriate, at an EPA permitted hazardous waste facility. Any excavations may be restricted by building foundations.

11) Emergency equipment used, must be replaced, repaired, recharged or otherwise be in good operating condition and placed in the appropriate location before operations resume.

G-4e Prevention of Recurrence or Spread of Fires, Explosions, or Releases [35 IAC 724.156(e)]

Actions to prevent the recurrence or spread of fires, explosions or releases may include:

1) Halting operations.

2) Collecting and containing released wastes.

3) Prohibiting smoking in all areas except designated smoking areas.

4) Using non-sparking tools.

5) Protecting the area from open flame or heat generating activities.

All reasonable safety procedures will be followed prior to resuming operations.

G-4f Storage and Treatment of Released Material [35 IAC 724.156(g)]

Immediately after an emergency, the Emergency Coordinator will make arrangements for proper treatment, storage and/or disposal of all water and contaminated materials resulting from the release, fire or explosion. All resulting wastes generated will be considered a RCRA hazardous waste and managed as a RCRA waste unless it can be demonstrated to be non-regulated.

G-4g Incompatible Waste [35 IAC 724.156(h)(1)]

The Emergency Coordinator will insure that wastes, which may be incompatible with the released material, are treated, stored, or disposed until cleanup procedures are completed.

G-4h Post-Emergency Equipment Maintenance [35 IAC 724.156(h)(2)]

After an emergency event, or as required during the emergency response, all emergency equipment utilized in the affected area will be cleaned, or replaced, so that they are suitable for future use. Prior to resuming operations, an inspection of all utilized safety equipment will be conducted. All proper authorities will be notified that the post-emergency equipment maintenance has been performed and operations will resume.

G-4i Container Spills and Leakage
[35 IAC 724.152, 724.271]

Procedures to be used when responding to container spills or leakage were described previously in Section G-4d(2).

G-4j Tank Spills and Leakage
[35 IAC 724.294(c)(1)]

Detrex Corporation does not and never has had a hazardous waste storage tank at the Gold Shield Solvents facility in Melrose Park, Illinois.

G-4k Waste Pile Spills and Leakage
[35 IAC 724.352, 724.353]

Detrex Corporation does not and never has had a waste pile at the Gold Shield Solvents facility in Melrose Park, Illinois.

G-4l Surface Impoundment Spills and Leakage
[35 IAC 724.322, 724.327]

Detrex Corporation does not and never has had a surface impoundment at the Gold Shield Solvents facility in Melrose Park, Illinois.

G-4m Incinerator Spills and Leakage
[35 IAC 724.152]

Detrex Corporation does not and never has had an incinerator at the Gold Shield Solvents facility in Melrose Park, Illinois.

G-4n Landfill Leakage
[35 IAC 724.152, 724.402(b)]

Detrex Corporation does not and never has had a landfill at the Gold Shield Solvents facility in Melrose Park, Illinois.

G-5 EMERGENCY EQUIPMENT [35 IAC 724.152(e)]

The type and physical location of Gold Shield Solvents' emergency equipment, including fire equipment, spill control equipment breathing apparatus and medical treatment facilities is presented in Attachment G-2. A brief discussion of each aspect of the Emergency Equipment follows.

1) Communications System

- telephone/public address system

2) Fire Control Systems and Equipment

- fire extinguishers
- fire hydrant

3) Spill Control Equipment

- absorbent material

4) Health and Medical Emergency Equipment/Supplies

- respirators
- self-contained breathing apparatus
- eye wash/safety shower
- first-aid
- safety goggles
- gloves (cotton, leather, rubber)
- boots

G-6 COORDINATION AGREEMENTS
[35 IAC 724.137, 724.152(c)]

To familiarize police, fire department, and hospital officials with the layout of the facility, properties of the hazardous wastes handled at the facility and associated hazards, entrances to the facility, possible evacuation routes, and other aspects of the Gold Shield Solvents facility, copies of the contingency plan have been submitted to the appropriate officials.

Each person, or the chief officer of each department, which received a copy of the contingency plan was asked to sign a Coordination Agreement form to acknowledge that he/she reviewed the plan, understood the department's, role under the plan, and that all members of the department, will be informed of the plan's content and their individual responsibilities. Signed agreements are maintained on file in the office.

G-7 EVACUATION PLAN [35 IAC 724.152(f)]

If an emergency situation occurs which cannot be resolved by plant personnel and a plant evacuation is necessary, the Emergency Coordinator will signal employees, over the intercom system or by personal communication, to evacuate the facility. All employees will exit the facility by the most expeditious route (see evacuation routes in Attachment G-3) and meet in front of the facility or another designated area outside of the facility to be accounted for. The Emergency Coordinator will then notify the appropriate emergency response agencies. The Emergency Coordinator, based on his assessment, may deviate from established procedure in order to effectively and safely respond to emergency situations.

G-8 REQUIRED REPORTS [35 IAC 724.156(j)]

As required, any emergency event requiring implementation of the contingency plan will be reported in writing to the Illinois Environmental Protection Agency (IEPA) within fifteen (15) days of the event. This report will, at minimum, contain:

1) Name, address, and telephone number of the owner or operator;

2) Name, address, and telephone number of the facility;

3) Date, time, and type of incident (i.e. fire, explosion);

4) Name and quantity of material(s) involved;

5) The extent of injuries, if any;

6) The assessment of actual or potential hazards to human health or the environment, where this is applicable; and

7) Estimated quantity and disposition of recovered material that resulted from the incident.

It will be the responsibility of The Risk Management Group of Detrex Corporation to submit reports to the appropriate agencies and to retain on file all applicable information in the event that the contingency plan was implemented.

The Risk Management Group of Detrex will also inform the appropriate departments, agencies and authorities that clean-up is complete before operations at the facility resume.

G-9 AMENDMENTS TO THE CONTINGENCY PLAN [35 IAC 724.154]

The contingency plan will be reviewed and immediately amended, if necessary, whenever:

1) the facility permit is revised

2) the plan fails in an emergency

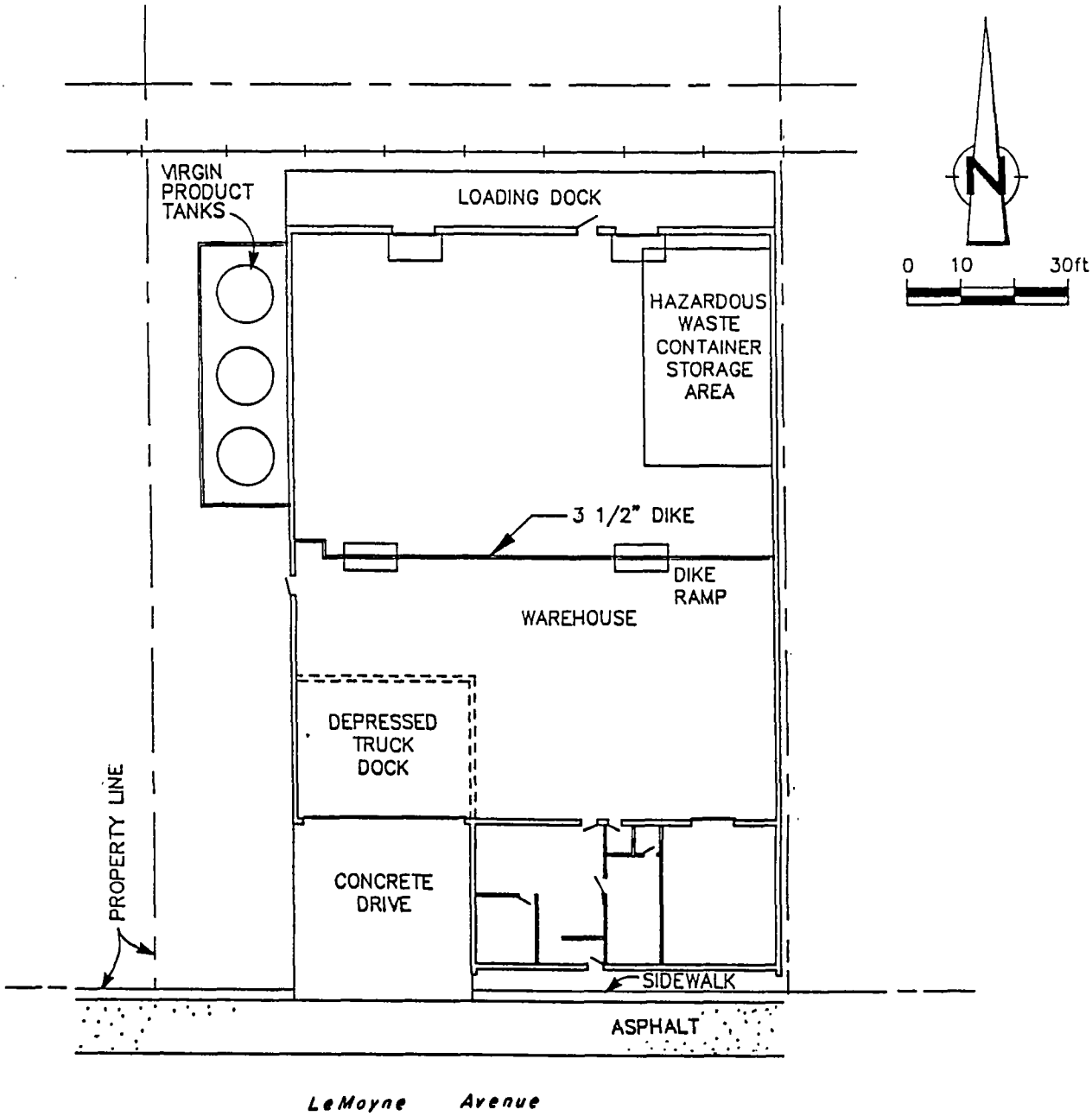
3) the facility changes its design, construction, operation, maintenance, or other circumstances in a way that materially increases the potential for fires, explosions or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency

4) the list of emergency coordinators changes

5) the list of emergency equipment changes

All changes in this plan will be sent to every organization on the contingency plan distribution list within 30 days of the effective date of the change.

ATTACHMENT G-1



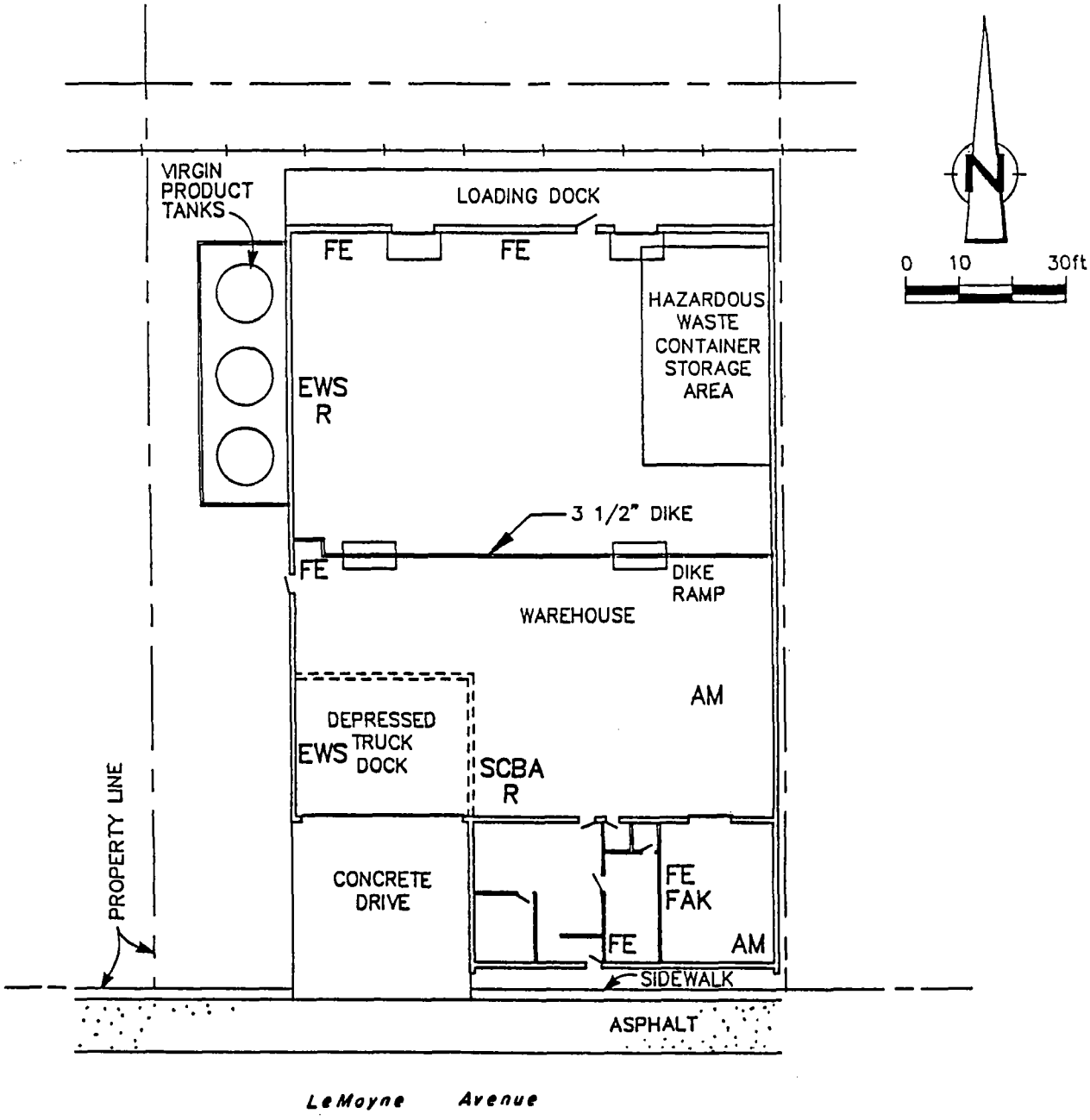
FACILITY PLAN
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

ATTACHMENT G-2

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT



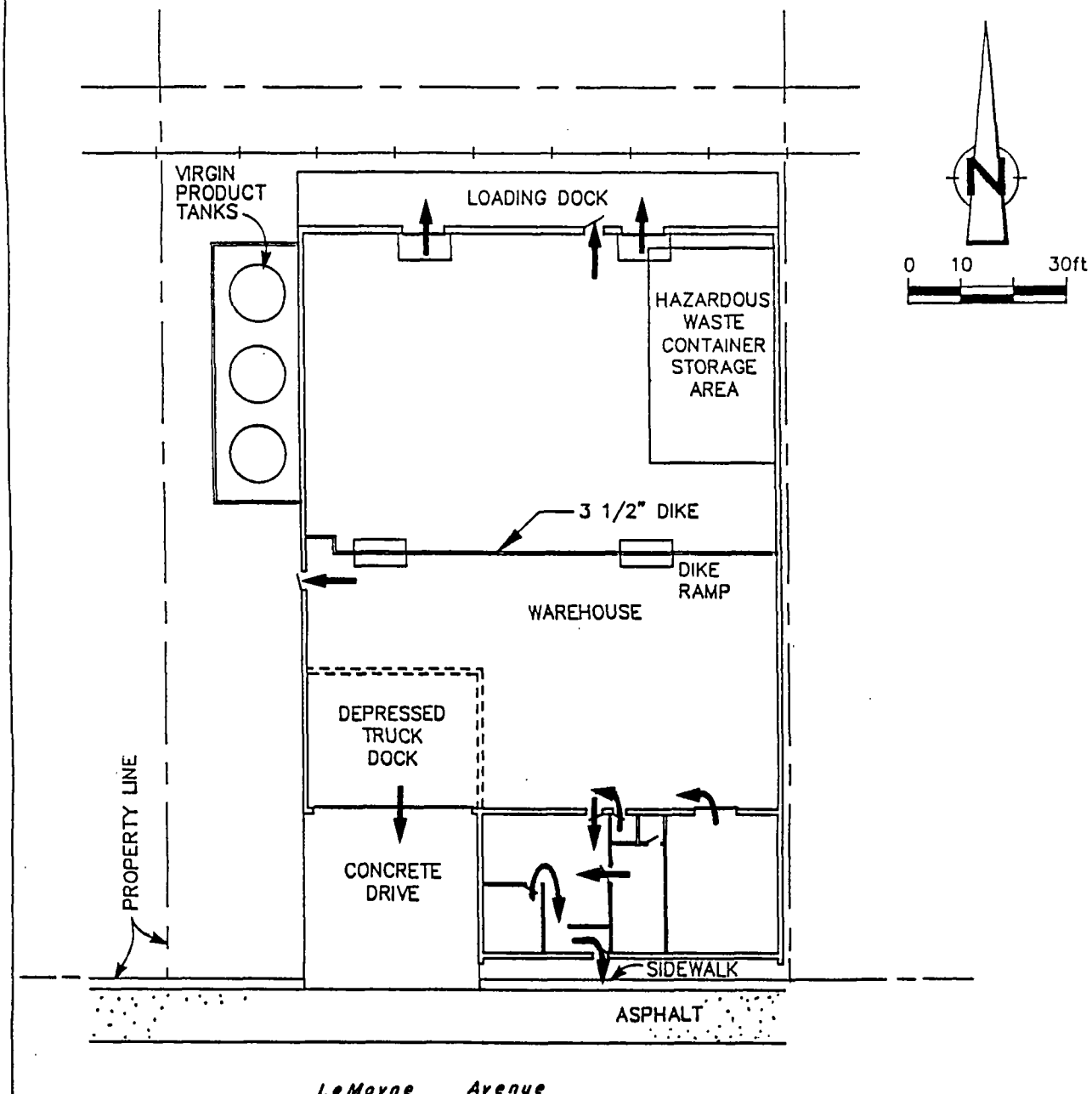
LEGEND

AM – ABSORBENT MATERIAL
EWS – EYE WASH STATION
FAK – FIRST AID KIT
FE – FIRE EXTINGUISHER
SCBA – SELF CONTAINED BREATHING APPARATUS
R – RESPIRATOR

