OHIO RCRA PART B PERMIT APPLICATION

Delco Products

Dayton Operations

General Motors Corporation
2701 Home Avenue
Dayton, Ohio 45417

Prepared By

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Cincinnati, Ohio

August 1989

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FOREWORD

This Ohio Resource Conservation and Recovery Act (RCRA) Part B permit application has been prepared for the hazardous waste management facility (HWMF) located at the General Motors Corporation (GMC), Delco Products - Dayton Operations (formerly Inland Division) in Dayton, Ohio. The HWMF U.S. Environmental Protection Agency (EPA) Identification Number is OHD 000817023. The HWMF consists of one hazardous waste container storage area approximately 77 feet by 75 feet (a covered, curbed, concrete pad) and two hazardous waste storage tanks (a 7,000-gallon steel holding tank and a 500-gallon stainless steel mixing tank). The tanks are located within a covered, curbed, concrete pad adjacent to the hazardous waste container storage area. The primary hazardous wastes stored are liquids displaying the characteristics of ~~EP~~ toxicity for ~~lead, cadmium, and~~ chromium, the characteristic of ignitability, and waste solvents (F001, F002, F003, AND F005).

This application incorporates information requirements in accordance with relevant sections of Ohio Administrative Code (OAC), Chapters 3745-50-42, 3745-50-43, 3745-50-44, 3754-54, and 3745-55. The format of the application follows the U.S. EPA Part B Permit Application Completeness/Technical Review Checklist. A completed checklist referencing page numbers in the application is also included in the application and follows the Table of Contents.

This application has been prepared in response to the Ohio Environmental Protection Agency's (OEPA) letter dated May 16, 1989. The letter requested detailed information concerning information presented in the Part B permit application submitted by GMC in early 1989. The information required was described in OEPA comments attached to the May 16, 1989 letter. Due to the extent and nature of the comments, a completely new application has been prepared. ~~Therefore, the requested editorial protocol: overstrike the old language and capitalization for new language, has not been followed.~~ Each ORIGINAL page header does indicate Revision: 0 and August 17, 1989.

It should be pointed out that the GMC Delco Products - Dayton Operations received its final federal RCRA Part B permit on September 23, 1983. The permit is in effect until September 23, 1993.

The following major items have been incorporated into this application which are different from the last submittal. The Delco Products - Dayton Operations was formerly the Inland Division of GMC. Therefore, references to Inland have been changed, and some individual names have been changed. The facility no longer receives waste from other offsite GMC facilities. Therefore, the additional requirements for wastes generated offsite is not addressed. The secondary containment for the hazardous waste tanks ~~is~~ HAS ~~being~~ BEEN improved by the installation of chemically resistant water stops in the joints, and by the addition of an impermeable interior coating on the concrete~~.; however, these items have not been completed at the time of this submittal.~~

SECTION A

PART A PERMIT APPLICATION

Delco Products has included a revised FORM 3 Part A permit application in this submittal. ~~It follows this page.~~ The revised ~~Part A~~ FORM 3 presents:

- ~~The new name of the facility~~
- ~~A new facility contact~~
- ~~A current environmental permit list~~
- ~~A new item XI map~~
- ~~A new item V facility drawing~~
- ~~New item VI photographs~~
- ~~The addition of the following wastes in item IV: D002, D011, F001~~
- ~~In item IV, a reduction in the amount of U223 from 60,000 pounds to 6,000 pounds, because of the discontinuation of a process line~~
- The deletion of ~~the D006~~ waste codeS ~~in Item IV~~ D008 AND U223 because of the discontinuation of a wastestream
- THE ADDITION OF WASTE CODE F027

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

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 0 H D 0 0 0 8 1 7 0 2 3 T/A C 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.)*

C 8 — YR. MO. DAY — FOR EXISTING FACILITIES, PROVIDE THE DATE *(yr., mo., & day)* OPERATION BEGAN OR THE DATE CONSTRUCTION COMMENCED *(use the boxes to the left)*

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

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

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
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	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
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 T/A C 1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 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. 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	12,540	G		7				
2	S 0 2	7,500	G		8				
3					9				
4					10				

Continued from the front.

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

If facility 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 account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: 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	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				*included with above*

 CONTINUE ON PAGE 3

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 O H D 0 0 0 8 1 7 0 2 3 T/A C 1	W DUP T/A C 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)				D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D001	160,000	P	S01				
2	F002							Included with above
3	F003	100,000	P	S02				
4	F001							Included with above
5	F002							Included with above
6	F005							Included with above
7	F007							Included with above
8	F027	451	P					Weed killer waiting treatment
9								standards for disposal.
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

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 O H D 0 0 0 8 1 7 0 2 3 T/A 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)*
39 45 00 N	84 14 20 W

VIII. FACILITY OWNER

[X] 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
J. Bridenbaugh		4·15·91

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

CONTINUE ON PAGE 5

ITEM X. EXISTING ENVIRONMENTAL PERMITS

E. OTHER

PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE
OHIO E.P.A.
DAYTON OPERATIONS

PERMIT NO.:

0857140927B001
B002
B003
P001

0857040928P001

0857040929P002
P003
P004
P005
P006
P007

0857040930P002

0857040931P001
P002
P006
P007
P009
P011

0857040933P001
P002

0857040934P001

0857040936P001
P004
P005
P007
P010
P013
P014
R001

0857041160R001
R002
P006

REGISTRATION NOTIFICATION:

0857040923P002

0857040931P003
P004
P005
P008

0857040932N001
P001
P002

0857040933B001

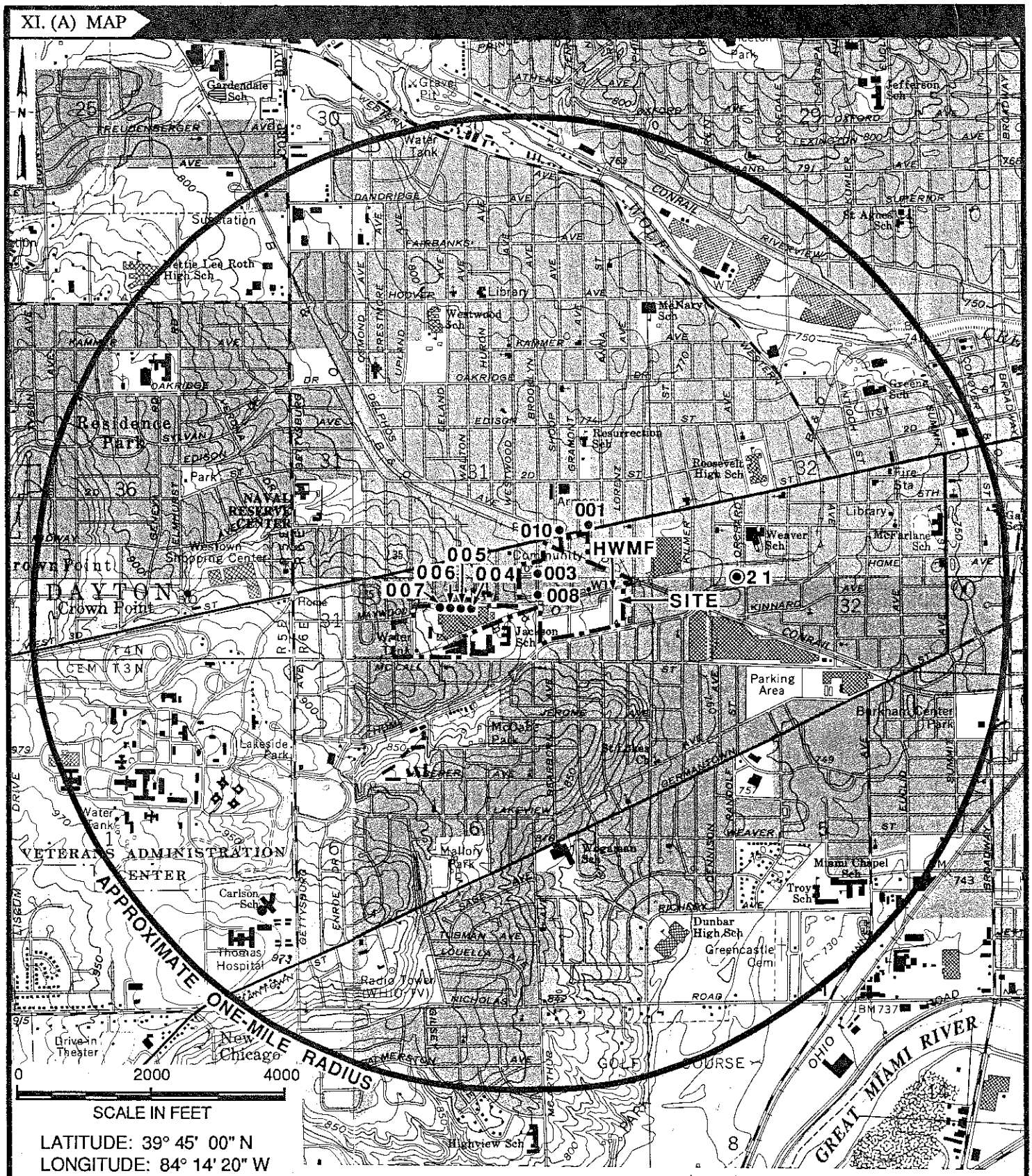
0857040934P002

0857040935B001
B002

0857040936P008
P009
P011
P012

0857041160P001
P002
P003
P004
P005

XI. (A) MAP



LATITUDE: 39° 45' 00" N
LONGITUDE: 84° 14' 20" W

BASE MAP SOURCE: Compiled from the following USGS 7 1/2 minute topographic quadrangle maps: Dayton North, Ohio 1965, photorevised 1981; Dayton South, Ohio 1966, photorevised 1981; Miamisburg, Ohio 1965, photorevised 1987; Trotwood, Ohio 1965, photorevised 1982.

Quadrangle location

NOTE: The facility does not have any injection wells.

Legend:

- ◉ Ground Water Withdrawal Well
- • NPDES Discharges

DELCO PRODUCTS
GENERAL MOTORS CORPORATION
DAYTON OPERATIONS

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

S												T/A	C
F	0	H	D	0	0	0	8	1	7	0	2	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.)*

C 8 — 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

☐ 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	D	HECTARE-METER	F
CUBIC YARDS	Y	METRIC TONS PER HOUR	W	ACRES	B
CUBIC METERS	C	GALLONS PER HOUR	E	HECTARES	Q
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.

S												T/A	C
C	D	U	P										1

LINE NUMBER	A. PROCESS CODE (from list above)	B. PROCESS DESIGN CAPACITY 1. AMOUNT (specify)	B. 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. 2. UNIT OF MEASURE (enter code)	FOR OFFICIAL USE ONLY
X-1	S02	600	G		5				
X-2	T03	20	E		6				
1	S01	12,540	G		7				
2	S02	7,500	G		8				
3					9				
4					10				

 CONTINUE ON REVERSE

Continued from the front.

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

If facility 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 account the appropriate density or specific gravity of the waste.

D. **PROCESSES**

1. PROCESS CODES:
   For listed hazardous waste: 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	K 0 5 4	900	P	T 0 3 D 8 0	
X-2	D 0 0 2	400	P	T 0 3 D 8 0	
X-3	D 0 0 1	100	P	T 0 3 D 8 0	
X-4	D 0 0 2				*included with above*

 CONTINUE ON PAGE 3

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 0 H D 0 0 0 8 1 7 0 2 3 — T/A C 1	W DUP — T/A C 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)	D. PROCESSES 2. PROCESS DESCRIPTION (if a code is not entered in D(1))
1	D001	30,000	P	S01	
2	D008				Included with above
3	F002				Included with above
4	F003	540,000	P	S02	
5	F001				Included with above
6	F002				Included with above
7	F005				Included with above
8	D007				Included with above
9	D008				Included with above
10	U223	6,000	P	S01	
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					

EPA Form 3510-3 (6-80)

CONTINUE ON REVERSE

(enter "A", "B", "C", etc. behind the "3" to identify photocopied pages)

Continued from the front.

IV. DESCRIPTION OF HAZARDOUS WASTES *(continued)*

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 0 H D 0 0 0 8 1 7 0 2 3 T/A C 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)*
3 9 4 5 0 0 N	8 4 1 4 2 0 W

VIII. FACILITY OWNER

[X] 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.)*
C E	

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

X. OPERATOR CERTIFICATION

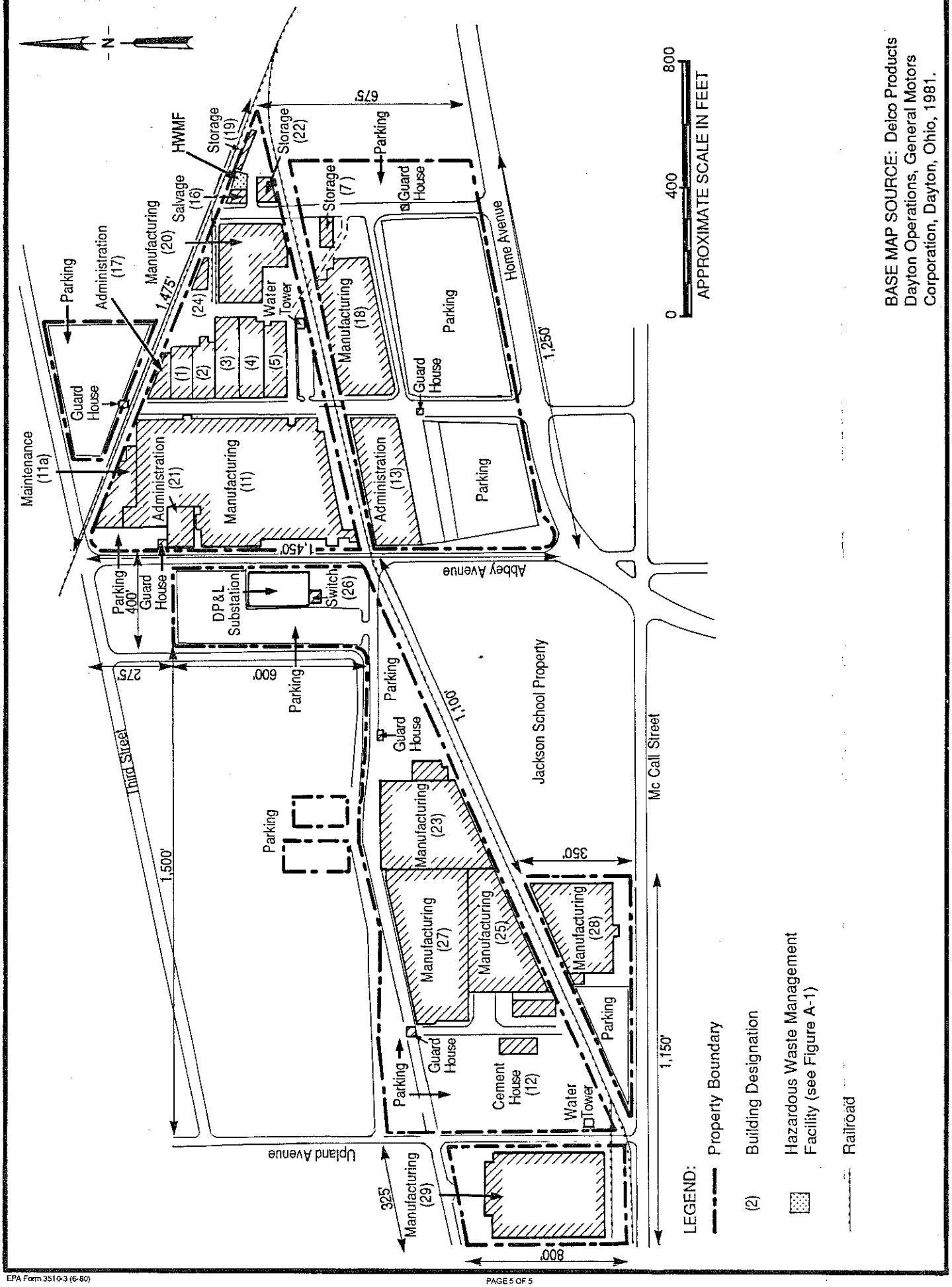
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, 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. Bridenbaugh	J. Bridenbaugh	8-29-90

CONTINUE ON PAGE 5

Continued from page 4.

V. (A) FACILITY DRAWING (see page 4)

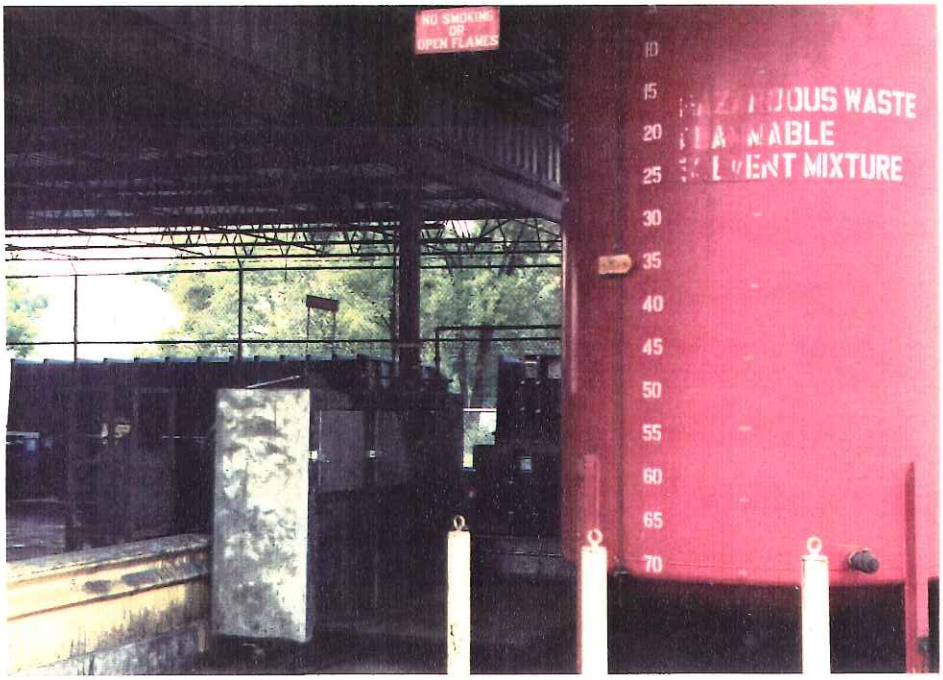


BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1981.

PHOTOGRAPH 1 View looking north showing the hazardous waste container storage area; August 10, 1989.

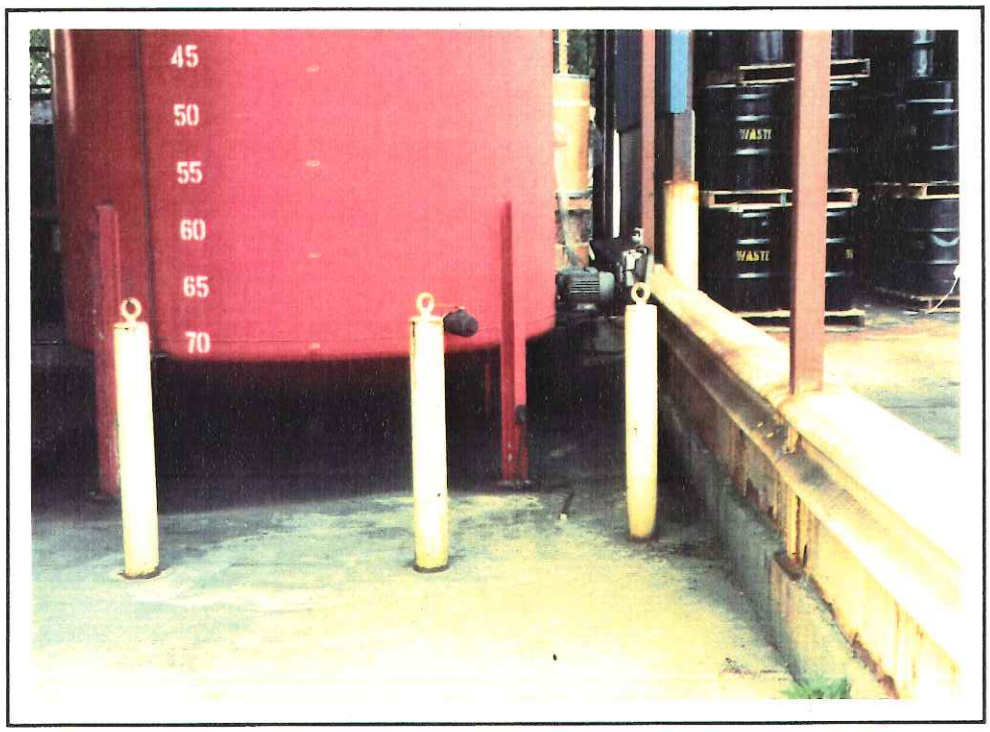
PHOTOGRAPH 2 View looking north along west boundary of the hazardous waste container storage area showing containment trench in foreground; August 10, 1989.

PHOTOGRAPH 3 View looking northeast showing the 7,000-gallon hazardous waste storage tank; August 10, 1989.

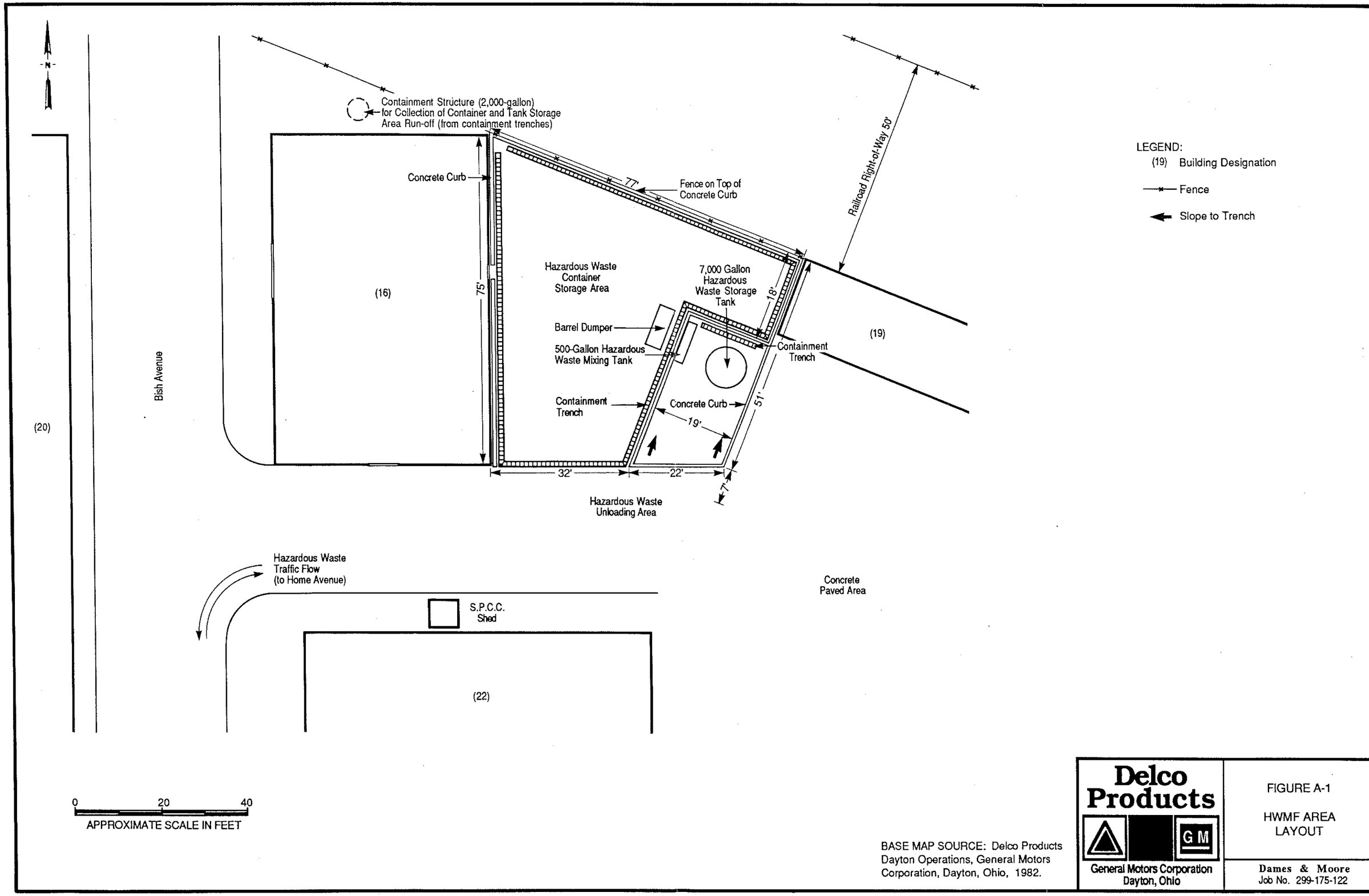


PHOTOGRAPH 4 View looking north showing the 500-gallon hazardous waste mix tank and the 7,000-gallon hazardous waste storage tank. The hazardous waste container storage area is shown in the background; August 10, 1989.

PHOTOGRAPH 5 View looking northeast along the western wall of the containment vault showing the 500-gallon hazardous waste mix tank and the 7,000-gallon hazardous waste storage tank. The hazardous waste container storage area is shown in the background; August 10, 1989.



PHOTOGRAPH 6 View looking northeast along the eastern wall of the secondary containment vault showing the base of the vault and the 7,000-gallon hazardous waste storage tank; August 10, 1989.



BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE A-1

HWMF AREA LAYOUT

Dames & Moore
Job No. 299-175-122

SECTION B

FACILITY DESCRIPTION

This section provides, as required by OAC 3745-50-44(A)(1), (10), (11), and (19), and 40 CFR 270.14(b)(1), (10), (11), and (19), a general description of the Delco Products Dayton Operations (Delco Products) Hazardous Waste Management Facility (HWMF) and plant site in Dayton, Ohio. It is intended to acquaint the permit reviewer with the site's general operations and hazardous waste generating processes and the facility's location and geographic setting, physical layout, and traffic patterns.

B.1 GENERAL DESCRIPTION

B.1.a Site Description

Delco Products Dayton Operations is located on approximately 67 contiguous acres within the city limits of Dayton, Ohio, in Montgomery County, at the following addresses:

2701 Home Avenue Dayton, OH 45417	or	P.O. Box 1224 Dayton, OH 45401

Figure B-1 shows the vicinity of the site. Primary operations at the plant are the manufacture of plastic and rubber automobile components, many of which have metal inserts. The product line includes steering wheels, motor and transmission mounts, weatherseals, brake hose, and liteflex springs. Hazardous wastes are generated in these manufacturing processes from molding, curing, and cementing of rubber and plastics; from painting, cleaning, grinding, and etching processes; and from general maintenance and laboratory activities. The wastes include:

- Cements and solvents
- ~~Paints, paint solvents, paint sludges~~
- Etching solution for copper
- Solvents
- Cleaning caustics ~~and solvents~~
- ~~Grinding sludge~~
- Hypalon (coating for latex weatherstrips)

~~• Epoxy resins~~
~~• Polyol~~
~~• Isocyanates~~
~~• Mold release~~
~~• Curative~~

These wastes are classified as:

- Wastes that exhibit characteristics of ignitability (D001-U.S. EPA identification number)
- Wastes that exhibit the characteristics of corrosivity (D002)
- Wastes that exhibit the characteristics of ~~EP~~-toxicity for ~~cadmium (D006),~~ chromium (D007)~~, lead (D008), and silver (D011)~~
- Spent halogenated solvents (F001, F002)
- Spent non-halogenated solvents (F003, F005)
- WEED KILLER ~~Isocyanates~~ (~~U223~~ F027)

In reference to the above list, (1) the majority of the wastes are hazardous because of ignitability (D001) and RCRA solvents (F001, F002, F003, F005)~~, and (2) the isocyanates (U223) and Polyol are accumulated and then sold for reuse.~~

B.1.b Hazardous Waste Management Facility

Hazardous waste activities at Dayton Operations are limited to storage of liquid wastes in drums or tanks for offsite disposal; the facility does not treat or dispose of hazardous wastes. In all cases, the waste will be managed so as to minimize storage times. Normally, wastes will be removed for final disposal in less than 90 days. The wastes are stored in (1) a container storage area, and (2) a tank storage area adjacently located at the northeast end of the property (see Figures B-2 and B-3). The area occupies approximately 3,840 square feet and is entirely under roof. Wastes are stored in 55-gallon steel drums (meeting DOT requirements), and those suitable for bulk storage are transferred to the waste storage tanks.

B.2 GEOGRAPHIC AND TOPOGRAPHIC INFORMATION

B.2.a Geographic Information

Delco Products Dayton Operations is located in Montgomery County in southwest Ohio in the city of Dayton, approximately 2-1/2 miles west of the central business district. The geographic coordinates of the site are north latitude 39° 45' 00" and west longitude 84° 14' 20". Baltimore and Ohio and Conrail railways traverse the property in southwest-northeast and northwest-southeast directions, respectively. The HWMF is located along the northeast boundary of the plant, adjacent to the Conrail line.

B.2.b Topography

General drainage on the property is from west to east; the difference in elevation is approximately 110 feet from the western to the eastern boundary. The HWMF is located at the lower end of the site where drainage is relatively slight (approximately 10-foot drop every 800 feet to the east). Topographic contours are provided on the topographic map described in the following section.

B.2.c Topographic Map

A topographic map, at a scale of 1 inch equals 200 feet, is provided in Figure B-4. The map shows a distance of approximately 1,000 feet (minimum) surrounding the site with contours at 10-foot intervals. The information contained on the map includes:

- Map scale and date
- 100-year floodplain area
- Surface waters
- Orientation of the map
- Legal boundaries
- Access control
- Buildings
- Hazardous waste management facility
- Access and internal roads

- Storm and sanitary sewerage systems
- Solid waste management units

Fire control facilities in the HWMF area are shown on the 1 inch equals 20-foot scale map in Figure B-3.

There are no surface waters and no injection wells or ground water withdrawal wells located within 1,000 feet of the property, and therefore none are shown on Figure B-4.

Surrounding land use is shown in Figure B-5.

There is no 100-year floodplain zone within the facility and, therefore, no flood control or drainage barriers are needed (see Figure B-6).

B.2.d Climatic Information

Dayton is located in a continental climatic zone, experiencing moderate extremes in temperature and precipitation. Mean annual precipitation is 36.4 inches and mean annual temperature is 53°F. Mean annual wind speed is 7 knots, prevailing from the west. A wind rose for the Dayton area is provided in Figure B-7.

B.2.e Access Control

The portion of the plant which contains the HWMF is entirely surrounded by a 6-foot-high chainlink fence, topped by three strands of barbed wire, and full-time plant guards are stationed at the four pedestrian and/or vehicle entrances (see Figure B-4).

There are four railroad entrances which are closed by remote-controlled electric gates except during switching maneuvers. The gates fully close against the fence to prevent pedestrian entrance. Similarly, electric gates close off the pedestrian/truck entrances anytime the guard stations are unmanned; e.g., weekends or holidays. There are two emergency gates in the north fence and three in the west fence, which are chained and padlocked shut. Access control is further discussed in Section F.

B.3 LOCATION INFORMATION

The Dayton Operations' HWMF meets the existing facility definition and is not subject to the location information requirements for new facilities specified in 40 CFR 270.14(b)(11).

A map was obtained to document where the site is located relative to the 100-year floodplain: U.S. Department of Housing and Urban Development, Federal Insurance Administration, Community-Panel Number 390409 0020C, March 4, 1985. The facility is not located within the 100-year floodplain, as shown by the referenced map in Figure B-6.

B.4 TRAFFIC INFORMATION

Access to Dayton Operations Delco Products is from Third Street, U.S. Highway 35 (four-lane divided roadway with fifth middle turning lane) in West Dayton, south on Abbey Avenue (two-lane divided roadway) 1/4 mile, and east 1 block on Home Avenue (two-lane divided roadway) to the main entrance, or two blocks to the HWMF entrance. Traffic control signals regulate traffic at the corners of Third Street and Abbey, and at Abbey and Home Avenue. This route can be seen on Figure B-2, which also shows onsite traffic routes.

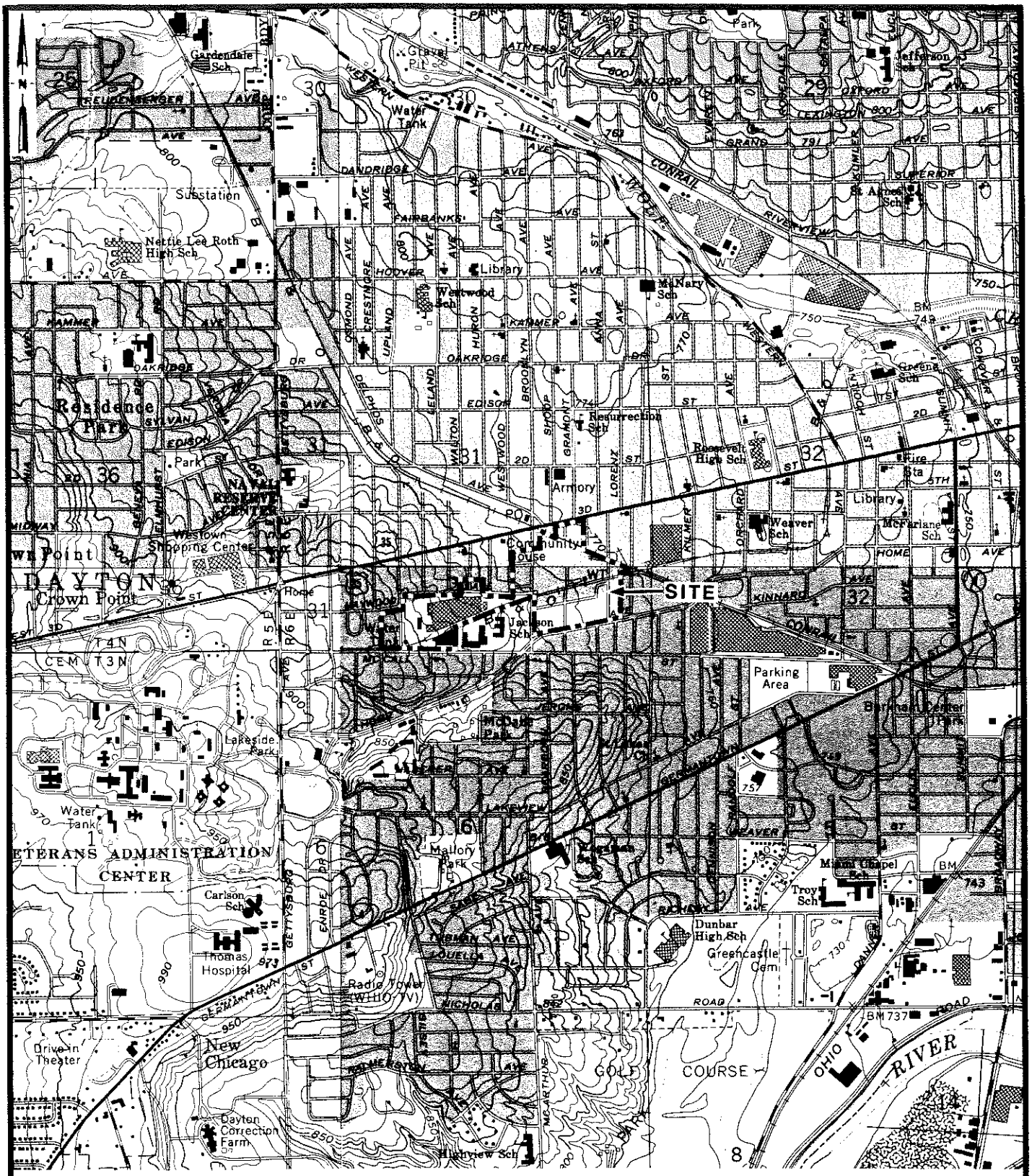
Intra-plant traffic consists chiefly of forklift trucks and tow motors. Inter-plant shipping of all materials and products is carried out by semi-tractor trailers and stake-bed trucks. Approximately three times per month, on average, a semi-tractor trailer removes a full or partial load of hazardous wastes to a RCRA-approved TSDF. Incoming (empty) trucks weigh from 29,000 to 31,000 pounds. Outgoing shipments containing approximately 5,500 gallons of bulk wastes to be incinerated have weighed (to date) from 74,560 pounds to 77,000 pounds, gvw. Shipments of non-bulkable wastes, consisting of 80 drums per load, weigh under 70,000 pounds, gvw.

Other traffic leaving the HWMF consists of truckloads of steel scrap, aluminum turnings, oils for reclaiming, empty drums, etc. This type of traffic amounts to 2 to 3 truckloads per day.

Third Street is constructed of 9-inch-thick concrete, rated for 32,000 pounds per axle loadings. Abbey and Home Avenues are constructed of 1-1/2 inches of asphalt over 8-inch-thick concrete. All were first paved before 1930 and have been resurfaced as needed.

B.5 STATE REPORTING REQUIREMENTS

In accordance with OAC 3745-54-75, Delco Products submits a Facility Annual Hazardous Waste Report to account for all hazardous waste generated and stored at the facility during the previous year. In addition, Delco Products submits a Generator Annual Hazardous Waste Report to cover all hazardous waste that was shipped offsite to a treatment or disposal facility in the previous year. The annual reports include the name, address, and EPA identification number of the site. Additional information included in the Facility Annual Report is the description and quantity of each hazardous waste generated during the year, a cost estimate of closure and/or post-closure, and a signed certification statement. Additional information included in the Generator Annual Report is the name and EPA identification of transportation services used to transport waste offsite as well as descriptions and quantities of wastes shipped to particular treatment or disposal facilities. The name, address, and EPA identification number of each treatment or disposal facility is included in the Report.



BASE MAP SOURCE: Compiled from the following USGS 7 1/2 minute topographic quadrangle maps: Dayton North, Ohio 1965, photorevised 1981; Dayton South, Ohio 1966, photorevised 1981; Miamisburg, Ohio 1965, photorevised 1987; Trotwood, Ohio 1965, photorevised 1982.

0 2000 4000

SCALE IN FEET

Quadrangle location

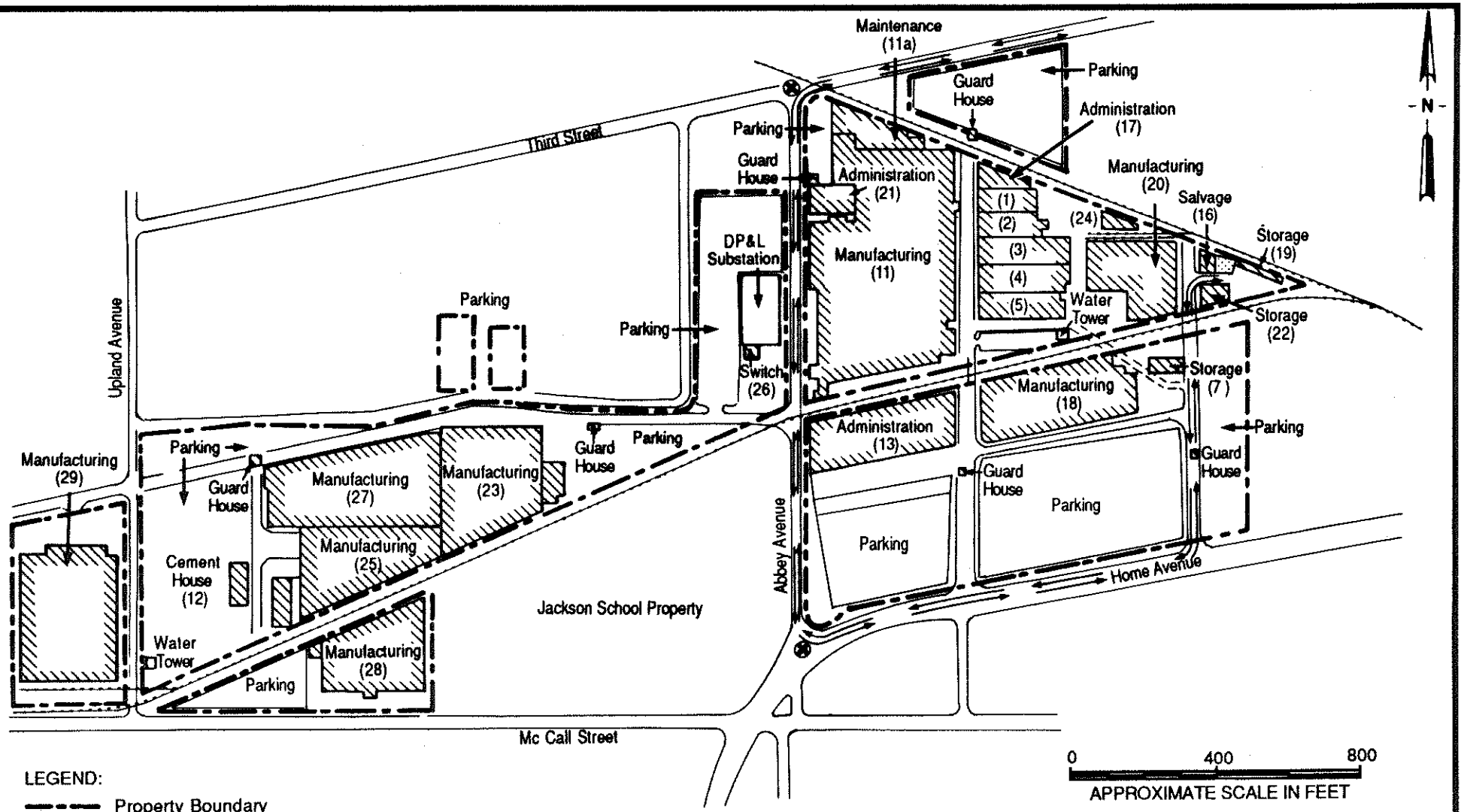
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE B-1

SITE VICINITY MAP

Dames & Moore
Job No. 299-175-122



LEGEND:

- Property Boundary
- (2) Building Designation
- Hazardous Waste Management Facility
- Railroad
- Traffic Light
- Hazardous Waste Traffic Flow Pattern

BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1981.

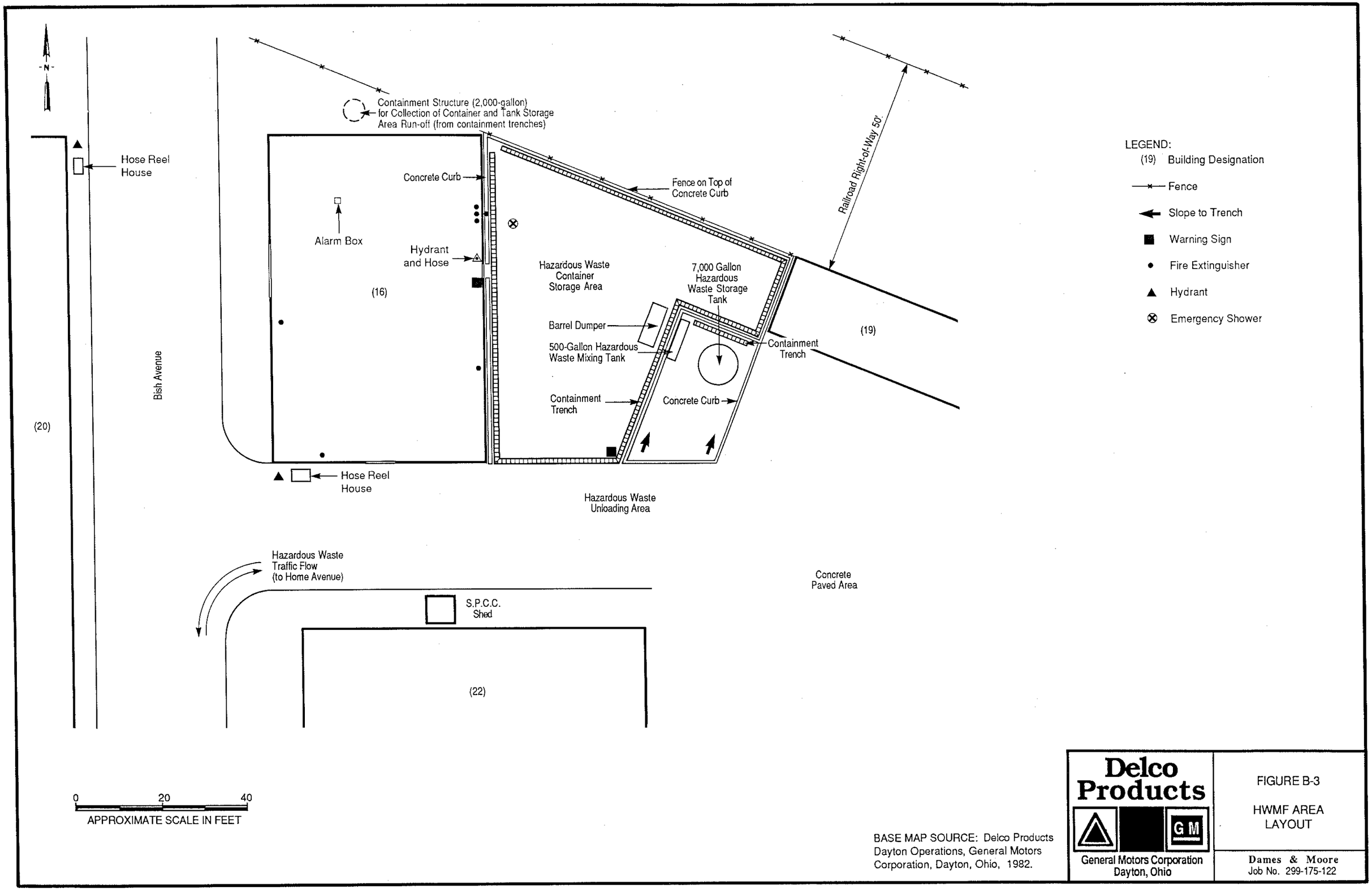
Delco Products

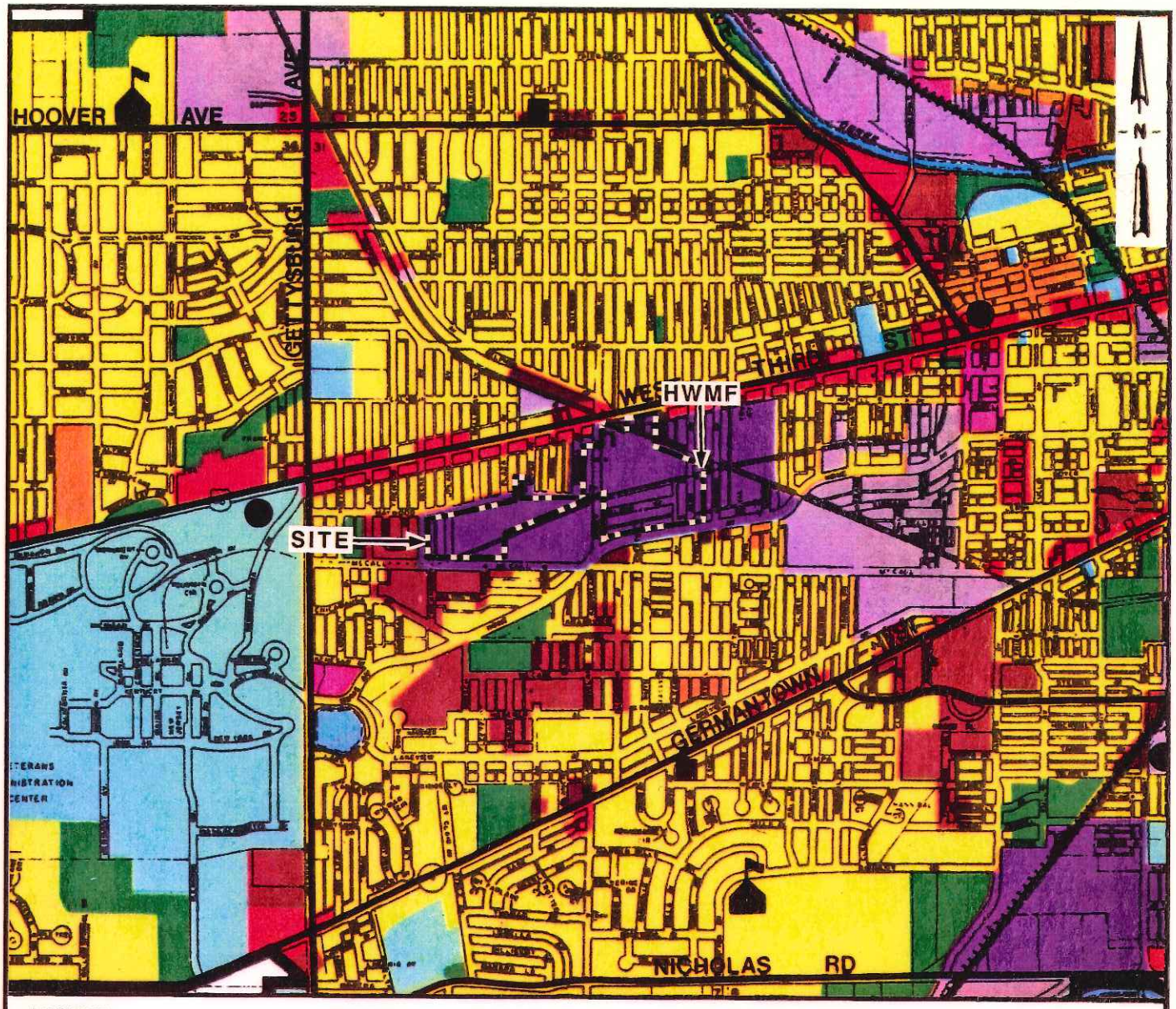
General Motors Corporation
Dayton, Ohio

FIGURE B-2

DAYTON OPERATIONS PLANT LAYOUT

Dames & Moore
Job No. 299-175-122


N
Containment Structure (2,000-gallon) for Collection of Container and Tank Storage Area Run-off (from containment trenches)
Hose Reel House
Concrete Curb
Fence on Top of Concrete Curb
Railroad Right-of-Way 50'
Alarm Box
Hydrant and Hose
(16)
Hazardous Waste Container Storage Area
7,000 Gallon Hazardous Waste Storage Tank
Barrel Dumper
500-Gallon Hazardous Waste Mixing Tank
Containment Trench
(19)
Containment Trench
Concrete Curb
Bish Avenue
(20)
Hose Reel House
Hazardous Waste Unloading Area
Hazardous Waste Traffic Flow (to Home Avenue)
Concrete Paved Area
S.P.C.C. Shed
(22)
0
20
40
APPROXIMATE SCALE IN FEET
LEGEND:
(19) Building Designation
Fence
Slope to Trench
Warning Sign
Fire Extinguisher
Hydrant
Emergency Shower
BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.
Delco Products
GM
General Motors Corporation
Dayton, Ohio
FIGURE B-3
HWMF AREA LAYOUT
Dames & Moore
Job No. 299-175-122



LEGEND:

- Low Density Residential (0-8 DU/AC)
- Medium Density Residential (9-18 DU/AC)
- High Density Residential (19 + 18 DU/AC)
- Park & Open Space
- Public Parking
- Public High School
- Public/Quasi-Public
- fire station
- library
- police station
- hospital
- Community Commercial
- Neighborhood Commercial
- Office/Residential
- Light Industrial
- Heavy Industrial
- Water
- Major Thoroughfare
- Expressway
- Rail Line

0 2000 4000

SCALE IN FEET

SOURCE: The General Land Use Plan, Department of Planning, Dayton, Ohio, April 1979.

Delco Products

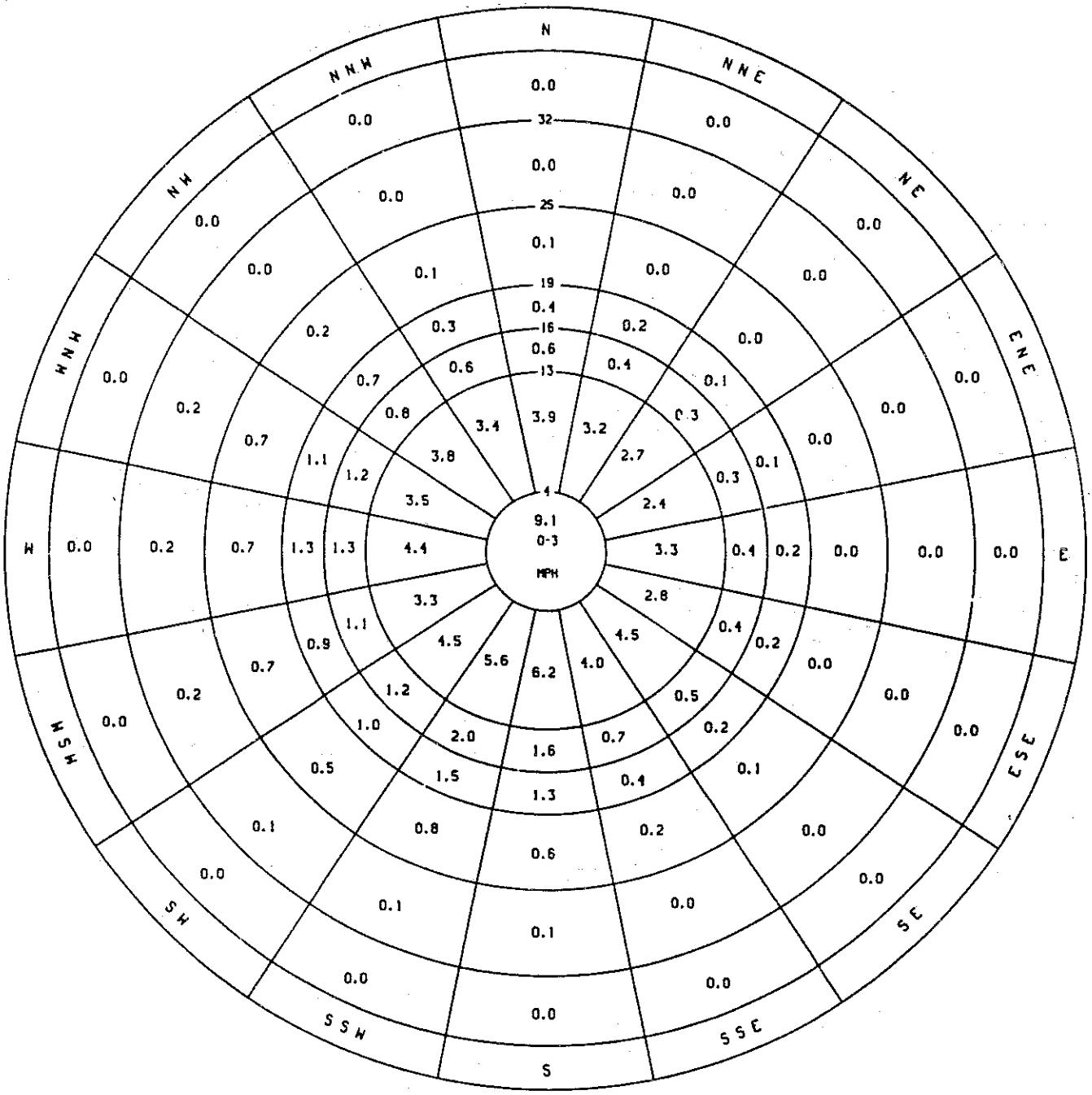
GM

General Motors Corporation
Dayton, Ohio

FIGURE B-5

GENERAL LAND USE MAP

Dames & Moore
Job No. 299-175-122



Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE B-7
WIND ROSE
DAYTON INTERNATIONAL
AIRPORT, 1948-1978

Dames & Moore
Job No. 299-175-122

SECTION C

WASTE CHARACTERISTICS

This section describes the chemical and physical nature of the hazardous wastes generated and potentially stored at GMC Delco Products Dayton Operations (Delco Products or Dayton Operations). Also included is the Waste Analysis Plan for sampling, testing, and evaluating the wastes to assure that sufficient information is available for safe handling of the wastes. The information submitted is in accordance with the requirements of OAC 3745-50-44(A)(2) and (3), and 40 CFR 270.14(b)(2) and (3).

C.1 CHEMICAL AND PHYSICAL ANALYSIS

List of Hazardous Wastes Potentially Stored at the Facility

Hazardous wastes are stored at this facility in 55-gallon containers, one 7,000-gallon tank, and one 500-gallon tank.

Storage capacity is:

228	containers (drums)
1	7,000-gallon tank
1	500-gallon tank

Containers/Tanks

All the waste materials are delivered by the generating departments to the Waste Management Hazardous Waste Storage area in containers (55-gallon drums). PRIOR TO OFFSITE SHIPMENT, DELCO PRODUCTS EVALUATES DISPOSAL/TREATMENT OPTIONS BASED ON ITS WASTE INVENTORY. THIS INCLUDES EVALUATING WHETHER A WASTE IS LAND-BANNED. LICENSED TSDFS ARE CONTACTED AND EVALUATION SAMPLES ARE COLLECTED BY THE CONTRACTORS. WHETHER A WASTE SHIPMENT GOES TO A PARTICULAR TSDF IS BASED ON THIS ANALYSES. Many of Dayton Operations' hazardous waste streams have been found compatible and acceptable for incineration and/or fuels blending program. These materials are transferred from the containers into the 7,000-gallon tank prior to shipment to

the incinerator company. ONLY WASTES THAT ARE IGNITABLE (D001 OR F003 AND F005) ~~and that~~ ARE PUT IN THE TANK. A LIST OF WASTES THAT CAN BE PUT IN THE TANK IS POSTED IN THE CONTAINER STORAGE AREA. IF THE WASTES ARE TOO VISCOUS OR DO NOT CONTAIN EXCESSIVE INSOLUBLES THEY ARE NOT PUT IN THE TANK. THESE CONDITIONS ARE BASED ON THE POINT OF GENERATION AND THE OPERATORS' KNOWLEDGE OF THESE CHARACTERISTICS. A preshipment sample is supplied to the incinerator source prior to each shipment for their evaluation. The sample is drawn out of a sample tap provided on the tank for this purpose. Since the material in the tank is constantly agitated, the sample will be a representative composite. It flows directly into a 1-gallon metal container which is then sealed and delivered to a designated representative of the incinerator source for analysis.

Containers of all other waste not suitable for bulk disposal are placed onto the storage pad prior to shipment for recycling, recovery, or disposal.

Waste Analyses

Table C-1 lists the hazardous waste potentially stored at the Dayton Operations, their associated hazard characteristics, their U.S. EPA identification numbers, and the basis for the hazard designation. In most cases, the classification (I.E. EPA WASTE CODE) is based on known ~~characteristics~~ PARAMETERS of the waste, FOR CHARACTERISTIC WASTES: ~~such as~~ ignitability, reactivity, corrosivity, or TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) ~~EP-toxicity~~ analyses. THIS INFORMATION IS OBTAINED FROM REFERENCE MATERIALS (I.E. MSDS) FOR THE VARIOUS MATERIALS USED AND A KNOWLEDGE OF THE ONSITE MANUFACTURING PROCESSES INTO WHICH THE MATERIALS ARE FED THAT MAY EFFECT THE GENERATED WASTE STREAM. IN ADDITION, GENERATED SPENT OR OFF SPECIFICATION MATERIALS ARE COMPARED TO LISTED HAZARDOUS WASTES DESCRIBED IN OAC 3745-51-33 TO ESTABLISH WORK CODES. THESE DETERMINATIONS ARE PERIODICALLY VERIFIED WITH LABORATORY ANALYSES. ~~For listed wastes, the classification is based on the listing~~. Laboratory reports detailing the chemical and physical analysis of representative samples are contained in Appendix C-1. TCLP TEST RESULTS FOR HYPALON ARE PRESENTED IN ATTACHMENT C-3. A LOGIC FLOW DIAGRAM USED BY PLANT PERSONNEL IS

PRESENTED IN ATTACHMENT C-2. ATTACHMENT C-1 PRESENTS MSDSS FOR MOST OF THE HAZARDOUS COMPONENTS OF THE WASTE STREAMS.

WASTES typicalLY bulkED ~~waste composite from~~ INTO the storage tank ARE ~~is~~ shown in Table C-~~2~~1. ~~However, the composition of bulked wastes and container wastes vary at any given point in time because the various waste streams are not generated in a uniform manner~~.

Waste Handling

All waste drums are labeled in the generating department prior to delivery to the waste management area. The label describes the contents of the container and its associated hazard (ignitability, corrosivity, reactivity, or toxicity). This practice informs the workers handling these wastes of the associated hazards so that appropriate precautions can be taken.

C.2 WASTE ANALYSIS PLAN

The following waste analysis plan was prepared in accordance with OAC 3745-54-13(B) and 40 CFR 264.13(b) to provide sampling and analysis of hazardous wastes at Dayton Operations, so that the wastes can be properly stored before shipment offsite for ultimate disposal. The waste analysis plan is based on Delco Products' knowledge of manufacturing processes at the site, supplemented by data from chemical analysis of the wastes. This plan is maintained at the site by Delco Products' Environmental Engineering and Waste Management Departments.

C.2.a Parameters and Rationale

The hazardous wastes stored at Dayton Operations are generated onsite from internal manufacturing processes. To provide full information about the physical and chemical characteristics of wastes generated, the parameters listed in Table C-3 ARE evaluated for each waste as appropriate. Solid and semi-solid wastes will be analyzed for the same list of wastes, except when not applicable. Materials suspected of ~~being EP toxic~~ exhibiting the toxicity characteristic will be analyzed accordingly (see Table C-4), as will materials suspected of containing PCBs. These analyses, along with the generator's knowledge of the processes and materials that go into generating the waste, are sufficient to determine if the waste materials are RCRA hazardous wastes. Where a waste could be

F002), Delco Products will utilize generator knowledge to correctly classify the waste. This information enables proper management of the waste materials.

C.2.b Test Methods

The test methods used to determine the concentrations of constituents in the waste are shown in ~~Table C-3~~ TABLES C-3 AND C-4 along with the test method reference.

C.2.c Sampling Methods

The methods and equipment used for sampling waste materials will vary. The following methods are considered by EPA to be acceptable. These methods or an equivalent will be used.

Extremely viscous liquid	ASTM Standard D140-70
Crushed or powdered material	ASTM Standard D346-75
Soil or rock-like material	ASTM Standard D420-69
Soil-like material	ASTM Standard D1452-65
Fly ash-like material	ASTM Standard D2234-76
Containerized liquid wastes	COLIWASA: *Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, third edition, SW-846, Section 7.0, U.S. EPA, November 1986

C.2.d Frequency of Sampling and Analysis

The analysis must be repeated as necessary to ensure that it is accurate and up to date. Frequency of analysis will be as follows:

1. All "unknown" waste streams will be sampled and characterized when they are delivered to the Waste Management area for storage and/or disposal. (NOTE: An "unknown" waste stream is one that has not been previously characterized.)

2. Analysis for specific waste materials will be repeated if the process generating the waste has changed.

3. Analysis for specific waste materials will be repeated if an analysis by the disposal contractor does not match Delco Products' original analysis.

4. Analysis data will be reviewed an an annual basis and determination made as to which require repeating.

C.2.e Additional Requirements for Wastes Generated Offsite

Delco Products does not receive hazardous wastes from offsite generators; therefore, this section is not applicable.

C.2.f Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

As described in Section C.2.d above, all unknown waste materials will be sampled and analyzed. Included in the list of analysis parameters is the test for flash point to determine ignitability. Unknown wastes will be handled as if they are ignitable until analysis shows that they are not. All wastes suspected of being reactive or incompatible will also be treated as such until sampling and analysis are conducted to prove otherwise.

C.3 PROHIBITIONS ON LAND DISPOSAL

Dayton Operations generates hazardous wastes that are land-banned. Those wastes that are land banned are indicated as such in each manifest that accompanies the wastes as they are shipped offsite to a RCRA-approved facility for acceptable disposal.

Dayton Operations assumes that wastes subject to land disposal restriction do not meet applicable standards (e.g., California List, HOCs above 1,000 mg/kg, etc.) unless analytical data indicates otherwise. Analytical test methods used to determine land disposal restrictions for spent solvents are listed in Table C-5.

TABLE C-1

WASTE CHARACTERISTICS

Waste	Hazard Characteristic	U.S. EPA Identification Number	Department	Building	Analysis Reference Number
Hypalon-dip tank compound #17346 (cement house) *	I-5 part sol base Butyl acetate - 30% Isobutyl isobutyrate Naphtha - 20% Toluene - 12% Xylene - 8%	D001 F003 F005	464	27	7 **
Neoprene-dip tank compound #17343 (cement house)	NA - water base latex dip	NA	464	27	N/A
Chromic acid	C -mold cleaning pH <1	D002 D007	452	25	8
Hypalon coating weatherstrips (made in cement house) *	I-solvent/xylene Flow coater #2 Interceptor pit #2 f.p. <70F	D001 F003	473	25	12
Neoprene coating weatherstrips (made in cement house) *	I - flow coater #1 Flow coat pit #1 Xylene - 17%	D001 F003	473	25	N/A
Lab waste (generation point cement house) *	I - cement house Waste solvents f.p. <70F (tested in lab and stored in cement house for disposal) Hexane di-isobutylene, xylene, neoprene	D001 F003	615	25	14
Waste cement and solvent *	I - cement house Iso-butyl butyrate, xylene, toluene, and neoprene (19196)	D001 F003 F005	481	12	17
Etching copper solution	C - mezzanine pH <0.1 part #2581004 - 1,1,1-trichloroethane (spent) with inhibitor 1,4-diethylene dioxide Ferric chloride Hydrochloric acid	D002 F002	44	27	19

* Denotes can be bulked into the 7,000-gallon bulk storage tank.

** A sample of the hypalon-dip tank has been analyzed for the toxicity characteristic. It was not found to meet the definition of a toxicity characteristic waste. The laboratory reports are presented in Attachment C-3.

N/A - not available.

Table C-1 (Continued)

Waste	Hazard Characteristic	U.S. EPA Identification Number	Department	Building	Analysis Reference Number
	Ammonium chloride				
Caustic cleaning part #1912091	C - parts washer pH 12.7 Larsip 15	D002	292	11	42
Cleaning solvent safety kleen *	I - parts tanks Tool room Mineral spirits f.p. >100F Other locations (maintenance, etc.)	D001	23	3	43
Solvents	I - paint lab Spent/MIBK Isopropyl alcohol Mineral spirits Xylene except this one - 1,1,1-trichloroethane (spent) Second floor of Bldg. 13 f.p. <70	D001 F003 F002	88	13	48
Solvent	I - maintenance Spray booth Mineral spirits f.p. <70F	D001	21	11A	50
Titration sol * acetone	I - bench lab Lite flex spring Perchloric acid #2555850 Acetic acid #2555852 Acetone #13311	D001 D002, F003	490	29	55
Spent solvent	T/1,1,1-trichloroethane RIM lab Vapor degreaser	F001	683	5	N/A

TABLE C-3

GENERAL PARAMETERS AND TEST METHODS

Parameter	Test Methods[1]
pH (S.U.)	9040
Flash Point	1010
Viscosity	D-88[2]
Vapor pressure	D-323[2]
Specific gravity	p 121[3]
Heating value	D-2015 [2]
Layers	p 95, 129, Observation
Total solids	160.3[4]
Ash content	p 95[3]
Total cyanide	9010
FRee cyanide	9010
Sulfate	9035, 9036, 9038
Chloride	9250, 9251, 9252
Silver	7760, 6010
Arsenic	~~7741~~ 7060, 7061, 6010
Barium	7080, 6010
Cadmium	7130, 7131, 6010
Chromium (total)	7190, 7191, 6010
Copper	7210, 6010
Mercury	7470, 7471
Nickel	7520, 6010
Lead	7420, 7421
Selenium	7740, 7741
Zinc	7950, 6010
~~EP toxicity~~	~~1310~~
PCBs	8080
F-LISTED SOLVENTS	8240
PAINT FILTER LIQUIDS TEST	9095

[1] "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods," 3RD EDITION, SW-846 U.S. EPA, unless otherwise noted.
[2] American Society for Testing and Materials, (ASTM) Philadelphia, Pennsylvania.
[3] Standard Methods for the Examination of Water and Wastewater, 14th Edition, 1975.
[4] "Methods for Chemical Analysis of Water and Wastes," U.S. EPA.
mh(15)

TABLE C-4

TOXICITY CHARACTERISTIC TEST METHODS

Parameter	Test Methods[1]
Extraction	
TCLP	1311 (40 CFR 261.24 Appendix II)
Analysis	
Toxicity Characteristic Parameters[2]	
Arsenic	7060, 7061, 6010
Barium	7080, 6010
Cadmium	7130, 7131, 6010
Chromium (total)	7190, 7191, 6010
Lead	7420, 7421
Mercury	7470
Selenium	7740, 7741
Silver	7760, 6010
Benzene	8240
Carbon tetrachloride	8240
Chlorobenzene	8240
Chloroform	8240
1,2-Dichloroethane	8240
1,1-Dichloroethylene	8240
Methyl Ethyl Ketone	8240
Tetrachloroethylene	8240
Trichlorothylene	8240
Vinyl Chloride	8240
O-Cresol	8270
M-Cresol	8270
p-Cresol	8270
Cresol (mixed)	8270
1,4-Dichlorobenzene	8270
2,4-Dinitrotoluene	8270
Hexachlorobenzene	8270
Hexachlorobutadiene	8270
Hexachloroethane	8270
Nitrobenzene	8270
Pentachlorophenol	8270
Pyridine	8270
2,4,5-Trichlorophenol	8270
2,4,6-Trichlorophenol	8270
Chlordane	8080
Edrin	8080
Heptachlor	8080
Lindane	8080
Methoxychlor	8080, 8270
Toxaphene	8080
2,4-D	8150
2,4,5-TP (Silver)	8150

[1] Test Methods for the Evaluation of Solid Waste: Physical Chemical Methods, 3rd Edition, U.S. EPA.

[2] Generally, based on knowledge of generation, only those parameters reasonably expected to be in the waste will be analyzed.

TABLE C-5

TEST METHODS FOR DETERMINATION OF LAND DISPOSAL RESTRICTIONS FOR SPENT SOLVENTS[1]

Parameter	Test Methods[2]
Extraction	
TCLP	40 CFR 268 Appendix I
Analysis	
F001/F002	
Tetrachloroethylene	8240
Trichloroethylene	8240
Methylene chloride	8240
1,1,1-Trichloroethane	8240
Carbon tetrachloride	8240
F003	
Xylene	8240
Acetone	8240
Ethyl acetate	8240
Ethyl ether	8240
Methyl isobutyl ketone	8240
n-Butanol	8240
Cyclohexanone	8240
Methanol	8240
F005	
Toluene	8240
Methyl ethyl ketone	8240
Carbon disulfide	8240
Isobutanol	8240
Pyridine	8240
Benzene	8240
2-Ethoxyethanol	8240
2-Nitropropane	8240

[1] Spent solvent wastes may also be assumed to exceed land disposal restriction treatment standards based on knowledge of the waste; in such cases, the TCLP extractions and analyses will not be conducted and all supporting data used to make this determination will be maintained onsite in Dayton Operations' files in accordance with 40 CFR 268.7(a)(4).

[2] Test Methods for the Evaluation of Solid Wastes: Physical Chemical Methods, 3rd Edition, SW-846, U.S. EPA.

APPENDIX C-1

WASTE ANALYSES

APPENDIX C-1

WASTE ANALYSIS

Note: Several wastes identified in Revision ~~0~~1 of the Part B permit application have been eliminated as hazardous waste at Delco Products. Therefore, the waste analyses sheets referencing those wastes should be removed for Revision ~~1~~2 of the permit application. The waste analyses sheets to be removed are identified by analysis reference number below:

- ~~16~~
- ~~20~~
- ~~21-24~~
- 1
- 4
- 47
- 51
- 60
- POLYOL (GMI-07)
- PAINT (MSDS) start here
- ISOCYANATES (MSDS)
- BULK TANK SOLVENTS (GENERATOR KNOWLEDGE)

HES REF. NO. 7

COMPANY: Inland

LOCATION: Dayton, OH

BUILDING: 25

DEPARTMENT: 473

WASTESTREAM: Hypalon

PHYSICAL CHARACTERISTICS: Very Odorous, Black Viscous Stringy Liquid

SAFETY DATA SHEET NO.:	CHEMICAL MAKE-UP:
29029	Epoxy Resin (Epichlororhydrin & Biphenol A)
1518	Xylene
19367	Polysiloxane
30022	Ethylene Glycol Ethyl Ether
3004	Di-ortho-tolylguanidine
3017	Tetramethylthiuram Monosulfide ORM-A; NA 1693
3138	Petroleum Hydrocarbon
3141	Aliphatic Hydrocarbon
3199	Heavy Naphthenic Distillate
3334	Graphite
16921	Synthetic Rubber
19613	Modified Melamine-Formaldehyde Resin
19619	Amorphous Hydrated Silicon Dioxide
13680	Carbon

EMS ANALYSIS NO.: 62331 (Attached)

RESULTS: Liquid Ignitability ..... < 70°F

DISPOSAL OPTION: Incineration

PEG RECOMMENDATIONS: Resample and run additional analysis specific to disposal site requirements to obtain disposal approval.

DOT SHIPPING DESCRIPTION: RQ Flammable Liquid, N.O.S. UN 1993
Note: Use RQ designation only if shipping greater than 100 pounds

E.P.A. HAZARDOUS WASTE NO.: D001

LABEL REQUIRED: Flammable Liquid

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62331 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.7 25/473
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

HES REF. NO. 8

COMPANY: Inland

LOCATION: Dayton, OH

BUILDING: 25

DEPARTMENT: 473

WASTESTREAM: Chromic Acid

PHYSICAL CHARACTERISTICS: Weather Strip Mold Cleaning
Clean Aluminum

SAFETY DATA SHEET NO.:

1912029

CHEMICAL MAKE-UP:

Chromic Acid 31%
Sulfuric Acid 20%
Phosphoric Acid 5%
Water 44%

EMS ANALYSIS NO.: 62332 (Attached)

RESULTS:

pH 0.3
Hexavalent Chromium ....100,000 mg/l

DISPOSAL OPTION: Disposal by HES Chemical Treatment

DOT SHIPPING DESCRIPTION: RQ Waste Chromic Acid Solution (RQ 1000/454)
Corrosive Material; UN 1755
Note: Use RQ designation only if shipping greater than 100 pounds

LABEL REQUIRED: Corrosive

E.P.A. HAZARDOUS WASTE NO.: D002

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62332 00

DATE RECEIVED : 03/05/86 DATE REPORTED : 03/15/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.8 25/473
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC
7901 W. MORRIS ST.

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 W. MORRIS ST.

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
PH	0.3	0.1	STD. UNITS	EPA 150.1	HMB	03/07/86
HEXAVALENT CHROMIUM	100000	10000	MG/L	APHA 312.B	SON	03/13/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

HES REF. NO. 12

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 27 **DEPARTMENT:** 464

WASTESTREAM: Solvent Base Hypalon Coating

PHYSICAL CHARACTERISTICS: Black Liquid

SAFETY DATA SHEET NO.:	**CHEMICAL MAKE-UP:**
30043	Butyl Acetate 30%
	Isobutyl Isobutyrate 30%
	Special Naptholite 205
	Toluene 12%
	Xyene 8%
16921	Butadiene-Acrylonitrite
	Copolymer 63%
	Water 30%
	Fatty Acid Soap 5%
3004	Diortho Tolyguanidine
3017	Tetra Methylthiuram Monosolfide
3138	Paraffinic Distillate; Paraffin Wax
3334	Graphite
3316 (13505)	Calcium Carbonate
3141	Aliphatic Hydrocarbon Wax
3199	Heavy Naphthenic Distillate
19367	Polysiloxane
19691	Amorphous Hydrated Silicon Dioxide
29029	Epichlorohydrin & Bisphenol A
13680	Carbon Black
30022	

EMS ANALYSIS NO.: 62336 (Attached)

RESULTS: Liquid Ignitability ..... < 70°F

DISPOSAL OPTION: Incineration/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ Waste Flammable Liquid, n.o.s. UN 1933
Note: Use RQ designation only if shipping greater than 100 pounds

LABEL REQUIRED: Flammable Liquid

E.P.A. HAZARDOUS WASTE NO.: D001

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62336 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.12 27/464
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : _____

EMS

HES REF. NO. 14

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 12 **DEPARTMENT:** 418

WASTESTREAM: Lab Waste

PHYSICAL CHARACTERISTICS: Latex Waste
Black Watery Liquid

SAFETY DATA SHEET NO.: None **CHEMICAL MAKE-UP:** Unknown

EMS ANALYSIS NO.: 62338 (Attached)

RESULTS:

Liquid Ignitability ..... < 70°F
Arsenic, EP Toxicity Extract ..... ND @ 0.01 mg/l
Barium, EP Toxicity Extract ..... ND @ 0.1 mg/l
Cadmium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Chromium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Lead, EP Toxicity Extract ..... 0.6 mg/l
Mercury, EP Toxicity Extract ..... ND @ 0.0005mg/l
Selenium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Silver, EP Toxicity Extract ..... ND @ 0.01 mg/l

DISPOSAL OPTION: Incineration/ HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: Flammable Liquid, n.o.s. UN 1993

LABEL REQUIRED: Flammable Liquid

E.P.A. HAZARDOUS WASTE NO.: D001

PEG COMMENTS: Resample each time due to changing wastestream.

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62338 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.14 12/418
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
TOTAL SOLIDS DRIED AT 103-105 C	NM	NA	NA	EPA 160.3	SON	03/14/86
ANALYSIS NOTE	NO METHOD FOR TOTAL SOLIDS. SAMPLE IS AN					
ANALYSIS NOTE	OIL.					
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86
ARSENIC, EP TOXICITY EXTRACT	ND	0.01	MG/L	SW846 7060	JRS	03/25/86
INSTRUMENT	PE 3030 GFAA					
ADDITION 1 (MG/L)	0.010					
ADDITION 2 (MG/L)	0.025					
ADDITION 3 (MG/L)	0.050					
SAMPLE (ABS)	ND					
SAMPLE + ADD 1 (ABS)	0.010					
SAMPLE + ADD 2 (ABS)	0.035					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3 (ABS)	0.079					
	DILUTION	NA					
BARIUM, EP TOXICITY EXTRACT		ND	0.1	MG/L	SW846-7080	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.2					
	ADDITION 2 (MG/L) ..	0.5					
	ADDITION 3 (MG/L) ..	1.0					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.2					
	SAMPLE + ADD 2 MG/L	0.4					
	SAMPLE + ADD 3 MG/L	0.9					
	DILUTION	NA					
CADMIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7130	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.20					
	SAMPLE + ADD 2 MG/L	0.51					
	SAMPLE + ADD 3 MG/L	1.02					
	DILUTION	NA					
CHROMIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7190	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.23					
	SAMPLE + ADD 2 MG/L	0.52					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3 MG/L	1.02					
	DILUTION	NA					
LEAD, EP TOXICITY EXTRACT		0.6	0.1	MG/L	SW846-7420	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	2.0					
	ADDITION 2 (MG/L) ..	5.0					
	ADDITION 3 (MG/L) ..	10.0					
	SAMPLE MG/L	0.5					
	SAMPLE + ADD 1 MG/L	2.6					
	SAMPLE + ADD 2 MG/L	5.7					
	SAMPLE + ADD 3 MG/L	10.6					
	DILUTION	NA					
MERCURY, EP TOXICITY EXTRACT		ND	0.0005	MG/L	SW846-7470	HHW	03/28/86
	INSTRUMENT	PE 370 CVAA					
	ADDITION 1 (MG/L) ..	0.001					
	ADDITION 2 (MG/L) ..	0.003					
	ADDITION 3 (MG/L) ..	0.005					
	SAMPLE ABS	ND					
	SAMPLE + ADD 1 ABS	36					
	SAMPLE + ADD 2 ABS	129					
	SAMPLE + ADD 3 ABS	237					
	DILUTION	NA					
SELENIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846 7740	JRS	03/26/86
	INSTRUMENT	PE 3030 GFAA					
	ADDITION 1, MG/L ...	0.020					
	ADDITION 2, MG/L ...	0.050					
	ADDITION 3, MG/L ...	0.1					
	SAMPLE ABS	ND					
	SAMPLE + ADD 1, ABS.	0.028					
	SAMPLE + ADD 2, ABS.	0.098					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3, ABS.	0.214					
	DILUTION	NA					
SILVER, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7760	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.20					
	SAMPLE + ADD 2 MG/L	0.51					
	SAMPLE + ADD 3 MG/L	1.00					
	DILUTION	NA					
EP TOXICITY EXTRACTION, WITHOUT ORGANICS		COMPLETE	NA	NA	SW846 1310	CDS	03/17/86
	TOT SAMPLE WEIGHT, G	100					
	SOLID PORTION, G ...	NA					
	LIQUID PORTION, ML .	NA					
	9.5 mm SIEVE TEST ..	PASSED					
	INITIAL DI ADDED, ML	1600					
	FINAL DI ADDED, ML .	349					
	INITIAL PH	7.81					
	FINAL PH	4.83					
	PH ADJUSTMENTS	ATTACHED					
	TOTAL ACID ADDED, ML	51					
	VOL EXTRACT FILT, ML	2000					
	TOT VOL FILTRATES,ML	2000					
	VOL EXTRACT ANAL, ML	19					
	SPIKE SOLUTION, ML .	1					

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

S - 732.6 F 738.6 6hrs

S - 732.6 F756.8 24hrs

CDS.

TEST : **P101.1** **SIDE B**

SAMPLE NUMBER	62267	62284	62295	62338	62345	62349
TIME, hr meter	+15	+15	+15	+15	+15	+15
pH INITIAL	4.42	6.53	6.29	7.81	7.70	8.33
pH FINAL		4.82	4.84	4.31	5.63	4.83
VOL. ACID, ml	0	200mL	21mL	11mL	400mL	50mL
TIME, hr meter	+345	+15	+15	+15	+345	+15
pH INITIAL	4.40	5.83	6.10	5.14	5.00	5.19
pH FINAL		5.23	5.09			
VOL. ACID, ml	0	200mL	179	0	0	0
TIME, hr meter	+1080	+330	+330	+30	+1080	+30
pH INITIAL	5.17	4.52	5.05	5.14	2.59	5.12
pH FINAL						
VOL. ACID, ml	0	0	0	0	0	0
TIME, hr meter		+1080	+1080	+60		+60
pH INITIAL		3.07	4.99	5.90		4.89
pH FINAL				5.02		
VOL. ACID, ml		0	0	5ml		0
TIME, hr meter				+60		+60
pH INITIAL				5.36		4.86
pH FINAL				4.98		
VOL. ACID, ml				20mL		0
TIME, hr meter				+60		+60
pH INITIAL				5.10		4.82
pH FINAL						
VOL. ACID, ml				0		0
TIME, hr meter				+60		+60
pH INITIAL				5.76		4.83
pH FINAL				4.94		
VOL. ACID, ml				15mL		0
TIME, hr meter				+60		+60
pH INITIAL				4.89		5.01
pH FINAL						
VOL. ACID, ml				0		0
TIME, hr meter				+1080		+1080
pH INITIAL				4.83		4.43
pH FINAL						
VOL. ACID, ml				0		0
TIME, hr meter						
pH INITIAL						
pH FINAL						
VOL. ACID, ml						

HES REF. NO. 17

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 12 **DEPARTMENT:** 481

WASTESTREAM: Waste Cement & Solvents

PHYSICAL CHARACTERISTICS: Black Liquid

SAFETY DATA SHEET NO.: None **CHEMICAL MAKE-UP:** Unknown

EMS ANALYSIS NO.: 62340 (Attached)

RESULTS:

Ignitability	70°F
Ethyl Benzene	24,000 ppm
Methyl Ethyl Ketone	42,000 ppm
Toluene	690,000 ppm
Xylene	100,000 ppm

DISPOSAL OPTION: Incineration/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ Waste Cement, Flammable Liquid, UN 1993
NA 1133, (D001)
Note: Use RQ designation only if shipping greater than 100 pounds

E.P.A. HAZARDOUS WASTE NO.: D001

LABEL REQUIRED: Flammable Liquid

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62340 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 05/08/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.17 12/481
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	70	NA	DEGREES F	SW846 1010	SON	04/02/86
RCRA SOLVENTS, GC/MS	ATTACHED	NA	NA	EPA 8240	ACB	05/05/86
FILE REFERENCE NO...	3662B					

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

EMS LABS RCRA SOLVENTS ANALYSIS REPORT

DESCRIPTION : PEG-JB INLAND DIVISION GMC DAYTON 85-159 17 12/481

EMS SAMPLE # : 62340
DILUTION FACTOR:100.0000
ANALYSIS METHOD: Direct Injection

DATA FILE: >3662B::B2
ANALYSIS TIME: 5/05/86 21:17
QUANTITATION TIME: 860505 22:02

COMPOUND	RESULTS (ppm)
Acetone	ND
n-Butanol	ND
Carbon disulfide	ND
Carbon tetrachloride	ND
Chlorinated fluorocarbons	ND
Chlorobenzene	ND
Cyclohexanone	ND
o-Dichlorobenzene	ND
Diethyl ether	ND
Ethyl acetate	ND
Ethyl benzene	24000.
Isobutanol	ND
Methanol	ND
Methylene chloride	ND
Methylethylketone (MEK)	42000.
Methylisobutylketone (MIBK)	ND
Pyridine	ND
Toluene	690000.
Tetrachloroethene	ND
1,1,1-Trichloroethane	ND
Trichloroethene	ND
Trichlorofluoromethane	ND
Xylene	100000.

Detection limit (ppm) 500

HES REF. NO. 19

COMPANY: Inland

LOCATION: Dayton, OH

BUILDING: 23

DEPARTMENT: 23

WASTESTREAM: Etching Solution for Copper

PHYSICAL CHARACTERISTICS: Dark Green Liquid

SAFETY DATA SHEET NO.:

CHEMICAL MAKE-UP:

Muriatic Acid
Ferric Chloride
Water

EMS ANALYSIS NO.: 62342 (Attached)

RESULTS: pH ..... < 0.1

DISPOSAL OPTION: Chemical Treatment by HES

DOT SHIPPING DESCRIPTION: RQ Waste Corrosive Liquid, n.o.s. UN 1759
Note: Use RQ designation only if shipping greater than 100 pounds

E.P.A. HAZARDOUS WASTE NO.: D002

LABEL REQUIRED: Corrosive

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62342 00

DATE RECEIVED : 03/05/86 DATE REPORTED : 03/13/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.19 23/23
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC
7901 W. MORRIS ST.

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 W. MORRIS ST.

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
PH	<0.1	0.1	STD. UNITS	EPA 150.1	HMB	03/07/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

21-24 waste analysis sheets no longer valid

HES REF. NO. 21 thru 29

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 23 **DEPARTMENT:** 310

WASTESTREAM: Banberry Oil Composite

PHYSICAL CHARACTERISTICS: Black Oil

SAFETY DATA SHEET NO.: None **CHEMICAL MAKE-UP:** Unknown

EMS ANALYSIS NO.: 62345

RESULTS:

Liquid Ignitability ..... > 180°F
pH 7.70
Arsenic, EP Toxicity Extract ..... ND @ 0.01 mg/l
Barium, EP Toxicity Extract ..... 0.3 mg/l
Cadmium, EP Toxicity Extract ..... 0.40 mg/l
Chromium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Lead, EP Toxicity Extract ..... 0.7 mg/l
Mercury, EP Toxicity Extract ..... ND @ 0.0005 mg/l
Selenium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Silver, EP Toxicity Extract ..... ND @ 0.01 mg/l
PCB Gas Chromatography; ECD ..... ND @ 1.0 mg/l
Total Organic Halogen (TOX) ..... 45 mg/kg

RCRA Solvents:
F001 ..... 2,200 MG/G
F002 ..... 2,200 MG/G
F003 ..... 649 MG/G
F004 ..... 330 MG/G
F005 ..... ND @ MG/G

DISPOSAL OPTION: Oil Recovery by HES, Inc.

PEG COMMENTS: Non-hazardous waste oil based on above data.

DOT SHIPPING DESCRIPTION: Non-hazardous waste

LABEL REQUIRED: Non-hazardous waste

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62345 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/09/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : BANBERRY OIL COMP. 23/310
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
TOTAL SOLIDS DRIED AT 103-105 C	NM	NA	NA	EPA 160.3	SON	03/14/86
ANALYSIS NOTE	NO METHOD FOR TOTAL SOLIDS. SAMPLE IS AN					
ANALYSIS NOTE	OIL.					
IGNITABILITY, LIQUID	>180	NA	DEGREES F	SW846 1010	SON	04/07/86
ARSENIC, EP TOXICITY EXTRACT	ND	0.01	MG/L	SW846 7060	JRS	03/25/86
INSTRUMENT	PE 3030 GFAA					
ADDITION 1 (MG/L)	0.010					
ADDITION 2 (MG/L)	0.025					
ADDITION 3 (MG/L)	0.050					
SAMPLE (ABS)	0.012					
SAMPLE + ADD 1 (ABS)	0.026					
SAMPLE + ADD 2 (ABS)	0.048					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3 (ABS)	0.103					
	DILUTION	NA					
BARIUM, EP TOXICITY EXTRACT		0.3	0.1	MG/L	SW846-7080	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.2					
	ADDITION 2 (MG/L) ..	0.5					
	ADDITION 3 (MG/L) ..	1.0					
	SAMPLE MG/L	0.3					
	SAMPLE + ADD 1 MG/L	0.5					
	SAMPLE + ADD 2 MG/L	0.7					
	SAMPLE + ADD 3 MG/L	1.3					
	DILUTION	NA					
CADMIUM, EP TOXICITY EXTRACT		0.40	0.01	MG/L	SW846-7130	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	0.40					
	SAMPLE + ADD 1 MG/L	0.61					
	SAMPLE + ADD 2 MG/L	0.92					
	SAMPLE + ADD 3 MG/L	1.43					
	DILUTION	NA					
CHROMIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7190	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.20					
	SAMPLE + ADD 2 MG/L	0.51					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3 MG/L	1.01					
	DILUTION	NA					
LEAD, EP TOXICITY EXTRACT		0.7	0.1	MG/L	SW846-7420	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	2.0					
	ADDITION 2 (MG/L) ..	5.0					
	ADDITION 3 (MG/L) ..	10.0					
	SAMPLE MG/L	0.7					
	SAMPLE + ADD 1 MG/L	2.7					
	SAMPLE + ADD 2 MG/L	5.8					
	SAMPLE + ADD 3 MG/L	10.8					
	DILUTION	NA					
MERCURY, EP TOXICITY EXTRACT		ND	0.0005	MG/L	SW846-7470	HHW	03/28/86
	INSTRUMENT	PE 370 CVAA					
	ADDITION 1 (MG/L) ..	0.001					
	ADDITION 2 (MG/L) ..	0.003					
	ADDITION 3 (MG/L) ..	0.005					
	SAMPLE ABS	ND					
	SAMPLE + ADD 1 ABS	32					
	SAMPLE + ADD 2 ABS	130					
	SAMPLE + ADD 3 ABS	239					
	DILUTION	NA					
SELENIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846 7740	JRS	03/26/86
	INSTRUMENT	PE 3030 GFAA					
	ADDITION 1, MG/L ...	0.020					
	ADDITION 2, MG/L ...	0.050					
	ADDITION 3, MG/L ...	0.1					
	SAMPLE ABS	0.008					
	SAMPLE + ADD 1, ABS.	0.035					
	SAMPLE + ADD 2, ABS.	0.092					

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TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 3, ABS.	0.169					
	DILUTION	NA					
SILVER, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7760	HHW	03/24/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.22					
	SAMPLE + ADD 2 MG/L	0.50					
	SAMPLE + ADD 3 MG/L	1.02					
	DILUTION	NA					
PCB, GAS CHROMATOGRAPHY:ECD ..	AROCLOR 1016	ND	1.0	MG/KG	EPA 608	KKR	03/11/86
	AROCLOR 1221	ND					
	AROCLOR 1232	ND					
	AROCLOR 1242	ND					
	AROCLOR 1248	ND					
	AROCLOR 1254	ND					
	AROCLOR 1260	ND					
TOTAL ORGANIC HALOGEN (TOX)		45	1.0	MG/KG	SW846 9020	JEM	03/18/86
EP TOXICITY EXTRACTION, WITHOUT ORGANICS		COMPLETE	NA	NA	SW846 1310	CDS	03/17/86
	TOT SAMPLE WEIGHT, G	100					
	SOLID PORTION, G ...	NA					
	LIQUID PORTION, ML .	NA					
	9.5 mm SIEVE TEST ..	PASSED					
	INITIAL DI ADDED, ML	1600					
	FINAL DI ADDED, ML .	0					
	INITIAL PH	7.70					
	FINAL PH	2.59					
	PH ADJUSTMENTS	ATTACHED					

EMS

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
TOTAL ACID ADDED, ML	400					
VOL EXTRACT FILT, ML	2000					
TOT VOL FILTRATES,ML	2000					
VOL EXTRACT ANAL, ML	19					
SPIKE SOLUTION, ML .	1					
PCB EXTRACTION, WASTE OIL	COMPLETE	NA	NA	NA	KKR	03/11/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

F 738.6 / 6hrs F756.8 / 24hrs CDS.

TEST : **P101.1** **SIDE B**

SAMPLE NUMBER :	62267	62284	62295	62338	62345	62349
TIME, hr meter :	+15	+15	+15	+15	+15	+15
pH INITIAL :	4.42	6.53	6.29	9.81	7.70	8.33
pH FINAL :		4.82	4.84	4.31	5.63	4.83
VOL. ACID, ml :	0	200mL	21mL	11mL	400mL	50mL
TIME, hr meter :	+345	+15	+15	+15	+345	+15
pH INITIAL :	4.40	5.83	6.10	5.14	5.00	5.19
pH FINAL :		5.23	5.09			
VOL. ACID, ml :	0	200mL	179	0	0	0
TIME, hr meter :	+1080	+330	+330	+30	+1080	+30
pH INITIAL :	5.11	4.52	5.05	5.14	2.59	5.12
pH FINAL :						
VOL. ACID, ml :	0	0	0	0	0	0
TIME, hr meter :		+1080	+1080	+60		+60
pH INITIAL :		5.07	4.99	5.40		4.89
pH FINAL :				5.02		
VOL. ACID, ml :		0	0	5ml		0
TIME, hr meter :				+60		+60
pH INITIAL :				5.36		4.86
pH FINAL :				4.98		
VOL. ACID, ml :				20mL		0
TIME, hr meter :				+60		+60
pH INITIAL :				5.10		4.82
pH FINAL :						
VOL. ACID, ml :				0		0
TIME, hr meter :				+60		+60
pH INITIAL :				5.76		4.83
pH FINAL :				4.94		
VOL. ACID, ml :				15mL		0
TIME, hr meter :				+60		+60
pH INITIAL :				4.89		5.01
pH FINAL :						
VOL. ACID, ml :				0		0
TIME, hr meter :				+1080		+1080
pH INITIAL :				4.83		4.43
pH FINAL :						
VOL. ACID, ml :				0		0
TIME, hr meter :						
pH INITIAL :						
pH FINAL :						
VOL. ACID, ml :						

400

HERITAGE RESEARCH

JOB INFORMATION SHEET

Job No. 2005PG6	Date : 4/22/86
Job Title : INLAND-DAYTON (PEG 85-159)	
Client : PEG	Client Contact : JONNIE BAKER

Job Description :

SAMPLE	VISCOSITY	PM FLASHPOINT
No. 56	NONE (rubber)	-
No. 3	-	> 160 F
BANBERRY COMPOSITE	-	> 180 F

Laboratory Itemized Charges :

# Tests/Hrs	Test/Prof.Services	Cost
2	ASTM D-93	$ 80.00
	Total	$ 80.00

Reviewed By : Jeffrey J. Rhoades

C E R T I F I C A T E O F A N A L Y S I S

--- CORRESPOND TO ---------- SAMPLE ----------

EMS Laboratories, Inc.
7901 West Morris Street
Indianapolis, Indiana 46231
(317) 243-8304

EMS SAMPLE : 97136
REPORT DATE : 02/19/88
DATE RECEIVED : 02/08/88
DATE COMPLETE : 02/18/88

---------- REPORT TO ---------- BILL TO ----------

JOHN BAKER
PROCESS ENGINEERING GROUP, INC
7901 WEST MORRIS STREET
INDIANAPOLIS IN 46231

TOM ROBERTS
PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS IN 46231

---------- DESCRIPTION ----------

INLAND DIV.; G.M.C. - DAYTON, OH. PEG #88-021
BANBERRY OIL COMPOSITE (23/310) HES D 21-29
DATE SAMPLED : 2/5/88 TIME SAMPLED :

TEST DESCRIPTION ANALYTE	RESULT	METHOD	DATE DET. LIMIT	ANALYST UNITS
RCRA SOLVENTS, GC:FID SCAN	NA		02/09/88	JLM
RCRA SOLVNTS, GC:FID	: COMPLETE		NA	NA
GC/FID FILE.....	: GC97136			
GC BLANK FILE #.....	: GC8210.B			
GC STANDARD FILE #..	: GC8210.S			

ND - Not Detected
NA - Not Applicable

Approved by : D L Peterson

EMS LABS RCRA SOLVENTS ANALYSIS REPORT
INDIANAPOLIS, INDIANA

EMS SAMPLE #: 97136 ANALYSIS TIME: 2/09/88
ANALYSIS METHOD : GC/FID

	COMPOUND	RESULTS(uG/G)
F001		
	Tetrachloroethylene	1000.
	Trichloroethylene	ND
	Methylene chloride	ND
	1,1,1-Trichloroethane	1200.
	Carbon tetrachloride	ND
F002		
	Tetrachloroethylene	1000.
	Methylene chloride	ND
	Trichloroethylene	ND
	1,1,1-Trichloroethane	1200.
	Chlorobenzene	ND
	1,1,2-Trichloro-1,2,2-trifluoroethane	ND
	o-Dichlorobenzene	ND
	Trichlorofluoromethane	ND
	1,1,2-Trichloroethane	ND
F003		
	Xylene	ND
	Acetone	79.
	Ethyl acetate	ND
	Ethyl benzene	ND
	Ethyl ether	ND
	Methyl isobutyl ketone	ND
	n-Butanol	ND
	Cyclohexanone	ND
	Methanol	570.
F004		
	o-Cresol	ND
	m-Cresol	ND
	p-Cresol	ND
	Nitrobenzene	330.
F005		
	Toluene	ND
	Methyl ethyl ketone	ND
	Carbon disulfide	ND
	Isobutanol	ND
	Pyridine	ND
	Benzene	ND
	2-Ethoxyethanol	ND
	2-Nitropropane	ND

Detection Limit (uG/G): 50

Sample weight (G) : .112

Identification of compounds is based solely on gas chromatographic relative retention times. It is recommended that any samples with significant positive results be submitted for confirmation by GC/MS.

HES REF. NO. 42

COMPANY: Inland

LOCATION: Dayton, OH

BUILDING: 9

DEPARTMENT: 235

WASTESTREAM: Caustic Cleaning Solution

PHYSICAL CHARACTERISTICS: Dark Liquid

SAFETY DATA SHEET NO.:

1912015

CHEMICAL MAKE-UP:

Caustic Soda 70-80%
Soda Ash 10-20%
Sodium Gluconate < 5%
Sulfuric Acid, Sodium Salt, < 5%

EMS ANALYSIS NO.: 62350 (Attached)

RESULTS:

Total Alkalinity ..... 280,000 mg/l
pH 12.7
Arsenic, EP Toxicity Extract ..... ND @ 0.01 mg/l
Barium, EP Toxicity Extract ..... ND @ 0.1 mg/l
Cadmium, EP Toxicity Extract ..... ND @ 0.01 mg/l
Chromium, EP Toxicity Extract ..... 0.2 mg/l
Lead, EP Toxicity Extract ..... ND @ 0.1 mg/l
Mercury, EP Toxicity Extract ..... ND @ 0.0005 mg/l
Selenium, EP Toxicity Extract ..... 0.02 mg/l
Silver, EP Toxicity Extract ..... ND @ 0.01 mg/l

DISPOSAL OPTION: Chemical Treatment by HES, Inc.

DOT SHIPPING DESCRIPTION: RQ Waste Corrosive Liquid, n.o.s. UN 1760
Note: Use RQ designation only if shipping greater than 100 pounds

LABEL REQUIRED: Corrosive

E.P.A. HAZARDOUS WASTE NO.: D002

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62350 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.42 9/235
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
TOTAL SOLIDS DRIED AT 103-105 C	NM	NA	NA	EPA 160.3	SON	03/14/86
ANALYSIS NOTE	NO METHOD FOR TOTAL SOLIDS. SAMPLE IS AN					
ANALYSIS NOTE	OIL.					
ALKALINITY, TOTAL	280000	1.0	MG/L	EPA 310.1	SON	03/11/86
PH	12.7	0.1	STD. UNITS	EPA 150.1	JWT	03/27/86
ARSENIC, EP TOXICITY EXTRACT	ND	0.01	MG/L	SW846 7060	JRS	04/03/86
INSTRUMENT	PE 3030 GFAA					
ADDITION 1 (MG/L)	0.01					
ADDITION 2 (MG/L)	0.025					
ADDITION 3 (MG/L)	0.05					
SAMPLE (ABS)	0.006					
SAMPLE + ADD 1 (ABS)	0.034					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 2 (ABS)	0.095					
	SAMPLE + ADD 3 (ABS)	0.130					
	DILUTION	NA					
BARIUM, EP TOXICITY EXTRACT		ND	0.1	MG/L	SW846-7080	HHW	03/26/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.2					
	ADDITION 2 (MG/L) ..	0.5					
	ADDITION 3 (MG/L) ..	1.0					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.2					
	SAMPLE + ADD 2 MG/L	0.5					
	SAMPLE + ADD 3 MG/L	1.0					
	DILUTION	NA					
CADMIUM, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7130	HHW	03/26/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.22					
	SAMPLE + ADD 2 MG/L	0.54					
	SAMPLE + ADD 3 MG/L	1.04					
	DILUTION	NA					
CHROMIUM, EP TOXICITY EXTRACT		0.20	0.01	MG/L	SW846-7190	HHW	03/26/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	0.15					
	SAMPLE + ADD 1 MG/L	0.35					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 2 MG/L	0.64					
	SAMPLE + ADD 3 MG/L	1.10					
	DILUTION	NA					
LEAD, EP TOXICITY EXTRACT		ND	0.1	MG/L	SW846-7420	HHW	03/26/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	2.0					
	ADDITION 2 (MG/L) ..	5.0					
	ADDITION 3 (MG/L) ..	10.0					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	2.2					
	SAMPLE + ADD 2 MG/L	5.3					
	SAMPLE + ADD 3 MG/L	10.3					
	DILUTION	NA					
MERCURY, EP TOXICITY EXTRACT		ND	0.0005	MG/L	SW846-7470	HHW	03/28/86
	INSTRUMENT	PE 370 CVAA					
	ADDITION 1 (MG/L) ..	0.001					
	ADDITION 2 (MG/L) ..	0.003					
	ADDITION 3 (MG/L) ..	0.005					
	SAMPLE ABS	ND					
	SAMPLE + ADD 1 ABS	33					
	SAMPLE + ADD 2 ABS	146					
	SAMPLE + ADD 3 ABS	250					
	DILUTION	NA					
SELENIUM, EP TOXICITY EXTRACT		0.02	0.01	MG/L	SW846 7740	JRS	03/26/86
	INSTRUMENT	PE 3030 GFAA					
	ADDITION 1, MG/L ...	0.020					
	ADDITION 2, MG/L ...	0.050					
	ADDITION 3, MG/L ...	0.1					
	SAMPLE ABS	0.019					
	SAMPLE + ADD 1, ABS.	0.031					

EMS

TEST DESCRIPTION		RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
	SAMPLE + ADD 2, ABS.	0.048					
	SAMPLE + ADD 3, ABS.	0.113					
	DILUTION	NA					
SILVER, EP TOXICITY EXTRACT		ND	0.01	MG/L	SW846-7760	HHW	03/26/86
	INSTRUMENT	PE 370 FAA					
	ADDITION 1 (MG/L) ..	0.20					
	ADDITION 2 (MG/L) ..	0.50					
	ADDITION 3 (MG/L) ..	1.00					
	SAMPLE MG/L	ND					
	SAMPLE + ADD 1 MG/L	0.19					
	SAMPLE + ADD 2 MG/L	0.50					
	SAMPLE + ADD 3 MG/L	0.98					
	DILUTION	NA					
EP TOXICITY EXTRACTION, WITHOUT ORGANICS		COMPLETE	NA	NA	SW846 1310	CDS	03/17/86
	TOT SAMPLE WEIGHT, G	100					
	SOLID PORTION, G ...	NA					
	LIQUID PORTION, ML .	NA					
	9.5 mm SIEVE TEST ..	PASSED					
	INITIAL DI ADDED, ML	1600					
	FINAL DI ADDED, ML .	0					
	INITIAL PH	12.74					
	FINAL PH	12.75					
	PH ADJUSTMENTS	ATTACHED					
	TOTAL ACID ADDED, ML	400					
	VOL EXTRACT FILT, ML	2000					
	TOT VOL FILTRATES,ML	2000					
	VOL EXTRACT ANAL, ML	19					
	SPIKE SOLUTION, ML .	1					

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED

APPROVED BY : DLP

NA - NOT APPLICABLE

EMS

S - 582.1 S - 582.1 3-17-86 EPA WP 882 = 573./570
F - 588.1 F - 606.1 CDS
6hrs 24hrs

Page #2

TEST : P101.1 SIDE B

SAMPLE NUMBER	62350	pull through 62352	62354	62362		
TIME, hr meter	+15		+15	+15		
pH INITIAL	12.74	7.72	11.42	7.08		
pH FINAL	12.72	7.72	10.27	4.81		
VOL. ACID, ml	400mL		400mL	100mL		
TIME, hr meter	+345		+245	+15		
pH INITIAL	11.65		10.56	4.82		
pH FINAL						
VOL. ACID, ml	0			0		
TIME, hr meter	+1080		+1080	+30		
pH INITIAL	12.75		11.60	4.97		
pH FINAL						
VOL. ACID, ml	0		0	0		
TIME, hr meter				+60		
pH INITIAL				5.21		
pH FINAL				5.01		
VOL. ACID, ml				100mL		
TIME, hr meter				+240		
pH INITIAL				7.43		
pH FINAL						
VOL. ACID, ml				0		
TIME, hr meter				+1080		
pH INITIAL				7.00		
pH FINAL						
VOL. ACID, ml				0		
TIME, hr meter						
pH INITIAL						
pH FINAL						
VOL. ACID, ml						
TIME, hr meter						
pH INITIAL						
pH FINAL						
VOL. ACID, ml						
TIME, hr meter						
pH INITIAL						
pH FINAL						
VOL. ACID, ml						
TIME, hr meter						
pH INITIAL						
pH FINAL						
VOL. ACID, ml						

HES REF. NO. 43

COMPANY: Inland

LOCATION: Dayton, OH

BUILDING: 3

DEPARTMENT: 23

WASTESTREAM: Cleaning Solvent

PHYSICAL CHARACTERISTICS: Dark Liquid

SAFETY DATA SHEET NO.:

3678003

CHEMICAL MAKE-UP:

Mineral Spirits

EMS ANALYSIS NO.: 62351 (Attached)

RESULTS: Liquid Ignitability ..... < 70°F

DISPOSAL OPTION: Incineration or Possible Reclamation/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ waste Flammable Liquid, n.o.s., UN 1993
Note: Use RQ designation only if shipping greater than 100 pounds

LABEL REQUIRED: Flammable Liquid

E.P.A. HAZARDOUS WASTE NO.: D001

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62351 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.43 3/23
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

HES REF. NO. 48

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 13 **DEPARTMENT:** 88

WASTESTREAM: Vinyl Paint/Acrylic Paint Solvents

PHYSICAL CHARACTERISTICS: Composite of 3 Drums

SAFETY DATA SHEET NO.: None **CHEMICAL MAKE-UP:** Unknown

EMS ANALYSIS NO.: 62355 (Attached)

RESULTS: Liquid Ignitability ..... < 70°F
RCRA Solvents:
F001 ..... ND @ 500 ppm
F002 ..... 36,200 ppm
F003 ..... 548,000 ppm
F004 ..... ND @ 500 ppm
F005 ..... 542,000 ppm

DISPOSAL OPTION: Incineration/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ Waste Flammable Liquid, n.o.s., UN 1993
Note: Use RQ designation only when shipping greater than 100 pounds

LABEL REQUIRED: Flammable Liquid

E.P.A. HAZARDOUS WASTE NO.: D001

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62355 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 05/08/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.48 13/88
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86
RCRA SOLVENTS, GC/MS	ATTACHED	NA	NA	EPA 8240	ACB	05/05/86
FILE REFERENCE NO...	3663B					

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

EMS LABS RCRA SOLVENTS ANALYSIS REPORT

DESCRIPTION : PEG-JB INLAND DIVISION GMC DAYTON 85-159 48 13/88

EMS SAMPLE # : 62355
DILUTION FACTOR:100.0000
ANALYSIS METHOD: Direct Injection

DATA FILE: >3663B::B2
ANALYSIS TIME: 5/05/86 22:14
QUANTITATION TIME: 860505 22:58

COMPOUND	RESULTS (ppm)
Acetone	ND
n-Butanol	12000.
Carbon disulfide	ND
Carbon tetrachloride	ND
Chlorinated fluorocarbons	ND
Chlorobenzene	ND
Cyclohexanone	10000.
o-Dichlorobenzene	ND
Diethyl ether	ND
Ethyl acetate	ND
Ethyl benzene	56000.
Isobutanol	24000.
Methanol	ND
Methylene chloride	34000.
Methylethylketone (MEK)	450000.
Methylisobutylketone (MIBK)	270000.
Pyridine	ND
Toluene	68000.
Tetrachloroethene	ND
1,1,1-Trichloroethane	2200.
Trichloroethene	ND
Trichlorofluoromethane	ND
Xylene	200000.

Also detected:
2-Propanone
2-Propanol
5-Methyl-2-hexanone
2-Butoxy-ethanol

Detection limit (ppm) 500

HES REF. NO. 50

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 11A **DEPARTMENT:** 021

WASTESTREAM: Used Paint Thinner

PHYSICAL CHARACTERISTICS: Dark Brown Liquid

SAFETY DATA SHEET NO.: None **CHEMICAL MAKE-UP:** Unknown

EMS ANALYSIS NO.: 62357 (Attached)

RESULTS: Liquid Ignitability ..... < 70°F

DISPOSAL OPTION: Incineration/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ Waste Flammable Liquid, n.o.s., UN 1993
Note: Use RQ designation only if shipping greater than 100 pounds

LABEL REQUIRED: Flammable Liquid

E.P.A. HAZARDOUS WASTE NO.: D001

88CE1152

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62357 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.50 11A/021
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

HES REF. NO. 55

COMPANY: Inland **LOCATION:** Dayton, OH

BUILDING: 29 **DEPARTMENT:** 490

WASTESTREAM: Titration Solution, Acetone

PHYSICAL CHARACTERISTICS: Light grey acetone (clear)

SAFETY DATA SHEET NO.:	**CHEMICAL MAKE-UP:**
2555850	Perchloric Acid
2555851	Acetone 85%
2555852	Acetic Acid

EMS ANALYSIS NO.: 62360 (Attached)

RESULTS: Ignitability, Liquid ..... < 70°F
pH 0.8

DISPOSAL OPTION: Solvent Recovery/Incineration/HES Supplemental Fuels

DOT SHIPPING DESCRIPTION: RQ Waste Flammable Liquid, Corrosive, n.o.s., UN 2924
Note: Use RQ designation only if shipping greater than 100 pounds

LABELS REQUIRED: Flammable Liquid and Corrosive

E.P.A. HAZARDOUS WASTE NO.: D001, D002

DIRECT INQUIRIES TO :

EMS LABORATORIES, INC.
7901 WEST MORRIS STREET
INDIANAPOLIS, INDIANA 46231
(317) 243-8304

FINAL REPORT ON SAMPLE : 62360 00

DATE RECEIVED : 03/05/86 DATE COMPLETE : 04/04/86

DESCRIPTION 1 : INLAND DIVISION,GMC, DAYTON, OH PEG 85-159
DESCRIPTION 2 : NO.55 29/490
DATE SAMPLED : 6/20/85 TIME SAMPLED : UNKNOWN

REPORT TO :

JOHN BAKER
PROCESS ENGINEERING GROUP, INC

7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

BILL TO :

PROCESS ENGINEERING GROUP, INC.
7901 WEST MORRIS STREET

INDIANAPOLIS IN 46231

TEST DESCRIPTION	RESULT	DET. LIMIT	UNITS	METHOD	ANALYST	DATE
IGNITABILITY, LIQUID	<70	NA	DEGREES F	SW846 1010	SON	04/03/86
PH	0.8	0.1	STD. UNITS	EPA 150.1	HMB	03/07/86

ND - ANALYTE NOT DETECTED AT DETECTION LIMIT INDICATED
NA - NOT APPLICABLE

APPROVED BY : DLP

EMS

MATERIAL SAFETY DATA SHEET

5485AW

SECTION I

PRODUCT [redacted]5485AW 800121 10/19/88

SYNONYMS NOT AVAILABLE

MANUFACTURER E.I. DU PONT DE NEMOURS & CO., INC
AUTOMOTIVE PRODUCTS DEPARTMENT

DUNS NUMBER 001325704

DOT NAME & CLASS #13150 LIQUID

CHEMICAL FAMILY [redacted]HED RED AW Red

FORMULA NOT AVAILABLE

GM LOCATIONS USING PRODUCT NOT AVAILABLE

SECTION II INGREDIENTS

CAS NUMBER	NAME	APPROX WEIGHT PERCENT	EXPOSURE LIMITS			
16013-44-8	BON RED PIGMENT	LESS THAN 3	SUPPLIR	10.0 (MG/M3)		
12656-85-8	LEAD CHROMATE MOLYBDATE	LESS THAN 7	ACGIH	150.0 (UG/M3)		PB
			OSHA	50.0 (UG/M3)		PB
			ACGIH	50.0 (UG/M3)		CR
			OSHA	.1 (MG/M3)		CR
18454-12-1	LEAD CHROMATE	LESS THAN 1	ACGIH	150.0 (UG/M3)		PB
			OSHA	50.0 (UG/M3)		PB
			ACGIH	50.0 (UG/M3)		CR
			OSHA	.1 (MG/M3)		CR
1047-16-1	QUINACRIDONE PIGMENT	LESS THAN 2	DUPONT	10.0 (MG/M3)		
67922-67-2	ALKYD RESIN	LESS THAN 14	NONE	NONE		
96591-17-2	ACRYLIC POLYMER	LESS THAN 21	NONE	NONE		
123-86-4	BUTYL ACETATE	LESS THAN 3	ACGIH	150.0 (PPM)		
			OSHA	150.0 (PPM)		
			ACGIH	200.0 (PPM)		15 MIN(STEL)
78-93-3	METHYL ETHYL KETONE	LESS THAN 4	ACGIH	200.0 (PPM)		
			OSHA	200.0 (PPM)		
			ACGIH	300.0 (PPM)		15 MIN(STEL)
108-88-3	TOLUENE	LESS THAN 12	ACGIH	100.0 (PPM)		
			OSHA	200.0 (PPM)		
			ACGIH	150.0 (PPM)		15 MIN(STEL)
			OSHA	300.0 (PPM)	CEILING	
			OSHA	500.0 (PPM)		MAX (10MIN)
64742-89-8	VM&P NAPHTHA	LESS THAN 9	ACGIH	300.0 (PPM)		
			DUPONT	100.0 (PPM)		
1330-20-7	XYLENE	LESS THAN 26	ACGIH	100.0 (PPM)		
			OSHA	100.0 (PPM)		
			ACGIH	150.0 (PPM)		15 MIN(STEL)
64742-94-5	AROMATIC HYDROCARBON	LESS THAN 2	DUPONT	100.0 (PPM)		

* ACGIH - THRESHOLD LIMIT VALUE

KEY # 2554531

HMCC APPR. DATE

FID #

MATERIAL SAFETY DATA SHEET

5485AW

SECTION III PHYSICAL DATA

APPROX BOILING RANGE (C)	78-218
VAPOR PRESSURE PRINCIPAL SOLVENT (MM HG)	71.00
VAPOR DENSITY PRINCIPAL SOLVENT (AIR=1)	2.40
SOLUBILITY IN WATER	MODERATE
APPEARANCE AND ODOR	NT WITH CHARACTERISTIC ODOR #13160
SPECIFIC GRAVITY (WATER=1)	1.02
PERCENT VOLATILE BY VOLUME	NOT AVAILABLE
PERCENT SOLIDS BY WEIGHT	46.37
EVAPORATION RATE	SLOWER THAN ETHER
PH	NOT APPLICABLE
MATERIAL IS A	LIQUID
V.O.C. THEORETICAL	4.56
V.O.C. ANALYTICAL	NOT APPLICABLE.

SECTION IV FIRE & EXPLOSION HAZARD DATA

FLASH POINT (METHOD)	BETWEEN 20 - 73 F (CC)
APPROX FLAMMABLE LIMITS	LEL .7 % UEL 13.1 %
EXTINGUISHING MEDIA	FOAM, CARBON DIOXIDE, DRY CHEMICAL
SPECIAL FIRE FIGHTING PROCEDURES	FULL PROTECTIVE EQUIPMENT, INCLUDING SELF-CONTAINED BREATHING APPARATUS, IS RECOMMENDED. WATER FROM FOG NOZZLES MAY BE USED TO COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILD UP.
UNUSUAL FIRE AND EXPLOSION HAZARDS	WHEN HEATED ABOVE THE FLASH POINT, EMITS FLAMMABLE VAPORS WHICH, WHEN MIXED WITH AIR, CAN BURN OR BE EXPLOSIVE. FINE MISTS OR SPRAYS MAY BE FLAMMABLE AT TEMPERATURES BELOW THE FLASH POINT.

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	SEE SECTION II
EFFECTS OF OVEREXPOSURE	INHALATION - MAY CAUSE NOSE AND THROAT IRRITATION. MAY CAUSE NERVOUS SYSTEM DEPRESSION CHARACTERIZED BY THE FOLLOWING PROGRESSIVE STEPS: HEADACHE, DIZZINESS, NAUSEA, STAGGERING GAIT, CONFUSION, UNCONSCIOUSNESS. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OVEREXPOSURE TO SOLVENTS WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE. INGESTION- MAY RESULT IN GASTRO-INTESTINAL DISTRESS SKIN OR EYE CONTACT - MAY CAUSE IRRITATION OR BURNING OF THE EYES. REPEATED OR PROLONGED LIQUID CONTACT MAY CAUSE SKIN IRRITATION WITH DISCOMFORT AND DERMATITIS.
EMERGENCY AND FIRST AID PROCEDURES	INHALATION - IF AFFECTED BY INHALATION OF VAPOR OR SPRAY MIST, REMOVE TO FRESH AIR. IF BREATHING DIFFICULTY PERSISTS, OR OCCURS LATER, CONSULT A PHYSICIAN. INGESTION - IN THE UNLIKELY EVENT OF INGESTION, CALL A PHYSICIAN IMMEDIATELY AND HAVE THE NAMES OF THE INGREDIENTS AVAILABLE. SKIN CONTACT - WASH WITH SOAP AND WATER. IF IRRITATION OCCURS, CONTACT A PHYSICIAN. EYE CONTACT - IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES; CALL A PHYSICIAN.

SECTION V CONTINUED 5485AW 10/19/88

OTHER POTENTIAL HAZARDS INCLUDE

LEAD CHROMATE MOLYBDATE
OVER EXPOSURE TO LEAD MAY CAUSE ADVERSE EFFECTS TO THE BLOOD FORMING, NERVOUS, URINARY, REPRODUCTIVE SYSTEMS INCLUDING EMBRYOTOXIC EFFECTS. SYMPTOMS MAY INCLUDE LOSS OF APPETITE, ANEMIA, DISTURBANCE OF SLEEP AND FATIGUE.SEE OSHA LEAD STANDARD 29CFR1910.1025. FOR EXPOSURES LONGER THAN 8 HOURS THE OSHA EXPOSURE LIMIT IS REDUCED BY THIS FORMULA:
LIMIT(IN UG/M3)= 400/HOURS WORKED IN THE DAY.
IS AN IARC, NTP OR OSHA CARCINOGEN

LEAD CHROMATE
OVER EXPOSURE TO LEAD MAY CAUSE ADVERSE EFFECTS TO THE BLOOD FORMING, NERVOUS, URINARY, REPRODUCTIVE SYSTEMS INCLUDING EMBRYOTOXIC EFFECTS. SYMPTOMS MAY INCLUDE LOSS OF APPETITE, ANEMIA, DISTURBANCE OF SLEEP AND FATIGUE.SEE OSHA LEAD STANDARD 29CFR1910.1025. FOR EXPOSURES LONGER THAN 8 HOURS THE OSHA EXPOSURE LIMIT IS REDUCED BY THIS FORMULA:
LIMIT(IN UG/M3)= 400/HOURS WORKED IN THE DAY.
IS AN IARC, NTP OR OSHA CARCINOGEN

BUTYL ACETATE
RECURRENT OVEREXPOSURE MAY RESULT IN LIVER AND KIDNEY INJURY.
TESTS FOR EMBRYOTOXIC ACTIVITY IN ANIMALS HAS BEEN INCONCLUSIVE

METHYL ETHYL KETONE
HIGH CONCENTRATIONS HAVE CAUSED EMBRYOTOXIC EFFECTS IN LABORATORY ANIMALS.
METHYL ETHYL KETONE HAS BEEN DEMONSTRATED TO POTENTIATE (I.E., SHORTEN THE TIME OF ONSET) THE PERIPHERAL NEUROPATHY CAUSED BY EITHER N-HEXANE OR METHYL N-BUTYL KETONE. MEK BY ITSELF HAS NOT BEEN DEMONSTRATED TO CAUSE PERIPHERAL NEUROPATHY.
LIQUID SPLASHES IN THE EYE MAY RESULT IN CHEMICAL BURNS.

TOLUENE
RECURRENT OVEREXPOSURE MAY RESULT IN LIVER AND KIDNEY INJURY.
HIGH AIRBORNE LEVELS HAVE PRODUCED IRREGULAR HEART BEATS IN ANIMALS AND OCCASIONAL PALPITATIONS IN HUMANS.
RATS EXPOSED TO VERY HIGH AIRBORNE LEVELS HAVE EXHIBITED HIGH FREQUENCY HEARING DEFICITS. THE SIGNIFICANCE OF THIS TO MAN IS UNKNOWN.

VM&P NAPHTHA
LABORATORY STUDIES WITH RATS HAVE SHOWN THAT PETROLEUM DISTILLATES CAUSE KIDNEY DAMAGE AND KIDNEY OR LIVER TUMORS. THESE EFFECTS WERE NOT SEEN IN SIMILAR STUDIES WITH GUINEA PIGS, DOGS, OR MONKEYS. SEVERAL STUDIES EVALUATING PETROLEUM WORKERS HAVE NOT SHOWN A SIGNIFICANT INCREASE OF KIDNEY DAMAGE OR AN INCREASE IN KIDNEY OR LIVER TUMORS.

SECTION V CONTINUED 5405AW 10/19/88

XYLENE
HIGH CONCENTRATIONS HAVE CAUSED ENBRYOTOXIC EFFECTS IN LABORATORY ANIMALS.
RECURRENT OVEREXPOSURE MAY RESULT IN LIVER AND KIDNEY INJURY.
CAN BE ABSORBED THROUGH THE SKIN IN HARMFUL AMOUNTS.

PRIMARY ROUTES OF ENTRY	INHALATION.

SECTION VI REACTIVITY DATA

STABILITY	STABLE
HAZARDOUS POLYMERIZATION	STABLE.
CONDITIONS TO AVOID	NOT APPLICABLE.
INCOMPATIBILITY (MATERIALS TO AVOID)	NONE REASONABLY FORESEEABLE.
HAZARDOUS DECOMPOSITION PRODUCTS	CO, CO2, SMOKE
CONDITIONS TO AVOID FOR HAZARDOUS POLYMERIZATION	NOT APPLICABLE.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	AVOID PROLONGED CONTACT WITH SKIN AND BREATHING OF VAPOR. REMOVE SOURCES OF IGNITION. REMOVE WITH INERT ABSORBENT. VENTILATE AREA.
WASTE DISPOSAL METHOD	DO NOT ALLOW MATERIAL TO CONTAMINATE GROUND WATER SYSTEMS. BURN OR DISPOSE OF ABSORBED MATERIAL IN A HAZARDOUS WASTE LANDFILL WHICH COMPLIES WITH FEDERAL, STATE AND LOCAL REQUIREMENTS. DO NOT INCINERATE IN CLOSED CONTAINERS.
CERCLA	IF A RCRA HAZARDOUS WASTE RQ=1B.
RCRA	WASTE FROM THIS PRODUCT IS CLASSIFIED D001 IGNITABLE. IF LEAD OR CHROMIUM IS REPORTED IN SECTION II, WASTE IS THEN CLASSIFIED EPTOXIC D008 (LEAD) OR EPTOXIC D007 (CHROMIUM).

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	DO NOT BREATHE VAPORS OR MISTS. WEAR AN APPROPRIATE, PROPERLY FITTED RESPIRATOR (NIOSH/MSHA APPROVED) DURING AND AFTER APPLICATION UNLESS AIR MONITORING DEMONSTRATES VAPOR/MIST LEVELS ARE BELOW APPLICABLE LIMITS. FOLLOW RESPIRATOR MANUFACTURER'S DIRECTIONS FOR RESPIRATOR USE.
VENTILATION: LOCAL	PROVIDE SUFFICIENT VENTILATION IN VOLUME AND PATTERN TO KEEP CONTAMINANTS BELOW APPLICABLE OSHA AND OTHER SUGGESTED EXPOSURE LIMITS.
VENTILATION: MECHANICAL	NOT APPLICABLE.
VENTILATION: SPECIAL	REMOVE IGNITION SOURCES.
VENTILATION: OTHER	NOT APPLICABLE.
PROTECTIVE GLOVES	NEOPRENE OR "VITON" GLOVES ARE RECOMMENDED.
EYE PROTECTION	GOGGLES ARE PREFERRED TO PREVENT EYE IRRITATION. IF SAFETY GLASSES ARE SUBSTITUTED, INCLUDE SPLASH GUARD OR SIDE SHIELDS.

OTHER PROTECTIVE EQUIPMENT	USE APPROPRIATE INDUSTRIAL HYGIENE PRACTICES.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	OBSERVE LABEL PRECAUTIONS. KEEP AWAY FROM HEAT, SPARKS AND FLAME. CLOSE CONTAINER AFTER EACH USE. GROUND CONTAINERS WHEN POURING. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING AND SMOKING.
OTHER PRECAUTIONS	DO NOT SAND, FLAME CUT, BRAZE OR WELD DRY COATING WITHOUT A NIOSH/MSHA APPROVED RESPIRATOR OR APPROPRIATE VENTILATION.
EFFECTIVE DATE	10/19/88
COMMENTS	NOT APPLICABLE.
USAGE (VOLUME)	NOT APPLICABLE.

NOTICE FROM DUPONT

THE DATA IN THIS MATERIAL SAFETY DATA SHEET RELATE ONLY TO THE SPECIFIC MATERIAL DESIGNATED HEREIN AND DO NOT RELATE TO USE IN COMBINATION WITH ANY OTHER MATERIAL OR ANY PROCESS.

M.S.D.S. APPROVED BY T.R. LOUER (CONSULTANT - PRODUCT SAFETY)

ATTACHMENT C-1

MATERIAL SAFETY DATA SHEETS

CHEMCENTRAL/Cincinnati

SOLVENT 1286 ; KEY# 300431

VM&P
Isobutyl Isobutyrate
Xylene
Toluene
Normal Butyl Acetate

dept: 481

Shell

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17087
Cincinnati, OH 45217

MATERIAL SAFETY DATA SHEET

MSDS NUMBER ▶ 7.620-5 PAGE 1

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300	SHELL: 713-241-4819

ACUTE HEALTH 2 FIRE 3 REACTIVITY 0 HAZARD RATING ▶ EASY SLIGHT MODERATE HIGH EXTREME

*For acute and chronic health effects refer to the discussion in Section III

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION AND PASS IT ON

SECTION I

	NAME
PRODUCT ▶	SHELL VM&P NAPHTHA - EC
CHEMICAL NAME ▶	SOLVENT NAPHTHA (PETROLEUM), LIGHT ALIPHATIC
CHEMICAL FAMILY ▶	HYDROCARBON SOLVENT
SHELL CODE ▶	83208

NFPA 704 DESIGNATION: 3 / 2 / 0

CIN # NONE

CAS # 64742-89-8

KEY# 300431

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SHELL VM&P NAPHTHA - EC*	64742-89-8	100
--	TYPICAL DISTRIBUTION		
	PARAFFINS	NOT APPL	50
	NAPHTHENES	NOT APPL	41
	AROMATICS (C8+ AROM EXCLD EB MAX 6 O)	NOT APPL	9
	XYLENE	1330-20-7	--
	ETHYLBENZENE	100-41-4	--
	OLEFINS	NOT APPL	<0.1

* A COMPLEX COMBINATION OF C6 TO C9 HYDROCARBONS. EXACT COMPOSITION WILL VARY

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
**	>8 ML/KG (RAT)	>4 ML/KG (RAT)	3400 PPM 4H (RAT)

** BASED UPON TESTING OF ESSENTIALLY SIMILAR PRODUCTS

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT
LIQUID IS MILDLY IRRITATING TO THE EYES. HIGH VAPOR CONCENTRATIONS MAY ALSO BE IRRITATING.

SKIN CONTACT
LIQUID IS MILDLY IRRITATING TO THE SKIN. PROLONGED OR REPEATED LIQUID CONTACT CAN RESULT IN DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION
VAPORS MAY BE IRRITATING TO NOSE, THROAT AND RESPIRATORY TRACT. HIGH VAPOR CONCENTRATIONS MAY CAUSE CNS DEPRESSION.

INGESTION
INGESTION OF PRODUCT MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES MAY RESULT IN ASPIRATION PNEUMONITIS

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY DIZZINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR. ASPIRATION PNEUMONITIS MAY BE EVIDENCED BY COUGHING, LABORED BREATHING AND CYANOSIS (BLUISH SKIN); IN SEVERE CASES DEATH MAY OCCUR

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

NO.	OSHA PEL/TWA	OSHA PEL/CEILING	ACGIH TLV/TWA	ACGIH TLV/STEL	OTHER
9			300 PPM	400 PPM	

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING/SHOES. FLUSH SKIN WITH WATER. FOLLOW BY WASHING WITH SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING UNTIL CLEANED.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION

INGESTION
DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION *

NOTE TO PHYSICIAN
*IF MORE THAN 2.0 ML PER KG HAS BEEN INGESTED AND VOMITING HAS NOT OCCURRED, EMESIS SHOULD BE INDUCED WITH SUPERVISION. KEEP VICTIM'S HEAD BELOW HIPS TO PREVENT ASPIRATION. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE USING A CUFFED ENDOTRACHEAL TUBE SHOULD BE CONSIDERED.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

MALE RATS EXPOSED BY PROLONGED AND REPEATED INHALATION TO HIGH VAPOR CONCENTRATIONS OF SIMILAR SOLVENTS SHOWED EVIDENCE OF KIDNEY DAMAGE. THE RELEVANCE OF THIS EFFECT TO MAN IS UNKNOWN.

LABORATORY ANIMALS EXPOSED BY VARIOUS ROUTES TO HIGH DOSES OF XYLENE SHOWED EVIDENCE OF EFFECTS IN THE LIVER, KIDNEYS, LUNGS, SPLEEN, HEART AND ADRENALS. RATS EXPOSED TO XYLENE VAPOR DURING PREGNANCY SHOWED EMBRYO/FETOTOXIC EFFECTS. MICE EXPOSED ORALLY TO DOSES PRODUCING MATERNAL TOXICITY ALSO SHOWED EMBRYO/FETOTOXIC EFFECTS. RATS EXPOSED BY INHALATION TO 800 PPM OR GREATER OF XYLENE FOR 14H/DAY FOR 6 WEEKS OR TO 1450 PPM 8H/DAY FOR 1 OR 3 DAYS EXHIBITED HIGH FREQUENCY HEARING DEFICITS

SECTION VII — PHYSICAL DATA

BOILING POINT (DEG F): 246-270

SPECIFIC GRAVITY (H2O=1): 0.75

VAPOR PRESSURE (MM HG): 26 @ 100 DEG

MELTING POINT (DEG F): NOT AVAILABLE

SOLUBILITY (IN WATER): NEGLIGIBLE

VAPOR DENSITY (AIR=1): 3.8

EVAPORATION RATE (N-BUTYL ACETATE=1): [illegible]

APPEARANCE AND ODOR: LIGHT COLORED LIQUID, HYDROCARBON ODOR

SECTION VIII — FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
55 DEG F (TCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER 1 UPPER 7

EXTINGUISHING MEDIA
USE WATER FOG, FOAM, DRY CHEMICAL OR CO2. DO NOT USE A DIRECT STREAM OF WATER. PRODUCT WILL FLOAT AND CAN BE REIGNITED ON SURFACE OF WATER.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
WARNING: FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS
CONTAINERS EXPOSED TO INTENSE HEAT FROM FIRES SHOULD BE COOLED WITH WATER TO PREVENT VAPOR PRESSURE BUILDUP WHICH COULD RESULT IN CONTAINER RUPTURE. CONTAINER AREAS EXPOSED TO DIRECT FLAME CONTACT SHOULD BE COOLED WITH LARGE QUANTITIES OF WATER AS NEEDED TO PREVENT WEAKENING OF CONTAINER STRUCTURE.

SECTION IX — REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, SPARKS, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

SECTION X — EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
AVOID PROLONGED OR REPEATED BREATHING OF VAPORS. IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR SAFETY GLASSES OR GOGGLES AS APPROPRIATE. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL-RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE OR POLYVINYL ALCOHOL MATERIAL.

ADDITIONAL PROTECTIVE MEASURES
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. AIR-DRY CONTAMINATED CLOTHING IN A WELL VENTILATED AREA, THEN LAUNDER BEFORE REUSING.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
WARNING. FLAMMABLE. ELIMINATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. *** LARGE SPILLS *** EVACUATE THE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO DIKE AND CONTAIN. IF VAPOR CLOUD FORMS, WATER FOG MAY BE USED TO SUPPRESS. CONTAIN RUN-OFF REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL. PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. DISPOSE OF FLUSH SOLUTIONS AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS. SEAL TIGHTLY FOR PROPER DISPOSAL.

WASTE DISPOSAL
UNDER EPA - RCRA (40 CFR 261.21), IF THIS PRODUCT BECOMES A WASTE MATERIAL, IT WOULD BE IGNITABLE HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER D001. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

ENVIRONMENTAL HAZARDS
UNDER EPA-CWA THIS PRODUCT IS CLASSIFIED AS AN OIL AND CONTAINS COMPONENTS DESIGNATED AS HAZARDOUS SUBSTANCES UNDER SECTION 311. SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802. EPA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT. UNDER EPA-CERCLA ("SUPERFUND") RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE REPORTABLE QUANTITY MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802

SECTION XII SPECIAL PRECAUTIONS

LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY TE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM THE HANDLING SITE; FLASH-FIRE CAN RESULT. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILATION.

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS.

STATIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND GROUND TRANSFER CONTAINERS AND EQUIPMENT.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION. FLAMMABLE LIQUID
D.O.T. PROPER SHIPPING NAME: PETROLEUM NAPHTHA

OTHER REQUIREMENTS:
UN1255. GUIDE SHEET 27. RQ XYLENE (1000 LB)

SECTION XIV OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN

DATE PREPARED OCTOBER 10, 1987

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

JOHN P. SEPESI

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

in 3012

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17067
Cincinnati, OH 45217

MATERIAL SAFETY DATA SHEET

EASTMAN CHEMICAL PRODUCTS, INC.
EASTMAN KODAK COMPANY
Kingsport, Tennessee 37662

For Health Hazard Information, Call: (615) 229-6094

For Other Information, Call Your Eastman Representative

Eastman Operator: (615) 229-2000 Date of Preparation 03-03-87

SECTION I. IDENTIFICATION

NFPA 704 DESIGNATION: 0 2 0

CIN # NONE

CAS # 97-85-8

-- Name:

"EASTMAN" IBIB

-- Synonyms: PM 2103; Isobutyl isobutyrate; 2-Methylpropyl 2-methylpropanoate
-- Formula: $(CH_3)_2CHCO_2CH_2CH(CH_3)_2$
-- Molecular Weight: 144.22

SECTION II. PRODUCT AND COMPONENT HAZARD DATA

A. COMPONENT:	Approx Percent	CAS Reg No	Eastman Kodak No
Isobutyl isobutyrate*	100	97-85-8	900945

See Section VI-A for information on exposure limits.
*Hazardous material as defined by OSHA, 29 CFR 1910.1200.

B. PRECAUTIONARY LABEL STATEMENTS:

WARNING! FLAMMABLE
MAY FORM EXPLOSIVE PEROXIDES
HARMFUL IF INHALED

Keep away from heat, light, and flame.
Do not allow to evaporate to near dryness.
Keep container closed.
Avoid prolonged or repeated breathing of vapor.
Use with adequate ventilation.

FIRST AID: If inhaled, remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Get medical attention.

IN CASE OF FIRE: Use water spray, dry chemical, foam, or CO_2. Water may be ineffective in fighting the fire. Use water spray to keep fire-exposed containers cool.

IN CASE OF SPILL: Eliminate all ignition sources. Use water spray to disperse vapors and to flush spill area. Prevent runoff from entering drains, sewers, and streams.

Since emptied containers retain product residue, follow label warnings even after container is emptied. Do not cut, drill, grind, or weld on or near this container.

FOR MANUFACTURING USE ONLY

SECTION III. PHYSICAL DATA (1)

-- Appearance and Odor: Clear liquid, fruity odor.
-- Boiling Point: 148°C (298°F).
-- Specific Gravity (H_2O = 1): 0.855 at 20°/20°C.
-- Vapor Pressure: 3 mm Hg at 20°C (68°F).
-- Volatile Fraction by Weight: >99.0%.
-- Vapor Density (Air = 1): 5.0.
-- Evaporation Rate (n-butyl acetate = 1): 0.43.
-- Solubility in Water: Negligible.

SECTION IV. FIRE AND EXPLOSION HAZARD DATA (1)

-- Flash Point: 36°C (97°F); Method Used: Seta Closed Cup.
-- Autoignition Temperature: 435°C (815°F); Method Used: ASTM E 659-78.
-- Flammable Limits: LEL 0.96% at 93°C.
UEL 7.59% at 93°C.
-- Extinguishing Agent: Water Spray, Dry Chemical, CO_2, or Foam.
-- Electrical resistivity: 7.2 Ohm-cm.
-- Special Fire-Fighting Procedures: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Use water with caution. Since this material is lighter than water and negligibly soluble in water, the fire could easily be spread by the use of water in an area where the water could not be contained. Water may be ineffective in fighting fire. Use water spray to keep fire-exposed containers cool.
-- Unusual Fire and Explosion Hazards: Flammable liquid (see Section VIII). Vapors are heavier than air and may travel along the ground or may be moved by ventilation to an ignition source and may flash back.

SECTION V. REACTIVITY DATA (1)

-- Stability: Stable.
Heat of decomposition: -0.27 kcal/g.
Heat of combustion: -7.52 kcal/g.
-- Incompatibility: Oxidizing materials can cause a vigorous reaction.
-- Hazardous Decomposition Products: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.
-- Hazardous Polymerization: Will not occur.

SECTION VI. TOXICITY AND HEALTH

A. EXPOSURE LIMITS

-- Threshold Limit Value (TLV): Not established.
-- OSHA Permissible Exposure Limit (PEL): Not established.
-- An industrial hygiene analytical method is available to health and safety professionals upon request.

B. EXPOSURE EFFECTS

Inhalation: High vapor concentrations may cause narcosis.

Eyes: No specific hazard known to Eastman. Any material gotten into the eye may be irritating.

Skin: Prolonged or repeated contact may cause drying, cracking, or irritation of the skin.

C. FIRST AID

Inhalation: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth to mouth. If breathing is difficult, give oxygen. Get medical attention.

Eyes: Any material gotten into the eye should be washed out immediately and medical attention obtained if symptoms are present after washing.

Skin: Immediately flush with plenty of water. Get medical attention if symptoms persist.

D. TOXICITY DATA

Test	Species	Result(2)	Acute Toxicity Classification (3)
Acute oral LD_{50}	Rat	6.4 to 12.8 g/kg	Practically nontoxic
Acute oral LD_{50}	Mouse	6.4 to 12.8 g/kg	
Dermal LD_{50}	Guinea pig	>10 mL/kg	
Skin irritation	Guinea pig	Slight	

Inhalation of vapors at a concentration of about 5000 ppm killed 2 out of 3 rats in 6 h; symptoms observed were prostration and complete narcosis. Similar exposures to 600 ppm caused no death or symptoms in 6 h. (4)

Rats were given 0, 10, 100, or 1000 mg/kg/day of isobutyl isobutyrate by gavage, 7 days/wk, for 126 doses; no biologically significant findings were noted in feed intake, weight gain, clinical signs, hematology, clinical chemistry, body/organ weights (liver and kidney), gross pathology, or histopathology. (5)

SECTION VII. VENTILATION AND PERSONAL PROTECTION

A. VENTILATION

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. Local exhaust ventilation or an enclosed handling system may be needed to control airborne levels.

B. RESPIRATORY PROTECTION

An appropriate NIOSH-approved respirator for organic vapor must be worn if needed. If respirators are used, a program should be established to assure compliance with OSHA Standard 29 CFR 1910.134.

C. SKIN AND EYE PROTECTION

Safety glasses with side shields (or goggles) are recommended for any ty of industrial chemical handling. For operations where prolonged or repeated skin contact may occur, impervious gloves are recommended.

SECTION VIII. SPECIAL STORAGE AND HANDLING PRECAUTIONS

Material is classified as a Flammable Liquid. Keep away from heat, sparks, and flame. Keep container closed. Use with adequate ventilation. Vapors are heavier than air and may travel along the ground or may be moved by ventilation to an ignition source and flash back. Keep container closed to prevent drying out. Peroxide former. Do not allow to evaporate to near dryness. Store away from heat and light. After opening, purge container with nitrogen before reclosing. Periodically test for peroxide formation on long-term storage. Addition of water or appropriate reducing materials will lessen peroxide formation. Comply with all federal, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids. Since emptied containers retain product residue, follow label warnings even after container is emptied. Do not cut, drill, grind, or weld on or near this container.

SECTION IX. SPILL, LEAK, AND DISPOSAL PRACTICES

Steps to be Taken in Case Material is Released or Spilled: Eliminate all ignition sources. Small spills may be collected with absorbent materials. Use water spray to disperse vapors and to flush spill area. Prevent runoff from entering drains, sewers, or streams.

Waste Disposal Method: Mix with compatible chemical which is less flammable and incinerate. Observe all federal, state, and local laws concerning health and environment.

SECTION X. ENVIRONMENTAL EFFECTS DATA

This product has not been tested for environmental effects.

SECTION XI. TRANSPORTATION

DOT Hazard Classification: Flammable liquid.
Flash Point: See Section IV.
Proper DOT Shipping Name: Flammable liquid NOS (Isobutyl isobutyrate).
UN Number: 1993.

SECTION XII. REFERENCES

1. File data, Material Safety Program, Eastman Chemicals Division, Eastman Kodak Company, Kingsport, Tennessee.

2.. Unpublished data, Health and Environment Laboratories, Eastman Kodak Company, Rochester, New York.

3. AM IND HYG ASSOC Q 10, 93-96 (1949).

4. F. A. Patty, Editor. INDUSTRIAL HYGIENE AND TOXICOLOGY, 2nd Revised Edition, Volume II. Wiley-Interscience, New York, 1963, pp. 1867-1868.

5. AM J FOOD COSMET. TOXICOL. 16, 337-342 (1978).

SECTION XIII. HAZARD RATINGS

	Health	Flammability	Reactivity
HMIS* Rating:	1	3	1
NFPA** Rating:	1	3	1

NOTICE: These ratings involve data and interpretations that may vary from company to company and are intended only for rapid, general identification of the magnitude of the specific hazard. TO DEAL ADEQUATELY WITH THE SAFE HANDLING OF THIS MATERIAL, ALL THE INFORMATION CONTAINED IN THIS MSDS MUST BE CONSIDERED. The customer is responsible for determining the proper personal protective equipment needed for its particular use of this material.

*Hazardous Materials Identification System's [HMIS] Revised RAW MATERIALS RATING MANUAL, National Paint & Coatings Association, Fall 1984.

**NFPA 704 Standard System for the Identification of the Fire Hazards of Materials, National Fire Protection Association, 1985.

The information contained herein is furnished without warranty of any kind. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers.

TX0239S/900945/R-2, S-1, F-3, C-1

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17067
Cincinnati, OH 45217

TOLUENE

EXXON COMPANY, USA
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 10/08/87
SUPERSEDES DATE: 09/18/87

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

KEY# 3955

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
TOLUENE

CHEMICAL NAME
Petroleum Solvent

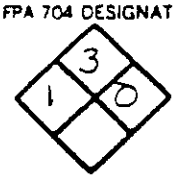
PRODUCT APPEARANCE AND ODOR
Clear water-white liquid
Aromatic hydrocarbon odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

PRODUCT CODE
132010 - 00650

CAS NUMBER
108-88-3

NFPA 704 DESIGNATION



CIN # 7580

CAS # 108-88-3

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
This product can be defined as: Toluene	108-88-3	100%

See Section E for Health and Hazard Information

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
100 ppm (375 mg/m3) for an 8-hour workday. 150 ppm (560 mg/m3) STEL	Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)
200 ppm (300 ppm Ceiling: 500 ppm Peak)	OSHA Regulation 29 CFR 1910.1000

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
FLAMMABLE - Per DOT 49 CFR 173.115
7°C (45°F)
ASTM D 56, Tag Closed Cup

AUTOIGNITION TEMPERATURE
Greater than 538°C (1000°F)
ASTM D 2155

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
2	3	0	Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS
Keep product away from heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1% Upper Flammable Limit 7.1%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic, and may have other central nervous system effects including death.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
110.2-111.0°C (230.4-231.8°F)

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.87

MOLECULAR WEIGHT
92

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -18°C (0°F)
Pour Point by ASTM D 97

VISCOSITY
0.57 cP @ 25°C ASTM D 445

VAPOR PRESSURE
Approximately 54 mm Hg @ 25°C
ASTM D 2879

VAPOR DENSITY (AIR = 1)
Approximately 3.2

PERCENT VOLATILE BY VOLUME
100 @ 1 atm. and 25°C (77°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
1.8

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions

for volatile, flammable vapors from absorbed material.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302
The RQ for toluene is 1,000 pounds. This product contains approximately 100% toluene.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355
Not applicable

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372
This product contains approximately 100% toluene.

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
	XXX		XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
UN 1294

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:

DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:

MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17067
Cincinnati, OH 45217

XYLENE

481

EXXON COMPANY, U.S.A.
A DIVISION OF EXXON CORPORATION

DATE ISSUED: 10/08/87
SUPERSEDES DATE: 09/21/87

MATERIAL SAFETY DATA SHEET

EXXON COMPANY, U.S.A. P.O. BOX 2180 HOUSTON, TX 77252-2180

KEYH. 1518

A. IDENTIFICATION AND EMERGENCY INFORMATION

PRODUCT NAME
XYLENE

PRODUCT CODE
132020 - 00651

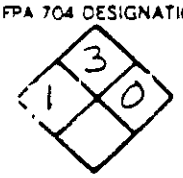
CHEMICAL NAME
Petroleum Solvent

CAS NUMBER
1330-20-7

PRODUCT APPEARANCE AND ODOR
Clear water-white liquid
Aromatic hydrocarbon odor

EMERGENCY TELEPHONE NUMBER
(713) 656-3424

NFPA 704 DESIGNATION



CIN # 8040

CAS # 1330-20-7

B. COMPONENTS AND HAZARD INFORMATION

COMPONENTS	CAS NO. OF COMPONENTS	APPROXIMATE CONCENTRATION
This product can be defined as:		
Xylene	1330-20-7	100%
This product contains:		
Xylene	1330-20-7	Approximately 83 mass %
Ethylbenzene	100-41-4	Approximately 17 mass %

See Section E for Health and Hazard Information

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	Flammability	Reactivity	BASIS
1	3	0	Recommended by Exxon

EXPOSURE LIMIT FOR TOTAL PRODUCT	BASIS
100 ppm (435 mg/m3) for an 8-hour workday	OSHA Regulation 29 CFR 1910.1000
100 ppm (435 mg/m3) TLV; 150 ppm (655 mg/m3) STEL	Recommended by the American Conference of Governmental Industrial Hygienists (ACGIH)

C. PRIMARY ROUTES OF ENTRY AND EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN
In case of skin contact, remove any contaminated clothing and wash skin thoroughly with soap and water.

INHALATION
If overcome by vapor, remove from exposure and call a physician immediately. If breathing is irregular or has stopped, start resuscitation, administer oxygen, if available.

INGESTION
If ingested, DO NOT induce vomiting; call a physician immediately.

D. FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM)
FLAMMABLE - Per DOT 49 CFR 173.115
27°C (80°F)
ASTM D 56, Tag Closed Cup

AUTOIGNITION TEMPERATURE
Greater than 499°C (930°F)
ASTM D 2155

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION

Health	Flammability	Reactivity	BASIS
2	3	0	Recommended by the National Fire Protection Association

HANDLING PRECAUTIONS
Keep product away from heat, sparks, pilot lights, static electricity, and open flame.

FLAMMABLE OR EXPLOSIVE LIMITS (APPROXIMATE PERCENT BY VOLUME IN AIR)
Estimated values: Lower Flammable Limit 1% Upper Flammable Limit 7%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES
Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type of product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use dry chemical, foam or carbon dioxide. Water may be ineffective, but water should be used to keep fire-exposed containers cool. If a leak or spill has ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Water spray may be used to flush spills away from exposures. Minimize breathing gases, vapor, fumes or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

NOTE: The inclusion of the phrase "water may be ineffective" is to indicate that although water can be used to cool and protect exposed material, water may not extinguish the fire unless used under favorable conditions by experienced fire fighters trained in fighting all types of flammable liquid fires.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
Fumes, smoke, carbon monoxide, aldehydes and other decomposition products, in the case of incomplete combustion.

"EMPTY" CONTAINER WARNING
"Empty" containers retain residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. All other containers should be disposed of in an environmentally-safe manner and in accordance with governmental regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

E. HEALTH AND HAZARD INFORMATION

VARIABILITY AMONG INDIVIDUALS
Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure)
High vapor concentrations (greater than approximately 1000 ppm) are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic, and may have other central nervous system effects including death.

NATURE OF HAZARD AND TOXICITY INFORMATION
Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

PRE-EXISTING MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY EXPOSURE
Petroleum Solvents/Petroleum Hydrocarbons - Skin contact may aggravate an existing dermatitis.

F. PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE
Approximately 137-140°C (278.6-284.0°F)

SPECIFIC GRAVITY (15.6 C/15.6 C)
0.87

MOLECULAR WEIGHT
106

pH
Essentially neutral

POUR, CONGEALING OR MELTING POINT
Less than -18°C (0°F)
Pour Point by ASTM D 97

VISCOSITY
0.62 cP @ 25°C ASTM D 445

VAPOR PRESSURE
Approximately 25 mm Hg @ 25°C
ASTM D 2879

VAPOR DENSITY (AIR = 1)
Approximately 3.7

PERCENT VOLATILE BY VOLUME
100 @ 1 atm. and 25°C (77°F)

EVAPORATION RATE @ 1 ATM. AND 25 C (77 F)
(n-BUTYL ACETATE = 1)
0.7

SOLUBILITY IN WATER @ 1 ATM. AND 25 C (77 F)
Negligible; less than 0.1%

G. REACTIVITY

This product is stable and will not react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

H. ENVIRONMENTAL INFORMATION

EPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Shut off and eliminate all ignition sources. Keep people away. Recover free product. Add sand, earth or other suitable absorbent to spill area. Minimize breathing vapors. Minimize skin contact. Ventilate confined spaces. Open all windows and doors. Keep product out of sewers and watercourses by diking or impounding. Advise authorities if product has entered or may enter sewers, watercourses, or extensive land areas.
Assure conformity with applicable governmental regulations. Continue to observe precautions

for volatile, flammable vapors from absorbed material.

REPORTABLE QUANTITY (RQ), EPA REGULATION 40 CFR 302
The RQ for xylene is 1,000 pounds. This product contains approximately 83% xylene.

The RQ for ethylbenzene is 1,000 pounds. This product contains approximately 17% ethylbenzene.

THRESHOLD PLANNING QUANTITY (TPQ), EPA REGULATION 40 CFR 355
Not applicable

TOXIC CHEMICAL RELEASE REPORTING, EPA REGULATION 40 CFR 372
This product contains approximately 83% xylene.

This product contains approximately 17% ethylbenzene.

EPA HAZARD CLASSIFICATION CODE:	Acute Hazard	Chronic Hazard	Fire Hazard	Pressure Hazard	Reactive Hazard	Not Applicable
	XXX		XXX			

I. PROTECTION AND PRECAUTIONS

VENTILATION
Use only with ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air. Use explosion-proof equipment. No smoking or open lights.

RESPIRATORY PROTECTION
Use supplied-air respiratory protection in confined or enclosed spaces, if needed.

PROTECTIVE GLOVES
Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION
Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT
Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES / ENGINEERING CONTROLS
Keep containers and storage containers closed when not in use. Do not store near heat, sparks, flame or strong oxidants. To prevent fire or explosion risk from static accumulation and discharge, effectively ground product transfer system in accordance with the National Fire Protection Association standard for petroleum products.

PERSONAL HYGIENE
Minimize breathing vapor or mist. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean and dry before reuse. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water

J. TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION
For further information relative to spills resulting from transportation incidents, refer to latest Department of Transportation Emergency Response Guidebook for Hazardous Materials Incidents, DOT P 5800.3.

DOT IDENTIFICATION NUMBER
UN 1307

The information and recommendations contained herein are, to the best of Exxon's knowledge and belief, accurate and reliable as of the date issued. Exxon does not warrant or guarantee their accuracy or reliability, and Exxon shall not be liable for any loss or damage arising out of the use thereof.

The information and recommendations are offered for the user's consideration and examination, and it is the user's responsibility to satisfy itself that they are suitable and complete for its particular use.

The Environmental Information included under Section H hereof as well as the Hazardous Materials Identification System (HMIS) and National Fire Protection Association (NFPA) ratings have been included by Exxon Company, U.S.A. in order to provide additional health and hazard classification information. The ratings recommended are based upon the criteria supplied by the developers of these rating systems, together with Exxon's interpretation of the available data.

FOR ADDITIONAL INFORMATION ON HEALTH EFFECTS CONTACT:
DIRECTOR OF INDUSTRIAL HYGIENE
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 3157
HOUSTON, TX 77252-2180
(713) 656-2443

FOR OTHER PRODUCT INFORMATION CONTACT:
MANAGER, MARKETING TECHNICAL SERVICES
EXXON COMPANY, U.S.A.
P. O. BOX 2180 ROOM 2355
HOUSTON, TX 77252-2180
(713) 656-5949

Dept. 464

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER (as it appears on label) NEOPRENE LATEX COATING 75-7852 - 17343	GM COMMON CODE
MANUFACTURER'S NAME INLAND DIVISION, G.M.C.	EMERGENCY TELEPHONE NO. (513) 455-3831
ADDRESS (Number, Street, City, State and Zip Code) P. O. BOX 1224, DAYTON, OHIO 45401	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101)	
ADDITIONAL HAZARD CLASSES (as applicable)	
CHEMICAL FAMILY COATING	FORMULA MIXTURE

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
N?A	25.5		Neoprene Latex	
	0.04		Silicone Emusion	
	0.5		1,2 - Dihydro-2,2,4-Tri-Methyquinoline	
	0.2		Sodium Salts of Sulfonic Acid -Polymerized Naphta Halene	
	0.5		Casein	
	0.4		Ammonium Hydroxide	
	2.5		Oil	
	0.1		Soap	
	2.4		Carbon Black	
	1.2		Zinc Oxide	
	0.2		Sulfur	
	0.02		Clay	
	02		Dupodimethyl-P-Tolyl Sulfone	
	3		Sodium Dibutyldithiocarbamate	
	2		Tetra Ethylthiuram Disulfide	
	1		Carboxymolymethylene	
	8.3		Nitrile Latex	
	63.0		Water	
	[illegible]		Sodium Lauryl Sulfate	

SECTION III — PHYSICAL DATA

BOILING POINT As Water 212 °F ___ °C		SPECIFIC GRAVITY (H,O = 1)	1.08		
VAPOR PRESSURE @ ___ °F ___ °C ☐ mm Hg ☐ psi		PERCENT VOLATILE BY VOLUME (%)	N/A	PERCENT SOLID BY WEIGHT (%)	36.5
VAPOR DENSITY (AIR = 1)	NA	EVAPORATION RATE (= 1)	N/A		
SOLUBILITY IN WATER	100%	pH =	11.0		
APPEARANCE AND ODOR Color is Blue Gray				IS MATERIAL: GAS PASTE (LIQUID) SOLID POWDER	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT NA °F ___ °C method used	FLAMMABLE LIMITS NE	LEL	UEL
EXTINGUISHING MEDIA CO_2, Water, Dry Chemical - When Water Boils Off			
SPECIAL FIRE FIGHTING PROCEDURES NONE KNOWN			
UNUSUAL FIRE AND EXPLOSION HAZARDS None Known			

SECTION V-HEALTH HAZARD DATA

OF OVEREXPOSURE — Conditions to Avoid Eye and	THRESHOLD LIMIT VALUE ☐ PERMISSIBLE EXPOSURE LIMIT ☐ NE
in Irritant	OTHER LIMIT ☐ NA

PRIMARY ROUTES OF ENTRY Inhalation ☐ Skin Contact ☐ Other (specify)

EMERGENCY AND FIRST AID PROCEDURES
Skin contact flush w/water, wash with soap & water. Eye contact flush w/water for 15 mins occassionally lifting eye lids.

SECTION VI-REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATIBILITY (materials to avoid) Strong oxidizers, Acids

HAZARDOUS DECOMPOSITION PRODUCTS: N/A

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Spread absorbent to contain material and stop spread, shove into container, mop floor

WASTE DISPOSAL METHOD Approved landfill or other EPA Approved method

CERCLA (Superfund) REPORTABLE QUANTITY (in lbs) NA

RCRA HAZARDOUS WASTE NO. (40 CFR 261.33) NA

LATILE ORGANIC COMPOUND (VOC) (as packaged, minus water) NA

☐ Theoretical NA lb/gal ☐ Analytical NA lb/gal

SECTION VIII-SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type) Not normally required

VENTILATION	LOCAL EXHAUST (Specify Rate) Not determined	SPECIAL N/A
	MECHANICAL (General) (Specify Rate) N/A	OTHER N/A

PROTECTIVE GLOVES (specify type) Rubber

EYE PROTECTION (specify type) Goggles of splashing hazard exist

OTHER PROTECTIVE EQUIPMENT
Eye wash and other protective equipment to prevent prolonged or repeated skin contact

SECTION IX-SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in closed containers

OTHER PRECAUTIONS N/A

Seller agrees not to assert any claim (other than a claim for a patent infringement) against General Motors Corporation for any use or disclosure of any technical data or information disclosed in connection with this questionnaire

LEASE COMPLETE QUESTIONNAIRE D RETURN TO:	Name (print) ROBERT ONEAL BROWN
	Signature Robert Oneal Brown
	Title CHEMIST
	Date 03 JAN 87

Key # 17343
Dept. 430, 464, 414

RISK ASSESSMENT WORKSHEET

Company: _____
Address: _____
Product: _____

MATERIAL SAFETY DATA SHEET CHECKLIST:

YES	NO	Section 1 - General
●	O	Manufacturer's Name
●	O	Product Name or Number
●	O	Address
O	●	Hazardous Materials Description
O	●	Additional Hazard Class
●	O	Chemical Family
●	O	Formula
●	O	Emergency Telephone Number
		Section 2 - Ingredients
O	●	CAS Registry Number
●	O	% Weight % Volume (100% listed)
●	O	Chemical Name(s)
O	●	Carcinogen (NTP,IARC,OSHA)
		Section 3 - Physical Data
●	O	Boiling Point
O	●	Vapor Pressure
O	●	Vapor Density
●	O	Solubility in Water
●	O	Appearance and Odor
●	O	Specific Gravity
O	●	Percent Volatile by Volume
O	●	Evaporation Rate
●	O	pH
●	O	Percent Solid by Weight
		Section 4 - Fire & Explosion
O	●	Flash Point
O	●	Flammable Limits
●	O	Extinguishing Media
O	●	Special fire Fighting Procedures
O	●	Unsual Fire & Explosion Hazards

YES	NO	Section 5 - Health Hazard
●	O	Effects of Overexposure
O	●	Threshold Limit Value
●	O	Emergency & First Aid
O	●	Primary Routes of Entry
		Section 6 - Reactivity Data
●	O	Stability
●	O	Incompatibility
O	●	Hazardous Decomposition
O	●	Hazardous Polymerization
		Section 7 - Spill or Leak
●	O	Steps to be taken-Release
●	O	Waste Disposal Method
O	●	CERCLA-Reportable Quantity
O	●	RCRA Hazard Waste Number
O	●	Volatile Organic Compound
		Section 8 - Special Protection Information
O	●	Respiratory Protection
O	●	Ventilation
●	O	Protective Gloves
●	O	Eye Protection
●	O	Other Protective Equipment
		Section 9 - Special
●	O	Precautions for handling
O	●	Other Precautions
●	O	Date
●	O	Signature

PHYSICAL RISK ASSESSMENT:

Solubility in Water:
- O Negligible (0-0.1%)
- O Slight (0.1-1%)
- O Moderate (1-10%)
- O Appreciable (10% +)
- ● Complete (100%)

pH:
- O Strongly Acidic 1-4
- O Weakly Acidic 5-7
- O Weakly Basic 8-9
- ● Strongly Basic 10-14

Boiling Point:
- O Less than 100F
- O Greater than 100F
- ● 200F and Higher
- O 300F and Higher
- O 400F and Higher

Physical Appearance:
- ● Liquid
- O Solid
- O Gas
- O Powder
- O Paste

Specific Gravity:
- O Less Than 1 (Floats)
- ● Greater Than 1 (Sinks)

Type of Container
- O 55 gallon drum
- O 5 gallon pail
- O 1 gallon jug/pail
- O Tube applicator
- O Bag

FIRE AND REACTIVITY ASSESSMENT:

O Very flammable gas, very volatile flammable liquid which forms explosive mixtures in air (FP less than 73F, BP less than 100F, NFPA Class 1A).

O Materials that are readily capable of detonation or explosive decomposition at normal temperatures and pressures.

Liquids which can be ignited under most all normal temperature conditions (FP 73-100F; BP above 100F; NFPA Class 1B and 1C).

Liquids which must be moderately heated before ignition will occur and solids which give off flammable vapors (FP Above 100F but less than 200F, BP Above 100F; NFPA Class 2 & 3).

O Materials must be preheated before ignition (FP above 200F; NFPA Class 3B).

● Will not burn.

O Materials that are capable of detonation or explosive reaction but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water.

O Materials that are normally stable and will readily undergo violent chemical change but will not det[illegible]. These materials may also react with water violently.

O Materials that are normally stable but become unstable at high temperatures and pressures. These materials may react with water but will not release energy violently.