LOCATION OF EMERGENCY AND SAFETY EQUIPMENT
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)



LEGEND

EVACUATION ROUTE

EVACUATION ROUTES
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)

TABLE OF CONTENTS

LIST OF ATTACHMENTS

SECTION H

PERSONNEL TRAINING

This section outlines the personnel training program completed by all employees of Detrex Corporations' Gold Shield Solvents facility in Melrose Park, Illinois. The information is provided pursuant to the Illinois Rule 35 IAC 703.183(1) and 724.116. The applicable section(s) of the Illinois regulations is referenced as appropriate.

H-1 OUTLINE OF TRAINING PROGRAM
[35 IAC 724.116(a)(1)]

Detrex Corporation has developed a personnel training program for training employees in the safe handling of the hazardous wastes received at the facility. The training consists of study, on-the-job training and competence evaluation. Each employee must complete the full training program before working unsupervised in the facility. The training program provides each employee with a firm knowledge of how to handle the hazardous wastes and also how to react, in the event of an emergency situation, to protect human health and the environment.

H-1a Job Titles/Job Description
[35 IAC 724.116(d)(1) and (d)(2)]

Detrex maintains the following documents and records at the facility:

1) The job title for each position related to hazardous waste management, and the name of the employee currently filling each job.

2) The written job description for each position as described in (1) above, which includes experience, skills and responsibilities. Job descriptions, a copy of which is provided in Attachment H-1, are kept on file in the plant office.

3) A written description of the type and amount of both introductory and continuing training given to personnel for each position related to hazardous waste management.

4) Records that document that the training and job experience have been completed by facility personnel.

Detrex maintains training records of former employees involved with hazardous waste management for three years from the date they last worked at the facility and will maintain training records on current personnel until closure of the facility.

H-1c Training Director [35 IAC 724.116(a)(2)]

The personnel training program is directed by the Emergency Coordinator. He has been trained in all aspects of Hazardous Waste Management Procedures.

H-1d Relevance of Training to Job Position [35 IAC 724.116(a)(2)]

Contents of the training program is tailored to each job position. The Warehouseman receives training in the operation of: Drum Filling Station, Safety Equipment, Emergency Equipment, and Forklift and Hand Truck Operation.

The Truck Operator receives training in the operation of: Drum Filling Station, Safety Equipment, Emergency Equipment and Transportation and Material Handling Equipment.

The secretary receives training in Record Keeping, Manifesting of Hazardous Waste Shipments, Inventory, Contingency Plan procedures and other clerical duties.

The Branch Manager/Emergency Coordinator receives training in the Operation, Inspection and Recordkeeping for: Process Equipment, Safety Equipment, Transportation and Material Handling Equipment and Contingency Plan Procedures.

H-1e Training for Emergency Response [35 IAC 724.116(a)(3)]

This training program is designed to ensure that personnel not only handle hazardous wastes in a safe manner, but also properly respond to emergency situations. The program trains hazardous waste handling/management personnel to maintain compliance under both normal operating conditions and emergency conditions.

H-2 IMPLEMENTATION OF TRAINING PROGRAM [35 IAC 724.116(b), (d)(4) and (e)]

An employee is hired to fill a specific position (i.e. Warehouseman). The employee is first required to review the written training program for the position he/she is to fill. Upon completion, the employee is then given 40 hours of on-the-job training within 1 month of hiring.

No employee hired to work at this facility will work unsupervised in tasks related to hazardous waste management prior to completion of the training program.

Employees are required to meet annually for reviews and updates of this training program and to discuss and study the following subjects:

1. All hazardous wastes currently being handled at the facility, noting any changes in waste type, volume, source, characteristics, or location that have occurred during the past year;

2. The status of operating conditions and procedures, noting any areas where there are problems or potential for problems. Employees participate in developing effective solutions;

3. The requirements contained in the facility's operating permit, noting any changes that have occurred during the past year. Areas where maintenance or compliance is a problem are identified and discussed, and effective solutions are sought; and

4. Incidents that have occurred in the past year that warranted use of contingency plans and/or emergency action. This review focuses on the cause of the incident and identification of steps to be taken to prevent or to ensure better handling of such events in the future.

Records documenting that the required training or job experience required to ensure that employees are trained to perform their duties in such a manner that compliance with the operating permit is assured, will be kept onsite in the office. These records will be kept until closure of the facility for current employees and for 3 years from the date of the individual employee's termination for former employees. Records will include job description, employee name, training contents, date and duration of training and the instructor assessment of competency.

Date: 11/08/88
Revision: 88-0
Attachment: H-1

TITLE: BRANCH MANAGER

1. Total administrative duties relating to employee supervision and office management.

2. Total sales administrative duties and direct sales customer calls and related functions.

3. Total office, warehouse, tank farm and truck equipment maintenance programs and implementation of such programs.

4. Hazardous waste management.

   a. Perform duties of Branch Emergency Coordinator.

   b. Supervises record keeping of hazardous waste manifests.

   c. Supervises hazardous waste drum sampling and testing if done on premises.

   d. Supervises record keeping of all daily and weekly facility inspection reports.

   e. Contact for all regulatory agency personnel and Detrex Risk Management.

Date: 11/08/88
Revision: 88-0
Attachment: H-1

TITLE: WAREHOUSEMAN

1. Drums and labels all new material for shipment to customers.

2. Performs minor maintenance on facility equipment.

3. Notifies office when material and/or services are required.

4. Hazardous Wste Management

   a. Stores containers of hazardous waste in designated areas of the warehouse.

   b. Samples incoming hazardous waste.

   c. Checks manifests for incoming waste for accuracy.

   d. Performs daily and weekly facility inspections and maintains records of such inspections.

Date: 11/08/88
Revision: 88-0
Attachment: H-1

TITLE: TRUCK OPERATOR

1. Delivers new and reclaimed solvent to customers.

2. Performs minor maintenance on Company truck unloading equipment, (i.e. pump, meter, valves, fittings, etc.).

3. Assists in unloading bulk solvent received at Detrex warehouse.

4. Must have Chauffeur license.

5. Must be able to pass annual DOT physical.

6. Must be able to pass road driving test at time of hire.

7. Hazardous Waste Management.

   a. Drums and labels outgoing material.

   b. Loads bulk or drummed solvent for truck shipment.

   c. Loads hazardous waste at customer's facility, checks and signs customer's manifest and inspects waste containers to insure that they are in good condition and properly labeled. Secures all waste containers properly on truck before leaving customer's facility.

   d. Unloads containers of hazardous materials at Detrex facility.

   e. Must be familiar with truck contingency plan and procedure for implementing said plan.

Date: 25/09/88
Revision: 88-0
Attachment: H-1

TITLE: SECRETARY

1. Does billing.

2. Keeps records of accounts payable and receivable.

3. Does mailing and correspondence.

4. Schedules delivery runs.

5. Fills out shipping forms, keeps records of shipping and receiving.

6. Answers phones and processes paperwork on orders.

7. Hazardous Waste Management.

   a. Responsible for inventory control.

   b. Completes hazardous waste manifests.

   c. Maintains records of incoming and outgoing hazardous waste.

   d. Functions as Alternate Emergency Coordinator.

Date: 11/08/88
Revision: 88-0
Attachment: H-2

TRAINING PROGRAM

OVERVIEW

This facility primarily conducts on-the-job training programs. All new employees are familiarized with general/specific chemical hazards and instructed to perform their assigned tasks in a safe, efficient manner. Additional safety/product information is presented on a continual basis.

This facility operates essentially without detailed written job descriptions relying on a "standard operating procedures" approach. Employees are instructed/prepared for their assignments on a supervised, individual basis.

1. Job Titles and Duties

(a) Job Titles

An organization chart is presented for this storage and sales facility in Appendix 1. The titles of the personnel involved with hazardous waste management are:

Titles

Branch Manager
Truck Operator
Warehouseman
Secretary

(b) Duties

Gold Shield Solvents does not utilize detailed job descriptions for hourly employees or salaried sales employees. Rather, employees are assigned tasks similar to a given job title and are expected to perform those tasks in a safe and orderly fashion. The majority of training is "hands-on" the job directly related to an assigned position.

The different job titles reflect the relative knowledge, skill, care, effort and responsibility required to perform the duties of the assigned job. All employees are aware of their assigned tasks and are offered sufficient instruction to safely accomplish them.

The written job descriptions for the personnel involved with hazardous waste management are maintained at the facility as well as a list of the current personnel filling each job.

2. Training Content, Frequency and Techniques

(a) Training Content

Gold Shield Solvents' employee training regarding the safe handling of hazardous wastes is initiated during the first week of employment. This orientation includes the following:

Attachment	Description
Appendix 2	Clerical-Technical Orientation Checklist (if applicable)
Appendix 3	Hourly Orientation Checklist (if applicable)
Appendix 4	What To Do If You Get Chemicals Spilled On Various Parts Of Your Body

Additionally, the training program addresses as a minimum the following topics:

1. Contingency plan for assigned facility.
2. Information on hazardous materials and their potential hazards.
3. Internal and external communications.
4. Personnel safety equipment.
5. Respiratory equipment including fit-testing.
6. Decontamination procedures in case of material spill/release.

7. Evacuation, first aid and emergency procedures dealing with fire and medical situations, including hands-on training in the proper use of fire extinguishers and foam.

8. Safe work practices associated with employee's work assignment.

New employees are supervised until they are deemed competent by the branch manager for their assigned tasks.

As part of this program, employees are provided with a variety of written material. New employees receive copies of Section G (Contingency Plan) and appropriate portions of Section H (Personnel Training). Annual reviews contain information regarding regulatory changes, any implementations of the facility's contingency plan in the past year, and any changes in the facility's operating permit. In addition, employees' questions and opinions are solicited and employees are, in turn, questioned to insure their comprehension.

Procedures for responding to emergencies are presented to employees on a general and a specific basis. As previously described, each employee receives, among other documents and training, a copy of the facility's contingency plan, as well as information regarding the type and location of emergency and communication equipment. This emergency equipment is inspected on a regular basis (see schedules and inspection forms contained in Section F).

Persons responsible for operation of the hazardous waste drum storage area are trained in the proper storage requirements to avoid potential hazards, which are described more fully in Section F of this permit application.

In the event of an emergency such as an explosion or fire, the specific procedures set forth in the contingency plan (with which employees are familiar through the training program) would govern. Documentation of this training program is maintained in the form of sheets signed by affected employees upon completion of the training session. These sheets are maintained with the facility's operating record.

(b) Frequency

The employee training program, as described in this document, is undertaken by all employees immediately upon their hiring by the facility.

In addition, all employees are required to meet, at a minimum, annually for reviews and updates of the training program. These reviews cover any and all changes in the operational or response procedures at the facility, past incidents that have caused the implementation of the contingency plan, and any changes to the operating permit and/or Federal and State regulations that require an alteration to existing operational procedures.

(c) Technique

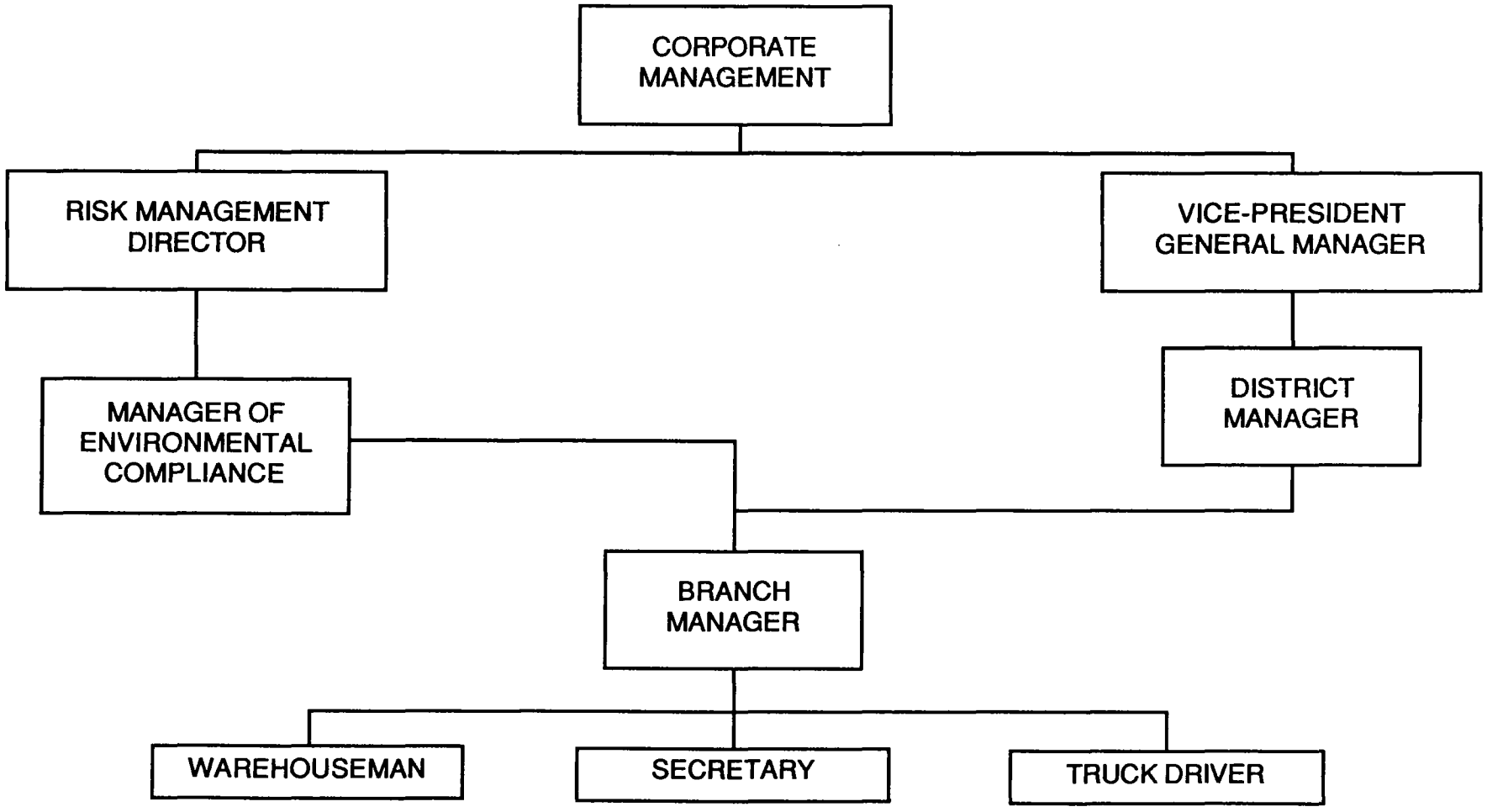
Gold Shield Solvents utilizes the plant environment for all employee orientation and on-the-job training.