● Materials that are normally stable, even under fire conditions, and will not react with water.

EXPLOSIVE LIMIT RANGE ASSESSMENT:

O Range difference 20-30; FP less than 100F; BP less than 100F.
O Range difference 10-15; FP greater than 100F less than 200F; BP equal to or [illegible] 100F equal to or less than 250F.
Range difference 5-10; FP greater than 100F; BP greater than 250F equal to or less than 350F.
O Range difference 5-10; FP greater than 200F; BP greater than 350F.
● Not Flammable.

% Volatile:
O 5-10 or less O 10-20 O 20-30 O 30-40 O 40-50 O 50-60 O 60-80 O 80-1[illegible]

Vapor Pressure:
O less than 0.1 mmHg @ STP.
O Greater than 0.1 mmHg @ STP.

HEALTH HAZARD ASSESSMENT:

Skin:
O Absorbed through skin. Extremely irritating. Can cause skin/eye burns or substantial irritation in short period of time.

O Strong sensitizer, can cause serious dermatitis or irreversible alteration (burns) on contact.

O Moderately irritating to some persons when in contact for prolonged period or following relatively few short-term contacts.

● Mildly irritating on prolonged/repeated contact.

O Nonirritating or produces mild transient irritation following prolonged repeated contact.

Respiratory:

Causes fibrosis, toxic metals, nerve poisons, blood toxins, other systemic poisons that cause injury to one or more organs or immediate delayed lung damage.

O Allergen, CNS depressant, chemical asphyxiant. Inhalation can cause [illegible] or immediate lung damage. Strong irritant affecting deep lung tissue.

Inhalation causes inflammation of upper respirator tract. Includes simple asphyxiants. Concentration more important than duration of exposure.

Inhalation can cause minor irritation to upper respiratory tract on prolonged or repeated exposure.

Slightly or nonirritating. Readily reversible effects upon repeated or prolonged exposure.

Carcinogenic Risk:

- O Carcinogenic, Mutagenic, Teratogenic in man (NTP,IARC,OSHA List)
- O Cancer suspect - Man. Animal carcinogen, mutagen, teratogen (in two or more species by two or more routes of exposure).
- O Suspect carcinogen, mutagen, teratogen - animal (in one or more species by one of three routes of exposure).
- O Ames test positive. Single acute dose causes non-malignant/malignant tumors in animal.
- ● No carcinogenic potential.

Toxicity Assessment:

- O Extremeley Toxic: Oral-1mg/Kg, Skin-5mg/Kg, Air-10ppm or less.
- O Highly Toxic: Oral-1-50mg/Kg, Skin-5-43mg/Kg, Air-10-100ppm.
- O Moderately Toxic: Oral-50-500mg/Kg, Skin-44-340mg/Kg, Air-100-1,000ppm.
- O Slightly Toxic: Oral-0.5-5g/Kg, Skin-0.35-2.81g/Kg, Air-1,000-10,000ppm.
- O Practically Non-Toxic: Oral-5-15g/Kg, Skin-2.82-22.59g/Kg, Air -10^4 10^5 ppm

Environmental Risk Assessment:

- O Solvent use greater than 8 lbs. per hour or 40 lbs. per day requires the use of environmental control equipment.
- O Solvent use if material is heated and is greater than 3 lbs. per hour or 15 lbs. per day requires the use of environmental control equipment.
- O Any operation requiring ventilation exhaust equipment may require an EPA permit application to be filed before commencement of the process.
- O Any contaminant discharged to the sewer requires city approval and or pretreatment.
- O Any waste stream determined to be hazardous by EPA standards requires a RCRA permit application before begining operations.
- O Local emergency response notification (SARA) - see checklist.
- O IS material ignitable, EP toxic, corrosive, reactive?

(If any of the above items are checked approval cannot be granted until the proper permit applications are completed and filed with the EPA

Label Information:

Health: 1, Fire: 1, Reactivity: 0, Special: ____

Comments: _____

Label Safe Use Category Number: 2

Date of Assessment: _____

MATERIAL SAFETY DATA

Gem City Chemicals, Inc.
1287 AIR CITY AVE. P.O. BOX 251
DAYTON, OHIO 45404
(513/224-0711)

CHROMIC ACID MOLD CLEANER

(Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-00S-4)
Information on this form is furnished solely for the purpose of compliance with the Occupational Safety and Health Act of 1970 and shall not be used for any other purpose. Use or dissemination of all or any part of this information for any other purpose or purposes is illegal.

PRODUCT ALUMINUM MOLD CLEANER #500

1912029

SECTION I — PRODUCT

MANUFACTURER'S NAME: Gem City Chemicals, Inc.
EMERGENCY TELEPHONE NO: 513/224-0711
ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE): 1287 Air City Ave., P.O. Box 251, Dayton, OH 45404
CHEMICAL NAME AND SYNONYMS: Chromic Acid Solution
TRADE NAME AND SYNONYMS: Aluminum Mold Cleaner
CHEMICAL FAMILY: Acid Anhydride
FORMULA: N/A

SECTION II — HAZARDOUS INGREDIENTS

INGREDIENT	% by wt	TLV (UNITS)	INGREDIENT	% by wt	TLV (UNITS)
Water	60 %		Phosphoric Acid -	4	
Sulfuric Acid -	8 %		CAS #07664-38-2		
CAS #07664-93-9					
Chromic Acid -	28 %				
CAS #1333-82-0					

Hazardous Mixtures of Other Liquids, Solids or Gases

			%	TLV (UNITS)
Sulfuric Acid	Chromic Acid	Phosphoric Acid		

HAZARD RATING
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT
* = SEE SECTION IV

FIRE: 0 — TOXICITY: 3 — REACTIVITY: 2 — SPECIAL: W

HAZARD RATING
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT
* = SEE SECTION IV

FIRE: 0 — TOXICITY: 3 — REACTIVITY: 1 — SPECIAL: OXY

HAZARD RATING
4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT
* = SEE SECTION IV

FIRE: 0 — TOXICITY: 2 — REACTIVITY: 0 — SPECIAL:

SECTION III — PHYSICAL DATA

BOILING POINT (°F)	N/A	SPECIFIC GRAVITY (H_2O = 1)	1.330
VAPOR PRESSURE (MM HG.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE (= 1)	N/A
SOLUBILITY IN WATER	Complete	Density	11.08 #/gal.

APPEARANCE AND ODOR
Reddish color liquid with a slight pungent odor. pH = 1

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED): Not flammable
FLAMMABLE LIMITS: N/A — LEL: N/A — UEL: N/A

EXTINGUISHING MEDIA
Dry chemical or CO2

SPECIAL FIRE FIGHTING PROCEDURES
Cool fire exposed containers with water spray. Use caution when apply water because steam explosions may occur under certain conditions. Use full protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Powerful oxidizing agent. May react with organic materials rapidly enough to cause ignition. Avoid contact with combustibles.

SECTION V — HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Dust or mist 0.1 mg/m3 of air (ACHIH-1970)

EFFECTS OF OVEREXPOSURE
Concentrated-skin; can destroy tissue and cause severe burns. Eyes; can burn and cause loss of sight. Ingestion may cause severe injury or death. May irritate nasal passages

EMERGENCY AND FIRST AID PROCEDURES
Skin; flush with plenty of water without delay. Eyes; immediately flush thoroughly with plenty of water for 15 min. Get medical attention for eyes and skin burns or if ingested. If inhaled, remove to fresh air and get medical attention.

SECTION VI — REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Exposure to moist air.

INCOMPATABILITY (MATERIALS TO AVOID)
Combustibles and many organics, reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS
Oxygen gas and chromic oxide

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
			N/A
	WILL NOT OCCUR	X	

SECTION VII — SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Neutralize with alkali such as soda ash, lime or limestone. Adequate ventilation is required due to release of CO2 gas. Recover solution or slurry for proper disposal. Keep out of sewers.

WASTE DISPOSAL METHOD
One method is to dissolve, acidify and reduce with an agent such as sodium metabisulfite, then precipitate trivalent chromium by neutralizing with alkali. Lagoon resulting slurry or flush to waste as permitted by local regulations.

SECTION VIII — SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)
Respirator approved for use by U.S Bureau of Mines.

PROTECTIVE GLOVES	EYE PROCTECTION
Rubber	chemical safety goggles, face shield

VENTILATION	LOCAL EXHAUST	SPECIAL
	adequate to remove mist	N/A
	MECHANICAL (GENERAL)	OTHER
	N/A	N/A

OTHER PROTECTIVE EQUIPMENT
Rubber sleeves, aprons, boots, hard hats, clothing with maximum body covering.

SECTION IX — SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Storn in dry area in tightly closed steel containers our to contact with combustibles or organics such as greases. Avoid wood flooring.

OTHER PRECAUTIONS
Avoid mixing with organics, combustibles or oxidizable material. Hot concentrated solutions attach most metal.

Date Issued 1-23-89 By:

TO:

Gem City Chemicals, Inc.
1287 AIR CITY AVE. • P.O. BOX 251
DAYTON, OHIO 45404

Name

Title

Signature:

We believe all information given is accurate. It is offered in good faith, but without guarantee. Since conditions of use are beyond our control, all risks of use are assumed by the user. Nothing herein shall be construed as a recommendation for uses which infringe valid

TMC 002
11/84

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

Dept

SECTION I

PRODUCT NAME OR NUMBER (as it appears on label) Exempt Hypalon Coating (75-7853) - 17346	GM COMMON CODE
MANUFACTURER'S NAME Inland Division G.M.C.	EMERGENCY TELEPHONE NO. (513) 455-3831
ADDRESS (Number, Street, City, State and Zip Code) P.O. Box 1224 Dayton OH 45401	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101) Flammable Liquid, Flammable liquid, N.O.S., UN1993	
ADDITIONAL HAZARD CLASSES (as applicable) OSHA - Class 1B -Flammable	
CHEMICAL FAMILY Coating	FORMULA Mixture

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
N/A	.07		DI-O-Tolylguanidine	No
N/A	1.1		Silicone Fluid	No
1330-20-7	6.1		Xylene SARA	No
108-88-3	9.1		Toluene SARA	No
8030-30-6	15.3		Naptha	No
123-86-4	22.8		Buthylacetate	No
N/A	22.8		Isobutyl Isobutyrate	No
107-21-1	8.9		Ethylene Glycol Ethyl Ether SARA	No
N/A	11.5		Hypalon-Chlorosulfonated Polyethylene	No
7782-42-5	1.1		Graphite	No

SECTION III — PHYSICAL DATA

BOILING POINT 281 °F 138 °C		SPECIFIC GRAVITY (H_2O = 1)	0.9		
VAPOR PRESSURE 9.5 @ ___ °F 20 °C ☒ mm Hg ☐ psi		PERCENT VOLATILE BY VOLUME (%)	81	PERCENT SOLID BY WEIGHT (%)	19
VAPOR DENSITY (AIR = 1)	>1	EVAPORATION RATE (= 1)	.75		
SOLUBILITY IN WATER	0	pH =	N/A		
APPEARANCE AND ODOR Black				IS MATERIAL: (LIQUID) SOLID GAS PASTE POWDER	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 62 °F ___ °C method used	FLAMMABLE LIMITS Toluene LEL 1.2 UEL 7.1
EXTINGUISHING MEDIA Carbon Dioxide, dry chemical, foam, water spray (fog). Wear SCBA. Water spray may be ineffective in fighting fire; containers could rupture violently in a fire.	
SPECIAL FIRE FIGHTING PROCEDURES	
UNUSUAL FIRE AND EXPLOSION HAZARDS Vapors of Toluene, Xylene heavier than air-May travel at low levels over long distances to an ignition source and flash back.	

TMC 002
11/84

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER (as it appears on label) Exempt Hypalon Coating 75-7853	GM COMMON CODE
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (Number, Street, City, State and Zip Code)	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101)	
ADDITIONAL HAZARD CLASSES (as applicable)	
CHEMICAL FAMILY	FORMULA

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
1317-65-3	.6		Limestone	No
1333-86-4	.9		Carbon Black	IARC-Animal
17808-60-7	1.7		Silica Powder	No
8002-74-2	.2		Wax	No
NA	.5		Petrolatum	No
NA	1.1		Oil	No
NA	1.1		Epoxy	No
NA	.2		Tetramethylthiuram Monosulfide	No

SECTION III — PHYSICAL DATA

BOILING POINT ___ °F ___ °C	SPECIFIC GRAVITY (H_2O = 1)		
VAPOR PRESSURE @ ___ °F ___ °C ☐ mm Hg ☐ psi	PERCENT VOLATILE BY VOLUME (%)	PERCENT SOLID BY WEIGHT (%)	
VAPOR DENSITY (AIR = 1)	EVAPORATION RATE (= 1)		
SOLUBILITY IN WATER	pH =		
APPEARANCE AND ODOR		IS MATERIAL: LIQUID SOLID GAS PASTE POWDER	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT ___ °F ___ °C method used	FLAMMABLE LIMITS	LEL	UEL
EXTINGUISHING MEDIA			
SPECIAL FIRE FIGHTING PROCEDURES			
UNUSUAL FIRE AND EXPLOSION HAZARDS			

SECTION V-HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE — Conditions to Avoid
Toxic, irritant; narcotic in high concentrations; can be absorbed through the skin. Dizziness, headache, defatting of skin, dermatitis, depressed respiration.

THRESHOLD LIMIT VALUE [X] 100 ppm
PERMISSIBLE EXPOSURE LIMIT [X] mixture
OTHER LIMIT [X] Mixture

PRIMARY ROUTES OF ENTRY Inhalation [X] Skin Contact [X] Other (specify)

EMERGENCY AND FIRST AID PROCEDURES
Skin - flush with copious amounts of water, remove clothing, use soap; eye - flush 20-30 mins. using water or normal saline; ingestion - drink water to dilute, get medical attention.

SECTION VI-REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID Keep away from heat, sparks, open flame, store in tightly sealed containers.
	STABLE	X	

INCOMPATIBILITY (materials to avoid) Oxidizers, strong caustics and acids

HAZARDOUS DECOMPOSITION PRODUCTS: Smoke, Carbon Monoxide, others

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Isolate area, contain spill with non-reactive absorbent, eliminate ignition sources, use non-sparking tools to remove absorbent containing solvent. Ventilate area to keep vapor concentration below level.

WASTE DISPOSAL METHOD check with local agencies

CERCLA (Superfund) REPORTABLE QUANTITY (in lbs) NA

RCRA HAZARDOUS WASTE NO. (40 CFR 261.33) (U220) Toluene, U239 Xylene

VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water)

☐ Theoretical NA lb/gal ☐ Analytical NA lb/gal

SECTION VIII-SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
If TLV exceeded a NIOSH/MSHA approved respirator is advised in absence of env. controls

VENTILATION	LOCAL EXHAUST (Specify Rate) All vapors, gases smoke - rate 1000-1400 rpm	SPECIAL	NA
	MECHANICAL (General) (Specify Rate) Adequate to efficiently operate-local exhaust systems	OTHER	NA

PROTECTIVE GLOVES (specify type) NBR

EYE PROTECTION (specify type) goggles/fare shield

OTHER PROTECTIVE EQUIPMENT
as necessary to prevent repeated or prolonged contact

SECTION IX-SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Store in tightly sealed containers away from heat, open flame, etc. When dispensing material from container make sure it is properly bonded and grounded to prevent against static build-up and discharge.

OTHER PRECAUTIONS

Seller agrees not to assert any claim (other than a claim for a patent infringement) against General Motors Corporation for any use or disclosure of any technical data or information disclosed in connection with this questionnaire.

COMPLETE QUESTIONNAIRE
RETURN TO:

Name (print) ROBERT O. BROWN
Signature Robert O. Brown
Title CHEMIST
Date 26 FE 87

RISK ASSESSMENT WORKSHEET

Key # 75-7853
17346

Company: Inland
Address: P.O. Box 1024 Dayton OHIO
Product: Exempt Hypalon Coating

Dept. 430, 464, 489

MATERIAL SAFETY DATA SHEET CHECKLIST: 513-455-3831

YES	NO	Section 1 - General
✓	O	Manufacturer's Name
✓	O	Product Name or Number
✓	O	Address
✓	O	Hazardous Materials Description
✓	O	Additional Hazard Class
✓	O	Chemical Family
✓	O	Formula
✓	O	Emergency Telephone Number
		Section 2 - Ingredients
✓	O	CAS Registry Number
✓	O	% Weight % Volume (100% listed)
✓	O	Chemical Name(s)
✓	O	Carcinogen (NTP,IARC,OSHA)
		Section 3 - Physical Data
✓	O	Boiling Point
✓	O	Vapor Pressure
✓	O	Vapor Density
✓	O	Solubility in Water
✓	O	Appearance and Odor
✓	O	Specific Gravity
✓	O	Percent Volatile by Volume
✓	O	Evaporation Rate
	O	pH
	O	Percent Solid by Weight
		Section 4 - Fire & Explosion
✓	O	Flash Point
✓	O	Flammable Limits
✓	O	Extinguishing Media
✓	O	Special fire Fighting Procedures
✓	O	Unusual Fire & Explosion Hazards

YES	NO	Section 5 - Health Haza
✓	O	Effects of Overexposure
✓	O	Threshold Limit Value
✓	O	Emergency & First Aid
✓	O	Primary Routes of Entry
		Section 6 - Reactivity
✓	O	Stability
✓	O	Incompatibility
✓	O	Hazardous Decomposition
✓	O	Hazardous Polymerization
		Section 7 - Spill or Leak
✓	O	Steps to be taken-Release
✓	O	Waste Disposal Method
✓	O	CERCLA-Reportable Quantity
✓	O	RCRA Hazard Waste Number
✓	O	Volatile Organic Compound
		Section 8 - Special Protection Information
✓	O	Respiratory Protection
✓	O	Ventilation
✓	O	Protective Gloves
✓	O	Eye Protection
✓	O	Other Protective Equipment
		Section 9 - Special
✓	O	Precautions for handling
✓	O	Other Precautions
✓	O	Date
✓	O	Signature

PHYSICAL RISK ASSESSMENT:

Solubility in Water:
- ✓ Negligible (0-0.1%)
- O Slight (0.1-1%)
- O Moderate (1-10%)
- O Appreciable (10% +)
- O Complete (100%)

pH:
- O Strongly Acidic 1-4
- O Weakly Acidic 5-7
- O Weakly Basic 8-9
- O Strongly Basic 10-14

Boiling Point:
- O Less than 100F
- O Greater than 100F
- ✓ 200F and Higher
- O 300F and Higher
- O 400F and Higher

Physical Appearance:
- ✓ Liquid
- O Solid
- O Gas
- O Powder
- O Paste

Specific Gravity:
- ✓ Less Than 1 (Floats)
- O Greater Than 1 (Sinks)

Type of Container
- O 55 gallon drum
- O 5 gallon pail
- O 1 gallon jug/pail
- O Tube applicator
- O Bag

FIRE AND REACTIVITY ASSESSMENT:

✓ Very flammable gas, very volatile flammable liquid which forms explosive mixtures in air (FP less than 73F, BP less than 100F, NFPA Class 1A).

O Materials that are readily capable of detonation or explosive decomposition at normal temperatures and pressures.

Inhalation causes inflammation of upper respirator tract. Includes simple asphyxiants. Concentration more important than duration of exposure.

Inhalation can cause minor ~~irritation~~ to upper respiratory tract on prolonged or repeated exposure.

Slightly or nonirritating. Readily reversible effects upon repeated or prolonged exposure.

Carcinogenic Risk:

Carcinogenic, Mutagenic, Teratogenic in man (NTP,IARC,OSHA List).

Cancer suspect - Man. Animal carcinogen, mutagen, teratogen (in two or more species by two or more routes of exposure).

Suspect carcinogen, mutagen, teratogen - animal (in one or more species by one of three routes of exposure).

Ames test positive. Single acute dose causes non-malignant/malignant tumors in animal.

No carcinogenic potential.

Toxicity Assessment:

Extremeley Toxic: Oral-1mg/Kg, Skin-5mg/Kg, Air-10ppm or less.

Highly Toxic: Oral-1-50mg/Kg, Skin-5-43mg/Kg, Air-10-100ppm.

Moderately Toxic: Oral-50-500mg/Kg, Skin-44-340mg/Kg, Air-100-1,000ppm.

Slightly Toxic: Oral-0.5-5g/Kg, Skin-0.35-2.81g/Kg, Air-1,000-10,000ppm.

Practically Non-Toxic: Oral-5-15g/Kg, Skin-2.82-22.59g/Kg, Air -10^4-10^5ppm.

Environmental Risk Assessment:

Solvent use greater than 8 lbs. per hour or 40 lbs. per day requires the use of environmental control equipment.

Solvent use if material is heated and is greater than 3 lbs. per hour or 15 lbs. per day requires the use of environmental control equipment.

Any operation requiring ventilation exhaust equipment may require an EPA permit application to be filed before commencement of the process.

Any contaminant discharged to the sewer requires city approval and or pretreatment.

Any waste stream determined to be hazardous by EPA standards requires a RCRA permit application before begining operations.

Local emergency response notification (SARA) - see checklist.

IS material ignitable, EP toxic, corrosive, reactive?

(If any of the above items are checked approval cannot be granted until the proper permit applications are completed and filed with the EPA)

Label Information:

Health: 3, Fire: 4, Reactivity: 0, Special: ____

Comments: _____

Label Safe Use Category Number: 2

Date of Assessment: _____

TMC 002
11/84

dept 4-23

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

SECTION I

KEY# 17196

PRODUCT NAME OR NUMBER (as it appears on label) Neoprene Coating 65-7768	GM COMMON CODE
MANUFACTURER'S NAME Inland Division GMC	EMERGENCY TELEPHONE NO. 513-455-3831
ADDRESS (Number, Street, City, State and Zip Code) P.O. 1224 Dayton, OH 45401	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101) Flammable Liquid; flammable liquid N.O.S. UN1993	
ADDITIONAL HAZARD CLASSES (as applicable) OSHA - Flammable Liquid - 1B	
CHEMICAL FAMILY Coating	FORMULA N/A

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
126-99-8	2.4		Chloroprene	No
119-47-1	.06		Methylene-Bis T-Butylphenol	No
N/A	.5		Polybutadiene	No
57-11-4	.02		Stearic Acid	No
[illegible]	.1		Zinc Oxide	No
1309-48-4	.1		Magnesium Oxide	No
14808-60-7	.2		Silica Oxide	No
[illegible]	.5		Oil - Napthenic	No
1333-86-4	1.0		Carbon Black	Iarc-Animal
[illegible]	.01		Wax	No

SECTION III — PHYSICAL DATA

BOILING POINT 281 °F 138 °C		SPECIFIC GRAVITY (H_2O = 1)	.91		
VAPOR PRESSURE @ ___ °F 20 °C [X] mm Hg [ ] psi	9.5	PERCENT VOLATILE BY VOLUME (%)	87.9	PERCENT SOLID BY WEIGHT (%)	15.8
VAPOR DENSITY (AIR = 1)	>1	EVAPORATION RATE (= 1)	.75		
SOLUBILITY IN WATER	0	pH =	N/A		
APPEARANCE AND ODOR Black				IS MATERIAL: GAS PASTE (LIQUID) POWDER SOLID	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 76 °F 24 °C method used Tag Closed Cup	FLAMMABLE LIMITS Xylene (%) 1.0 (%) 7.0
EXTINGUISHING MEDIA CO_2, Foam, dry chemical, water spray/fog	
SPECIAL FIRE FIGHTING PROCEDURES Wear SCBA. A water stream may be unsuitable and spread flame, use as a fog or fine spray to cool container.	
UNUSUAL FIRE AND EXPLOSION HAZARDS Containers may build pressure as a result of expanding vapor and rupture violently.	

TMC 002
11/84

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

SECTION I

PRODUCT NAME OR NUMBER (as it appears on label) Neoprene Coating 65-7768	GM COMMON CODE
MANUFACTURER'S NAME	EMERGENCY TELEPHONE NO.
ADDRESS (Number, Street, City, State and Zip Code)	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101)	
ADDITIONAL HAZARD CLASSES (as applicable)	
CHEMICAL FAMILY	FORMULA

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
N/A	.002		Epoxy Epon 828	No
	.1		Wax-Chlorinated Paraffin-chlorowax lv	No
	.06		Pine oil - terpene alcohol	No
1330-20-7	94.8		Xylene Dimethylbenzene	No
	.001		Fluorosilicone Fluid	

SECTION III — PHYSICAL DATA

BOILING POINT ___ °F ___ °C	SPECIFIC GRAVITY (H_2O = 1)		
VAPOR PRESSURE @ ___ °F ___ °C ☐ mm Hg ☐ psi	PERCENT VOLATILE BY VOLUME (%)	PERCENT SOLID BY WEIGHT (%)	
VAPOR DENSITY (AIR = 1)	EVAPORATION RATE (= 1)		
SOLUBILITY IN WATER	pH =		
APPEARANCE AND ODOR		IS MATERIAL: LIQUID SOLID GAS PASTE POWDER	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT ___ °F ___ °C method used	FLAMMABLE LIMITS LEL UEL
EXTINGUISHING MEDIA	
SPECIAL FIRE FIGHTING PROCEDURES	
UNUSUAL FIRE AND EXPLOSION HAZARDS	

SECTION V-HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE — Conditions to Avoid
Drying of skin, eye irritation. Excessive inhalation may cause anesthesia, headache, dizziness, nausea, upper respiratory irritation

THRESHOLD LIMIT VALUE ☐
PERMISSIBLE EXPOSURE LIMIT ☒ 100ppm
OTHER LIMIT ☐ N/A

PRIMARY ROUTES OF ENTRY Inhalation ☒ Skin Contact ☐ Other (specify)

EMERGENCY AND FIRST AID PROCEDURES
Inhalation: move to fresh air, apply artificial respiration if necessary, call a physcian. Skin Contact: Wash with soap and water, apply a mild skin cream. Eye Contact: Flush with water, call a physician. Ingenstion: call a physician.

SECTION VI-REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID: Avoid free fall of material during dispensing of product. Proper grounding and bonding of containers is required.
	STABLE	X	

INCOMPATIBILITY (materials to avoid): strong acids, caustics, oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS: carbon monoxide, carbon dioxide, smoke

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: open containers, heat, sparks, open flame
	WILL NOT OCCUR	X	

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Evacuate area, contain spill with absorbent, isolate all ignition sources. Large spills dike area and remove by vacuum truck etc.

WASTE DISPOSAL METHOD
incinerate according to approved EPA methods or use other Government methods

CERCLA (Superfund) REPORTABLE QUANTITY (in lbs)
N/A

RCRA HAZARDOUS WASTE NO. (40 CFR 261.33)
U239 - xylene

VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water)
N/A

☐ Theoretical N/A lb/gal ☐ Analytical N/A lb/gal

SECTION VIII-SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)
Per OSHA regulations if PEL is exceeded

VENTILATION	LOCAL EXHAUST (Specify Rate): sufficient to keep workroom concentration	SPECIAL	N/A
	MECHANICAL (General) (Specify Rate): below PEL = 100ppm	OTHER	N/A

PROTECTIVE GLOVES (specify type) buna-n neoprene
EYE PROTECTION (specify type) Chemical goggles while dispensing

OTHER PROTECTIVE EQUIPMENT
Apron, barrier cream if deemed necessary to avoid contact

SECTION IX-SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep cool away from sources of ignition, use with adequate ventilation. Avoid prolonged or repeated personal contact

OTHER PRECAUTIONS
use with approved class, explosion-proof motors and switches.

Seller agrees not to assert any claim (other than a claim for a patent infringement) against General Motors Corporation for any use or disclosure of any technical data or information disclosed in connection with this questionnaire.

PLEASE COMPLETE QUESTIONNAIRE AND RETURN TO:

Name (print) ROBERT OWEN BROWN
Signature Robert Owen Brown
Title CHEMIST
Date 10-1-86

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-FID #071143 -

(P) HEXANE
1533
M00659
02-5068
C6H14

MANUFACTURER INFORMATION

(*) MID:#533196
UNION OIL CO OF CALIFORNIA, UNION OIL CENTER
DUNS ACCOUNT #: 09-250-7169
EMERGENCY TELEPHONE #: 213/486-7600
461 S BOYLESTON AVE
LOS ANGELES, CA 90017

FORMULA INFORMATION

OWNER LAST UPDATE DATE : 030791
FORMULA STATUS : Incomplete
USER STATUS : Owner
USAGE STATUS : Deactivated on 123189
MSDS ON FILE AT LOCATION 39001 : Yes
MSDS ON FILE IN CSIS : Yes
SAFE USE CATEGORY: Solvents - Flashpoint < 100F

SHIPPING INFORMATION
NO SHIPPING NAME ON FILE FOR THIS F.I.D.
Flash Point : NA

INGREDIENTS

CAS#		Formulation	Chemical Name
000110543	=	100% BY WT	Hexane

REGULATORY CONSIDERATIONS
(Information compiled by TMCA. See bulletin board file 'CRITLIST' for expanded key.)

CAS#		LISTS
000110543	=	01, 02, 03, 04, 17, 19, 31, 32, 37, 38, 39, 42, 46, 56, 61, 63, 65, 90.

- REGULATORY LIST KEY -

01 - OSHA-PEL	02 - GM-EEG	03 - ACGIH-TLV	04 - GM-Spec Chem
17 - CA Haz Subst	19 - MA Subst	31 - Allghny Cty	32 - IL-RTK
37 - MO Species	38 - MO-RTK	39 - ONT 654/86	42 - WI TABLE 1
46 - SARA312HzSub	56 - CT 29-3	61 - PA RTK	63 - PELs REVISED
65 - NJ W&C RTK	90 -		

LOCATION CODE : 18008 39002
(D)39001(D) 36001(D)

DISPLAY USAGE?

DISPLAY G.M. MATERIAL SAFETY DATA SHEET? y
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-->Effective Date: 30179
-->MSDS signed by: Not Provided
3 -->Title: Not Provided
4 -->Comments: A DISCLAIMER IS ATTACHED TO PAGE 4 OF SUPPLIERS DATA SHEET
5 -->Safe Use Category: 2 - SOLVENTS - Flash Point: < 100F
6 ->Last Date Updated: 012991

SECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: Not Provided
2 -->Formula: Not Provided

SECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: 152 TO 157 F
2 -->Specific Gravity: 0.68
3 -->Vapor Pressure: 137 AT 68 F
4 -->% Volatile by Volume: 100
5 -->% Solid by Weight: Not Provided
6 -->Vapor Density: 3
7 -->Evaporation Rate: 8.1
8 -->Solubility in H2O: NEGLIGIBLE
9 -->pH: Not Provided
0 -->Appearance & Odor: CLEAR ,COLORLESS,
1 -->State: LIQUID

SECTION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: 1
2 -->Flammable Limits - UEL: 8
3 ->Extinguishing Media: FOAM, CO2, DRY CHEMICAL, WATER SPRAY.
4 ->Special Fire Fighting Procedures: WEAR SELF-CONTAINED BREATHING APPARATUSWATER MAY BE UNSUITABLE EXCEPT AS A COOLING MEDIUM.
5 -->Unusual Fire & Explosion Hazards: NONE

SECTION 5 -- HEALTH HAZARD DATA

1 -->Effects of Overexposure: DRYING OF SKIN. EYE IRRITATION. EXCESSIVE INHALATIONMAY CAUSE ANESTHESIA, HEADACHE, DIZZINESS, NAUSEA, UPPPER RESPIRATORYIRRITATION.
2 -->Threshold Limit Value: 160PPM
3 -->Permissible Exposure Limit: Not Provided
4 -->Other limit: Not Provided
5 -->Primary routes of entry: Not Provided
6 -->Emergency First Aid Procedures: INHALATION: REMOVE TO FRESH AIR, APPLY ARTIFICIALRESPIRATION IF NECESSARY. CALL A PHYSCIAN. SKIN CONTACT: WASH WITH MILDSOAP AND WATER, APPLY A MILD SKIN CREAM, IN SEVERE CASES CONTACT A PHYSCIAN. EYE CONTACT: FLUSH WITH WATER, CALL APHYSICIAN. INGESTION: CALL A PHYSICIAN.

SECTION 6 -- REACTIVITY DATA

-->Stable: YES
-->Conditions to Avoid: HEAT, SPARKS, OPEN FLAME, FIRE.
-->Incompatible Materials: STRONG OXIDIZING AGENTS.
4 -->Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY YEILD CARBONMONOXIDE AND CARBON DIOXIDE.
5 -->Can Hazardous Polymerization Occur: NO
-->Conditions to Avoid: Not Provided

SECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: FLUSH WITH WATER INTO RE-TAINING AREA OF CONTAINER. AVOID SPARKS, FIRE OR HOT METAL SURFACES.SMALL QUANTITIES MAY BE ABSORBED ONTO AN APPROPRIATE ABSORBANT>
2 -->Waste Disposal Method: INCINERATE UNDER SAFE CONDITIONS OR DISPOSE OF IN ACCORDANCE WITH APPLICABLE LOCAL ,STATE AND FEDERAL REGULATIONS.
3 -->CERCLA (Superfund) Reportable quantity (lbs): Not Provided
4 -->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided
5 -->Volatile Organic Compound (VOC) Theoretical: Not Provided
6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

SECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: RESPIRATION WITH ORGANIC CARTRIDGE IF CONCENTRATION IS ABOVE 164 PPM.
2 -->Local Exhaust: WHATEVER IS SUFFICIENT OT KEEP WORKROOM CONCENTRATIONS BELOW THE TLV.
3 -->Special: Not Provided
4 -->Mechanical: Not Provided
5 -->Other: Not Provided
6 -->Protective Gloves (Specify type): IMPERMEABLE
7 ->Eye Protection (Specify type): CHEMICAL GOGGLES
8 ->Other Protective Equipment: GOGGLES

SECTION 9 -- SPECIAL PRECAUTIONS

1 -->Precautions to be taken in Handling & Storage: KEEP COOL AND AWAY FROM SOURCESOF IGNITION. USE WITH ADEQUATE VENTILATION. AVOID PROLONGED OR REPEATEDPERSONAL CONTACT.
2 -->Other Precautions: Not Provided

SECTION 10 -- ADDITIONAL DATA

>Additional Health Hazard Data: Not Provided

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DISPLAY SAFE USE INSTRUCTIONS? n

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- FID : 208260 -

ISOBUTYLENE
ISOBUTENE
2-METHYLPROPENE
LIQUID AIR ISOBUTYLENE

MANUFACTURER INFORMATION

(*) MID:#550245
LIQUID AIR CORP
EMERGENCY TELEPHONE #: 800/231-1366
ONE CALIFORNIA PLAZA, STE 350
2121 N CALIFORNIA BLVD
OR CHEMTREC 800/424-9300
WALNUT CREEK, CA 94596

FORMULA INFORMATION

OWNER LAST UPDATE DATE : 030188
FORMULA STATUS : Complete
MSDS ON FILE IN CSIS : Yes
SAFE USE CATEGORY: Compressed Gas - Flammable

SHIPPING INFORMATION

SID #10010 Name: LIQUEFIED PETROLEUM GAS
Hazard Class: Flammable Gas
U.N. Code: UN1075
Reference: SID NO. 10010 IS FORBIDDEN VIA ALL PASSENGER MODES! PLEASE NOTE T HE '+' IN COLUMN (1) OF THE HM TABLE, 49CFR 172.101.
C.A.S Number: 000074986
Flash Point : -105 F (-76 C) CC.

INGREDIENTS

CAS#	Formulation	Chemical Name
000115117	= 100%	1-Propene, 2-methyl-

REGULATORY CONSIDERATIONS
(Information compiled by TMCA. See bulletin board file 'CRITLIST' for expanded key.)

CAS#	LISTS
000115117	= 19, 46, 61, 65.

- REGULATORY LIST KEY -

19 - MA Subst ; 46 - SARA312HzSub; 61 - PA RTK ; 65 - NJ W&C RTK .

LOCATION CODE : (D)89150

DISPLAY G.M. MATERIAL SAFETY DATA SHEET? y
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FID: 208260

SECTION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

1 -->Effective Date: 100185.
2 -->MSDS signed by: Not Provided
3 -->Title: CORPORATE SAFETY DEPT.
4 -->Comments: Not Provided
5 -->Safe Use Category: 12 - COMPRESSED GAS - FLAMMABLE
6 -->Last Date Updated: 031488

SECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: MONOLEFIN.
2 -->Formula: (ISO) C4H8. MOLECULAR WEIGHT: 56.03

SECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: 19.18F (-7.12C). FREEZING POINT: -220.63F (-140.35C). AUTO IGNITION TEMPERATURE: 869F (465C).
2 -->Specific Gravity: 1.98.
3 -->Vapor Pressure: @ 70F (21.1C) = 38.43 PSIA (265 KPA).
4 -->% Volatile by Volume: Not Provided
5 -->% Solid by Weight: Not Provided
6 -->Vapor Density: LIQUID DENSITY AT BOILING POINT: 39.09 BL/FT3 (626.2 KG/M3). GAS DENSITY AT 70F 1 ATM: .148 LB/FT3 (2.37 KG/M3).
7 -->Evaporation Rate: Not Provided
-->Solubility in H2O: INSOLUBLE.
. -->pH: Not Provided
10 -->Appearance & Odor: COLORLESS GAS WITH AN UNPLEASANT ODOR SIMILAR TO THAT WHICH IS EMITTED WHEN BURNING ANTHRACITE COAL.
11 -->State: GAS

SECTION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: 1.8.
2 -->Flammable Limits - UEL: 9.6.
3 -->Extinguishing Media: WATER, CARBON DIOXIDE, DRY CHEMICAL. ELECTRICAL CLASSIFICATION: CLASS 1, GROUP NOT SPECIFIED.
4 -->Special Fire Fighting Procedures: IF POSSIBLE, STOP THE FLOW OF ISOBUTYLENE. USE WATER SPRAY TO COOL SURROUNDING CONTAINERS.
5 -->Unusual Fire & Explosion Hazards: ISOBUTYLENE IS HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION. SHOULD FLAME BE EXTINGUISHED AND FLOW OF GAS CONTINUE, INCREASE VENTILATION TO PREVENT FLAMMABLE MIXTURE FORMATION IN LOW AREAS OR POCKETS. ISOBUTYLENE IS FLAMMABLE OVER A WIDE RANGE IN AIR.

SECTION 5 -- HEALTH HAZARD DATA

1 -->Effects of Overexposure: INHALATION: MODERATE CONCENTRATIONS SO AS TO EXCLUDE AN ADEQUATE SUPPLY OF OXYGEN TO THE LUNGS CAUSES DIZZINESS, DROWSINESS AND EVENTUAL UNCONSCIOUSNESS. IT ALSO HAS A VERY MILD ANESTHETIC EFFECT WHICH MIGHT CAUSE LACK OF COORDINATION OR LESSENED MENTAL ALERTNESS. SKIN AND EYE CONTACT: IT IS MILDLY IRRITATING TO MUSOUS MEMBRANES. DUE TO ITS RAPID RATE OF EVAPORATION, IT CAN CUASE TISSUE FREEZING OR FROSTBITE ON DERMAL CONTACT.
2 -->Threshold Limit Value: ISOBUTYLENE IS DEFINED AS A SIMPLE ASPHYXIANT. OXYGEN LEVELS SHOULD BE MAINTAINED AT GREATER THAN 18 MOLAR PERCENT AT NORMAL ATMOSPHERIC PRESSURE WHICH IS EQUIVALENT TO A PARTIAL PRESSURE OF 135 MM HG. (ACGIH, 1984-85). TWA (OSHA, 1985) FOR LPG (LIQUIFIED PETROLEUM GAS) IS 1,000 MOLAR PPM.
3 -->Permissible Exposure Limit: Not Provided
4 -->Other limit: Not Provided
5 -->Primary routes of entry: INHALATION, SKIN AND EYE CONTACT.
6 -->Emergency First Aid Procedures: PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ISOBUTYLENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD. INHALATION: CONSCIOUS PERSONS SHOULD BE ASSISTED TO AN UNCONTAMINATED AREA AND INHALE FRESH AIR. QUICK REMOVAL FROM THE CONTAMINATED AREA IS MOST IMPORTANT. UNCONSCIOUS PERSONS SHOULD BE MOVED TO AN UNCONTAMINATED AREA, GIVEN MOUTH-TO-MOUTH RESUSCITATION AND SUPPLEMENTAL OXYGEN. MEDICAL ASSISTANCE SHOULD BE SOUGHT IMMEDIATELY. DERMAL CONTACT OR FROSTBITE: REMOVE CONTAMINATED CLOTHING AND FLUSH AFFECTED AREAS WITH LUKEWARM WATER. DO NOT USE HOT WATER. A PHYSICIAN SHOULD SEE THE PATIENT PROMPTLY IF THE CRYOGENIC 'BURN' HAS RESULTED IN BLISTERING OF THE DERMAL SURFACE OR DEEP TISSUE FREEZING.

SECTION 6 -- REACTIVITY DATA

1 -->Stable: YES.
2 -->Conditions to Avoid: Not Provided
3 -->Incompatible Materials: OXIDIZERS.
4 -->Hazardous Decomposition Products: NONE.
5 -->Can Hazardous Polymerization Occur: NO.
6 -->Conditions to Avoid: Not Provided

SECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: EVACUATE ALL PERSONNEL FROM AFFECTED AREA. USE APPROPRIATE PROTECTIVE EQUIPMENT. IF LEAK IS IN USER'S EQUIPMENT, BE CERTAIN TO PURGE PIPING WITH AN INERT GAS PRIOR TO ATTEMPTING REPAIRS. IF LEAK IS IN CONTAINER OR CONTAINER VALVE, CONTACT THE CLOSEST LIQUID AIR CORPORATION LOCATION.
2 -->Waste Disposal Method: DO NOT ATTEMPT TO DISPOSE OF WASTE OR UNUSED QUANTITIES. RETURN IN THE SHIPPING CONTAINER PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE TO LIQUID AIR CORPORATION FOR PROPER DISPOSAL. FOR EMERGENCY DISPOSAL, CONTACT THE CLOSEST LIQUID AIR CORPORATION LOCATION.

3 -->CERCLA (Superfund) Reportable quantity (lbs): Not Provided
-->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided
-->Volatile Organic Compound (VOC) Theoretical: Not Provided
6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

SECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: POSITIVE PRESSURE AIR LINE WITH MASK OR SELF-CONTAINED BREATHING APPARATUS SHOULD BE AVAILABLE FOR EMERGENCY USE.
2 -->Local Exhaust: HOOD WITH FORCED VENTILATION, TO PREVENT ACCUMULATION ABOVE THE LEL.
3 -->Special: Not Provided
4 -->Mechanical: HOOD WITH FORCED VENTILATION, IN ACCORDANCE WITH ELECTRICAL CODES.
5 -->Other: Not Provided
6 -->Protective Gloves (Specify type): PLASTIC OR RUBBER.
7 -->Eye Protection (Specify type): SAFETY GOGGLES OR GLASSES.
8 -->Other Protective Equipment: SAFETY SHOES, SAFETY SHOWER, EYEWASH 'FOUNTAIN'.

SECTION 9 -- SPECIAL PRECAUTIONS

1 -->Precautions to be taken in Handling & Storage: USE ONLY IN WELL-VENTILATED AREAS. VALVE PROTECTION CAPS MUST REMAIN IN PLACE UNLESS CONTAINER IS SECURED WITH VALVE OUTLET PIPED TO USE POINT. DO NOT DRAG, SLIDE OR ROLL CYLINDERS. USE A SUITABLE HAND TRUCK FOR CYLINDER MOVEMENT. USE A PRESSURE REDUCING REGULATOR WHEN CONNECTING CYLINDER TO LOWER PRESSURE (<250 PSIG) PIPING OR SYSTEMS. DO NOT HEAT CYLINDER BY ANY MEANS TO INCREASE THE DISCHARGE RATE OF PRODUCT FROM THE CYLINDER. USE A CHECK VALVE OR TRAP IN THE DISCHARGE LINE TO PREVENT HAZARDOUS BACK FLOW INTO THE CYLINDER. PROTECT CYLINDERS FROM PHYSICAL DAMAGE. STORE IN COOL, DRY, WELL-VENTILATED AREA OF NON-COMBUSTIBLE CONSTRUCTION AWAY FROM HEAVILY TRAFFICKED AREAS AND EMERGENCY EXITS. DO NOT ALLOW THE TEMPERATURE WHERE CYLINDERS ARE STORED TO EXCEED 130F (54C). CYLINDERS SHOULD BE STORED UPRIGHT AND FIRMLY SECURED TO PREVENT FALLING OR BEING KNOCKED OVER. FULL AND EMPTY CYLINDERS SHOULD BE SEGREGATED. USE A 'FIRST IN-FIRST OUT' INVENTORY SYSTEM TO PREVENT FULL CYLINDERS BEING STORED FOR EXCESSIVE PERIODS OF TIME. POST 'NO SMOKING OR OPEN FLAMES' SIGNS IN THE STORAGE OR USE AREA. THERE SHOULD BE NO SOURCES OF IGNITION IN THE STORAGE OR USE AREA.
2 -->Other Precautions: ISOBUTYLENE IS NON-CORROSIVE AND MAY BE USED WITH ANY COMMON STRUCTURAL MATERIAL. EARTH-GROUND AND BOND ALL LINES AND EQUIPMENT ASSOCIATED WITH THE ISOBUTYLENE SYSTEM. ELECTRICAL EQUIPMENT SHOULD BE NON-SPARKING OR EXPLOSION PROOF. COMPRESSED GAS CYLINDERS SHOULD NOT BE REFILLED EXCEPT BY QUALIFIED PRODUCERS OF COMPRESSED GASES. SHIPMENT OF A COMPRESSED GAS CYLINDER WHICH HAS NOT BEEN FILLED BY THE OWNER OR WITH HIS (WRITTEN) CONSENT IS A VIOLATION OF FEDERAL LAW (49CFR).

SECTION 10 -- ADDITIONAL DATA

1 -->Additional Health Hazard Data: IT HAS A VERY MILD ANESTHETIC EFFECT; HOWEVER, THE MAJOR PROPERTY IS THE EXCLUSION OF AN ADEQUATE SUPPLY OF OXYGEN TO THE LUNGS. FROSTBITE EFFECTS ARE A CHANGE IN COLOR OF THE SKIN TO GRAY OR WHITE POSSIBLY FOLLOWED BY BLISTERING.

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FILE NAME? #105930
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FID : 105930 -

(P) HYDROCHLORIC ACID
MURIATIC ACID
CHLOROHYDRIC ACID
HYDROCHLORIDE
SAG 7309510

ANUFACTURER INFORMATION

*) MID:#533952
J.T. BAKER INC.
DUNS ACCOUNT #: 00-495-2123
EMERGENCY TELEPHONE #: 908/859-2151
222 RED SCHOOL LANE
CHEMTREC: 800/424-9300 & 800-424-8802
PHILLIPSBURG, NJ 08865

ORMULA INFORMATION

SER LAST UPDATE DATE : 030791
ORMULA STATUS : Incomplete
SER STATUS : User
SAGE STATUS : Unspecified
SDS ON FILE AT LOCATION 39001 : Yes
SDS ON FILE IN CSIS : Yes
AFE USE CATEGORY: Corrosives - Concentrated Acid - pH < 4

HIPPING INFORMATION
O 'IPPING NAME ON FILE FOR THIS F.I.D.
l. Point : NON-COMBUSTIBLE

NGREDIENTS

CAS#	Formulation	Chemical Name
07647010	36.5/38.0% BY WT	Hydrochloric acid

REGULATORY CONSIDERATIONS
Information compiled by TMCA. See bulletin
board file 'CRITLIST' for expanded key.)

CAS# LISTS

07647010 = 01, 03, 04, 09, 15, 17, 19, 23, 26, 28, 31, 32, 33, 34, 35, 37, 38, 39, 41, 42, 46, 47, 48, 53, 56, 59, 61, 65, 90.

- REGULATORY LIST KEY -

01 - OSHA-PEL	03 - ACGIH-TLV	04 - GM-Spec Chem	09 - FWPC-Sec 311
15 - Sup Tax Chem	17 - CA Haz Subst	19 - MA Subst	23 - MD Class II
26 - EPA-ChemConc	28 - WB Other Tox	31 - Allghny Cty	32 - IL-RTK
33 - OSHA-HHCL	34 - GM-AHCL DRFT	35 - GM-AHC	37 - MO Species
38 - MO-RTK	39 - ONT 654/86	41 - SARA312ExHaz	42 - WI TABLE 1
46 SARA312HzSub	47 - SARA 313	48 - CERCLASEC103	53 - MD ClsII .12
56 CT 29-3	59 - CA Air Tox 1	61 - PA RTK	65 - NJ W&C RTK
90 -			

(M) LOCATION CODE : 44001 57003(D)
44066 (O)33028 35006 19300
19078 44050(D) 36123 42158

ION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

1 -->Effective Date: 080786
2 -->MSDS signed by: Not Provided
3 -->Title: Not Provided
4 -->Comments: Not Provided
5 >Safe Use Category: 9 - CONCENTRATED ACID - pH < 4
6 -->Last Date Updated: 100686

ECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: INORGANIC ACID
2 -->Formula: HCl (AQUEOUS)

ECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: 100C (230F)
2 -->Specific Gravity: 1.19
3 -->Vapor Pressure: NS
4 -->% Volatile by Volume: 100%
5 -->% Solid by Weight: Not Provided
6 -->Vapor Density: 1.3
7 -->Evaporation Rate: NS
8 -->Solubility in H2O: COMPLETE
9 -->pH: NS
0 -->Appearance & Odor: CLEAR OR YELLOW LIQUID PUNGENT IRRITATING ODOR
1 -->State: LIQUID

ECTION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: NS
2 >Flammable Limits - UEL: NS
3 >Extinguishing Media: USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
4 -->Special Fire Fighting Procedures: FIRE FIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK. USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL. DO NOT GET WATER INSIDE CONTAINERS.
5 -->Unusual Fire & Explosion Hazards: HIGHLY CORROSIVE TO MOST METALS WITH EVOLUTION OF HYDROGEN GAS, WHICH IS HIGHLY FLAMMABLE WHEN MICED WITH AIR.

ON 5 -- HEALTH HAZARD DATA

-->Effects of Overexposure: MATERIAL IS CORROSIVE AND CAUSES SEVERE BURNS. MAY BE FATAL IF SWALLOWED. HIGHLY IRRITATING TO RESPIRATORY TRACT. MAY RESULT IN SEVERE LUNG DAMAGE FROM SHORT HIGH-LEVEL EXPOSURE.
2 -->Threshold Limit Value: 5 PPM, 7MG/M3 CEILING
3 -->Permissible Exposure Limit: NS
4 >Other limit: Not Provided
5 -->Primary routes of entry: Not Provided
6 -->Emergency First Aid Procedures: CALL A PHYSICIAN. EXTERNAL: IN CASE OF EYE CONTACT, FLUSH WITH WATER FOR AT LEAST 15 MINUTES.FOR SKIN CONTACT, FLOOD WITH TAP WATER, THEN WATER CONTAINING SODIUM BICARBONATE. INTERNAL: DO NOT GIVE EMETICS. GIVE TAP WATER, MILK OR MILK OF MAGNESIA. GIVE WHITES OF EGGS BEATEN WITH WATER. INHALATION: GET PATIENT TO FRESH AIR.

ECTION 6 -- REACTIVITY DATA

1 -->Stable: Y
2 -->Conditions to Avoid: NS
3 -->Incompatible Materials: REACTS WITH MOST METALS TO PRODUCE HYDROGEN GAS. OXIDIZING AGENTS: FORMS CHLORINE.
4 -->Hazardous Decomposition Products: NS
5 -->Can Hazardous Polymerization Occur: N
6 -->Conditions to Avoid: NS

ECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: COVER CONTAMINED SURFACE WITH SODIUM BICARBONATE OR SODA ASH - SLAKED LIME MIXTURE (50-50). MIX AND ADD WATER IF NECESSARY TO FORM SLURRY. SCOOP UP SLURRY AND WASH DOWN DRAIN WITH EXCESS WATER.
2 >Waste Disposal Method: HAZARDOUS WASTE: DILUTE 10 TIMES WITH WATER. USE WASTE ACID CONTAINER.
3 -->CERCLA (Superfund) Reportable quantity (lbs): Not Provided
4 -->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided
5 -->Volatile Organic Compound (VOC) Theoretical: Not Provided
6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

ECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: SELF CONTAINED BREATHING APPARATUS
2 -->Local Exhaust: Y
3 -->Special: NS
4 -->Mechanical: Y
5 -->Other: NS
6 -->Protective Gloves (Specify type): RUBBER
7 -->Eye Protection (Specify type): CHEMICAL GOGGLES, FACE SPLASH SHIELD
8 -->Other Protective Equipment: EYE WASH AND SAFETY SHOWER. APPROVED WORKING CLOTHES. HAVE BODY SHIELD AVAILABLE.

ION 9 -- SPECIAL PRECAUTIONS

-->Precautions to be taken in Handling & Storage: KEEP IN TIGHTLY CLOSED CONTAINER IN A COOL PLACE. LOOSEN CLOSURE CAREFULLY. WASH THOROUGHLY AFTER HANDLING.

2 -->Other Precautions: STORE SEPARATED FROM ALL OXIDIZING AGENTS.

S. ION 10 -- ADDITIONAL DATA

1 -->Additional Health Hazard Data: Not Provided

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024450

1980021

CHEMCENTRAL
CHEMCENTRAL/Detroit
13395 Huron River Dr.
Romulus, MI 48174

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A.* Midland, MI 48674 Emergency Phone: 517-636-4400

Product Code: 16896 Page: 1

PRODUCT NAME: CHLOROTHENE (R) SM SOLVENT

Effective Date: 05/12/89 Date Printed: 10/12/89 MSDS:001111

1. INGREDIENTS: (% w/w, unless otherwise noted)

1,1,1-Trichloroethane	CAS# 000071-55-6	96.5% (wt.)
Diethylene Ether (1,4-Dioxane)	CAS# 000123-91-1	2.5
1,2-Butylene oxide	CAS# 000106-88-7	0.47
Nitromethane	CAS# 000075-52-5	0.34

The hazard information presented is based on tests conducted on this or similiar mixtures. Therefore, pursuant to the OSHA Hazard Communication Standard (see 29 CFR Part 1910.1200 (g)(2)(b)), the information is based on the tested mixture and not individual ingredients.

2. PHYSICAL DATA:

BOILING POINT: 165F (74C)
VAP PRESS: 100 mmHg @ 20C
VAP DENSITY: 4.55
SOL. IN WATER: 0.07 g/100g @ 25C
SP. GRAVITY: 1.321 @ 25/25C
APPEARANCE: Colorless liquid.
ODOR: Irritating odor at high concentrations.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: None

METHOD USED: TOC, TCC, COC

FLAMMABLE LIMITS
LFL: 7.5% @ 25C
UFL: 12.5% @ 25C

EXTINGUISHING MEDIA: Water fog.

FIRE & EXPLOSION HAZARDS: Vapors of this solvent may develop a flammable atmosphere in confined or poorly-ventilated areas.

(Continued on Page 2)
(R) Indicates a Trademark of The Dow Chemical Company

* An Operating Unit of The Dow Chemical Company

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FIRE-FIGHTING EQUIPMENT: Wear positive pressure, self-contained breathing apparatus.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Avoid open flames, welding arcs or other high temperature sources which induce thermal decomposition.

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Prolonged contact with free water may result in corrosion and diminished stabilizer levels. Prolonged contact with, or storage in aluminum, its alloys, and particularly metallic aluminum and zinc powders should be avoided. These reactive metals can cause hydrochloric acid gas to form and, if confined as in an aerosol can or pump, the gas pressure may rupture the container.

HAZARDOUS DECOMPOSITION PRODUCTS: Hydrogen chloride and very small amounts of phosgene and chlorine.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Small leaks: Mop up, wipe up, or soak up immediately. Remove to out-of-doors.
Large spills: Evacuate area. Contain liquid; transfer to closed metal containers. Keep out of water supplies.

DISPOSAL METHOD: When disposing of the unused contents, the preferred options are to send to licensed reclaimer, or to

permitted incinerators. Any disposal practice must be in compliance with federal, state, and local regulations. Do not dump into sewers, on the ground, or into any body of water.

(Continued on Page 3)
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6. HEALTH HAZARD DATA:

EYE: May cause pain. May cause slight transient (temporary) irritation with slight transient corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause skin irritation. Repeated contact may cause drying or flaking of skin.

SKIN ABSORPTION: A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The LD50 for rabbits is about 15,000 mg/kg.

INGESTION: Single dose oral toxicity is low. The LD50 for rats is >10,000 mg/kg. If aspirated (liquid enters the lung), may be rapidly absorbed through the lungs and result in injury to other body systems.

INHALATION: Minimal anesthetic or narcotic effects may be seen in the range of 500-1000 ppm trichloroethane. Progressively higher levels over 1000 ppm may cause dizziness, drunkenness; concentrations as low as 10,000 ppm can cause unconsciousness and death. These high levels may also cause cardiac arrhythmias (irregular heartbeats). In confined or poorly ventilated areas, vapors which readily accumulate can cause unconsciousness and death.

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any significant adverse effects. The formulation containing 1,1,1-trichloroethane, 1,4-dioxane, 1,2-butylene oxide, and nitromethane was tested in long-term animal studies and did not cause cancer. Birth defects are unlikely. Exposures having no adverse effects on the mother should have no effect on the fetus. In animal studies, has been shown not to interfere with reproduction. Results of in vitro (test tube) mutagenicity tests have been negative. Results of mutagenicity tests in animals have been negative.

(Continued on Page 4)
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7. FIRST AID:

EYES: Irrigate immediately with water for at least 5 minutes.

SKIN: Wash off in flowing water or shower.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Because rapid absorption may occur through lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by an attending physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. Exposure may increase "myocardial irritability." Do not administer sympathomimetic drugs unless absolutely necessary. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): 1,1,1-Trichloroethane (methyl chloroform): OSHA PEL and ACGIH TLV are 350 ppm TWA, 450 ppm STEL. Dioxone (diethylene ether): OSHA PEL and ACGIH TLV are 25 ppm, Skin.

ACGIH TLV is 25 ppm (skin) for diethylene ether. OSHA PEL is 100 ppm (skin) for diethylene ether. Dow Industrial Hygiene Guide for 1,2-butylene oxide is 40 ppm (excursion 100 ppm). ACGIH TLV and OSHA PEL for nitromethane is 100 ppm.

VENTILATION: Control airborne concentrations below the exposure guideline. Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Lethal

(Continued on Page 5)

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8. HANDLING PRECAUTIONS: (CONTINUED)

concentrations may exist in areas with poor ventilation.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved positive pressure self-contained breathing apparatus.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. When prolonged or frequently repeated contact could occur, use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full body suit will depend on operation.

EYE PROTECTION: Use safety glasses. Where contact with liquid is likely, chemical goggles are recommended because eye contact with this material may cause discomfort, even though it is unlikely to cause injury.

9. ADDITIONAL INFORMATION:

REGULATORY REQUIREMENTS:

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

An immediate health hazard

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Handle

(Continued on Page 6)

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#1

HALOGENATED SOLVENT **SEE SPECIFIC MSDS FOR MORE INFORMATION**

CHEMICAL MATERIAL INFORMATION DOCUMENT

Material Identity: **Product Name** CHLOROTHENE (TRI CLEAN)
Manufacturer DOW CHEMICAL CORP.
Emergency Phone No. 517-636-4400

ROUTES OF ENTRY	EFFECTS OF OVEREXPOSURE*	EMERGENCY FIRST AID
Harmful by Inhalation	CNS Effects-Headache, Dizziness Nausea, Unconsciousness, Death Peripheral Neuropathy, Narcosis	Remove to Fresh Air. If Breathing Stops, Perform CPR. Get Immediate Medical Attention
Irritant, Skin & Eye	Dry or Cracked Skin. Rash. Redness and/or burning Itching	Flush with water Immediatley
May be harmful by Ingestion	Gastrointestinal Disturbance	Get Medical Attention
May be harmful by Skin Absorption	Possible Liver, Kidney, Blood Cardiac Effects. Cancer causing potential-animals	Get Medical Attention

*Individual materials may contain additonal chemical ingredients which have toxic properties and are listed in the NIOSH Registry of Toxic Effects of Chemical Substances, Patty's Industrial Hygiene and Toxicology, or Dangerous Properties of Industrial Materials.

USE INSTRUCTIONS- Do not use in confined areas without consulting Confined Space Procedure. Breathing vapors may be hazardous. Ventilation may be required, where feasible, to maintain concentrations below applicable limits (OSHA). Keep containers tightly closed when not in use or empty. Avoid contact with skin. Wash hands after use and before eating, drinking, smoking, or applying cosmetics. No smoking allowed in area of use. If clothing becomes contaminated, remove and wash skin with soap and water. Keep away from welding and heat sources such as, furnaces, radiators, flames, and molten metal. May be incompatible with chemically active metals such as aluminum and magnesium, forming toxic gas. Some chlorinated solvents under pressure may chemically react with aluminum creating an explosion hazard.

PERSONAL PROTECTIVE EQUIPMENT-Safety glasses or goggles if potential for splashing exists. Impervious gloves. Recommended glove type:_____
Respirator: yes___ no___ Respirator type:_____
Skin Absorption Hazard yes___ no___ Barrier Cream yes___ no___

FIRE FIGHTING INSTRUCTIONS-Contact Plant Security. Decomposes to yield toxic gas when heated. Use Class 'B' or 'C' fire extinguishing agent. Use water to cool exposed containers. Most Chlorinated Solvents will not burn, but excessive heat (welding torch or open flame) produces decomposition.

SPILL AND LEAK INSTRUCTIONS- Persons not wearing protective equipment should be restricted from spill area. Remove all ignition sources. Ventilate area of spill or leak. Material should not be allowed to enter a confined space, such as a sewer, because of the possibility of explosion. Evacuate and isolate area. Use absorbent material to contain spill. Contact the Ohio EPA, phone number 1-800-282-9378 for Emergency spill information. Material may be disposed of by atomizing in a suitable combustion chamber after checking local policy.

STORAGE INSTRUCTIONS- Store away from heat and direct sunlight. Store in approved containers. Storage requires separation from certain other reactive materials.

EMERGENCY INSTRUCTIONS - Immediatley wash contaminated skin with soap and water. If solvent soaks clothing, remove clothing and wash skin with soap and water. Eyes- Immediately wash the eyes with large amounts of water, occasionally lifting the upper and lower lids. Get Medical attention immediately. Contact lenses should not be worn when working with solvents.

Examples of products - Thinners, Fabric Cleaners, Penetrating Oils, Freons, Degreasers, Chlorinated Solvents(Methylene Chloride, Trichloroethylene, Perchloroethylene, Methyl Chloroform)

- FID : 072571 -
NP0001500
ETCHANT
FERRIC CHLORIDE
ET-1G
ET-4G
(P) HI-SPEED CIRCUIT ETCH
1949076
2580689

MANUFACTURER INFORMATION

(*) MID:#525119
PHILIP A. HUNT CHEMICAL CO
900 CARNEGIE ST
ROLLING MEADOWS, IL 60008

MID:#537400
C.M. PETERSON CO. LTD.,
DUNS ACCOUNT #: 20-731-5771
665 GLENGARRY AVE.,
WINDSOR, ONTARIO.
N9A 1R2. CANADA

FORMULA INFORMATION

USER LAST UPDATE DATE : 072987
FORMULA STATUS : Incomplete
USER STATUS : User
USER STATUS : Deactivated on 123189
MSDS ON FILE AT LOCATION 39001 : Yes
MSDS ON FILE IN CSIS : Yes
SAFE USE CATEGORY: Corrosives - Concentrated Acid - pH < 4

SHIPPING INFORMATION
NO SHIPPING NAME ON FILE FOR THIS F.I.D.
Flash Point : NONE

INGREDIENTS

CAS#	Formulation	Chemical Name
007705080	= 37.5% BY VOL	Ferric chloride
007732185	Balance	Water
007229507	Trace Amount	FREE ACID
989922679	Trace Amount	INSOLUBLES

REGULATORY CONSIDERATIONS
(Information compiled by TMCA. See bulletin board file 'CRITLIST' for expanded key.)

CAS# LISTS

007705080 = 09, 38, 46, 48, 61, 65.

- REGULATORY LIST KEY -

09 - FWPC-Sec 311; 38 - MO-RTK ; 46 - SARA312HzSub; 48 - CERCLASEC103;
61 - PA RTK ; 65 - NJ W&C RTK .

LOCATION CODE ?

65050 94017 39001(D)

DISPLAY USAGE?

DISPLAY G.M. MATERIAL SAFETY DATA SHEET? Y

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072571

ECTION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

1 -->Effective Date: 010886
2 -->MSDS signed by: Not Provided
3 -->Title: Not Provided
4 -->Comments: Not Provided
5 -->Safe Use Category: 9 - CONCENTRATED ACID - pH < 4
6 -->Last Date Updated: 043086

SECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: Not Provided
2 -->Formula: Not Provided

SECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: APPROX 212 F
2 -->Specific Gravity: 1.41
3 -->Vapor Pressure: 20
4 -->% Volatile by Volume: 85
5 -->% Solid by Weight: Not Provided
6 -->Vapor Density: Not Provided
7 -->Evaporation Rate: Not Provided
8 -->Solubility in H2O: COMPLETE
9 -->pH: Not Provided
10 -->Appearance & Odor: CLEAR, VERY DEEP AMBER COLORED LIQUID; ESSENTIALLY ODORLESS
11 -->State: Not Provided

SE ION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: Not Provided
2 -->Flammable Limits - UEL: Not Provided
3 -->Extinguishing Media: N/A
4 -->Special Fire Fighting Procedures: WATER SPRAY SHOULD BE USED TO COOL FIRE EXPOSED CONTAINERS AND/OR TO DISPERSE UNIGNITED VAPORS. USE NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS WHEN ANY MATERIAL IS INVOLVED IN A FIRE
5 -->Unusual Fire & Explosion Hazards: WHEN STRONGLY HEATED WILL LIBERATE HYDROGEN CHLORIDE

SECTION 5 -- HEALTH HAZARD DATA

1 -->Effects of Overexposure: BURNS TO ALL TISSUES CONTACTED. INHALATION MAY CAUSE EYE, MUCOUS MEMBRANE & RESPIRATORY TRACT IRRITATION. INGESTION MAY CAUSE NAUSEA, VOMITING, DIARRHEA. ACUTE: BURNS TO ALL TISSUE CONTACTED. EYE, MUCOUS MEMBRANE & RESPIRATORY IRRITATION
2 -->Threshold Limit Value: IRON SALTS: 1MG/M3, AMMONIUM CHLORIDE: 10MG/M3, HYDROGEN CHLORIDE: 5PPM C
3 -->Permissible Exposure Limit: Not Provided
4 -->Other limit: Not Provided
5 -->Primary routes of entry: INHALATION, DERMAL
6 -->Emergency First Aid Procedures: SKIN & EYES: FLUSH W/WATER FOR 15 MIN., CALL A PHYSICIAN. INGESTION: DRINK LARGE AMTS OF WATER. DO NOT INDUCE VOMITING. CALL A PHYSICIAN. INHALATION: REMOVE VICTIM TO FRESH AIR. CALL A PHYSICIAN

SECTION 6 -- REACTIVITY DATA

1 -->Stable: YES
2 -->Conditions to Avoid: HEAT
3 -->Incompatible Materials: STRONG ALKALIES, REDUCING AGENTS
4 -->Hazardous Decomposition Products: WHEN STRONGLY HEATED WILL LIBERATE HYDROGEN CHLORIDE
5 -->Can Hazardous Polymerization Occur: WILL NOT OCCUR
6 -->Conditions to Avoid: Not Provided

SECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: WEAR NIOSH/MSHA APPROVED POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS IN THE EVENT OF A MASSIVE SPILL OR A SMALL SPILL OF A HIGHLY HAZARDOUS CHEMICAL. FOLLOW OSHA REGULATIONS FOR RESPIRATOR USE. WEAR GOGGLES, COVERALLS, IMPERVIOUS GLOVES & BOOTS--NEOPRENE OR NBR. ISOLATE AREA OF SPILL BYDIKING. STOP SOURCE OF LEAK. TRANSFER CONTENTS TO NON-LEAKING CONTAINER OR STORAGE VESSEL. ADD DRY ABSORBENT. CLEAN UP & PLACE IN AN APPROVED DOT CONTAINER & SEAL. IN THE EVENT OF A LARGE SPILL, USE THE EMERG TELEPHONE NO.
2 -->Waste Disposal Method: DISPOSE OF CONTAMINATED PRODUCT, EMPTY CONTAINERS & MATERIALS USED INCLEANING UP SPILLS OR LEAKS IN A MANNER APPROVED FOR THIS MATERIAL. CONSULT APPROPRIATE FEDERAL, STATE & LOCAL REGULATORY AGENCIES TO ASCERTAIN PROPER PROCEDURES
3 -->CERCLA (Superfund) Reportable quantity (lbs): Not Provided
4 -->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided
5 -->Volatile Organic Compound (VOC) Theoretical: Not Provided
6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

SECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: NOT NORMALLY REQUIRED
2 -->Local Exhaust: RECOMMENDED
-->Special: Not Provided
4 -->Mechanical: Not Provided
5 -->Other: Not Provided
6 -->Protective Gloves (Specify type): RUBBER OR PLASTIC
7 -->Eye Protection (Specify type): GOGGLES OR FACE SHIELD
8 -->Other Protective Equipment: PROTECT CLOTHING W/WATERPROOF APRON

SECTION 9 -- SPECIAL PRECAUTIONS

1 -->Precautions to be taken in Handling & Storage: (CORROSIVE). STORE IN COOL (40-80 DEG F) AREA AWAY FROM STRONG ALKALIES, REDUCING AGENTS, & OTHER CORROSIVES. PROTECT CONTAINER FROM DAMAGE. KEEP PLAINLY LABELED
2 -->Other Precautions: Not Provided

SECTION 10 -- ADDITIONAL DATA

1 -->Additional Health Hazard Data: Not Provided

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- FID : 123115 -

(P) AMMONIUM CHLORIDE
SAL AMMONIA
CHEM17
EX.NO.5708
89C081
89L081

MANUFACTURER INFORMATION

(*) MID:#529957
FISHER SCIENTIFIC CO.
DUNS ACCOUNT #: 004-32-1519
EMERGENCY TELEPHONE #: 201/796-7100
1 REAGENT LANE
P.O. BOX 375
FAIRLAWN, NJ 07410

FORMULA INFORMATION

USER LAST UPDATE DATE : 030791
FORMULA STATUS : Complete
USER STATUS : User
USAGE STATUS : Unspecified
MSDS ON FILE AT LOCATION 39001 : Yes
MSDS ON FILE IN CSIS : Yes
SAFE USE CATEGORY: Corrosives - Acid/Base - Powder, Flake and Salt

SHIPPING INFORMATION
N' 'HIPPING NAME ON FILE FOR THIS F.I.D.
F. ..h Point : N/A

INGREDIENTS

CAS#	Formulation	Chemical Name
012125029	= 100%	Ammonium chloride

REGULATORY CONSIDERATIONS
(Information compiled by TMCA. See bulletin board file 'CRITLIST' for expanded key.)

CAS#	LISTS
012125029	= 03, 09, 17, 19, 31, 38, 39, 46, 48, 56, 61, 65.

- REGULATORY LIST KEY -

03 - ACGIH-TLV ;	09 - FWPC-Sec 311;	17 - CA Haz Subst;	19 - MA Subst ;
31 - Allghny Cty ;	38 - MO-RTK ;	39 - ONT 654/86 ;	46 - SARA312HzSub;
48 - CERCLASEC103;	56 - CT 29-3 ;	61 - PA RTK ;	65 - NJ W&C RTK .

(M) LOCATION CODE : (O)96003 62001
94017 65040 19300 35001
65090 19605 36123 41001
36001 19600(D) 39001

DISPLAY G.M. MATERIAL SAFETY DATA SHEET? y

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FID: 123115

SECTION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

1 -->Effective Date: 072587
-->MSDS signed by: GASTON L. PILLORI
3 -->Title: Not Provided
4 -->Comments: Not Provided
5 -->Safe Use Category: 10 - ACID/BASE - POWDER, FLAKE AND SALT
6 -->Last Date Updated: 082388

SECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: INORGANIC SALT
2 -->Formula: CL-H4-N MOLECULAR WEIGHT: 53.50

SECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: 520C. MELTING POINT: SUBL 644F (340C)
2 -->Specific Gravity: 1.5
3 -->Vapor Pressure: 1MM HG @ 321F
4 -->% Volatile by Volume: N/A
5 -->% Solid by Weight: Not Provided
6 -->Vapor Density: 1.9
7 -->Evaporation Rate: N/A
8 -->Solubility in H2O: 26.0 @ 15C
9 -->pH: 5.5 @1% SOLUTION @25C
10 -->Appearance & Odor: COLORLESS TO WHITE, ODORLESS CRYSTALS, CRYSTALLINE MASSES, OR POWDER WITH COOLING, SALINE TASTE.
11 -->State: *POWDER OR CRYSTALS

SECTION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: Not Provided
2 -->Flammable Limits - UEL: Not Provided
3 -->Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM. (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3).
4 -->Special Fire Fighting Procedures: MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. DO NOT SCATTER SPILLED MATERIAL WITH MORE WATER THAN NEEDED FOR FIRE CONTROL. DIKE FIRE CONTROL WATER FOR LATER DISPOSAL (1984 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.3, GUIDE PAGE 31). EXTINGUISH USING AGENT INDICATED. AVOID BREATHING HAZARDOUS VAPORS: KEEP UPWIND (BUREAU OF EXPLOSIVES, EMERGENCY HANDLING OF HAZARDOUS MATERIALS IN SURFACE TRANSPORTATION, 1981).
5 -->Unusual Fire & Explosion Hazards: NEGLIGIBLE FIRE AND EXPLOSION HAZARD.

SECTION 5 -- HEALTH HAZARD DATA

1 -->Effects of Overexposure: INHALATION (ACUTE): NO DATA AVAILABLE, HOWEVER, INHALAITON OF SOME AMMONIUM SALTS MAY CAUSE IRRITATION OF THE MOUTH, NOSE, AND THROAT. SEVERE EXPOSURE MAY CAUSE WHEEZING, CHEST PAIN, AND DELAYED PULMONARY EDEMA. (CHRONIC): REPEATED OR PROLONGED EXPOSURE MAY CAUSE IRRITATION. SKIN CONTACT (ACUTE): THERE MAY BE REDNESS AND IRRITATION. (CHRONIC): REPEATED OR PROLONGED CONTACT MAY CAUSE IRRITATION. EYE CONTACT (ACUTE): MAY CAUSE SEVERE REDNESS AND IRRITATION. (CHRONIC): CONJUNCTIVITIS. INGESTION (ACUTE): INGESTION OF AMMONIUM SALTS MAY PRODUCE NAUSEA, VOMITING, GASTRIC IRRITATION. LARGE DOSES (OVER 6 GRAMS) MAY CAUSE IN ADDITION, SYSTEMIC AMMONIA TOXIICITY; SYMPTOMS MAY INCLUDE HEAVY BREATHING, BLUE SKIN, DULLNESS, RESTLESSNESS, CONVULSIONS OR COMA. WORKERS WITH PRE-EXISTING IMPAIRED KIDNEY OR LIVER FUNCTIONS SHOULD BE CONSIDERED PARTICULARLY SUSCEPTIBLE.
2 -->Threshold Limit Value: ACGIH TWA: FUME: 10MG/M3
3 -->Permissible Exposure Limit: Not Provided
4 -->Other limit: ACGIH STEL: FUME: 20MG/M3
5 -->Primary routes of entry: INHALATION, SKIN/EYE CONTACT, INGESTION
6 -->Emergency First Aid Procedures: INHALATION: REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP AFFECTED PERSON WARM AND AT REST. GET MEDICAL ATTENTION IMMEDIATELY. SKIN CONTACT: REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER (APPROXIMATELY 15-20 MINUTES) UNTIL NO EVIDENCE OF CHEMICAL REMAINS. GET MEDICAL ATTENTION. EYE CONTACT: WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY. INGESTION: IF VICTIM IS CONSCIOUS, IMMEDIATELY GIVE 2 TO 4 GLASSES OF WATER, AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION 6 -- REACTIVITY DATA

1 -->Stable: YES (UNDER NORMAL CONDITIONS, BUT MAY BECOME UNSTABLE AT ELEVATED TEMPERATURES).
2 -->Conditions to Avoid: AVOID HEATING ABOVE THE MELTING POINT, WHERE SUBLIMATION OCCURS.
3 -->Incompatible Materials: CONTACT WITH BROMINE TRIFLUORIDE MAY CAUSE EXPLOSION. VIOLENT REACTION MAY OCCUR ON CONTACT WITH IODINE HEPTAFLUORIDE. FORMS UNSTABLE AMMONIUM PERCHLORATE IN COMBINATION WITH POTASSIUM CHLORATE. CAUSES VIOLENT DECOMPOSITION OF AMMONIUM NITRATE IN PRESENCE OF AMMONIUM CHLORIDE.
4 -->Hazardous Decomposition Products: NOT APPLICABLE. SUBLIMES UNCHANGED AT 340C.
5 -->Can Hazardous Polymerization Occur: NO (HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES).
6 -->Conditions to Avoid: Not Provided

SECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: SOIL SPILL: DIG A PIT, POND, LAGOON OR HOLDING AREA TO CONTAIN LIQUID OR SOLID MATERIAL. COVER SOLIDS WITH A PLASTIC SHEET TO PREVENT DISSOLVLING IN RAIN OR FIREFIGHTING WATER. WATER SPILL: ADD SUITABLE AGENT TO NEUTRALIZE SPILLED MATERIAL TO PH-7. USE ACTIVATED CARBON TO ABSORB SPILLED SUBSTANCE THAT IS DISSOLVED. USE MECHANICAL DREDGES OR LIFTS TO EXTRACT IMMOBOLIZED MASSES OF POLLUTION AND PRECIPITATES. OCCUPATIONAL SPILL: STOP LEAK IF YOU CAN DO IT WITHOUT RISK. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL.
2 -->Waste Disposal Method: Not Provided
3 -->CERCLA (Superfund) Reportable quantity (lbs): CERCLA RATINGS (SCALE 0-3): HEALTH=2; FIRE=0; REACTIVITY=1; PERSISTENCE=0.
4 -->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided
5 -->Volatile Organic Compound (VOC) Theoretical: Not Provided
6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

SECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: 10,000 MG/M3 FUME - SUPPLIED-AIR RESPIRATOR; SELF-CONTAINED BREATHING APPARATUS. DUST OR MIST - DUST/MIST RESPIRATOR. FIREFIGHTING - SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.
2 -->Local Exhaust: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.
3 -->Special: Not Provided
4 -->Mechanical: Not Provided
-->Other: Not Provided
6 -->Protective Gloves (Specify type): EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.
7 -->Eye Protection (Specify type): EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE. WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.
8 -->Other Protective Equipment: CLOTHING: EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

SECTION 9 -- SPECIAL PRECAUTIONS

1 -->Precautions to be taken in Handling & Storage: Not Provided
2 -->Other Precautions: Not Provided

SECTION 10 -- ADDITIONAL DATA

1 -->Additional Health Hazard Data: TOXICITY: 500MG/24 HOURS EYE-RABBIT SEVERE IRRITATION; 1650MG/KG ORAL-RAT LD50; 1000MG/KG ORAL-RABBIT LD50; 30MG/KG INTRAMUSCULAR-RAT LD50; 485MG/KG INTRAPERITONEAL-MOUSE LD50; 500MG/KG SUBCUTANEOUS-MOUSE LDLO; 78MG/KG INTRAVENOUS-RABBIT LDLO; CARCINOGEN STATUS: NONE. AMMONIUM CHLORIDE IS A MILD SKIN AND RESPIRATORY IRRITANT. IT IS A SEVERE EYE IRRITANT.

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DISPLAY SAFE USE INSTRUCTIONS? n
COMMAND? sel tn =
TRADE NAME? 1533

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

FZ 1912091

SECTION I

PRODUCT NAME OR NUMBER (as it appears on label) LARZIP-15	GM COMMON CODE
MANUFACTURER'S NAME Barrington Chemicals Co. 1912091	EMERGENCY TELEPHONE NO. 313-437-2022
ADDRESS (Number, Street, City, State and Zip Code) P.O.Box 847, 12865 Silver Lake Rd. Brighton, MI 48116	MANUFACTURER'S D-U-N-S NO.
HAZARDOUS MATERIAL DESCRIPTION, PROPER SHIPPING NAME, HAZARD CLASS, HAZARD ID NO. (49 CFR 172.101) Cleaning compound, corrosive material (09) Corrosive Material (173.240)	
ADDITIONAL HAZARD CLASSES (as applicable) N/A	
CHEMICAL FAMILY Caustic	FORMULA Complex trade secret

SECTION II — INGREDIENTS
(list all ingredients)

CAS REGISTRY NO.	%W	%V	CHEMICAL NAME(S)	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
1310-58-3	70-90%		Potassium Hydroxide	No
	10-30%		Complex trade secret	No

SECTION III — PHYSICAL DATA

BOILING POINT 218 °F ___ °C		SPECIFIC GRAVITY (H_2O = 1)	1.44		
VAPOR PRESSURE @ ___ °F ___ °C N/A ☐ mm Hg ☐ psi		PERCENT VOLATILE BY VOLUME (%)	N/A	PERCENT SOLID BY WEIGHT (%)	N/
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE (= 1)	N/A		
SOLUBILITY IN WATER	100%	pH = 100% @ 70° F.	14+		
APPEARANCE AND ODOR Amber viscous liquid--neutral odor				IS MATERIAL: (LIQUID) SOLID GAS PASTE POWDER	

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

FLASH POINT ___ °F ___ °C method used N/A	FLAMMABLE LIMITS	LEL N/A	UEL N/A
EXTINGUISHING MEDIA Water Fog			
SPECIAL FIRE FIGHTING PROCEDURES As appropriate for surrounding fire. Self-contained breathing apparatus with full face piece in pressure demand or other positive pressure mode.			
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A			

EFFECTS OF OVEREXPOSURE — Conditions to Avoid	THRESHOLD LIMIT VALUE ☐ PERMISSIBLE EXPOSURE LIMIT ☐
Irritant--Eyes-severe damage	OTHER LIMIT ☐
Skin-burns	

PRIMARY ROUTES OF ENTRY Inhalation ☐ Skin Contact ☒ Other (specify) Eyes

EMERGENCY AND FIRST AID PROCEDURES Skin--flush immediate exposed areas w/water 15 mins. Remove contaminated clothing, wash. Eyes--flush with water thoroughly lifting lids. Ingestion--DO NOT indume vomiting. Dilute by giving water. Give milk of magnesia. Get medical attention.

SECTION VI-REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID Do not mix with acids. Liberates flammable compounds.
	STABLE	X	

INCOMPATIBILITY (materials to avoid) Acids

HAZARDOUS DECOMPOSITION PRODUCTS: None

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID Same as above.
	WILL NOT OCCUR	X	

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Large--put in large tank of water & neutralize. Flush to drain w/large amt of water in accordance with applicable regulations. Small--neutralize w/6 m hydrochloric acid and flush down drain w/excess water.

WASTE DISPOSAL METHOD See above.

CERCLA (Superfund) REPORTABLE QUANTITY (in lbs) Unknown

RCRA HAZARDOUS WASTE NO. (40 CFR 261.33) Unknown

VOLATILE ORGANIC COMPOUND (VOC) (as packaged, minus water) N/A

☐ Theoretical 10.5 lb/gal ☐ Analytical _____ lb/gal N/A

SECTION VIII-SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

VENTILATION	LOCAL EXHAUST (Specify Rate) Sufficient to maintain	SPECIAL	N/A
	MECHANICAL (General) (Specify Rate) below TLV	OTHER	N/A

PROTECTIVE GLOVES (specify type) Rubber

EYE PROTECTION (specify type) Chemical splash goggles

OTHER PROTECTIVE EQUIPMENT Rubber boots and clothing to protect regular clothes.

SECTION IX-SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING Do not freeze. Store inside.

OTHER PRECAUTIONS Use caution in handling empty containers as they may contain product residue or fumes.

Seller agrees not to assert any claim (other than a claim for a patent infringement) against General Motors Corporation for any use or disclosure of any technical data or information disclosed in connection with this questionnaire.

PLEASE COMPLETE QUESTIONNAIRE AND RETURN TO:	
	Name (print) John C. Browne
	Signature JCBrowne
	Title President
	Date 1/28/87

EXXON CHEMICALS

MATERIAL SAFETY DATA SHEET

EXXON CHEMICAL AMERICAS • P.O. BOX 3272, HOUSTON, TEXAS 77001
A Division of EXXON CHEMICAL COMPANY, A Division of EXXON CORPORATION

05/02/89

NO. 9023000

SECTION I PRODUCT IDENTIFICATION & EMERGENCY INFORMATION

PRODUCT NAME
Isopropyl Alcohol, Anhydrous

CHEMICAL NAME
Isopropyl Alcohol — CAS 67-63-0

CHEMICAL FAMILY
Aliphatic Alcohol

PRODUCT APPEARANCE
Clear colorless liquid.

EMERGENCY TELEPHONE NUMBERS: EXXON CHEMICAL AMERICAS 713-870-6000
CHEMTREC 800-424-9300

SECTION II HAZARDOUS INGREDIENT INFORMATION

This product is hazardous as defined in 29 CFR1910.1200.

OSHA HAZARD
Flammable
PEL; TLV
Eye irritant

For additional information see Section III.

SECTION III HEALTH INFORMATION AND PROTECTION

NATURE OF HAZARD

EYE CONTACT:
Irritating, and will injure eye tissue if not removed promptly.

SKIN CONTACT:
Frequent or prolonged contact may irritate and cause dermatitis.
Low order of toxicity.

INHALATION:
High vapor concentrations are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anesthetic and may have other central nervous system effects.
Negligible hazard at ambient temperature (-18 to 38 Deg C; 0 to 100 Deg F)

INGESTION:
Minimal toxicity.
Small amounts of the liquid aspirated into the respiratory system during ingestion, or from vomiting, may cause bronchiopneumonia or pulmonary edema.

FIRST AID

EYE CONTACT:
Immediately flush eyes with large amounts of water for at least 15 minutes. Get prompt medical attention.

SKIN CONTACT:
Immediately flush with large amounts of water; use soap if available. Remove contaminated clothing, including shoes, after flushing has begun.

INHALATION:
Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

THIS INFORMATION RELATES TO THE SPECIFIC MATERIAL DESIGNATED AND MAY NOT BE VALID FOR SUCH MATERIAL USED IN COMBINATION WITH ANY OTHER MATERIALS OR IN ANY PROCESS. SUCH INFORMATION IS TO THE BEST OF OUR KNOWLEDGE AND BELIEF, ACCURATE AND RELIABLE AS OF THE DATE COMPILED. HOWEVER, NO REPRESENTATION, WARRANTY OR GUARANTEE IS MADE AS TO ITS ACCURACY, RELIABILITY OR COMPLETENESS. IT IS THE USER'S RESPONSIBILITY TO SATISFY HIMSELF AS TO THE SUITABILITY AND COMPLETENESS OF SUCH INFORMATION FOR HIS OWN PARTICULAR USE. WE DO NOT ACCEPT LIABILITY FOR ANY LOSS OR DAMAGE THAT MAY OCCUR FROM THE USE OF THIS INFORMATION NOR DO WE OFFER WARRANTY AGAINST PATENT INFRINGEMENT.

INGESTION:
If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

ACUTE TOXICITY DATA IS AVAILABLE UPON REQUEST

WORKPLACE EXPOSURE LIMITS

OSHA REGULATION 29CFR1910.1000 REQUIRES THE FOLLOWING PERMISSIBLE EXPOSURE LIMITS:
A TWA of 400 ppm (980 mg/m3) and a STEL of 500 ppm (1225 mg/m3) for Isopropyl Alcohol.

THE ACGIH RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMIT:
a TWA of 400 ppm (980 mg/m3), and a STEL of 500 ppm (1225 mg/m3) for Isopropyl Alcohol.

PRECAUTIONS

PERSONAL PROTECTION
For open systems where contact is likely, wear long sleeves, chemical resistant gloves, and chemical goggles.
Where contact may occur, wear safety glasses with side shields.
Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH/MSHA approved respirators may be necessary to prevent overexposure by inhalation.

VENTILATION
The use of mechanical dilution ventilation is recommended whenever this product is used in a confined space, is heated above ambient temperatures, or is agitated.
Use explosion-proof ventilation equipment.

SECTION IV FIRE & EXPLOSION HAZARD

FLASHPOINT: 54 DEG F METHOD: TCC NOTE: TOC: 19 Deg C (66 Deg F)
FLAMMABLE LIMITS: LEL: 2.0 UEL: 12.0 77 @ F
AUTOIGNITION TEMPERATURE: 662 DEG F NOTE: Minimum

GENERAL HAZARD
Flammable Liquid, can release vapors that form flammable mixtures at temperatures at or above the flashpoint.
"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.
Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

FIRE FIGHTING
Use water spray to cool fire exposed surfaces and to protect personnel.
Shut off "fuel" to fire. If a leak or spill has not ignited, use water spray to disperse the vapors.
Either allow fire to burn under controlled conditions or extinguish with alcohol type foam and dry chemical. Try to cover liquid spills with foam.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS
No unusual

SECTION V SPILL CONTROL PROCEDURE

LAND SPILL

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section VII) notify the National Response Center.
Vapors/dust can be harmful/fatal. Warn occupants of downwind areas.
Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.
Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

WATER SPILL

Eliminate sources of ignition. Vapors/dust can be harmful/fatal. Warn occupants and shipping in downwind areas.
Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

SECTION VI NOTES

HAZARD RATING INFORMATION

	NPCA/HMIS	NFPA
Health	3	1
Flammability	3	3
Reactivity	0	0

KEY

4 = Severe
3 = Serious
2 = Moderate
1 = Slight
0 = Minimal

SECTION VII REGULATORY INFORMATION

TSCA:

This product is listed on the TSCA Inventory at CAS Registry Number: 67-63-0

CERCLA:

Under the Comprehensive Response, Compensation, and Liability Act, (CERCLA), certain releases to air, land, or water may be reportable to the National Response Center at 800-424-8802. Circumstances surrounding the release and cleanup determine reportablity.
This product is not subject to CERCLA reporting requirements.

SARA TITLE III:

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Immediate health, Delayed Health, Fire.

COMPUCHEM LABORATORIES, INC.

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Randall L. Green
Delco Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE SAMPLE EXTRACTED	DATE TCLP PERFORMED	DATE HERBICIDES FRACTION ANALYZED
1.	HYPALON	376723	10/30/90	10/31/90	10/31/90	11/03/90

METHOD REFERENCE

To determine the concentration of Herbicides as required by the February 13, 1986 Federal Register for Waste Characterization, the analysis is performed following preparation of the sample as required in the June 13, 1986 Federal Register (Toxicity Characteristics Proposed Rule under the authority of Subtitle C of the Resources Conservation and Recovery Act or RCRA). This preparation method is intended to replace the SW-846 extraction procedures with an improved leaching test known as the Toxicity Characteristic Leaching Procedure (TCLP). The test simulates the leaching a waste undergo when land disposed. CompuChem® employs the TCLP methodology contained in Draft 13XX (revised October 4, 1985). The leachate resulting from the application of the TCLP can be assessed for a large number of organic and inorganic constituents.

Method Summary

The solid phase sample (maximum 100g) is placed in an extractor bottle with an amount of extraction fluid 20 times the weight of the solid. The bottle is closed, secured in a rotary extractor device and rotated for 18 hours at 30 rpm. Different extraction fluids are used depending upon the pH of the solid samples. After extraction, the TCLP extract is obtained by means of pressure filtration. For analysis, the herbicides present in the sample are separated based on chromatographic conditions. Once separated, the individual components are detected using an Electron Capture detector. Concentration is determined relative to the response of known standards.

SECTION VIII TYPICAL PHYSICAL & CHEMICAL PROPERTIES

SPECIFIC GRAVITY:
0.79 at 68/68

SOLUBILITY IN WATER, WT. % AT °F:
100.00 at 68

SP. GRAV. OF VAPOR, at 1 ATM AIR=1:
Greater than 1.00

EVAPORATION RATE, n-BU ACETATE=1:
2.5

VAPOR PRESSURE, mmHg at °F:
173 at 100
30 at 68

VISCOSITY OF LIQUID, CST AT °F:
3 at 77

FREEZING/MELTING POINT, °F:
Less than 32

BOILING POINT, °F:
180 to 181

SECTION IX REACTIVITY DATA

STABILITY:
Stable

CONDITIONS TO AVOID INSTABILITY:
Not Applicable

HAZARDOUS POLYMERIZATION:
Will not occur

COND. TO AVOID HAZARDOUS POLYMERIZATION:
Not Applicable

MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:
Caustics, amines, alkanolamines, aldehydes, ammonia, strong oxidizing agents, and chlorinated compounds.

HAZARDOUS DECOMPOSITION PRODUCTS:
None

SECTION X TRANSPORT AND STORAGE

U.S. DOT CLASSIFICATION:
Flammable liquid

ELECTROSTATIC ACCUMULATION HAZARD:
No, but use proper grounding procedure

STORAGE TEMPERATURE, °F:
Ambient

STORAGE/TRANSPORT PRESSURE, mmHg:
Atmospheric

UN NUMBER:
U.S. DOT Identification Number: UN 1219

LOADING/UNLOADING TEMPERATURE, °F:
Ambient

VISC. AT LOADING/UNLOADING TEMP., cST:
3

REFERENCE NUMBER: HDHA-C-00021

DATE PREPARED: MAY 2, 1989

SUPERCEDES ISSUE DATE: AUGUST 25, 1988

FOR ADDITIONAL PRODUCT INFORMATION, CONTACT YOUR TECHNICAL SALES REPRESENTATIVE
FOR ADDITIONAL HEALTH/SAFETY INFORMATION, CALL 713-870-6885

AFE USE INSTRUCTIONS SEE SPECIFIC MSDS FOR ADDITIONAL INFORMATION

SOLVENTS - FLASH POINT: < 100F

FID #:197079
Latest Revision Date: 01/01/86
Material Identity: ISOPROPYL ALCOHOL, ANHYDROUS

ROUTES OF EXPOSURE	EFFECTS OF OVEREXPOSURE *	EMERGENCY FIRST AID
HARMFUL BY INHALATION	CNS EFFECTS - HEADACHE, DIZZINESS, NAUSEA, UNCONSCIOUSNESS, DEATH	REMOVE TO FRESH AIR. CONTACT MEDICAL.
IRRITANT, EYE & SKIN	DRY OR CRACKED SKIN - RASH REDNESS AND/OR BURNING ITCHING	IMMEDIATELY FLUSH WITH WATER. CONTACT MEDICAL.
HARMFUL BY INGESTION	GASTROINTESTINAL DISTURBANCE	CONTACT MEDICAL.
MAY BE HARMFUL BY SKIN ABSORPTION	-	-
-	POSSIBLE LIVER, KIDNEY EFFECTS	-

Individual materials may contain additional chemical Ingredients which have toxic properties and are listed in the NIOSH Registry of Toxic Effects of Chemical substances.

USE INSTRUCTIONS

DO NOT USE IN CONFINED AREAS WITHOUT FIRST CONSULTING CONFINED SPACE PROCEDURE.
BREATHING VAPORS MAY BE HAZARDOUS. VENTILATION MAY BE REQUIRED, WHERE FEASIBLE, TO MAINTAIN CONCENTRATIONS BELOW APPLICABLE LIMITS (OSHA, GM EMPLOYE EXPOSURE GUIDELINES).
AVOID CONTACT WITH SKIN.
KEEP CONTAINER TIGHTLY CLOSED WHEN NOT IN USE OR EMPTY.
KEEP AWAY FROM HEAT, SPARKS, AND OPEN FLAMES.
CONTAINERS TO BE GROUNDED WHEN IN USE AND BONDED WHEN CONTENTS ARE TRANSFERRED TO ANOTHER CONTAINER.
USE APPROVED SAFETY CONTAINERS.
WASH HANDS AFTER USE AND BEFORE EATING, DRINKING, SMOKING OR APPLYING COSMETICS.
NO SMOKING ALLOWED IN AREA OF USE.

PERSONAL PROTECTIVE EQUIPMENT

SAFETY GLASSES OR GOGGLES IF POTENTIAL FOR SPLASHING EXISTS.
IMPERVIOUS GLOVES FOR PROLONGED USE. RECOMMENDED TYPE:
RESPIRATOR: YES NO RECOMMENDED TYPE:

FIRE FIGHTING INSTRUCTIONS

USE CLASS B OR C FIRE EXTINGUISHING AGENT.
USE WATER TO COOL EXPOSED CONTAINERS.

1524

GENERAL MOTORS CORPORATION
MATERIAL SAFETY DATA SHEET

==========

') 197079 ISOPROPYL ALCOHOL, ANHYDROUS
9981293
ISOPROPYL ALCOHOL
1524

SECTION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

1 -->Effective Date: 052385
2 -->MSDS signed by: NEX
3 -->Title: NEX
4 -->Comments: NONE
5 -->Safe Use Category: 2 - SOLVENTS - Flash Point: < 100F
6 -->Last Date Updated: 013087

SECTION 1 -- SHIPPING INFORMATION

1 -->Chemical Family: ALIPHATIC ALCOHOL
2 -->Formula: NEX

(*)MID: #533724
EXXON CHEMICAL AMERICAS
Emergency telephone #: 713/870-6000
PO BOX 3272
HOUSTON, TX 77001

MID: #537744
CHEMCENTRAL/CINCINNATI
Emergency telephone #: 713/870-6000
P.O. BOX 17067
CINCINNATI, OH 45217

Shipping Name: ALCOHOL,N.O.S.
Hazard Class: Flammable Liquid
U.N. Code: UN1987
Flash Point: 54 DEG F TCC

SECTION 2 -- INGREDIENTS

CAS#	Formulation	Chemical Name
000067630	= 100% BY WT	2-Propanol

REGULATORY CONSIDERATIONS
rmation compiled by TMCA. See bulletin
board file 'CRITLIST' for expanded key.)

CAS# LISTS

000067630 = 01, 03, 14, 17, 19, 23, 26, 31, 32, 34, 35, 37, 38, 39, 46.

- REGULATORY LIST KEY -

01 - OSHA-PEL ; 03 - ACGIH-TLV ; 14 - MI Air Pollu; 17 - CA Haz Subst;
19 - MA Subst ; 23 - MD Class II ; 26 - EPA ChemConc; 31 - Allshny Cty ;
32 - IL-RTK ; 34 - GM-AHCL DRFT; 35 - GM-AHC ; 37 - MO Species ;
38 - MO-RTK ; 39 - ONT 654/86 ; 46 - GM SP SOLV .

SECTION 3 -- PHYSICAL DATA

1 -->Boiling Point: 179.96 TO 181.04 DEG F
2 -->Specific Gravity: 2.0
3 -->Vapor Pressure: 7.501 @ 32 DEG F - 30.003 @ 68 DEG F
4 -->% Volatile by Volume: 100
5 -->% Solid by Weight: 0
6 -->Vapor Density: NEX
7 -->Evaporation Rate: 2.4
8 -->Solubility in H2O: 100% @ 68 DEG F
9 -->pH: NEX
10 -->Appearance & Odor: CLEAR COLORLESS LIQUID WITH AN ALCOHOL ODOR
11 >State: LIQUID

SECTION 4 -- FIRE AND EXPLOSION DATA

1 -->Flammable Limits - LEL: 2.0
2 -->Flammable Limits - UEL: 12.0
3 -->Extinguishing Media: WATER SPRAY, ALCOHOL FOAM, DRY CHEMICAL
4 -->Special Fire Fighting Procedures: USE WATER SPRAY TO COOL FIRE EXPOSED SURFACES AND TO PROTECT PERSONNEL. SHUT OFF FUEL TO FIRE. IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS. EITHER ALLOW FIRE TO BURN UNDER CONTROLLED CONDITIONS OR EXTINGUISH WITH ALCOHOL TYPE FOAM AND DRY CHEMICAL. TRY TO COVER LIQUIDSPILLS WITH FOAM.
5 -->Unusual Fire & Explosion Hazards: FLAMMABLE LIQUID, CAN RELEASE VAPORS THAT FORM FLAMMABLE MIXTURES AT TEMPERATURES AT OR ABOVE THE FLASHPOINT. EMPTY PRODUCT CONTAINERS MAY CONTAIN PRODUCT RESIDUE. DO NOT PRESSURIZE, CUT, HEAT, WELD OR EXPOSE CONTAINERS TO FLAME OR OTHER SOURCES OF IGNITION.

TION 5 -- HEALTH HAZARD DATA

-->Effects of Overexposure: EYE CONTACT - SEVERELY IRRITATING. IF NOT PROMPTLY REMOVED, WILL INJURE EYE TISSUE, WHICH MAY RESULT IN PERMANENT DAMAGE.SKIN CONTACT - FREQUENT OR PROLONGED CONTACT MAY IRRITATE AND CAUSE DERMATITIS. LOW ORDER OF TOXICITY.INHALATION - HIGH VAPOR CONCENTRATIONS ARE IRRITATING TO THE EYES AND THE RESPIRATORY TRACT. MAY CAUSE HEADACHES AND DIZZINESS. ARE ANESTHETIC AND MAY HAVE OTHER CENTRAL NERVIOUS SYSTEM EFFECTS. NEGLIGIBLE HAZARD AT AMBIENT TEMPERATURE (-18 TO 38 DEG C).INGESTION - MINIMAL TOXICITY.

2 -->Threshold Limit Value: 400PPM

3 -->Permissible Exposure Limit: STEL 500PPM

4 -->Other limit: NEX

5 -->Primary routes of entry: INHALATION AND SKIN CONTACT

6 -->Emergency First Aid Procedures: EYE CONTACT - IMMEDIATELY FLUSH EYES WITHLARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. GET PROMPT MEDICAL ATTENTION.SKIN CONTACT - FLUSH WITH LARGE AMOUNTS OF WATER: USE SOAP IF AVAILABLE.INHALATION -'USING PROPER RESPIRATORY PROTECTION, IMMEDIATELY REMOVE THE AFFECTED VICTIM FROM EXPOSURE. ADMINISTER ARTIFICIAL RESPIRATION IF BREATHING IS STOPPED. KEEP AT REST. CALL FOR PROMPT MEDICAL ATTENTION.INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. KEEP AT REST.GET PROMPT MEDICAL ATTENTION.

SECTION 6 -- REACTIVITY DATA

1 -->Stable: Y

2 -->Conditions to Avoid: NA

-->Incompatible Materials: CAUSTICS, AMINES, ALKANOLAMINES, ALDEHYDES, AMMONIS,STRONG OXIDIZING AGENTS, AND CHLORINATED COMPOUNDS.

4 -->Hazardous Decomposition Products: NONE

5 -->Can Hazardous Polymerization Occur: N

6 -->Conditions to Avoid: NA

SECTION 7 -- SPILL OR LEAK PROCEDURES

1 -->Steps to be taken in case material is released or spilled: ELIMINATE SOURCES OF IGNITION. PREVENT ADDITIONAL DISCHARGE OF MATERIAL, IF POSSIBLE TO DO SO WITHOUT HAZARD. FOR SMALL SPILLS IMPLEMENT CLEANUP PROCEDURES: FOR LARGE SPILLS IMPLEMENT CLEANUP PROCEDURES; AND IF IN PUBLIC AREA, KEEP PUBLIC AWAY AND ADVISE AUTHORITIES. PREVENT LIQUID FROM ENTERING SEWERS, WATER COURSES, OR LOW AREAS. CONTAIN SPILLED LIQUID WITH SAND OR EARTH. DO NOT USE COMBUSTIBLE MATERIALS SUCH AS SAWDUST.RECOVER BY PUMPING (USE AN EXPLOSION PROOF PUMP OR HAND PUMP) OR WITHASUITABLE ABSORBENT.

2 -->Waste Disposal Method: CONSULT AN EXPERT ON DISPOSAL OF RECOVERED MATERIAL AND ENSURE CONFORMITY TO LOCAL DISPOSAL REGULATIONS.

3 -->CERCLA (Superfund) Reportable quantity (lbs): NEX

4 -->RCRA Hazardous Waste No. (40 CFR 261.33): NEX

5 -->Volatile Organic Compound (VOC) Theoretical: NEX

6 -->Volatile Organic Compound (VOC) Analytical: NEX

TION 8 -- SPECIAL PROTECTION INFORMATION

-->Respiratory Protection: USE PROPER RESPIRATORY PROTECTION
2 -->Local Exhaust: YES
3 -->Special: NEX
4 -->Mechanical: NEX
5 -->Other: NEX
6 -->Protective Gloves (Specify type): CHEMICAL RESISTANT
7 -->Eye Protection (Specify type): YES
8 -->Other Protective Equipment: NEX

SECTION 9 -- SPECIAL PRECAUTIONS

1 -->Precautions to be taken in Handling & Storage: USE PROPER GROUNDING
2 -->Other Precautions: NEX

SECTION 10 -- ADDITIONAL DATA

1 -->Additional Health Hazard Data: Not Provided

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(P) 197079 ISOPROPYL ALCOHOL, ANHYDROUS
197079 9981293
197079 ISOPROPYL ALCOHOL
197079 1524

1524

RISK ASSESSMENT WORKSHEET

Company: Chemcentral
Address: P.O. Box 17067 Cincinnati, OH 45217
Product: Isopropyl Alcohol, Anhydrous

MATERIAL SAFETY DATA SHEET CHECKLIST:

YES	NO	Section 1 - General
⊘	O	Manufacturer's Name
⊘	O	Product Name or Number
⊘	O	Address
⊘	O	Hazardous Materials Description
O	⊘	Additional Hazard Class
⊘	O	Chemical Family
⊘	O	Formula
⊘	O	Emergency Telephone Number
		Section 2 - Ingredients
⊘	O	CAS Registry Number
O	⊘	% Weight % Volume (100% listed)
⊘	O	Chemical Name(s)
O	⊘	Carcinogen (NTP,IARC,OSHA)
		Section 3 - Physical Data
⊘	O	Boiling Point
⊘	O	Vapor Pressure
⊘	O	Vapor Density
⊘	O	Solubility in Water
⊘	O	Appearance and Odor
⊘	O	Specific Gravity
O	⊘	Percent Volatile by Volume
⊘	O	Evaporation Rate
O	⊘	pH
O	⊘	Percent Solid by Weight
		Section 4 - Fire & Explosion
⊘	O	Flash Point
⊘	O	Flammable Limits
⊘	O	Extinguishing Media
⊘	O	Special fire Fighting Procedures
⊘	O	Unusual Fire & Explosion Hazards

YES	NO	Section 5 - Health Hazard
O	⊘	Effects of Overexposure
⊘	O	Threshold Limit Value
⊘	O	Emergency & First Aid
O	⊘	Primary Routes of Entry
		Section 6 - Reactivity Dat
⊘	O	Stability
⊘	O	Incompatibility
⊘	O	Hazardous Decomposition
⊘	O	Hazardous Polymerization
		Section 7 - Spill or Leak
⊘	O	Steps to be taken-Release
⊘	O	Waste Disposal Method
O	⊘	CERCLA-Reportable Quantity
O	⊘	RCRA Hazard Waste Number
O	⊘	Volatile Organic Compound
		Section 8 - Special ProtectionInformation
⊘	O	Respiratory Protection
⊘	O	Ventilation
⊘	O	Protective Gloves
⊘	O	Eye Protection
⊘	O	Other Protective Equipment
		Section 9 - Special
O	⊘	Precautions for handling
O	⊘	Other Precautions
⊘	O	Date
O	⊘	Signature

PHYSICAL RISK ASSESSMENT:

Solubility in Water:
- O Negligible (0-0.1%)
- O Slight (0.1-1%)
- O Moderate (1-10%)
- O Appreciable (10% +)
- ⊘ Complete (100%)

pH: NA
- O Strongly Acidic 1-4
- O Weakly Acidic 5-7
- O Weakly Basic 8-9
- O Strongly Basic 10-14

Boiling Point:
- O Less than 100F
- ⊘ Greater than 100F
- O 200F and Higher
- O 300F and Higher
- O 400F and Higher

Physical Appearance:
- ⊘ Liquid
- O Solid
- O Gas
- O Powder
- O Paste

Specific Gravity:
- O Less Than 1 (Floats)
- ⊘ Greater Than 1 (Sinks)

Type of Container NA
- O 55 gallon drum
- O 5 gallon pail
- O 1 gallon jug/pail
- O Tube applicator
- O Bag

FIRE AND REACTIVITY ASSESSMENT:

O Very flammable gas, very volatile flammable liquid which forms explosive mixtures in air (FP less than 73F, BP less than 100F, NFPA Class 1A).

O Materials that are readily capabl of detonation or explosive decomp osition at normal temperatures and pressures.

O Liquids which can be ignited under almost all normal temperature conditions (FP 73-100F; BP above 100F; NFPA Class 1B and 1C).

Liquids which must be moderately heated before ignition will occur and solids which give off flammable vapors (FP Above 100F but less than 200F, BP Above 100F; NFPA Class 2 & 3).

O Materials must be preheated before ignition (FP above 200F; NFPA Class 3B).

O Will not burn.

Materials that are capable of detonation or explosive reaction but require a strong initiating source or must be heated under confinement before initiation; or materials that react explosively with water.

O Materials that are normally stable and will readily undergo violent chemical change but will not detona These materials may also react with water violently.

O Materials that are normally stable but become unstable at high temperatures and pressures. These materials may react with water but will not release energy violently.

O Materials that are normally stable, even under fire conditions, and will not react with water.

EXPLOSIVE LIMIT RANGE ASSESSMENT:

Range difference 20-30; FP less than 100F; BP less than 100F.
Range difference 10-15; FP greater than 100F less than 200F; BP equal to or above 100F equal to or less than 250F.
) Range difference 5-10; FP greater than 100F; BP greater than 250F equal to or less than 350F.
O Range difference 5-10; FP greater than 200F; BP greater than 350F.
O Not Flammable.

% Volatile: NA
O 5-10 or less O 10-20 O 20-30 O 30-40 O 40-50 O 50-60 O 60-80 O 80-10(

Vapor Pressure:
O less than 0.1 mmHg @ STP.
Greater than 0.1 mmHg @ STP.

HEALTH HAZARD ASSESSMENT:

Skin:
O Absorbed through skin. Extremely irritating. Can cause skin/eye burns or substantial irritation in short period of time.

O Strong sensitizer, can cause serious dermatitis or irreversible alterations (burns) on contact.

Moderately irritating to some persons when in contact for prolonged period or following relatively few short-term contacts.

O Mildly irritating on prolonged/repeated contact.

O Nonirritating or produces mild transient irritation following prolonged or repeated contact.

Respiratory:

Causes fibrosis, toxic metals, nerve poisons, blood toxins, other systemic poisons that cause injury to one or more organs or immediate/delayed lung damage.

O Allergen, CNS depressant, chemical asphyxiant. Inhalation can cause delayed or immediate lung damage. Strong irritant affecting deep lung tissue.

- Inhalation causes inflammation of upper respirator tract. Includes simple asphyxiants. Concentration more important than duration of exposure.
- Inhalation can cause minor irritation to upper respiratory tract on prolonged or repeated exposure.
- Slightly or nonirritating. Readily reversible effects upon repeated or prolonged exposure.

Carcinogenic Risk:

- Carcinogenic, Mutagenic, Teratogenic in man (NTP,IARC,OSHA List).
- Cancer suspect - Man. Animal carcinogen, mutagen, teratogen (in two or more species by two or more routes of exposure).
- Suspect carcinogen, mutagen, teratogen - animal (in one or more species by one of three routes of exposure).
- Ames test positive. Single acute dose causes non-malignant/malignant tumors in animal.
- No carcinogenic potential.

Toxicity Assessment:

- Extremeley Toxic: Oral-1mg/Kg, Skin-5mg/Kg, Air-10ppm or less.
- Highly Toxic: Oral-1-50mg/Kg, Skin-5-43mg/Kg, Air-10-100ppm.
- Moderately Toxic: Oral-50-500mg/Kg, Skin-44-340mg/Kg, Air-100-1,000ppm.
- Slightly Toxic: Oral-0.5-5g/Kg, Skin-0.35-2.81g/Kg, Air-1,000-10,000ppm.
- Practically Non-Toxic: Oral-5-15g/Kg, Skin-2.82-22.59g/Kg, Air -10^4-10^5 ppm.

Environmental Risk Assessment:

- Solvent use greater than 8 lbs. per hour or 40 lbs. per day requires the use of environmental control equipment.
- Solvent use if material is heated and is greater than 3 lbs. per hour or 15 lbs. per day requires the use of environmental control equipment.
- Any operation requiring ventilation exhaust equipment may require an EPA permit application to be filed before commencement of the process.
- Any contaminant discharged to the sewer requires city approval and or pretreatment.
- Any waste stream determined to be hazardous by EPA standards requires a RCRA permit application before begining operations.
- Local emergency response notification (SARA) - see checklist.
- IS material ignitable, EP toxic, corrosive, reactive?

(If any of the above items are checked approval cannot be granted until the proper permit applications are completed and filed with the EPA)

Label Information:

Health: 2, Fire: 3, Reactivity: 0, Special: /

Comments: _____

Label Safe Use Category Number: 2

Date of Assessment: 8-18-88

3678003

MATERIAL SAFETY DATA SHEET

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17067
Cincinnati, OH 45217

UNOCAL 76

UNOCAL CHEMICALS DIVISION
PETROCHEMICALS GROUP

Product Name: MINERAL SPIRITS 66/3
Product Code No: 11104

Issue Date: 7/23/

MANUFACTURER:

UNOCAL CHEMICALS DIVISION
UNION OIL COMPANY OF CALIFORNIA
1345 N. MEACHAM
SCHAUMBURG, ILLINOIS 60196

CONTACT FOR FURTHER INFORMATION:
MSDS COORDINATOR (312) 490-2500

RECEIVED APR 15 1987 HEALTH & SAFETY

Transportation Emergencies
Call CHEMTREC
(800) 424-9300 Cont. U.
(202) 483-7616 (Collect
from Alaska & Hawaii
Health Emergencies:
CALL LOS ANGELES POISON
INFORMATION CENTER (24 hrs
(213) 664-2121

PRODUCT IDENTIFICATION

PRODUCT NAME: MINERAL SPIRITS 66/3

SYNONYMS: AMSCO SOLV 1104

GENERIC NAME: VOLATILE SOLVENT

CHEMICAL FAMILY: HYDROCARBON MIXTURE

DOT PROPER SHIPPING NAME: PETROLEUM NAPHTHA

ID NUMBER: UN1255

DOT HAZARD CLASSIFICATION: COMBUSTIBLE LIQUID

CAS NUMBER: 64742-47-8

NFPA 704 [illegible]
1 2 0

NONE

64742-47-8

SECTION I - HAZARDOUS INGREDIENTS/EXPOSURE LIMITS

	TLV	UNITS	AGENCY	TYPE
C9-C12 PARAFFINS	NOT ESTABLISHED			
C9-C12 CYCLOPARAFFINS	NOT ESTABLISHED			
AROMATIC HYDROCARBONS	NOT ESTABLISHED			

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY
Have physician call LOS ANGELES POISON INFORMATION CENTER (24 hrs.) (213) 664-2121

EYE CONTACT:

IF IRRITATION OR REDNESS FROM EXPOSURE TO VAPORS DEVELOPS, MOVE VICTIM AWAY FROM EXPOSURE AND INTO FRESH AIR. IF IRRITATION OR REDNESS PERSISTS, SEEK MEDICAL ATTENTION. FOR DIRECT CONTACT, FLUSH THE AFFECTED EYE(S) WITH CLEAN WATER. SEEK MEDICAL ATTENTION.

SKIN CONTACT:

REMOVE CONTAMINATED CLOTHING. CLEANSE AFFECTED AREA(S) THOROUGHLY BY WASHING WITH MILD SOAP AND WATER. IF IRRITATION OR REDNESS DEVELOPS AND PERSISTS, SEEK MEDICAL ATTENTION.

SECTION II - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY
Have physician call LOS ANGELES POISON INFORMATION CENTER (24 hrs.) (213) 664-212

INHALATION (BREATHING):

IF IRRITATION OF NOSE OR THROAT DEVELOPS, MOVE VICTIM AWAY FROM SOURCE OF EXPOSURE AND INTO FRESH AIR. IF IRRITATION PERSISTS, SEEK MEDICAL ATTENTION. IF VICTIM IS NOT BREATHING, ARTIFICIAL RESPIRATION SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. IF BREATHING DIFFICULTIES DEVELOP, OXYGEN SHOULD BE ADMINISTERED BY QUALIFIED PERSONNEL. SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION (SWALLOWING):

ASPIRATION HAZARD: DO NOT INDUCE VOMITING OR GIVE ANYTHING BY MOUTH BECAUSE THIS MATERIAL CAN ENTER THE LUNGS AND CAUSE SEVERE LUNG DAMAGE. IF VICTIM IS DROWSY OR UNCONSCIOUS, PLACE ON THE LEFT SIDE WITH THE HEAD DOWN. IF POSSIBLE, DO NOT LEAVE VICTIM UNATTENDED. SEEK MEDICAL ATTENTION.

SECTION III - HEALTH HAZARDS/ROUTES OF ENTRY

EYE CONTACT:

THIS PRODUCT MAY CAUSE EYE IRRITATION. DIRECT CONTACT WITH THE LIQUID OR EXPOSURE TO ITS VAPORS OR MISTS MAY CAUSE BURNING, TEARING AND REDNESS.

SKIN CONTACT:

THIS PRODUCT MAY CAUSE SKIN IRRITATION. PROLONGED OR REPEATED EXPOSURE TO THIS MATERIAL MAY CAUSE REDNESS AND BURNING, DRYING AND CRACKING OF THE SKIN AND DERMATITIS. PERSONS WITH PRE-EXISTING SKIN DISORDERS MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS MATERIAL.

INHALATION (BREATHING):

INHALATION OF EXCESSIVE CONCENTRATIONS OF VAPORS OR MISTS MAY CAUSE: IRRITATION OF THE NOSE AND THROAT. SIGNS OF NERVOUS SYSTEM DEPRESSION (E.G., DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE). PERSONS WITH IMPAIRED LUNG FUNCTION OR ASTHMA-LIKE CONDITIONS MAY EXPERIENCE ADDITIONAL BREATHING DIFFICULTIES DUE TO THE IRRITANT PROPERTIES OF THIS MATERIAL.

INGESTION (SWALLOWING):

INGESTION OF EXCESSIVE QUANTITIES MAY CAUSE: IRRITATION OF THE DIGESTIVE TRACT. SIGNS OF NERVOUS SYSTEM DEPRESSION (E.G., DROWSINESS, DIZZINESS, LOSS OF COORDINATION, AND FATIGUE). ASPIRATION HAZARD - THIS MATERIAL CAN ENTER LUNGS DURING SWALLOWING OR VOMITING AND CAUSE LUNG INFLAMMATION AND DAMAGE.

COMMENTS:

THIS SUBSTANCE HAS NOT BEEN IDENTIFIED AS A CARCINOGEN OR PROBABLE CARCINOGEN BY NTP, IARC OR OSHA.

SECTION IV - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF CURRENT VENTILATION PRACTICES ARE NOT ADEQUATE FOR MINIMIZING EXPOSURES, ADDITIONAL VENTILATION OR EXHAUST SYSTEMS MAY BE REQUIRED. WHERE EXPLOSIVE MIXTURES MAY BE PRESENT, SYSTEMS SAFE FOR SUCH LOCATIONS SHOULD BE USED.

SECTION IV - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

RESPIRATORY PROTECTION MAY BE NECESSARY TO MINIMIZE EXPOSURE TO VAPORS OR GASES. DEPENDING ON THE NATURE AND CONCENTRATION OF THE AIRBORNE MATERIAL, USE A RESPIRATOR OR GAS MASK WITH APPROPRIATE CARTRIDGES AND CANNISTERS (NIOSH APPROVED, IF AVAILABLE) OR SUPPLIED AIR EQUIPMENT.

PROTECTIVE GLOVES:

THE USE OF GLOVES IMPERMEABLE TO THE SPECIFIC MATERIAL HANDLED IS ADVISED TO PREVENT SKIN CONTACT AND POSSIBLE IRRITATION.

EYE PROTECTION:

APPROVED EYE PROTECTION TO SAFEGUARD AGAINST POTENTIAL EYE CONTACT, IRRITATION OR INJURY IS RECOMMENDED.

OTHER PROTECTIVE EQUIPMENT:

IT IS SUGGESTED THAT A SOURCE OF CLEAN WATER BE AVAILABLE IN WORK AREA FOR FLUSHING EYES AND SKIN. IMPERVIOUS CLOTHING SHOULD BE WORN AS NEEDED.

SECTION V - REACTIVITY DATA

STABILITY:

STABLE

INCOMPATIBILITY (MATERIALS TO AVOID):

THIS PRODUCT IS INCOMPATIBLE WITH STRONG ACIDS OR BASES, OXIDIZING AGENTS AND SELECTED AMINES.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION IN THE PRESENCE OF AIR MAY YIELD CARBON MONOXIDE AND/OR CARBON DIOXIDE.

HAZARDOUS POLYMERIZATION:

WILL NOT OCCUR

SECTION VI - SPILL OR LEAK PROCEDURES

HIGHWAY OR RAILWAY SPILLS
Call CHEMTREC (800) 424-9300 Cont. U.S.
(Collect) (202) 483-7616 from Alaska & Hawaii

PRECAUTIONS IN CASE OF RELEASE OR SPILL:

STAY UPWIND AND AWAY FROM SPILL. KEEP ALL SOURCES OF IGNITION AND HOT METAL SURFACES AWAY FROM SPILL. IF SPILL IS INDOORS, VENTILATE AREA OF SPILL. FOAM, ESPECIALLY HIGH EXPANSION FOAM, MAY BE USED TO SUPPRESS VAPORS. KEEP OUT OF DRAINS, SEWERS OR WATERWAYS. USE SAND OR OTHER INERT MATERIAL TO DAM AND CONTAIN SPILL. DO NOT FLUSH AREA WITH WATER. FOR SMALL SPILLS, DO NOT FLUSH WITH WATER; USE ABSORBANT PADS. CALL SPILL RESPONSE TEAM IF LARGE SPILL. NOTIFY APPROPRIATE STATE/LOCAL AGENCIES.

WASTE DISPOSAL METHOD:

DISPOSE OF PRODUCT IN ACCORDANCE WITH LOCAL, COUNTY, STATE, AND FEDERAL REGULATIONS.

SECTION VII - STORAGE AND SPECIAL PRECAUTIONS

HANDLING AND STORAGE PRECAUTIONS:

KEEP CONTAINERS TIGHTLY CLOSED. KEEP CONTAINERS COOL, DRY, AND AWAY FROM SOURCES OF IGNITION. USE AND STORE THIS PRODUCT WITH ADEQUATE VENTILATION. AVOID INHALATION OF VAPORS AND PERSONAL CONTACT WITH THE PRODUCT. USE GOOD PERSONAL HYGIENE PRACTICE. "EMPTY" CONTAINERS RETAIN RESIDUE (LIQUID AND/OR VAPOR) AND CAN BE DANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. "EMPTY" DRUMS SHOULD BE COMPLETELY DRAINED, PROPERLY BUNGED AND PROMPTLY SHIPPED TO THE SUPPLIER OR A DRUM RECONDITIONER. ALL OTHER CONTAINERS SHOULD BE DISPOSED OF IN AN ENVIRONMENTALLY SAFE MANNER AND IN ACCORDANCE WITH GOVERNMENTAL REGULATIONS. BEFORE WORKING ON OR IN TANKS WHICH CONTAIN OR HAVE CONTAINED THIS PRODUCT, REFER TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS, ANSI Z49.1, AND OTHER GOVERNMENTAL AND INDUSTRIAL REFERENCES PERTAINING TO CLEANING, REPAIRING, WELDING, OR OTHER CONTEMPLATED OPERATIONS.

SECTION VIII - FIRE AND EXPLOSION HAZARD DATA

NFPA HAZARD CLASS
HEALTH HAZARD: 1
FLAMMABILITY: 2
REACTIVITY: 0
OTHER: -

HAZARD RANKING
0 = LEAST
1 = SLIGHT
2 = MODERATE
3 = HIGH
4 = EXTREME

HMIS HAZARD CLASS
HEALTH: 1
FLAM: 2
REACT: 0
P.P.E.: -

LOWER EXPLOSIVE LIMIT (% VOL.)
0.7

UPPER EXPLOSIVE LIMIT (% VOL.)
6.0

FLASH POINT
107, TCC F

EXTINGUISHING MEDIA:

SMALL FIRES: EXTINGUISH WITH DRY CHEMICAL, CO2 OR FOAM. LARGE FIRES: THE USE OF DRY CHEMICAL OR FOAM IS RECOMMENDED. WATER MAY BE AN INEFFECTIVE EXTINGUISHING AGENT.

FIRE & EXPLOSION HAZARDS:

THIS MATERIAL IS COMBUSTIBLE AND MAY BE IGNITED BY HEAT OR FLAME. THIS MATERIAL WILL BURN, BUT WILL NOT IGNITE READILY.

FIRE FIGHTING PROCEDURES:

THE USE OF A SCBA IS RECOMMENDED FOR FIRE FIGHTERS. WATER SPRAY MAY BE USEFUL IN MINIMIZING VAPORS AND COOLING CONTAINERS EXPOSED TO HEAT AND FLAME. AVOID SPREADING BURNING LIQUID WITH WATER USED FOR COOLING PURPOSES.

SECTION IX - PHYSICAL DATA

APPROX. BOILING POINT
318 TO 383 F

VAPOR DENSITY (AIR = 1)
4.8

VAPOR PRESSURE
2.6 MM HG @ 20C

EVAPORATION RATE (N-BUTYL ACETATE = 1)
0.13

% VOLATILE
100%

% SOLUBILITY IN WATER
NEGLIGIBLE (< 5%)

SPECIFIC GRAVITY (TEMP/TEMP)
0.772 (60F/60F)

APPEARANCE
CLEAR, HAS LITTLE IF ANY COLOR

ODOR
CHARACTERISTIC

SECTION XI - DOCUMENTARY INFORMATION

ISSUE DATE: 7/23/86 PRODUCT CODE NO. 11104

PREV. DATE: 10/20/80 PREV. PROD. CODE NO. 1104

MSDS NO: 6283 PREV. MSDS NO: 857

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

MATERIAL SAFETY DATA SHEET

SAFETY-KLEEN CORP.
777 Big Timber Rd.
Elgin, IL 60123

safety-kleen corp

IDENTITY *(As Used on Label and List)*	*Note: Blank spaces are not permitted. If any item is not applicable, or information is available, the space must be marked to indicate th*
Safety-Kleen 105 Solvent-MS #6617	

Section I

Manufacturer's Name Safety-Kleen Corporation	Emergency Telephone Number 312/697-8460
Address *(Number, Street, City, State, and ZIP Code)* 777 Big Timber Road	Telephone Number for Information 312/697-8460
Elgin, Illinois 60123	Date Prepared 09/12/86 Revised 05/26/87, 09/29/87, 10/06/88, 10/20/88
	Signature of Preparer *(optional)*

Section II—Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))		OSHA PEL	ACGIH TLV	Other Limits Recommended	% *(optiona*
Mineral Spirits	CAS No. 8032-32-4	500 ppm	100 ppm	N/A	99.9+
Dye	N/A	Unknown	Unknown	unk.	0.003
Anti-Static Agent	N/A	Unknown	Unknown	100 est.	1 ppm

Section III—Physical/Chemical Characteristics

Boiling Point (°F)	310-400	Specific Gravity ($H_2O = 1$)	0.775-0.795
Vapor Pressure (mm Hg.) @ 68°F (20°C)	2	Melting Point	N/A
Vapor Density (AIR = 1)	4.9	Evaporation Rate (Toluene = 1)	0.2
Solubility in Water Negligible.		VOC	795g./L

Appearance and Odor
Clear green liquid with characteristic hydrocarbon odor.

Section IV—Fire and Explosion Hazard Data

Flash Point (Method Used) 105 °F TCC	Flammable Limits	LEL 0.7	UEL 6.0

Extinguishing Media
CO_2, foam, dry chemical, water (mist only)

Special Fire Fighting Procedures
None.

Unusual Fire and Explosion Hazards
None.

Section V—Reactivity Data

Stability			Conditions to Avoid
	Unstable		
	Stable	X	Heat, sparks, flame and fire.

Incompatability *(Materials to Avoid)*
Strong oxidizing agents.

Hazardous Decomposition or Byproducts
Normally none; however, incomplete burning may yield carbon monoxide.

Hazardous Polymerization			Conditions to Avoid
	May Occur		N/A
	Will Not Occur	X	

Section VI—Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	Yes.	Yes.	Yes.

Health Hazards *(Acute and Chronic)*
Skin: Can cause drying of skin. Eyes: Severe irritant. Inhalation: Excessive inhalation can cause headache, dizziness and nausea. Ingestion: Harmful or fatal if swallowed.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	Not listed.	Not listed.	No.

Not a known or suspected carcinogen.

Signs and Symptoms of Exposure
Drying of skin, eye irritation, headache, dizziness, nausea.

Medical Conditions
Generally Aggravated by Exposure Unknown.

Emergency and First Aid Procedures
Skin: Wash with soap and water. Eyes: Irrigate with water. Inhalation: Remove to fresh air source and call a physician. Ingestion: DO NOT induce vomiting. Call a physician.

Section VII—Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled
Catch and collect for recovery as soon as possible. Avoid exposure to sparks, fire, flame, hot surface.

Waste Disposal Method
Dispose of in accordance with company, local, state and federal regulations.

Precautions to Be Taken in Handling and Storing
Combustible. Keep away from heat, sparks, flame. Use with adequate ventilation. Avoid long and repeated contact with skin. If clothes are inadvertently saturated with solvent - DO NOT SMOKE. Remove the solvent saturated clothes immediately to avoid skin rash. Keep away from ignition sources. Keep out of reach of children.

Section VIII—Control Measures

Respiratory Protection *(Specify Type)*
Self-contained breathing apparatus for concentrations above TLV limits.

Ventilation	Local Exhaust	Special
	Normal room ventilation.	None.
	Mechanical *(General)*	Other
	None.	None.

Protective Gloves	Eye Protection
In case of prolonged contact, wear rubber gloves.	Yes - Eyeglasses, safety glasses.

Other Protective Clothing or Equipment
N/A

Work/Hygeienic Practices
Do not smoke while using this solvent.

KN 1597 KN 1597
FIO 102576
No SVI

Shell

CHEMCENTRAL
CHEMCENTRAL/Cincinnati
P.O. Box 17067
Cincinnati, OH 45217

MATERIAL SAFETY DATA SHEET

97368 (4-85)

MSDS NUMBER ▶ 5,060-4 PAGE

24 HOUR EMERGENCY ASSISTANCE	GENERAL MSDS ASSISTANCE
SHELL: 713-473-9461 CHEMTREC: 800-424-9300	SHELL: 713-241-4819

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
3	3	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

*For acute and chronic health effects refer to the discussion in Section III

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ... AND PASS IT ON
(PRODUCT LIABILITY LAW REQUIRES IT)

SECTION I

NAME

PRODUCT ▶	METHYL ISOBUTYL KETONE
CHEMICAL NAME ▶	2-PENTANONE,4-METHYL-
CHEMICAL FAMILY ▶	KETONE
SHELL CODE ▶	31135

NFPA 704 DESIGNATION: 3 3 0

CIN # 880

CAS # 78-93-3

RECEIVED MAR 27 1987 HEALTH & SAFETY

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	METHYL ISOBUTYL KETONE	108-10-1	100

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P *	2.08 G/KG (RAT)	>20 ML/KG (RABBIT)	2000 PPM/4H (RAT) 0/6 DEATHS 4000 PPM/4H (RAT) 6/6 DEATHS

SECTION III HEALTH INFORMATION

THE HEALTH EFFECTS NOTED BELOW ARE CONSISTENT WITH REQUIREMENTS UNDER THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200).

EYE CONTACT
LIQUID IS SLIGHTLY TO SEVERELY IRRITATING TO THE EYES. VAPORS ARE ALSO IRRITATING.

SKIN CONTACT
LIQUID IS SLIGHTLY TO MODERATELY IRRITATING TO SKIN. PROLONGED OR REPEATED LIQUID CONTACT CAN RESULT IN DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION
VAPORS ARE MODERATELY TOXIC; MAY PRODUCE CNS DEPRESSION. VAPORS MAY ALSO IRRITATE THE UPPER RESPIRATORY TRACT.

INGESTION
LIQUID IS MODERATELY TOXIC AND MAY BE HARMFUL IF SWALLOWED; MAY PRODUCE CNS DEPRESSION. MAY ALSO CAUSE IRRITATION TO UPPER DIGESTIVE TRACT.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS (CENTRAL NERVOUS SYSTEM) DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING EYE, SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO METHYL ISOBUTYL KETONE.

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
P	100 PPM		50 PPM	75 PPM	

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

EYE CONTACT
IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT
FLUSH SKIN WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. IF IRRITATION OCCURS, GET MEDICAL ATTENTION. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION
NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC.* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN
*NOTE TO THE PHYSICIAN: IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15 CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

ALTHOUGH THE SIGNIFICANCE TO HUMANS IS UNKNOWN, IN MALE RATS EXPOSED BY INHALATION TO VAPORS (UP TO 1000 PPM) FOR 90 DAYS, EVIDENCE OF SLIGHT KIDNEY DAMAGE WAS OBSERVED.

SECTION VII — PHYSICAL DATA

BOILING POINT: 241 (DEG F)

SPECIFIC GRAVITY: 0.81 (H2O=1) (60 DEG F.)

VAPOR PRESSURE: 15 AT 68 (MM HG) DEG F.

MELTING POINT: -118 (DEG F)

SOLUBILITY IN: MODERATE (WATER)

VAPOR DENSITY: 3.5 (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1) 1.6

APPEARANCE AND ODOR: COLORLESS, MOBILE LIQUID. PLEASANT ODOR.

SECTION VIII
FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
60 DEG F. (TCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: 1.4 HIGHER: 7.5

EXTINGUISHING MEDIA
USE WATER FOG, "ALCOHOL" FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
WARNING. FLAMMABLE. CLEAR FIRE AREA OF UNPROTECTED PERSONNEL. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX
REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, SPARKS, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS
CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

SECTION X
EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
AVOID PROLONGED OR REPEATED BREATHING OF VAPORS.IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SEC. IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER A FULL-FACE, ATMOSPHERE-SUPPLYING RESPIRATOR OR AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS.

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES, OR PROLONGED/REPEATED CONTACT WITH SKIN. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. WEAR CHEMICAL RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA INDICATE THE BEST PROTECTION IS PROVIDED BY POLYVINYL ALCOHOL GLOVES.

ADDITIONAL PROTECTIVE MEASURES
USE EXPLOSION-PROOF VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.AIR-DRY CONTAMINATED CLOTHING IN A WELL VENTILATED AREA BEFORE LAUNDERING.

SECTION XI
ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
WARNING. FLAMMABLE. ELIMINATE ALL IGNITION SOURCES. HANDLING EQUIPMENT MUST BE GROUNDED TO PREVENT SPARKING. *** LARGE SPILLS *** EVACUATE THE HAZARD AREA OF UNPROTECTED PERSONNEL. WEAR APPROPRIATE RESPIRATOR AND PROTECTIVE CLOTHING. SHUT OFF SOURCE OF LEAK ONLY IF SAFE TO DO SO. DIKE AND CONTAIN. IF VAPOR CLOUD FORMS, WATER FOG MAY BE USED TO SUPPRESS; CONTAIN RUN-OFF. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; PLACE IN NON-LEAKING CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE; DISPOSE OF FLUSH SOLUTIONS AS ABOVE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND PLACE IN NON-LEAKING CONTAINERS; SEAL TIGHTLY FOR PROPER DISPOSAL.

WASTE DISPOSAL
UNDER EPA - RCRA (40 CFR 261.33), IF METHYL ETHYL KETONE BECOMES A WASTE MATERIAL, IT WOULD BE A HAZARDOUS WASTE, HAZARDOUS WASTE NUMBER U161. REFER TO LATEST EPA OR STATE REGULATIONS REGARDING PROPER DISPOSAL.

ENVIRONMENTAL HAZARDS
EPA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT. UNDER EPA-CERCLA ("SUPERFUND") RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE REPORTABLE QUANTITY MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

SECTION XII — SPECIAL PRECAUTIONS

KEEP LIQUID AND VAPOR AWAY FROM HEAT, SPARKS AND FLAME. SURFACES THAT ARE SUFFICIENTLY HOT MAY IGNITE EVEN LIQUID PRODUCT IN THE ABSENCE OF SPARKS OR FLAME. EXTINGUISH PILOT LIGHTS, CIGARETTES AND TURN OFF OTHER SOURCES OF IGNITION PRIOR TO USE AND UNTIL ALL VAPORS ARE GONE. VAPORS MAY ACCUMULATE AND TRAVEL TO IGNITION SOURCES DISTANT FROM THE HANDLING SITE; FLASH-FIRE CAN RESULT. KEEP CONTAINERS CLOSED WHEN NOT IN USE. USE WITH ADEQUATE VENTILATION.

CONTAINERS, EVEN THOSE THAT HAVE BEEN EMPTIED, CAN CONTAIN EXPLOSIVE VAPORS. DO NOT CUT, DRILL, GRIND, WELD OR PERFORM SIMILAR OPERATIONS ON OR NEAR CONTAINERS. STATIC ELECTRICITY MAY ACCUMULATE AND CREATE A FIRE HAZARD. GROUND FIXED EQUIPMENT. BOND AND GROUND TRANSFER CONTAINERS AND EQUIPMENT.

SECTION XIII — TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION: FLAMMABLE LIQUID
D.O.T. PROPER SHIPPING NAME: FLAMMABLE LIQUID, N.O.S.

OTHER REQUIREMENTS:
UN1993. GUIDE SHEET 26.

SECTION XIV — OTHER REGULATORY CONTROLS

THIS PRODUCT IS LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

THE INFORMATION CONTAINED HEREIN IS BASED ON THE DATA AVAILABLE TO US AND IS BELIEVED TO BE CORRECT. HOWEVER, SHELL MAKES NO WARRANTY, EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF. SHELL ASSUMES NO RESPONSIBILITY FOR INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN.

DATE PREPARED: JULY 11, 1985

ORIGINAL SIGNED BY:

JOHN P. SEPESI

BE SAFE

READ OUR PRODUCT
SAFETY INFORMATION ...AND PASS IT ON
(PRODUCT LIABILITY LAW
REQUIRES IT)

SHELL OIL COMPANY
PRODUCT SAFETY AND COMPLIANCE
P. O. BOX 4320
HOUSTON, TX 77210

Fisher Scientific Company

Chemical Manufacturing Division
P. O. Box 375, 1 Reagent Lane
Fair Lawn, NJ 07410

2555 850

MATERIAL SAFETY DATA SHEET (Adapted from USDL From LSD-005-4) (201) 796-7100

SECTION I. IDENTIFICATION OF PRODUCT

CHEMICAL NAME	FORMULA
Perchloric Acid	$HClO_4$

SYNONYM OR CROSS REFERENCE

SECTION II. HAZARDOUS INGREDIENTS

MATERIAL	NATURE OF HAZARD
Perchloric Acid	Oxidizer, corrosive

SECTION III. PHYSICAL DATA

BOILING POINT 200°C	MELTING POINT -18°C
VAPOR PRESSURE(mm Hg) unknown	SPECIFIC GRAVITY 1.6
VAPOR DENSITY (AIR = 1) unknown	PERCENT VOLATILE BY VOLUME (%) 100%
WATER SOLUBILITY complete	EVAPORATION RATE (ether = 1) greater than 1

APPEARANCE Colorless liquid

SECTION IV. FIRE AND EXPOSION HAZARD DATA

FLASH POINT (method used)	FLAMMABLE LIMITS	Uel	Lel
(°F) NA	NA		

FIRE EXTINGUISHING MEDIA foam, CO_2, dry chemical

SPECIAL FIRE-FIGHTING PROCEDURES Wear self-contained breathing apparatus. When heated to decomposition, emits toxic fumes of chlorides.

UNUSUAL FIRE AND EXPLOSION HAZARD Fire and explosion hazard when mixed with carbonaceous material or finely divided metals. A powerful oxidizer. ~~Explosion hazard by chemical reaction.~~

SECTION V. HEALTH HAZARD

THRESHOLD LIMIT VALUE
None listed

HEALTH HAZARDS
May be fatal if swallowed. Causes severe burns.

FIRST AID PROCEDURES Ingestion: Do not induce vomiting, give large quantity of water. Contact a physician immediately. Skin & eyes: Flush with water for at least 15 minutes, consult a physician.

See Disclaimer on reverse side.

SECTION VI. REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

IMCOMBATIBILITY (material to avoid)

Carbonaceous material, finely divided metals, reducing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

When heated to decomposition emits toxic fumes of chlorides.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII. SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Cover with soda ash. Scoop up and place in a suitable container.

WASTE DISPOSAL METHOD

DISPOSE OF BY MEANS AS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS OR CONTACT AN APPROVED AND LICENSED DISPOSAL AGENCY.

SECTION VIII. PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

Face mask with acid vapor canister

VENTILATION	LOCAL acceptable	SPECIAL
	MECHANICAL (general) preferred	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
rubber	safety glasses; face shield

OTHER PROTECTIVE EQUIPMENT

SECTION IX. HANDLING AND STORAGE PRECAUTIONS

STORAGE AND HANDLING

Keep away from heat and oxidizable materials.

SECTION X. MISCELLANEOUS INFORMATION

INFORMATION FURNISHED BY:	TITLE
Gaston L. Pillori	Manager of Quality Assurance

The above information is believed to be accurate and represents the best information currently available to us. However, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

REV. NO. 0 DATE: June 27, 1980

FID 117957

Tool ~~KEY #~~ 2555850

F.S. ~~HM.CC~~ APPR. DATE SP339500

FID # _____

**PERCHLORIC ACID N/10 IN

**PERCHLORIC ACID N/10 IN
**PERCHLORIC ACID N/10 IN
**PERCHLORIC ACID N/10 IN

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY CONTACTS
GASTON L. PILLORI
(201) 796-7100

DATE 02/06/88
PO NBR: AW029196 AB99
ACCT: 302859-02
INDEX: 12880350041
CAT NO: SP339500

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SUBSTANCE IDENTIFICATION

SUBSTANCE: **PERCHLORIC ACID N/10 IN GLACIAL ACETIC ACID**

TRADE NAMES/SYNONYMS:
SO-P-339; ACC40130

CERCLA RATINGS (SCALE 0-3): HEALTH=2 FIRE=2 REACTIVITY=2 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=2 REACTIVITY=1

COMPONENTS AND CONTAMINANTS

COMPONENT: PERCHLORIC ACID H-CL-O4 PERCENT: 0.006
CAS 7601-90-3

COMPONENT: ACETIC ANHYDRIDE C4-H6-O3 PERCENT: 2.5
CAS 106-24-7

COMPONENT: GLACIAL ACETIC ACID C2-H4-O2 PERCENT: 97.4
CAS 64-19-7

EXPOSURE LIMITS:
ACETIC ACID, GLACIAL:
10 PPM OSHA TWA; 10 PPM ACGIH TWA; 15 PPM ACGIH STEL
ACETIC ANHYDRIDE:
5 PPM OSHA TWA; 5 PPM ACGIH CEILING

PHYSICAL DATA

DESCRIPTION: COLORLESS LIQUID WITH A PUNGENT, VINEGAR-LIKE ODOR.

ODOR IS A SATISFACTORY WARNING PROPERTY. BOILING POINT: 244 F (118 C)

MELTING POINT: 63 F (17 C) SPECIFIC GRAVITY: 1.05

PR SURE: 11 MMHG @ 20 C EVAPORATION RATE: (BU ACI TE=1) 0.97

H: 2.4 (10M ACETIC AC) SOLUBILITY IN WATER: MISICIBLE

VAPOR DENSITY: 2.1

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:
MODERATE FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME. ACETIC ACID MAY REACT EXPLOSIVELY WITH OXIDIZING MATERIALS. GIVES OFF FLAMMABLE/ EXPLOSIVE VAPORS ABOVE ITS FLASH POINT, 104 F. VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL CONSIDERABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.

FLASH POINT: 106 F (41 C) (CC) FLAMMABILITY CLASS(OSHA): II

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. COOL FIRE-EXPOSED CONTAINERS WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT.

TOXICITY

GLACIAL ACETIC ACID: 50 MG/24 HOURS SKIN-HUMAN MILD IRRITATION; 525 MG OPEN SKIN-RABBIT SEVERE IRRITATION; 50 MG/24 HOURS SKIN-RABBIT MILD IRRITATION; 50 UG EYE-RABBIT SEVERE IRRITATION; 3310 MG/KG ORAL-RAT LD50; 1060 MG/KG SKIN-RABBIT LD50; 16,000 PPM/4 HOURS INHALATION-RAT LC50; 816 PPM/3 MINUTES INHALATION-HUMAN TCLO; 4960 MG/KG ORAL-MOUSE LD50; 5620 PPM/1 HOUR INHALATION-MOUSE LC50; 525 MG/KG INTRAVENOUS-MOUSE LD50; 1200 SUBCUTANEOUS-RABBIT LDLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS); CARCINOGEN STATUS: NONE; SEVERE EYE, MUCOUS MEMBRANE AND SKIN IRRITANT AND SKIN SENSITIZER.

ACETIC ANHYDRIDE: 10 MG/24 HOURS SKIN-RABBIT MILD IRRITATION; 540 MG OPEN SKIN-RABBIT MILD IRRITATION; 250 UG EYE-RABBIT SEVERE IRRITATION; 1780 MG/KG ORAL-RAT LD50; 1000 PPM/4 HOURS INHALATION-RAT LCLO; 4000 MG/KG SKIN-RABBIT LD50; CARCINOGEN STATUS: NONE; SEVERE EYE, MUCOUS MEMBRANE, AND SKIN IRRITANT AND SKIN SENSITIZER.

HEALTH EFFECTS AND FIRST AID

INHALATION:
CORROSIVE.
1000 PPM GLACIAL ACETIC ACID IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.
1000 PPM ACETIC ANHYDRIDE IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE
GLACIAL ACETIC ACID: LOW LEVELS MAY CAUSE MUCOUS MEMBRANE IRRITATION, COUGHING, CHOKING, DYSPNEA, HEADACHE, DIZZINESS AND WEAKNESS. DELAYED SYMPTOMS ARE PULMONARY EDEMA, ANGINA, FROTHY SPUTUM, CYANOSIS, RALES AND HYPOTENSION. EXPOSURE TO 50 PPM IS INTOLERABLE TO MOST INDIVIDUALS.
ACETIC ANHYDRIDE: CAUSES THE SAME SYMPTOMS AS WITH GLACIAL ACETIC ACID.

CHRONIC EXPOSURE
GLACIAL ACETIC ACID: PROLONGED OR REPEATED EXPOSURE TO FUMES MAY CAUSE

DE...AL EROSION, TOOTH DISCOLORATION, JAW NECROSIS, NA...L ULCERATION, LARYNGITIS, PNEUMONIA, BRONCHITIS, COUGHING AND GASTROINTESTINAL DISTURBANCES.

ACETIC ANHYDRIDE: MAY CAUSE THE SAME SYMPTOMS AS GLACIAL ACETIC ACID. SEE MUTAGENIC DATA AND ANIMAL REPRODUCTIVE EFFECTS DATA REFERENCES IN TOXICITY SECTION.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:
CORROSIVE/SENSITIZER.

ACUTE EXPOSURE

GLACIAL ACETIC ACID: CONTACT CAUSES SEVERE IRRITATION AND PAIN WITH BURNS, VESICULATION AND YELLOWISH-BROWN STAINS. SENSITIZATION DERMATITIS MAY OCCUR IN PREVIOUSLY EXPOSED PERSONS.

ACETIC ANHYDRIDE: CAUSES THE SAME SYMPTOMS AS GLACIAL ACETIC ACID.

CHRONIC EXPOSURE

GLACIAL ACETIC ACID: PROLONGED OR REPEATED CONTACT MAY CAUSE SENSITIZATION DERMATITIS.

ACETIC ANHYDRIDE: MAY CAUSE THE SAME SYMPTOMS AS GLACIAL ACETIC ACID.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). IN CASE OF CHEMICAL BURNS, COVER AREA WITH STERILE, DRY DRESSING. BANDAGE SECURELY, BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:
CORROSIVE.

ACUTE EXPOSURE

GLACIAL ACETIC ACID: CONTACT WITH THE VAPORS ABOVE 5 PPM OR DIRECT CONTACT CAUSES CORNEAL AND CONJUNCTIVAL EDEMA, IRITIS, CORNEAL EROSION AND CORNEAL OPACITY, PAIN, LACRIMATION, PHOTOPHOBIA AND BLURRED VISION.

ACETIC ANHYDRIDE: CAUSES THE SAME SYMPTOMS AS GLACIAL ACETIC ACID.

CHRONIC EXPOSURE

GLACIAL ACETIC ACID: PROLONGED OR REPEATED CONTACT WITH VAPORS MAY CAUSE CONJUNCTIVITIS.

ACETIC ANHYDRIDE: MAY CAUSE THE SAME SYMPTOMS AS GLACIAL ACETIC ACID.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (AT LEAST 15-20 MINUTES). IN CASE OF BURNS, APPLY STERILE BANDAGES LOOSELY WITHOUT MEDICATION. GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:
CORROSIVE.

ACUTE EXPOSURE

GLACIAL ACETIC ACID: SEVERE BURNING PAIN IN THE MOUTH, THROAT AND ABDOMEN FOLLOWED BY NAUSEA, VOMITING, DIARRHEA, BLOODY STOOLS, HEMATEMESIS, HEMATURIA, ALBUMINURIA AND POSSIBLY ASPHYXIA. PERFORATION OF THE ESOPHAGUS AND STOMACH MAY OCCUR. NEPHROSIS IS ALSO POSSIBLE. DEATH MAY OCCUR FROM CARDIOVASCULAR COLLAPSE.

ACETIC ANHYDRIDE: MAY CAUSE THE SAME SYMPTOMS AS GLACIAL ACETIC ACID.

FIRST AID- IF VICTIM IS CONSCIOUS, GIVE HIM LARGE QUANTITIES OF WATER IMMEDIATELY TO DILUTE THE ACID. DO NOT INDUCE VOMITING. GIVE PATIENT 1 OUNCE (30 ML) OF MILK OF MAGNESIA. GET MEDICAL ATTENTION IMMEDIATELY.

REACTIVITY

245°F

REACTIVITY:
STABLE AT ORDINARY PRESSURES UP TO THE BOILING POINT, 118 C. HOWEVER, NOTE FLASH POINT IS 41 C.

INCOMPATIBILITIES:
OXIDIZING, ALKALINE AND OTHER MATERIALS, EXAMPLES FOLLOW:

ACETIC ACID, GLACIAL:
- BROMINE PENTAFLUORIDE: EXPLOSIVE REACTION AND FIRE.
- CHLORINE TRIFLUORIDE: EXPLOSIVE OR VIOLENT REACTION.
- CHROMIC ACID: EXPLOSIVE REACTION IF NOT KEPT COLD.
- CHROMIC ANHYDRIDE: ACETIC ANHYDRIDE TITRATED INTO MIXTURE OF CHROMIC ANHYDRIDE AND ACETIC ACID REACTS EXPLOSIVELY.
- DIALLYL METHYL CARBINOL AND OZONE: EXPLOSIVE REACTION.
- NITRIC ACID: EXPLOSIVE REACTION IF NOT KEPT COLD.
- NITRIC ACID AND ACETONE: EXPLOSIVE REACTION (DELAYED) IN CLOSED CONTAINER.
- PERCHLORIC ACID: EXPLOSIVE REACTION IN ELECTROLYTIC POLISHING BATH.
- PERMANGANATES: EXPLOSIVE REACTION IF NOT KEPT COLD.
- PHOSPHORUS TRICHLORIDE: EXPLOSIVE REACTION.
- SODIUM PEROXIDE: EXPLOSIVE REACTION IF NOT KEPT COLD.
- N-XYLENE: FORMS EXPLOSIVE COMPOUND UNLESS WATER PRESENT.
- AZIDOTETRAZOLE: POSSIBLE EXPLOSIVE REACTION.
- PHOSPHORUS ISOCYANATE: VIOLENT REACTION.
- POTASSIUM HYDROXIDE: VIOLENT REACTION BETWEEN RESIDUE AND ACETIC ACID.
- HYDROGEN PEROXIDE: EXOTHERMIC REACTION ON HEATING WITH THE PRODUCTION OF PERACETIC ACID WHICH WILL EXPLODE AT 110 C.
- POTASSIUM TERT-BUTOXIDE: IGNITION REACTION.
- AMMONIUM NITRATE: IGNITES ON WARMING, ESPECIALLY IF CONCENTRATED.
- ETHYLENE DIAMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- ETHYLENEIMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- CHLOROSULFONIC ACID: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- 2-AMINOETHANOL: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- OLEUM: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- SODIUM HYDROXIDE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER.
- ACETALDEHYDE: MAY BE POLYMERIZED BY ACETIC ACID.
- OXIDIZERS: VIOLENT REACTION.
- ACETIC ANHYDRIDE: VIOLENT EXOTHERMIC REACTION. ADDITION OF WATER TO MIXTURE MAY CAUSE VIOLENT, LARGE SCALE EXPLOSION.
- METALS: ATTACKS MOST METALS, INCLUDING ZINC.

DECOMPOSITION:
COMBUSTION MAY RELEASE TOXIC OXIDES OF CARBON.

POLYMERIZATION:
WILL NOT OCCUR.

CONDITIONS TO AVOID

AVOID HEATING TO THE FLASH POINT, 41 C. AVOID CONTACT OR STORAGE WITH INCOMPATIBLE MATERIALS, INCLUDING THOSE LISTED IN THE REACTIVITY SECTION.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:
SHUT OFF IGNITION SOURCES. DO NOT TOUCH SPILLED MATERIAL. PROVIDE VENTILATION. WEAR PERSONAL PROTECTIVE EQUIPMENT. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. CLOSE TIGHTLY AND LABEL 'CORROSIVE'. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA. KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY. KEEP OUT OF SEWERS AND WATER SOURCES.

PROTECTIVE EQUIPMENT

VENTILATION:
PROVIDE PROCESS ENCLOSURE, LOCAL EXHAUST, OR GENERAL DILUTION VENTILATION TO MEET PERMISSIBLE EXPOSURE LIMITS.

RESPIRATOR:
ACETIC ACID:
EXPOSURE LIMIT TO 500 PPM-
CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE AND FULL FACEPIECE AND WITH A PARTICULATE FILTER.
SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE, HELMET, OR HOOD.
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

>500 PPM INCLUDING THE IDLH LEVEL, 1000 PPM-
SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE, OR USE EQUIVALENT RESPIRATOR

FIREFIGHTING- SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE-PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH THIS SOLUTION.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT ANY POSSIBILITY OF CONTACT WITH THIS SOLUTION. PREFERRED MATERIALS: NATURAL, NEOPRENE AND NITRILE RUBBER AND PVC PLASTIC.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF SAFETY GOGGLES AND A FACESHIELD TO PREVENT ANY POSSIBILITY OF CONTACT WITH THIS SOLUTION. DO NOT WEAR CONTACT LENSES WHEN WORKING WITH CHEMICALS.

WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SOLUTION, THE EMPLOYER SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC GROUP, INC.
CREATION DATE: 11/11/85 REVISION DATE: 03/04/86

-ADDITIONAL INFORMATION-

THE INFORMATION BELOW IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

Fisher Scientific Company

Chemical Manufacturing Division
P. O. Box 375, 1 Reagent Lane
Fair Lawn, NJ 07410

MATERIAL SAFETY DATA SHEET (Adapted from USDL Form LSD-005-4) (201) 796-7100
See Disclaimer on reverse side.

SECTION I. IDENTIFICATION OF PRODUCT

CHEMICAL NAME	FORMULA
Acetic Acid, Glacial	CH_3COOH

SYNONYM OR CROSS REFERENCE

SECTION II. HAZARDOUS INGREDIENTS

MATERIAL	NATURE OF HAZARD
Acetic Acid	Corrosive

SECTION III. PHYSICAL DATA

BOILING POINT	118°C	MELTING POINT	16.7°C
VAPOR PRESSURE(mm Hg)	11	SPECIFIC GRAVITY	1.05
VAPOR DENSITY (AIR = 1)	2.1	PERCENT VOLATILE BY VOLUME (%)	100
WATER SOLUBILITY	Complete	EVAPORATION RATE (butyl acetate = 1)	0.97

APPEARANCE Colorless Liquid

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (method used) (°F)	FLAMMABLE LIMITS	Uel	Lel
106°F closed cup		16.0	5.4

FIRE EXTINGUISHING MEDIA CO_2, dry chemical, alcohol foam

SPECIAL FIRE-FIGHTING PROCEDURES
Wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARD
When heated to decomposition, emits toxic fumes.

SECTION V. HEALTH HAZARD

THRESHOLD LIMIT VALUE
Air: 10 ppm

HEALTH HAZARDS
Causes severe burns to skin & eyes. May be fatal if swallowed.

FIRST AID PROCEDURES Flush skin and eyes with plenty of water for at least 15 minutes. Contact a physician. Ingestion: do not induce vomiting, if patien is concious give water, milk or milk of magnesia. Contact a physician.

SECTION VI. REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATABILITY (materials to avoid)
Alkalies, amines, and strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII. SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Cover with soda ash. Scoop up slurry and place in a suitable container.

WASTE DISPOSAL METHOD

DISPOSE OF BY MEANS AS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS OR CONTACT AN APPROVED AND LICENSED DISPOSAL AGENCY.

SECTION VIII. PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

Self-contained breathing apparatus

VENTILATION	LOCAL	SPECIAL
	MECHANICAL (general) preferred	OTHER

PROTECTIVE GLOVES	EYE PROTECTION
rubber	safety glasses

OTHER PROTECTIVE EQUIPMENT

SECTION IX. HANDLING AND STORAGE PRECAUTIONS

STORAGE AND HANDLING

Store containers at room temperature. (material freezes at 62°F) If frozen, thaw by moving to a warm area.

SECTION X. MISCELLANEOUS INFORMATION

NFORMATION FURNISHED BY:	TITLE
Gaston L. Pillori	Manager of Quality Assurance

The above information is believed to be accurate and represents the best information currently available to us. However, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

REV. NO. 1 DATE: January 28, 1982

Form No. 11-79

2555852

DISPLAY?SAFE USE INSTRUCTIONS
VARIABLE-TYPE? tn
RELATIONAL-TYPE? =
CODE NAME? 2555852

- FID : 073505 -

(P) ACETIC ACID
01-08
99.7%
SSG CHEM-105
SSG HMS-1010
2555852
ACETIC ACID, GLACIAL
EX.NO.5726
87C353
ACETIC ANHYDRIDE
100024743
HMC# 88-0261

MANUFACTURER INFORMATION

(*) MID:#529957
FISHER SCIENTIFIC CO.
DUNS ACCOUNT #: 004-32-1519
EMERGENCY TELEPHONE #: (201)796-7100
1 REAGENT LANE
P.O. BOX 375
FAIRLAWN, NJ 07410

FORMULA INFORMATION

USER LAST UPDATE DATE : 040886
FORMULA STATUS : Incomplete
USER STATUS : User
USAGE STATUS : Unspecified
MSDS ON FILE AT LOCATION 39001 : Yes
MSDS ON FILE IN CSIS : Yes
SAFE USE CATEGORY: Corrosives - Concentrated Acid - pH < 4

SHIPPING INFORMATION
NO SHIPPING NAME ON FILE FOR THIS F.I.D.
Flash Point : 104F/40C

INGREDIENTS

CAS#	Formulation	Chemical Name
000064197	= 100% BY VOL	Acetic acid

REGULATORY CONSIDERATIONS
(Information compiled by TMCA. See bulletin
Card file 'CRITLIST' for expanded key.)

CAS#	LIST
000064197	= 01, 03, 09, 17, 19, 31, 32, 33, 37, 42, 46, 48.

- REGULATORY LIST KEY -

MA Subst ; 31 - [illegible] ; [illegible] ; 38 - [illegible]
- ONT 654/86 ; 42 - WI TABLE 1 ; 46 - SARA312HzSub; 48 - CERCLA[illegible]

(M) LOCATION CODE : 26001 [illegible]
44001 94017 91005 42167
41001 19605 (O)39080(D) 19087
19300 31005

DISPLAY G.M. MATERIAL SAFETY DATA SHEET? y
==========

234.23469

234.61130

235.15599

235.20890

235.38783

235.53955

236.13934

236.31973

236.59834

237.20744

7.32538

237.47500

237.55935

238.07016

238.34711

238.57445

239.12093

239.31198

239.46140

240.04779

240.21014

240.46426

2 .07997

1.29574

241.55409

242.11021

242.49474

10030

243.26453

243.54364

.15497

244.49739

245.10670

245.35364

246.09173

ID: 073505

SECTION 0 -- EFFECTIVE & LAST UPDATE DATES, COMMENTS

--->Effective Date: 022486
2 --->MSDS signed by: GASTON L PILLORI
3 --->Title: Not Provided
4 --->Comments: Not Provided
5 --->Safe Use Category: 9 - CONCENTRATED ACID pH < 4
6 --->Last Date Updated: 021088

SECTION 1 -- SHIPPING INFORMATION

1 --->Chemical Family: CARBOXYLIC ACID, ALIPHATIC
2 --->Formula: MOLECULAR FORMULA: $C_2H_4O_2$; MOL WT: 60.05

SECTION 3 -- PHYSICAL DATA

1 --->Boiling Point: 244F/118C; MELTING POINT: 62F/18C; 867F/464C
2 --->Specific Gravity: 1.04
3 --->Vapor Pressure: 11MMHG @ 20C
4 --->% Volatile by Volume: Not Provided
5 --->% Solid by Weight: Not Provided
6 --->Vapor Density: 2.1
7 --->Evaporation Rate: (BU ACETATE=1) 0.97
8 --->Solubility in H2O: MISCIBLE
9 --->pH: Not Provided
10 --->Appearance & Odor: COLORLESS LIQUID OR SOLID WITH PUNGENT VINEGAR-LIKE ODOR; ODOR THRESHOLD: 1.0PPM.
--->State: LIQUID OR SOLID

SECTION 4 -- FIRE AND EXPLOSION DATA

1 --->Flammable Limits - LEL: 5.4
2 --->Flammable Limits - UEL: 16
3 --->Extinguishing Media: DRY CHEMICAL, CARBON DIOXIDE, WATER SPRAY OR FOAM. FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM.
4 --->Special Fire Fighting Procedures: MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. DO NOT GET WATER INSIDE CONTAINER. COOL FIRE-EXPOSED CONTAINERS WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF STORAGE TANK DUE TO FIRE. USE FLOODING AMOUNTS OF WATER AS A FOG; SOLID STREAMS MAY BE INEFFECTIVE. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER FROM AS FAR A DISTANCE AS POSSIBLE. USE WATER SPRAY TO ABSORB CORROSIVE VAPORS. AVOID BREATHING CORROSIVE VAPORS; KEEP UPWIND.
5 --->Unusual Fire & Explosion Hazards: FIRE AND EXPLOSION HAZARD: MODERATE FIRE AND EXPLOSION HAZARD WHEN EXPOSED TO HEAT OR FLAME. ACETIC ACID MAY REACT EXPLOSIVELY WITH OXIDIZING MATERIALS. GIVES OFF FLAMMABLE/EXPLOSIVE VAPORS ABOVE ITS FLASH POINT, 104 F. VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL UNNOTICEABLE DISTANCE TO SOURCE OF IGNITION AND FLASH BACK.