3. Training Direction and Implementation

All employees involved with hazardous waste management are trained by the facility Emergency Coordinator. All new personnel assigned to hazardous waste management tasks will complete the in-house training program within one (1) month of assignment to any hazardous waste management position. Employees will not perform assigned tasks unsupervised until training is complete.

Employees are required to meet annually for review/update of this training program. Their active participation is sought to maintain a valid program.

LIST OF APPENDICES



Appendix 1

ORGANIZATIONAL CHART

DETREX CORPORATION GOLD SHIELD SOLVENTS

MELROSE PARK, ILLINOIS

CLERICAL-TECHNICAL ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Positive Attitude	- Assure employee that your role is to help him in his new job and that he should come to you for information and assistance.	Supervisor	First Day		
Salary	- Advise employee of his starting salary and the job rate. - Explain that employee's performance will be reviewed periodically and, if satisfactory, his salary will be increased until the job rate is attained. If progress is not satisfactory, the employee will be told the reason and salary increases will be withheld until satisfactory performance is reached. - Inform employee of periodic adjustments in the salary ranges to keep salaries comparable with other area employers. - Explain overtime payment provisions.	Supervisor	First Day		
Shop Rules of Conduct and Work Practices	- Give copy to employee. - Review each item with employee. - Stress importance of regular attendance and advance notice to the supervisor if absence is unavoidable. - Explain requirement to work reasonable overtime. - Instruct employee in the proper use and safeguarding of vehicles, tools and equipment.	Supervisor	First Week		
Community "Right to Know"	- Discuss the contents of the manual, particularly the valuable source of specific toxic substance information in the Material Safety Data Sheet binders. - Review each item with the employee.	Supervisor	First Week		
Safety	- Explain Detrex's objective of production with no injuries, that all injuries can be prevented and that employee is to report any unsafe conditions and all injuries promptly to you. - Discuss fire and emergency procedures, including location of first aid facilities, fire extinguishers, etc. - Send employee to see the Emergency Coordinator for detailed instructions if the employee's job is potentially hazardous.	Supervisor and Emergency Coordinator	First Day		

CLERICAL-TECHNICAL ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Equal Employment Opportunity	- Inform employee that Detrex does not discriminate and that Detrex bases clerical-technical personnel decisions on merit, qualifications, service and business needs.	Supervisor	First Week		
Company Background	- Explain corporate operations, the number and location of facilities, the number of employees, etc.	Supervisor	First Week		
Benefits	- Give employee a copy of "Employee Benefits Booklet". - Review the highlights of each plan, including the eligibility date, summary of the coverage, what the employee pays and what the Company pays.	Supervisor	First Week		
Pollution Control	- Explain that Detrex must meet Federal and State laws and regulations pertaining to air, water and land purity. - Point out that the improper handling and disposition of chemicals can pollute the air, water and land and can have adverse impact on Detrex and on Detrex's employees. - Review the required actions to minimize pollution in the plant. - Give employee a copy of the Annual Training and Orientation Checklist for Employees Regarding Hazardous Wastes. Discuss the contents, specifically Detrex's intent to protect our environment through proper handling of hazardous wastes.	Supervisor	First Week		
Energy Conservation	- Point out that Detrex's energy costs, like the employees, are constantly increasing and that Detrex welcomes any suggestions to reduce these energy costs. - Emphasize the need to conserve energy; e.g. heat, light, etc.	Supervisor	First Week		
Employee Confidential and Proprietary Information Agreement	- Have employee read the entire Agreement and sign and return to the Supervisor the Employee's Agreement Form.	Supervisor	First Week		

CLERICAL-TECHNICAL ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Acknowledgement of Orientation	- By signing below, the employee acknowledges that his supervisor and Personnel have covered the items listed above and that he intends to comply with the rules contained therein.	Supervisor	Second Week		

_____ _____

Employee's Signature Date

_____ _____

Supervisor's Signature Date

_____ _____

Personnel's Signature Date

* Wherever his, him or he are used, the terms are meant to cover male and female.

DISTRIBUTION: Original for employee's personnel folder in Payroll
Copy for employee's on-site personnel folder
Copy for employee

HOURLY ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Positive Attitude	- Assure employee that your role is to help him in his new job and that he should come to you for information and assistance.	Supervisor	First Day		
Salary	- Advise employee of his starting salary and the job rate. - Explain the timing and amount of progression increases and that progression increases will be withheld for unsatisfactory performance. - Inform employee of scheduled general and cost of living increases. - Explain overtime payment provisions.	Supervisor	First Day		
Shop Rules of Conduct and Work Practices	- Give copy to employee. - Review each item with employee. - Stress importance of regular attendance and advance notice to the supervisor if absence is unavoidable. - Explain requirement to work reasonable overtime and on any shift. - Instruct employee in the proper use and safeguarding of vehicles, tools and equipment.	Supervisor	First Week		
Community "Right to Know"	- Discuss the contents of the manual, particularly the valuable source of specific toxic substance information in the Material Safety Data Sheet binders. - Review each item with the employee.	Supervisor	First Week		
Safety	- Explain Detrex's objective of production with no injuries, that all injuries can be prevented and that employee is to report any unsafe conditions and all injuries promptly to you. - Discuss fire and emergency procedures, including location of first aid facilities, fire extinguishers, etc. - Send employee to see the Emergency Coordinator for detailed instructions.	Supervisor and Emergency Coordinator	First Day		

HOURLY ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Equal Employment Opportunity	- Inform employee that Detrex does not discriminate and that Detrex bases hourly personnel decisions on merit and seniority.	Supervisor	First Week		
Company Background and Welcome	- Explain corporate operations, the number and location of facilities, the number of employees, etc.	Supervisor	First Week		
Benefits	- Give employee a copy of "Employee Benefits Booklet". - Review the highlights of each plan, including the eligibility date, summary of the coverage, what the employee pays and what the Company pays.	Supervisor	First Week		
Pollution Control	- Explain that Detrex must meet Federal and State laws and regulations pertaining to air, water and land purity. - Point out that the improper handling and disposition of chemicals can pollute the air, water and land and can have adverse impact on Detrex and on Detrex's employees. - Review the required actions to minimize pollution in the plant. - Give employee a copy of the Annual Training and Orientation Checklist for Employees Regarding Hazardous Wastes. Discuss the contents, specifically Detrex's intent to protect our environment through proper handling of hazardous wastes.	Supervisor	First Week		
Energy Conservation	- Point out that Detrex's energy costs, like the employees, are constantly increasing and that Detrex welcomes any suggestions to reduce these energy costs. - Emphasize the need to conserve energy; e.g. heat, light, etc.	Supervisor	First Week		

HOURLY ORIENTATION CHECKLIST

Items to Cover	Key Points to Cover	Who Should Cover	When	Item Covered Initial	Item Covered Date
Acknowledgement of Orientation	- By signing below, the employee acknowledges that his supervisor and Personnel have covered the items listed above and that he intends to comply with the rules contained therein.	Supervisor	Second Week		

_____ _____
Employee's Signature Date

_____ _____
Supervisor's Signature Date

_____ _____
Personnel's Signature Date

* Wherever his, him or he are used, the terms are meant to cover male and female.

DISTRIBUTION: Original for employee's personnel folder in Payroll
Copy for employee's on-site personnel folder
Copy for employee

WHAT TO DO IF YOU GET CHEMICALS SPILLED ON VARIOUS PARTS OF YOUR BODY

1. Chemicals in the Eye

Splashes of irritant chemicals in the eye, or even exposure to vapor or mist of some chemicals, may lead to serious eye injury. Those who may be exposed to such chemicals should always use proper protective goggles of face shields.

Seconds count. First aid should be immediate, and consists of a thorough flushing of the eye with tap water, using eye bath fountain if available, a gentle stream of water from a hose, or any other means by which the eye may be freely flushed. Lids should be forcibly held apart so that the entire surface of the eye may be flushed. Under most circumstances this flushing should be continued for at least fifteen minutes. Contact lenses should not be worn in chemical laboratories because of the added difficulty they cause in eye irritation.

The patient should then be referred to a physician, preferably an ophthalmologist with experience in handling chemical burns of the eye. Neutralizing solutions should never be used for first aid, since experience has demonstrated that they often aggravate the injury. Ointments are not recommended for first aid use.

2. Chemicals on Body or Clothing

The primary consideration is the prompt removal of the chemical from contact with the skin. This is true whether or not the material has local action. All contaminated clothing should be removed at once, preferably under a shower, and the contacted areas freely flushed with water, preferably with plenty of soap, and under a shower or running water. If exposure has been severe, call a physician, telling him the location of the patient and chemical involved.

The copious use of water to remove as far as possible all traces of the chemical is the most available and effective first aid measure. This applies whether or not the material is water-soluble. Chemical antidotes, such as alkalies for acid contacts and vice versa, or solvents such as alcohol for phenol, should not be used as first aid measures.

After thorough removal of the chemical, the patient should be kept warm and preferably lying down. Further treatment should be as directed by the physician.

SECTION I

CLOSURE AND POST-CLOSURE REQUIREMENTS

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SECTION I

CLOSURE AND POST-CLOSURE REQUIREMENTS
[35 IAC 703.183(m), 724.210 Through 724.220]

This section identifies operational activities which are necessary to completely close the facility at the end of its intended operating life. A post-closure plan is not required because this is not a disposal facility and all wastes are being removed at closure.

Detrex Corporation operates a hazardous waste container storage area at the Melrose Park facility. Drummed solvent wastes are stored prior to transfer of these wastes to an off-Site Detrex solvent reclamation (recycling) facility or to another off-Site permitted treatment/disposal facility.

The closure plan and financial requirements are submitted pursuant to Illinois Rule 35. The applicable sections of the Illinois regulations are referenced as appropriate.

Detrex Corporation will maintain an on-site copy of the approved closure plan, and all revision to the closure plan, until certification of closure completeness has been submitted and accepted by the Illinois Environmental Protection Agency (IEPA). Detrex will notify the IEPA at least 180 days prior to the date Detrex expects to begin final closure at the Gold Shield Solvents facility.

Upon completion of closure activities, Detrex Corporation will submit a certification to the IEPA verified by both Detrex Corporation and an independent registered professional engineer that the facility has been closed in accordance with the specifications in the approved closure plan.

I-1 CLOSURE PLAN [35 IAC 703.183(m), 724.212]

I-1a Closure Performance Standard [35 IAC 724.211]

This closure plan is designed to ensure that the facility will be closed in a manner that:

1) Minimizes the need for further maintenance; and

2) Controls, minimizes, or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, or hazardous constituents to the ground or surface waters or to the atmosphere.

The following sections present, in detail, efforts which will be made to satisfy the closure performance standard.

1-1b Partial Closure Activities [35 IAC 724.212(b)(1) and (2)]

Detrex does not expect to partially close the hazardous waste container storage area. Procedures for final closure of the facility are discussed in Section I-1d. Final closure of the facility is not forseeable at this time.

I-1c Maximum Waste Inventory [35 IAC 724.212(b)(3)]

The maximum hazardous waste inventory expected at any given time during the operation life of this facility is 27,500 gallons (500 x 55-gallon drums).

Table I-1 lists the various hazardous waste handled at the facility, their EPA hazardous waste identification number, and their respective hazardous constituent/characteristic.

I-1d Inventory Removal and Disposal or Decontamination of Equipment [35 IAC 724.212(b)(4), 724.214]

At final closure, assuming a third party is completing the closure, the hazardous waste drum inventory will be transferred to licensed hazardous waste tanker trucks for transportation to a permitted off-Site facility. Material transfer would be accomplished utilizing drum pumps and flexible hosing.

TABLE I-1

LIST OF HAZARDOUS WASTES

Hazardous Waste	*EPA Hazardous Waste Number*	*Hazardous Constituent/ Characteristic*
1,1,1 Trichloroethane	F001/F002	Toxic
Trichloroethylene	F001/F002	Toxic
Penchloroethylene	F001/F002	Toxic
Methylene Chloride	F001/F002	Toxic
Trichlorotrifluorethane	F001/F002	Toxic
Arsenic	D004	Toxic
Barium	D005	Toxic
Cadmium	D006	Toxic
Chromium	D007	Toxic
Lead	D008	Toxic
Mercury	D009	Toxic
Selenium	D010	Toxic
Silver	D011	Toxic
Benzene	D018	Toxic
Carbon Tetrachloroide	D019	Toxic
Chlorobenzene	D021	Toxic
Chloroform	D022	Toxic
1,4-Dichlorobenzene	D027	Toxic
1,2-Dichloroethane	D028	Toxic
1,1-Dichloroethylene	D029	Toxic
2,4-Dinitrotoluene	D030	Toxic
Hexachloroethane	D034	Toxic
Methyl Ethyl Ketone	D035	Toxic
Nitrobenzene	D036	Toxic
Pyridine	D038	Toxic
Tetrachloroethylene	D039	Toxic
Trichloroethylene	D040	Toxic
Vinyl Chloride	D043	Toxic

I-1d(1) Closure of Containers (drums)
[35 IAC 724.278]

Following the removal of the hazardous waste inventory, the drum storage area will be swept. All sweepings will be drummed and transported off site to a RCRA permitted solids processor under the fuels program. The area will be subsequently decontaminated by steam cleaning. Wash water generated will be collected and transported off site to a RCRA permitted solids processor under the fuels program.

It is estimated that approximately 900 gallons of waste wash water and one drum of solid waste will be generated during the decontamination process.

Decontamination will be verified by collecting a minimum of three samples of the final rinsate and submitting the samples for analysis of the major constituents that were in storage. Analyses will be by an approved method of SW-846. The "cleanup" level will be the appropriate MCL (Maximum Contaminant Level) for the constituents analyzed. Subsequent cleaning operations (further steam cleaning or water rinses) will be implemented as necessary until rinsate sampling and analysis indicates cleanup standards have been reached.

Rinsate samples will be collected by vacuum and transferred to the appropriate glass sampling bottles (3 x 40 mL glass vials). The samples will be placed in coolers, packed with ice to approximately 4°C and shipped under chain-of-custody protocols to the preselected approved laboratory. One blind duplicate sample and one field blank sample will be collected for every ten rinsate samples collected as a check on laboratory and field QA/QC procedures. A trip blank will also be supplied by the laboratory and analyzed for the same parameters as the rinsate sample as a check on cross-contamination during shipment.

Subsequent to the completion of decontamination operations, a visual examination of the secondary containment area will be conducted. The visual examination is required to assess the integrity of the containment system after closure. If visible staining of the containment system is observed or cracks are found in the concrete surface within the containment area, further decontamination verification will be conducted.

Concrete core samples will be collected from any area in which visible staining is present subsequent to decontamination or where cracks in the concrete within the secondary containment area are identified.

Such concrete cores will be submitted for analysis of the major constituents that were in storage. For the basis of the closure cost estimate, it is assumed that three concrete core samples will be collected. In the event concrete core samples are collected, decontamination shall be considered complete if core sample results indicate non-detect level of the major constituents in storage.

At closure, a total of approximately 65 wooden pallets used to support 55-gallon drums within the container storage area may be present. Since hazardous waste drums are not opened after they are placed within the container storage area, the wooden pallets will not be contacted by potentially hazardous waste constituents unless a spill has occurred. After inventory removal, all wooden pallets will be visually examined to determine, by evidence of staining, if hazardous waste constituents may be present. All pallets exhibiting visual signs of staining will be segregated. All other pallets will not be considered as hazardous waste and will not be subject to the closure plan. All pallets exhibiting visual signs of staining (assumed to be 25 for purposes of closure cost estimate) will be drummed and transported to a RCRA permitted solids processor under the fuel program.