SECTION 5 -- HEALTH HAZARD DATA

1 -->Effects of Overexposure [illegible] EXPOSURE LOW LEVELS MAY CAUSE MUCOUS MEMBRANE IRRITATION, COUGHING, CHOKING, DYSPNEA, HEADACHE, DIZZINESS AND WEAKNESS. DELAYED SYMPTOMS MAY INCLUDE PULMONARY EDEMA, ANGINA, FROTHY SPUTUM, CYANOSIS, RALES AND HYPOTENSTION. EXPOSURE TO 50 PPM IS INTOLERABLE TO MOST INDIVIDUALS. CHRONIC EXPOSURE-PROLONGED EXPOSURE TO FUMES MAY CAUSE DENTAL EROSION, TOOTH DISCOLORATION JAW NECROSIS, NASAL ULCERATION, LARYNGITIS, PNEUMONIA, BRONCHITIS, COUGHING AND GASTROINTESTINAL DISTRUBANCES. SKIN CONTACT: ACUTE EXPOSURE-CONTACT MAY CAUSE SEVERE IRRITATION AND PAIN, WITH BURNS, VESICULATION AND BROWNISH OR YELLOWISH STAINS. SENSITIZATION DERMATITIS MAY OCCUR IN PREVIOUSLY EXPOSED PERSONS. CHRONIC EXPOSURE-SENSITIZATION DERMATITIS FROM REPEATED/PROLONGED CONTACT. EYE CONTACT: ACUTE EXPOSURE-LOW VAPOR CONCENTRATIONS OR DIRECT CONTACT MAY CAUSE CORNEAL AND CONJUNCTIVAL EDEMA, IRITIS, CORNEAL EROSION AND CORNEAL OPACITY, PAIN, LACRIMATION, PHOTOPHOBIA AND BLURRED VISION. CHRONIC EXPOSURE REPEATED OR PROLONGED VAPOR CONTACT MAY CAUSE CONJUNCTIVITIS. INGESTION: CORROSIVE. ACUTE EXPOSURE-THERE MAY BE SEVERE BURNING PAIN IN THE MOUTH, THROAT AND ABDOMEN FOLLOWED BY VOMITING AND DIARRHEA OF DARK PRECIPITATED BLOOD. ASPHYXIA CAN OCCUR FROM SWELLING OF THE THROAT. PERFORATION OF THE ESOPHAGUS AND STOMACH CAN OCCUR.

2 -->Threshold Limit Value: Not Provided

3 -->Permissible Exposure Limit: 10 PPM OSHA TWA, 10 PPM ACGIH TWA, 15 PPM ACGIH STEL

4 -->Other limit: Not Provided

5 -->Primary routes of entry: Not Provided

-->Emergency First Aid Procedures: SKIN: FIRST AID-REMOVE CONTAMINATED CLOTHING WHILE RUNNING STREAMS OF WATER UNDER CLOTHING. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER (APPROXIMATELY 15-20 MINUTES) UNTIL NO EVIDENCE OF CHEMICAL REMAINS. FOR CHEMICAL BURNS, APPLY STERILE BANDAGE SECURELY BUT NOT TOO TIGHTLY. GET MEDICAL ATTENTION. EYE: FIRST AID-WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS, (APPROXIMATELY 15-20 MINUTES). IN PRESENCE OF BURNS, APPLY STERILE BANDAGES LOOSELY WITHOUT MEDICATION. GET MEDICAL ATTENTION. INGESTION: FIRST AID-IF VICTIM IS CONSCIOUS, GIVE LARGE QUANTITIES OF WATER IMMEDIATELY TO DILUTE THE ACID. DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

SECTION 6 -- REACTIVITY DATA

-->Stable: Not Provided

-->Conditions to Avoid: MAY BE IGNITED BY HEAT, SPARKS OR FLAMES. CONTAINER MAY EXPLODE IN HEAT OF FIRE. VAPOR EXPLOSION HAZARD INDOOR, OUTDOORS OR IN SEWERS. RUN-OFF TO SEWER MAY CREATE FIRE OR EXPLOSION HAZARD.

3 -->Incompatible Materials: DANGEROUS IN CONTACT WITH OXIDIZERS. ATTACKS MOST METALS, INCLUDING STAINLESS STEELS. ACETIC ACID, GLACIAL: BROMIDE PENTAFLUORIDE: EXPLOSIVE REACTION AND FIRE. CHLORINE TRIFLUORIDE: EXPLOSIVE OR VIOLENT REACTION. CHROMIC ACID: EXPLOSIVE REACTION IF NOT KEPT COLD. CHROMIC ANHYDRIDE: ACETIC ANHYDRIDE TITRATED INTO MIXTURE OF CHROMIC ANHYDRIDE AND ACETIC ACID REACTS EXPLOSIVELY. DIALLYL METHYL CARBINOL AND OZONE: EXPLOSIVE REACTION. NITRIC ACID: EXPLOSIVE REACTION IF NOT KEPT COLD. NITRIC ACID AND ACETONE: EXPLOSIVE REACTION (DELAYED) IN CLOSED CONTAINER. PERCHLORIC ACID: EXPLOSIVE REACTION IN ELECTROLYTIC POLISHING BATH. PERMANGANATES: EXPLOSIVE REACTION IF NOT KEPT COLD. PHOSPHORUS TRICHLORIDE: EXPLOSIVE REACTION. SODIUM PEROXIDE: EXPLOSIVE REACTION IF NOT KEPT COLD. N-XYLENE: FORMS EXPLOSIVE COMPOUND UNLESS WATER PRESENT. AZIDOTETRAZOLE: POSSIBLE EXPLOSIVE REACTION. PHOSPHORUS ISOCYANATE: VIOLENT REACTION. POTASSIUM HYDROXIDE: VIOLENT REACTION BETWEEN RESIDUE AND ACETIC ACID. HYDROGEN PEROXIDE: EXOTHERMIC REACTION ON HEATING WITH THE PRODUCTION OF PERACETIC ACID WHICH WILL EXPLODE AT 110C. POTASSIUM TERT-BUTOXIDE: IGNITION REACTION. AMMONIUM NITRATE: IGNITES ON WARMING, ESPECIALLY IF CONCENTRATED. ETHYLENE DIAMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. ETHYLENEIMINE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. CHLOROSULFONIC ACID: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. 2-AMINOETHANOL: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. OLEUM: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. SODIUM HYDROXIDE: TEMPERATURE AND PRESSURE INCREASE IN CLOSED CONTAINER. ACETALDEHYDE: MAY BE POLYMERIZED BY ACETIC ACID. OXIDIZERS: VIOLENT REACTION. ACETIC ANHYDRIDE: VIOLENT EXOTHERMIC REACTION. ADDITION OF WATER TO MIXTURE MAY CAUSE VIOLENT, LARGE SCALE EXPLOSION. METALS: ATTACKS MOST METALS, INCLUDING ZINC.

4 -->Hazardous Decomposition Products: THERMAL DECOMPOSITION MAY RELEASE TOXIC OXIDES OF CARBON.

5 -->Can Hazardous Polymerization Occur: Not Provided

6 -->Conditions to Avoid: Not Provided

SECTION 7 -- SPILL OR LEAK PROCEDURES

-->Steps to be taken in case material is released or spilled: SOIL SPILL: DIG A HOLDING AREA SUCH AS A PIT, POND OR LAGOON TO CONTAIN SPILL AND DIKE SURFACE FLOW USING BARRIER OF SOIL, SANDBAGS, FOAMED POLYURETHANE OR FOAMED CONCRETE. ABSORB LIQUID MASS WITH FLY ASH OR CEMENT POWDER. AIR SPILL: KNOCK DOWN VAPORS WITH WATER SPRAY. KEEP UPWIND. WATER USED TO KNOCK DOWN VAPORS MAY BECOME CORROSIVE OR TOXIC AND SHOULD BE CONTAINED PROPERLY FOR LATER DISPOSAL. WATER SPILL: NEUTRALIZE WITH CAUSTIC SODA. OCCUPATION SPILL: SHUT OFF IGNITION SOURCES. DO NOT TOUCH SPILLED MATERIAL. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. DO NOT GET WATER INSIDE CONTAINER. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

2 -->Waste Disposal Method: Not Provided

3 -->CERCLA (Superfund) Reportable Quantity (lbs): Not Provided

4 -->RCRA Hazardous Waste No. (40 CFR 261.33): Not Provided

5 -->Volatile Organic Compound (VOC) Theoretical: Not Provided

6 -->Volatile Organic Compound (VOC) Analytical: Not Provided

SECTION 8 -- SPECIAL PROTECTION INFORMATION

1 -->Respiratory Protection: 500PPM - CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE AND FULL FACEPIECE. GAS MASK WITH ORGANIC VAPOR CANISTER (CHIN-STYLE OR FRONT OR BACK-MOUNTED CANISTER). AIR-SUPPLIED RESPIRATOR WITH FULL FACEPIECE. SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE. 1000PPM-TYPE C AIR-SUPPLIED RESPIRATOR WITH FULL FACEPIECE OPERATED IN AIR-SUPPLIED RESPIRATOR WITH FULL FACEPIECE OPERATED IN PRESSURE-DEMAND, POSITIVE-PRESSURE OR CONTINUOUS-FLOW MODE. ESCAPE - GAS MASK WITH ORGANIC VAPOR CANISTER. SELF-CONTAINED BREATHING APPARATUS.

2 -->Local Exhaust: PROVIDE LOCAL EXHAUST VENTILATION SYSTEM TO MEET PUBLISHED EXPOSURE LIMITS.

3 -->Special: Not Provided

4 -->Mechanical: Not Provided

5 -->Other: Not Provided

6 -->Protective Gloves (Specify type): EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

7 -->Eye Protection (Specify type): EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES AND A FACESHIELD TO PREVENT CONTACT WITH THIS SUBSTANCE. WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHALL PROVIDE AN EYE-WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

8 -->Other Protective Equipment: WEAR IMPERVIOUS CLOTHING. AVOID REPEATED OR PROLONGED CONTACT WITH SUBSTANCE, AVOID ANY POSSIBILITY OF CONTACT WITH > 50% SOLUTIONS.

SECTION 9 --- SPECIAL PRECAUTIONS

--->Precautions to be taken in handling & storage: Not Provided
--->Other Precautions: Not Provided

SECTION 10 --- ADDITIONAL DATA

1 --->Additional Health Hazard Data: TOXICITY: 3311MG/KG ORAL-RAT LD50; 16000PPM/4 HR INHALATION-RAT LC50; 1060MG/KG SKIN-RABIT LD50; MUTAGENIC DATA (RTEC); CARCINOGENICITY: NONE. ACETIC ACID IS A SEVERE EYE, MUCOUS MEMBRANE AND SKIN IRRITANT AND SKIN SENSITIZER.

VA

Fisher Scientific Company

Chemical Manufacturing Division
P. O. Box 375, 1 Reagent Lane
Fair Lawn, NJ 07410

MATERIAL SAFETY DATA SHEET (Adapted from USDL Form LSD-005-4) (201) 796-71
See Disclaimer on reverse side.

SECTION I. IDENTIFICATION OF PRODUCT

CHEMICAL NAME	FORMULA
Acetone	CH_3COCH_3

SYNONYM OR CROSS REFERENCE
Dimethyl Ketone; 2-Propanone; Dimethyl Ketal

SECTION II. HAZARDOUS INGREDIENTS

MATERIAL	NATURE OF HAZARD
Acetone	flammable

SECTION III. PHYSICAL DATA

BOILING POINT	56°C	MELTING POINT	-94°C
VAPOR PRESSURE(mm Hg)	186	SPECIFIC GRAVITY	0.79
VAPOR DENSITY (AIR = 1)	2	PERCENT VOLATILE BY VOLUME (%)	100
WATER SOLUBILITY	complete	EVAPORATION RATE (butyl acetate = 1)	14.5

APPEARANCE Colorless liquid

SECTION IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (method used) (°F)	FLAMMABLE LIMITS	Uel	Lel
0°F closed cup		12.8	2.6

FIRE EXTINGUISHING MEDIA CO_2, dry chemical, alcohol foam

SPECIAL FIRE-FIGHTING PROCEDURES

UNUSUAL FIRE AND EXPLOSION HAZARD

SECTION V. HEALTH HAZARD

THRESHOLD LIMIT VALUE
1780mg/M^3 As per ACGIH 1983-84

HEALTH HAZARDS Causes eye irritation. Avoid repeated skin contact.

FIRST AID PROCEDURES Eyes: Flush with water for at least 15 minutes. Contact a physician.

SECTION VI. REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY (materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		
	WILL NOT OCCUR	X	

SECTION VII. SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Absorb on vermiculite. Scoop up and place in a suitable container.

WASTE DISPOSAL METHOD

DISPOSE OF BY MEANS AS TO COMPLY WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS OR CONTACT AN APPROVED AND LICENSED DISPOSAL AGENCY.

SECTION VIII. PROTECTION INFORMATION

RESPIRATORY PROTECTION (specify type)

Face mask with organic vapor canister.

VENTILATION	LOCAL acceptable	SPECIAL
	MECHANICAL (general) acceptable	OTHER

PROTECTIVE GLOVES rubber	EYE PROTECTION safety glasses

OTHER PROTECTIVE EQUIPMENT

SECTION IX. HANDLING AND STORAGE PRECAUTIONS

STORAGE AND HANDLING

SECTION X. MISCELLANEOUS INFORMATION

INFORMATION FURNISHED BY: Gaston L. Pillori	TITLE Manager of Quality Assurance

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REV. NO. 1 DATE: April 21, 1981

#2

FLAMMABLE SOLVENT **SEE SPECIFIC MSDS FOR MORE INFORMATION**

FLASH POINT BELOW 100 ° F

CHEMICAL MATERIAL INFORMATION DOCUMENT

Material Identity: **Product Name** ACETONE

Manufacturer FISHER SCIENTIFIC

Emergency Phone No. 201 796 7523

ROUTES OF ENTRY	EFFECTS OF OVEREXPOSURE* 2555851	EMERGENCY FIRST AID
Harmful by Inhalation	CNS Effects-Headache, Dizziness Nausea, Unconsciousness, Death Drowsiness, Fatigue, Narcosis	Remove to Fresh Air. If Breathing Stops, Perform CPR. Get Immediate Medical Attention
Irritant, Skin & Eye	Dry or Cracked Skin. Rash. Redness and/or burning Itching	Flush with water Immediatley
May be harmful by Ingestion	Gastrointestinal Disturbance	Get Medical Attention
May be harmful by Skin Absorption	Possible Liver, Kidney, Blood Effects.	Get Medical Attention

*Individual materials may contain additonal chemical ingredients which have toxic properties and are listed in the NIOSH Registry of Toxic Effects of Chemical Substances, Patty's Industrial Hygiene and Toxicology, or Dangerous Properties of Industrial Materials.

USE INSTRUCTIONS- Do not use in confined areas without consulting Confined Space Procedure. Breathing vapors may be hazardous. Ventilation may be required, where feasible, to maintain concentrations below applicable limits (OSHA). Keep containers tightly closed when not in use or empty. Avoid contact with skin. Wash hands after use and before eating, drinking, smoking, or applying cosmetics. Keep away from heat sparks, open flames. No smoking allowed in area of use. If clothing becomes contaminated, remove and wash skin with soap and water.

PERSONAL PROTECTIVE EQUIPMENT-Safety glasses or goggles if potential for splashing exists. Impervious gloves. Recommended glove type:_____

Respirator: yes___ no__ Respirator type:_____

Skin Absorption Hazard yes___ no__ Barrier Cream yes___ no___

FIRE FIGHTING INSTRUCTIONS-Consult Plant Security for Fire Fighting Instructions. Use Class 'B' or 'C' fire extinguishing agent. Use self-contained breathing apparatus. Use water to cool exposed containers. Water spray or stream can be used. A solid water stream may spread fire, use water in Fog application. Do not extinguish fire unless flow can be stopped.

SPILL AND LEAK INSTRUCTIONS- Persons not wearing protective equipment should be restricted from spill area. Remove all ignition sources. Ventilate area of spill or leak. Material should not be allowed to enter a confined space, such as a sewer, because of the possibility of explosion. Evacuate and isolate area. Use absorbent material to contain spill. Contact the Ohio EPA, phone number 1-800-282-9378 for Emergency spill information. Material may be disposed of by atomizing in a suitable combustion chamber after checking local policy.

STORAGE INSTRUCTIONS- Store away from heat and direct sunlight. Store in approved containers located in flammable materials storage area. Store away from strong oxidizing agents and combustible materials. Containers must be effectively grounded when dispensing flammable liquids. Storage Areas must be clearly identified and Marked for Hazard type.

EMERGENCY INSTRUCTIONS - Immediatley wash contaminated skin with soap and water. If solvent soaks clothing, remove clothing and wash skin with soap and water. Eyes- Immediately wash the eyes with large amounts of water, occasionally lifting the upper and lower lids. Get Medical attention immediately. Contact lenses should not be worn when working with solvents.

Examples of products - Toluene, MEK, Xylene, Acetone, Fuels, Thinners, Alcohol, Paint Stripper, Production Paint Coatings, Varnish and Shellac, Glass Cleaner.

19571

MATERIAL SAFETY DATA SHEET

Dow Chemical U.S.A. Midland, MI 48674 Emergency Phone: 517-636-4400

PRODUCT NAME: VORANATE (R) T-80 TYPE I TOLUENE DIISOCYANATE

Effective Date: 11/23/87 Date Printed: 12/10/87 Product Code: 92097

1. INGREDIENTS:

Toluene-2,4-diisocyanate (TDI)	CAS# 02647-62-5	80%
Toluene-2,6-diisocyanate	CAS# 02647-62-5	20%

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). In addition, other substances not 'Hazardous' per this OSHA Standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard.

2. PHYSICAL DATA:

BOILING POINT: 250C (482F)
VAP PRESS: 0.01 mmHg @ 20C
VAP DENSITY: 6.0
SOL. IN WATER: Insoluble
SP. GRAVITY: 1.22 @ 25/15.5C
APPEARANCE: Water white to pale yellow liquid.
ODOR: Sharp pungent odor.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: 127C (260F)
METHOD USED: PMCC, ASTM D-93

FLAMMABLE LIMITS
LFL: Not determined
UFL: Not determined

EXTINGUISHING MEDIA: Carbon dioxide, dry chemical, foam, halon 1211. If water is used, it should be in very large quantity. The reaction between water and hot isocyanate may be vigorous.

FIRE & EXPLOSION HAZARDS: Down-wind personnel must be evacuated.

(Continued on Page 2)
(R) Indicates a trademark of The Dow Chemical Company

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

Do not reseal contaminated containers since pressure build-up may cause rupture. Fire point: 146C (295F).

FIRE-FIGHTING EQUIPMENT: People who are fighting isocyanate fires must be protected against nitrogen oxide fumes and isocyanate vapors by wearing positive pressure self-contained breathing apparatus and full protective clothing.

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID) Stable when stored under recommended storage conditions. Store in a dry place at temperatures between 18-41C (65-105F).

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Water, acid, base, alcohols, metal compounds, surface active materials. Avoid water as it reacts to form heat, CO_2 and insoluble urea. The combined effect of the CO_2 and heat can produce enough pressure to rupture a closed container.

HAZARDOUS DECOMPOSITION PRODUCTS: Isocyanate vapor and mist, carbon dioxide, carbon monoxide, nitrogen oxides and traces of hydrogen cyanide.

HAZARDOUS POLYMERIZATION: May occur with incompatible reactants, especially strong bases, water or temperatures over 41C (105F).

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Evacuate and ventilate spill area, dike spill to prevent entry into water system, wear full protective equipment including respiratory equipment during clean up. Major spill: Call Dow Chemical U.S.A. (409) 238-2112. If transportation spill involved call CHEMTREC (800) 424-9300. If temporary control of isocyanate vapor is required a blanket of protein foam (available at most fire departments) may be placed over the spill. Large quantities may be pumped into closed but not sealed containers

(Continued on Page 3)

(R) Indicates a trademark of The Dow Chemical Company

5. ENVIRONMENTAL AND DISPOSAL INFORMATION: (CONTINUED)

for disposal. Minor spill: Absorb the isocyanate with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution consisting of a mixture of water and 3-8% concentrated ammonium hydroxide (or 5-10% sodium carbonate). Add about 10 parts of neutralizer per part of isocyanate with mixing. Allow to stand for 48 hours letting evolved CO_2 escape.

Clean-up: Decontaminate floor using water/ammonia solution with 1-2% added detergent letting stand over affected area for at least 10 minutes. Cover mops and brooms used for this with plastic and dispose properly (often by incineration).

DISPOSAL METHOD: Follow all federal, state and local regulations. Liquids are usually incinerated in a proper facility. Solids are usually also incinerated or landfilled. Empty drums should be filled with water; let stand for at least 48 hours; drums should be drained, triple rinsed, and holed or crushed to prevent reuse. Dispose of drain and rinse fluid according to local regulations.

6. HEALTH HAZARD DATA:

EYE: May cause pain, severe eye irritation and moderate corneal injury. Vapors may irritate eyes.

SKIN CONTACT: Prolonged or repeated exposure may cause severe irritation, even a burn. Skin contact may result in allergic sensitization even though it is not expected to result in absorption of amounts sufficient to cause other adverse effects.

SKIN ABSORPTION: The LD50 for skin absorption in rabbits is >9400 mg/kg.

INGESTION: Single dose oral toxicity is low. The oral LD50 for rats is 5800 mg/kg. Ingestion may cause gastrointestinal irritation or ulceration.

(Continued on Page 4)
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6. HEALTH HAZARD DATA: (CONTINUED)

INHALATION: Excessive vapor concentrations are attainable and could be hazardous on single exposure. Single and repeated excessive exposure may cause severe irritation to upper respiratory tract and lungs (choking sensation, chest tightness), respiratory sensitization, decreased ventilatory capacity, liver effects, cholinesterase depression, gastro-intestinal distress and/or neurologic disorders. The 4-hour LC50 for TDI for rats is 13.9 ppm.

SYSTEMIC & OTHER EFFECTS: Based on available data, repeated exposures are not anticipated to cause any additional significant adverse effects. For hazard communication purposes under OSHA standard 29 CFR Part 1910.1200, this chemical is listed as a potential carcinogen by Nat'l. Tox. Program and IARC. An oral study in which high doses of TDI were reported to cause cancer in animals has been found to contain numerous deficiencies which compromise the validity of the study. TDI did not cause cancer in laboratory animals exposed by inhalation, the most likely route of exposure. Results of in vitro ("test tube") mutagenicity tests have been inconclusive.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician if irritation persists. Wash clothing before reuse. Destroy contaminated shoes.

INGESTION: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

INHALATION: Remove to fresh air. If not breathing, give mouth-to-mouth resuscitation. If breathing is difficult, give oxygen. Call a physician.

NOTE TO PHYSICIAN: Corrosive. May cause stricture. If lavage

(Continued on Page 5)

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7. FIRST AID: (CONTINUED)

is performed, suggest endotracheal and/or esophagoscopic control. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient. The manifestations of the respiratory symptoms, including pulmonary edema, resulting from acute exposure may be delayed. May cause respiratory sensitization. Cholinesterase inhibition has been noted in human exposure but is not of benefit in determining exposure and is not correlated with signs of exposure.

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): OSHA PEL is 0.02 ppm as a ceiling limit for toluene 2,4-diisocyanate. ACGIH TLV is 0.005 ppm; 0.02 ppm STEL for toluene 2,4-diisocyanate. Dow Industrial Hygiene Guide is 0.02 ppm as a ceiling limit for toluene diisocyanate.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved supplied-air respirator. For emergency and other conditions where the exposure guideline may be greatly exceeded, use an approved positive-pressure self-contained breathing apparatus.

SKIN PROTECTION: Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse. Safety shower should be located in immediate work area.

EYE PROTECTION: Use chemical goggles. If vapor exposure causes eye irritation, use a full-face, supplied-air respirator. Eye wash fountain should be located in immediate work area.

(Continued on Page 6)

(R) Indicates a trademark of The Dow Chemical Company

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Warning properties of this material (irritation of eyes, nose and throat) not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposure to lower concentrations. Exposures to vapors of heated TDI can be extremely dangerous. (Have TDI neutralizer available for spills.)

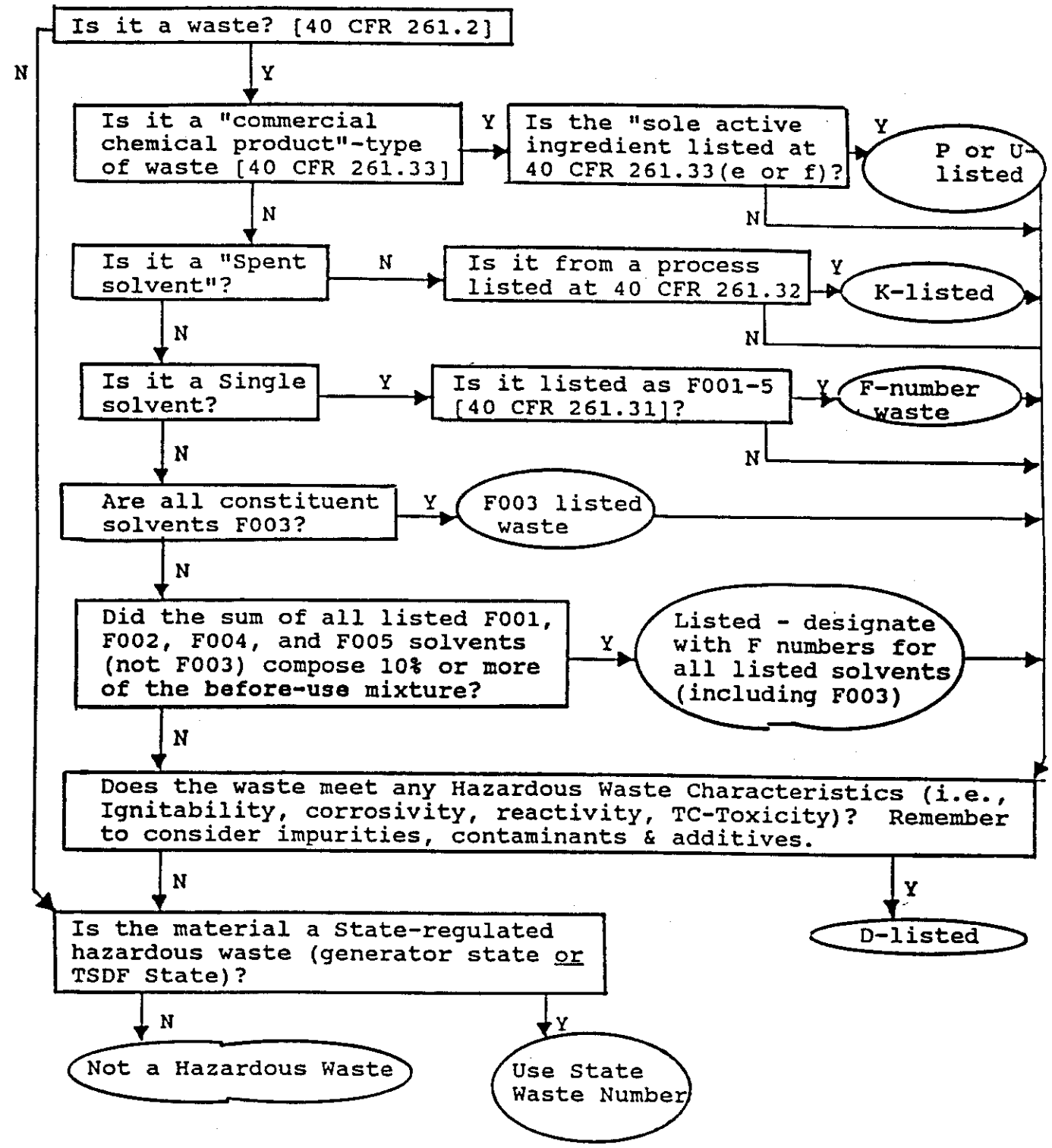
MSDS STATUS: Revised Section 7.

(R) Indicates a trademark of The Dow Chemical Company
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.

ATTACHMENT C-2

LOGIC FLOW DIAGRAM
FOR DETERMINING WASTE CODES

Solvent Waste: Is it Hazardous?



ATTACHMENT C-3

TCLP TEST RESULTS FOR HYPALON

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

Unless noted by Quality Assurance Notices included in this report of data, all Quality control requirements associated with the preparation and analysis of this sample have been met.

Release of the analytical data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Sarah A Hubbard

Sarah A. Hubbard
Technical Reviewer

Date: 11/13/90

COMPUCHEM LABORATORIES, INC.

- TABLE OF CONTENTS -

Chronicle

Method Reference

Data Summary

- Method 8150 Herbicides Compound List

Quality Assurance Notices*

Chain of Custody**

*These notices are included where appropriate for data qualification.

**When the original chain of custody is submitted with the sample(s), a copy of it is included with the report.

COMPOUND LIST

HERBICIDES, METHOD 8150

SAMPLE IDENTIFIER: HYPALON
COMPUCHEM® SAMPLE NUMBER: 376723

	CONCENTRATION (mg/L)	DETECTION LIMIT (mg/L)
1. 2,4-D	BDL	0.10
2. 2,4,5-TP(Silvex)	BDL	0.010
3. 2,4,5-T	BDL	0.010

BDL=BELOW DETECTION LIMIT

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

November 26, 1990

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

Dear Mr. Green:

We at CompuChem® are pleased to provide our report for the analysis you requested. Data for the following sample are enclosed:

Your ID Number	Our ID Number	Analysis Code	Order Number	Description of Work Requested
HYPALON	376712	486,779	21670	Volatiles TCLP with ZHE Method 8240 (Style 1)

In this report we have included the analytical results, the method reference, and the quality control summary. To obtain additional technical information concerning this report, please contact your Sales Representative. In addition to resolving your questions, they can provide you with a complete overview of our line of services and assist you in identifying those services which will effectively and efficiently support your monitoring program.

For your convenience, your Customer Service Representative can help you place a new order, obtain information about a sample's status or obtain assistance with sample logistics. Your Sales Representative and your Customer Service Representative can be reached at 1/919-549-8263.

Thank you for choosing CompuChem®. We would like to continue providing you analytical support and services. We would appreciate your comments regarding the quality of services you have received from CompuChem®; client satisfaction is important to us. Please address your comments to your Sales or Customer Service Representative at the address given above.

Sincerely,

Mark A Gabriel
for Elise L. Cobb
Supervisor, Report Deliverables

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

Unless noted by Quality Assurance Notices included in this report of data, all Quality control requirements associated with the preparation and analysis of this sample have been met.

Release of the analytical data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Sarah A Hubbard

Sarah A. Hubbard
Technical Reviewer

Date: 11/26/90

COMPUCHEM LABORATORIES, INC.

- TABLE OF CONTENTS -

Chronicle

Method Reference

Data Summary

- Data Reporting Qualifier
- Method 8240 Volatile (TCLP) Compound List and Detection Limits

Quality Assurance Notices*

Chain of Custody**

*These notices are included where appropriate for data qualification.

**When the original chain of custody is submitted with the sample(s), a copy of it is included with the report.

COMPUCHEM
LABORATORIES, INC.

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

CHRONICLE

Sample Identifier:	HYPALON
CompuChem Number:	376712
Date TCLP Performed:	11/06/90

METHOD REFERENCE

The USEPA published in the June 13, 1986, Federal Register the Toxicity Characteristic Proposed Rule under the authority of Subtitle C of the Resource Conservation and Recovery Act (RCRA). The rule is intended to replace the SW-846 Extraction Procedure with an improved leaching test known as the Toxicity Characteristic Leaching Procedure (TCLP). The test simulates the leaching a waste would undergo when land disposed. CompuChem employs the TCLP methodology contained in Draft Method 13XX (Revised October 4, 1985). The leachate resulting from the application of the TCLP can be assessed for a large number of organic and inorganic constituents. If volatile constituents are to be assessed in a TCLP leachate, a special Zero Headspace Extraction (ZHE) vessel must be used.

Method Summary - TCLP with ZHE; When Volatile Organics Involved

Preparation

The solid phase sample (maximum 25g) is placed into a special extraction device containing no headspace, the ZHE, and an amount of extraction fluid (pH 4.93 ± 0.02) equal to 20 times the weight of the solid is introduced. The ZHE is pressurized and rotated for 18 hours at 30 rpm. After extraction, the TCLP extract is obtained by means of filtration using gentle air pressure. The extract is placed in VOA bottles, devoid of headspace, and stored refrigerated until analysis for volatile organics.

Analysis

Following sample preparation, volatile organic chemical compounds present in the sample are separated based on chromatographic conditions. Once seperated the individual constituents are charged/fragmented in an electronic field. The detector, a mass spectrometer, measures a response based on the mass to charge ratio of the fragmented compound and compares it to a known standard material.

METHOD REFERENCE

To determine the concentration of volatile organic compounds in a variety of waste matrices, CompuChem® employs the methods stated in the RCRA Method 8240.

As a point of information, the analytes present on the enclosed compound list have been validated for Method 8240 as required by SW-846.

Method Summary

The volatile compounds are introduced to the gas chromatograph by the direct injection, or the Purge-and-Trap Method (RCRA Method 5030). The components are separated via the gas chromatograph and detected using a mass spectrometer which is used to provide both qualitative and quantitative information. The chromatographic conditions as well as typical mass spectrometer operating parameters are given in the RCRA Method 8240.

REPORTING ANOMALLIES

There is anomaly on the Volatile reporting form. The dilution factor is relative only to Semi-volatile extracts and is not used for Volatiles. Dilutions are indicated by the sample weight/volume section on the header.

DATA REPORTING QUALIFIERS

VALUE – If the result is a value greater than or equal to the detection limit, report the value.

U – Indicates compound was analyzed but not detected. The sample Quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to:

$$\frac{(330\ U) \times df}{D} \quad \text{Where } D = \frac{100 - \%\ Moisture}{100}$$

and df = dilution factor

At 24% moisture, $D = \frac{100-24}{100} = 0.76$

$$\frac{(330\ U) \times 10}{.76} = 4300\ U$$ rounded to the appropriate number of significant figures

For soil sample subjected to GPC clean-up procedures, the CRQL is also multiplied by 2, to account for the fact that only half of the extract is recovered.

J – Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/l, but a concentration is 3 ug/l is calculated, report it as 3J. The sample quantitation limit must be adjusted for both dilution and percent moisture as discussed for the U flag, so that if a sample with 24% moisture and a 1 to 10 dilution factor has a calculated concentration of 300 ug/l and a sample quantitation limit of 430 ug/kg, report the concentration as 300J on Form I.

DATA REPORTING QUALIFIERS - PAGE 2

C - This flag applies to pesticides results where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract shall be confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified TCL compound.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed according to the specifications. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample and all concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and the Case Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z", as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags, as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample.

1X
ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

HYPALON

Name: COMPUCHEM,RTP Contract: 500069

Lab Code: COMPU Case No.: 21670 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 376712

Sample wt/vol: 1.0 (g/mL) ML Lab File ID: CR076712C03

Level: (low/med) LOW Date Received: 10/30/90

% Moisture: not dec. _____ Date Analyzed: 11/14/90

GC Column: CAP ID: _____(mm) Dilution Factor: 1.0

Soil Extract Volume: _____(ul) Soil Aliquot Volume: _____(ul)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
75-01-4	Vinyl Chloride	50	U
75-09-2	Methylene Chloride	36	BJ
75-15-0	Carbon Disulfide	25	U
75-35-4	1,1-Dichloroethene	25	U
67-66-3	Chloroform	19	J
107-06-2	1,2-Dichloroethane	25	U
78-93-3	2-Butanone	50	U
71-55-6	1,1,1-Trichloroethane	25	U
56-23-5	Carbon Tetrachloride	400	
79-01-6	Trichloroethene	25	U
79-00-5	1,1,2-Trichloroethane	25	U
71-43-2	Benzene	25	U
127-18-4	Tetrachloroethene	25	U
79-34-5	1,1,2,2-Tetrachloroethane	50	U
108-88-3	Toluene	25	U
108-90-7	Chlorobenzene	25	U
107-13-1	Acrylonitrile	600	U
630-20-6	1,1,1,2-Tetrachloroethane	25	U

COMPUCHEM LABORATORIES

QUALITY ASSURANCE NOTICE
CompuChem ID# 376712
Blank ID# 378063
Case # 21670

CompuChem offers various types of analytical services. The above sample was analyzed according to the protocol checked:

( ) "Contract Laboratory Program (CLP)--Volatile / Semivolatile analysis". Analytical requirements were derived from the EPA.

(✓) "Volatile Analysis by GC/MS--Method 8240" / "Semivolatile Analysis by GC/MS--Method 8270". Many of the Quality Control requirements of these methods were derived from the EPA's Contract Laboratory Program.

( ) Clean Water Act " Purgeable Volatile Analysis--Method 624" / "Base Neutrals and Acids--Method 625". Requirements were established in the Federal Register of October 26, 1984, 40 CFR Part 136.

( ) "Lower Detection Limit / ResWell Volatile or Semivolatile". CLP requirements have been modified for application to this method.

The CLP protocols allow certain levels of common laboratory solvents (Acetone, Methylene Chloride, and Toluene), the solvent-related artifact 2-Butanone, and phthalates to be present in blanks, up to five times the Contract Required Quantitation Limit (CRQL). CompuChem has a more stringent policy for liquid samples, allowing up to a maximum of twice the CRQL for these commonly occuring contaminants. An exception is made in the case of liquid Instrument Blanks where the analyses of three successive blanks indicate a consistent background level of Methylene Chloride. The concentration of Methylene Chloride in Low Level Soil Method Blanks may not exceed 25 ug/kg; Acetone may not exceed 50 ug/kg (Medium Level Soil methodology applies a correction factor of 125 to the concentrations to yield the reported amounts). Exception to our policy is made <u>only</u> when the volatile analysis or extraction holding times are in jeopardy of being exceeded (although the CLP requirements must be met).

Analysis of the Method Blank (and/or Instrument Blank) associated with the above sample indicated the following common laboratory contaminants were present at the indicated levels:

common laboratory contaminant	concentration	units
Methylene Chloride	12	ug/L

The reporting convention used in the CLP is to "flag" with a "B" all allowable target compounds present in the sample when also found in its associated blank. No adjustments are made to the analytical results.

This notice serves to explain the use of the "B" flag in reporting analytical results, while presenting the actual levels of the common laboratory solvents or phthalates seen in the associated blank.

Data Usability: General Guidelines

In evaluating data usability, the following general guidelines originating from the US EPA are offered for assessing the significance of common laboratory artifacts in samples. If the concentration of an analyte in a sample is less than three times that in the blank, it may be negated due to laboratory contamination. If the concentration of an analyte in a sample is greater than five times that in the blank, it may be considered an actual sample component. If the concentration of an analyte in a sample is greater than three times but less than five times that in the blank, the presence of that compound in the sample may be considered suspect.

QAN-VSV-15
901001

Reviewer's initials/ID CLC / GDP
date 11-15-90

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

November 30, 1990

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

Dear Mr. Green:

We at CompuChem® are pleased to provide our report for the analysis you requested. Data for the following sample are enclosed:

Your ID Number	Our ID Number	Analysis Code	Order Number	Description of Work Requested	Report Format
HYPALON	376724	637	21670	Metals (TCLP)	Style 1

To obtain additional technical information concerning this report, please contact your Sales Representative. In addition to resolving your questions, they can provide you with a complete overview of our line of services and assist you in identifying those services which will effectively and efficiently support your monitoring program.

For your convenience, your Customer Service Representative can help you place a new order, obtain information about a sample's status or obtain assistance with sample logistics. Your Sales Representative and your Customer Service Representative can be reached at 1/919-549-8263.

Thank you for choosing CompuChem®. We would like to continue providing you analytical support and services. We would appreciate your comments regarding the quality of services you have received from CompuChem®; client satisfaction is important to us. Please address your comments to your Sales or Customer Service Representative at the address given above.

Sincerely,

Mark Gabriel
for Elise L. Cobb
Supervisor, Report Deliverables

COMPUCHEM LABORATORIES, INC.

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE TCLP PERFORMED	DATE METALS ANALYZED
1.	HYPALON	376724	10/30/90	10/31/90	11/13/90 thru 11/14/90

CHEMWEST ANALYTICAL LABORATORIES
TCLP EXTRACTION

SAMPLE I.D. HYPALON
Client I.D.: 376724
Date(s) Analyzed: 11/13/90
thru: 11/14/90

CHEMWEST I.D.: 7053-1
Matrix :Leachate

Element	Amount Detected (mg/L)	Max. Conc (mg/L)	RL (mg/L)
Arsenic	BRL	5.0	1.0
Barium	BRL	100.0	1.0
Cadmium	BRL	1.0	0.05
Chromium	BRL	5.0	0.10
Lead	BRL	5.0	1.0
Mercury (CV)	BRL	0.2	0.001
Selenium	BRL	1.0	0.2
Silver	BRL	5.0	0.10

BRL: Below Reporting Limit.
RL: Reporting Limit.

CV: Cold Vapor.

Approved by: _____

Date Reported:
11/20/90

REV3:1.90

№ 013413

COMPUCHEM LABORATORIES

CHAIN-OF-CUSTODY RECORD

ROJECT NAME: Compuchem
ROJECT NUMBER: CW-H90-273
AMPLERS (SIGNATURE) 21670
RINTED NAME

CLIENT ID (9 CHARACTERS) 1	2	3	4	5	6	7	8	9	# No. of Bottles/Vials	GC/MS 624-8240	625-8270	TCL-VOA	TCL-SVOA	Other:	GC 601-8010	602-8020	608-8080	8140	TCL PEST/PCB's	Herbicides	Other:	INORGANICS Metals	Cyanide	TAL Metals	Other:	OTHER TOC	TOX	Oil & Grease	Pet. Hydro.	Phenols	WC metals\TCLP-EX 160101 Batch QC	MATRIX: Water/Soil	SAMPLING INFO DATE 10/18/90	TIME	REMARKS Date Due 11/23/90 Price 96.00 $
																															83	wa	leachate date		10/31/90
H	Y	P	A	L	O	N			1																						✓	✓	376724		leachate
3	7	6	7	3	7				1																						✓	✓	376737		leachate Blank

SAMPLES REC'D IN GOOD CONDITION
NO LEAKAGE OR BREAKAGE

RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time
Reginald Dawkins	11/5/90 4:30				
COMPANY NAME: Compuchem		COMPANY NAME:		COMPANY NAME:	
RECEIVED BY: SUSAN GILBERT	Date/Time 11-6-90 09:45	RECEIVED BY:	Date/Time	RECEIVED BY:	Date/Time
COMPANY NAME: CHEMWEST LAB		COMPANY NAME:		COMPANY NAME:	
RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time	RELINQUISHED BY:	Date/Time
COMPANY NAME:		COMPANY NAME:		COMPANY NAME:	

SHIPPING INFORMATION
Number of Shipping Containers- 1
Method of Shipment
Airborne Express
Special Handling Requirements

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

November 19, 1990

Mr. Randall L. Green
DELCO PRODUCTS
GENERAL MOTORS CORPORATION
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

Dear Mr. Green:

We at CompuChem® are pleased to provide our report for the analysis you requested. Data for the following sample are enclosed:

Your ID Number	Our ID Number	Analysis Code	Order Number	Description of Work Requested	Report Format
HYPALON	376715	487,796	21670	Semi-Volatiles (TCLP) Method 8270 - 3rd Ed.	Style 1

In this report we have included the analytical results, the method reference, and the quality control summary. To obtain additional technical information concerning this report, please contact your Sales Representative. In addition to resolving your questions, they can provide you with a complete overview of our line of services and assist you in identifying those services which will effectively and efficiently support your monitoring program.

For your convenience, your Customer Service Representative can help you place a new order, obtain information about a sample's status or obtain assistance with sample logistics. Your Sales Representative and your Customer Service Representative can be reached at 1/919-549-8263.

Thank you for choosing CompuChem®. We would like to continue providing you analytical support and services. We would appreciate your comments regarding the quality of services you have received from CompuChem®; client satisfaction is important to us. Please address your comments to your Sales or Customer Service Representative at the address given above.

Sincerely,

for Mark Gabriel
Elise L. Cobb
Supervisor, Report Deliverables

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

Unless noted by Quality Assurance Notices included in this report of data, all Quality control requirements associated with the preparation and analysis of this sample have been met.

Release of the analytical data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Sarah A. Hubbard
Sarah A. Hubbard
Technical Reviewer

Date: 11/19/90

COMPUCHEM LABORATORIES, INC.

- TABLE OF CONTENTS -

Chronicle

Method Reference

Data Summary

- Data Reporting Qualifiers
- Method 8270 Semi-Volatile (TCLP) Compound List and Detection Limits

Quality Assurance Notices*

Chain of Custody**

*These notices are included where appropriate for data qualification.

**When the original chain of custody is submitted with the sample(s), a copy of it is included with the report.

COMPUCHEM
LABORATORIES, INC.

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Randall L. Green
DELCO PRODUCTS
GENERAL MOTORS CORPORATION
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

CHRONICLE

Sample Identifier:	HYPALON
CompuChem Number:	376715
Date TCLP Performed:	10/31/90

METHOD REFERENCE

To determine the concentration of semivolatile organic compounds in aqueous matrix CompuChem® employs, essentially, the sample preparation methods indicated in Method 3510 (Separatory Funnel Extraction) of "The Test Methods for Evaluating Solid Waste", SW-846. For sample analysis, CompuChem® employs Method 8270 for the analysis of semivolatile organics in accordance with "The Test Methods for Evaluating Solid Waste", SW-846. This method is approved for obtaining data to satisfy the requirement of 40CFR Part 261, Identification and Listing of Hazardous Waste.

Method Summary

Preparation

Surrogates are added to an aliquot (usually 1-liter) of aqueous sample. The sample is extracted at a pH of greater than 11 and then at a pH of less than 2 using a separatory funnel. The solvent used is methylene chloride. The extracts are dried and concentrated.

Analysis

After the extracts are combined, qualitative identification is performed using retention time and the relative abundance of three characteristic ions. Quantatative analysis is performed using internal standard techniques.

METHOD REFERENCE

The USEPA published in the June 13, 1986, Federal Register the Toxicity Characteristics Proposed Rule under the authority of Subtitle C of the Resource Conservation and Recovery Act (RCRA). The rule is intended to replace the SE-846 Extraction Procedure with an improved leaching test know as the Toxicity Characteristic Leaching Procedure (TCLP). The test simulates the leaching a waste would undergo when land disposed. CompuChem employs the TCLP methodology contained in Draft Method 13XX (Revised October 4, 1985). The leachate resulting from the application of the TCLP can be assessed for a large number of organic and inorganic constituents for analysis of volatile organics. For analysis of volatile organics, a special Zero Headspace Extraction (ZHE) vessel must be used.

Method Summary - TCLP; When Volatile Organics Not Involved

The solid phase sample (maximum 100g) is placed in an extractor bottle with an amount of extraction fluid 20 times the weight of the solid, the bottle closed, secured in a rotary extractor device and rotated for 18 hours at 30 rpm. Different extraction fluids are used depending on the pH of the solid sample. After extraction, the TCLP extract is obtained by means of pressure filtration.

DATA REPORTING QUALIFIERS

VALUE – If the result is a value greater than or equal to the detection limit, report the value.

U – Indicates compound was analyzed but not detected. The sample Quantitation limit must be corrected for dilution and for percent moisture. For example, 10 U for phenol in water if the sample final volume is the protocol–specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to:

$$\frac{(330\ U) \times df}{D} \quad \text{Where } D = \frac{100 - \%\ Moisture}{100}$$

and df = dilution factor

At 24% moisture, D = 100–24

$$\frac{\quad}{100} = 0.76$$

$$\frac{(330\ U) \times 10}{.76} = 4300\ U$$ rounded to the appropriate number of significant figures

For soil sample subjected to GPC clean–up procedures, the CRQL is also multiplied by 2, to account for the fact that only half of the extract is recovered.

J – Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater than zero. For example, if the sample quantitation limit is 10 ug/l, but a concentration is 3 ug/l is calculated, report it as 3J. The sample quantitation limit must be adjusted for both dilution and percent moisture as discussed for the U flag, so that if a sample with 24% moisture and a 1 to 10 dilution factor has a calculated concentration of 300 ug/l and a sample quantitation limit of 430 ug/kg, report the concentration as 300J on Form I.

DATA REPORTING QUALIFIERS - PAGE 2

C - This flag applies to pesticides results where the identification has been confirmed by GC/MS. Single component pesticides >10 ng/ul in the final extract shall be confirmed by GC/MS.

B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified TCL compound.

E - This flag identifies compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. This flag will not apply to pesticides/PCBs analyzed by GC/EC methods. If one or more compounds have a response greater than full scale, the sample or extract must be diluted and re-analyzed according to the specifications. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses shall be reported on separate Forms I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample and all concentration values reported on that Form I are flagged with the "D" flag.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags and footnotes may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and the Case Narrative. Begin by using "X". If more than one flag is required, use "Y" and "Z", as needed. If more than five qualifiers are required for a sample result, use the "X" flag to combine several flags as needed. For instance, the "X" flag might combine the "A", "B", and "D" flags for some sample.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

HYPALON

Lab Name: COMPUCHEM,RTP Contract: 500069

Lab Code: COMPU Case No.: 21670 SAS No.: _____ SDG No.: _____

Matrix: (soil/water) WATER Lab Sample ID: 376715

Sample wt/vol: 500 (g/mL) ML Lab File ID: GH076715A22

Level: (low/med) LOW Date Received: 10/30/90

% Moisture: not dec. ____ dec. ____ Date Extracted: 10/31/90

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 11/05/90

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 0.50

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
110-86-1	Pyridine	10	U
108-95-2	Phenol	7	J
111-44-4	bis(2-Chloroethyl)Ether	20	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-39-4	3-Methylphenol	10	U
106-44-5	4-Methylphenol	10	U
67-72-1	Hexachloroethane	5	J
98-95-3	Nitrobenzene	10	U
87-68-3	Hexachlorobutadiene	10	U
88-06-2	2,4,6-Trichlorophenol	20	U
95-95-4	2,4,5-Trichlorophenol	20	U
121-14-2	2,4-Dinitrotoluene	10	U
58-90-2	2,3,4,6-Tetrachlorophenol	20	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	20	U

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

November 12, 1990

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

Dear Mr. Green:

We at CompuChem® are pleased to provide our report for the analysis you requested. Data for the following sample are enclosed:

Your ID Number	Our ID Number	Analysis Code	Order Number	Description of Work Requested	Report Format
HYPALON	376722	625	21670	Pesticides + TCLP - Method 8080	Style 1

In this report we have included the analytical results, the method reference, and the quality control summary. To obtain additional technical information concerning this report, please contact your Sales Representative. In addition to resolving your questions, they can provide you with a complete overview of our line of services and assist you in identifying those services which will effectively and efficiently support your monitoring program.

For your convenience, your Customer Service Representative can help you place a new order, obtain information about a sample's status or obtain assistance with sample logistics. Your Sales Representative and your Customer Service Representative can be reached at 1/919-549-8263.

Thank you for choosing CompuChem®. We would like to continue providing you analytical support and services. We would appreciate your comments regarding the quality of services you have received from CompuChem®; client satisfaction is important to us. Please address your comments to your Sales or Customer Service Representative at the address given above.

Sincerely,

Mack Galvan

for Elise L. Cobb
Supervisor, Report Deliverables

COMPUCHEM LABORATORIES, INC. P.O. Box 12652 3308 Chapel Hill/Nelson Highway Research Triangle Park, NC 27709 (919) 549-8263

Unless noted by Quality Assurance Notices included in this report of data, all Quality control requirements associated with the preparation and analysis of this sample have been met.

Release of the analytical data contained in this data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Sarah A. Hubbard
Technical Reviewer

Date: 11/8/90

COMPUCHEM LABORATORIES, INC.

- TABLE OF CONTENTS -

Chronicle

Method Reference

Data Summary

- Method 8080 Pesticides Compound List

Quality Assurance Notices*

Chain of Custody**

*These notices are included where appropriate for data qualification.

**When the original chain of custody is submitted with the sample(s), a copy of it is included with the report.

COMPUCHEM LABORATORIES, INC.

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Mr. Randall L. Green
Delcon Products
General Motors Corporation
2701 Home Avenue
Post Office Box 1224
Dayton, OH 45401

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE SAMPLE EXTRACTED	DATE TCLP PERFORMED	DATE PESTICIDES FRACTION ANALYZED
1.	HYPALON	376722	10/30/90	11/01/90	10/30/90	11/02/90 11/15/90*

*Second column confirmation analysis which serves to verify the presence or absence of Pesticide compounds.

METHOD REFERENCE

To determine the concentration of Pesticides as required by the February 13, 1986 Federal Register for Waste Characterization, the analysis is performed following preparation of the sample as required in the June 13, 1986 Federal Register (Toxicity Characteristics Proposed Rule under the authority of Subtitle C of the Resources Conservation and Recovery Act or RCRA). This preparation method is intended to replace the SW-846 extraction procedures with an improved leaching test known as the Toxicity Characteristic Leaching Procedure (TCLP). The test simulates the leaching a waste undergo when land disposed. CompuChem® employs the TCLP methodology contained in Draft 13XX (revised October 4, 1985). The leachate resulting from the application of the TCLP can be assessed for a large number of organic and inorganic constituents.

Method Summary

The solid phase sample (maximum 100g) is placed in an extractor bottle with an amount of extraction fluid 20 times the weight of the solid. The bottle is closed, secured in a rotary extractor device and rotated for 18 hours at 30 rpm. Different extraction fluids are used depending upon the pH of the solid samples. After extraction, the TCLP extract is obtained by means of pressure filtration. For analysis, the pesticides present in the sample are separated based on chromatographic conditions. Once separated, the individual components are detected using an Electron Capture detector. Concentration is determined relative to the response of known standards.

COMPOUND LIST

PESTICIDES, METHOD 8080
COMPOUND LIST

SAMPLE IDENTIFIER: HYPALON
COMPUCHEM® SAMPLE NUMBER: 376722

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1P.	CHLORDANE	BDL	0.60
2P.	ENDRIN	BDL	0.25
3P.	HEPTACHLOR	BDL	0.15
4P.	P,P'-METHOXYCHLOR	BDL	1.5
5P.	TOXAPHENE	BDL	5.0
6P.	GAMMA-BHC (LINDANE)	BDL	0.15

BDL=BELOW DETECTION LIMIT

the maximum amount containing liquid hazardous waste is not expected to exceed 112 drums.

D.1.a.(2) Container Management Practices

The containers in storage are kept closed except as necessary to remove waste for analysis or to empty them into the mixing tank. Empty drums are sent to a drum reclaimer for cleaning and recycling. Handling of the drums is conducted in a manner to prevent rupture or leakage of the drums. Transportation of the drums is provided by two fork-lift trucks in use in the HWMF. They are used to move pallets of containers to appropriate storage zones, to load pallets of waste and reclaimable materials onto trucks. This is accomplished with a special 360-degree rotating barrel clamping mechanism on each lift truck.

Containers from the satellite areas from the manufacturing facility west of Abbey Road (Hill Plant) to be stored in the HWMF are transported by forklift trucks to a tractor/trailer truck. From here the tractor/trailer truck transports the containers to the 20/18 dock located at the main plant. The containers are then transported by forklift trucks to the HWMF for storage. Containers from the satellite areas from the main plant are transported to the HWMF by forklift trucks.

A drawing of the container storage area showing the storage zones, maximum number of drums per zone, and aisle spacing is presented in Figure D-2. The normal stacking procedures for the drums is a two-pallet-high stack with four drums per pallet, as shown in Figure D-3. Additional capacity could be generated by using three-pallet stacking, but this is not expected to be necessary and is not included in the capacity numbers in Figure D-2.

A DRAWING SHOWING THE ROUTES UTILIZED WITHIN THE FACILITY FOR TRANSPORTING HAZARDOUS WASTE IS PRESENTED IN ATTACHMENT D-1.

The tanks and secondary containment are entirely under roof to prevent infiltration of precipitation and are entirely surrounded by curbing (9-inch-high minimum) to prevent run-on into the vault. Any residual precipitation that could potentially blow into the containment would be less than the excess capacity of the containment system.

Delco Products HAS ~~is in the process of~~ installED~~ing~~ chemical resistant water stops in place at the joints, and a compatible impermeable coating to the interior of the concrete secondary containment vault. THE SPECIFICATIONS FOR THESE MATERIALS ARE PRESENTED IN ATTACHMENT D-2. These measures will prevent the permeation of liquid wastes to the surrounding soil in the future. Although these measures were not previously installed, there is no evidence that waste liquids have permeated to the surrounding soils and there have been no major spills in the waste storage area.

The wastes stored in the tank meet the definition of flammability. The vault is exposed to the atmosphere (under roof but no walls) and natural ventilation patterns protect against the formation of vapors within the vault.

To prevent ignition of any vapor in the vault or tank area, the following precautions are used. The barrel dumper, Tank No. 1 and Tank No. 2, are grounded through #4/0 copper wire to six 10-feet long grounding rods below the concrete slab. All connections are thermite welded. There are no sources of flame or spark in the hazardous material storage area. The pumps are operated through explosion-proof disconnects with push button controls located inside Building 16. The barrel dumper is hydraulic powered with manual controls. The agitators in the mix tank are air-powered. Both tanks are 21 feet from the edge of the B&O Railroad right-of-way. Further protection is assured by the Delco Products-built and maintained outer perimeter security fence on the far side of the railroad right-of-way.

To prevent against the formation and potential ignition of vapors in the subsurface containment structure, Delco Products is in the process of venting the structure in accordance with Ohio Plumbing Code 4101; 2-51-24 interceptors. In

SECTION D

PROCESS INFORMATION

The information in this section is submitted in accordance with the requirements of OAC 3745-50-44(A),(C)(1) and (2); 3745-55-70 through 77; and 3745-55-9098; and 40 CFR 270.14 through 270.16 and 264 Subparts I and J.

This section discusses specific process information for the storage of hazardous waste in containers and tanks. The Delco Products, Dayton Operations manages an approximate 3,840-square-foot storage area for hazardous waste. It includes container storage, a 500-gallon mix tank, and a 7,000-gallon storage tank, as shown in Figure D-1. The container storage area includes areas set aside for storage of other materials and a working area for sorting incoming drums into categories of reclaimable or waste, etc.

Hazardous waste storage activities at Dayton Operations are handled by:

Gail Spears
Supervisor
Waste Management Department
(513) 455-3801

D.1 CONTAINERS

The hazardous waste stored in containers at Dayton Operations contains free liquids. Provided below is a description of the containers, the storage area, and secondary containment.

D.1.a Containers with Free Liquids

D.1.a.(1) Description of Containers

The containers used to store hazardous waste in the container storage area are all new or recycled 55-gallon steel drums meeting U.S. Department of Transportation (DOT) requirements (17E or 17H). All drums containing hazardous waste are clearly marked as such. The maximum inventory of containers stored in the container storage area at any given time is not expected to exceed 228 drums containing liquids. Of these 228 drums,

the maximum amount containing liquid hazardous waste is not expected to exceed 112 drums.

D.1.a.(2) Container Management Practices

The containers in storage are kept closed except as necessary to remove waste for analysis or to empty them into the mixing tank. Empty drums are sent to a drum reclaimer for cleaning and recycling. Handling of the drums is conducted in a manner to prevent rupture or leakage of the drums. Transportation of the drums is provided by two fork-lift trucks in use in the HWMF. They are used to move pallets of containers to appropriate storage zones, to load pallets of waste and reclaimable materials onto trucks. This is accomplished with a special 360-degree rotating barrel clamping mechanism on each lift truck.

CONTAINERS FROM THE SATELLITE AREAS FROM THE MANUFACTURING FACILITY WEST OF ABBEY ROAD (HILL PLANT) TO BE STORED IN THE HWMF ARE TRANSPORTED BY FORKLIFT TRUCKS TO A TRACTOR/TRAILER TRUCK. FROM HERE THE TRACTOR/TRAILER TRUCK TRANSPORTS THE CONTAINERS TO THE 20/18 DOCK LOCATED AT THE MAIN PLANT. THE CONTAINERS ARE THEN TRANSPORTED BY FORKLIFT TRUCKS TO THE HWMF FOR STORAGE. CONTAINERS FROM THE SATELLITE AREAS FROM THE MAIN PLANT ARE TRANSPORTED TO THE HWMF BY FORKLIFT TRUCKS.

A drawing of the container storage area showing the storage zones, maximum number of drums per zone, and aisle spacing is presented in Figure D-2. The normal stacking procedures for the drums is a two-pallet-high stack with four drums per pallet, as shown in Figure D-3. Additional capacity could be generated by using three-pallet stacking, but this is not expected to be necessary and is not included in the capacity numbers in Figure D-2.

D.1.a.(3) Secondary Containment System Design and Operation

The container storage area consists of approximately 3,150 square feet, of which approximately 540 square feet is used for actual storage, 450 square feet is processing area, and approximately 2,160 square feet is aisle space. The entire area is a poured concrete slab under a 12-foot-high roof and is surrounded by a 10-inch wide by 10-inch minimum depth concrete trench to contain run-on and/or spilled material. The capacity (minimum) of the containment trench, which totals 242 feet in length, is in excess of 1,260 gallons. The flow from this trench is to a subsurface containment structure with a capacity of 2,000 gallons. This combined quantity (3,260 gallons) is greater than 10 percent of the maximum capacity of the containers (228 drums x 55-gallon/drum x 10 percent = 1,254 gallons) as required in OAC 3745-55-75(3) and 40 CFR 264.175(b)(3). Containment capacity calculations are presented in Appendix D-1.

The maximum amount of hazardous liquid waste stored in containers at any one time is not expected to exceed 112 drums during normal operations. The remaining storage area inside the primary containment system is used for storage of reclaimable liquids and non-hazardous waste.

The drummed waste consists chiefly of ignitable wastes which are to be transferred to the 7,000-gallon waste tank prior to removal in bulk for offsite incineration. The remaining liquid waste storage consists of wastes that are not suitable for placement in the bulk tank, generally because they are too viscous to be pumped or contain excessive insolubles.

The material storage area is separated into zones designated for storage of the various hazardous wastes and materials. Surplus materials are stored in the north end of the pad, in storage Zones 1, 2, and 3. They are picked up six times yearly, and transported to the buyer's plant. Bulkable wastes are temporarily stored in Zones 4 and 5 adjacent to the barrel dumper facility until they can be added to the bulk tank. Non-bulkable wastes are stored across the main aisle in Zone 9. At the entrance to the HWM pad are two drop areas, Zones 11 and 12, on the west side of the main aisle. Incoming pallets are deposited in this area until they can be logged in, identified if necessary, and directed to the proper individual storage area. Any drums containing unknown wastes that must be analyzed in

accordance with Section C of this report are held in the drop area on the east side of the entrance, Zone 10.

Any unusual wastes that are known or are found through analysis to contain wastes that are incompatible with other wastes stored on the pad, will be stored in Zones 6 or 7, surrounded by a 5-foot buffer area. Any such incompatible waste will be removed for disposal offsite as quickly as arrangements can be made with an appropriate disposal site.

The remaining storage area, Zone 8, contains a row of re-salable iso-cyanates, which are a reactive material. They are kept separate from the ignitable liquids and are sold approximately every 60 days.

D.1.a(3)(a) Requirement for the Base or Liner to Contain Liquids

Figure D-3 shows a cross-sectional view of the container storage pad. The pad is concrete-paved and approximately 8 inches thick. The pad is currently free of gaps and cracks, and is routinely inspected for deterioration. It is anticipated that concrete is compatible with the type of wastes stored in the area.

The north end is bounded by an 8-feet-high chainlink fence atop a 2-feet-high concrete curb. North of this fence (not shown) is a 50-feet-wide railroad right-of-way, which in turn is bounded by another chainlink fence built and maintained by Delco Products. That fence and railroad gates form part of the perimeter security fence, which prevents public access within 50 feet of the drums.

D.1.a(3)(b) Containment System Drainage and
D.1.a(3)(c) Containment System Capacity

The storage area consists of a concrete pad, completely surrounded by a 10-inch-wide by 10- to 28-inch-deep containment trench. The perimeter trench flows to the subsurface containment structure (2,000 gallon). Figure D-4 is a cross-sectional view of this containment structure. For additional protection, the rainwater release valve shown at the outlet of the tank is used to prevent the accidental overflow of water that may contain some waste. The total capacity of the trench and containment structure is, therefore, more

than 3,200 gallons, exceeding the capacity of 10 percent of stored drums plus any rainfall that could potentially blow in (see containment calculations in Appendix D-1).

D.1.a(3)(d) Control of Runon

The west side of the storage area consists of the wall of the waste management administration building. The east side is bounded by the storage tanks (covered later in this section) and another storage building. The south side of the storage pad slopes down toward the lift truck entrance. The entire area is roofed to prevent run-on from precipitation. Any rain that blows onto the storage pad drains to the perimeter trench and flows from there to a 2,000-gallon underground tank for collection and removal.

D.1.a(3)(e) Removal of Liquids from Containment System

THE 2,000 GALLON CONTAINMENT STRUCTURE IS PUMPED APPROXIMATELY EVERY TWO WEEKS. THIS SCHEDULE IS SUFFICIENT TO PREVENT OVERFLOW FROM ACCUMULATED MOP WATER AND RAIN WATER RUNOFF. ANY SPILLS THAT MAY OCCUR WILL ALSO RESULT IN THE PUMPING OF THE STRUCTURE, AS APPROPRIATE.

IN ADDITION TO THE BI-WEEKLY PUMPING OF THE CONTAINMENT STRUCTURE, management practice for the liquid in this secondary containment tank dictates that it be pumped out twice yearly and analyzed, if indicated, for hazardous waste according to the sampling plan for tanks in Section C. If the underground tank should be found to contain hazardous waste, that waste will be pumped into a tank wagon and removed to an approved offsite facility for disposal.

D.1.b Containers Without Free Liquids

Delco Products does not currently treat, store, or dispose of containers that do not contain free liquids; therefore, this section is not applicable.

D.2 TANKS

D.2.a Existing Tank Systems

Storage of hazardous waste in tanks at Dayton Operations is facilitated by two existing tanks: a 500-gallon mixing tank (No. 1) and a 7,000-gallon storage tank (No. 2), as shown in Figures D-5 and D-6. The tanks provide storage for a variety of wastes from adhesive and coating operations. Drums containing ignitable wastes are emptied into the 500-gallon tank No. 1. Tank No. 1 is used to assess the suitability of the wastes to be pumped and stored in Tank No. 2. After thorough mixing, the contents of Tank No. 1 are pumped into Tank No. 2, the 7,000-gallon bulk storage tank.

D.2.a.(1) Assessment of Existing Tank Systems' Integrity

As shown in Figure D-5, the tanks are surrounded by a secondary containment system that meets the requirements of OAC 3745-55-93 and 40 CFR 264.193. As such, according to OAC 3745-55-91 and 40 CFR 264.191, an assessment of the existing tank systems' integrity is not required.

D.2.a.(2) External Corrosion Protection

Both tanks are located under roof providing protection from external corrosion caused by precipitation. In addition, Tank No. 1 is constructed of 316 stainless steel which is corrosion resistant, and Tank No. 2 is externally coated with a urethane paint (see engineering drawings in Appendix D-2).

D.2.b New Tank Systems

As indicated above, the tanks are existing tanks; therefore, this section is not applicable.

D.2.c Dimensions and Capacity of Each Tank

The dimensions and capacity of each tank are shown below and in the engineering drawings in Appendix D-2.

	Configuration	Dimensions	Capacity (gallons)	Materials	Specs.
Tank No. 1	Rectangular See Appendix D-2	9' - 6" x 2' - 6" x 2' - 11" deep	500	316 stainless, 11 ga. bottom, 14 ga. walls, w/3 x 3 1/4 stainless angle frame	Machinery's Handbook 16th Edition, p. 418
Tank No. 2	Cylindrical Vertical Dish-Bottom See Appendix D-2	12'-4" straight Side 9'-6" diameter	7,000	5/16" 1020 HRS 56,000-65,000 psi	ASME Fab. Std.

Tank No. 1 is supported by two 8-inch channels running the length of the tank, each welded onto two 6-inch-square, 1/2-inch-thick plate. Two 3/4-inch-diameter anchors secure the tank to the 6-inch-thick concrete slab.

Tank No. 2 is supported by four equally spaced 4- x 4- x 13-foot H-beams, continuous welded for 30 inches to the straight sides of the tank. Assuming a 16,000-pound load per column allows a 3.5:1 safety factor. Each leg is welded to an 8 x 8 x 1-inch-thick steel plate secured to the 6-inch concrete slab (two) places, each with 3/4-inch anchors. Liquid level is indicated by a 12-inch ball float and exterior level indicator. Atmospheric venting is provided by the 3-inch pipe coupling at the ball float. There are two 3-inch top inlets and two 3-inch outlets, one on the dish bottom for recirculation, and one for cleanout on the straight side. The top manway is 24 inches diameter.

D.2.d Description of Feed Systems, Safety Cutoff, Bypass Systems, and Pressure Controls

As shown in Figure D-6, the tank feed system at Dayton Operations consists of a hydraulic dumper which empties contents of the drums into Tank No. 1. The waste is mixed to determine if it is pumpable and then is pumped into storage Tank No. 2. IF THE WASTE IS NOT SUITABLE FOR PUMPING TO TANK NO. 2, IT IS PUMPED INTO DRUMS. FURTHERMORE, IF THE WASTE IS CONTAMINATED (A DIFFERENT

CHARACTERISTIC FROM WASTE IN TANK NO. 2), THEN TANK NO. 1 IS RINSED AND THE RINSATE ALSO PUMPED INTO DRUMS. The feed process is manually controlled and supervised, takes place entirely in the container storage and tank storage area, and is conducted at a maximum rate of 2 drums at one time; therefore, safety cutoffs are not necessary and have not been incorporated into the feed system. Bypass systems at Dayton Operations consist of a return line which can return liquid from Tank No. 2 to Tank No. 1 as necessary (Figure D-6). Pressure control is provided in Tank No. 1 by the openings that receive the waste from the barrel dumper, and in Tank No. 2 by a 3-inch pipe coupling vent at the top of Tank No. 2 (Figure D-6).

D.2.e Piping, Instrumentation, and Process Flow

Figure D-6 shows piping, instrumentation, and process flow of both tanks. Operation is as follows, referring to Figure D-6. The hazardous waste facility operator positions a suitable drum of ignitable waste in front of the barrel dumper (1) and open it. The hydraulic barrel dumper then upends the drum, draining it into the mix tank (2). The material in the mix tank is constantly agitated and recirculated by agitator (3) and pump (4). As the mix tank is filled, the liquid level indicator (5) rises until the operator is given a visual signal to transfer the mix to Tank No. 2 (6). This is done by shifting two valves on the recirculation line. The liquid mix in the 7,000-gallon tank continues to recirculate through the bulk tank pump (7). If it is desired, liquid can be returned to the mix tank through the bypass line (8). When the liquid level indicator (9) indicates at least 5,000 gallons (but long before the tank is full), a sample is drawn off through sample tap (16) and sent to the incinerator operators for their analysis. After drawing the sample, the general supervisor of Waste Management locks the tank inlet valves closed so that no more waste can be added to the tank.

Upon obtaining approval from the incinerator that the batch is acceptable, the bulk tank is emptied into a tank wagon through one of the 3-inch drains, (10) or (11). Other items of interest on the tank and piping sketch are the manway (12), the level indicator opening which vents the tank, the electrical grounding system (14), and the concrete containment curb (15) that provides spill capacity of over 7,600 gallons. An accidental spill or overfill of either tank would be captured in this containment area for reprocessing.

D.2.f Containment and Detection of Releases

D.2.f.(1) Plans and Description of the Design, Construction, and Operation of the Secondary Containment System

D.2.f.(1)(a) Tank Age Determination

The hazardous waste tanks at Dayton Operations were installed in 1982. Documentation for the age determination is provided by work orders for tank installation (Tank No. 1, October 8, 1981; Tank No. 2, October 9, 1981; see Appendix D-3), and by the engineering design drawings dated in late 1981 (Tank No. 1 - September 22, 1981; Tank No. 2 - October 7, 1981; see Appendix D-2 for drawings). Based on the normal schedule for such installations at Dayton Operations, the date of actual installation was likely in early 1982, the year used in this application. As such, the tanks are not required to have secondary containment until 1997, which is when the tanks reach 15 years of age as specified in OAC 3745-55-93(A)(3) and 40 CFR 264.193(a)(3). However, secondary containment and leak detection is provided for the tanks as described in the following section.

D.2.f.(1)(b) Requirements for Secondary Containment and Leak Detection

The secondary containment system for the Dayton Operations' hazardous waste tanks is designed, installed, and operated to prevent any migration of waste or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and capable of detecting and collecting any releases and accumulated liquids until the collected material is removed.

The secondary containment system is constructed of concrete. The wastes contained in the tanks are primarily considered hazardous because of ignitability; these wastes are compatible with concrete.

The containment system construction consists of a concrete vault with a 6-inch-thick base and 8-inch-thick walls (curbing). This construction is designed, installed, and operated to be of sufficient strength and thickness to prevent failure due to pressure gradients (e.g., static head and external hydrological forces), physical contact with the

waste, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic). The base of the system is capable of providing support to the system and is resistant to pressure gradients (above and below the system), and capable of preventing failure due to settlement, compression, or uplift.

The leak detection system at Dayton Operations is designed to detect the failure of either the tanks (primary containment) or the secondary containment structure, or the presence of accumulated liquids or any releases of hazardous waste in the secondary containment within 24 hours. The leak detection system employs the operational control of daily visual inspection for releases into the secondary containment system in accordance with OAC 3745-50-10(59) and 40 CFR 260.10. Details of the inspection schedule are provided in Section F.

The secondary containment system is sloped from south to north (a drop of approximately 1 foot over the entire containment vault), as shown in Figure D-5 (see also Appendix D-2). Any liquids in the containment system drain to and are collected in a containment sump at the low end (Figure D-5) where they can be removed. In the event that rainwater were to blow into the containment system, it could be diverted within 24 hours to the container storage area containment trench and the subsurface containment structure used by the container storage area (see Figure D-4) by temporarily opening the rainwater release valve (normally closed) shown in Figures D-4 and D-5. Spilled or leaked waste would be removed within 24 hours (or in as timely a manner as is possible to prevent harm to human health or the environment) and placed in 55-gallon steel drums (DOT approved) and reprocessed as necessary or returned to the tank or shipped offsite for disposal.

D.2.f.(1)(c) Requirements for External Liner, Vault, Double-Walled Tank or Equivalent Device

The secondary containment system at Dayton Operations is a vault. The capacity of the vault is over 7,600 gallons, which is in excess of 100 percent of the capacity of the largest tank (7,000 gallons) as required in OAC 3745-55-93(E)(2)(a) and 40 CFR 264.193(e)(2)(ii). The containment capacity is greater than the combined capacity of both tanks. Capacity calculations are shown in Appendix D-1.

The tanks and secondary containment are entirely under roof to prevent infiltration of precipitation and are entirely surrounded by curbing (9-inch-high minimum) to prevent run-on into the vault. Any residual precipitation that could potentially blow into the containment would be less than the excess capacity of the containment system.

Delco Products is in the process of installing chemical resistant water stops in place at the joints, and a compatible impermeable coating to the interior of the concrete secondary containment vault. THESE MEASURES WILL PREVENT THE PERMEATION OF LIQUID WASTES TO THE SURROUNDING SOIL IN THE FUTURE. ALTHOUGH THESE MEASURES WERE NOT PREVIOUSLY INSTALLED, THERE IS NO EVIDENCE THAT WASTE LIQUIDS HAVE PERMEATED TO THE SURROUNDING SOILS AND THERE HAVE BEEN NO MAJOR SPILLS IN THE WASTE STORAGE AREA.

The wastes stored in the tank meet the definition of flammability. The vault is exposed to the atmosphere (under roof but no walls) and natural ventilation patterns protect against the formation of vapors within the vault.

To prevent ignition of any vapor in the vault or tank area, the following precautions are used. The barrel dumper, Tank No. 1 and Tank No. 2, are grounded through #4/0 copper wire to six 10-feet long grounding rods below the concrete slab. All connections are thermite welded. There are no sources of flame or spark in the hazardous material storage area. The pumps are operated through explosion-proof disconnects with push button controls located inside Building 16. The barrel dumper is hydraulic powered with manual controls. The agitators in the mix tank are air-powered. Both tanks are 21 feet from the edge of the B&O Railroad right-of-way. Further protection is assured by the Delco Products-built and maintained outer perimeter security fence on the far side of the railroad right-of-way.

TO PREVENT AGAINST THE FORMATION AND POTENTIAL IGNITION OF VAPORS IN THE SUBSURFACE CONTAINMENT STRUCTURE, DELCO PRODUCTS IS IN THE PROCESS OF VENTING THE STRUCTURE IN ACCORDANCE WITH OHIO PLUMBING CODE 4101; 2-51-24 INTERCEPTORS. IN

ADDITION, A NO SMOKING SIGN IS BEING POSTED IN THE AREA TO PREVENT POSSIBLE IGNITION OF ANY VAPORS.

Tables 2-6 of the N.F.P.A. Flammable and Combustible Code requires tanks with a capacity of 751 to 12,000 gallons to be no less than 5 feet from the near side of a public way or important building and 15 feet from the opposite side of a public way or property line that can be built upon. The 7,000-gallon tank is actually 21 feet from the near side of the railroad right-of-way, 71 feet from the far side, and 7 1/2 feet from the nearest building of any type, the open storage Building #19. In addition, signs have been posted stated "No Smoking or Open Flame" at access locations to the tank storage area.

The vault is not subject to hydraulic pressure; therefore, moisture does not migrate into the vault and an exterior moisture barrier is not necessary.

D.2.f.(1)(d) Secondary Containment and Leak Detection Requirements for Ancillary Equipment

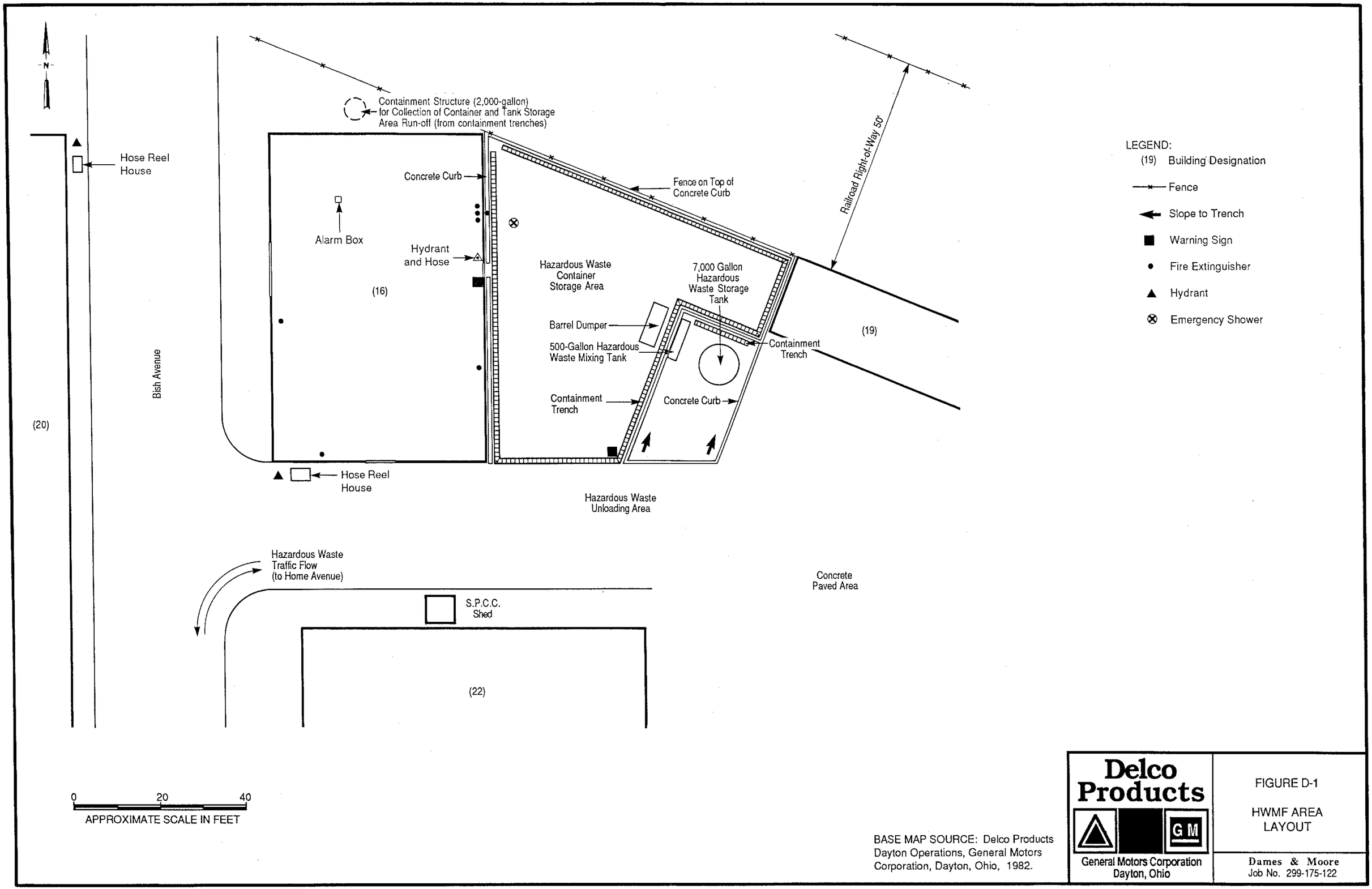
As described in Section D.2.e above, and as shown in Figures D-2, D-5, and D-6, the entire process and all ancillary equipment for the hazardous waste tanks are situated within secondary containment. The containment for the barrel dumper (feed source) is provided by the container storage area containment, and the remaining ancillary equipment is within the tank secondary containment. As such, the descriptions in Sections D.1.a(3) and D.2.f are applicable and provide the demonstration of the adequacy of ancillary equipment secondary containment and leak detection.