It is to be noted that a comprehensive historical records review will be conducted in order to select an appropriate parameter list representing the major constituents that were in storage in the container storage area over the life of the facility.

I-1d(2) Closure of Tank Systems
[35 IAC 724.297, 724.410]

A closure plan for tanks is not required since Detrex does not utilize hazardous waste storage tanks at the facility in Melrose Park, Illinois.

I-1d(3) Closure of Waste Piles
[35 IAC 703.204(h), 724.358]

A closure plan for a waste pile is not required since Detrex does not and has never had a waste pile at the facility in Melrose Park, Illinois.

I-1d(4) Closure of Surface Impoundments
[35 IAC 703.203(f), 724.328]

A closure plan for a surface impoundment is not required since Detrex does not and has never had a surface impoundment at the facility in Melrose Park, Illinois.

I-1d(5) Closure of Incinerators
[35 IAC 724.451]

A closure plan for an incinerator is not required since Detrex does not and has never had an incinerator at the facility in Melrose Park, Illinois.

I-1d(6) Closure of Land Treatment Facilities
[35 IAC 724.380, 724.212]

A closure plan for a land treatment facility is not required since Detrex does not and has never had a land treatment facility at the facility in Melrose Park, Illinois.

I-1e Closure of Disposal Units
[35 IAC 703.183(m), 703.203(f),
703.204(h), 703.207(e), 724.328(a)(2),
724.328(c)(1)(A), 724.358(c), 724.410(a)]

A closure plan for a disposal unit is not required since Detrex does not and has never had a disposal unit at the facility in Melrose Park, Illinois.

I-1f Schedule of Closure [35 IAC 724.212(b)(6)]

Within 90 days after receipt of the final volume of hazardous wastes, and at the direction of the Board of Directors of Detrex Corporation, final closure activities will be initiated and completed within 180 days of this occurrence. The IEPA will be notified by Detrex 180 days before beginning final closure.

A proposed closure schedule is presented as Attachment I-2. Final closure will be certified by both Detrex Corporation and an independent professional engineer.

I-1g Extensions for Closure Time
[35 IAC 724.213]

Detrex Corporation does not anticipate requiring an extension for closure time for the facility.

I-2 Post-Closure Plan
[35 IAC 703.183(m), 703.203(f), 703.204(h), 703.207(e), 724.218, 724.297(b) and (c), 724.328(b), 724.328(c)(1)(B), 724.380(c), 724.410(b)]

Post-closure care will not be required for this facility as it is not a disposal facility.

I-3 Notice in Deed
[35 IAC 703.183(n), 724.216, 724.217(c), 724.219]

Notation is not necessary in any deed informing potential purchasers of restrictions associated with a disposal site because this facility is only a hazardous waste storage facility and no hazardous wastes will be disposed on site at any time.

I-4 CLOSURE COST ESTIMATE
[35IAC 703.183(o), 724.242]

The closure cost information is presented in accordance with proper requirements. The total closure cost for the closure of the Detrex Corporation's hazardous waste facility is estimated at $153,848.00. (1991 dollars). Attachment I-3 provides a closure cost estimate. Activities include removal of waste inventory, decontamination and closure certification.

The cost estimate assumptions made are:

1) All drummed hazardous wastes will be disposed at a permitted off-Site facility.

2) Labor costs will be presented at $29.00 per hour to account for labor costs and $34.00 per hour for supervisors. All labor rates reflect commercial rates and include fringe benefits, payroll burden and taxes.

3) Total costs include a 15% contingency for administrative and 20% contingency for miscellaneous operating costs.

This closure cost estimate will be maintained at this facility. It will be revised whenever a change in the closure plan affects the cost of closure. It will be adjusted as required by pertinent regulations.

I-5 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE
[35 IAC 703.183(o), 724.243]

Financial assurance for closure costs is provided by a demonstration that Detrex Corporation meets the financial test to guarantee the availablility of closure funds. Attachment I-4 includes a copy of the latest independent CPA's report on the examination of the Company's latest financial statement, a special CPA report on the data used by the Company's chief financial officer (CFO), and the CFO's certification. The appropriate IEPA form from the CFO is also provided.

I-6 POST-CLOSURE COST ESTIMATE
[35 IAC 703.183(p), 724.244]

Since all wastes will be recycled or disposed off site, there will be no post-closure activities or costs.

I-7 FINANCIAL ASSURANCE MECHANISM FOR POST-CLOSURE
[35 IAC 703.183(p), 724.245]

Since all wastes will be recycled or disposed off site, there will be no post-closure activities or costs.

I-8 LIABILITY REQUIREMENTS
[35 IAC 703.183(q), 724.247]

I-8a Coverage for Sudden Accidental Occurrences
[35 IAC 724.247(a)]

Coverage for sudden accidental insurance is provided by a demonstration that Detrex Corporation meets the financial test requirements. This demonstration is presented in Section I-8a(2).

I-8a(1) Endorsement or Certification
[35 IAC 724.247(a)(1)]

Certification of liability coverage is provided with the financial test in the following section.

I-8a(2) Financial Test for Liability Coverage
[35 IAC 724.247(a)(2), 724.247(f)]

Financial assurance for sudden accidental insurance is provided by a demonstration that Detrex Corporation meets the financial test. Attachment I-4 includes a copy of the Company's latest financial statement, a special CPA report on the data used by the Company's chief financial officer (CFO), and the CFO's certification.

I-8a(3) Use of Multiple Insurance Mechanisms
[35 IAC 724.247(a)(3)]

The requirements of this section do not apply since financial assurance for sudden accidental insurance was provided above.

I-8b Coverage for Nonsudden Accidental Occurrences
[35 IAC 724.247(b)]

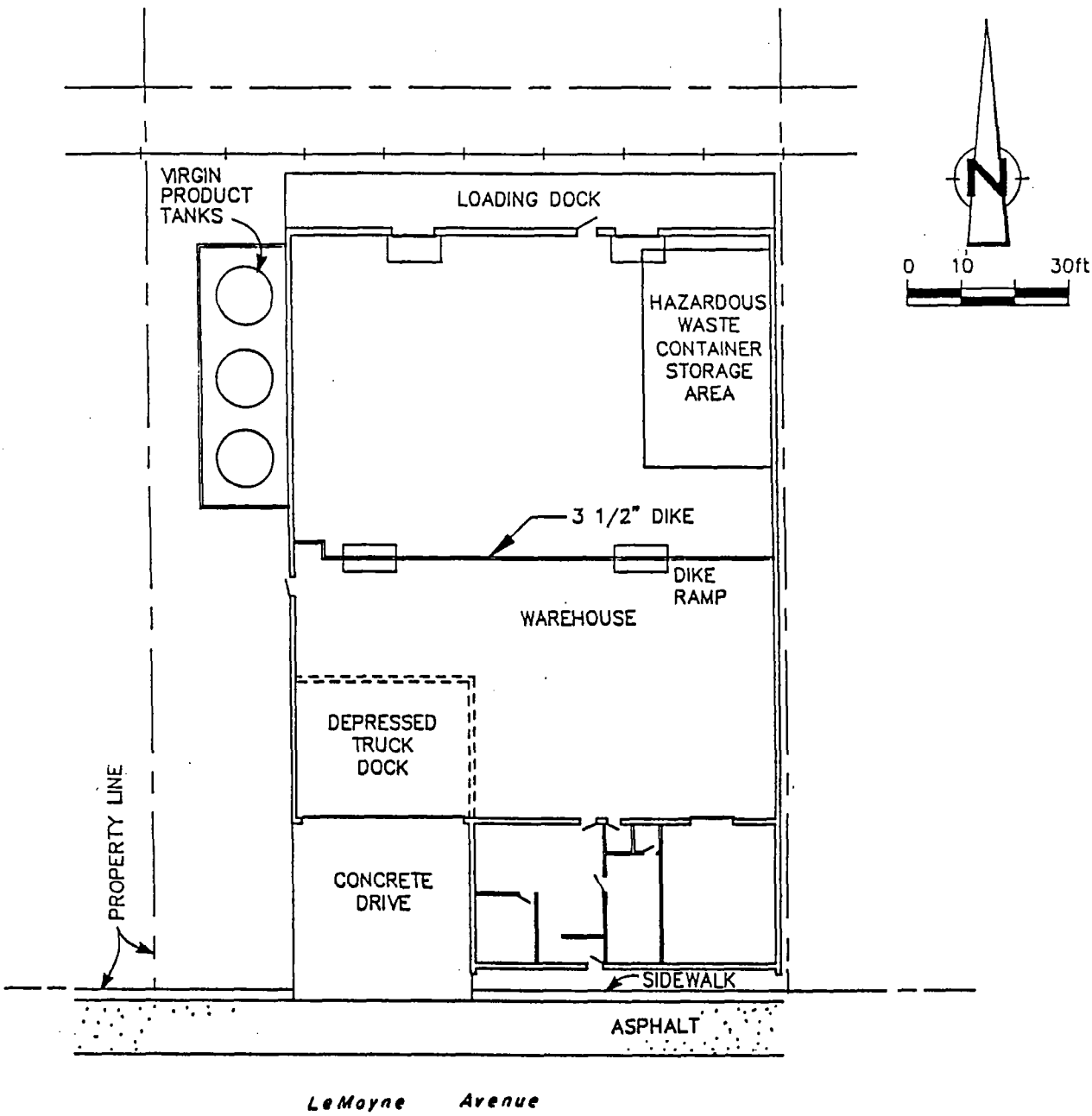
The Detrex facility does not have a surface impoundment, landfill or land treatment facility; hence, coverage for nonsudden accidental occurrences is not required.

I-8c Request for Variance [35 IAC 724.247(c)]

Detrex Corporation does not wish to request for variance from the requirements for liability coverage.

I-9 STATE MECHANISMS

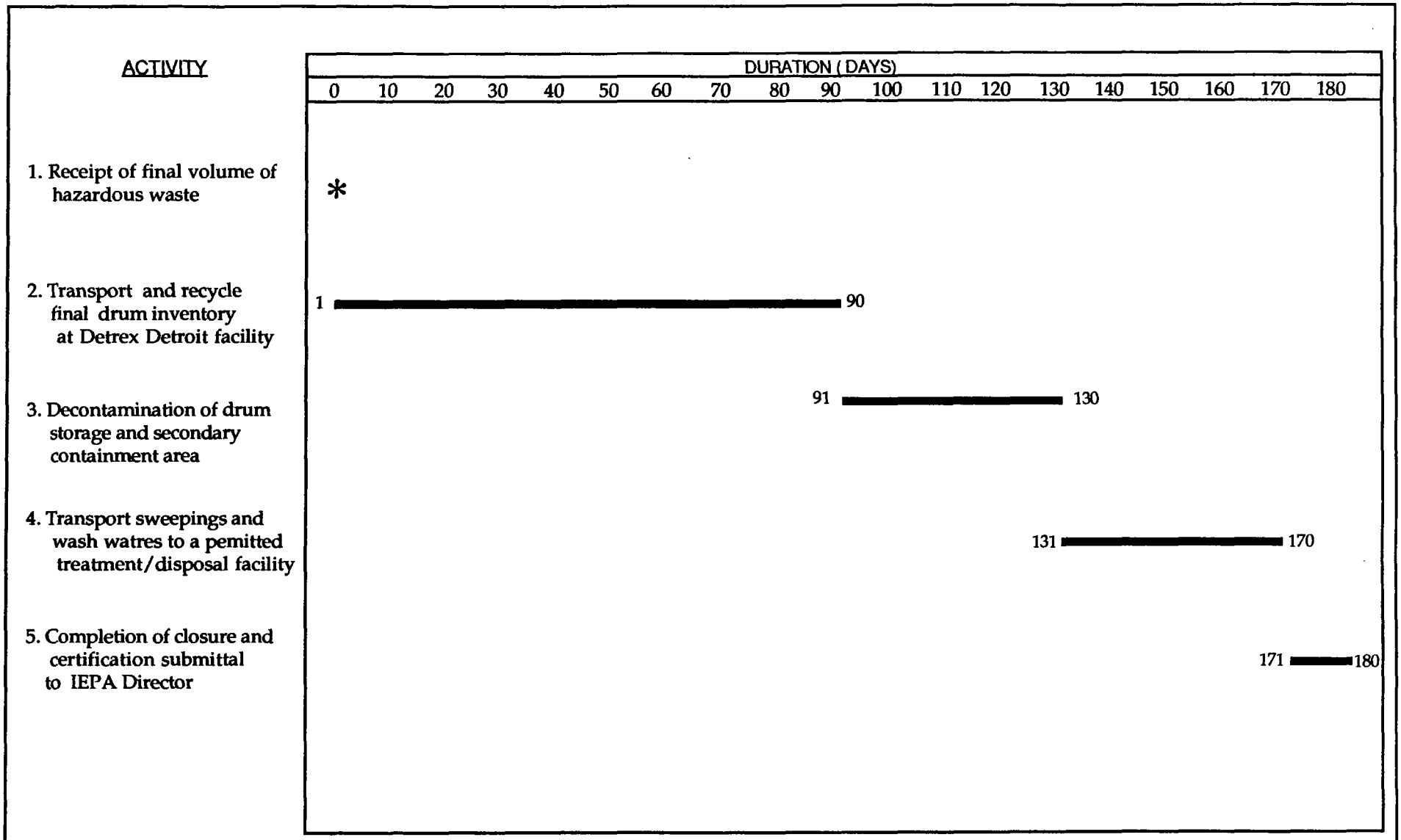
Detrex Corporation does not intend to request State assumption of the legal or financial responsibilities for the facility.



FACILITY PLAN
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)



LEGEND

▬ ACTIVITY DURATION

* EVENT

PROPOSED DRUM CLOSURE SCHEDULE

Detrex Corporation

Gold Shield Solvents, Melrose Park

CRA

2471 11/04/88-3-F-O

ATTACHMENT I-2

B-113-m-3 cc: Maywood/USEPA

DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111

FAX: (313) 358-5803

TELEPHONE: (313) 358-5800

April 13, 1994

VIA: Certified Mail

Director
Illinois Environmental Protection Agency
Hazardous Waste Section
2200 Churchill Road
Springfield, IL 60706

RE: Part B Permit-Class 1 Modification
Detrex Corporation-Solvents Division
2537 LeMoyne Ave.
Melrose Park, IL 60160
EPA ID# ILD 074 424 938

A.4.5

Dear Sir:

Enclosed are revisions to our Part B Permit Application made necessary due to our recalculations of the closure costs for the above named facility. Incorporated are changes in the cost of disposal for wastes on-site and a switch to bulk disposal for the waters associated with the decontamination process. Reduction in disposal costs are results of a more competitive market for the waste solvents.

If you should have any questions regarding the revisions to the permit application please feel free to give me a call.

Sincerely,

William M. Moore, Jr.
Corporate Manager,
Environmental Compliance

Enclosures:
Section I page I-11
Attachment I-3

cc:
file
facility
Amy Dragouich-IEPA

RECEIVED
APR 18 1994

A proposed closure schedule is presented as Attachment I-2. Final closure will be certified by both Detrex Corporation and an independent professional engineer.

I-1g Extensions for Closure Time
[35 IAC 724.213]

Detrex Corporation does not anticipate requiring an extension for closure time for the facility.

I-2 Post-Closure Plan
[35 IAC 703.183(m), 703.203(f), 703.204(h), 703.207(e), 724.218, 724.297(b) and (c), 724.328(b), 724.328(c)(1)(B), 724.380(c), 724.410(b)]

Post-closure care will not be required for this facility as it is not a disposal facility.

I-3 Notice in Deed
[35 IAC 703.183(n), 724.216, 724.217(c), 724.219]

Notation is not necessary in any deed informing potential purchasers of restrictions associated with a disposal site because this facility is only a hazardous waste storage facility and no hazardous wastes will be disposed on site at any time.

I-4 CLOSURE COST ESTIMATE
[35IAC 703.183(o), 724.242]

The closure cost information is presented in accordance with proper requirements. The total closure cost for the closure of the Detrex Corporation's hazardous waste facility is estimated at $110,169.00. (1992 dollars). Attachment I-3 provides a closure cost estimate. Activities include removal of waste inventory, decontamination and closure certification.

The cost estimate assumptions made are:

1) All drummed hazardous wastes will be disposed at a permitted off-Site facility.

ATTACHMENT I-3

FINAL CLOSURE COST ESTIMATE (1992)

Item	*Activity*	*Estimated Cost*
1.	Transfer Drum Inventory (500 drums) to Bulk Hazardous Waste Transport Vehicles	
	- labor: 6 man days @ $232/day	$ 1,392
	- supervision: 2 mandays @$272/day	544
	- protective safety equipment: @$100/manday	800
	Subtotal 1	$ 2,736
2.	Transportation and Disposal of Waste Inventory at Permitted Off-Site Facility	
	a) transporation: 7 loads	$ 11,200
	b) disposal: 27,500 gallons @ $1.55/gallon (waste containing 40% recoverable solvents)	42,625
	Subtotal 2	$ 53,825
3.	Drum Handling rinse 500 drums and containerize rinsate	
	- labor: 9 man days @ $232/day	$ 2088
	- supervision: 3 mandays @ $272/day	816
	- protective safety equipment: @ $100/manday	1,200
	- transport and dispose 8 drums @ $400/drum	3,200
	Subtotal 3	$ 7,304
4.	Sweep and Clean Secondary Containement Area (include cut up and disposal of 25 wood pallets)	
	- labor: 4 mandays @ $232/manday	$ 928
	- supervision: 2 mandays @ $272/manday	544
	- equipment @ $400/day	800
	- sampling and analysis @ $350/sample	1,750
	- dispose of 825 gallons @ $0.70/gallon	578
	- transporation:	1,692
	- dispose of 1 drum solids @ $250/drum	250
	Subtotal 4	$ 6,542

ATTACHMENT I-3

FINAL CLOSURE COST ESTIMATE (1992)

Item	*Activity*	*Estimated Cost*
5.	Visual examination of container storage area	$ 550
	a) collect concrete core samples and anayze @ $1,250	3,750
	b) equipment for sampling @ $400/day	400
	Subtotal 5	$ 4,700
6.	Closure Certification	
	a) Outside consultant to review fianl closure planns and certify closure 10 days @ $550/day	$ 5,500
	b) Disbursements including office expenses and travel expenses	1,000
	Subtotal 6	$ 6,500
	Subtotal 1+2+3+4+5+6	$ 81,607
	Administration (15%)	$ 12,241
	Contingency (20%)	$ 16,321
	Total Estimated Final Closure Cost	$110,169

Date: 04/12/93

ATTACHMENT I-3a
Indexing updates for Melrose Park, IL

1992 Closure Cost =	$ 110, 169
1993 closure cost update (factor = 1.026)	$ 113,033
1994 closure cost update (factor = 1.031)	$ 116,537

DETREX CORPORATION

P.O. Box 5111, Southfield, MI 48086-5111

TWX 810-224-4796

TELEPHONE
(313) 358-5000

March 31, 1988

Michigan Department of Natural Resources
Hazardous Waste Division
P. O. Box 30028
Lansing, MI 48909

I am the chief financial officer of Detrex Corporation, P. O. Box 5111, Southfield, MI 48086. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure, as specified in Subpart H of 40 CFR, Parts 264 and 265.

The owner or operator identified above is the owner or operator of the following facilities for which liability coverage is being demonstrated through the financial test specified in Subpart H of 40 CFR 264 and 265:

Region	Facility	EPA Identification
I	Gold Shield Division 260 Chapel Road So. Windsor, CT 06074	CTD 01 016 8870
II	Gold Shield Division 835 Industrial Highway Unit No. 1 Cinnaminson, NJ 08077	NJD 04 731 8043
IV	Gold Shield Division P. O. Box 5274 Charlotte, NC 28225	NCD 04 977 3245
V	Gold Shield Division 12886 Eaton Avenue Detroit, MI 48227	MID 09 180 3972
V	Gold Shield Division 312 Ellsworth Avenue, S.W. Grand Rapids, MI 49503	MID 02 090 6764
V	Gold Shield Division 1410 Chardon Road Euclid, OH 44117	OHD 08 015 8702

Region	Facility	EPA Identification
V	Gold Shield Division 2337 LeMoyne Avenue Melrose Park, IL 60160	ILD 07 442 4938
V	Gold Shield Division 2263 Distributors Drive Indianapolis, IN 46241	IND 08 561 6837
V	General Chemicals Division North State Road Ashtabula, OH 44004	OHD 00 416 5924
VI	Gold Shield Division 322 International Parkway Arlington, TX 76011	TXD 98 062 6154
IX	Gold Shield Division 3027 Fruitland Avenue Los Angeles, CA 90058	CAD 02 016 1642

1. The owner or operator identified above owns or operates the following facilities for which financial assurance for closure is demonstrated through the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure cost estimates covered by the test are shown for each facility:

Region	Facility	EPA Identification	Closure Cost
I	Gold Shield Division 260 Chapel Road So. Windsor, CT 06074	CTD 01 016 8870	$ 15,478
II	Gold Shield Division 835 Industrial Highway Unit No. 1 Cinnaminson, NJ 08077	NJD 04 731 8043	Via Trust Fund
IV	Gold Shield Division P. O. Box 5274 Charlotte, NC 28225	NCD 04977 3245	29,432
V	Gold Shield Division 12886 Eaton Avenue Detroit, MI 48227	MID 09 160 5972	18,165
V	Gold Shield Division 312 Ellsworth Avenue, S.W. Grand Rapids, MI 49507	MID 02 090 6784	10,845
V	Gold Shield Division 1410 Chardon Road Euclid, OH 44117	OHD 08 015 8702	6,575

Region	Facility	EPA Identification	Closure Cost
V	Gold Shield Division 2537 LaMoyne Avenue Melrose Park, IL 60160	ILD 07 442 4938	$ 31,634
V	Gold Shield Division 2263 Distributors Drive Indianapolis, IN 46241	IND 08 361 6837	24,831
V	General Chemicals Division North State Road Ashtabula, OH 44004	OHD 00 416 3924	41,000
VI	Gold Shield Division 322 International Parkway Arlington, TX 76011	TXD 98 062 6154	169,404
IX	Gold Shield Division 3027 Fruitland Avenue Los Angeles, CA 9005	CAD 02 018 1642	36,251
			$383,725

2. The owner or operator identified above guarantees, through the corporate guarantee specified in Subpart H of 40 CFR Parts 264 and 265, the closure and post-closure care of the following facilities owned or operated by its subsidiaries. The current cost estimates for the closure or post-closure care so guaranteed are shown for each facility: None.

3. In states where EPA is not administering the financial requirements of Subpart H of 40 CFR Parts 264 and 265, this owner or operator is demonstrating financial assurance for the closure or post-closure care of the following facilities through the use of a test equivalent or substantially equivalent to the financial test specified in Subpart H of 40 CFR Parts 264 and 265. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility: as noted above.

4. The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if disposal facility, post-closure care, is not demonstrated either to EPA or a State through the financial test or any other financial assurance mechanism specified in Subpart H of 40 CFR Parts 264 and 265 or equivalent or substantially equivalent State mechanisms. The current closure and/or post-closure cost estimates are not covered by such financial assurance are shown for each facility: None.

The owner or operator is required to file a Form 10K with the Securities and Exchange Commission (SEC) for the latest fiscal year.

The fiscal year of this firm ends on December 31. The figures for the following items marked with a asterisk are derived from this firm's independently audited, year-end financial statements for the latest completed fiscal year, ended 1987.

1.	Sum of current closure cost estimates (total of all cost estimates listed above)	$ 383,725
2.	Amount of annual aggregate liability coverage to be demonstrated	2,000,000
3.	Sum of lines 1 and 2	2,383,725
*4.	Total liabilities (if any portion of the closure cost estimates is included in total liabilities, you may deduct the amount of that portion from this line and add that amount to lines 5 and 6)	19,700,498
*5.	Tangible net worth	40,301,523
*6.	Net worth	41,027,175
*7.	Current assets	36,366,792
*8.	Current liabilities	10,404,482
*9.	Net working capital (line 7 minus line 8)	25,962,310
*10.	The sum of net income plus depreciation, depletion and amortization	6,077,893
*11.	Total assets in U.S. (required only if less than 90% of firm's assets are located in the U.S.)	N/A

		Yes	No
12.	Is line 5 at least $10 million?	X	
13.	Is line 5 at least 6 times line 3?	X	
14.	Is line 9 at least 6 times line 3?	X	
*15.	Are at least 90% of firm's assets located in the U.S.? If not, complete line 16	X	
16.	Is line 11 at least 6 times line 1?	N/A	
17.	Is line 4 divided by line 6 less than 3.0?	X	
18.	Is line 10 divided by line 4 greater than 0.1?	X	
19.	Is line 7 divided by line 8 greater than 1.5?		

I hereby certify that the wording of this letter is identical to the wording specified in 40 CFR 264.151(g) as such regulations were constituted on the date shown immediately below.

Very truly yours,

C. B. Stockmeyer, Jr.
Vice President & Treasurer

March 31, 1988

/smb

ACCOUNTANTS' REPORT

Deloitte Haskins+Sells
Certified Public Accountants

100 Renaissance Center
Detroit, Michigan 48243

To the Board of Directors and Stockholders of
Detrex Corporation

We have examined the consolidated balance sheets of Detrex Corporation and its subsidiaries as of December 31, 1987 and 1986 and the related consolidated statements of income and retained earnings and of changes in financial position for each of the three years in the period ended December 31, 1987. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying consolidated financial statements present fairly the financial position of the companies at December 31, 1987 and 1986 and the results of their operations and the changes in their financial position for each of the three years in the period ended December 31, 1987, in conformity with generally accepted accounting principles consistently applied during the period except for the change, with which we concur, in 1987 in the method of accounting for income taxes as described in Note 5 to the consolidated financial statements.

Deloitte Haskins + Sells

February 29, 1988

DETREX
CORPORATION

1987 ANNUAL REPORT

HIGHLIGHTS

	1987	1986	1985
Net sales	$100,257,000	$94,205,000	$88,268,000
Income before accounting change	2,639,000	2,495,000	4,753,000
Cumulative effect of accounting change	458,000		
Net income	3,097,000	2,495,000	4,753,000
Earnings per common share before accounting change	1.67	1.58	3.01
Cumulative effect of accounting change per common share	.29		
Earnings per common share	1.96	1.58	3.01
Cash dividends per common share	1.20	1.20	1.20
Stockholders' equity per common share	25.96	25.20	24.82
Additions to land, buildings and equipment	3,921,000	6,902,000	4,614,000
Current ratio	3.5 to 1	3.7 to 1	3.6 to 1
Percent long-term debt to equity	17.9	20.8	1.5
Number of stockholders	762	825	945
Number of employees	595	742	666

TO OUR SHAREHOLDERS:

Detrex sales and net income were $100,257,000 and $3,097,000, respectively, for 1987 while sales for the previous year were $94,205,000 and net income was $2,495,000. Net income for 1987 includes $458,000 which represented the effect of an accounting change concerning deferred income taxes.

We are maintaining our strong emphasis on research and development with expenditures for these activities in 1987 at $2,326,000. This represents the second highest level of expenditures for research and development in our company history.

A number of new products have been introduced by our profit centers as a result of our various ongoing research activities. Some of these products include an additive for paper machine oils, a new line of soluble oil bases, a non-chlorinated, non-toxic extreme pressure additive to replace chlorinated wax; a new HVP line of high pressure defluxer machines for cleaning complex electronic assemblies and sophisticated printed circuit boards; new dry film lubricants; cleaners and patented ultrasonic phosphating compounds for the coil coater industries; and heat treat systems for aluminum alloys and mesh belt atmosphere controlled furnace lines.

Detrex has established a new analytical and testing laboratory entity, RTI, which will be providing contract services for companies requiring sophisticated analytical assistance in environmental matters and specialized testing in metalworking, water treatment, paints and coatings. While the beginning for RTI will not be in the form of a giant step, we believe, in time it will provide Detrex with significant growth.

Seibert-Oxidermo, which was acquired by Detrex in 1986, and Viking Chemicals, which was acquired the year before, are continuing their programs to expand marketing of their lines of products and are also maintaining joint projects with our other profit centers to augment sales of our various lines of products. All of the programs are designed to produce additional revenues and profits for our company.

While our Solvents Division has been profitably marketing its services in reclamation and recycling of spent chlorinated solvents to its customers, it has not heretofore been involved with flammable solvents. The Solvents Division has completed studies and investigations and expects to be providing additional service to those customers who employ flammable as well as chlorinated solvents. This additional service will enable the Solvents Division to add greater value to the many ways it serves its customers.

We are continuing our program of evaluating suitable candidates for acquisition which meet our objectives of "fit" and margin and which provide opportunities for growth.

During 1987 we have continued our programs to provide optimum quality and reduced unit operating costs at our customers' plants. Programs are also continuing at our Detrex profit centers to reduce operating expenses and improve margins.

We report with sadness the death on January 18, 1988 of Mr. Robert A. Emmett, Jr., who had served on the Board of Directors from March 29, 1951 until his death. Mr. Emmett was employed by the Company from June 10, 1946 until his retirement December 31, 1983. During most of his employment period, Mr. Emmett was a Vice President in charge of several divisions and departments, and played a leadership role in developing and manufacturing products and processes which added a great deal to the growth and sales of the Company.

We honor Mr. Emmett for his loyalty and for his adherence to the ideals of honesty and business ethics.

Following the loss of Robert A. Emmett, Jr., the Board of Directors has fixed the number of Directors of the Corporation at eight.

We wish to extend our sincere appreciation to all of our employees for their fine performance and their dedication.

Louis Schlossberg
President

A. O. Thalacker
Chairman

DETREX CORPORATION

CONSOLIDATED BALANCE SHEETS

December 31

ASSETS

	1987	1986
Current Assets:		
Cash and short-term investments	$ 4,621,438	$ 2,388,524
Accounts receivable	17,062,604	19,078,075
Inventories	13,860,121	14,452,411
Prepaid expenses and deferred income taxes	822,629	1,268,984
Total Current Assets	36,366,792	37,187,994
Land, Buildings and Equipment:		
Land	1,044,468	1,044,468
Buildings and improvements	15,985,142	15,223,006
Machinery and equipment	24,443,866	22,449,937
Construction in progress	1,057,105	1,118,810
	42,530,581	39,836,221
Less allowance for depreciation and amortization	20,210,281	18,261,130
Land, Buildings and Equipment—Net	22,320,300	21,575,091
Other Assets	2,040,581	2,089,784
	$60,727,673	$60,852,869

See Notes to Consolidated Financial Statements.

LIABILITIES AND STOCKHOLDERS' EQUITY

	1987	1986
Current Liabilities:		
Current maturities of long-term debt	$ 1,568,354	$ 724,809
Accounts payable	4,312,881	4,369,092
Income taxes	198,767	56,603
Accrued payroll and commissions	1,246,208	1,754,166
Accrued insurance and other liabilities	3,078,272	3,074,896
Total Current Liabilities	10,404,482	9,979,566
Long-Term Debt	7,343,734	8,288,221
Deferred Income Taxes	1,952,282	2,757,983
Stockholders' Equity:		
Common stock	3,160,828	3,160,828
Retained earnings	37,866,347	36,666,271
Total Stockholders' Equity	41,027,175	39,827,099
	$60,727,673	$60,852,869

See Notes to Consolidated Financial Statements.