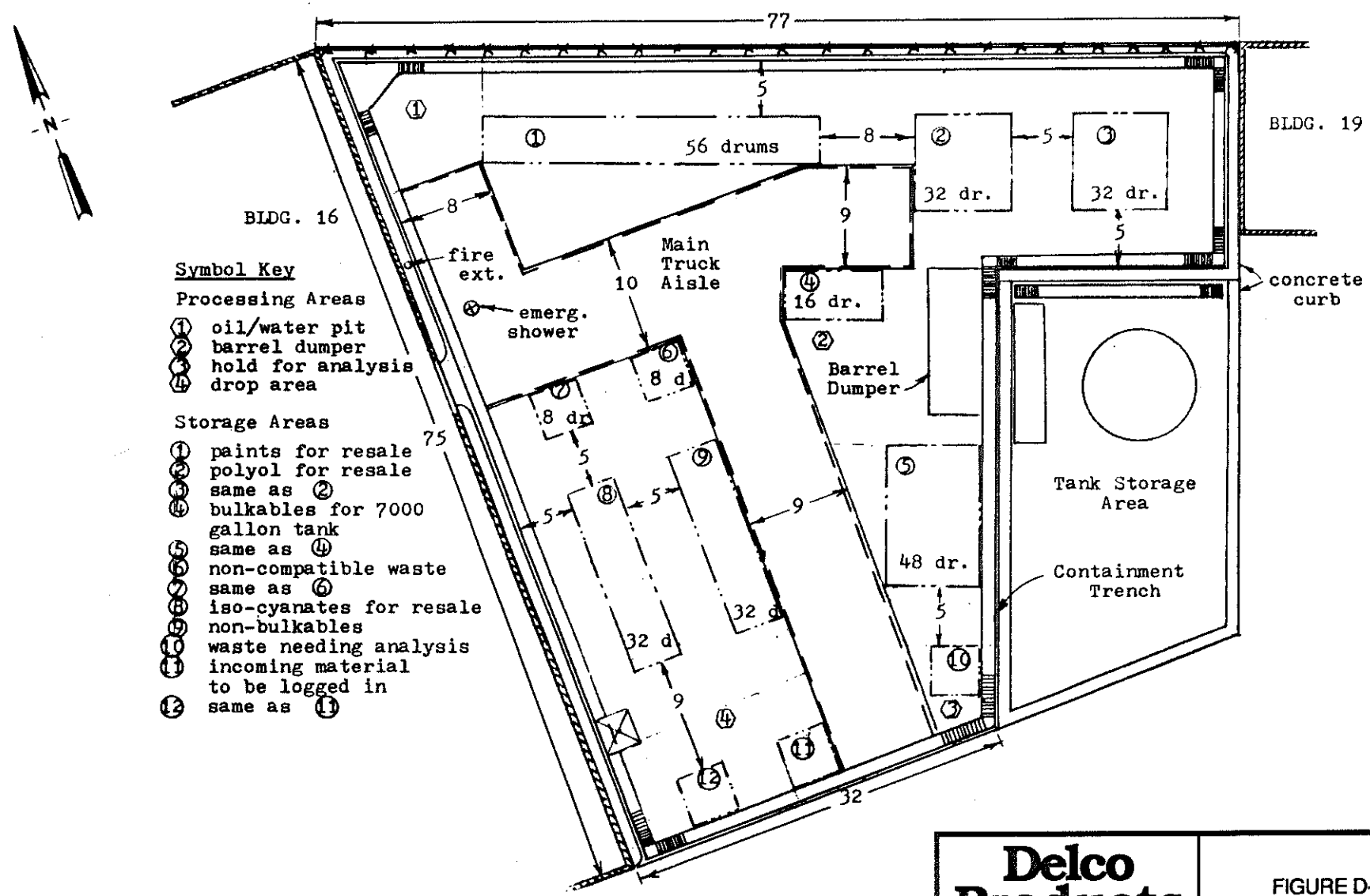
D.2.g Controls and Practices to Prevent Spills and Overflows

As described in Section D.2.e above, the tanks are filled via a barrel dumper, which empties drums into Tank No. 1 where the waste is mixed and then pumped to Tank No. 2. The positioning and upending in the barrel dumping process are manually supervised and controlled to prevent spills. Because the process involves emptying drums by upending, the use of check valves or dry-disconnect couplings is not applicable.

Overfill prevention is facilitated by liquid level indicators on both tanks, as shown in Figure D-5. As an additional precaution, Tank No. 2 is emptied and the contents

disposed when the liquid level indicator reads 5,000 gallons, which is 2,000 gallons less than the tank's capacity. Both tanks are covered tanks; therefore, maintenance of sufficient freeboard to prevent overtopping is not applicable.


N
Hose Reel House
Bish Avenue
(20)
Containment Structure (2,000-gallon) for Collection of Container and Tank Storage Area Run-off (from containment trenches)
Concrete Curb
Alarm Box
Hydrant and Hose
(16)
Fence on Top of Concrete Curb
Railroad Right-of-Way 50'
Hazardous Waste Container Storage Area
7,000 Gallon Hazardous Waste Storage Tank
Barrel Dumper
500-Gallon Hazardous Waste Mixing Tank
Containment Trench
(19)
Containment Trench
Concrete Curb
Hose Reel House
Hazardous Waste Unloading Area
Hazardous Waste Traffic Flow (to Home Avenue)
S.P.C.C. Shed
(22)
Concrete Paved Area
LEGEND:
(19) Building Designation
Fence
Slope to Trench
Warning Sign
Fire Extinguisher
Hydrant
Emergency Shower
0 20 40
APPROXIMATE SCALE IN FEET
BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.
Delco Products
GM
General Motors Corporation
Dayton, Ohio
FIGURE D-1
HWMF AREA LAYOUT
Dames & Moore
Job No. 299-175-122



0 12 24

APPROXIMATE SCALE IN FEET

SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

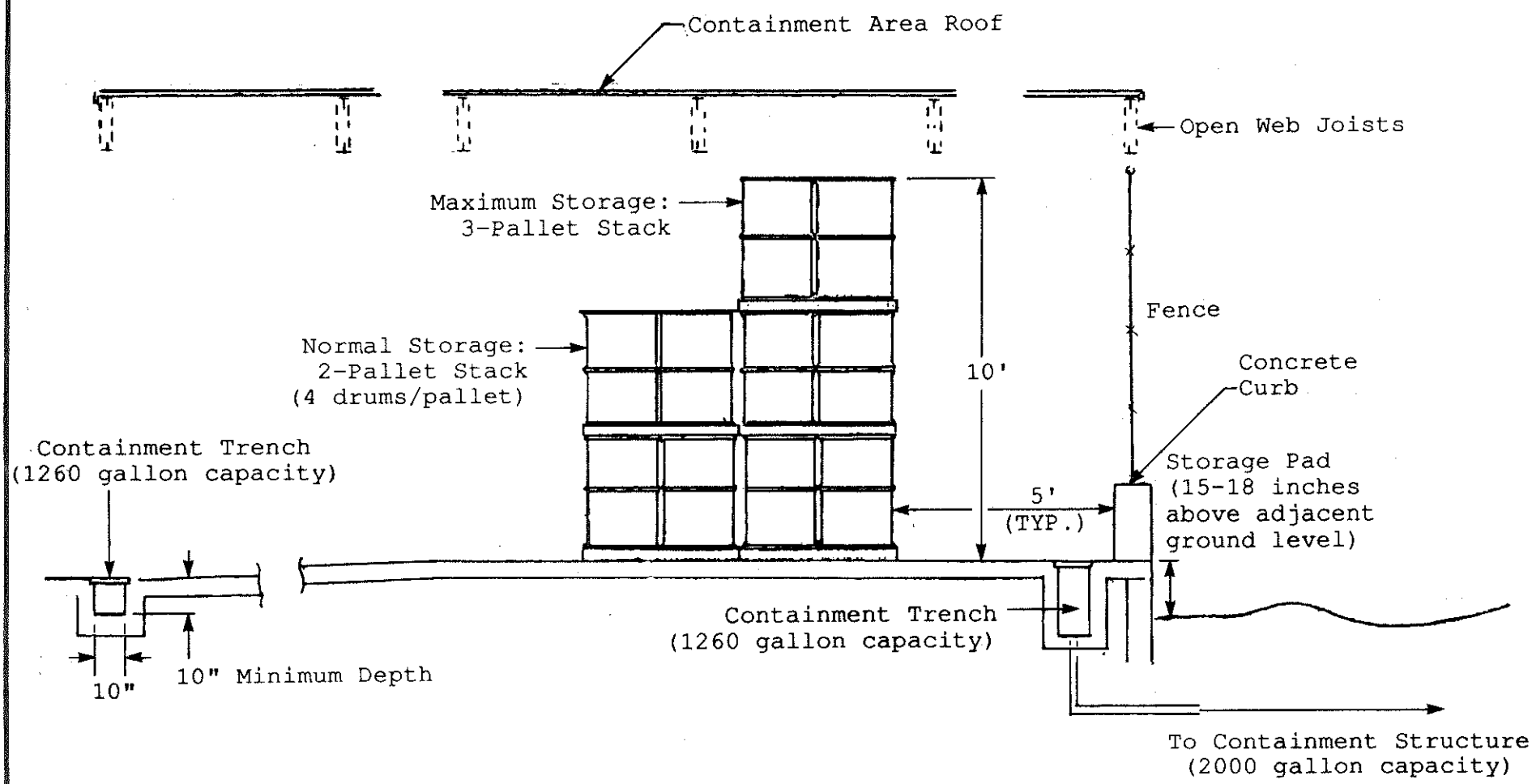
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE D-2

CONTAINER STORAGE AREA

Dames & Moore
Job No. 299-175-122



NOT TO SCALE

SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

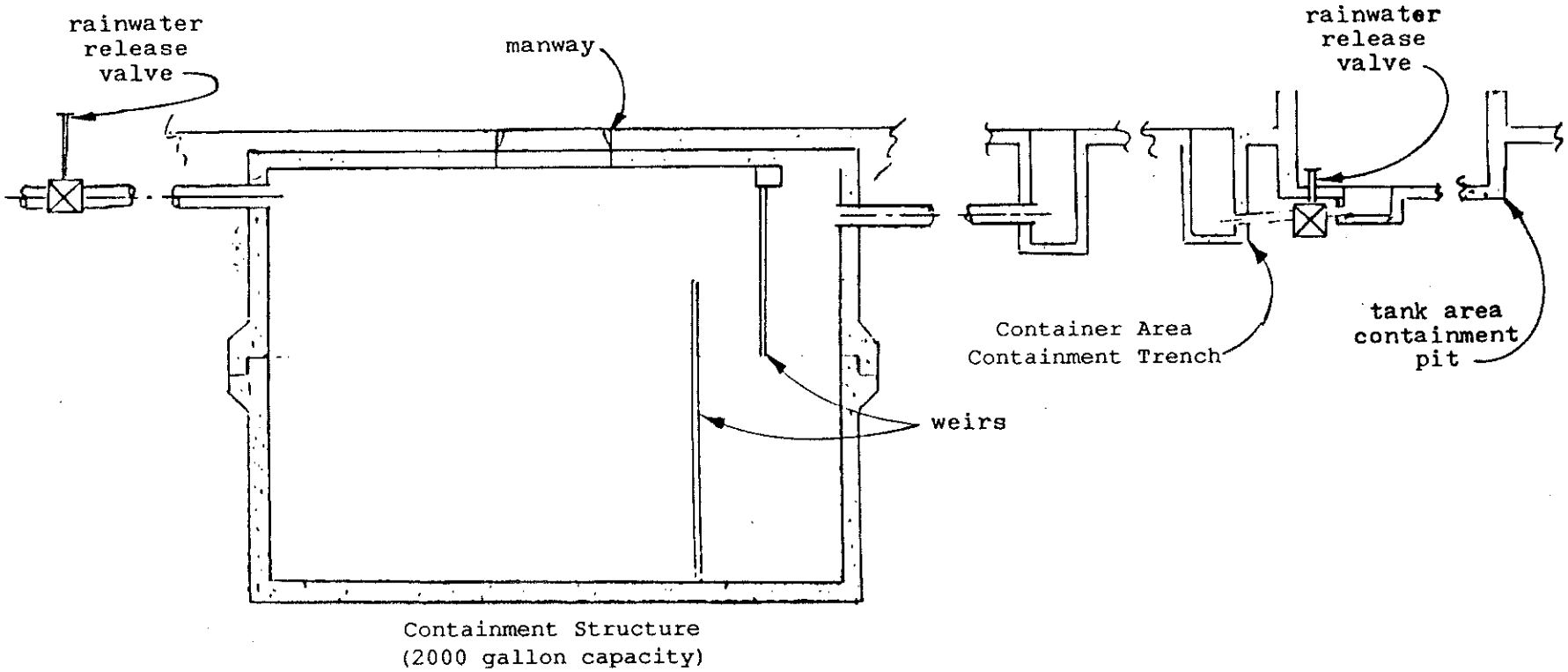
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE D-3

CONTAINER STORAGE AREA CROSS SECTION

Dames & Moore
Job No. 299-175-122



SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

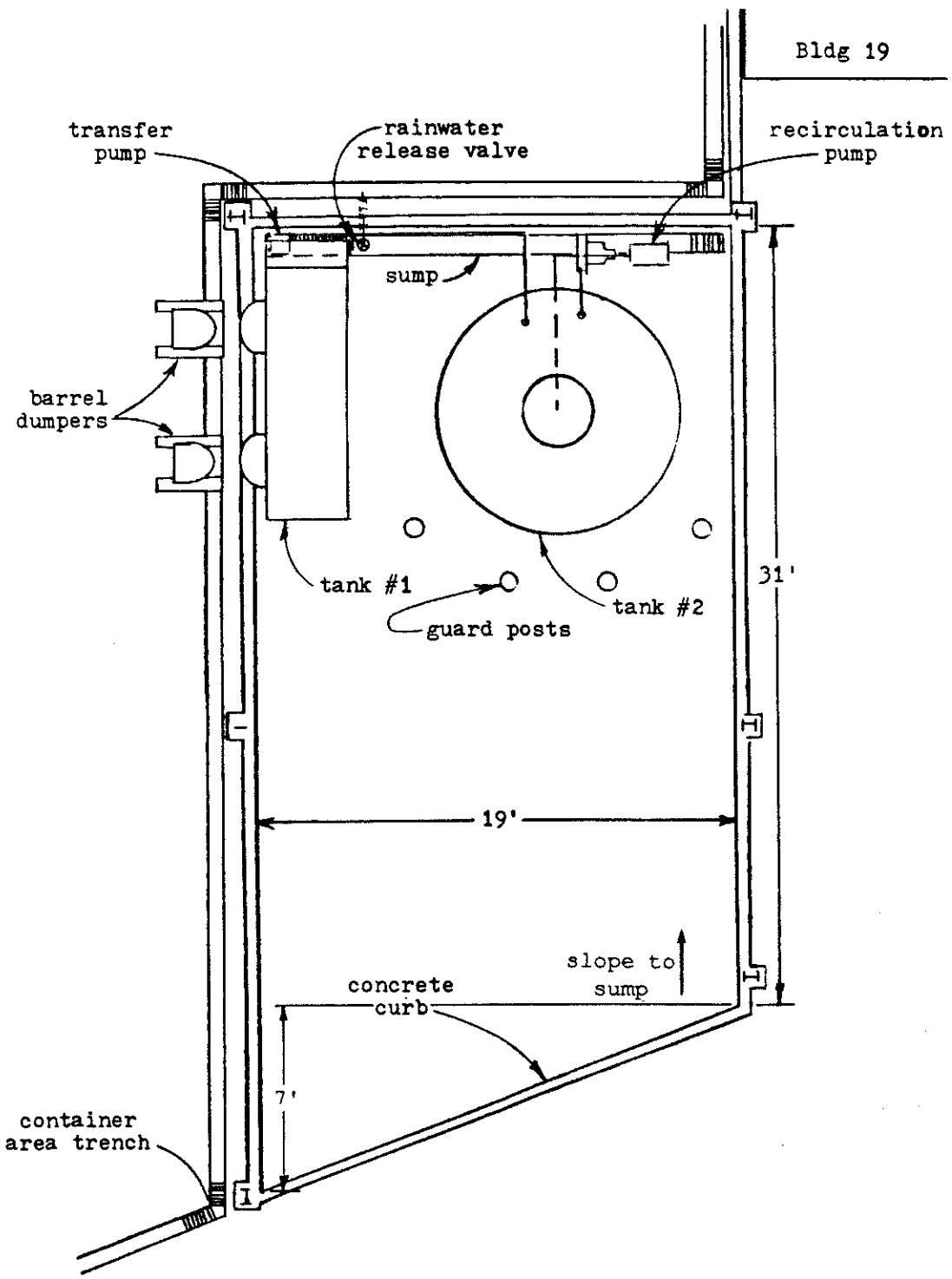
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE D-4

SECONDARY CONTAINMENT SYSTEM

Dames & Moore
Job No. 299-175-122



NOT TO SCALE

SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

Delco Products

General Motors Corporation
Dayton, Ohio

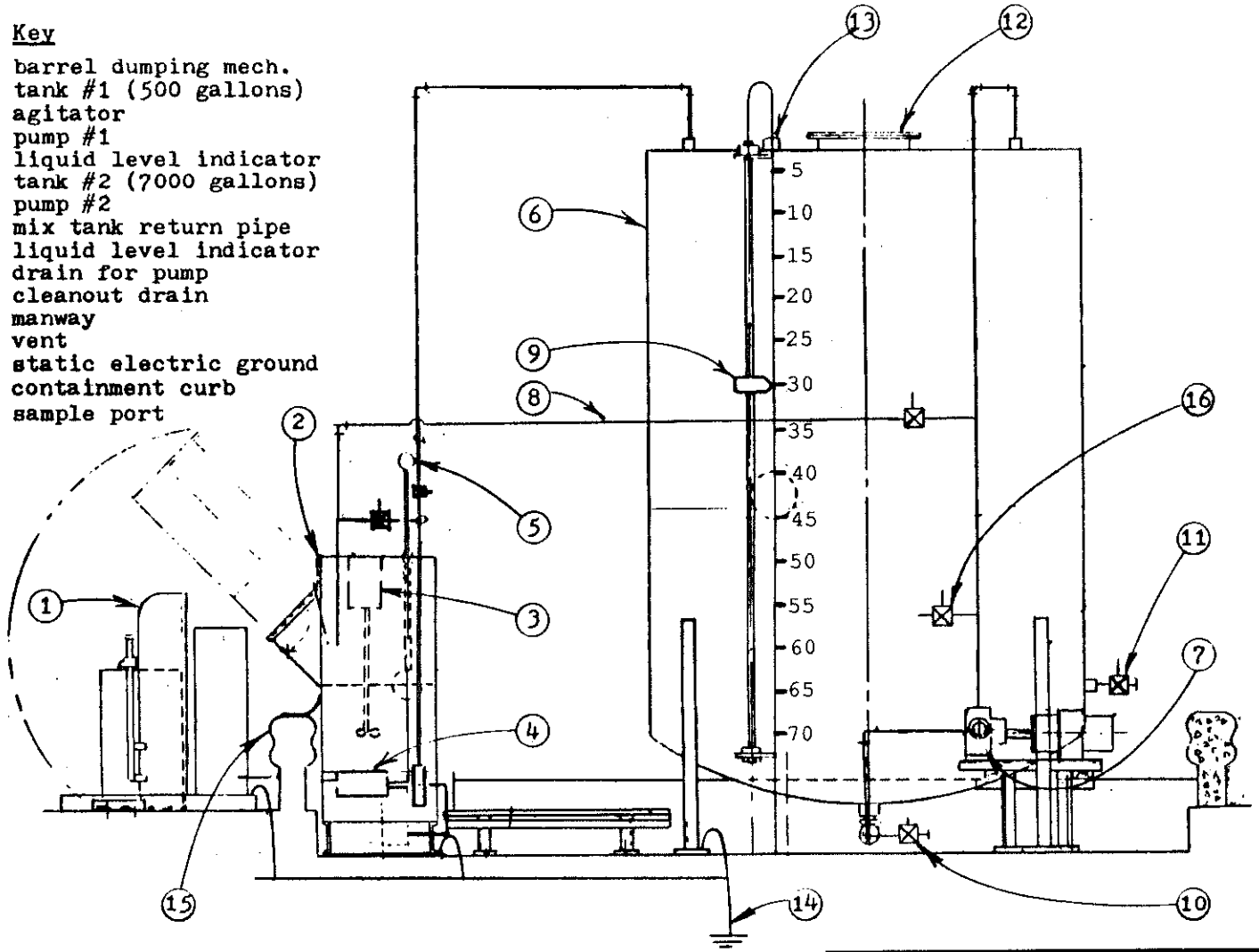
FIGURE D-5

TANK STORAGE AREA

Dames & Moore
Job No. 299-175-122

Key

1. barrel dumping mech.
2. tank #1 (500 gallons)
3. agitator
4. pump #1
5. liquid level indicator
6. tank #2 (7000 gallons)
7. pump #2
8. mix tank return pipe
9. liquid level indicator
10. drain for pump
11. cleanout drain
12. manway
13. vent
14. static electric ground
15. containment curb
16. sample port



SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE D-6

TANKS AND PIPING SCHEMATIC

Dames & Moore
Job No. 299-175-122

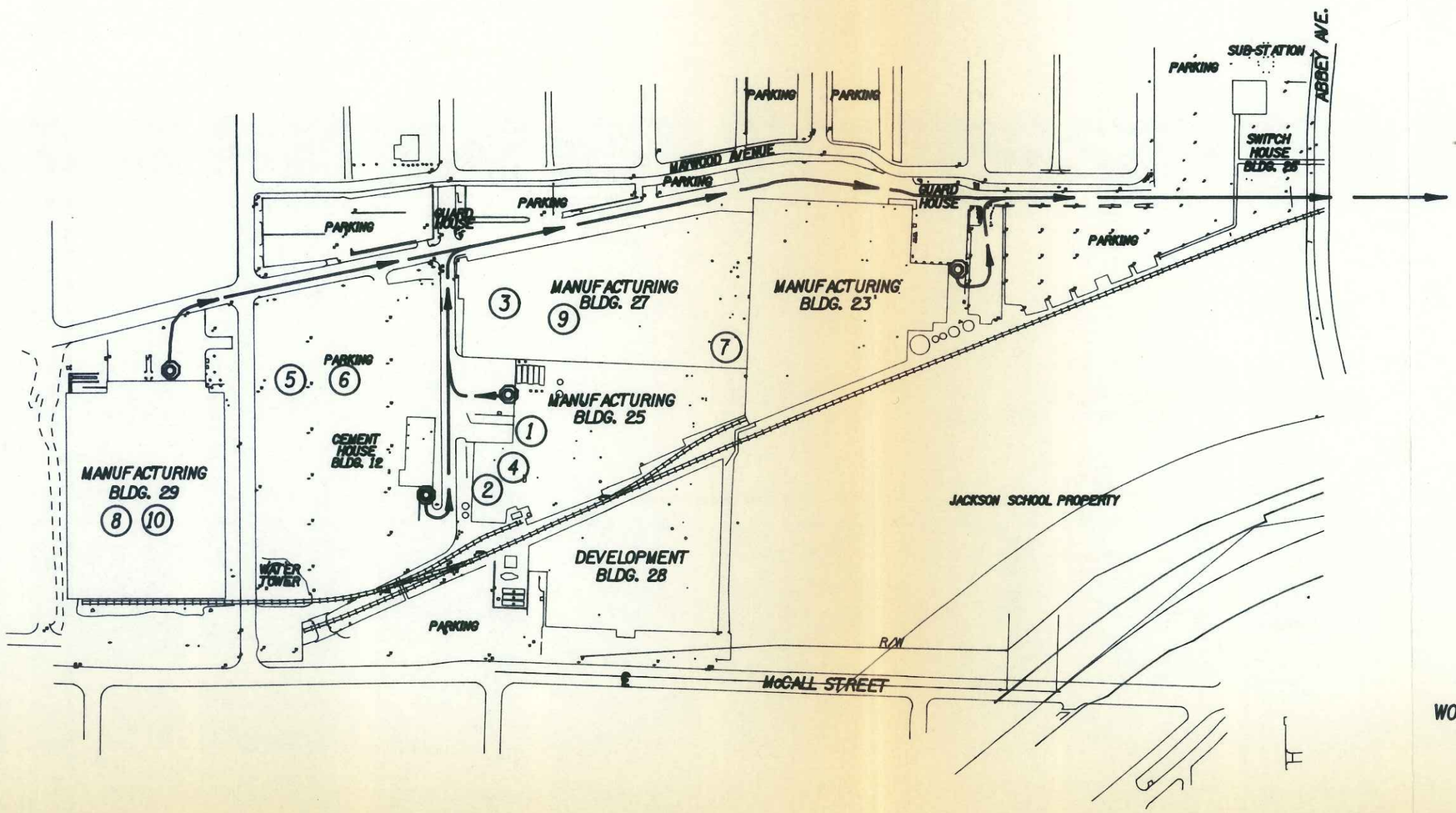
ATTACHMENT D-1

ROUTES USED FOR INTERNAL HAZARDOUS WASTE TRANSPORTATION

THE VARIOUS DOCKS AT BUILDINGS 12, 23, 25 & 29 ARE IDENTIFIED AS "◎". ANY WASTE THAT IS ACCUMULATED IN THE DRUMS AT THE HILL PLANT WOULD BE TAKEN TO THE CLOSEST DOCK AND LOADED ON TO DELCO TRAILERS AND MOVED TO THE MAIN PLANT USING THE ROUTE SHOWN ⟶ ⟶

THE TRAILERS ARE TAKEN TO BUILDING 18 OR BUILDING 20 DOCKS.

SITE #	LOCATION BLDG	LOCATION DEPT	DESCRIPTION
1	25	473	FLOW COAT #1
2	26	473	FLOW COAT #2
3	27	464	HYPALON DIP TANK
4	25	452	CHROMIC ACID
5	12	615	LAB WASTE
6	12	481	WASTE CEMENT & SOLVENT
7	27	44	ETCHING SOLUTION FOR COPPER
8	29	490	TITRATION SOLUTION-ACETONE
9	27	452	NEOPRENE DIP TANK
10	29	490	M-PYROL-LITE FLEX



WORK THIS DRAWING WITH C2

No.	DATE	DESCRIPTION	By
0	3-6-91	Released For Permit	

REVISIONS

STATE OF OHIO — MICHAEL C. WRIGHT — 47432 — REGISTERED PROFESSIONAL ENGINEER

JOB NO. 7190 II

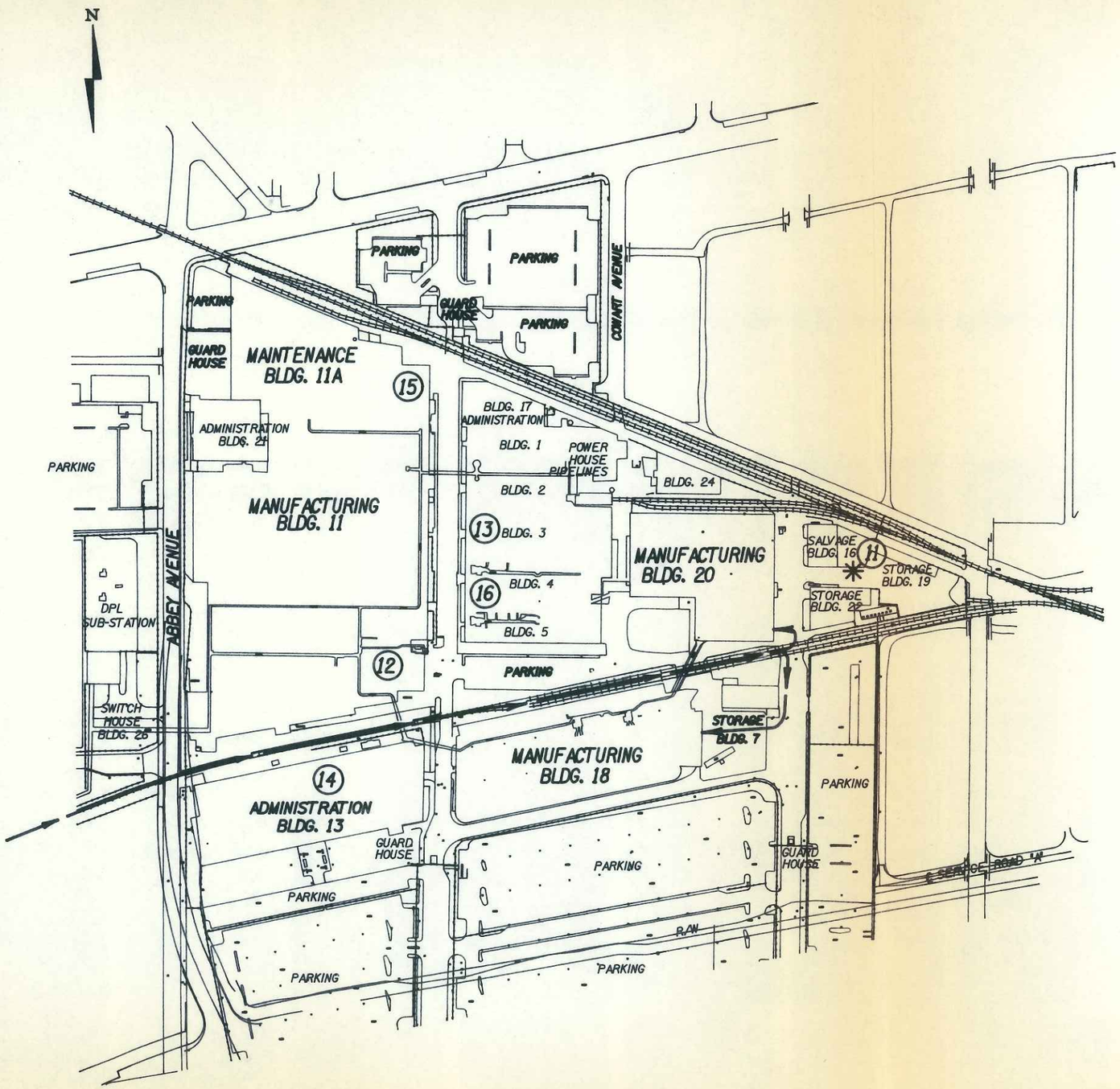
PLANT NO.

LJB engineers architects
1500 E.Dorothy Lane
Dayton, Ohio 45469
TEL: (516) 993-8987
FAX: (516) 993-8880
LOCKWOOD, JONES AND BEALS INC.

DELCO PRODUCTS DIVISION
GENERAL MOTORS CORPORATION
DAYTON OPERATIONS
P.O. BOX 1224
DAYTON, OHIO 45401-1224

Date 3-4-91	Sheet Title: PART "B" PERMIT WASTE STREAM GENERATION POINTS DELCO PRODUCTS DAYTON, OHIO PLANT
Drawn	
Engineer MCW	
SHT.NO. C1 of 2	DRAWING NUMBER PLE-34341-1

7190II



SITE *	LOCATION		DESCRIPTION
	BLDG	DEPT	
11	NA	NA	HOT DUMP PAD
12	9	292	CAUSTIC CLEANING SOLUTION
13	3	23	CLEANING SOLVENT-Safety Kleen
14	13	88	PAINT LAB
15	11A	21	USED PAINT THINNER
16	5	683	RIM LAB

ALL WASTE THAT IS ACCUMULATED IN DRUMS IS TRANSPORTED BY LIFTTRUCK DIRECTLY TO THE HOT DOCK "✳" AT BUILDING 16.

WORK THIS DRAWING WITH C1

No.	DATE	DESCRIPTION	By
0	3-6-91	Released For Permit	

REVISIONS

STATE OF OHIO MICHAEL C. WRIGHT 47432 REGISTERED PROFESSIONAL ENGINEER

JOB NO. 7190 II

PLANT NO.

LJB engineers architects

DELCO PRODUCTS DIVISION
GENERAL MOTORS CORPORATION
DAYTON OPERATIONS
P.O. BOX 1224
DAYTON, OHIO 45401-1224

Date 3-4-91	Sheet Title PART "B" PERMIT WASTE STREAM GENERATION POINTS DELCO PRODUCTS DAYTON, OHIO PLANT
Drawn	
Engineer MCW	
SHT.NO. C2 of 2	DRAWING NUMBER PLE-34841-2

7190II

ATTACHMENT D-2

SPECIFICATIONS FOR CHEMICAL RESISTANT COATING

07920/MOR
Buy Line 3644

JACO COATINGS INC.
1894 OLD OXFORD ROAD
HAMILTON, OHIO 45013-1099
(513) 863-8050
FAX (513) 863-8131

THIOKOL

Coatings and Sealants

RLP 2078 Chemical Resistant Elastomeric Coating

Morton International

Specialty Chemicals Group

RLP 2078 is a reinforced polysulfide, two component system from Morton International, based on LP® liquid polysulfide polymer technology. When mixed, RLP 2078 coating cures by chemical reaction to form a tough, flexible, chemically resistant lining that acts as a leak-proof barrier.

RLP 2078 coating provides a highly elastomeric membrane when applied to properly prepared concrete surfaces or other compatible substrates, and is ideally suited as a coating for structures which must retain or exclude water, sewage, oils, fuels, solvents and many other chemicals.

RLP 2078 coating is resilient, seamless and quick to install - yet it is competitively priced with other chemically resistant coatings.

Application Properties

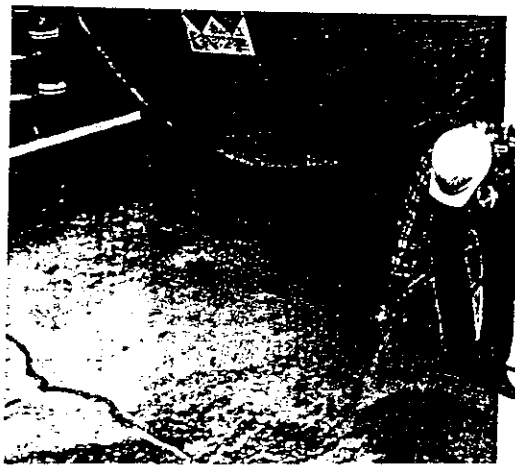
RLP 2078 coating can be applied to vertical and horizontal surfaces, above and below grade. Surfaces should be smooth and monolithic. Construction joints must be caulked with a compatible sealant. Structural defects, cracks, voids and spalled areas should also be patched with appropriate and compatible sealant material.

Priming the surfaces to be coated is the best way to prepare them for bonding and should be considered part of the essential chemistry required to have a successful RLP 2078 coating application.

RLP 2078 coating can be applied by spray, roller, or squeegee - when ambient temperatures are as low as 40°F. **Do not apply the coating if the substrate surface temperature is below 30°F.** Spraying is the recommended method of application because it saves time and is the best way to achieve a continuous membrane of 40 mils (the minimum thickness for effective leak-proofing),

Performance Advantages

- Excellent resistance to a wide range of chemicals, fuels, oils, solvents and sewage.
- Ease of application.
- Excellent physical properties.
- Excellent adhesion to a wide variety of substrates.
- Excellent adhesion between coats.
- Low permeability to solvent vapor, gases and water vapor.
- Shrinkage is virtually zero.
- Excellent UV resistance.
- tear strength.



Typical Properties

Hardness, Shore A	41	ASTM D-2240
Tensile strength	400 psi	ASTM D-638
Elongation	490%	ASTM D-412
Modulus @ 200% E	170 psi	ASTM D-638
Low Temp. flexibility	Flexible to -65°F	
Water vapor transmission 0.04" thick membrane (grams/meter²/day)	9.476	ASTM E-96
Abrasion resistance Taber Abrader -510 Wheel, 500 gram wt. (weight loss)	0.53 grams/300 cycles	
Chemical resistance	(See RLP 2078 data sheet)	

with no seams, wrinkles or voids. This membrane will remain flexible in temperatures down to -65°F. If it is necessary to reduce the viscosity in certain applications, this can be accomplished with heat or by the use of a thinner, such as xylene, at manufacturer's recommended percentages.

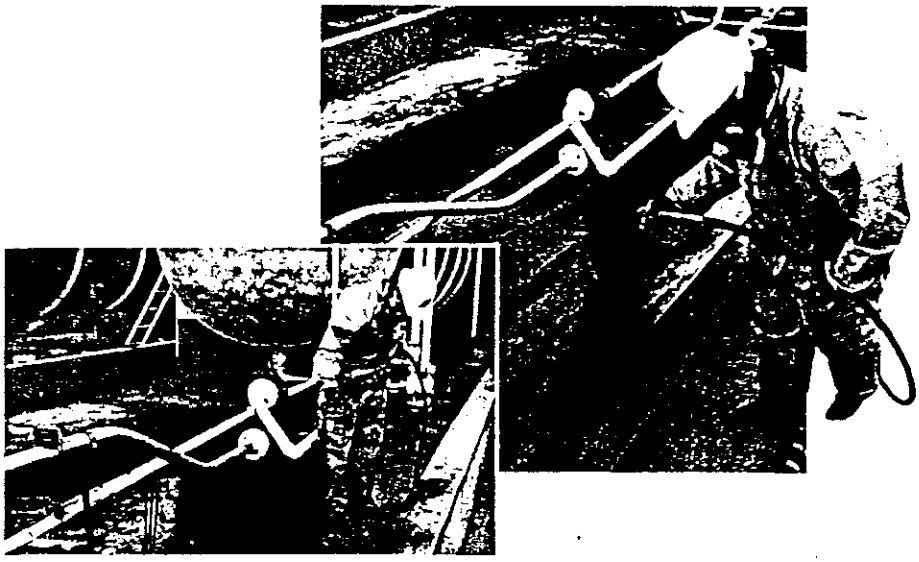
RLP 2078 coating adheres strongly to a wide variety of substrates, and its elastomeric properties allow it to bridge non-structural cracks in concrete. It is not, however, intended to be used as a wear surface in vehicular traffic areas.

Description

Type	Reinforced liquid polysulfide polymer
Color	Black, gray
Solids	100% by weight
Density	11.8 lbs./gal.
Specific gravity	1.42

Application - Airless Spray, Roller, Squeegee

Temp. range	40°-110°F
Coverage (40 mils)	40 sq. ft./gal.
Work time @ 70°F	60+ mins.
Cure @ 70°F	2 hrs., tack free



Approved Applicators

Morton International's RLP 2078 chemical resistant coating is available, installed, through a network of independent approved applicators trained and supported by Morton International, Inc. to ensure professional installation and performance.

RLP 2078 reinforced polysulfide elastomeric coating does not require maintenance as long as the coating is installed by an approved applicator in accordance with the manufacturer's recommendations.

Availability and Cost

Thiokol chemical resistant coatings are competitively priced. Call us at 312-807-3127 for the name of our applicator in your area.

SPEC DATA®

This Spec-Data sheet conforms to editorial style prescribed by The Construction Specifications Institute. The manufacturer is responsible for technical accuracy.

1. PRODUCT NAME

One-Part and Two-Part Joint Sealant Products Based on Morton Thiokol's LP® Liquid Polysulfide Polymer

2. MANUFACTURER

LP liquid polysulfide polymer based joint sealant products are manufactured throughout the United States and Canada. To obtain the names of manufacturers of LP polymer base sealants contact:

Customer Service:
Morton Thiokol/Morton Chemical Division
333 W. Wacker Drive
Chicago, Illinois 60606-1292
Phone: (312) 807-3173

In Canada:
Morton Thiokol Ltd./Morton Chemical Division
430 Finley Avenue
Ontario, Canada L1S-3C2
Phone: (416) 683-2071

3. PRODUCT DESCRIPTION

Basic Use: glazing; curtain walls; concrete; masonry; deck areas; terrazzo flooring; quarry tile; skylights; metal roofs; stone; wood; glazing of insulating glass.

Limitations: Primers may be required under certain conditions. They should be supplied by and used in accordance with the recommendations of the supplier of the particular joint sealant product.

Composition and Materials: One- and two-part LP liquid polysulfide polymer base joint sealant systems are cold-applied, chemically-curing type, synthetic rubber-base compounds used for sealing, caulking or glazing applications for buildings and other types of construction. Sealant products based on LP liquid polysulfide polymer are available in two-part and one-part systems.

Two-Part Systems: Two-part systems are comprised of exact premeasured quantities of base and accelerator which must be combined and mixed before application. They are available in non-sag and self-leveling forms.

One-Part Systems: One-part systems are supplied with base and accelerator in single package ready-to-use cartridges or bulk containers. They are available in non-sag form suitable for either vertical or horizontal application.

Sizes: Joint sealant products, based on LP liquid polysulfide polymer, are available in specially packaged containers or in standard packages as follows:

Two-Part Systems: One, two, and five-gallon containers with exact quantity of accelerator ready for mixing.

One-Part Systems: Single package 1/10 gallon ready-to-use cartridges and bulk packages one- and five-gallon containers.

Colors: Both the one-part and two-part systems are available in white, black, and a variety of colors. Contact sealant manufacturers for specific colors available.

Applicable Standards: TT-S-00227 (most current issue)—spec for two-component elastomeric sealants—National Bureau of Standards (GSA).

TT-S-00230 (most current issue)—spec for single component elastomeric sealants—National Bureau of Standards (GSA).

ASTM C920-79 Standard Specification for Elastomeric Joint Sealants.

(Applies to both one-part and two-part sealants) Type I (Self-Leveling): for joints in horizontal surfaces.

Type II (Non-Sag): for joints in vertical surfaces.

Class A-Compounds resistant to 50% total joint movement.

Class B-Compounds resistant to 25% total movement.

4. TECHNICAL DATA

Joint sealant products based on Morton Thiokol's LP liquid polysulfide polymers resist the effects of sunlight, rain, snow, ozone, aging, shrinkage and the daily and seasonal cyclic changes in temperature. Its oustanding weatherability enables it to retain these properties even after years of exposure. See Table for typical properties.

5. INSTALLATION

Joint sealants based on LP liquid polysulfide polymers are installed by applicators who specialize in this trade and it is recommended that the specifier require installation only by trained applicators familiar with this type of sealant.

For specific applications requiring sealing of unusual joint designs, materials, or other special requirements, consult the manufacturer of the particular sealant that is to be used, or Morton Chemical Division's Technical Service Department.

6. AVAILABILITY AND COST

Availability: Joint sealants based on LP liquid polysulfide polymers are available throughout the United States and Canada.

Cost: Material costs are available from manufacturers. Refer to current list of manufacturers.

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TYPICAL PHYSICAL CHARACTERISTICS OF CURED COMPOSITIONS BASED ON LP LIQUID POLYSULFIDE POLYMER

	ONE-PART AND TWO-PART SEALANTS	
PROPERTY	**TYPE I (self-leveling)**	**TYPE II (non-sag)**
Hardness	25-50 Shore A	15-50 Shore A
Hardness, after heat aging	60 Shore A, max.	50 Shore A, max.
Durability, for adhesive and cohesive bond strength*	maximum adhesive and/or cohesive loss less than 1.5 sq. in.	maximum adhesive and/or cohesive loss less than 1.5 sq. in.
Peel adhesion strength	5 pli. min., 25% max. adhesive failure	5 pli min., 25% max. adhesive failure
Weight loss: 3 wks (@ 158°F (70°C)	10% maximum	10% maximum
Staining	none allowed	none allowed
Tensile adhesive strength after 4 day water immersion*	10 to 60 psi @ 150% extension	10 to 60 psi @ 100% extension
	(Extension should be maintained for 24 hours, maximum bond loss ½ sq. in.)	

*Joint size ½" x ½" x 2", testing done in triplicate

7. WARRANTY

Consult the sealant manufacturer for specific information on guarantees and warranties, and for compliance with previously referenced specifications.

8. MAINTENANCE

Minimum maintenance is required on joints properly sealed with sealants based on LP liquid polysulfide polymers. If, during construction, damage should occur, repairs are simple. Just reseal that portion which has been damaged.

9. TECHNICAL SERVICES

Complete technical information and literature should be available from sealant manufacturers. In addition, application and technical information is readily available upon request from the Morton Chemical Division of Morton Thiokol, Inc. Also, Morton Thiokol's Construction Service Specialists are available to assist in solving any sealant problems which may be encountered. For assistance, call: (312) 807-3173.

10. FILING SYSTEMS

SPEC-DATA® II
Sweet's Catalog
Joints Design Digest

MORTON THIOKOL, INC.
Morton Chemical Division

MORTON THIOKOL, INC.
MORTON CHEMICAL DIVISION
333 WEST WACKER DRIVE
CHICAGO, IL 60606-1292

SECTION 1: PRODUCT INFORMATION

PRODUCT NAME: THIOFLEX RLP-2078 PART B EFFECTIVE DATE: 03/22/89

CHEMICAL NAME: Mixture of Metallic Oxide & Plasticizers SUPERCEDES: ZM-2078 PART B, dated 03/02/89

PRODUCT USE: Curing Agent for Chemical Resistant Coating

EMERGENCY PHONE: (815)338-1800 (24 hours/day) OTHER INFORMATION PHONE: (312)807-3421

SECTION 2: HAZARDOUS INGREDIENTS

CHEMICAL NAME/COMMON NAME	% [1]	CAS NO.	OSHA PEL	ACGIH TLV	OTHER
Manganese Dioxide	50	1313-13-9	5 mg/m3 [2]	5 mg/m3 [2,3]	--
Hydrogenated Terphenyls	>40-50	61788-32-7	1 ppm [2]	0.5 ppm [2,4]	--
Terphenyls	1.5-4	26140-60-3	1 ppm [2]	0.5 ppm [2,4]	--
Tetramethylthioperoxydi-carbonic Diamide/Thiram	< 1	137-26-8	5 mg/m3	5 mg/m3 [5]	--

SECTION 3: PHYSICAL DATA [1]

% NON-VOLATILES: 100

VAPOR DENSITY (Air = 1): > 1

pH: Not Applicable

BOILING POINT: Not Applicable

VAPOR PRESSURE: < 0.1 mm Hg (estimated)

SOLUBILITY IN WATER: Practically Insoluble

SPECIFIC GRAVITY (water = 1): 1.68

EVAPORATION RATE (nBUOAc = 1): < 1

APPEARANCE AND ODOR: Brown Paste

SECTION 4: FIRE AND EXPLOSION HAZARDS

FLASH POINT: > 200 F

METHOD USED: Setaflash

FLAMMABLE LIMITS:
LEL: Not Applicable
UEL: Not Applicable

[1] Typical amount, not a specification.
[2] Governed by a ceiling limit value (C) - The value which should not be exceeded during any part of the working exposure.
[3] Dust and compounds.
[4] As Airborne aerosols.
[5] A.C.G.I.H. Notice of Intended Changes (for 1987-88) - 1 mg/m3.

EXTINGUISHING MEDIA: Water, water spray.

SPECIAL FIRE FIGHTING PROCEDURES: Full emergency equipment with NIOSH/MSHA approved self-contained positive pressure breathing apparatus should be worn. Decontaminate after use.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Material contains an oxidizing agent, smothering is not effective. Use water.

HAZARDOUS DECOMPOSITION PRODUCTS: Manganese bearing smoke which is highly toxic, also carbon monoxide and carbon dioxide.

SECTION 5: HEALTH HAZARD DATA

ORAL TOXICITY:
Unknown for product mixture.

DERMAL TOXICITY:
Unknown for product mixture.

EYE:
Unknown for product mixture.

INHALATION TOXICITY:
Unknown for product mixture.

Manganese Dioxide:	Subcutaneous Mouse:	LD50:	422 mg/kg	R.T.E.C.S. No. OP 0350000
	Intravenous Rabbit:	LD50:	45 mg/kg	

Reference: N.I.O.S.H. - R.T.E.C.S., 1981-1982.
Sax: Dangerous Properties of Industrial Materials (1984)

CHRONIC TOXICITY:

Unknown for product mixture.

EFFECTS OF OVEREXPOSURE:

INGESTION:
Unknown for product mixture. Manganese dioxide may cause weakness, lethargy, headaches, tremors and reslessness. Tetramethylthioperoxydicarbonic diamide will cause severe digestive tract reaction in a person who has consumed alcohol within the last 48 hours.

SKIN CONTACT:
Unknown for product mixture. May cause slight skin irritation.

EYE CONTACT:
Unknown for product mixture. May cause irritation.

INHALATION:
Unknown for product mixture.

ACUTE SYSTEMIC EFFECTS:
Overexposure may cause irritation to eyes and skin.

CHRONIC SYSTEMIC EFFECTS:
Signs and symptoms from chronic exposure resemble those from acute mishaps but are in part systemically more severe.

NOTES:
Manganese dioxide is in paste form and does not present an inhalation hazard.
Tetramethylthioperoxycarbonic diamide is in paste form and does not present an inhalation hazard.

SECTION 6: EMERGENCY HEALTH AND FIRST AID PROCEDURES

EYE CONTACT: Flush with a steady stream of water for 15 minutes, frequently lifting upper and lower eyelids. If irritation persists, get medical attention.

SKIN CONTACT: Remove contaminated clothing. Wash exposed areas thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. If irritation persists after washing, get medical attention.

INHALATION: Move to an area with fresh air and free from risk of further exposure. Obtain medical attention.

INGESTION: DO NOT induce vomiting. Contact physician immediately. If not available, contact nearest Poison Control Center.

NOTE TO PHYSICIAN: No known antidote. Treat symptomatically. Careful lavage may be indicated after ingestion.

SECTION 7: REACTIVITY DATA

STABLE OR UNSTABLE: Stable under normal conditions.

CONDITIONS TO AVOID: Store away from high temperatures.

INCOMPATIBLE SUBSTANCES: Reducing agents such as aluminum or zinc. Strong oxidizing agents such as metal chlorates or peroxides.

CAN HAZARDOUS POLYMERIZATION OCCUR: Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS AND CONDITIONS: With combustion, manganese bearing smoke, irritating vapors, carbon dioxide and carbon monoxide.

SECTION 8: SPILL AND LEAK PROCEDURES

RESPONSE TO SPILLS:
Stop discharge and contain spill or contaminated material using dike, barrier, or other means. Recover with pumping equipment, vacuum truck, sorbent, vermiculite or other means. Place contaminated material in suitable containers for further handling.

HAZARDS TO BE AVOIDED:
Do not flush to stream, other bodies of water or sewer. Avoid contact with eyes and skin. Other hazard information see Section Nos. IV (Fire and Explosion Data), V (Health Hazard Data) and IX (Control Measures or Special Protection Information).

SPILL NOTIFICATION:
Check Federal, State and Local reporting regulations.

DISPOSAL METHODS:
(a) Recycle, if feasible.
(b) Incinerate in authorized facility.
(c) Treatment at Industrial or Liquid Waste treatment facility.
(d) Landfill in authorized facility. (Solidification or fixation may be required prior to landfill disposal.)

NOTES:
IF DISCARDING THIS MATERIAL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION 9: CONTROL MEASURES

RESPIRATORY PROTECTION:
RESPIRATORY PROTECTION:
None typically required. If desirable or necessary (operation dependent), use only NIOSH/MSHA approved equipment. Comply with OSHA 1910.134 (29 CFR), Respiratory Protection. Industrial Hygiene consultation is recommended to assist in respirator selection and use.

OTHER PROTECTIVE EQUIPMENT:

FOR HANDS AND BODY:
Minimize exposure with chemically resistant clothing. Chemical resistant gloves are recommended.

FOR EYES:
Safety glasses and chemical splash goggles in compliance with OSHA regulations are advised.

VENTILATION:
Sufficient exhaust to remove any buildup.

SECTION 10: SPECIAL PRECAUTIONS

RECOMMENDED STORAGE PRACTICE AND CONDITIONS:
For industrial use only. Store away from high temperatures.

SECTION 10: SPECIAL PRECAUTIONS, continued

OTHER PRECAUTIONS:
Use with adequate ventilation. Properly bond and ground all equipment before dispersing, pouring or mixing. Always wash-up after handling product and before eating, drinking, smoking or using restroom facilities.

SECTION 11: LABELING INFORMATION

DOT SHIPPING NAME:	Oxidizer, n.o.s. **(See Note Below)
DOT LABEL:	Oxidizer
DOT IDENTIFICATION NO.:	UN 1479
MORTON PRECAUTIONARY LABEL NO.:	L137

SECTION 12: REGULATORY INFORMATION

SARA TITLE III, SECTION 313 REQUIREMENTS:

Substances identified with an asterisk in SECTION 2 - HAZARDOUS INGREDIENTS, are toxic chemicals under Section 313. If no material is identified with an asterisk, then this product contains no substance reportable under this notification requirement.

SECTION 13: USERS RESPONSIBILITY

A BULLETIN SUCH AS THIS CANNOT BE EXPECTED TO COVER ALL POSSIBLE INDIVIDUAL SITUATIONS. AS THE USER HAS THE RESPONSIBILITY TO PROVIDE A SAFE WORKPLACE, ALL ASPECTS OF AN INDIVIDUAL OPERATION SHOULD BE EXAMINED TO DETERMINE IF, OR WHERE, PRECAUTIONS - IN ADDITION TO THOSE DESCRIBED HEREIN - ARE REQUIRED. ANY HEALTH HAZARD AND SAFETY INFORMATION CONTAINED HEREIN SHOULD BE PASSSED ON TO YOUR CUSTOMERS OR EMPLOYEES, AS THE CASE MAY BE. MORTON THIOKOL, INC. MUST RELY ON THE USER TO UTILIZE THE INFORMATION WE HAVE SUPPLIED TO DEVELOP WORK PRACTICE GUIDELINES AND EMPLOYEE INSTRUCTIONAL PROGRAMS FOR THE INDIVIDUAL OPERATION.

DISCLAIMER OF LIABILITY

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS. It is the responsibility of the user to comply with all applicable Federal, State and local laws and regulations.

Nothing contained herein is to be construed as a recommendation for use in violation of any patents or of applicable laws or regulations.

INITIALS: DBW:PSF - Chicago
SKF:mes - Woodstock

**NOTE: IATA/ICAO: PROPER SHIPPING NAME: Oxidizing Substances, n.o.s. (Manganese Dioxide); HAZARD CLASS: 5.1; UN NO.: 1479; PACKAGING GROUP: II; LABEL(S): Oxidizer.

COMMONWEALTH OF PENNSYLVANIA ADDENDUM TO MATERIAL SAFETY DATA SHEET

THIOFLEX RLP-2078 PART B

All of the materials in this product that are required by the Commonwealth of Pennsylvania to be identified are either listed below or in SECTION 2 of the Material Safety Data Sheet. In addition, some of the materials identified may have been placed by the Commonwealth of Pennsylvania on their Hazardous Substance List.

INGREDIENTS	CAS NUMBER	WEIGHT %

ALL MATERIALS THAT ARE REQUIRED BY THE COMMONWEALTH OF PENNSYLVANIA TO BE IDENTIFIED ARE LISTED IN SECTION 2 OF THE MATERIAL SAFETY DATA SHEET.

The specific chemical identity of any substance not identified with a Chemical Abstracts Service Number is being withheld as a trade secret.

MSDS EFFECTIVE DATE: 03/22/89
ADDENDUM EFFECTIVE DATE: 03/22/89

SKF:mes

MORTON THIOKOL, INC.
MORTON CHEMICAL DIVISION
333 WEST WACKER DRIVE
CHICAGO, IL 60606-1292

MATERIAL SAFETY DATA SHEET
DOCUMENT PREPARED: 03/22/89
PRODUCT: THIOFLEX RLP-2078 PART A

SECTION 1: PRODUCT INFORMATION

PRODUCT NAME: THIOFLEX RLP-2078 PART A — EFFECTIVE DATE: 03/21/89

CHEMICAL NAME: Formulated Polysulfide — SUPERCEDES: ZM-2078 PART A, dated 03/06/89

PRODUCT USE: Chemical Resistant Coating

EMERGENCY PHONE: (815)338-1800 (24 hours/day) — OTHER INFORMATION PHONE: (312)807-3421

SECTION 2: HAZARDOUS INGREDIENTS

CHEMICAL NAME/COMMON NAME	% [1]	CAS NO.	OSHA PEL	ACGIH TLV	OTHER
Carbon Black N991	20-40	1333-86-4	3.5 mg/3	3.5 mg/3	--

SECTION 3: PHYSICAL DATA [1]

% NON-VOLATILES: 99 min.

VAPOR DENSITY (Air = 1): Not Measurable

pH: 7 - 8

BOILING POINT: Not Applicable

VAPOR PRESSURE: Not Measurable

SOLUBILITY IN WATER: Insoluble

SPECIFIC GRAVITY (water = 1): 1.37

EVAPORATION RATE (nBUOAc = 1): < 1

APPEARANCE AND ODOR: Black Paste; Mercaptan Type Odor

SECTION 4: FIRE AND EXPLOSION HAZARDS

FLASH POINT: > 200 F; > 93 C

METHOD USED: Setaflash

FLAMMABLE LIMITS:
LEL: Not Applicable
UEL: Not Applicable

EXTINGUISHING MEDIA: Water, carbon dioxide, dry chemical, foam.

SPECIAL FIRE FIGHTING PROCEDURES: When fighting fires, firemen should be equipped with NIOSH/MSHA approved self-contained full-face positive pressure breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

HAZARDOUS DECOMPOSITION PRODUCTS: Sulfur dioxide, carbon monoxide, carbon dioxide, low molecular weight hydrocarbons, formaldehyde and hydrogen sulfide can be formed on burning.

SECTION 5: HEALTH HAZARD DATA

ORAL TOXICITY:
Not established for product mixture. LD50: orl-rat: > 5 grams per kilogram.
Reference: Industrial Biology Laboratories, June 11, 1962.

SECTION 5: HEALTH HAZARD DATA, continued

DERMAL TOXICITY:
Not established for product mixture. Not considered to be a primary skin irritant.

EYE:
Not established for product mixture. Not considered to be an ocular irritant.

INHALATION TOXICITY:
Not established for product mixture. Not considered to present an inhalation hazard under typical use conditions.

CHRONIC TOXICITY:

Not established for product mixture. Testing of other liquid polysulfide polymers of similar chemical structure and molecular weight have tested negative in the Ames Salmonella Plate Test with and without activation. Carbon Black is not a carcinogen - OSHA/NTP/IARC.

EFFECTS OF OVEREXPOSURE:

INGESTION:
Not established for product mixture. Possible nausea, vomiting and gastrointestinal pain.

SKIN CONTACT:
Not established for product mixture. Possible irritation, rash and dermatitis given prolonged or repeated skin contact.

EYE CONTACT:
Not established for product mixture. Possible irritation, tearing and reddaning.

INHALATION:
Not established for product mixture. Possible respiratory tract, mucous membrane irritation.

ACUTE SYSTEMIC EFFECTS:
Not established for the product.

CHRONIC SYSTEMIC EFFECTS:
Not established for the product.

NOTES:
Since this material is not a dust or powder, exposure to carbon black dust would not normally occur.

SECTION 6: EMERGENCY HEALTH AND FIRST AID PROCEDURES

EYE CONTACT: Flush with large amounts of fresh water for 15 minutes, lifting upper and lower eyelids frequently. Get medical attention immediately.

SKIN CONTACT: Promptly remove all contaminated clothing; shower if necessary. Wash with soap and water. If irritation is present after washing, get medical attention immediately.

INHALATION: Remove to fresh air. If breathing has stopped, perform artificial respiration. Keep affected person warm and at rest. Get medical attention immediately.

INGESTION: Seek medical attention. If unavailable, contact nearest Poison Control Center.

NOTE TO PHYSICIAN: Supportive therapy is recommended. No known antidote.

SECTION 7: REACTIVITY DATA

STABLE OR UNSTABLE: Stable under normal conditions of usage.

CONDITIONS TO AVOID: Temperatures > 300 F (149 C).

INCOMPATIBLE SUBSTANCES: Strong acids, oxidizing substances.

CAN HAZARDOUS POLYMERIZATION OCCUR. Will not occur.

HAZARDOUS DECOMPOSITION PRODUCTS AND CONDITIONS: Sulfur dioxide, carbon monoxide, carbon dioxide, low molecular weight hydrocarbons, formaldehyde and/or hydrogen sulfide can be formed upon burning.

SECTION 8: SPILL AND LEAK PROCEDURES

RESPONSE TO SPILLS:
Stop discharge and contain spill or contaminated material using dike, barrier, or other means. Recover with pumping equipment, vacuum truck, sorbent, vermiculite or other means. Place contaminated material in suitable containers for further handling.

HAZARDS TO BE AVOIDED:
Do not flush to stream, other bodies of water or sewer. Avoid contact with eyes and skin. Other hazard information see Section Nos. IV (Fire and Explosion Data), V (Health Hazard Data) and IX (Control Measures or Special Protection Information).

SPILL NOTIFICATION:
Check Federal, State and Local reporting regulations.

DISPOSAL METHODS:
(a) Recycle, if feasible.
(b) Incinerate in authorized facility.
(c) Treatment at Industrial or Liquid Waste treatment facility.
(d) Landfill in authorized facility. (Solidification or fixation may be required prior to landfill disposal.)

NOTES:
IF DISCARDING THIS MATERIAL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SECTION 9: CONTROL MEASURES

RESPIRATORY PROTECTION:
None needed if adequate ventilation is provided, otherwise an NIOSH/MSA approved chemical cartridge respirator with organic vapor cartridge(s) is recommended within equipment limitations. Comply with OSHA 1910.134 (29 CFR), Respiratory Protection. As contaminant levels will vary dependent upon operation, Industrial Hygiene Consultation is recommended.

OTHER PROTECTIVE EQUIPMENT:

FOR HANDS AND BODY:
Chemical resistant gloves recommended for hand protection. Chemical resistant work clothing for general body protection.

FOR EYES:
Wear safety glasses, chemical goggles or face shield (eight inch minimum).

VENTILATION:
Provide adequate ventilation to minimize inhalation.

SECTION 10: SPECIAL PRECAUTIONS

RECOMMENDED STORAGE PRACTICE AND CONDITIONS:
Store between 50-110 F (10-43 C).

ECTION 10: SPECIAL PRECAUTIONS, continued

OTHER PRECAUTIONS:
Do not breath vapor. Do not contact eyes, skin and/or clothing. Eye-wash and shower should be available. Use only under well-ventilated conditions. For personal hygiene protection, personnel should always wash thoroughly after handling product and before eating, drinking, smoking or using restroom facilities.

SECTION 11: LABELING INFORMATION

DOT SHIPPING NAME:	Non-Regulated
DOT LABEL:	Not Applicable
DOT IDENTIFICATION NO.:	Not Applicable
MORTON PRECAUTIONARY LABEL NO.:	L114

SECTION 12: REGULATORY INFORMATION

SARA TITLE III, SECTION 313 REQUIREMENTS:

Substances identified with an asterisk in SECTION 2 - HAZARDOUS INGREDIENTS, are toxic chemicals under Section 313. If no material is identified with an asterisk, then this product contains no substance reportable under this notification requirement.

ECTION 13: USERS RESPONSIBILITY

A BULLETIN SUCH AS THIS CANNOT BE EXPECTED TO COVER ALL POSSIBLE INDIVIDUAL SITUATIONS. AS THE USER HAS THE RESPONSIBILITY TO PROVIDE A SAFE WORKPLACE, ALL ASPECTS OF AN INDIVIDUAL OPERATION SHOULD BE EXAMINED TO DETERMINE IF, OR WHERE, PRECAUTIONS - IN ADDITION TO THOSE DESCRIBED HEREIN - ARE REQUIRED. ANY HEALTH HAZARD AND SAFETY INFORMATION CONTAINED HEREIN SHOULD BE PASSSED ON TO YOUR CUSTOMERS OR EMPLOYEES, AS THE CASE MAY BE. MORTON THIOKOL, INC. MUST RELY ON THE USER TO UTILIZE THE INFORMATION WE HAVE SUPPLIED TO DEVELOP WORK PRACTICE GUIDELINES AND EMPLOYEE INSTRUCTIONAL PROGRAMS FOR THE INDIVIDUAL OPERATION.

DISCLAIMER OF LIABILITY

The information contained herein is, to the best of our knowledge and belief, accurate. However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by use of this material. All chemicals may present unknown health hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist. Final determination of suitability of the chemical is the sole responsibility of the user. Users of any chemical should satisfy themselves that the conditions and methods of use assure that the chemical is used safely. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO THE INFORMATION CONTAINED HEREIN OR THE CHEMICAL TO WHICH THE INFORMATION REFERS. It is the responsibility of the user to comply with all applicable Federal, State and local laws and regulations.

Nothing contained herein is to be construed as a recommendation for use in violation of any patents or of applicable laws or regulations.

INITIALS: DBW:PSF - Chicago
SKF:mes - Woodstock

COMMONWEALTH OF PENNSYLVANIA ADDENDUM TO MATERIAL SAFETY DATA SHEET

THIOFLEX RLP-2078 PART A

All of the materials in this product that are required by the Commonwealth of Pennsylvania to be identified are either listed below or in SECTION 2 of the Material Safety Data Sheet. In addition, some of the materials identified may have been placed by the Commonwealth of Pennsylvania on their Hazardous Substance List.

INGREDIENTS	CAS NUMBER	WEIGHT %
Thiokol LP Propane, 1,2,3-tri-chloro-polymer 1,1' methylene bis(oxy) bis[2-chloroethane] and sodium sulfide NA2(Sx) reduced	68611-50-7	60-80

The specific chemical identity of any substance not identified with a Chemical Abstracts Service Number is being withheld as a trade secret.

MSDS EFFECTIVE DATE: 03/22/89
ADDENDUM EFFECTIVE DATE: 03/22/89

SKF:mes

Coordinator. His telephone number and other emergency coordinators and telephone numbers are listed in Table G-1. If the emergency involves a ~~release of~~ potential release of hazardous materials to the environment, the emergency coordinator will be aided by the Environmental Engineering personnel listed on Appendix G-1. The primary emergency coordinator and alternates have complete authority to commit all resources of the company in the event of an emergency.

G.3 IMPLEMENTATION OF THE CONTINGENCY PLAN

This plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents from the waste storage and handling areas at Delco Products that could threaten human health or safety or the environment.

Examples of such situations would be:

- Fires that are not controllable by hand-held extinguishers
- Fires that are in danger of spreading or causing explosion
- Spills in which a significant quantity of waste material has reached a sewer or public waterway or has the potential of causing soil contamination

THE DECISION ON WHEN TO IMPLEMENT THIS CONTINGENCY PLAN WILL BE MADE BY THE PRIMARY OR ALTERNATE EC (BOTH TRAINED IN DEALING WITH SUCH SITUATIONS) FOLLOWING AN ASSESSMENT OF SITE CONDITIONS. THE BASIS OF THE EC'S DECISION WILL BE THE ASSESSMENT THAT THE EMERGENCY IS OF SUCH MAGNITUDE THAT IT IS, EITHER DIRECTLY OR INDIRECTLY, CREATING AN ACTUAL OR IMMINENT THREAT TO HUMAN HEALTH OR THE ENVIRONMENT; THAT THE EVENT CANNOT BE CONTROLLED AND REMEDIED BY PERSONNEL AND RESOURCES ONSITE, OR THAT REMEDIATION IS REQUIRED BY REGULATION.

G.4 EMERGENCY RESPONSE PROCEDURES

G.4.a Notification

Whenever there is an imminent or actual emergency situation, the emergency coordinator will immediately activate internal facility alarm systems (if not already done) and internal communication systems to notify facility personnel (see Table G-3 for communication equipment). Subsequently, appropriate fire and/or police departments, local, state, and federal agencies will be notified, followed by reports as necessary to GM central office.

G.4.e Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The emergency coordinator will take all reasonable measures necessary to prevent the occurrence, recurrence, or spread of fire, explosions, or release of other hazardous waste, including stopping operations, containing and collecting waste and isolating or removing containers.

The Hazardous Material Data Sheets, available in the plant for all hazardous materials in use, give specific information on precautionary measures to take.

G.4.f Storage and Treatment of Released Material

Immediately after an emergency, the emergency coordinator will provide for the treatment, storage, or disposal of recovered waste, contaminated water, and contaminated absorbant material or soil.

Any residue or contaminated material remaining after an emergency situation has been brought under control must be quickly, but carefully, cleaned up to prevent the recurrence or establishment of a new emergency situation. Ignitable spilled material is to be recovered with non-sparking equipment, such as brass or aluminum shovels and air-operated pumps. Place recovered material into clean, empty containers only, such as 55-gallon hazardous waste drums from stock of empties.

Absorbent materials that were used to dike spills are to be placed in clean, empty containers along with rags, etc., used to clean and decontaminate emergency equipment. The waste will then be characterized to determine if it is a hazardous waste. If hazardous waste, the ~~All~~ drums are then ~~to be~~ labeled and prepared for disposal following the existing arrangements for disposal of hazardous waste to ~~in~~ a secure offsite facility. Note that all disposal options will adhere to applicable land ban regulations.

THE EXISTING CONTAINER STORAGE AREA, IF IN FULL OPERATING STATUS, WILL BE USED FOR CONTAINING RELEASED MATERIAL OR AS A TEMPORARY ACCUMULATION AREA SET-UP AND OPERATED IN ACCORDANCE WITH OAC 3745-52-34.

In certain situations, the clean-up of the facility may be contracted to an outside cleanup contractor.

G.4.g Incompatible Wastes

The emergency coordinator will ensure that no incompatible waste will be stored, treated, or disposed of in the AFFECTED area of the released waste until cleanup operations are complete, and that all emergency equipment is cleaned and/or replaced and fit for its intended use. THIS WILL BE CONDUCTED BY COMPARING THE RELEASED WASTES WITH THE WASTES STORED IN THE AREA EITHER BY LABELS ON THE CONTAINER, MSDS, ETC. OR CHEMICAL ANALYSES, IF NECESSARY. IF THE WASTE IS INCOMPATIBLE IT WILL BE PHYSICALLY SEPARATED WITHIN THE CONTAINER STORAGE UNIT (I.E., CONTAINMENT TRAYS, TEMPORARY BERMS) OR A SEPARATE TEMPORARY ACCUMULATION AREA WILL BE SET-UP AND OPERATED IN ACCORDANCE WITH OAC 3745-52-34.

If the emergency situation involved notification to the Regional Administrator and state or local authorities, those authorities will be subsequently notified that post-emergency maintenance is complete and operations will be resumed.

G.4.h Post-Emergency Equipment Maintenance

Any process equipment (pipes, valves, etc.) which has been contaminated in the fire, explosion, or release must be decontaminated prior to return to service. Should a fire, spill, or explosion cause operations to cease, the emergency coordinator shall monitor for leaks, pressure buildups, gas generation, or ruptures in pipes, valves, or process equipment to ensure that restart of operations does not result in another incident.

Reusable equipment, such as shovels, mops, pumps, pails, etc., is to be wiped clean of excess material with shop rags or paper towels and the rags containerized with the other dry materials. If necessary, rinse equipment with organic solvent to loosen sticky residue. Wash it with warm detergent solution and sanitize, rinse several times with tap water, and wipe dry.

If not decontaminated and characterized as hazardous waste, non-reusable equipment, such as brooms, will be disposed of offsite as a hazardous waste at a RCRA permitted facility. All protective clothing, gloves, etc. are disposable and are to be sealed in

steel drums for disposal offsite in a suitable facility. Mop and broom heads may also be treated this way.

Respirators are to be cleaned and outfitted for reuse by an approved outside vendor or the manufacturer. (Respirators were originally purchased from Sheridan Safety Supply Company.)

SPCC sheds and Iso-spill cages are to be restocked with any disposable materials that have been used.

G.4.i Container Spills and Leakage

If a leaking container is discovered, the leak will be stopped, if possible, until the material can be transferred into a sound container. Any spilled material will be cleaned up by absorbing onto absorbant material and disposing, or by flushing with sufficient water into the containment system. If the source of the release is not known, the waste will be sampled and analyzed. Based on this analysis the waste will be properly disposed of, adhering to all applicable land ban regulations and using the existing disposal arrangements of hazardous waste to a secure offsite facility. The appropriate technique will depend on the nature and amount of material.

G.4.j Tank Spills and Leakage

In the event of a leak developing a waste tank or the process piping, operations will be immediately shut down. If it is not possible to stop the leak by closing piping valves, etc., the tank would be drained into a suitable tank wagon.

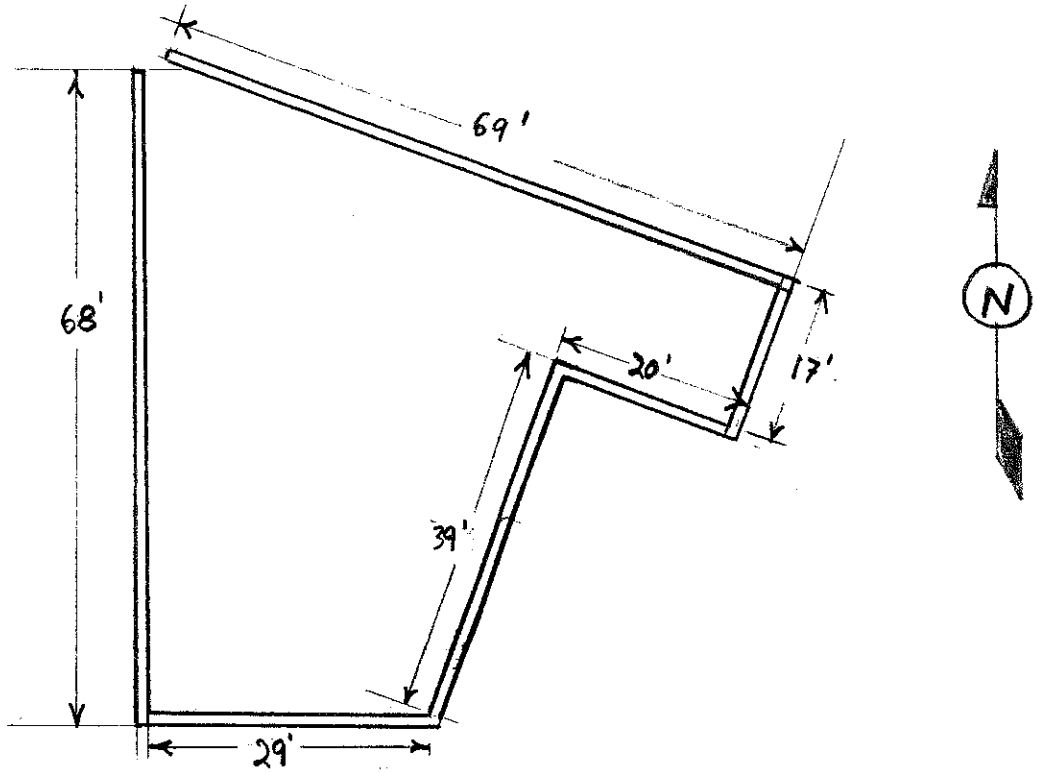
If the waste is leaking too rapidly to allow securing a tank wagon, the clean waste drums on hand in the waste management area would be used. Disposal of spilled material in the containment system is covered above. Delco Products does not store wastes F020, F021, F022, F023, F026, or F027; therefore, the immediate removal of such wastes is not applicable.

APPENDIX D-1

SECONDARY CONTAINMENT CAPACITY CALCULATIONS
CONTAINER AND TANK STORAGE AREAS

FILE GMC DELCO PRODUCTS
SUBJECT H.W. CONTAINER STORAGE AREA
CONTAINMENT CALCULATIONS SHEET 1 OF 1

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____



CONTAINER STORAGE AREA

CONTAINMENT TRENCH AND
CONTAINMENT STRUCTURE

Minimum trench dimensions 10" deep x 10" wide

$$V = \left[(10'' \times 10'')\frac{1\,ft^2}{144\,in^2}\right] \times (68' + 29' + 39' + 20' + 17' + 69') + 2{,}000 \text{ gallon structure}$$
(see Figure D-4)

$$V = 168\,ft^3 \times 7.5\,gallon/ft^3 + 2{,}000 \text{ gallon structure}$$

$V = 1{,}260$ gallons in trench + 2,000 gallon structure

$V = 3{,}260$ gallons total capacity of trench and structure

Maximum Capacity = 228 drums x 55 gallons/drum
= 12,540 gallons

The containment must hold 10% of the maximum capacity (OAC 3745-55-75(B)(3))

12,540 gallons x 0.10 = 1,254 gallons

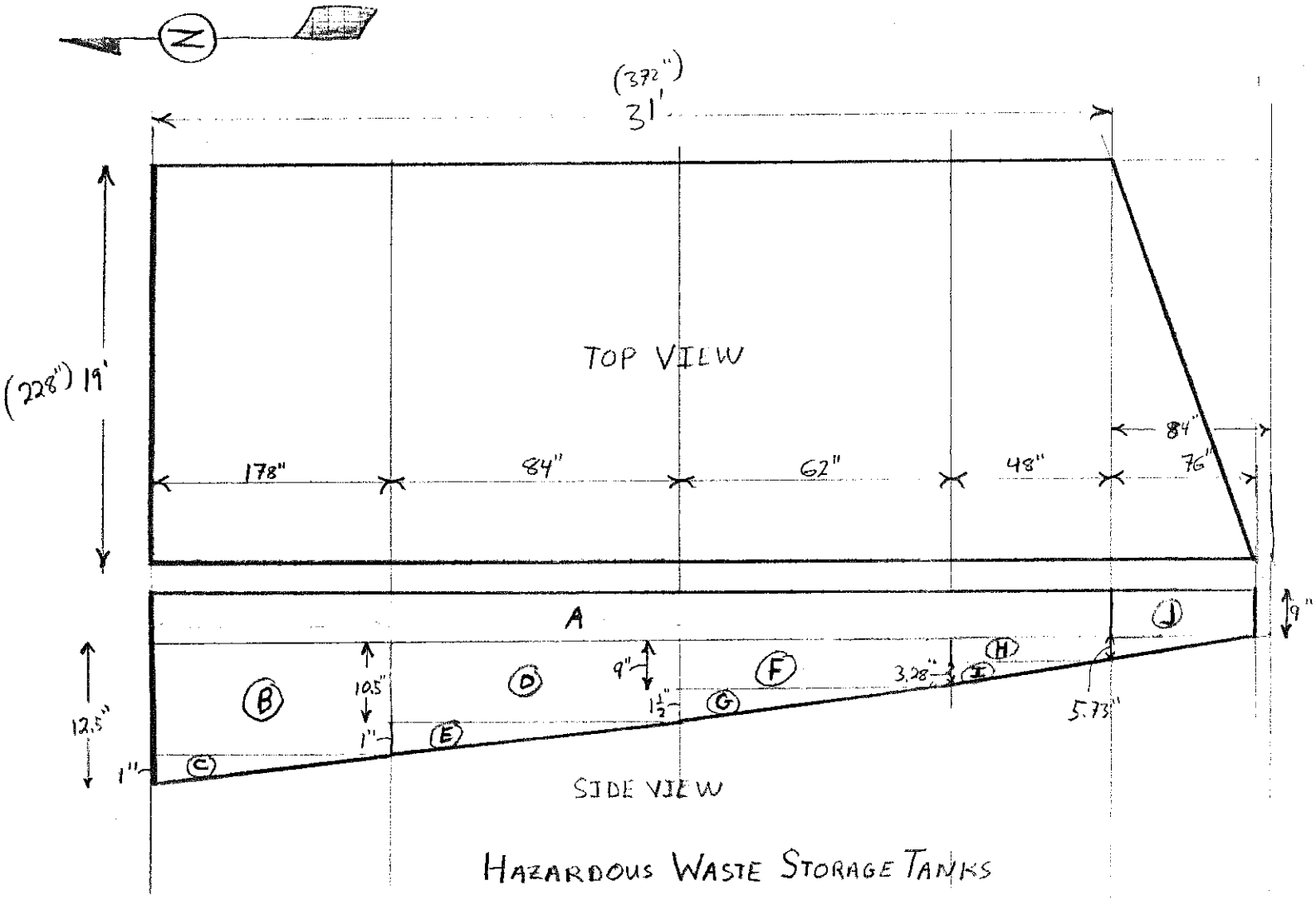
Therefore, Containment is sufficient (3,260 > 1,254)

BY J.H. FAITH DATE 7/28/89
CHECKED BY KEH
COPY TO EO

Dames & Moore

BY J.H. FATH DATE 7/28/89
CHECKED BY
COPY TO EO

REVISIONS
BY DATE TO EO
BY DATE TO EO



HAZARDOUS WASTE STORAGE TANKS
SECONDARY CONTAINMENT VAULT

FILE GMC DELCO PRODUCTS CORPORATE
SUBJECT H.W. STORAGE TANK SECONDARY CONTAINMENT CALCULATIONS
SHEET 1 OF

945.1 (12/88) PRINTED IN U.S.A.

Dames & Moore

FILE GMC DELCO PRODUCTS 00299-175-122
SUBJECT H.W. STORAGE TANK SECONDARY CONTAINMENT CALCULATIONS SHEET 2 OF 3

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

$V_A = 228'' \times 372'' \times 9''$

$V_A = 763{,}344 \text{ in}^3$

$V_B = 228'' \times 178'' \times 11.5''$

$V_B = 466{,}716 \text{ in}^3$

$V_C = 228'' \times \frac{1}{2}(1'' \times 178'')$

$V_C = 20{,}292 \text{ in}^3$

$V_D = 228'' \times 84'' \times 10.5''$

$V_D = 201{,}096 \text{ in}^3$

$V_E = 228'' \times \frac{1}{2}(1'' \times 84'')$

$V_E = 9{,}576 \text{ in}^3$

$V_F = 228'' \times 62'' \times 9''$

$V_F = 127{,}224 \text{ in}^3$

$V_G = 228'' \times \frac{1}{2}(1.5 \times 62'')$

$V_G = 10{,}602 \text{ in}^3$

$V_H = 228'' \times 48'' \times 5.73''$ *

$V_H = 62{,}709.12 \text{ in}^3$

$V_I = 228'' \times \frac{1}{2}(3.28'' \times 48'')$ *

$V_I = 17{,}948.16 \text{ in}^3$

$V_J = \frac{1}{2}(228'' \times 76'') \times 9''$

$V_J = 77{,}976 \text{ in}^3$

$V_{Total} = V_A + V_B + V_C + V_D + V_E + V_F + V_G + V_H + V_I + V_J$

$V_{TOTAL} = 1{,}757{,}483 \text{ in}^3 \times 4.329 \times 10^{-3} \text{ gallons/in}^3$

$V_{TOTAL} = 7{,}608 \text{ gallons}$

BY J.H. FATH DATE 7/28/89
CHECKED BY ____
COPY TO EO ____

LARGEST TANK IS 7,000 gallons, THEREFORE CONTAINMENT IS SUFFICIENT

$7{,}608_g - 7{,}000_g = 608_g$ excess capacity

* see page 3 of 3 for source of these numbers

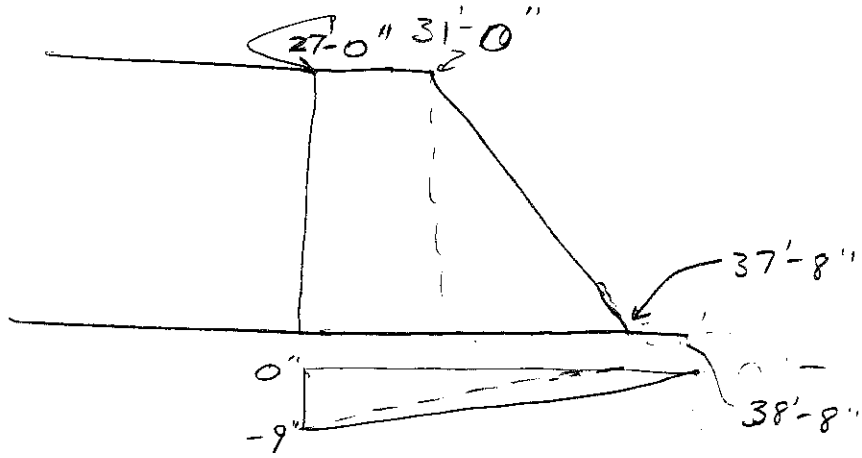
Dames & Moore

945.1 (12/88) PRINTED IN U.S.A.

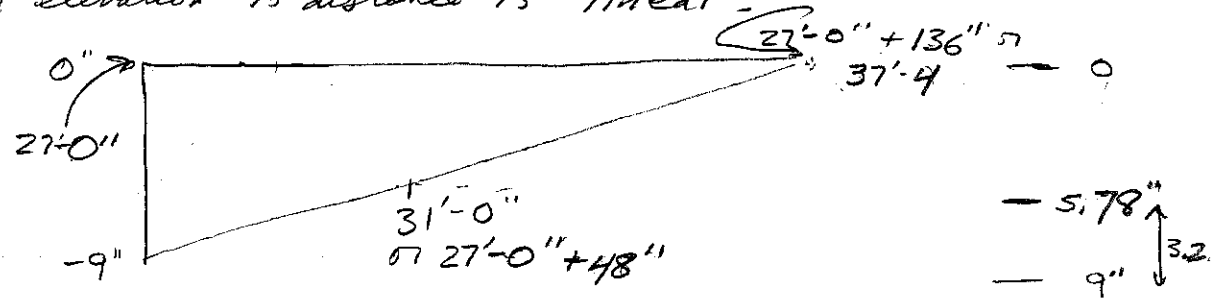
FILE GMC Delco Products 00299-175-122
SUBJECT H.W. Storage Tank Secondary Containment Calculations
SHEET 3 OF 3

REVISIONS
BY ____ DATE ____ TO EO ____
BY ____ DATE ____ TO EO ____

CALCULATE The elevation difference of the floor of the containment area between 27'-0" and 31'-0" and between 31'-0" and 37'-4"



Since there is 9" difference between 27'-0" and 38'-8" (from drawing PLE-32906-1) for the purpose of volume calculation it is safe to assume -9" elevation at 27'-0" and 0" elevation at 37'-8". Assume also that the relationship of elevation to distance is linear.



So using proportions

$\left(\frac{48''}{134}\right)(9'') = 3.22$ = elevation difference between 27'-0" and 31'-0"

$\left(\frac{90}{134}\right)(9'') = 5.78''$ = elevation difference between 31'-0" and 37'-8"

BY KEB DATE 8/3/87
CHECKED BY J.H. FATH
COPY TO EO ____

Dames & Moore

945.4 (12-73) PRINTED IN U.S.A.

APPENDIX D-2

ENGINEERING DRAWINGS OF TANKS NO. 1 AND NO. 2

APPENDIX D-3

TANK AGE DOCUMENTATION

WORK INSTRUCTION LETTER

TO B. DOWNEY 04-12

CHECK ONE ☐ MAINT ☐ TOOL ROOM ☐ TOOL DES ☒ PLANT ENGRG ☐ OTHER

FROM: CASPER BELLAR 10
ORIGINATOR DEPT

04-12 7-3591
MAIL CODE PHONE NO

APPROVALS H. JORDAN
SUPERVISOR DATE

W E Adams 9/17
SUPERINTENDENT DATE

DATE

DATE

SAFETY-HEALTH ADM DATE

UNPLANNED WORK _____ NOT TO EXCEED _____ HRS

WORK COMP _____
SKILLED TRADES FOREMAN DATE

CLOSING AUTHORIZED ☐ YES ☐ NO _____
ORIGINATOR DATE

REQUESTED BY _____

ISSUE DATE 09-17-81 LETTER NO. 01511656 REV.

CHARGE DEPT. ACCT. _____ W.O. 58830001

CHECK ONE ☒ FACILITIES ☐ TOOLS ☐ OPERATIONS

FOR DEPT 619 BLDG 16 PAGE 1 OF 1

DESCRIPTION CB BULK DIS SOL CT

RESP SUPV. 835 TOOL ROOM _____ PRIORITY 4 GOVT REG _____ SAFETY ITEM ☐ YES ☐ NO

D/T Req'd START DATE 09-29-81 TARGET DATE 10-12-81

TOOL NO. _____ PROMISE DATE _____

DWG. NO. _____ DESIGN LET NO. _____

IS THERE A PRIMARY LETTER ☐ YES ☒ NO PRIMARY LETTER NO _____

ESTIMATOR	RATE $	LABOR $	MATERIAL	TOTAL $
ORIGINATOR	$27.13	1502.00	1833.00	$3335.00
SKILLED TRADES				

CRAFT HOURS 1 2 3 4 5 6 7 8 9 TOTAL

COPIES TO _____

PART NO. _____

PART NAME _____

TOOL NAME _____

"BULK DISPOSAL OF WASTE SOLVENT SYSTEM CONTROLS"

PROVIDE ALL THE NECESSARY LABOR, MATERIAL AND EQUIPMENT TO COMPLETE THE FOLLOWING WORK AT "HOT DOCK" AT BLD'G #16:

SUPPLY DESIGN OF CONTROLS FOR 2 WASTE HANDLING PUMPS & HYD. PUMP MOTORS.

THE WAST PUMP MOTORS ARE: (1) ONE 2 HP @ 1800 RPM AND (1) ONE 1/2 H.P. @ 1800 RPM. BOTH ARE 460/3/60 EXP. MOTORS.

THE (2) HYD PUMP MOTORS ARE @ 1 HP OR LESS 230/460-3-60 T.E.N.V. MOTORS

SUPPLY LABOR & MATERIAL FOR CONTROLS; BUILD; & INSTALL & START-UP ~~FOR~~ IN HOT DOCK AREA AT BLD #16

SEE ATTACHED NOTES BY ROY SMITH.

F411A REV 10

WORK INSTRUCTION LETTER

TO: W. RINGO

CHECK ONE: ☒ MAINT ☐ TOOL ROOM ☐ TOOL DES ☐ PLANT ENGRG ☐ OTHER

FROM: CASPER BELCAR — ORIGINATOR — 10 — DEPT

04-12 — MAIL CODE — 7-3591 — PHONE NO

APPROVALS

SUPERVISOR — DATE

W. Adams — SUPERINTENDENT — DATE 10/2/81

DATE

DATE

SAFETY-HEALTH ADM — DATE

UNPLANNED WORK _____ NOT TO EXCEED _____ HRS

WORK COMP _____

SKILLED TRADES FOREMAN — DATE

CLOSING AUTHORIZED ☐ YES ☐ NO — ORIGINATOR — DATE

REQUESTED BY _____

ISSUE DATE 10-02-81 LETTER NO. 01111763 REV.

CHARGE DEPT. ACCT. _____ W.O. 58530001

CHECK ONE FOR DEPT ☒ FACILITIES ☐ TOOLS ☐ OPERATIONS

619 BLDG 16 PAGE 1 OF

DESCRIPTION CB FAB MIX TANK

RESP SUPV. 835 TOOL ROOM _____ PRIORITY 4 GOVT REG _____ SAFETY ITEM ☐ YES ☒ NO

D/T Req'd START DATE 10-08-81 TARGET DATE 10-23-81

TOOL NO. _____ PROMISE DATE _____

PLE 32906-2 & -3

DWG. NO. _____ DESIGN LET NO _____

IS THERE A PRIMARY LETTER ☐ YES ☐ NO PRIMARY LETTER NO _____

ESTIMATOR	RATE $	LABOR $	MATERIAL	TOTAL $
ORIGINATOR	24.16	$4711.20	4325 =	$9036.20
SKILLED TRADES				

CRAFT HOURS 1 2 3 4 5 6 7 8 9 TOTAL

COPIES TO H. JORDAN B. BURGA.

PART NO. _____

PART NAME _____

TOOL NAME _____

FOR "BULK DISPOSAL OF WASTE SOLVENT"

PROVIDE THE NECESSARY LABOR & MATERIALS TO FABRICATE "MIX TANK" AS SHOWN ON PLE 32906 SHEETS 2 & 3.

FABRICATE & COMPLETELY ASSEMBLE TANK & FRAME AS SHOWN ON SHEET #2

PLUMB TANK AS SHOWN ON SHEET #3, INCLUDING THE INSTALLATION OF PUMP ASSY. PUMP SUPPLIED BY ORIGINATOR TO BE DELIVERED TO PLUMBING SHOP BLD 11A ON OR ABOUT 10-19-81

FILL TANK WITH WATER TO DOOR LEVEL TO CHECK FOR LEAKS. TANK MUST BE WATER TIGHT BEFORE INSTALATION AT HOT DOCK BLD'G 16

NOTE HAND GRIND ALL CORNERS & OTHER WELDS TO CLEAN UP OUT SIDE SURFACE

F411A REV 10

WORK INSTRUCTION LETTER

TO W. RINGO

CHECK ONE ☒ MAINT ☐ TOOL ROOM ☐ TOOL DES ☐ PLANT ENGRG ☐ OTHER

FROM: CASPER BELLAR 10
ORIGINATOR DEPT

04-12 7-3591
MAIL CODE PHONE NO

APPROVALS 10/6/81
SUPERVISOR DATE

SUPERINTENDENT DATE

DATE

DATE

SAFETY-HEALTH ADM DATE

UNPLANNED WORK _____ NOT TO EXCEED _____ HRS

WORK COMP _____
SKILLED TRADES FOREMAN DATE

CLOSING AUTHORIZED ☐ YES ☐ NO
ORIGINATOR DATE

REQUESTED BY _____

ISSUE DATE 10-05-81 LETTER NO. 01116765 REV.

CHARGE DEPT. ACCT. W.O. 58830001

CHECK ONE ☒ FACILITIES ☐ TOOLS ☐ OPERATIONS

FOR DEPT 619 BLDG 16 PAGE 1 OF 2

DESCRIPTION CB BULK TANK INSTA

RESP SUPV. 835 TOOL ROOM ___ PRIORITY 4 GOVT REG ___ SAFETY ITEM ☐ YES ☒ NO

D/T Req'd START DATE 10-09-81 TARGET DATE 10-30-81

TOOL NO. PLE 32906-1 PROMISE DATE ___-___-___

DWG. NO. _____ DESIGN LET NO. _____

IS THERE A PRIMARY LETTER ☐ YES ☒ NO PRIMARY LETTER NO _____

ESTIMATOR	RATE $	LABOR $	MATERIAL	TOTAL $
ORIGINATOR	24.16	8600.00	2700.00	11300.00
SKILLED TRADES				

CRAFT HOURS 1 2 3 4 5 6 7 8 9 TOTAL

COPIES TO _____

PART NO. _____

PART NAME _____

TOOL NAME _____

FOR "BULK DISPOSAL OF WAST SOLVENTS"

PROVIDE THE NECESSARY LABOR & MATERIALS FOR FABRICATION & INSTALLATION ALL EQUIPMENT AS SHOWN ON PLE 32906-1. WORK THIS LETTER IN CONJUNCTION WITH LETTERS 01-11-1655 AND 01-11-1763

ITEM # 1 COMPLETE NORTH AND EAST CURBING BEFORE WEEK OF 10-26-81. SOUT CURB TO BE POURED AFTER 7000 GALLON TANT IS SET. (TANK DUE WEEK OF 10-26-81) ORIGINATOR HAS ORDERED TANK.

ITEM # 2 FABRICATE ALL ITEMS AS SHOWN ON PLE-32906-1 SO AS SOON AS TANK IS SET THESE ITEMS CAN BE INSTALLED.

ITEM # 3 OFF LOAD TANK. TANK WILL BE DELIVERED TO BLD'G 16. TAKE CARE SO THAT PIPE FITTING ARE NOT DAMAGED WHEN ERECTING TANK. TANK LEGS ARE TO BE FIELD WELDE IN PLACE. TANK BOTTOM TO CLEAR CEMENT BY 14" OR MORE. COORDINATE CLEARANCE REQUIREMENTS WITH PLUMBERS. NOTE TANK LOCATION & FITTING ORIENTATION. INSTALL ALL ACCESSORY ITEMS AS SHOWN ON DWG.

F411A REV 10

WORK INSTRUCTION LETTER

TO: W. RINGO

CHECK ONE: ☐ MAINT ☐ TOOL ROOM ☐ TOOL DES ☐ PLANT ENGRG ☐ OTHER

FROM: CASPER BELLAR — ORIGINATOR — DEPT 10

MAIL CODE: 01-12 — PHONE NO: 7-3591

APPROVALS: SUPERVISOR — DATE 10/12/81

SUPERINTENDENT — DATE

DATE

DATE

SAFETY-HEALTH ADM — DATE

UNPLANNED WORK _____ NOT TO EXCEED _____ HRS

WORK COMP _____

SKILLED TRADES FOREMAN — DATE

CLOSING AUTHORIZED ☐ YES ☐ NO — ORIGINATOR — DATE

REQUESTED BY _____

ISSUE DATE 10-12-81 LETTER NO. 01111765 REV. 01

CHARGE DEPT ACCT _____ W.O. 58830001

CHECK ONE FOR DEPT: ☒ FACILITIES ☐ TOOLS ☐ OPERATIONS

DEPT 619 BLDG 16 PAGE 1 OF

DESCRIPTION: CB BULK TANK INSTA

RESP SUPV 835 TOOL ROOM ___ PRIORITY 4 GOVT REG ___ SAFETY ITEM ☐ YES ☒ NO

D/T Req'd ☐ START DATE 10-16-81 TARGET DATE 10-30-81

TOOL NO. _____ PROMISE DATE ___-___-___

PLE 32906-1

DWG. NO. _____ DESIGN LET NO _____

IS THERE A PRIMARY LETTER ☐ YES ☐ NO PRIMARY LETTER NO _____

ESTIMATOR	RATE $	LABOR $	MATERIAL	TOTAL $
ORIGINATOR	24.16	821.00	450.00	1271.00
SKILLED TRADES				

CRAFT HOURS 1 2 3 4 5 6 7 8 9 TOTAL

COPIES TO _____

PART NO. _____

PART NAME _____

TOOL NAME _____

FOR "BULK DISPOSAL OF WASTE SOLVENTS

PROVIDE NECESSARY LABOR & MATERIAL FOR INSTALLATION OF ALL EQUIPMENT PER REVISION A & B AS SHOWN ON PLE 32906-1

F411A REV 10

WORK INSTRUCTION LETTER

TO: D. KISTLER

CHECK ONE: ☐ MAINT ☐ TOOL ROOM ☐ TOOL DES ☐ PLANT ENGRG ☐ OTHER

FROM: CASPER BECCAR — ORIGINATOR — 10 — DEPT

04-12 — MAIL CODE — 7-3084 — PHONE NO

APPROVALS: SUPERVISOR — DATE 8/5/82

SUPERINTENDENT — DATE

DATE

DATE

SAFETY-HEALTH ADM — DATE

UNPLANNED WORK ____ NOT TO EXCEED ____ HRS

WORK COMP ____ SKILLED TRADES FOREMAN — DATE

CLOSING AUTHORIZED ☐ YES ☐ NO ____ ORIGINATOR — DATE

REQUESTED BY ____

ISSUE DATE 08-05-82 LETTER NO. 01120754 REV.

CHARGE DEPT. ACCT. ____ W.O. 58830004

CHECK ONE FOR DEPT ☐ FACILITIES ☐ TOOLS ☒ OPERATIONS

DEPT 616 BLDG 16 PAGE 1 OF

DESCRIPTION: BULK DISPOSAL MIX

RESP SUPV. 835 TOOL ROOM ____ PRIORITY 8 GOVT REG ____ SAFETY ITEM ☐ YES ☒ NO

B/T Req'd ☐ START DATE 08-11-82 TARGET DATE 08-18-82

TOOL NO. PLE 32906-7 PROMISE DATE ____

DWG. NO. ____ DESIGN LET NO. ____

IS THERE A PRIMARY LETTER ☐ YES ☐ NO PRIMARY LETTER NO ____

ESTIMATOR	RATE $	LABOR $	MATERIAL	TOTAL $
ORIGINATOR	$11.44	$549.=	$275.=	$824.=
SKILLED TRADES				

CRAFT HOURS 1 2 3 4 5 6 7 8 9 TOTAL

COPIES TO ____

PART NO. ____

PART NAME ____

TOOL NAME ____

FOR "BULK DISPOSAL OF LIQUID WASTE"
WORK THIS LETTER WITH LETTER 01-12-0499
PROVIDE LABOR & MATERIAL TO DO THE FOLLOWING:

ITEM 1 REMOVE PUMP & MOTOR ASSEMBLY FROM MIX TANK FRAME. SEAL OFF EXPLOSION PROOF DISCONNECT BOX. SEE PLE 32906-7

ITEM 2 INSTALL WILDEN PUMP AS SHOWN ON PRINT PLE 32906-7, CHANGE ALL PLUMBING LINES AS SHOWN & NOTED ON PRINT. CONNECT AIR SUPPLY TO PUMP AS SHOWN.

F411A REV 10

SECTION E

GROUND WATER MONITORING

This application seeks a permit for hazardous waste container storage and hazardous waste tanks and does not seek a permit for a landfill, surface impoundment, land treatment, or waste pile. Thus, the requirements of OAC 3745-50-44(b) and 40 CFR 270.14(c) are not applicable.

SECTION F

PROCEDURES TO PREVENT HAZARDS

The information in this section is submitted in accordance with the requirements of OAC 7345-50-44(B), (4), (5), (6), (8), and (9), and 40 CFR Part 122.25(a) (4), (5), (6), (8), and (9). Other regulations addressed to complete this section include OAC 3745-54-14 and 15, and 40 CFR 264.14 and 264.15.

Delco Products will address the following subject areas as referenced above: general security provisions; inspection schedule; request for a waiver of preparedness and prevention requirements; spill prevention, containment, and countermeasures plan; and prevention of accidental ignition or reaction of ignitable, reactive, or incompatible wastes.

F.1 SECURITY

F.1.a. Security Procedures and Equipment

In addition to the general security provisions of fences, gates, and guards discussed below, several other features contribute to the safety and security of the facility. Ample lighting is provided throughout the site and guards and maintenance foremen are equipped with two-way hand-held radios to report and respond to upset conditions immediately. In addition to the two-way radios, an internal telephone system is provided, with phones in all occupied buildings and guard houses. The same telephone system is used for external communications.

Employees are required to show identification cards when reporting to work, and visitors, contractors, and outside truck drivers must sign a log sheet upon entering or leaving the plant. Visitors who will be going into the plant area must wear a green identification pass, while those visiting the office building wear yellow passes.

F.1.a.1 24-Hour Surveillance System

Security at Dayton Operations is maintained by a staff of trained security guards, who primarily monitor entry and exit from the facility and provide security measures within the plant premises.

The portion of the plant which includes the Hazardous Waste Management facility has four main entrance gates which are operated by remote control from an adjacent guard house (see Figure F-1). Each guard house is occupied at all times by at least one Plant Security agent (unless the gate is closed due to weekend shutdown, etc.). There are a total of 32 guards at the Dayton Operations, plus four supervisors, all reporting to the Chief of Plant Security.

The minimum staff on weekends is four guards. During normal working hours, as many as eight guards will be on duty. They patrol within the plant on foot and between widely separated plant areas by company vehicle. During nights and weekends, guards patrol unoccupied plant areas by a pre-set route and check in regularly through an ADT (autocall) system. The ADT system also monitors for power outages and proper operation of fire alarm boxes as discussed further in Section F.2.a.

Closed-circuit TV monitors also provide surveillance of remote areas of the plant, including truck docks, railroad gates, etc., which are out of the immediate line of sight from the guard house.

F.1.a.2 Barrier and Means to Control Entry

The entire facility is enclosed within a chainlink fence topped by barbed wire (except where a building wall is on the property line, the wall provides the barrier).

The four main gates are at plant entrances adjacent to employee parking areas. The parking lots are also enclosed by fences with remote control electric gates at the street entrance. These gates may be closed, sealing off one or more parking lots during weekends or holidays when few employees are working.

Other gates into the plant include the four railroad gates which are opened for railroad switching maneuvers and five emergency gates which are locked at all times.

F.1.a.3 Warning Signs

Warning signs displaying the message "Danger--Hazardous Material Storage" are posted at the lift-truck entrance between the drum and tank storage areas, and at the doorway leading from Building 16 to the drum storage area. "No Smoking" signs are also handling in the drum storage and tank storage areas. All signs are clearly legible from at least 25 feet away. Access from the other directions is restricted by chainlink fence and blank building walls.

F.1.b Waiver

Delco Products does not request a waiver of the preparedness and prevention requirements under OAC 3745-50-44(A)(b) and 40 CFR 270.14(b)(6).

F.2 INSPECTION SCHEDULE

F.2.a General Inspection Requirements

Delco Products conducts regular inspections of the facility for equipment malfunction or deterioration, discharges, or other factors that could cause or lead to the release of hazardous waste constituents or adversely affect the environment or threaten human health.

Table F-1 presents inspection schedules for the monitoring equipment, safety and emergency equipment, security devices, operating and structural equipment, the container storage area, tanks, and tank storage area. The items listed are itemized to improve prevention and early detection of possible hazards. Each item includes problems to look for and the inspection frequency.

These items which are under the direct control of the Waste Management personnel are inspected daily or weekly, as specified in the inspection logs (Appendix F-1).

The inspection of certain nonroutine items is best handled at Dayton Operations by other support personnel. These items are listed on a Special Inspection Log (Appendix F-

1). The Waste Management personnel will maintain this log and ensure that the inspections called for are being made as needed. These special items are discussed as follows:

1. *Spill Absorbent Materials* - As specified in the SPCC Plan, Environmental Engineering and Maintenance have the responsibility to keep the SPCC sheds stocked. Periodic inspections are therefore carried out to see that adequate materials are on hand.

2. *Fire Extinguishers* - Plant Security inspects all fire extinguishers plantwide monthly. The inspection records are maintained at a location remote from the HWM facility.

3. *Fire Alarms* - The fire alarms are tied into the ADT system. As part of the Plant Security check-route, the alarms are checked nightly by a key-switch to ensure that they are capable of sending the proper signals.

4. *Waste Tank (Internal)* - Due to the inherent safety hazards involved in entering enclosed tanks, this inspection will be performed by an outside contractor with the proper training and equipment. The Waste Management Department will coordinate the inspection to be held once per year, unless otherwise indicated.

F.2.b Specific Process Inspection Requirements

F.2.b.1 Container Inspections

Inspections of the container storage area will be conducted per the schedule provided in Table F-1. Results of each inspection will be recorded on the Daily and Weekly Inspection Log sheets, as appropriate.

Information requested on the log sheets includes the inspector's name and title, date and time of the inspections, any problems or observations, and remedial action. Problems to look for are provided on the log sheets to ensure a complete inspection.

F.2.b.2 Tank Inspections

Inspections of the tank area and operating equipment will be conducted and results will be noted on the aforementioned Daily and Weekly Inspection Log sheets. Internal tank inspections will be conducted annually as discussed in Section F.2.a.

F.2.c Remedial Action

If a hazard is imminent or has been discovered during the course of an inspection or between inspections, remedial action will be taken immediately. Minor repairs and remedial action are to be noted on the inspection log. In the event of a major problem or material release, the emergency procedures detailed in the SPCC Plan and Contingency Plan (Section G) will be implemented.

F.2.d Inspection Log

The inspection log sheets will be chronologically maintained in a three-ring binder in the Hazardous Waste Management office. The inspection records will be kept for 3 years, as required. The three-ring binder also includes a copy of the inspection schedule and other pertinent information.

F.3 EQUIPMENT REQUIREMENTS

Delco Products maintains equipment for preventing hazards that include internal and external communication systems, and emergency fire and spill equipment. A list of such equipment is contained in Table F-2. Locations of the equipment are shown in Figure F-2. The facility maintains sufficient aisle space to allow the unobstructed movement of personnel, fire protection equipment, or spill control equipment to any area of the HWMF as shown in Figure F-3.

F.4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

F.4.a Loading/Unloading Operations

A tank truck unloading procedure has been developed and incorporated into the SPCC Plan. The procedure is outlined in Appendix F-2; this plan effectively minimizes hazards involved in handling bulk materials.

Processing wastes are accumulated into drums in the various manufacturing areas of the plant in accordance with 40 CFR 262.34 accumulation requirements. The filled drums are prepared for transportation by closing and wrapping heavy tape around each

group of three or four drums standing on wooden pallets. A forklift truck then transports the pallet full of waste drums to the entrance of the container storage area.

The training procedures for lift truck operators include procedures for handling hazardous waste and how to report leakage of waste from containers (see Section H). Once delivered to the container storage area, the drums are handled as described in Section D.

F.4.b Runoff

Runoff from the container storage and tank storage areas drains to the containment trenches described in Section D and shown in Figures F-2 and F-3, and from there to the underground containment tank.

WHEN RUNOFF IS DISCOVERED WITHIN THE CONTAINMENT SYSTEM, IT IS CHARACTERIZED USING THE FOLLOWING DECISION-MAKING PROCESS: A DETERMINATION IS MADE OF THE MOST LIKELY SOURCE -- INCLUDING MOP WATER, RAIN WATER, AND SPILLS. IF THE RUNOFF IS DETERMINED TO CONTAIN LIQUIDS FROM A SPILL, THEN THE SPILL IS EVALUATED. IF THE CONSTITUENTS OF THE SPILL ARE KNOWN, THE RUNOFF IS CHARACTERIZED AS THOSE CONSTITUENTS. OTHERWISE, THE RUNOFF IS ANALYZED TO DETERMINE WHETHER OR NOT IT IS HAZARDOUS. SAMPLES CAN BE TAKEN FROM THE 2,000 GALLON CONTAINMENT STRUCTURE FOR ANALYSIS.

Runoff may be discharged from the underground tank to the sanitary sewer if it contains no hazardous waste. If inspections have revealed hazardous waste to have leaked into the containment system, it will be analyzed for hazardous contamination.

F.4.c Water Supplies

Ground water contamination is prevented by eliminating the discharge of hazardous materials onto the unprotected ground. The entire HWM facility is paved and spill control procedures are in effect to prevent water supply contamination.

F.4.d Equipment and Power Failure

The effect of a power outage on the waste handling operations would be minimal since there are no automatic delivery systems involved. The equipment would not produce additional hazards as a consequence of standing idle. Operations of loading, unloading, or moving hazardous materials would be halted since the plant would have reduced capability to cope with an emergency until power is resumed.

In the event of the failure of a particular piece of equipment, (e.g. a pump), operations in the affected area would be suspended until the plant Maintenance Department completes the necessary repairs.

F.4.e Personnel Protection Equipment

A variety of chemical products are in use at Delco Products. To control their use and minimize the hazards involved is the responsibility of the Hazardous Materials Review Committee (HMRC). One of the HMRC's functions is to maintain a file of chemical safety data sheets which provide complete information on the toxicity, fire/explosion, etc. hazards, and precautionary measures to prevent exposure of personnel. The recommended protective equipment is available to and used by maintenance, spill control, and fire control personnel in the event of potential exposure during emergency or repair situations.

F.5 PREVENTION OF REACTION OF IGNITABLE, REACTIVE, AND COMPATIBLE WASTES

The container and storage tank areas are the only areas on the facility property where ignitable wastes are stored. Reactive materials stored onsite until resale are protected by a 5-foot-wide buffer zone as described in Section D. Since containers of reactive material are not opened, mixed or treated, and incompatible materials are not mixed, the primary concern at Dayton Operations is the prevention of accidental ignition. The precautions, such as electric charge grounding, no smoking signs, and roof to prevent solar heat, are covered in Section D. Smoking, open flames, cutting and welding, etc., are prohibited while wastes are being handled.

Prior to storage, each container is sealed and labeled. This identifies the contents and prevents accidental mixing of incompatible or reactive wastes, as well as preventing precipitation from entering the drum.

Containers are stored on pallets to minimize contact with precipitation, leaks and spills, and to facilitate stacking (no more than three pallets high) in the proper storage area. A minimum aisle width of 5 feet is maintained to allow access of emergency equipment without risk of puncturing, scraping, or otherwise damaging containers.

The storage area is 50 feet inside the perimeter fence, which is in compliance with NFC standards for outdoor storage of containers of ignitable or reactive waste. To prevent accidental mixing of incompatible wastes, empty used drums are sent offsite for cleaning by an approved drum-cleaning vendor using the triple-rinse process.

The wastes stored in the hazardous waste tanks are ignitable. Reactive and incompatible wastes are not placed in the tanks. The location of the tanks complies with the buffer zone requirements for stable liquids (operation pressure 2.5 psig or less) contained in NFPA 1978 Flammable and Combustible Liquids Code (Table 2-6).

Protection for exposures is provided by the in-plant fire brigade and by virtue of location within the jurisdiction of the Dayton Fire Department.

TABLE F-1

INSPECTION SCHEDULE

Area/Equipment	Specific Item	Types of Problems	Frequency
Safety and emergency equipment	Absorbent material	Out of stock; note approximate quantity	Monthly/as needed
	Absorbent pads	Out of stock	Monthly/as needed
	Empty drums	Out of stock, corrosion, damage; note approximate quantity	Weekly
	Emergency shower	Water pressure, leaking	Weekly
	Fire extinguishers	Needs charging	Monthly/as needed
	Fire alarm	Power failure	Per plant security schedule
	Personal protective clothing	Insufficient inventory	Per plant security schedule
	Self-contained breathing apparatus equipment	Check conditions	Per plant security schedule
Security devices	Security fence	Corrosion, damage to chainlink fabric, damage to barb wire	Weekly
Container storage area	Container placement	Wrong location or area; aisle space, stacking	Weekly
	Container condition	Corrosion, leakage, open lids, labels missing*	Weekly

* Labels to be inspected for date and content identification upon arrival.

TABLE F-1 (Continued)

Area/Equipment	Specific Item	Types of Problems	Frequency
	Pallets	Damage, weakness	Weekly
	Concrete pad	Cracks, wet spots, debris, settling	Weekly
	Containment trench	Liquid present, cracks	Daily
	Warning signs	Damage, hanging improperly	Weekly
	General housekeeping	Debris Spilled material	Weekly Daily
	Storage area roof	Leaks, missing panels, deterioration	Weekly
Tank storage area	Concrete curb	Cracks, deterioration	~~Weekly~~ DAILY
	Base, foundation	Cracks, wet spots, settling	~~Weekly~~ DAILY
	Tank shell and walls	Corrosion, discoloration, cracks, buckles, bulges, rust spots, blisters	~~Weekly~~ DAILY
	Tank supports	Corrosion, cracking, deterioration, damage	~~Weekly~~ DAILY
	Pipes, valves, and fittings	Loss of metal thickness, leaks, corrosion, bad seals	~~Weekly~~ DAILY
	Containment trench leak detection	Liquid present	Daily
	Rainwater release valve	Open, inoperable	Daily
	Barrel dumpers	Hydraulic fluid leaking or low; frayed or deteriorated hoses	~~Weekly~~ DAILY

TABLE F-1 (Continued)

Area/Equipment	Specific Item	Types of Problems	Frequency
	Recirculation pump	Oil reservoir filled, oil leaking	Daily
	Liquid level indicators	Wire cable corroded or frayed; sticking float or pulley; note level	Daily
Tank area (internal)	Tank shell	Corrosion, loss of metal thickness, cracking	Yearly

Note: Tank to be checked by outside contractor.

TABLE F-2

EMERGENCY EQUIPMENT

Name	Location	Description/Use
EQUIPMENT FOR FIRE EMERGENCY		
(2) CO_2 extinguishers	1-Bldg. 16, east wall 1-Bldg. 16, west wall	Use for flammable liquids
H_2O extinguisher	Bldg. 16, east wall	Use for paper, wood, and trash
Dry chemical extinguisher	Bldg. 26, hazardous waste storage	Use for flammable liquid
Hydrant and hose	Bldg. 16, east wall	~~100 psi water~~ 510 GALLONS PER MINUTE AT 125 PSI WITH FIRE PUMP RUNNING
Hydrant and hose	Bldg. 16, south wall outside	~~100 psi water~~ 510 GALLONS PER MINUTE AT 125 PSI WITH FIRE PUMP RUNNING
Pull box #523	Bldg. 16	Notify authorities of fire
PERSONAL PROTECTIVE EQUIPMENT		
Scott air packs and spare tanks -1-box-20-2	Bish Avenue entrance Bldg. 20	Air-supplied breathing apparatus

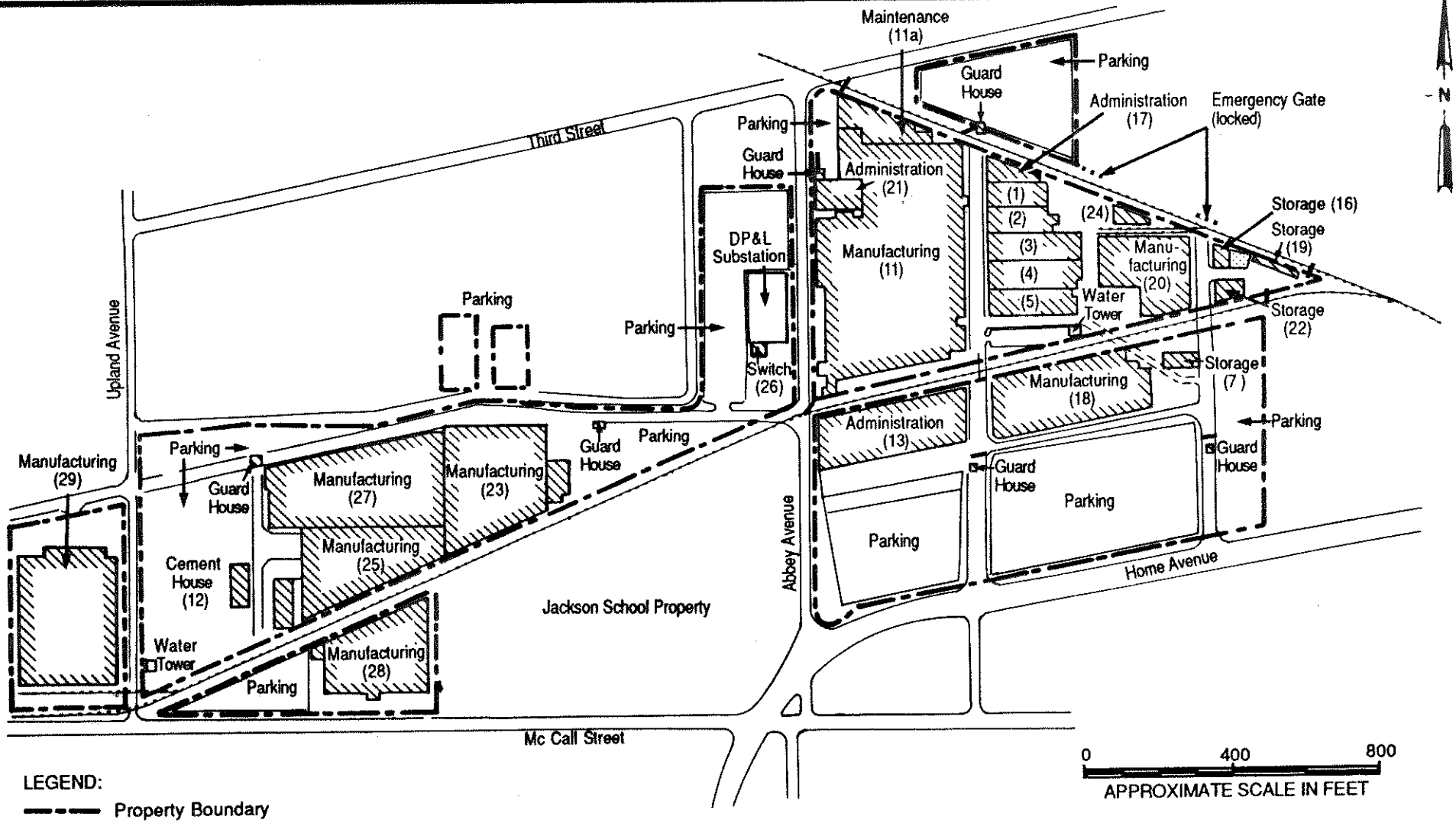
Note: Dust masks and cartridge filter respirators in normal use may **not** be satisfactory for emergency situations in oxygen-poor atmospheres.

EQUIPMENT FOR SPILL EMERGENCY		
SPCC shed: shovels picks	Bldg. 22, north wall	Dig trench
Absorbent material	Bldg. 22, north wall SPCC shed	Soak up spill and containment
Metal shoves, brass shovels, mops, 5-gallon pails, brooms, etc.	Iso-spill cage Bldg. 4	Clean up materials after spills
Empty 55-gallon steel drums	Salvage yard, Bldg. 19	Clean up liquid materials and spilled residue
Mobile spill cart	Bldg. 25	Mobile cleanup for spilled material

TABLE F-2 (Continued)

COMMUNICATION EQUIPMENT

Two-way radios	Carried by all plant security officers and		Used for communication between plant security maintenance foremen officers and plant security supervision, and communication between maintenance foremen and maintenance supervision. Maintenance radios will not monitor plant security radios and vice versa.
ADT	Connected to alarm		The alarm automatically boxes sends a message to ADTwho then transmits a series of coded tones back to Delco Products to alert plant security of which alarm box was activated.
Emergency telephone	Post 13	Dial 5-8743 Inland Avenue	



LEGEND:

- Property Boundary
- (2) Building Designation
- Hazardous Waste Management Facility
- Railroad
- Electric Gate

NOTE: Entire perimeter is fenced except where a building wall provides a barrier.

BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1981.

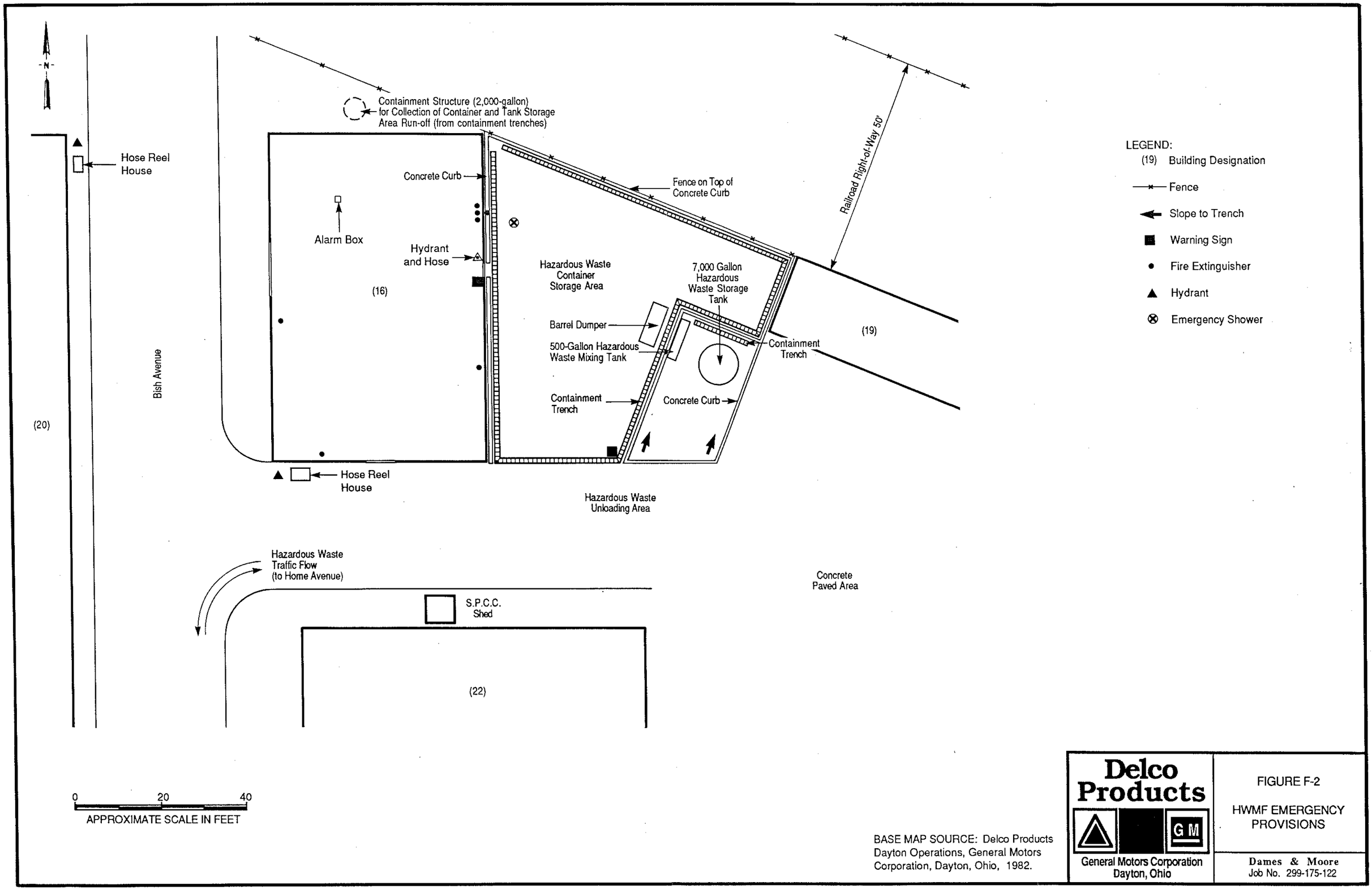
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE F-1

DAYTON OPERATIONS SECURITY PROVISIONS

Dames & Moore
Job No. 299-175-122



BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

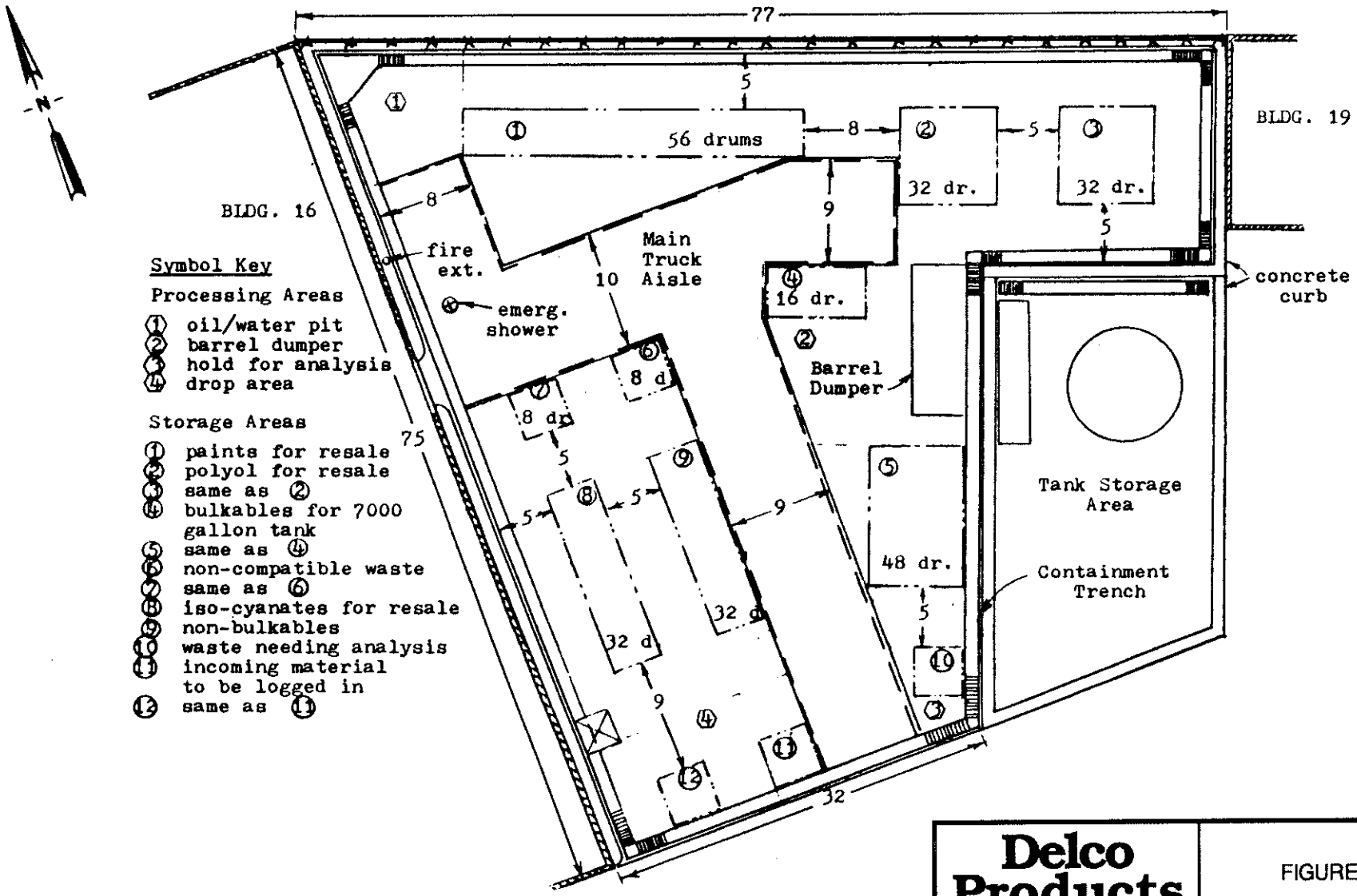
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE F-2

HWMF EMERGENCY PROVISIONS

Dames & Moore
Job No. 299-175-122



SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE F-3

CONTAINER STORAGE AREA AISLE SPACING

Dames & Moore
Job No. 299-175-122

APPENDIX F-1

INSPECTION LOGS

DAILY INSPECTION LOG

Item	Types of Problems	OK	Other: Indicate Problems or Repairs and Date
Bulk tank liquid level indicator	Wire cable corroded, frayed. Sticking float or pulley. Note level (gallons).		
Recirculation pump	Seals leaking. Motor overload.		
Tank area containment trench	Debris. Liquid present.		
Rainwater release valve	Inoperable open (should be closed)		
Mixing pump	Fluid in exhaust air; oil reservoir empty; oil leaking.		
Mix tank	Sticking float; agitators stopped; recirculating lines plugged.		
Container area trench	Debris; liquid present; cracks.		
Truck loading area	Spill material.		
Empty drums	Out of stock, damage. Note: Approximate number on hand.		
Storage area roof	Corrosion, leaks, missing, or loose panels.		
Emergency shower	Leaking, low water pressure		
Security fence	Corrosion, damage to chainlink fabric, barbwire.		
Container storage placement	Wrong location or area, aisle space, stacking height		

DAILY INSPECTION LOG

Item	Types of Problems	OK	Other: Indicate Problems or Repairs and Date
Drum condition	Corrosion, leakage, open lids, labels missing or illegible*		
Pallets	Damage, weakness.		
Concrete pad	Cracks, wet spots, settling, debris.		
Warning signs	Damage, hanging improperly.		
Tank storage concrete curb	Cracks, deterioration		
Base, foundation	Cracks, wet spots, settling.		
Tank shell and walls	Corrosion, discoloration, cracks, buckles, bulges, rust spots, blisters.		
Tank supports	Corrosion, cracking, deterioration, damage.		
Pipes, valves, and fittings	Loss of metal thickness, leaks, bad seals, corrosion.		
Barrel dumpers	Oil reservoir filled, oil leaks, frayed or deteriorated hoses.		
General housekeeping	Debris		

* Labels to be inspected for date and content identification upon arrival.

SPECIAL INSPECTION LOG

Item	Types of Problems	Inspection Responsibility	Date of Late Inspection
Spill absorbents pads materials	 Damage Out of stock	 Environmental Engineering	
Fire extinguishers	Need charging	Plant Security	
Fire alarm	Malfunctions	Plant Security (ADT)	Performed daily
Waste tank (internal)	Weakness; corrosion, of metal thickness	Outside contractor	

APPENDIX F-2

TANK TRUCK UNLOADING PROCEDURE

TANK TRUCK UNLOADING PROCEDURE

1. Department supervision responsible for unloading into storage tanks, or their designated representative, shall see that the tank trailer is accurately spotted at the proper unloading location.

2. The tank trailer number is to be compared with the number designated on invoice shipping papers to verify contents of the trailer.

3. The inventory balance of the receiving storage tank is to be verified by a physical measurement of the tank to be filled. The quantity order for the tank is then to be compared with the shipper invoice, as well as the measured balance in the tank, to assure that the receiving tank will hold the delivered quantity.

4. Unloading of tank trailers will be done only during daylight hours. Exception will be made only under emergency conditions, and with the approval of supervision responsible for unloading.

5. Unloading operations shall be performed by personnel designated by supervision responsible for the receiving storage system. These personnel shall have previously received proper instruction in unloading procedures and are to be made responsible for careful compliance with applicable regulations.

6. After spotting the trailer, personnel designated as responsible for unloading operation will check that trailer brakes have been set. The driver shall remain in the area near the vehicle during the entire unloading procedure.

7. Caution signs or barricades shall be placed in appropriate locations in the vicinity of the tank trailer during unloading and until disconnected to give warning to approaching personnel and vehicles.

8. No exposed flame of any kind shall be allowed near the vicinity of the tank trailer being unloaded. Smoking is strictly forbidden also in this area.

9. The tank trailer shall be checked for double valve system on unloading line, or equivalent safety features, to protect against hose or line rupture during unloading.

10. Check storage tank for proper venting before unloading begins.

11. Locate connection line between trailer and receiving tank so that any leak or spill during unloading may be secured by either containment or prevalent spill cleanup procedures.

12. In case of any spill that could reach a storm drain or sanitary outlet, the personnel responsible for unloading are to take immediate containment or preventative measures. Also notification of a spill, in the sequence as described in the SPCC procedure, is to be carried out by the responsible personnel at the scene.

SECTION G

CONTINGENCY PLAN

The information contained herein is submitted in accordance with the requirements for a Contingency Plan, as contained in OAC 3745-50-44(A)(7) and 3745-54 50 through 56, 40 CFR 270.14 (b)(7), and Section 264 Subpart D.

G.1 GENERAL INFORMATION

Delco Products Dayton Operations of General Motors Corporation (formerly Inland Division) is primarily a manufacturer of plastic and rubber automotive components. The plant is located at 2701 Home Avenue, Dayton, Ohio 45417 (see Figure G-1). The plant product lines include steering wheels, motor and transmission mounts, automotive weatherstrips, brake hose, liteflex springs, and miscellaneous trim components.

The plant has a hazardous waste storage facility for the purpose of collection and staging of liquid wastes prior to disposal offsite. Hazardous liquids are stored in 55-gallon drums and in one 7,000-gallon bulk tank at the facility. The storage locations are shown in Figures G-2 and G-3. The hazards and approximate quantities of the various materials in storage are shown on Table G-1. Information on the exact amounts of wastes in storage can be obtained from the operating records of the facility.

This plan describes the actions to be taken by facility personnel in response to fires, explosions, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water from the waste storage and handling areas at Delco Products.

G.2 EMERGENCY COORDINATOR

In the event of an emergency situation at the facility, the discoverer is to notify the nearest plant security officer on duty or dial 5-8743 (Plant Security) to initiate chain of communication shown in Appendix G-1. The emergency coordinator shall be the highest ranking plant security officer on duty. The primary coordinator is Tom Liles, Security

Coordinator. His telephone number and other emergency coordinators and telephone numbers are listed in Table G-1. If the emergency involves a ~~release of~~ potential release of hazardous materials to the environment, the emergency coordinator will be aided by the Environmental Engineering personnel listed on Appendix G-1. The primary emergency coordinator and alternates have complete authority to commit all resources of the company in the event of an emergency.

G.3 IMPLEMENTATION OF THE CONTINGENCY PLAN

This plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents from the waste storage and handling areas at Delco Products that could threaten human health or safety or the environment.

Examples of such situations would be:

- Fires that are not controllable by hand-held extinguishers
- Fires that are in danger of spreading or causing explosion
- Spills in which a significant quantity of waste material has reached a sewer or public waterway or has the potential of causing soil contamination

G.4 EMERGENCY RESPONSE PROCEDURES

G.4.a Notification

Whenever there is an imminent or actual emergency situation, the emergency coordinator will immediately activate internal facility alarm systems (if not already done) and internal communication systems to notify facility personnel (see Table G-3 for communication equipment). Subsequently, appropriate fire and/or police departments, local, state, and federal agencies will be notified, followed by reports as necessary to GM central office.

G.4.b Identification of Hazardous Wastes

The emergency coordinator will immediately identify the character, source, amount, and areal extent of any release. THE CHARACTER AND SOURCE OF HAZARDOUS WASTE RELEASED DURING AN EMERGENCY WILL BE DETERMINED BY ITS LOCATION ALONG THE PATHWAY FROM GENERATION TO STORAGE. THE POTENTIAL AMOUNTS OF HAZARDOUS WASTE RELEASED VARY, DEPENDING ON THE SOURCE AND THE INVENTORY PRESENT AT THAT TIME. OBSERVATION, INSPECTION FORMS, AND MANIFESTS WOULD BE INCLUDED IN THE DETERMINATION OF THE AMOUNT OF HAZARDOUS WASTE RELEASED DURING AN EMERGENCY. THE AREAL EXTENT OF ANY SUCH RELEASE WOULD PRIMARILY BE ASSESSED BY VISUAL OBSERVATION; HOWEVER, SAMPLING AND ANALYSES WILL BE CONDUCTED IF NECESSARY TO DETERMINE THE EXTENT OF WASTE RELEASED TO GROUND AND SURFACE WATER AND SOIL. Waste Management and Environmental Engineering personnel will provide any necessary support in such a situation.

G.4.c Assessment

The coordinator will assess hazard, both direct and indirect, to human health or the environment FROM THE ONGOING EMERGENCY. THE ASSESSMENT EVALUATION WILL BEGIN BY IDENTIFYING THE SPECIFIC NATURE OF THE INCIDENT, THE SOURCE, TYPE AND VOLUME OF HAZARDOUS WASTE INVOLVED, THE AREAL EXTENT OF THE CONTAMINATION, THE TIME OF DAY, WEATHER CONDITIONS AND LOCATION OF THE EMERGENCY. BASED ON THESE ISSUES, AN ASSESSMENT OF THE EMERGENCY WILL BE CONDUCTED. THE ASSESSMENT WILL IDENTIFY EMERGENCY RESPONSE AGENCIES NEEDED.

THE DECISION TO SUMMON OUTSIDE EMERGENCY SERVICES WILL BE DECIDED ON A CASE-BY-CASE BASIS BY PERSONS TRAINED IN RESPONDING TO EMERGENCIES. AMONG OTHER THINGS, THEY WILL EVALUATE THEIR ONSITE RESOURCES (PERSONNEL, EQUIPMENT) AND THE MAGNITUDE OF

THE SITUATION. BASED ON THEIR EXPERT KNOWLEDGE AND TRAINING, THEY WILL MAKE THE DECISION.

WHENEVER THERE IS AN IMMINENT OR ACTUAL EMERGENCY SITUATION, THE COORDINATOR WILL CONTACT THE APPROPRIATE STATE OR LOCAL AGENCIES, WITH DESIGNATED RESPONSE ROLES IF THEIR HELP IS NEEDED. THIS NOTIFICATION ALSO INCLUDES OEPA EMERGENCY RESPONSE.

IF THE ASSESSMENT CONCLUDES THAT THERE IS A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT, THE COORDINATOR WILL ASSIST IN DETERMINING REMEDIAL MEASURES AND WILL FURTHER ASSESS WHETHER AN EVACUATION OF THE SITE IS ADVISABLE. THE FIRE CHIEF OR OTHER CITY OFFICIAL WILL ASSESS THE NEED FOR EVACUATION OF THE LOCAL AREA BASED ON INFORMATION PROVIDED BY THE COORDINATOR. THE COORDINATOR WILL ALSO CONTACT THE GOVERNMENT OFFICIAL DESIGNATED AS ON-SCENE COORDINATOR FOR THIS AREA AND THE NATIONAL RESPONSE CENTER IF THE MAGNITUDE OF THE INCIDENT WARRANTS IT. ~~If the assessment concludes there is a need for evacuation and notification of authorities, the Ohio EPA and National Response Center will be notified.~~

G.4.d Control Procedures

Potential accidents fall under three general classifications:

- Fire and/or explosions
- Spills or material release
- Surface water flooding

Flooding is unlikely at Dayton operations due to its position above the flood plain. Natural disasters and civil disturbances (such as strikes or bomb threats) are considered as to their affect on one of the first two categories. Figure G-4 summarizes the emergency plan of action.

Fire and/or Explosion

The storage tank and waste containers are easily accessible to emergency equipment by roads through the plant and by a blacktop road between the Hazardous Waste Management facility and the railroad tracks. The City of Dayton maintains two fire stations within a mile of Delco Products, Dayton operations.

Delco Products also maintains its own fire brigade during working hours. The primary duties of this group would be to prevent the spread of fire or material released prior to the arrival of the Dayton Fire Department. Equipment used for fire emergency and personal protective equipment are listed in Table G-3, and emergency equipment locations are shown in Figure G-3.

Additional measures that will be taken at the direction of the emergency coordinator will include, but not be limited to:

- Isolating the fire by closing fire doors or by removing nearby flammable materials and wastes where possible.
- Stopping work in nearby areas or operations that may affect the emergency situation.
- Keeping the area clear of personnel not actively involved in fighting the fire.
- Removing any injured personnel obtaining qualified medical treatment.

In the event hazardous waste has been released as a result of the fire, it and any water containing that waste must be recovered and stored in accordance with the following procedures, unless it can be demonstrated that the recovered waste is not hazardous.

Until such determination is made, or the released material is disposed of and clean-up is complete, no incompatible waste may be stored in the affected area.

Spills or Material Release

The Delco Products' Spill Prevention Control and Countermeasure Plan spells out procedures to be followed to control the accidental release of liquid materials and apply to other material releases, with additional precautions as necessary. Containment of the spill is the first priority. An in-plant spill control team is trained in the proper techniques to contain spilled or leaked material. A situation in which the Spill Team could not contain the liquid flow to the facility property would trigger the notification requirements in G.4.a above.

If the spilled material poses a fire or explosion risk, the emergency coordinator will assemble the in-plant fire brigade or notify the Dayton Fire Department as necessary and in accordance with the procedures related above.

In the event the leak is in the tank area, the mixing, transfer, and barrel dumping operations will be immediately shut down. The containment area around the tanks has the capacity to hold in excess of the tank's contents, allowing adequate time to provide for cleanup. A list of contractors capable of providing cleanup services is contained in the SPCC Plan, in case the cleanup is of such magnitude as to be beyond the capability of in-plant personnel.

If for some reason a spill occurs outside the containment area, normal containment procedures will apply (diking the flow of liquids with absorbant materials, etc.). Only those personnel directly involved in the emergency operation will be allowed in the hazard area. The evacuation routes from the waste management area are shown in Figure G-3.

In the unlikely event of formation of a toxic vapor cloud (as by outbreak of fire or reaction with surround materials), immediate notification will be given to the Dayton Fire and Police Departments to begin evacuation proceedings for nearby residents. Evacuation procedures for in-plant personnel are discussed in Section G.7 below.

If the control and cleanup of an accidental spill, release, or fire is within the capabilities of company personnel and local response teams, the Ohio EPA, Division of

Surveillance and National Response Center will not be notified unless one of the following occurs:

- A spill discharges to a sewer leading to Wolf Creek and/or the Great Miami River, and the quantity of hazardous material spilled is equal to or greater than the reportable quantity specified in 40 CFR Part 117.

- One thousand gallons or more of oil is spilled in a single event. If a lesser quantity is spilled but has entered a storm sewer, appropriate measures will be taken to intercept the spill at or prior to the outfall. Local and state authorities may be requested to assist in this effort. If the oil is discharged to a sanitary sewer, the City of Dayton Sewage Treatment Plant (225-5443) will be notified.

- The spill involves other hazardous materials not listed, but used at the plant, if they pose an actual or potential hazard to life or property.

It is Delco Products' policy to comply with regulations developed under the Comprehensive Environmental Liability and Compensation Act of 1980 (Superfund) which call for report of a spill of one pound or more of any hazardous material for which a reportable quantity has not been established, but which is listed under applicable environmental legislation. Since the entire waste management area and most surrounding land is paved, a large spill onto unprotected ground that may contaminate ground water is unlikely.

Other Emergency Situations

In the case of other emergency conditions, there is increased risk of fire, explosions, or material releases (i.e., bomb threats or civil disturbances). Plant security has determined precautions to be followed under those conditions to minimize such risk.

G.4.e Prevention of Recurrence or Spread of Fires, Explosions, or Releases

The emergency coordinator will take all reasonable measures necessary to prevent the occurrence, recurrence, or spread of fire, explosions, or release of other hazardous waste, including stopping operations, containing and collecting waste and isolating or removing containers.

The Hazardous Material Data Sheets, available in the plant for all hazardous materials in use, give specific information on precautionary measures to take.

G.4.f Storage and Treatment of Released Material

Immediately after an emergency, the emergency coordinator will provide for the treatment, storage, or disposal of recovered waste, contaminated water, and contaminated absorbant material or soil.

Any residue or contaminated material remaining after an emergency situation has been brought under control must be quickly, but carefully, cleaned up to prevent the recurrence or establishment of a new emergency situation. Ignitable spilled material is to be recovered with non-sparking equipment, such as brass or aluminum shovels and air-operated pumps. Place recovered material into clean, empty containers only, such as 55-gallon hazardous waste drums from stock of empties.

Absorbent materials that were used to dike spills are to be placed in clean, empty containers along with rags, etc., used to clean and decontaminate emergency equipment. THE WASTE WILL THEN BE CHARACTERIZED TO DETERMINE IF IT IS A HAZARDOUS WASTE. IF HAZARDOUS WASTE, THE ~~All~~ drums are then ~~to be~~ labeled and prepared for disposal FOLLOWING THE EXISTING ARRANGEMENTS FOR DISPOSAL OF HAZARDOUS WASTE TO ~~in~~ a secure offsite facility. NOTE THAT ALL DISPOSAL OPTIONS WILL ADHERE TO APPLICABLE LAND BAN REGULATIONS.

In certain situations, the clean-up of the facility may be contracted to an outside cleanup contractor.

G.4.g Incompatible Wastes

The emergency coordinator will ensure that no incompatible waste will be stored, treated, or disposed of in the AFFECTED area of the released waste until cleanup operations are complete, and that all emergency equipment is cleaned and/or replaced and fit for its intended use. THIS WILL BE CONDUCTED BY COMPARING THE RELEASED WASTES WITH THE WASTES STORED IN THE AREA EITHER BY LABELS ON THE CONTAINER, MSDS, ETC. OR CHEMICAL ANALYSES, IF NECESSARY. IF THE WASTE IS INCOMPATIBLE IT WILL BE PHYSICALLY SEPARATED WITHIN THE CONTAINER STORAGE UNIT (I.E., CONTAINMENT TRAYS, TEMPORARY BERMS) OR A SEPARATE TEMPORARY ACCUMULATION AREA WILL BE SET-UP AND OPERATED IN ACCORDANCE WITH OAC 3745-52-34.

If the emergency situation involved notification to the Regional Administrator and state or local authorities, those authorities will be subsequently notified that post-emergency maintenance is complete and operations will be resumed.

G.4.h Post-Emergency Equipment Maintenance

Any process equipment (pipes, valves, etc.) which has been contaminated in the fire, explosion, or release must be decontaminated prior to return to service. Should a fire, spill, or explosion cause operations to cease, the emergency coordinator shall monitor for leaks, pressure buildups, gas generation, or ruptures in pipes, valves, or process equipment to ensure that restart of operations does not result in another incident.

Reusable equipment, such as shovels, mops, pumps, pails, etc., is to be wiped clean of excess material with shop rags or paper towels and the rags containerized with the other dry materials. If necessary, rinse equipment with organic solvent to loosen sticky residue. Wash it with warm detergent solution and sanitize, rinse several times with tap water, and wipe dry.

If not decontaminated and characterized as hazardous waste, non-reusable equipment, such as brooms, will be disposed of offsite as a hazardous waste at a RCRA permitted facility. All protective clothing, gloves, etc. are disposable and are to be sealed in steel drums for disposal offsite in a suitable facility. Mop and broom heads may also be treated this way.

ALL RINSEATE GENERATED AS A RESULT OF DECONTAMINATION ACTIVITIES CONDUCTED ON POST-EMERGENCY EQUIPMENT WILL IMMEDIATELY BE COLLECTED INTO 55-GALLON STEEL DRUMS FROM STOCK EMPTIES (DOT APPROVED). IT WILL THEN BE TESTED TO SEE IF IT IS HAZARDOUS. IF THE RINSEATE IS DETERMINED TO BE HAZARDOUS, THEN IT WILL BE MANAGED AS HAZARDOUS WASTE ONSITE UNTIL IT CAN BE SHIPPED OFFSITE FOR DISPOSAL AT A RCRA PERMITTED FACILITY. IF THE RINSEATE IS DETERMINED NOT TO BE HAZARDOUS, THEN IT WILL BE MANAGED IN AN APPROPRIATE MANNER.

Respirators are to be cleaned and outfitted for reuse by an approved outside vendor or the manufacturer. (Respirators were originally purchased from Sheridan Safety Supply Company.)

SPCC sheds and Iso-spill cages are to be restocked with any disposable materials that have been used.

G.4.i Container Spills and Leakage

If a leaking container is discovered, the leak will be stopped, if possible, until the material can be transferred into a sound container. Any spilled material will be cleaned up by absorbing onto absorbant material and disposing, or by flushing with sufficient water into the containment system. If the source of the release is not known, the waste will be sampled and analyzed. Based on this analysis the waste will be properly disposed of, adhering to all applicable land ban regulations and using the existing disposal arrangements of hazardous waste to a secure offsite facility. The appropriate technique will depend on the nature and amount of material.

LIQUIDS WHICH HAVE ACCUMULATED IN THE SECONDARY CONTAINMENT STRUCTURE AS A RESULT OF A SPILLAGE AND/OR LEAKAGE FROM CONTAINERS IN THE HAZARDOUS WASTE STORAGE AREA WILL BE INVESTIGATED BY THE EMERGENCY COORDINATOR IMMEDIATELY AFTER THEIR DETECTION. AFTER THE EMERGENCY COORDINATOR ASSESSES THE SITUATION, THE LIQUIDS WILL BE REMOVED FROM THE SECONDARY CONTAINMENT STRUCTURE AND COLLECTED INTO 55-GALLON STEEL DRUMS (DOT APPROVED) WITHIN A REASONABLE RESPONSE TIME. THESE LIQUIDS WILL BE TESTED TO SEE IF THEY ARE HAZARDOUS. IF THE LIQUIDS ARE DETERMINED TO BE HAZARDOUS, THEN THEY WILL BE MANAGED AS HAZARDOUS WASTE ONSITE UNTIL THEY CAN BE SHIPPED OFFSITE FOR DISPOSAL AT A RCRA-PERMITTED FACILITY. IF THE LIQUIDS ARE DETERMINED NOT TO BE HAZARDOUS, THEN THEY WILL BE MANAGED IN AN APPROPRIATE MANNER.

G.4.j Tank Spills and Leakage

In the event of a leak developing a waste tank or the process piping, operations will be immediately shut down. If it is not possible to stop the leak by closing piping valves, etc., the tank would be drained into a suitable tank wagon.

If the waste is leaking too rapidly to allow securing a tank wagon, the clean waste drums on hand in the waste management area would be used. Disposal of spilled material in the containment system is covered above. Delco Products does not store wastes F020, F021, F022, F023, F026, or F027; therefore, the immediate removal of such wastes is not applicable.

G.5 EMERGENCY EQUIPMENT

A list of emergency equipment and locations is contained in Table G-3; this includes fire, personal protective, spill, and communication emergency equipment. Locations of emergency equipment in the hazardous waste management area are shown in Figure G-3.

G.6 COORDINATION AGREEMENTS

Copies of the Contingency Plan have been give to local, state, and federal agencies. An initial meeting and tour of the facility was held on February 11, 1981, with an official from OEPA, the Dayton Fire Chief, the Dayton Chief of Police, and the administrator of St. Elizabeth Hospital in Dayton, to familiarize them with the plan. Subsequent updates of the Contingency Plan have been sent to the following:

Mr. Tom Crepeau
Ohio Environmental Protection Agency
Program Planning and Management Section
Division of Solid and Hazardous Waste Management
P.O. Box 1049
Columbus, OH 43266-0149

Mr. Harold O'Connell
Division of Solid and Hazardous Waste Management
Ohio Environmental Protection Agency
Southwest District Office
~~7 East Fourth Street~~
40 SOUTH MAIN STREET
Dayton, OH 45402

Mr. Don Heller
U.S. EPA Region V
Waste Management Division
230 S. Dearborn Street
Chicago, IL 60604

Mr. Glenn Alexander, Fire Chief
Dayton Fire Department
300 N. Main Street
Dayton, OH 45402

Mr. James Makos, Administrator
St. Elizabeth Hospital
601 Miami Blvd., West
Dayton, OH 45406

Ms. Mary Trimmer
Assistant Vice President
Good Samaritan Hospital
2222 Philadelphia Drive
Dayton, OH 45406

Mr. Ken LeBlanc
Information Coordinator
Montgomery-Greene County
LERC
400 Miami Valley Tower
40 West Fourth Street
Dayton, OH 45402

Mr. James E. Newby
Director and Chief of Police
Dayton Police Department
335 W. Third Street
Dayton, OH 45402

G.7 EVACUATION PLAN

There are two systems of evacuation signals. FIRST, plant-wide evacuation of the manufacturing area, the office building, or both, can be signaled by alarm horns controlled from a key switch located in the main plant security post. IN THE EVENT THAT A

SPILL AND/OR LEAK INCIDENT WOULD OCCUR, THE AFFECTED PERSONNEL WOULD IMMEDIATELY CALL THE SECURITY POST FROM THE NEAREST PHONE. SECURITY WOULD THEN NOTIFY THE AREA(S) INVOLVED, SIGNAL THE EVACUATION ALARM, AND CALL FOR EMERGENCY ASSISTANCE. DEPENDING ON THE NATURE OF THE INCIDENT, SECURITY WOULD CONTACT THE SPILL TEAM, THE LOCAL FIRE DEPARTMENT, OR BOTH. A DIAGRAM OF THE AREA EVACUATION ALARM SYSTEM OPERATION IS ILLUSTRATED IN APPENDIX G-5.

SECOND, localized evacuation of areas near a fire would be signaled by audible alarms that are set off by each individual fire alarm box. A fire alarm box is located near the hazardous waste management area in Building 16 as shown in Figure G-3. THE ALARM SYSTEM OPERATION WILL BE TESTED ONCE A MONTH TO ASSURE PROPER FUNCTIONING.

Evacuation routes are posted in buildings that are usually occupied, and evacuation procedures are discussed twice yearly with employees as a safety procedure (Appendix G-2). Personnel who are not in an affected area will stay in their respective work areas until the evacuation signal is given. Supervisors in unaffected areas will remain with their personnel and be ready to evacuate and account for those under their supervision if necessary. The evacuation routes for the waste management area are shown in Figure G-3.

When the fire has been extinguished or the emergency remediated, and the safety of personnel is no longer endangered, the emergency coordinator and the supervisor of the firefighters will determine that the "all clean" signal may be given.

G.8 REQUIRED REPORTS

Any emergency event that occurs that could threaten human health or the environment will be reported in writing within 15 days to the EPA Regional Administrator and the Ohio EPA. A copy of the reporting form for such events is included in the Waste Handling Contingency Plan. An internal form for reporting spills, whether they endanger the environment or not, is also used (see Appendix G-3).

Any time the contingency plan is implemented, a note is made in the Waste Management Operating Record listing the time, date, and details of the incident. A notice of activation of the contingency plan form (Appendix G-4) is submitted to the Regional Administrator, U.S. EPA, and to the GM plant environmental and legal staff.

TABLE G-1

WASTES: HAZARDS AND QUANTITIES IN STORAGE

Waste	Primary Hazard	Secondary Hazards	Quantity Stored
Cement (adhesives) Cement and oil Cement and solvent	Ignitable Toxic	Contain chlorinated solvents--vapors are irritants to eyes and skin. Thermal decomposition may yield toxic vapors, including hydrochloric acid (HC1).	0-32 drums
Paints Paint sludge	Ignitable Toxic	Thermal decomposition could yield toxic fumes, including HC1 and traces of hydrocyanic acid (HCN).	0-56 drums
Paint and solvents	Ignitable Toxic	Thermal decomposition could yield toxic fumes, including carbon monoxide (CO).	Included with paints above
Wax and water Mold release	Ignitable	Thermal decomposition. Products would include CO.	0-16 Bulk tank
Polyol	Ignitable	Thermal decomposition. Products would include CO.	0-64 drums
Grinding sludge Oil sludge	Ignitable, may contain traces of lead or other metals	Contain various hydrocarbons that would yield CO upon burning.	0-16 Bulk tank
Solvex	Corrosive, contains phenol derivatives	Does not burn, but thermal decomposition could yield HC1.	0-4 drums
Isocyanates (TDI and MDI)	Reactive, toxic, very strong irritants. Exposure to vapors may cause permanent sensitization to respiratory illness.	Reacts with water, alcohols, alkalies, or amines to create gases that may cause closed containers to rupture violently. Thermal decomposition products include HCN.	0-32 drums

TABLE G-1 (Continued)

Waste	Primary Hazard	Secondary Hazards	Quantity Stored
Cleaning liquid	Ignitable	Thermal decomposition could yield HC1 and and phosgene gas.	0-12 drums
Polymer	Ignitable, contains lead, silver, and/or cadmium.	Thermal decomposition could yield HC1.	0-12 drums
Silicone	Ignitable	Thermal decomposition. Products include CO.	0-12 drums
Catalysts	Ignitable	Thermal decomposition. Products include CO and HC1.	0-4 drums
Neoprene solvent	Ignitable, contains xylene	Thermal decomposition. Products include CO.	Bulk tank
Chloroform, methyl chloroform	Toxic by inhalation.	Narcotic, causes cancer in mice.	0-40 drums
Fyrol-CEF (phosphate)	Ignitable	Thermal decomposition. Products include CO and HC1.	0-4 drums

TABLE G-2

EMERGENCY COORDINATORS

Telephone Numbers

Primary Coordinators

Tom Liles, Security Coordinator 8280 Clugh Road Cincinnati, Ohio 45244	Office: Home:	5-3448, 5-3315 (513) 474-0496

Alternate Coordinators (In the absence of the primary coordinator, the plant security supervisor on duty* (as listed below) shall be the emergency coordinator

1.	S.A. McDanel 7051 Forrest Brook Road Centerville, Ohio	Office: Home:	5-3448 (513) 433-4313
2.	D.L. Campbell 5339 Robinwood Avenue Dayton, Ohio	Office: Home:	5-3448 (513) 252-1767

*Or the on-call supervisor

City Emergency Response

Fire and ambulance	224-9241
Police	222-9511

TABLE G-3

EMERGENCY EQUIPMENT

Name	Location	Description/Use
EQUIPMENT FOR FIRE EMERGENCY		
(2) CO_2 extinguishers	1-Bldg. 16, east wall 1-Bldg. 16, west wall	Use for flammable liquids
H_2O extinguisher	Bldg. 16, east wall	Use for paper, wood, and trash
Dry chemical extinguisher	Bldg. 26, hazardous waste storage	Use for flammable liquid
Hydrant and hose	Bldg. 16, east wall	100 psi water
Hydrant and hose	Bldg. 16, south wall outside	100 psi water
Pull box #523	Bldg. 16	Notify authorities of fire
PERSONAL PROTECTIVE EQUIPMENT		
Scott air packs and spare tanks -1-box-20-2	Bish Avenue entrance Bldg. 20	Air-supplied breathing apparatus

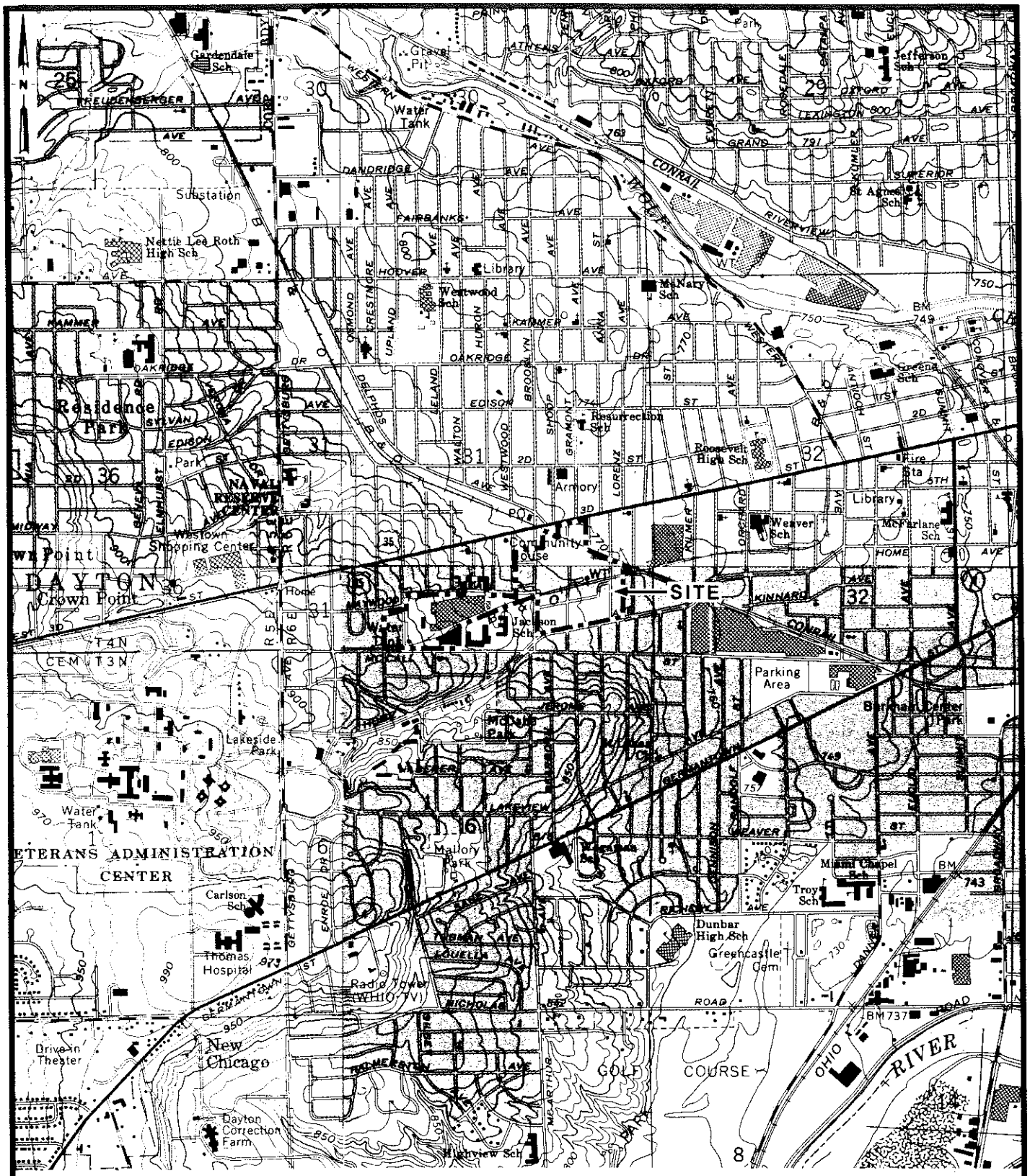
Note: Dust masks and cartridge filter respirators in normal use may **not** be satisfactory for emergency situations in oxygen-poor atmospheres.