DETREX CORPORATION

CONSOLIDATED STATEMENTS OF INCOME AND RETAINED EARNINGS

For the Years Ended December 31

	1987	1986	1985
Net Sales	$100,256,924	$94,204,793	$88,268,265
Costs and Expenses:			
Cost of sales	72,781,067	68,254,108	60,697,055
Selling, general and administrative expenses	19,201,960	18,382,335	16,442,105
Provision for depreciation and amortization	2,981,320	2,689,341	2,400,922
Total Costs and Expenses	94,964,347	89,325,784	79,540,082
Operating income	5,292,577	4,879,009	8,728,183
Other income—net	489,068	284,950	378,637
Interest expense	943,394	425,213	183,625
Income before income taxes	4,838,251	4,738,746	8,923,195
Provision for income taxes	2,199,382	2,243,702	4,170,350
Income before accounting change	2,638,869	2,495,044	4,752,845
Cumulative effect on prior years of change in accounting for income taxes	457,704		
Net Income	3,096,573	2,495,044	4,752,845
Retained Earnings at Beginning of Year	36,666,271	36,067,724	33,211,376
	39,762,844	38,562,768	37,964,221
Deduct:			
Cash dividends on common stock—1987, 1986 and 1985, $1.20 per share	1,896,497	1,896,497	1,896,497
Retained Earnings at End of Year	$ 37,866,347	$36,666,271	$36,067,724
Earnings Per Common Share:			
Before accounting change	$1.67	$1.58	$3.01
Cumulative effect of accounting change	.29		
Net Earnings	$1.96	$1.58	$3.01

See Notes to Consolidated Financial Statements.

DETREX CORPORATION

CONSOLIDATED STATEMENTS OF CHANGES IN FINANCIAL POSITION

For the Years Ended December 31

	1987	1986	1985
Funds Provided:			
Operations:			
Income before accounting change	$ 2,638,869	$ 2,495,044	$ 4,752,845
Add (deduct) items not affecting funds:			
Depreciation and amortization	2,981,320	2,689,341	2,400,922
Deferred income taxes	(805,701)	684,867	406,774
Total from Operations Before Acounting Change	4,814,488	5,869,252	7,560,541
Cumulative effect of accounting change	457,704		
Total from Operations	5,272,192	5,869,252	7,560,541
Working Capital Changes:			
Accounts receivable	2,015,471	(2,600,210)	(2,341,200)
Inventories	592,290	(1,487,759)	(966,621)
Prepaid expenses and deferred income taxes	446,355	(146,566)	181,396
Current maturities of long-term debt	843,545	187,098	(4,757)
Accounts payable	(56,211)	812,668	(743,588)
Income taxes	142,164	(43,170)	(492,888)
Accrued payroll and commissions	(507,958)	(35,351)	68,940
Accrued insurance and other liabilities	3,376	2,039	(592,884)
Total from Working Capital Changes	3,479,032	(3,311,251)	(4,891,602)
Disposals of machinery and equipment	385,608	417,932	369,381
Increase in long-term debt		7,685,888	
Total Funds Provided	9,136,832	10,661,821	3,038,320
Funds Used:			
Expenditures for buildings and equipment	3,920,592	6,901,854	4,614,396
Cash dividends	1,896,497	1,896,497	1,896,497
Increase in other assets	142,342	1,129,157	844,728
Decrease in long-term debt	944,487		150,952
Total Funds Used	6,903,918	9,927,508	7,506,573
Increase (Decrease) in Cash and Short-Term Investments	$ 2,232,914	$ 734,313	$(4,468,253)

See Notes to Consolidated Financial Statements.

DETREX CORPORATION

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. Summary of Significant Accounting Policies

Basis of Financial Statements

The consolidated financial statements comprise those of the Company and all of its subsidiaries. All balances and transactions between the companies have been eliminated.

Inventories

Inventories are stated at the lower of cost or market. Cost of raw materials, including raw materials in work in process and finished goods inventories, is determined by using the last-in, first-out method. Labor and burden in inventory are determined by using the average cost method. Inventories relating to fixed-price contracts are stated at the accumulated cost of material, labor and burden less related progress billings.

Land, Buildings and Equipment

Land, buildings and equipment are stated at cost. Depreciation and amortization are provided over the estimated useful lives of the assets using the straight-line method for financial reporting purposes. Leased equipment is amortized over the lease term. Annual depreciation rates for financial reporting purposes range from 2.5% to 20% for buildings and improvements and from 6.7% to 33.3% for machinery and equipment.

Research and Development

Research and development costs are charged to income as incurred. Research and development costs for 1987, 1986 and 1985 were approximately $2,326,000, $2,629,000 and $1,642,000, respectively.

Earnings Per Common Share

Earnings per common share are based upon the average number of common shares outstanding during the year.

Industry Segment

The Company and its subsidiaries operate predominantly in a single industry, chemicals and allied products, and supply processes for use by manufacturing and service industries.

2. Inventories

Inventories at December 31 consist of the following:

	1987	1986
Finished goods and work in process	$ 8,747,539	$ 8,547,623
Raw materials	5,112,582	5,904,788
Total	$13,860,121	$14,452,411

The excess of current cost over the stated last-in, first-out value is approximately $1,666,000 and $1,481,000 at December 31, 1987 and 1986, respectively.

3. Capital and Operating Leases

Capitalized leased assets (primarily automobiles, railroad tank cars and trucks and trailers) at December 31 are as follows:

	1987	1986
Machinery and equipment	$2,139,972	$1,923,046
Accumulated amortization	1,165,264	1,060,962
Leased assets—net	$ 974,708	$ 862,084

Rent expense applicable to operating leases for 1987, 1986 and 1985 was $710,000, $597,000 and $553,000, respectively.

Minimum annual lease payments for leases in effect at December 31, 1987 are as follows:

Minimum Lease Payments:	Capital	Operating
1988	$ 587,800	$ 691,000
1989	422,400	477,000
1990	177,800	70,000
1991	99,600	42,000
1992		23,000
Total minimum lease payments	1,287,600	$1,303,000
Less amount representing estimated executory costs (such as taxes, maintenance and insurance) and profit thereon included in total minimum lease payments	171,763	
Net minimum lease payments	1,115,837	
Less amount representing interest	111,208	
Present value of net minimum lease payments	1,004,629	
Less current portion	459,008	
Non-current portion	$ 545,621	

4. Long-Term Debt

The composition of long-term debt, exclusive of current maturities, as of December 31 is as follows:

	1987	1986
Term note at interest rate of 8.9%; due through 1991	$6,750,000	$7,750,000
Mortgages payable with interest principally at .9%; due through 1994	48,113	71,141
Capitalized lease obligations at interest rates from 5.7% to 15.1%; due through 1990 (see Note 3)	545,621	467,080
	$7,343,734	$8,288,221

The mortgages payable are collateralized by buildings with a carrying value of $2,027,000 at December 31, 1987.

The approximate aggregate annual maturities of long-term debt (exclusive of capital lease obligations) for the five years subsequent to December 31, 1987 are as follows: 1988, $1,109,346; 1989, $1,014,700; 1990, $1,007,900; 1991, $4,758,000; 1992 and after, $17,513.

The Company had unused lines of credit of $6,000,000 as of December 31, 1987.

5. Income Taxes

Financial Accounting Standards Board Statement No. 96, "Accounting for Income Taxes," was adopted by the Company effective January 1, 1987. The cumulative effect of the change on prior years was to increase income in 1987 by $457,704 or $.29 per share. Deferred income taxes for years prior to 1987 were computed based on generally accepted accounting principles in effect for those years.

The provision for income taxes for the years ended December 31 is summarized below:

	1987	1986	1985
Current:			
Federal	$1,605,511	$1,387,521	$2,818,072
State and local	270,983	211,030	402,148
Total current	1,876,494	1,598,551	3,220,220
Deferred:			
Federal	257,783	539,089	838,038
State and local	65,105	106,062	112,092
Total deferred	322,888	645,151	950,130
	$2,199,382	$2,243,702	$4,170,350

Deferred taxes result from timing differences in the recognition of revenue and expense for tax and financial statement purposes. The sources of these differences and the tax effect of each were as follows:

	1987	1986	1985
Depreciation and amortization	$ 207,263	$ 388,625	$ 447,620
Accruals not deductible until paid	58,650	81,376	250,865
Undistributed earnings of Company's DISC	79,949	210,524	160,436
Other—net	(22,974)	(35,374)	91,209
	$ 322,888	$ 645,151	$ 950,130

The effective income tax rates for 1987, 1986 and 1985 were 45.5%, 47.4% and 46.7%, respectively. The reasons for the difference between the income tax provision which resulted in these effective rates and income taxes computed at 40% for 1987 and at 46% for 1986 and 1985 are summarized below:

	1987	1986	1985
Computed "expected" tax provision	$1,935,300	$2,179,823	$4,104,670
Research and development tax credit		(140,997)	(50,239)
Investment tax credit, net of investment credit recapture		3,441	(178,318)
State and local income taxes, net of federal tax benefit	201,653	171,230	277,690
Other—net	62,429	30,205	16,547
	$2,199,382	$2,243,702	$4,170,350

6. Pension and Postretirement Costs

The Company and its subsidiaries have several noncontributory, defined benefit pension plans which cover substantially all employees. Benefits for salaried employees are based on years of service and the employee's average monthly compensation using the highest five consecutive years preceding retirement. Benefits for hourly employees are based on a specified payment per month for each year of service. The Company's funding policy is to contribute amounts sufficient to provide for benefits earned to date and those expected to be earned in the future.

Net pension cost of $5,932 and $103,953 for 1987 and 1986, respectively, was computed based on Financial Accounting Standards Board Statement No. 87, "Employers' Accounting for Pensions." Pension expense of $155,000 for 1985 was computed based on generally accepted accounting principles in effect for that period.

The following table sets forth the plans' funded status and amounts recognized in the Company's balance sheet at December 31, 1987 and 1986:

	1987	1986
Actuarial present value of benefit obligations:		
Accumulated benefit obligations:		
Vested benefits	$10,881,742	$10,979,261
Non-vested benefits	1,185,444	843,002
Total	$12,067,186	$11,822,263
Projected benefit obligation for service rendered to date	$16,950,314	$14,847,133
Plan assets at fair value—primarily equity and fixed income bond funds and group annuity insurance contracts	19,306,313	18,753,647
Excess of plan assets over projected benefit obligation	2,355,999	3,906,514
Unrecognized net asset at January 1, 1986 being recognized principally over 15 years	(2,892,725)	(3,100,588)
Unrecognized net loss (gain) from past experience different from that assumed	488,604	(909,879)
Pension liability included in other liabilities	$ (48,122)	$ (103,953)
Net pension cost included the following components:		
Service cost-benefits earned during the year	$ 697,134	$ 608,841
Interest cost on projected benefit obligations	1,234,402	1,083,409
Actual return on plan assets	(1,110,709)	(2,290,313)
Net amortization and deferral	(814,895)	702,016
Net periodic pension cost	$ 5,932	$ 103,953

The discount rate and rate of increase in future compensation levels used in determining the actuarial present value of the projected benefit obligation were 8.5% and 6.5%, respectively. The expected long-term rate of return on assets was 8.5%.

In addition to providing pension benefits, the Company and its subsidiaries provide certain health care benefits to retired employees. The majority of the Company's employees may become eligible for the benefits if they reach normal retirement age while working for the Company. The cost of retiree health care benefits, which is immaterial, is recognized as an expense when the related premiums are paid.

7. Capital Stock

The number and amount of shares of capital stock are as follows:

Preferred Stock—authorized 1,000,000 shares of $2 par value each, issuable in series. No shares were issued or outstanding as of December 31, 1987, 1986 and 1985.

Common Stock—authorized 4,000,000 shares of $2 par value each. The number of shares issued and outstanding as of December 31, 1987, 1986 and 1985 was 1,580,414.

8. Other Income—Net

Other income consists principally of interest income of approximately $238,000, $69,000 and $316,000 for 1987, 1986 and 1985, respectively, and miscellaneous service income of $340,000, $386,000 and $242,000 in 1987, 1986 and 1985, respectively.

9. Contingencies

The U.S. Environmental Protection Agency ("EPA") has notified the Company and 17 other companies that they may be potentially responsible for sharing the costs involved in a proceeding to clean up contaminated sediments in the Fields Brook watershed in Ashtabula, Ohio. The EPA has issued a Record of Decision concerning the methods it recommends using to accomplish this task. The Company and the other potentially responsible parties have expressed their disagreement with this recommendation, but will continue to negotiate with the EPA as to how best to effect the clean-up operation. At this time, managment cannot determine when, and to what extent, the Company may have to share the costs associated with the clean-up. In addition, there are several other claims and lawsuits pending against the Company and its subsidiaries.

Although the amount of liability, if any, at December 31, 1987, with respect to the actions then pending to which the Company and its subsidiaries are party cannot be ascertained, the disposition of the above matters, in the opinion of management, on the basis of information furnished by counsel, will not have a material effect on the Company's consolidated financial position.

ACCOUNTANTS' REPORT

Deloitte Haskins+Sells
Certified Public Accountants

100 Renaissance Center
Detroit, Michigan 48243

To the Board of Directors and Stockholders of
Detrex Corporation

We have examined the consolidated balance sheets of Detrex Corporation and its subsidiaries as of December 31, 1987 and 1986 and the related consolidated statements of income and retained earnings and of changes in financial position for each of the three years in the period ended December 31, 1987. Our examinations were made in accordance with generally accepted auditing standards and, accordingly, included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the accompanying consolidated financial statements present fairly the financial position of the companies at December 31, 1987 and 1986 and the results of their operations and the changes in their financial position for each of the three years in the period ended December 31, 1987, in conformity with generally accepted accounting principles consistently applied during the period except for the change, with which we concur, in 1987 in the method of accounting for income taxes as described in Note 5 to the consolidated financial statements.

Deloitte Haskins + Sells

February 29, 1988

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Liquidity and Capital Resources

The Company generates cash from operations sufficient to meet its needs for working capital, dividend payments on capital stock and capital expenditures.

A measure of liquidity used by the Company for internal management purposes can be illustrated by a review of cash and short-term investments.

Cash and Short-Term Investments

The following analysis is a condensation of the data contained in the Consolidated Statements of Changes in Financial Position. The comparisons (in thousands) are as follows:

	1987	1986	1985
Funds provided from operations	$ 5,272	$ 5,869	$ 7,561
Expenditures—net:			
Buildings and equipment	3,535	6,484	4,245
Dividends	1,896	1,896	1,896
Decrease (increase) in long-term debt	944	(7,686)	151
(Decrease) increase in other working capital items	(3,479)	3,311	4,892
Increase in other assets	143	1,130	845
	3,039	5,135	12,029
Increase (decrease) in Cash and Short-Term Investments	$ 2,233	$ 734	$(4,468)

With the exception of transportation equipment and the 1986 Seibert-Oxidermo asset purchase, the Company's capital spending programs have been financed using internally generated funds. The Company does not presently plan to borrow additional long-term funds, sell securities or enter into any material off-balance sheet financing arrangements. The Company had unused lines of credit of $6,000,000 at December 31, 1987.

Results of Operations

Comparative operating data (in thousands) are summarized below:

	1987		1986		1985	
	$	%	$	%	$	%
Sales	100,257	100.0	94,205	100.0	88,268	100.0
Gross profit	27,476	27.4	25,951	27.6	27,571	31.2
Operating expenses	19,202	19.2	18,382	19.5	16,442	18.6
Depreciation and amortization	2,981	3.0	2,689	2.8	2,401	2.7
Operating income	5,293	5.3	4,879	5.2	8,728	9.9

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS—Continued

Sales and Gross Profit

The year 1987—Increases in gross profit reflect the full-year profit contribution of Seibert-Oxidermo (which was acquired by the Company in August 1986,) sales volume increases in some commodity type product lines and tighter cost controls. These increases were partially offset by reduced sales volume at some of the Company's profit centers. The net result is a sales volume increase which yielded an increase in gross profit.

The year 1986—Decreases in gross profit resulted from cost overruns relating to new products developed, various costs associated with product warranties and related liabilities, and increases in the ratio of cost to selling price in commodity type product lines. These decreases were partially offset by gross profit gains on increased chemical specialty sales volume.

The year 1985—The gross profit levels remained comparable with the year 1984 despite a 1.9% decrease in overall sales volume. This reflects a more favorable mix in the sales of higher margin products and the continuing stability of raw material costs.

Inflation—The moderate level of inflation during the three year period has not had any significant impact on the Company.

Operating Expenses

Increases in 1987 reflect higher sales volume and modest inflationary pressures, offset to some extent by operating expense reductions in certain areas.

Increases in 1986 reflect higher sales volume, increased product development and modest inflationary pressures.

Increases in 1985 were the result of modest inflationary pressures.

A COPY OF THE COMPANY'S ANNUAL REPORT ON FORM 10-K AS FILED WITH THE SECURITIES AND EXCHANGE COMMISSION FOR THE YEAR 1987 WILL BE FURNISHED WITHOUT CHARGE TO SHAREHOLDERS UPON WRITTEN REQUEST. REQUESTS ARE TO BE SENT TO VICE PRESIDENT-TREASURER, DETREX CORPORATION, 4000 TOWN CENTER, SUITE 1100, SOUTHFIELD, MICHIGAN 48075.

DESCRIPTION OF BUSINESS

Detrex Corporation and its subsidiaries operate predominantly in a single industry, chemicals and allied products, and supply processes for use by manufacturing and service industries. The products include specialty chemicals, industrial cleaners, phosphate coatings, drawing lubricants, chlorinated solvents, degreasing and defluxing equipment, soldering machines, ultrasonic degreasers, drycleaning machines, industrial furnaces, commercial and reagent grade muriatic acid, PVC plastic pipe and fittings, industrial finishing materials and paints, and water treatment chemicals and equipment. The products are primarily sold by sales-service engineers. Most sales are direct to industrial users with lesser amounts to distributors for resale to industrial users.

Net sales by product line for each of the last five years are set forth below:

	Net Sales		
	Product Line		
	Chemical Products	Chemical Equipment	Total
1987	$76,512,225	$23,744,699	$100,256,924
1986	66,725,717	27,479,076	94,204,793
1985	62,337,906	25,930,359	88,268,265
1984	70,375,994	19,578,927	89,954,921
1983	59,773,729	14,137,943	73,911,672

SUPPLEMENTARY INFORMATION

Selected Quarterly Data

(Thousands of dollars except per share amounts)

	1987 Quarters				1986 Quarters			
	4th	3rd	2nd	1st	4th	3rd	2nd	1st
Net sales	$24,040	$26,479	$25,010	$24,728	$23,135	$24,784	$23,709	$22,577
Gross profit on sales	5,890	6,966	7,559	7,061	4,508	7,085	7,357	7,001
Income (loss) before accounting change	85	579	1,077	898(1)	(953)(2)	967	1,223	1,258
Cumulative effect of accounting change				458(1)				
Net income (loss)	85	579	1,077	1,356(1)	(953)(2)	967	1,223	1,258
Earnings (loss) per common share before accounting change	.05	.36	.70	.56(1)	(.60)(2)	.61	.77	.80
Cumulative effect of accounting change per common share				.29(1)				
Earnings (loss) per common share	.05	.36	.70	.85(1)	(.60)(2)	.61	.77	.80
Dividends per common share	.30	.30	.30	.30	.30	.30	.30	.30
Stock price range(5)								
High	32	37¼	40½	44	40¼	45¾	45¾	36¼
Low	20	30	35¼	37½	37½	38¼	35½	34½

Notes for Selected Quarterly Data and Selected Financial Data

(1) Previously reported earnings for the 1987 first quarter have been restated to include a credit of $457,704, or $.29 per common share, which is the cumulative effect on prior years of an accounting change to adopt Financial Accounting Standards Board Statement No. 96, "Accounting for Income Taxes." The effect of the change on the first three quarters of 1987 was not material.

(2) The 1986 fourth quarter loss includes a charge of $1,164,000, or $.74 per common share, to reflect cost overruns and development costs relating to new products, as well as various costs associated with product warranties and related liabilities. The 1986 fourth quarter loss also includes a charge of $127,000, or $.08 per common share, due to elimination of investment tax credits under the Tax Reform Act of 1986.

(3) Net income as a percent of sales and other net income ratios for 1984 reflect a deferred income tax reversal of $510,440 or $.32 per share due to a change in the tax law covering Domestic International Sales Corporations.

(4) Amounts per share for 1983 have been restated to give retroactive effect to the 100% stock distribution, the equivalent of a two-for-one stock split, declared on January 19, 1984 and distributed on February 24, 1984.

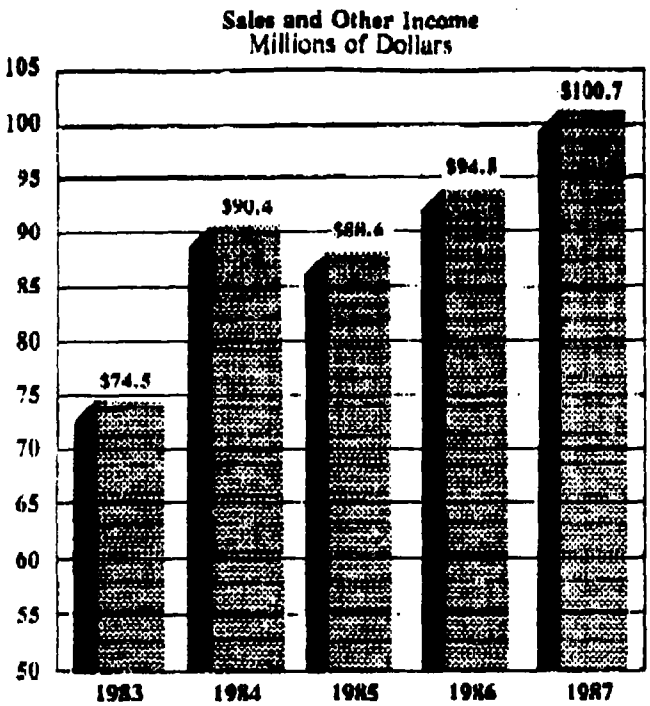
(5) Stock price range was obtained from National Over-The-Counter bid prices.

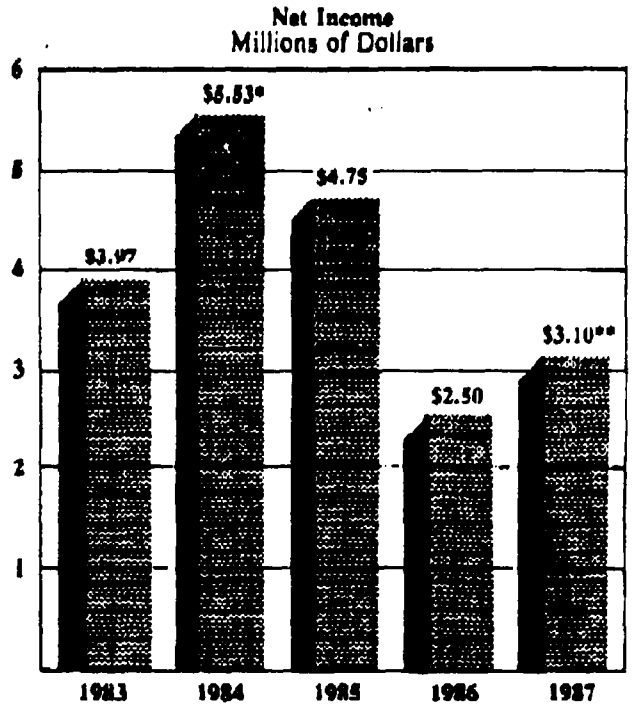
Selected Financial Data
(Thousands of dollars except per share amounts)

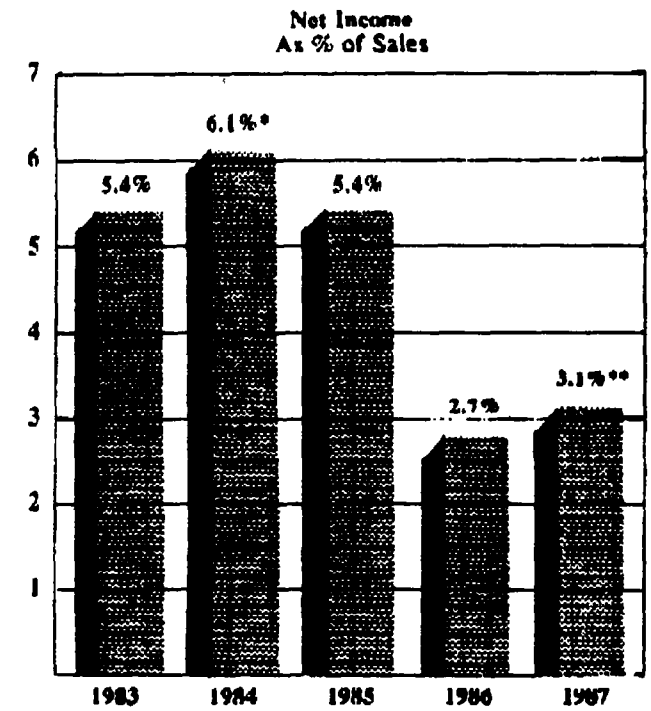
	1987	1986	1985	1984	1983(4)
Net sales	$100,257	$94,205	$88,268	$89,955	$73,912
Income before accounting change	2,639(1)	2,495(2)	4,753	5,531(3)	3,969
Cumulative effect of accounting change	458(1)				
Net income	3,097(1)	2,495(2)	4,753	5,531(3)	3,969
Earnings per common share before accounting change	1.67(1)	1.58(2)	3.01	3.50(3)	2.51
Cumulative effect of accounting change per common share	.29(1)				
Earnings per common share	1.96(1)	1.58(2)	3.01	3.50(3)	2.51
Dividends per common share	1.20	1.20	1.20	1.20	1.05
Total assets	60,728	60,853	50,960	49,613	46,016
Net working capital	25,962	27,208	23,163	22,740	20,978
Additions to land, buildings and equipment	3,921	6,902	4,614	4,259	2,920
Long-term debt	7,344	8,288	602	753	727
Stockholders' equity	41,027	39,827	39,229	36,372	32,737
Stockholders' equity per common share	25.96	25.20	24.82	23.01	20.71
Number of employees	595	742	666	617	562
Percentages to net sales:					
Gross profit	27.4	27.6	31.2	30.2	31.0
Net income	3.1(1)	2.7(2)	5.4	6.1(3)	5.4
Net income as a percent of:					
Average total assets	5.1(1)	4.5(2)	9.5	11.6(3)	9.1
First of year stockholders' equity	7.8(1)	6.4(2)	13.1	16.9(3)	13.0
Current ratio	3.5	3.7	3.6	3.1	3.0
Percent long-term debt to equity	17.9	20.8	1.5	2.1	2.2

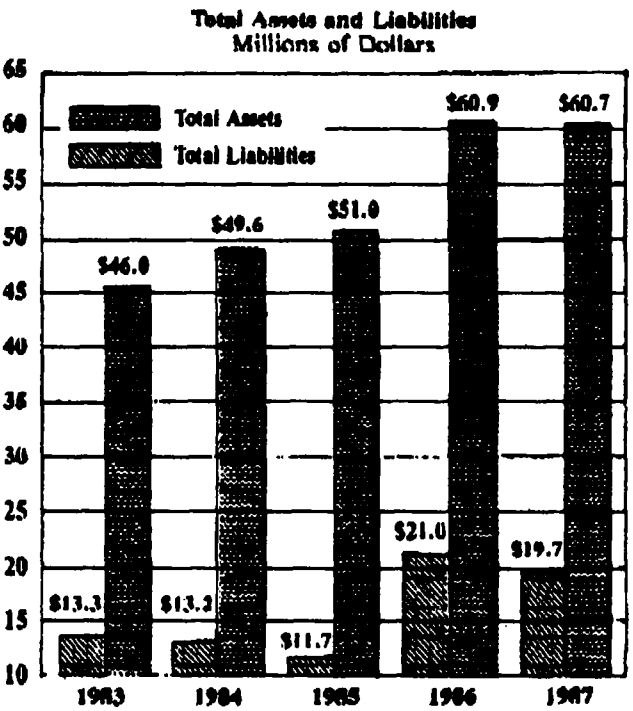
DETREX CORPORATION AND SUBSIDIARIES

5 YEAR HIGHLIGHTS







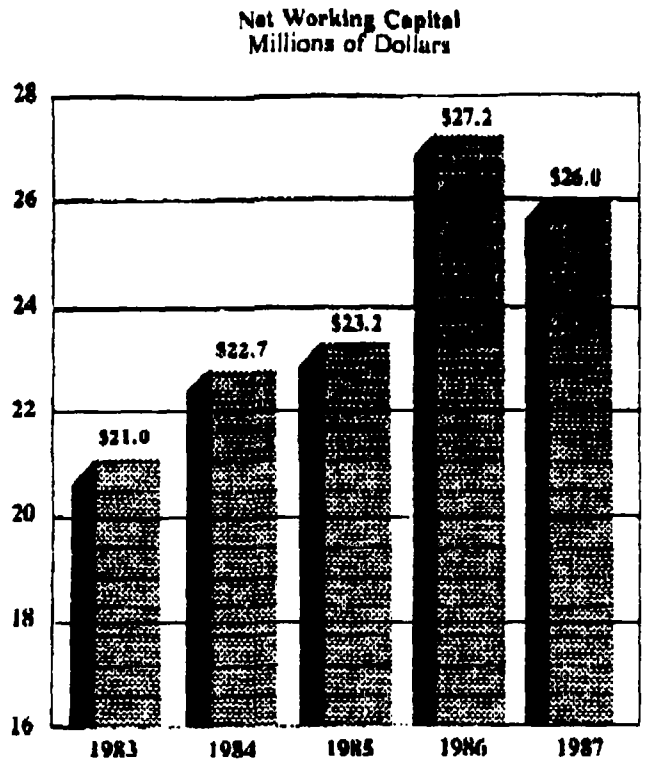


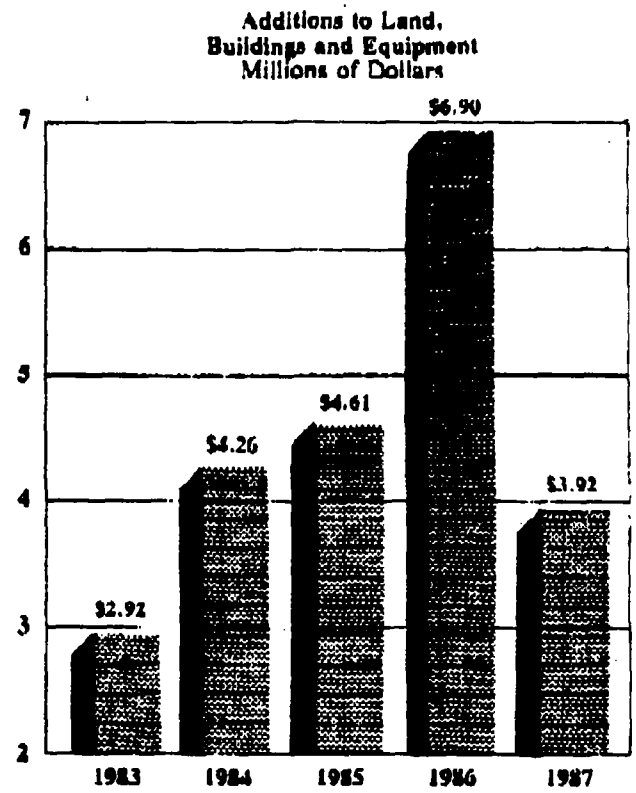
*Net income and net income as a percent of sales for 1984 reflect a deferred income tax reversal of $510,440 or $.32 per share due to a change in the tax law covering Domestic International Sales Corporations.

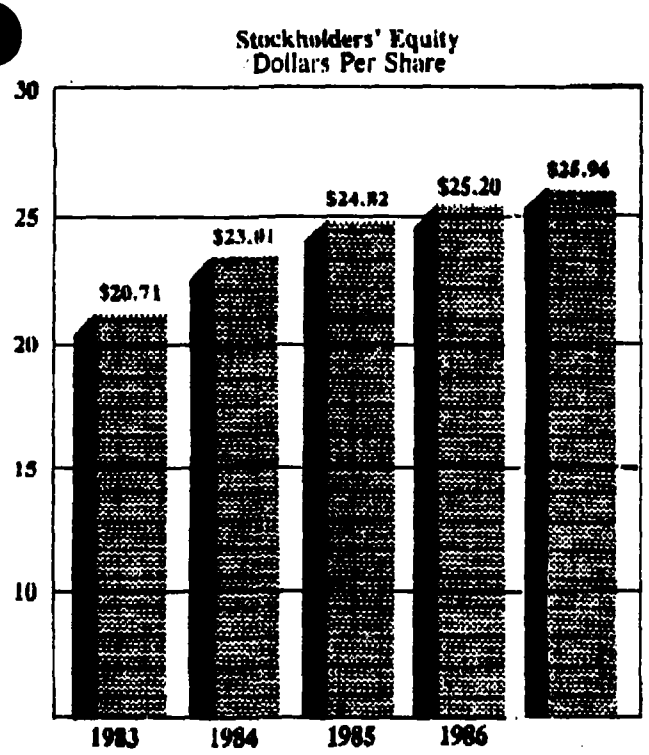
**Net income and net income as a percent of sales for 1987 reflect an income tax credit of $457,704 or $.29 per share which is the cumulative effect of an accounting change to adjust deferred income taxes on the balance sheet to reflect reduced tax rates under the Tax Reform Act of 1986.

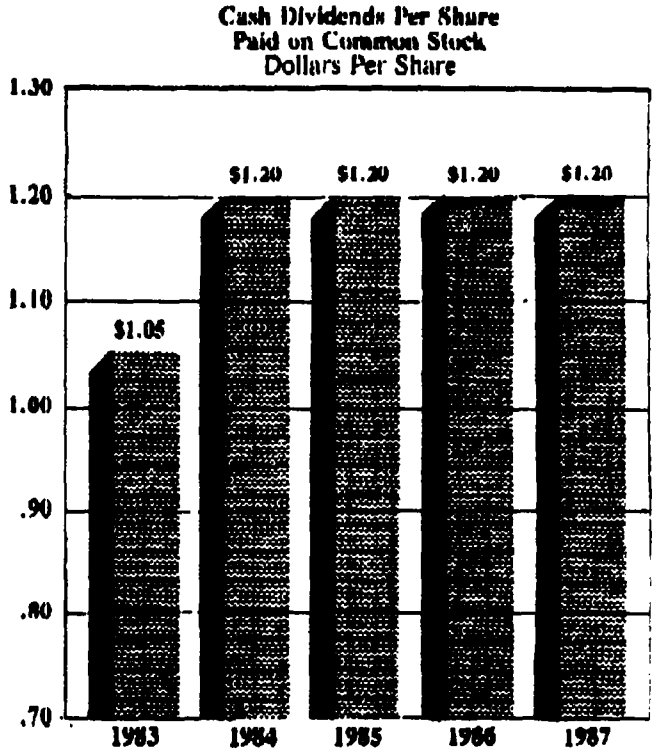
DETREX CORPORATION AND SUBSIDIARIES

5 YEAR HIGHLIGHTS









Amounts per share have been restated to give retroactive effect to the 100% stock distribution, the equivalent of a two-for-one stock split, declared on January 19, 1984 and distributed on February 24, 1984.

PRODUCTS OF DETREX AND DETREX SUBSIDIARIES

INDUSTRIAL CHEMICAL SPECIALTIES DIVISION
26000 CAPITOL AVENUE
REDFORD, MICHIGAN 48239-2499
T. A. McGREGOR, Vice President and General Manager

Immersion Phosphate Coatings—"Perm-Cote"
Industrial Cleaners
Rolling Oils
Spray Phosphate Coatings—"Paintbond"
Metalworking Compounds
Corrosion Preventives
Ultrasonic Phosphate—Hydrasonic
Ultrasonic Conversion Coatings

SOLVENTS DIVISION
P. O. BOX 1398,
ASHTABULA, OHIO 44004
R. J. JONES, Vice President and General Manager

Trichloroethylene—"Perm-A-Clor NA"
Perchloroethylene
1,1,1-Trichloroethane—"Perm-Ethane"
Trichlorotrifluoroethane (Freon TF)
Solvent Reclamation and Waste Management

EQUIPMENT DIVISION
P. O. BOX 5111,
SOUTHFIELD, MICHIGAN 48086-5111
C. B. STOCKMEYER, JR., Vice President and General Manager

Degreasing Equipment
Industrial Ultrasonic Machines
Environmental Emission Control Devices
Electronic Component Cleaning and Defluxing Machines
Soldering Machines
Hospital Ultrasonic Machines
Drycleaning Machines

CHEMICALS DIVISION
P. O. BOX 1398,
ASHTABULA, OHIO 44004
R. J. JONES, Vice President and General Manager

Muriatic Acid
N-Methyl Pyrrole
Pyrrole
Reagent Chemicals—Muriatic Acid, Sulfuric Acid
Nitric Acid

PACIFIC INDUSTRIAL FURNACE DIVISION
P. O. BOX 5111,
SOUTHFIELD, MICHIGAN 48086-5111
R. E. THALACKER, General Manager

Industrial Furnaces for:
Metal Treating
Sintering
Annealing
Hardening
Forging

THE ELCO CORPORATION
P. O. BOX 09168,
CLEVELAND, OHIO 44109
DR. W. T. BRANNEN, Executive Vice President

Chemical Additives for Gear Lubricants, Transmission, Hydraulic and Motor Oils
Industrial Gear Lubricants

HARVEL PLASTICS, INC.
P. O. BOX 757,
EASTON, PENNSYLVANIA 18042
H. G. WISMER, President

Rigid PVC Plastic Pipe
(Normal Impact)
(High Impact)
Solid Bar, Heavy Wall Tubular Stock, Angle Stock, Custom Extrusions

VIKING CHEMICALS, INC.
8 BRUSH STREET,
PONTIAC, MICHIGAN 48053
D. P. ANDERSON, Executive Vice President

Water Treatment Chemicals and Equipment

SEIBERT-OXIDERMO, INC.
16255 WAHRMAN
ROMULUS, MICHIGAN 48174
D. D. HURST, President

Industrial Finishing Materials
Automotive Paints

WAYNE CHEMICAL PRODUCTS COMPANY
9470 COPLAND,
DETROIT, MICHIGAN 48209-2680
L. P. GOWMAN, Executive Vice President

Cutting Fluids
Industrial Cleaners
Drawing Lubricants
Rust Preventives
Fluxes and Solders
Chemical Sealants
Soluble Oils

DIRECTORS
H. GLENN BIXBY
Former Chairman,
Ex-Cell-O Corporation
CHARLES B. BREEDLOVE
Former Executive Vice President
and Director of Reichhold
Chemicals, Inc.
BRUCE W. COX
President, B. W. Cox Company,
Manufacturers Representative
ROBERT A. EMMETT, III
Partner Reed Smith Shaw & McClay,
Attorneys, Washington, D.C.
T. KENNETH HAVEN
Director
LOUIS SCHLOSSBERG
President
ARBIE O. THALACKER
Chairman of the Board
ARBIE R. THALACKER
Partner, Shearman & Sterling,
Attorneys, New York City

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T. KENNETH HAVEN

TRANSFER AGENT AND REGISTRAR
NATIONAL BANK OF DETROIT

AUDITORS
DELOITTE HASKINS & SELLS

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Vice President
C. B. STOCKMEYER, JR.
Vice President and Treasurer
F. J. CHMIELNICKI
Secretary
F. X. GALLANT
Controller and Assistant Secretary
E. R. RONDEAU
Assistant Controller

DETREX CORPORATION

GENERAL OFFICES - 4000 TOWN CENTER, SOUTHFIELD MICHIGAN

MAILING ADDRESS - P.O. BOX 5111, SOUTHFIELD, MI 48086-5111

Telephone: (313) 358-5800

SECTION J

OTHER FEDERAL LAWS

Information will be provided in accordance with the requirements for 35 IAC 703.183(t) at the request of the EPA Region or the IEPA. At this time, however, we believe this facility is in compliance with the following Federal Laws; Wild and Scenic Rivers Act, National Historic Preservation Act of 1966, Endangered Species Act, Coastal Zone Management Act, and the Fish and Wildlife Coordination Act.

PART B CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibliity of fine and imprisonment for knowing violations.

Signature Robert J. Jones
Name R.J. Jones
Title Vice-President
Date 11-4-88

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ATTACHMENTS

SECTION L

CONTINUING RELEASES AT PERMITTED FACILITIES [§3004(u)]

This section of this RCRA Part B Permit Application provides a description of corrective action for the solid waste management units in operation at the Detrex facility in Melrose Park, Illinois.

L-1 SOLID WASTE MANAGEMENT UNITS

The solid waste management units (SWMU's) presently operational at the facility include the following:

1) Container Storage Area
2) Waste Handling Area (Loading/Unloading Area)

Each of these solid waste management units is identified on a facility plan provided in Attachment L-1.

L-1a Characterize the Solid Waste Management Units

L-1a(1) Container Storage Area

The container storage is located entirely within an enclosed building structure. Containers are placed on a concrete slab floor, complete with concrete diking and concrete access ramps to provide adequate secondary containment. The floor slab is free of all gaps, there are no expansion or control joints, and the slab has no floor drains or other such openings. Further details on the container storage area are presented in Section D of this permit application.

Hazardous waste drums are stored in the designated area prior to transfer off-site. The northern half of the warehouse area enclosed by the building walls and the concrete diking is utilized for the secondary containment system. This area measures approximately 90 feet by 60 feet.

The container storage area has been in operation since the 1974. The maximum volume of hazardous waste that may be stored in the container storage area is 27,500 gallons (500 x 55 gallon drums). A list of each of the hazardous wastes and the appropriate Hazardous Waste Identification Numbers and hazardous constituent/characteristic of the waste is presented in Table L-1.

TABLE L-1

LIST OF HAZARDOUS WASTES

Hazardous Waste	*EPA Hazardous Waste Number*	*Hazardous Constituent/ Characteristic*
1,1,1 Trichloroethane	F001/F002	Toxic
Trichloroethylene	F001/F002	Toxic
Penchloroethylene	F001/F002	Toxic
Methylene Chloride	F001/F002	Toxic
Trichlorotrifluorethane	F001/F002	Toxic
Arsenic	D004	Toxic
Barium	D005	Toxic
Cadmium	D006	Toxic
Chromium	D007	Toxic
Lead	D008	Toxic
Mercury	D009	Toxic
Selenium	D010	Toxic
Silver	D011	Toxic
Benzene	D018	Toxic
Carbon Tetrachloroide	D019	Toxic
Chlorobenzene	D021	Toxic
Chloroform	D022	Toxic
1,4-Dichlorobenzene	D027	Toxic
1,2-Dichloroethane	D028	Toxic
1,1-Dichloroethylene	D029	Toxic
2,4-Dinitrotoluene	D030	Toxic
Hexachloroethane	D034	Toxic
Methyl Ethyl Ketone	D035	Toxic
Nitrobenzene	D036	Toxic
Pyridine	D038	Toxic
Tetrachloroethylene	D039	Toxic
Trichloroethylene	D040	Toxic
Vinyl Chloride	D043	Toxic

L-1a(2) Waste Handling Area (Loading/Unloading Area)

The loading/unloading area, indicated on the facility plan in Attachment L-1, is utilized for the transfer of drums of solvent wastes, received from off-site facilities, to and from the container storage area and the loading of drums from the container storage area for transfer to an off-site Detrex reclamation (recycling) facility or to an off-site permitted treatment/disposal facility.

Waste drum handling practises includes the loading/unloading of drums from a truck, using a forklift equipped with a drum handling attachment, and the transfer of these drums to and from the appropriate area in the container storage area.

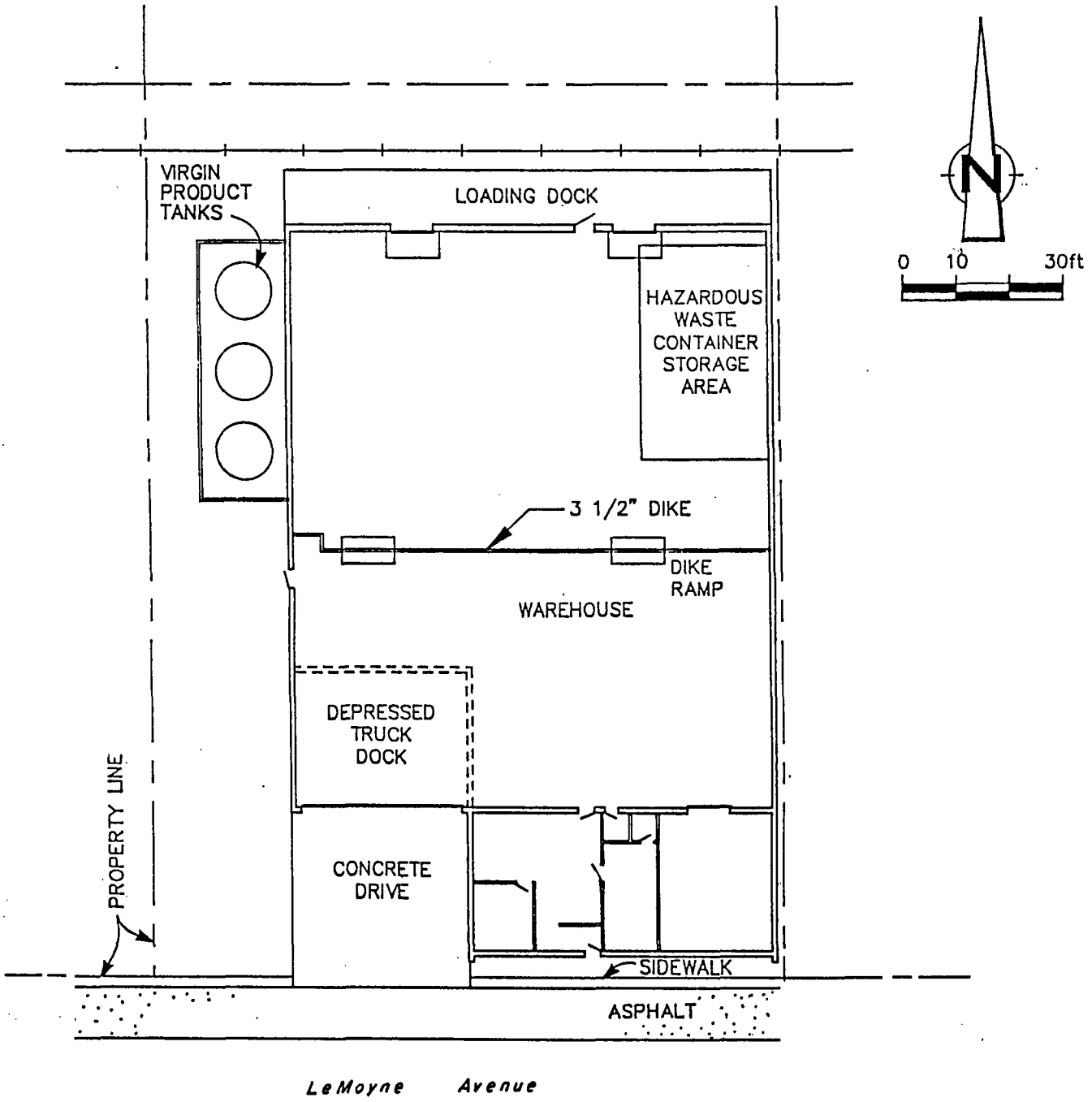
The floor in the receiving area is free of all gaps or any other openings in the same manner as the container storage area.

L-2 RELEASES

L-2a Characterize Releases

There have been no known releases of hazardous waste or hazardous waste constituents from the solid waste management units in operation at the Detrex facility in Melrose Park, Illinois.

ATTACHMENT L-1



FACILITY PLAN
Detrex Corporation
Gold Shield Solvents, Melrose Park

CRA

2471-19/10/88-3-F-0 (M-1)