EQUIPMENT FOR SPILL EMERGENCY		
SPCC shed: shovels picks	Bldg. 22, north wall	Dig trench
Absorbent material	Bldg. 22, north wall SPCC shed	Soak up spill and containment
Metal shoves, brass shovels, mops, 5-gallon pails, brooms, etc.	Iso-spill cage Bldg. 4	Clean up materials after spills
Empty 55-gallon steel drums	Salvage yard, Bldg. 19	Clean up liquid materials and spilled residue
Mobile spill cart	Bldg. 25	Mobile cleanup for spilled material

TABLE G-3 (Continued)

COMMUNICATION EQUIPMENT

Two-way radios	Carried by all plant security officers and		Used for communication between plant security maintenance foremen officers and plant security supervision, and communication between maintenance foremen and maintenance supervision. Maintenance radios will not monitor plant security radios and vice versa.
ADT	Connected to alarm		The alarm automatically boxes sends a message to ADTwho then transmits a series of coded tones back to Delco Products to alert plant security of which alarm box was activated.
Emergency telephone	Post 13	Dial 5-8743 Inland Avenue	



BASE MAP SOURCE: Compiled from the following USGS 7 1/2 minute topographic quadrangle maps: Dayton North, Ohio 1965, photorevised 1981; Dayton South, Ohio 1966, photorevised 1981; Miamisburg, Ohio 1965, photorevised 1987; Trotwood, Ohio 1965, photorevised 1982.

0 2000 4000

SCALE IN FEET

Quadrangle location

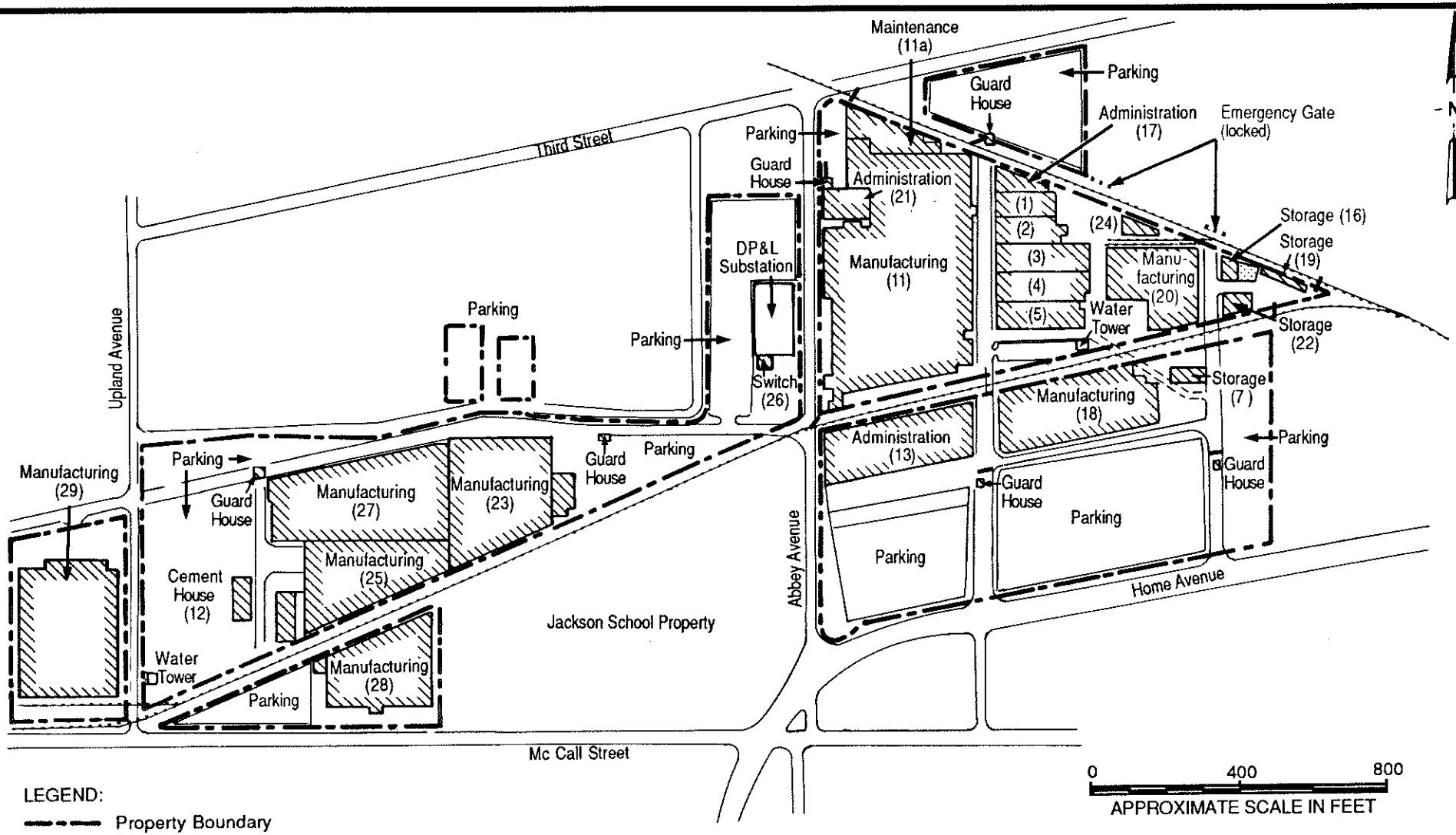
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE G-1

SITE VICINITY MAP

Dames & Moore
Job No. 299-175-122



LEGEND:

- Property Boundary
- (2) Building Designation
- Hazardous Waste Management Facility
- Railroad
- Electric Gate

NOTE: Entire perimeter is fenced except where a building wall provides a barrier.

BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1981.

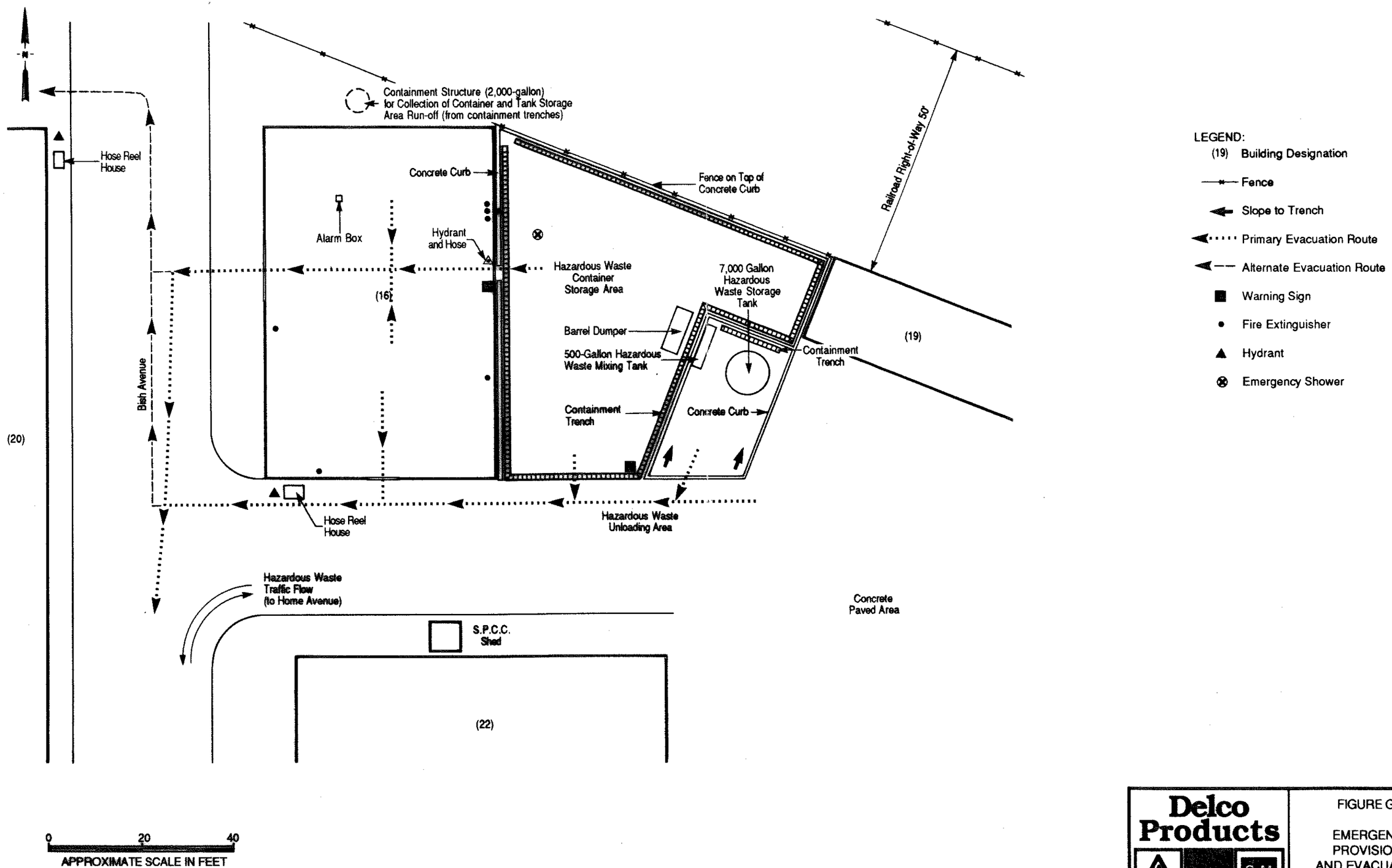
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE G-2

DAYTON OPERATIONS SECURITY PROVISIONS

Dames & Moore
Job No. 299-175-122



BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

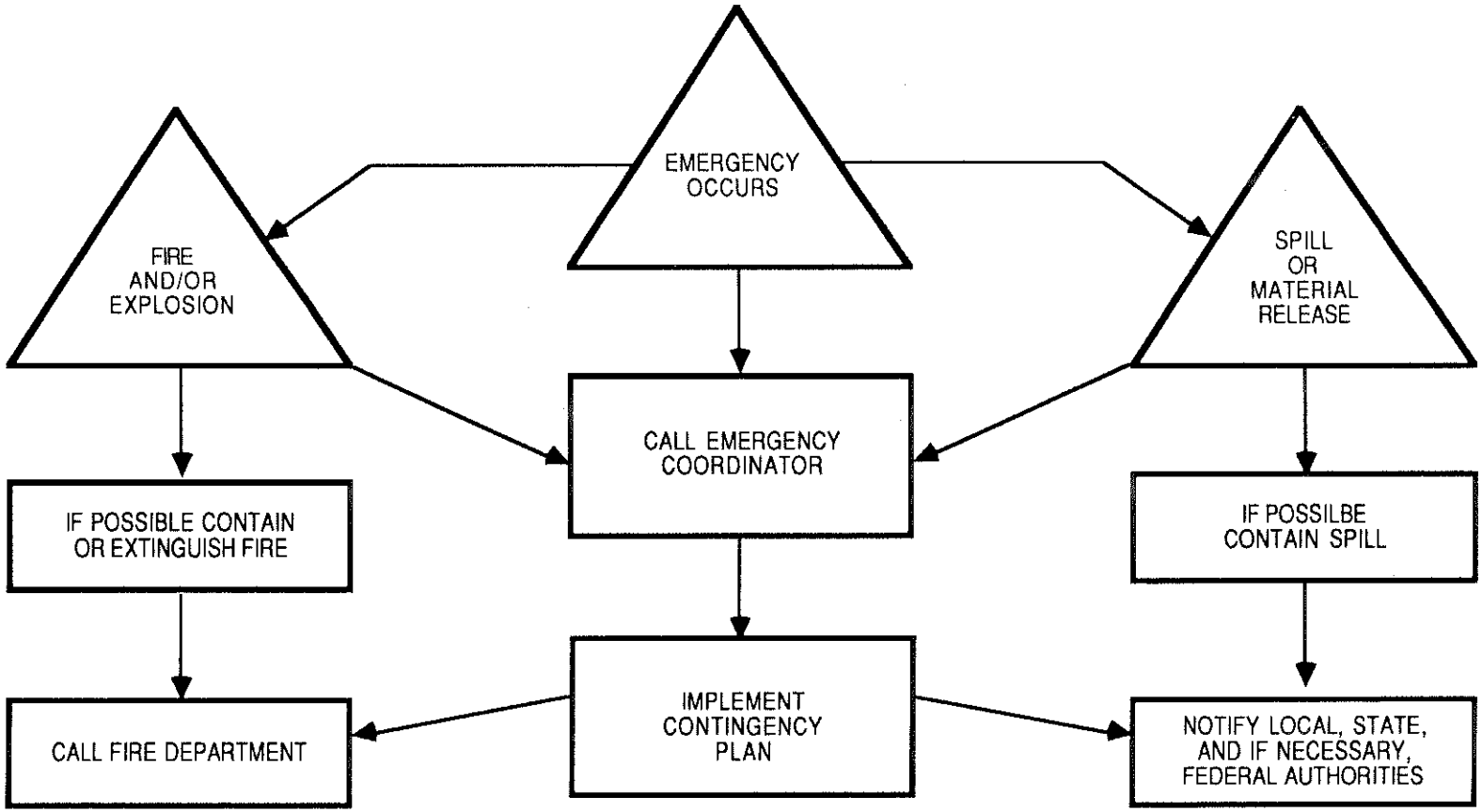
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE G-3

EMERGENCY PROVISIONS AND EVACUATION ROUTES

Dames & Moore
Job No. 299-175-122



Delco Products

General Motors Corporation
Dayton, Ohio

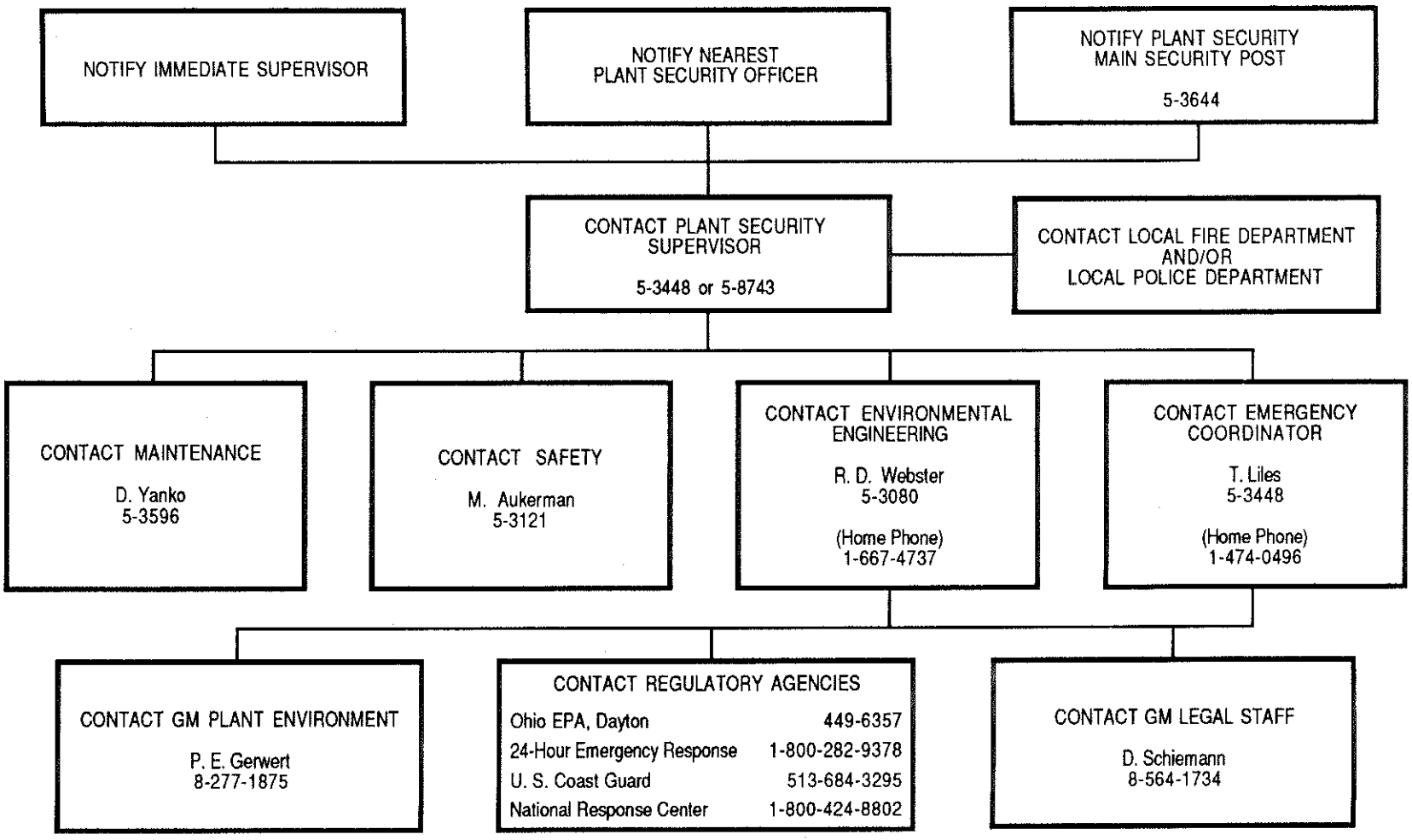
FIGURE G-4
EMERGENCY PLAN
OF ACTION

Dames & Moore
Job No. 299-175-122

APPENDIX G-1

DAYTON OPERATIONS HAZARDOUS WASTE FIRE/SPILL RESPONSE PLAN

DAYTON OPERATIONS
HAZARDOUS WASTE FIRE/SPILL RESPONSE PLAN



APPENDIX G-2

SAFETY CONTACT
SUPERVISOR'S GUIDELINE FOR EVACUATION PROCEDURE

SAFETY CONTACT

SUPERVISOR'S GUIDELINE FOR EVACUATION PROCEDURE

The following should be presented to and discussed with each employee at least twice each year as a safety contact.

1. Upon hearing evacuation signal, follow instructions as to shutdown of equipment, then proceed to leave the area by the predetermined route and exit. An alternate route and exit should also be discussed.

2. Maintain a distance of at least an arm's length behind the person ahead of you. On stairs keep two steps behind.

3. **DO NOT** run, climb over machinery or conveyors, or jump from docks or stairs.

4. Yelling, loud talk, or unnecessary noise will not be tolerated. Listen for and obey instructions from your foreman or leader.

5. When out of working area, remain with your group until told to re-enter area or disperse.

6. **DO NOT** attempt to take coat, purse, or other personal articles with you.

7. Report to your foreman any blocked aisles, stairs, or doors designated as exists.

8. A map or drawing showing all the emergency exists throughout the building should be reviewed should the employee be working in a different location other than the normal working area at the time of the emergency.

APPENDIX G-3

SAMPLE SPILL REPORT FORM

SAMPLE SPILL REPORT FORM
REPORT OF CHEMICAL SPILL

DATE OF SPILL:_____ PLANT:_____

TIME REPORTED:_____ BLDG.:_____

REPORTED BY:_____ DEPT.:_____

General nature, quantity and location of spill:_____

_____

_____

_____

Cause of spill:_____

_____

_____

_____

Did spill reach waterway? Yes____ No____
If "YES", description and location of spill:_____

_____

_____

_____

_____

Description of clean-up or containment measures implemented at spill site:_____

_____

_____

_____

_____

_____

PREPARED BY:_____

DATE:_____

APPENDIX G-4

NOTICE OF ACTIVATION OF CONTINGENCY PLAN

NOTICE OF ACTIVATION OF CONTINGENCY PLAN

To:

Regional Administrator
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

and

Chief, Waste Management Branch
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

From: _____
Name Address Telephone Number

Delco Products Dayton Operations, GMC; 2701 Home Avenue; Dayton, Ohio

_____
Date, time, and type of incident (e.g., fire, explosion, etc.)

_____
Name and quantity of material(s) involved]

_____
Extent of injuries (if any)

_____
Assessment of actual or potential hazards to human health or the environment (if applicable)

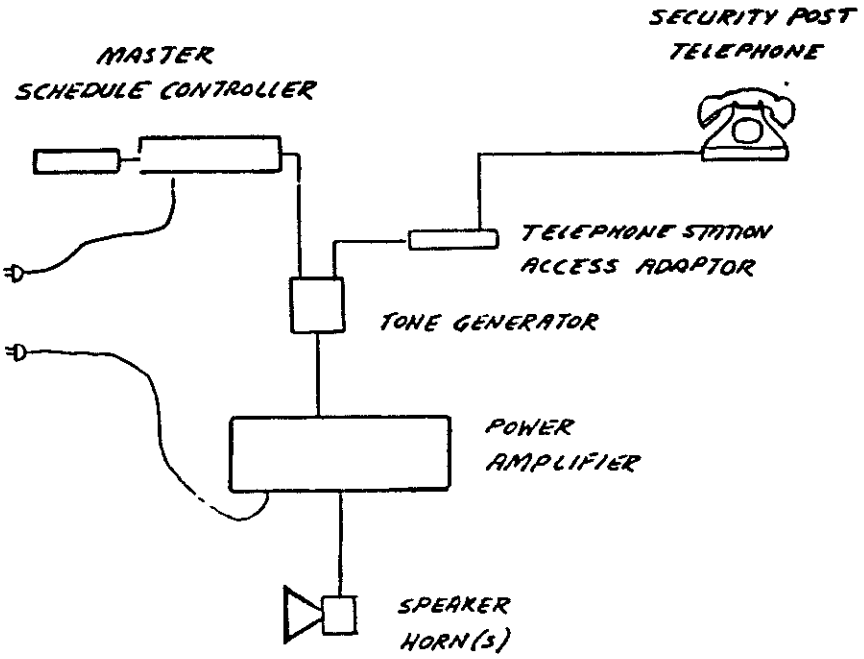
_____
Estimated quantity and disposition of material recovered from the incident

_____
State whether clean-up procedures are complete and emergency equipment is clean and fit for use. (The emergency coordinator is to ensure this prior to resumption of operations in the affected area. If cleanup is not complete, no waste that may be incompatible with the released material may be stored in the affected area.)

APPENDIX G-5

AREA EVACUATION ALARM SYSTEM OPERATION

DEPARTMENT EVENT SIGNALING AND
AREA EVACUATION ALARM SYSTEM



AREA EVACUATION ALARM SYSTEM OPERATION

INCIDENT ⇨ AFFECTED PERSONNEL — CALLS 5-3644 → SECURITY POST — DIALS → INVOLVED AREA'S SIGNAL EXTENSION NUMBER

EVACUATION ALARM — REPORTS SITUATION

HEARS..... ALERT TONE
HANGS UP.. PHONE
CALLS..... EMERGENCY ASSISTANCE

PROBLEM — HANDLES

Delco Chassis

RECEIVED
SEP 27 1994
OFFICE OF RCRA
WASTE MANAGEMENT DIVISION
EPA, REGION V

Delco Chassis Division
General Motors Corporation
2000 Forrer Boulevard
Post Office Box 1042
Dayton, Ohio 45401-1042

Area Code 513 455-5000

August 25, 1994

United States Environmental Protection Agency
Region 5
RCRA Activities
Waste Management Division
230 South Dearbon St.
Chicago, Illinois 60604

Subject: Revised Contingency Plan
OHD 000817023 (Home Avenue Facility)
OHD 052151701 (Vandalia Facility)

Dear Sir,

Enclosed Please find a copy of our revised contingency plan. Please include these plans with our RCRA part A (Home Avenue) and part B (Vandalia) application and discard the old copy in your file. Should you have questions please contact Richard D. Webster 513-455-8446 or Gail Spears 513-455-3801.

Thank you for your help.

Sincerely,

Richard D. Webster
Environmental Engineering

cc: OEPA
enclosures

Delco Chassis

Delco Chassis Division
General Motors Corporation
2000 Forrer Boulevard
Post Office Box 1042
Dayton, Ohio 45401-1042

Area Code 513 455-5000

August 25, 1994

Mr. James Newby
Director and Chief of Police
City of Dayton Police Department
335 West Third Street
Dayton, Ohio 45402

Subject: Revised contingency plan

Dear Director Newby,

The Federal Resource Conservation and Recovery Act and the U. S. Environmental Protection Agency (EPA) regulations impose certain obligations on "existing hazardous waste management (HWM) facilities; OHD 000817023 (Home Avenue Facility),OHD 052151701 (Vandalia Facility)." State of Ohio regulations may be found in OAC 3745-65-53(A)(B). The Delco Chassis Home Avenue/Vandalia facilities come within this definition, and we would appreciate receiving your cooperation in our efforts to comply with the applicable requirements.

One of the federal requirements is that a contingency plan for HWM facilities be prepared and copies of the plan be:

> "Submitted to all local police departments, fire departments hospitals, and state and local emergency response teams that may be called upon to provide emergency services."

Since your department may be called upon to provide services in the event of an emergency regarding our HWM facilities, we are attaching a copy of the revised contingency plan for our facilities. Please discard any old copies of the plan you may have in your files and replace with a new copy.

Thank you for your help on this matter. Should you have any question please call Gail Spears on 455-3801.

Sincerely,

Richard D. Webster
Environmental Engineering

cc: Ohio EPA
US EPA
Enclosure

DELCO CHASSIS' CONTINGENCY PLAN AND EMERGENCY PROCEDURES

FOR

WASTE STORAGE AND HANDLING AREAS
HOME AVENUE AND VANDALIA PLANTS

DELCO CHASSIS DIVISION
General Motors Corporation

January 26, 1981

Revised February 12, 1981
Revised September 20, 1982
Revised January 3, 1983
Revised June 30, 1983
Revised June 30, 1987
Revised October 30, 1987
Revised July 18, 1988
Revised July 12, 1991
Revised October 28, 1991
Revised June 1,1992
Revised June 24,1993
Revised August 5, 1993
Revised August 15, 1994

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DELCO CHASSIS' CONTINGENCY PLAN AND EMERGENCY PROCEDURES

FOR

WASTE STORAGE AND HANDLING AREAS
HOME AVENUE AND VANDALIA PLANTS

i. Introduction

The Delco Chassis Division of General Motors Corporation is primarily a manufacturer of plastic and rubber automotive components. It consists of two plants, one in Dayton at 2701 Home Avenue, 45417, and one in Vandalia at 480 N. Dixie Highway, 45377. The Home Avenue plant product lines include motor and transmission mounts, liteflex springs, and miscellaneous trim components. The Vandalia product lines include ball joints, brake linings and brake hose assemblies.

Each plant has a hazardous waste storage facility for the purpose of collection and staging of liquid wastes prior to disposal off-site. Hazardous liquids are stored in 55 gallon drums and in one 7,000 gallon bulk tank (currently unused for hazardous waste) at the Home Avenue facility. Storage at the Vandalia plant is limited to drum storage only. The storage locations are shown on the maps at the end of this plan. The hazards and approximate quantities of the various materials in storage are shown on the following charts. Information on the exact amounts of wastes in storage can be obtained from the operating records of the facility.

IV. Emergency Coordinator

A. Fire Emergency - In the event of a fire or explosion in the hazardous waste storage or handling area, the Plant Security supervisor will be notified. He will immediately assess the situation to determine what actions to take. These actions may include calling local fire or police for assistance, evacuation of personnel, and any other measures necessary to minimize the immediate hazards. He must also notify the emergency coordinator, Environmental Control, and Safety as soon as possible.

B. Spill Emergency - In the event of a spill emergency in the hazardous waste storage or handling area, the Plant Security supervisor will be notified. He will immediately assess the situation to determine what actions to take, including those actions required by law, listed in Section VI. Additional actions are discussed in Delco Chassis' Spill Prevention Control and Countermeasure Plan. He must also notify the emergency coordinator and Environmental Control immediately.

V. Immediate Action

A. Fire/Emergency - The person discovering the situation must immediately notify Plant Security by informing the nearest Plant Security Officer who will relay the information by radio to the Plant Security Supervisor, or by calling the dispatcher on 5-8743 at Home Avenue or 356-2500 at Vandalia. The Plant Security Officer on the scene will initiate actions to minimize the immediate hazard, by use of fire extinguishing and/or spill containment equipment and alerting personnel in the immediate area.

B. Identification of Hazardous Material(s) - When the Plant Security Supervisor arrives on the scene, he must determine the type and amount of material involved. This determination can be made by direct observation, by review of available records or if necessary, the identity of material can be determined by chemical or physical analysis.

V. C. (Continued)

Direct Effects	Indirect Effects	Possible Actions
	Can release effect other material on Haz. Waste Dock?	Remove currently unaffected Materials if risk to personnel is low.
Are vapors/fumes/ smoke from fire, explosion, or release rising up in a cone or plume?		Evacuate immediate plant area, notify fire dept. and local authorities of situation.
	Are vapors/fumes/ smoke from event toxic or unknown or irritating and drifting off Delco property in low hanging clouds?	Initiate plant evacuation and recommend possible evacuation of local areas to appropriate local authorities.

Note: If emergency Coordinator determines that the plant has had an event which could threaten human health or the environment beyond Delco's property, then he must: Recommend evacuation of local areas to local authorities and notify Delco Chassis Environmental Engineer who will notify Ohio EPA emergency response team by telephone at 24 hour number 1-800-282-9378 with following:

Name and phone number of caller

Name and address of plant

Time and type of incident

Name and Quantity of materials involved to the extent known

The extent of injuries to persons, if any

Possible hazards to human health, or to the environment inside and outside the plant

completed.

F. Before resuming operations on the Hazardous Waste Dock, notify local fire department and Ohio EPA, Dayton (513/285-6357) that facility is in compliance with Sections VI. C. and E. above.

VII. Equipment for Home Avenue Fire Emergency

Name	Location	Description/Use
(2) CO_2 Extinguishers	1-Bldg. 16, East Wall 1-Bldg. 16, West Wall	Use for flammable liquids
Water Extinguisher	Bldg. 16, East Wall	Use for paper, wood, and trash
Dry Chemical Extinguisher	Bldg. 16, Hazardous Waste Storage	Use for flammable liquid
Hydrant and Hose	Bldg. 16, East Wall	100 psi water
Hydrant and Hose	Bldg. 16, South Wall outside	100 psi water
Pull Box #523	Bldg. 16	Notify authorities of fire

VIII. Personal Protective Equipment - Home Avenue

Name	Location	Description/Use
Scott and Draeger Air Packs and Spare Tanks -1-Box-20-2	Bish Ave. Entrance Building 20	Air-supplied breathing apparatus

Note: Dust masks and cartridge filter respirators in normal use may not be satisfactory for emergency situations in oxygen-poor atmospheres.

IX. Equipment for Home Avenue Spill Emergency

Name	Location	Description/Use
SPCC Shed: Shovels Picks	Bldg. 22, North Wall	Dig trench
Absorbent Material	Bldg. 22, North Wall	Soak up spill and Containment
Empty 55 gallon Steel Drums	Salvage Yard Building 19	Clean-up liquid materials and spilled residue

XII. Equipment for Vandalia Spill Emergency

Name	Location	Description/Use
SPCC Shed: Shovels picks	West of Salvage Bldg.	Dig trench, soak up spill and containment
Absorbent Materials		
Absorbent booms	At reservoir outlet to North Creek	Prevent spread of floating materials to creek
Brass shovels, mops, 5-gallon pails, brooms, etc.	Chemical Spill Response Cage Bldg. 48	Clean-up materials after spill
Wilden Air Pump	Maintenance Dept. Bldg. 35	Pump flammable and other liquids
Empty 55-gallon steel drums	Concrete pad between Bldg. 31 and Bldg. 48	Clean-up liquid materials and residue
Mobile Spill Cart	Bldg. 31 Column FF29	Spill clean-up equipment and personal protective equipment
Overpack Drums	Bldg. 40	Containment for leaking drums
Flexible Rubber pads for plugging grates/manholes	Spill sheds by Bldg. 35 (Maintenance) & W. Salvage Bldg.	Seal off storm drains, or manholes

XV. Plant Evacuation Plan

In addition to the evacuation routes from the Hazardous Waste areas (see included diagrams), if the emergency coordinator determines that a fire or spill of hazardous waste poses an immediate threat to persons near the incident, he may order evacuation of all plant areas necessary to protect human health and safety. The emergency coordinator will direct the dispatcher or will himself announce over the public address systems that the evacuation plan is to be carried out immediately and will specify what routes or areas to avoid. Public address system is only located in Vandalia plants.

XVI. Clean-Up and Disposal of Residue from Emergency

Any residue or contaminated material remaining after an emergency situation has been brought under control must be quickly, but carefully cleaned up to prevent the recurrence or establishment of a new emergency situation. Ignitable spilled material is to be recovered with non-sparking equipment, such as brass or aluminum shovels and air-operated pumps. Place recovered material into clean, empty containers only, such as 55-gallon hazardous waste drums from stock of empties.

Absorbent materials that were used to dike spills are to be placed in clean, empty containers along with rags, etc., used to clean and decontaminate emergency equipment. all drums are then to be labeled and prepared for disposal in a secure off-site facility.

In certain situations, the clean-up of the facility may be contracted to one of the clean-up contractors listed in the SPCC Plan, Section IX.

Arrangements for removal of all recovered waste (including contaminated soil or surface water) resulting from an emergency must be made within 24 hours from time emergency has ended, as determined by the emergency coordinator.

XVII. Decontamination of Process Equipment

Any process equipment (pipes, valves, etc.,) which has been contaminated in the fire, explosion, or release must be decontaminated prior to return to service and resumption of operations. Should a fire, spill, or explosion cause operations to cease, the Emergency Coordinator shall monitor for leaks, pressure buildups, gas generation, or ruptures in pipes, valves, or process equipment to insure that restart of operations does not result in another incident.

XVIII. Decontamination of Emergency Equipment

Reusable equipment such as shovels, mops, pumps, pails, etc., is to be wiped clean of excess material with shop rags or paper towels and the rags containerized with the other dry materials. If necessary, rinse equipment with organic solvent to loosen sticky residue. Wash

NOTICE OF ACTIVIATION OF CONTINGENCY PLAN

TO:

Regional Administrator
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

and

, Chief
Waste Management Branch
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

FROM: _____

Name Address Telephone Number

Delco Chassis, GMC; 2701 Home Avenue; Dayton, Ohio

_____

_____

Date, time, and type of incident (e.g., fire, explosion, etc.)

_____

Name and quantity of material(s) involved

_____

Extent of injuries (if any)

_____

Assessment of actual or potential hazards to human health or the environment (if applicable)

_____

Estimated quantity and disposition of material recovered from the incident

_____

State whether clean-up procedures are complete and emergency equipment is clean and fit for use. (The Emergency Coordinator is to ensure this prior to resumption of operations in the affected area. If clean-up is not complete, no waste that may be incompatible with the released material may be stored in the affected area.)

III. City Emergency Response

A. Dayton

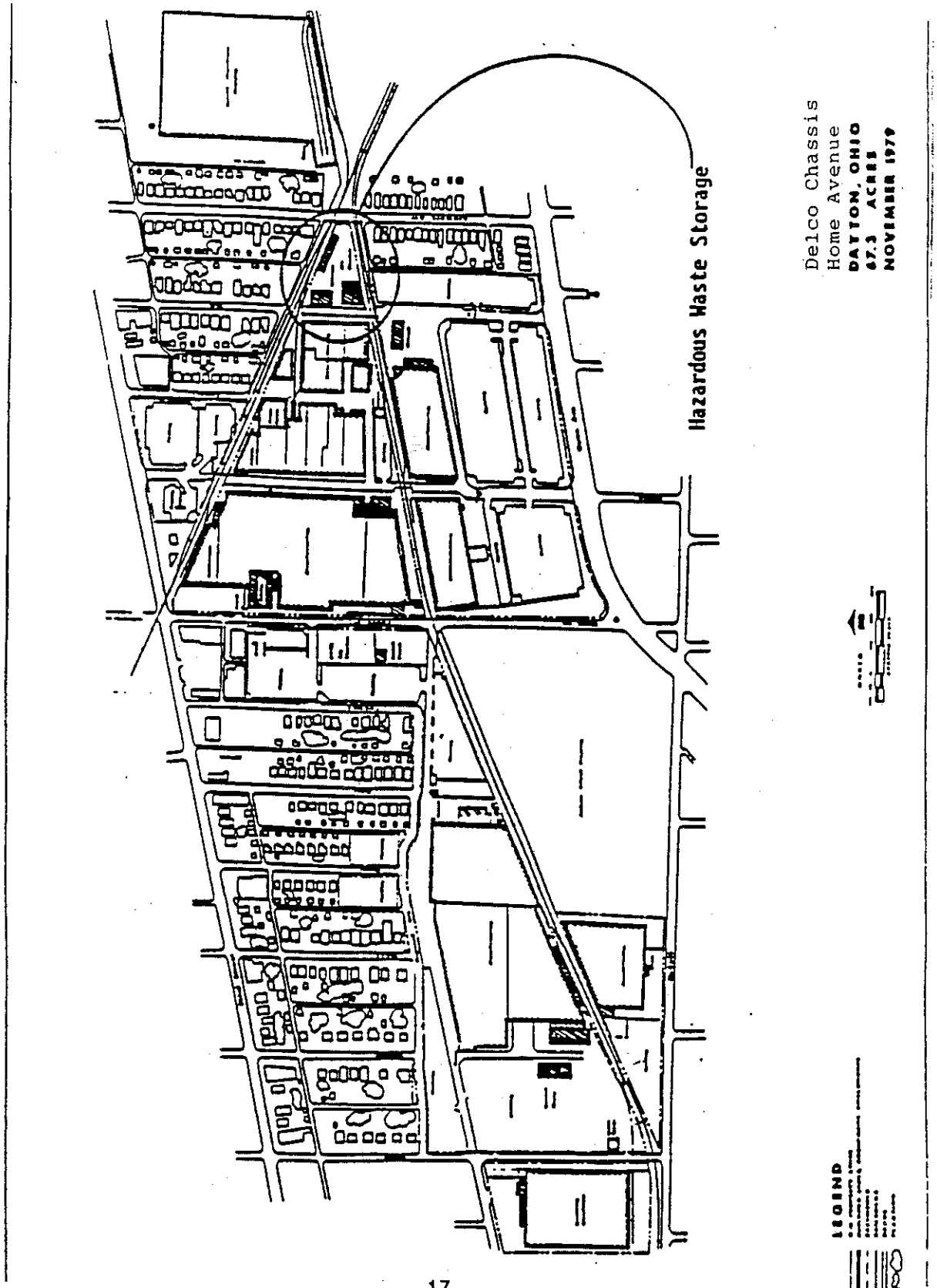
Fire and Ambulance	224-9241
Police	222-9511

B. Vandalia

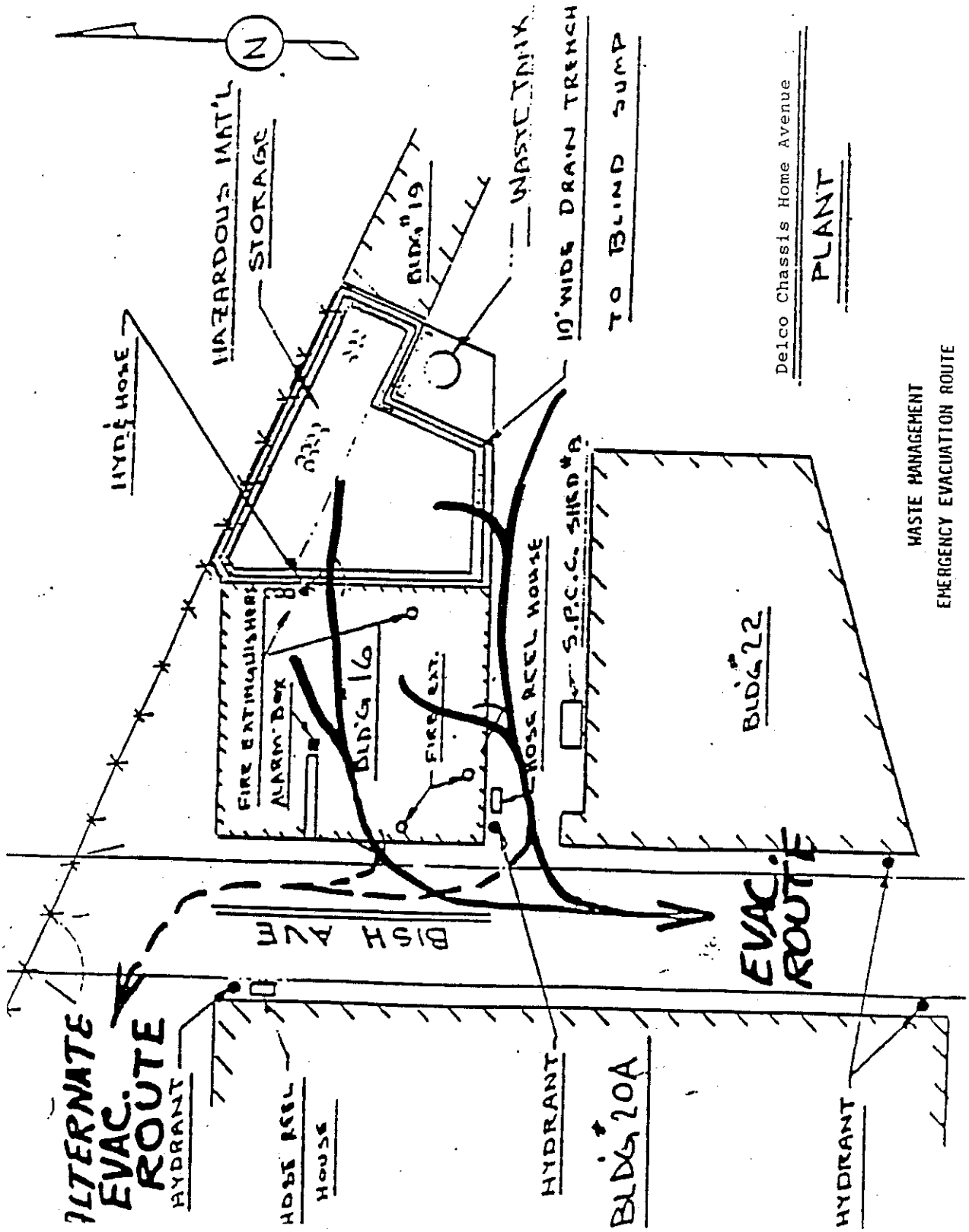
Fire and Ambulance	898-4993
Police	898-5868

*or the on-call supervisor

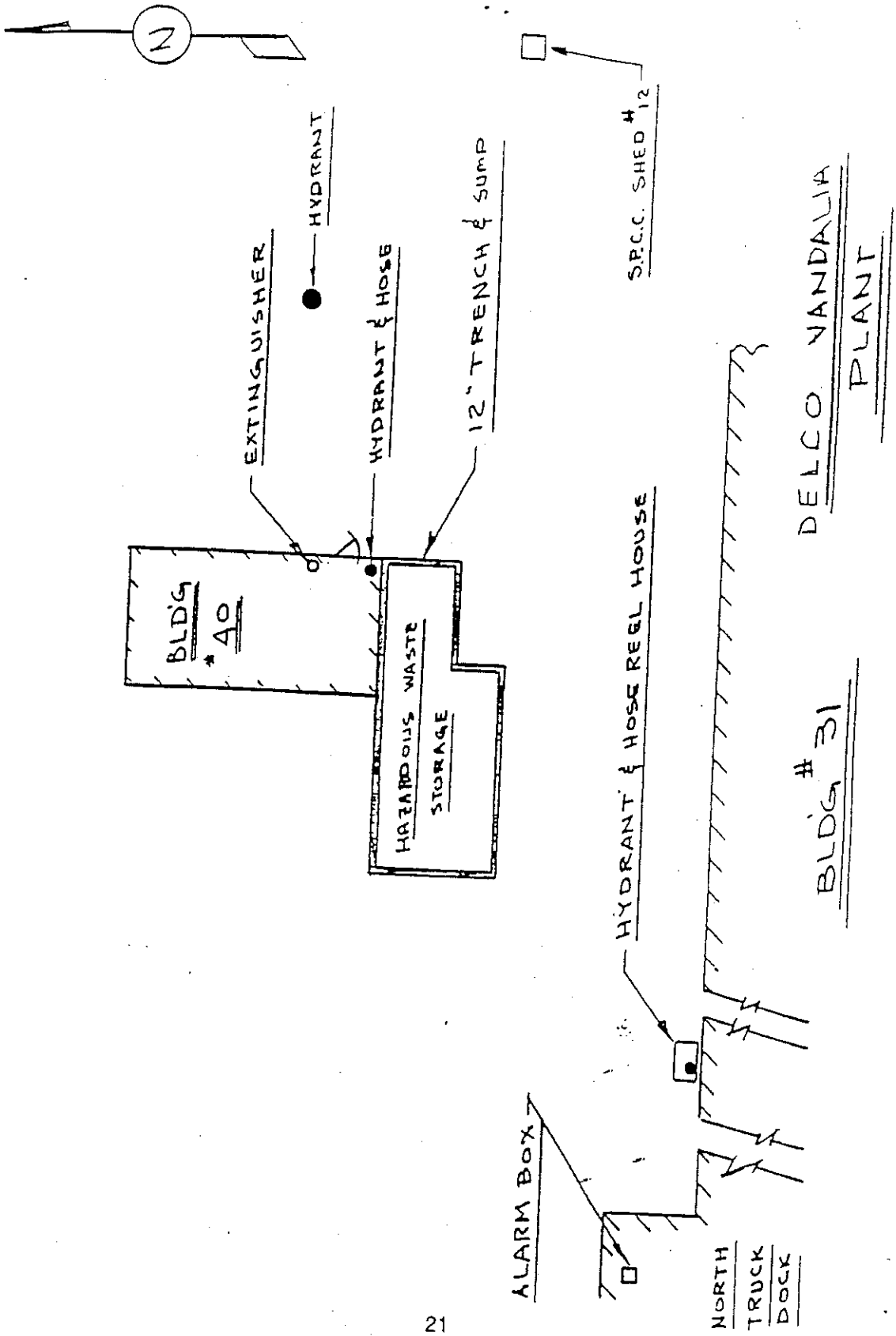
DELCO CHASSIS HOME AVENUE SITE PLAN



DELCO CHASSIS HOME AVENUE WASTE MANAGEMENT EMERGENCY EVACUATION ROUTE



DELCO CHASSIS VANDALIA HAZARDOUS WASTE SITE LAYOUT



WASTES: HAZARDS AND QUANTITIES IN STORAGE

WASTE	PRIMARY HAZARD	SECONDARY HAZARDS	DAYTON	VANDALIA
Isocyanates	Reactive, toxic, very strong irritants. Exposure to vapors may cause permanent sensitization to respiratory illness.	Reacts with water, alcohols, or amines to create gases that may cause closed containers to rupture violently. Thermal decomposition products include HCN.	0	0-10 drums
Cleaning Liquid	Ignitable	Thermal decomposition could yield ACl and phosgene gas.	0-5 drums	0-5 drums
Brake Resins	Ignitable, contains phenols	Evaporation or decomposition could yield hazardous fumes	0	0-32 drums
Catalysts	Ignitable	Thermal decomposition. Products	0-4 drums	0-4 drums
Caustics	Chemical burns	Vapors are irritants to eyes and skin	0-40 drums	0-25 drums

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DELCO CHASSIS' CONTINGENCY PLAN AND EMERGENCY PROCEDURES

FOR

WASTE STORAGE AND HANDLING AREAS
HOME AVENUE AND VANDALIA PLANTS

i. Introduction

The Delco Chassis Division of General Motors Corporation is primarily a manufacturer of plastic and rubber automotive components. It consists of two plants, one in Dayton at 2701 Home Avenue, 45417, and one in Vandalia at 480 N. Dixie Highway, 45377. The Home Avenue plant product lines include motor and transmission mounts, liteflex springs, and miscellaneous trim components. The Vandalia product lines include ball joints, brake linings and brake hose assemblies.

Each plant has a hazardous waste storage facility for the purpose of collection and staging of liquid wastes prior to disposal off-site. Hazardous liquids are stored in 55 gallon drums and in one 7,000 gallon bulk tank (currently unused for hazardous waste) at the Home Avenue facility. Storage at the Vandalia plant is limited to drum storage only. The storage locations are shown on the maps at the end of this plan. The hazards and approximate quantities of the various materials in storage are shown on the following charts. Information on the exact amounts of wastes in storage can be obtained from the operating records of the facility.

DELCO CHASSIS' CONTINGENCY PLAN AND EMERGENCY PROCEDURES

FOR

WASTE STORAGE AND HANDLING AREAS

HOME AVENUE AND VANDALIA PLANTS

I. Description

This plan describes the actions to be taken by facility personnel in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water from the waste storage and handling areas at Delco Chassis.

II. Implementation

This plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents from the waste storage and handling areas at Delco which could threaten human health or safety or the environment.

Examples of such situations would be:

A. Fires that are not controllable by hand held extinguishers, or

B. Fires that are in danger of spreading or causing explosion, or

C. Spills in which a significant quantity of waste material has reached a sewer or public waterway or has the potential of causing soil contamination.

III. Emergency Communication

In the event of a fire, explosion, or spill of hazardous waste, the person who discovers it should immediately notify the nearest Plant Security officer on duty, or dial 5-8831 at Home Avenue plants or 356-2500 at Vandalia plants. This will initiate the chain of communication shown on the page entitled, "Hazardous Waste Fire-Spill Response Plan".

The person who discovers the emergency should include all information about the situation including type and quantity of material involved, exact location of the incident, and the apparent extent of danger to persons, property, or buildings when notifying plant security or supervision.

IV. Emergency Coordinator

A. Fire Emergency - In the event of a fire or explosion in the hazardous waste storage or handling area, the Plant Security supervisor will be notified. He will immediately assess the situation to determine what actions to take. These actions may include calling local fire or police for assistance, evacuation of personnel, and any other measures necessary to minimize the immediate hazards. He must also notify the emergency coordinator, Environmental Control, and Safety as soon as possible.

B. Spill Emergency - In the event of a spill emergency in the hazardous waste storage or handling area, the Plant Security supervisor will be notified. He will immediately assess the situation to determine what actions to take, including those actions required by law, listed in Section VI. Additional actions are discussed in Delco Chassis' Spill Prevention Control and Countermeasure Plan. He must also notify the emergency coordinator and Environmental Control immediately.

V. Immediate Action

A. Fire/Emergency - The person discovering the situation must immediately notify Plant Security by informing the nearest Plant Security Officer who will relay the information by radio to the Plant Security Supervisor, or by calling the dispatcher on 5-8743 at Home Avenue or 356-2500 at Vandalia. The Plant Security Officer on the scene will initiate actions to minimize the immediate hazard, by use of fire extinguishing and/or spill containment equipment and alerting personnel in the immediate area.

B. Identification of Hazardous Material(s) - When the Plant Security Supervisor arrives on the scene, he must determine the type and amount of material involved. This determination can be made by direct observation, by review of available records or if necessary, the identity of material can be determined by chemical or physical analysis.

C. For an emergency (fire, spill, leakage, or explosion) on Hazardous Waste dock, the emergency coordinator will consider the following direct and indirect effects of emergency and determine possible actions as listed:

Direct Effects	Indirect Effects	Possible Actions
		(Note - Possible Actions are listed to stimulate thought process and not all possible actions are listed. Other actions may be taken as deemed appropriate for situation.)
Is release confined to Haz. W. dock?		Activate Chem. Response Team and/or clean-up contractor.
Has release entered Haz. W. Dock Drain or Sump?		Contact clean-up contractor.
	Is release spreading towards storm drains?	Plug drains
	Did release enter storm drains? Did it leave Delco property?	Contain release, contact clean-up Contractor. Must notify authorities if release not confined to Delco.

V. C. (Continued)

Direct Effects	Indirect Effects	Possible Actions
	Can release effect other material on Haz. Waste Dock?	Remove currently unaffected Materials if risk to personnel is low.
Are vapors/fumes/ smoke from fire, explosion, or release rising up in a cone or plume?		Evacuate immediate plant area, notify fire dept. and local authorities of situation.
	Are vapors/fumes/ smoke from event toxic or unknown or irritating and drifting off Delco property in low hanging clouds?	Initiate plant evacuation and recommend possible evacuation of local areas to appropriate local authorities.

Note: If emergency Coordinator determines that the plant has had an event which could threaten human health or the environment beyond Delco's property, then he must: Recommend evacuation of local areas to local authorities and notify Delco Chassis Environmental Engineer who will notify Ohio EPA emergency response team by telephone at 24 hour number 1-800-282-9378 with following:

Name and phone number of caller

Name and address of plant

Time and type of incident

Name and Quantity of materials involved to the extent known

The extent of injuries to persons, if any

Possible hazards to human health, or to the environment inside and outside the plant

V. C. (continued)

Direct Effects	Indirect Effects	Possible Actions
Is water or chemical runoff from fire fighting being contained within Haz. W. Dock drain and sump?		Activate Chemical Response Team and/ or clean-up contractor.
	Is water or chemical runoff from fire fighting spreading towards storm drains?	Plug drains.
	Has water or chemicals from fire fighting spread to non-Delco property"	Contain Material, contact clean-up contractor. Must notify authorities if material not confined to Delco.

VI. Required Actions

A. Measures that must be taken by law are: Temporarily stop all deliveries of additional Hazardous Waste to the Hazardous Waste Dock until the released waste has been contained and residues from fires or spills collected.

B. Transfer any leaking 55 gallon drums to secure over-pack drums, then seal.

C. Emergency Equipment listed in this procedure must be cleaned and made ready for its intended use (or replaced) before Hazardous Waste Dock operations are resumed if equipment has been used in a clean-up operation.

D. Arrangements for removal of all recovered waste (including contaminated soil or surface water) resulting from an emergency must be made within 24 hours from time emergency has ended as determined by the emergency coordinator and Environmental Engineer.

E. Consider whether or not to remove or isolate currently unaffected containers to a temporary location (that will have to be specifically prepared for such a purpose). Also consider whether or not the released material is incompatible with other materials stored on Hazardous Waste Dock. If such wastes are incompatible with released waste, then they must be removed from Hazardous Waste Dock, but not disposed of until cleanup of the affected area is

completed.

F. Before resuming operations on the Hazardous Waste Dock, notify local fire department and Ohio EPA, Dayton (513/285-6357) that facility is in compliance with Sections VI. C. and E. above.

VII. Equipment for Home Avenue Fire Emergency

Name	Location	Description/Use
(2) CO_2 Extinguishers	1-Bldg. 16, East Wall 1-Bldg. 16, West Wall	Use for flammable liquids
Water Extinguisher	Bldg. 16, East Wall	Use for paper, wood, and trash
Dry Chemical Extinguisher	Bldg. 16, Hazardous Waste Storage	Use for flammable liquid
Hydrant and Hose	Bldg. 16, East Wall	100 psi water
Hydrant and Hose	Bldg. 16, South Wall outside	100 psi water
Pull Box #523	Bldg. 16	Notify authorities of fire

VIII. Personal Protective Equipment - Home Avenue

Name	Location	Description/Use
Scott and Draeger Air Packs and Spare Tanks -1-Box-20-2	Bish Ave. Entrance Building 20	Air-supplied breathing apparatus

Note: Dust masks and cartridge filter respirators in normal use may not be satisfactory for emergency situations in oxygen-poor atmospheres.

IX. Equipment for Home Avenue Spill Emergency

Name	Location	Description/Use
SPCC Shed: Shovels Picks	Bldg. 22, North Wall	Dig trench
Absorbent Material	Bldg. 22, North Wall	Soak up spill and Containment
Empty 55 gallon Steel Drums	Salvage Yard Building 19	Clean-up liquid materials and spilled residue

Name	Location	Description/Use
Mobile Spill Cart	Bldg. 18	Mobile clean-up for spilled material

X. Equipment for Vandalia Fire Emergency

Name	Location	Description/Use
CO_2 Extinguisher	Bldg. 40, East Wall	Use for flammable solvents
Hydrant and Hose	Over reservoir	100 psi water
Hydrant and Hose	Bldg. 31, North	100 psi water
Pull Box	Bldg. 31, dock	Notify authorities of fire
In Plant Fire truck pumper	Bldg. 31 Dock Truck garage	Water at 120 psi/w foaming capabilities 250 amp pump
Mobile spill cart	Bldg. 31	Mobile clean-up for spilled material

XI. Personal Protective Equipment - Vandalia

Name	Location	Description/Use
Disposable clothing Rubber boots Vinyl gloves Face Shields Scott & Draeger air packs	Chemical spill Response Cart Building 31	Prevent personal contact

NOTE: Dust masks and cartridge filter respirators in normal use may not be satisfactory for emergency situations in oxygen-poor atmospheres.

XII. Equipment for Vandalia Spill Emergency

Name	Location	Description/Use
SPCC Shed: Shovels picks	West of Salvage Bldg.	Dig trench, soak up spill and containment
Absorbent Materials		
Absorbent booms	At reservoir outlet to North Creek	Prevent spread of floating materials to creek
Brass shovels, mops, 5-gallon pails, brooms, etc.	Chemical Spill Response Cage Bldg. 48	Clean-up materials after spill
Wilden Air Pump	Maintenance Dept. Bldg. 35	Pump flammable and other liquids
Empty 55-gallon steel drums	Concrete pad between Bldg. 31 and Bldg. 48	Clean-up liquid materials and residue
Mobile Spill Cart	Bldg. 31 Column FF29	Spill clean-up equipment and personal protective equipment
Overpack Drums	Bldg. 40	Containment for leaking drums
Flexible Rubber pads for plugging grates/manholes	Spill sheds by Bldg. 35 (Maintenance) & W. Salvage Bldg.	Seal off storm drains, or manholes

XIII. Communication Equipment for Vandalia

Name	Location	Description/Use
Two-Way Radios	Carried by all Plant Security officers and maintenance personnel	Used for communication between Plant Security officers, supervisors, and dispatcher. Maintenance radio available at Post 1 for communication between Maintenance and Security if needed.
Plant Autocall System	Connected to sprinkler system	The alarm sends a series of coded tones to main guard booth who then alerts Plant Security personnel and indicates which sprinkler or alarm box was activated.
Alarm Boxes	Bldg. 31, inside	Will active auto-call system described above.
Emergency Telephone	Post 5, IFG Bldg. 48C	Dial 356-2500

XIV. Communication Equipment for Home Avenue

Name	Location	Description/Use
Two-Way Radios	Carried by all Plant Security officers, Maintenance Foreman, and Spill Team Supervision.	Used for communication between Plant Security officers, and communication between Maintenance Foremen and Maintenance supervision. Maintenance radios will not monitor Plant Security radios and vice versa.
ADT	Connected to alarm boxes	The alarm automatically sends a message to ADT who then calls Delco to verify alarm. The guard booth would then transmit a series of coded tones depending on the emergency.
Emergency telephone	Plant Security Post 27 Halloway ST.	Dial 5-8831

XV. Plant Evacuation Plan

In addition to the evacuation routes from the Hazardous Waste areas (see included diagrams), if the emergency coordinator determines that a fire or spill of hazardous waste poses an immediate threat to persons near the incident, he may order evacuation of all plant areas necessary to protect human health and safety. The emergency coordinator will direct the dispatcher or will himself announce over the public address systems that the evacuation plan is to be carried out immediately and will specify what routes or areas to avoid. Public address system is only located in Vandalia plants.

XVI. Clean-Up and Disposal of Residue from Emergency

Any residue or contaminated material remaining after an emergency situation has been brought under control must be quickly, but carefully cleaned up to prevent the recurrence or establishment of a new emergency situation. Ignitable spilled material is to be recovered with non-sparking equipment, such as brass or aluminum shovels and air-operated pumps. Place recovered material into clean, empty containers only, such as 55-gallon hazardous waste drums from stock of empties.

Absorbent materials that were used to dike spills are to be placed in clean, empty containers along with rags, etc., used to clean and decontaminate emergency equipment. all drums are then to be labeled and prepared for disposal in a secure off-site facility.

In certain situations, the clean-up of the facility may be contracted to one of the clean-up contractors listed in the SPCC Plan, Section IX.

Arrangements for removal of all recovered waste (including contaminated soil or surface water) resulting from an emergency must be made within 24 hours from time emergency has ended, as determined by the emergency coordinator.

XVII. Decontamination of Process Equipment

Any process equipment (pipes, valves, etc.,) which has been contaminated in the fire, explosion, or release must be decontaminated prior to return to service and resumption of operations. Should a fire, spill, or explosion cause operations to cease, the Emergency Coordinator shall monitor for leaks, pressure buildups, gas generation, or ruptures in pipes, valves, or process equipment to insure that restart of operations does not result in another incident.

XVIII. Decontamination of Emergency Equipment

Reusable equipment such as shovels, mops, pumps, pails, etc., is to be wiped clean of excess material with shop rags or paper towels and the rags containerized with the other dry materials. If necessary, rinse equipment with organic solvent to loosen sticky residue. Wash

it with warm detergent solution and sanitizer, rinse several times with tap water and wipe dry.

All protective clothing, gloves, etc., are disposable and are to sealed in steel drums for disposal offsite in a suitable facility. Mop and broom heads may also be treated this way.

Respirators are to be cleaned and outfitted for reuse by an approved outside vendor or the manufacturer. (Respirators were originally purchased from Sheridan Safety Supply Co.)

Restock SPCC sheds and spill cages with any disposable materials that have been used.

XIX. Reporting and Notification Requirements

Any time the contingency plan is implemented, note in the Waste Management Operating Record the time, date, and details of the incident. Complete the form at the end of this plan and submit it to the Regional Administrator, U.S. EPA, and to the GM Plant Environmental and Legal
Staffs, within 15 days after the incident.

NOTICE OF ACTIVIATION OF CONTINGENCY PLAN

TO:

Regional Administrator
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

and

, Chief
Waste Management Branch
U.S. EPA, Region V
111 West Jackson Boulevard
Chicago, Illinois 60604

FROM: _____

Name Address Telephone Number

Delco Chassis, GMC; 2701 Home Avenue; Dayton, Ohio

_____

_____

Date, time, and type of incident (e.g., fire, explosion, etc.)

_____

Name and quantity of material(s) involved

_____

Extent of injuries (if any)

_____

Assessment of actual or potential hazards to human health or the environment (if applicable)

_____

Estimated quantity and disposition of material recovered from the incident

_____

State whether clean-up procedures are complete and emergency equipment is clean and fit for use. (The Emergency Coordinator is to ensure this prior to resumption of operations in the affected area. If clean-up is not complete, no waste that may be incompatible with the released material may be stored in the affected area.)

EMERGENCY COORDINATORS

Telephone Numbers

I. Primary Coordinators

A. Home Avenue Operations

Sue McDaniel, Security Coordinator

Office: 5-3448, 5-3315; Pager: 9-220-7784 (Digital)

Home: 513-433-4313

B. Vandalia Operations

D. L. Campbell Capt. - Security Coordinator

Office: 5-8122; Pager: 9-220-7741 (Digital)

Home: 513-252-1767

II. Alternate Coordinators: In the absence of the primary coordinator, the Plant Security supervisor on duty* (as listed below) shall be the emergency coordinator.

A. Home Avenue

	Office	Home
1. D. L. Campbell	5-3448	252-1767

B. Vandalia Plant

	Office	Home
1. Lenard Webb	5-8122 5-8411	9-268-7914

III. City Emergency Response

A. Dayton

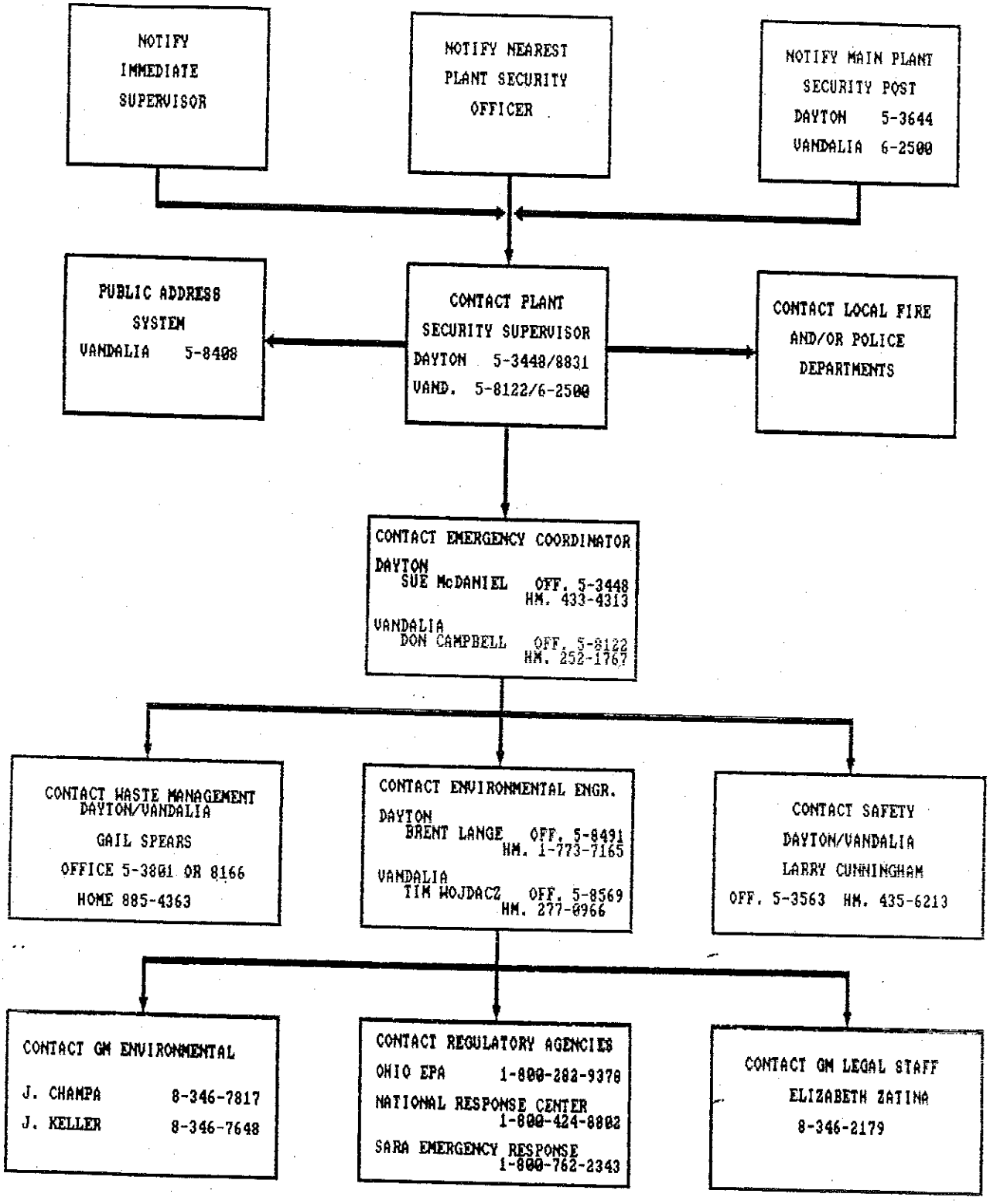
Fire and Ambulance	224-9241
Police	222-9511

B. Vandalia

Fire and Ambulance	898-4993
Police	898-5868

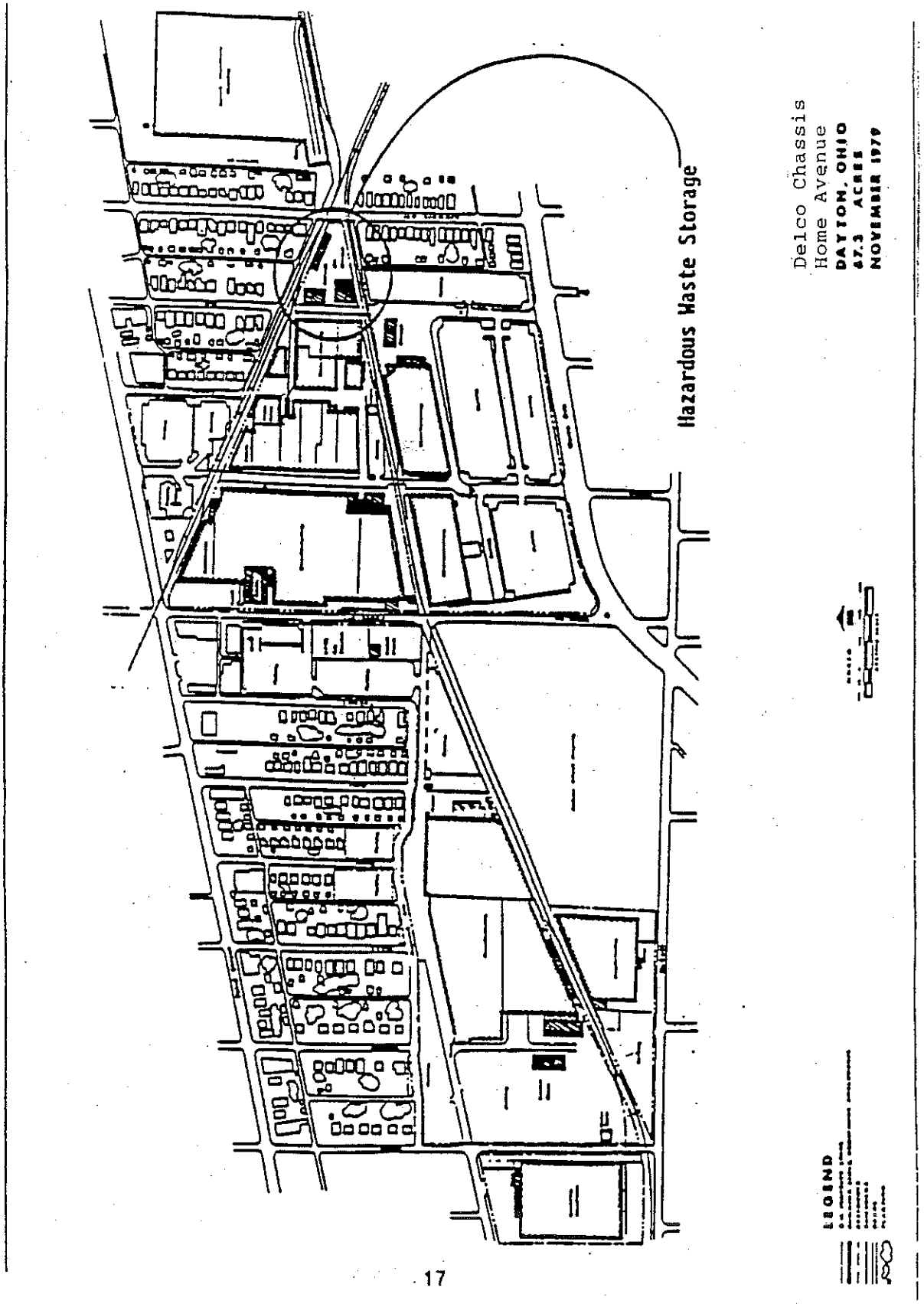
*or the on-call supervisor

HAZARDOUS WASTE FIRE/SPILL RESPONSE PLAN FLOW CHART

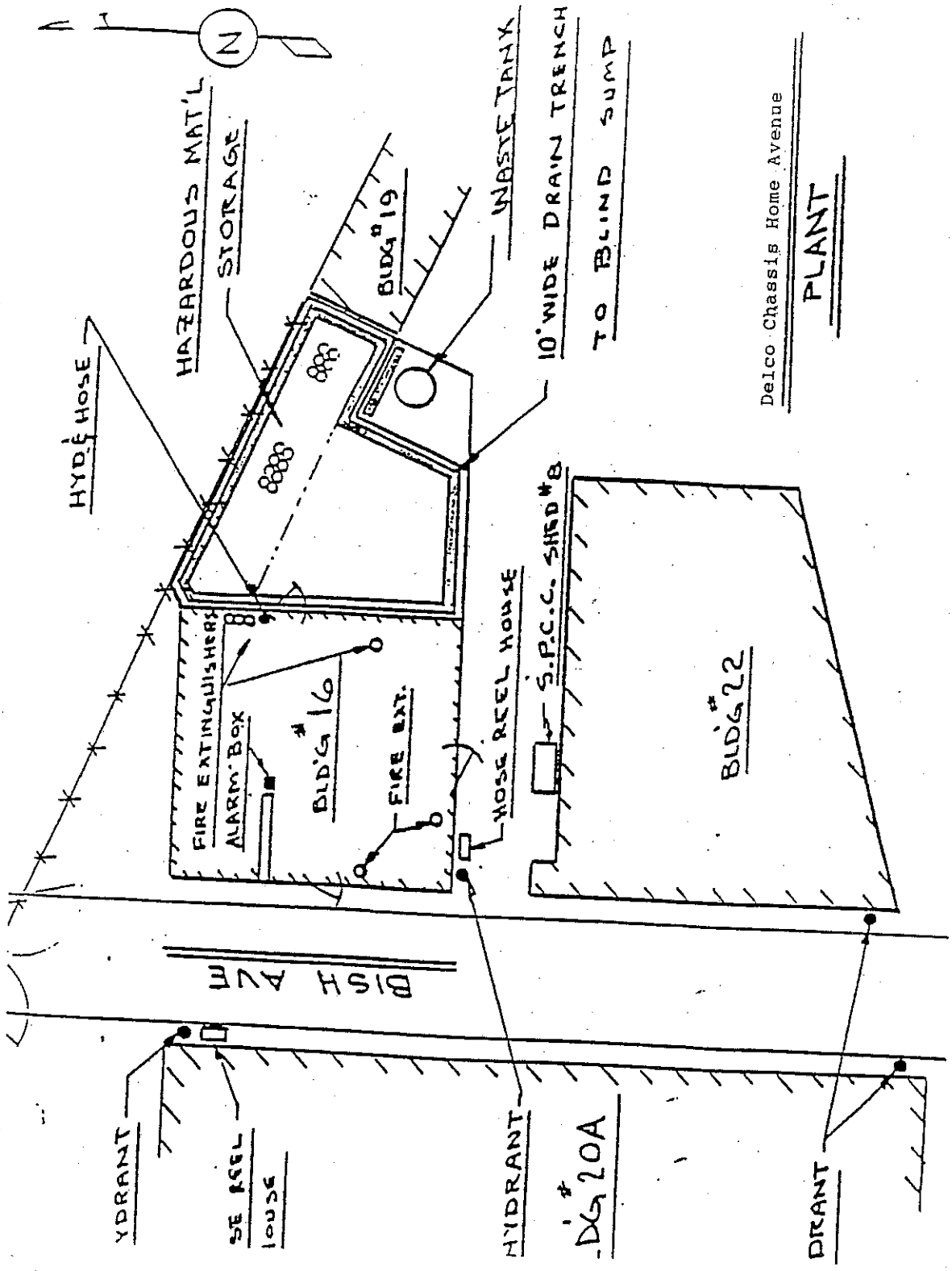


AUGUST 15, 1994

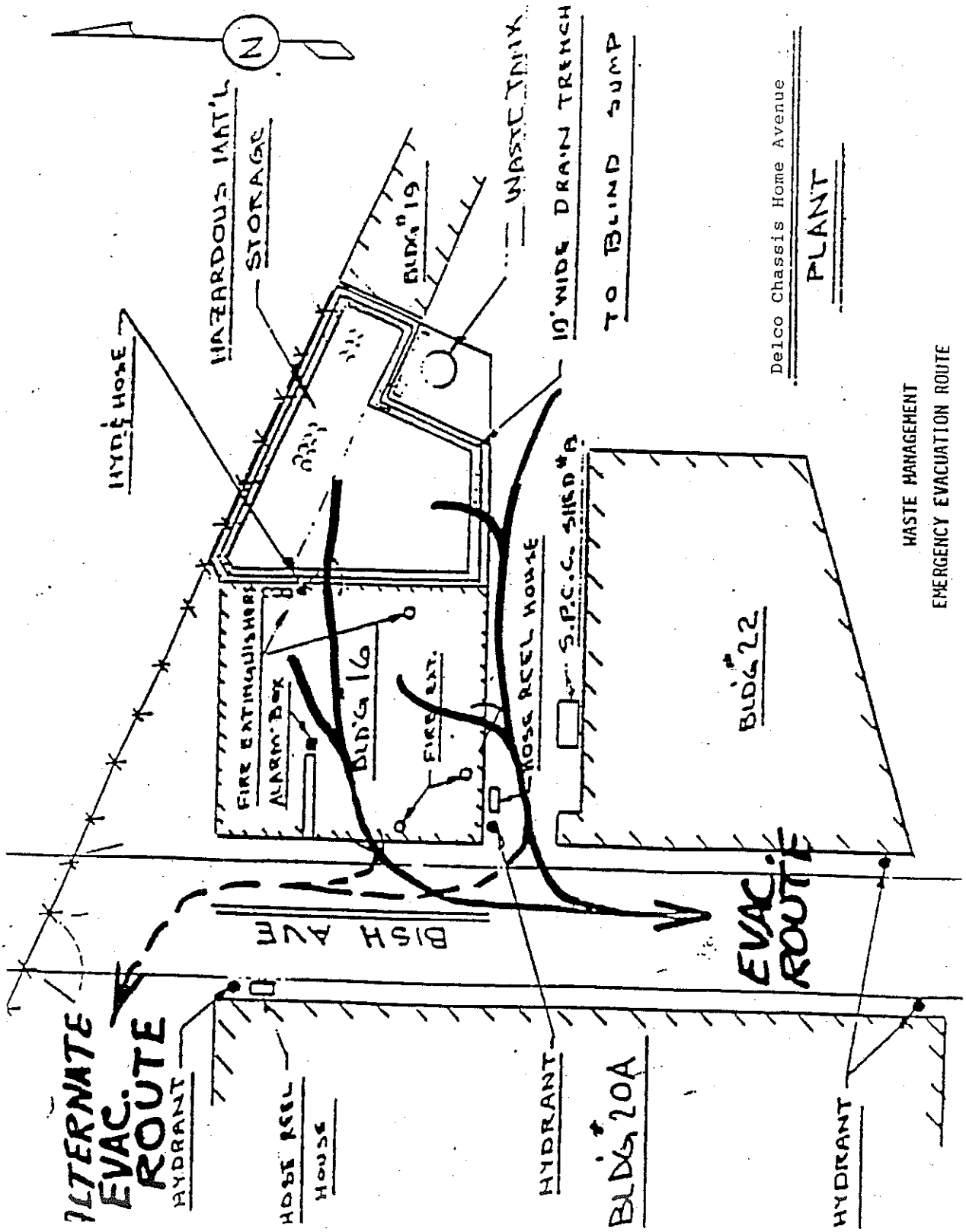
DELCO CHASSIS HOME AVENUE SITE PLAN



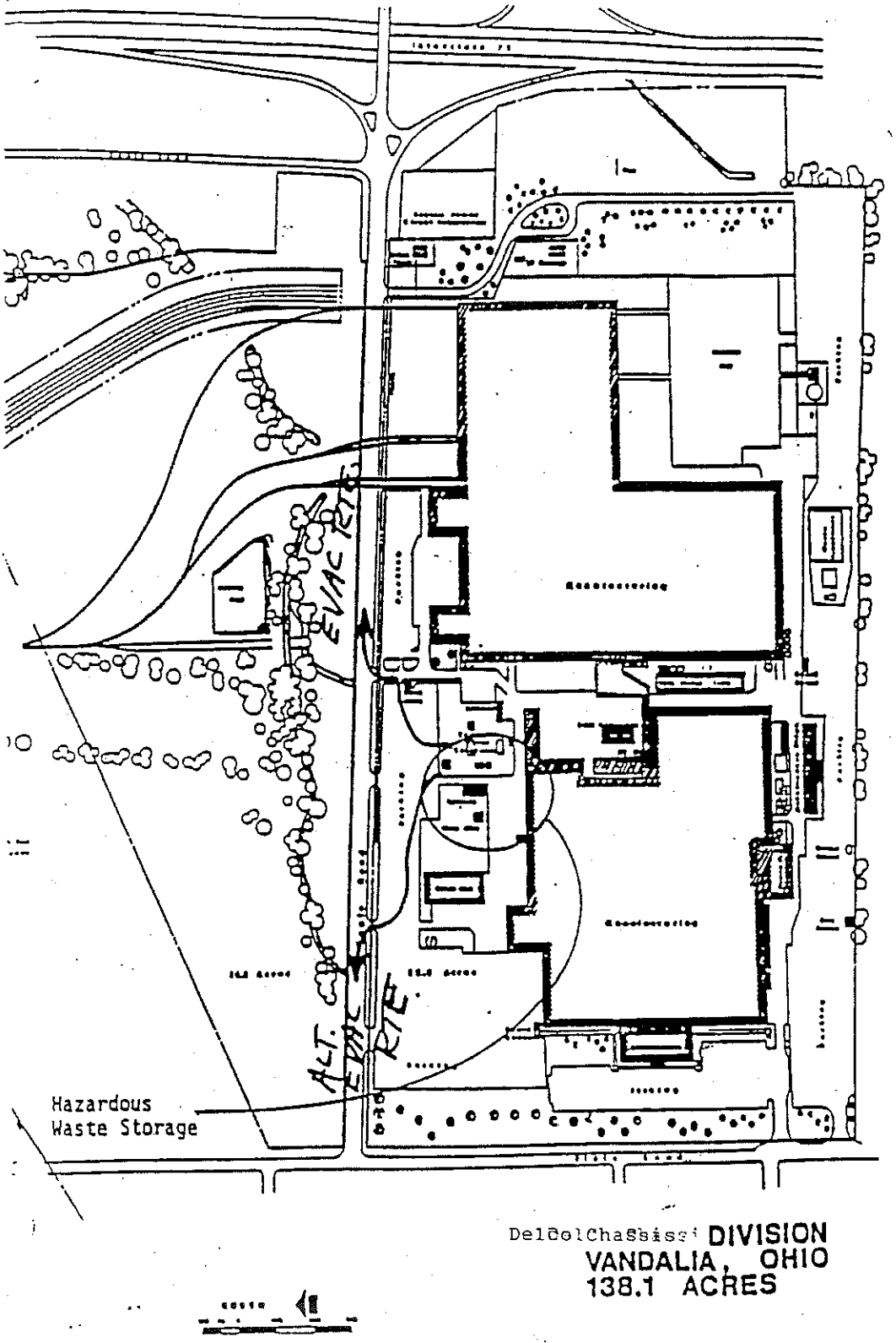
DELCO CHASSIS HOME AVENUE HAZARDOUS WASTE SITE LAYOUT



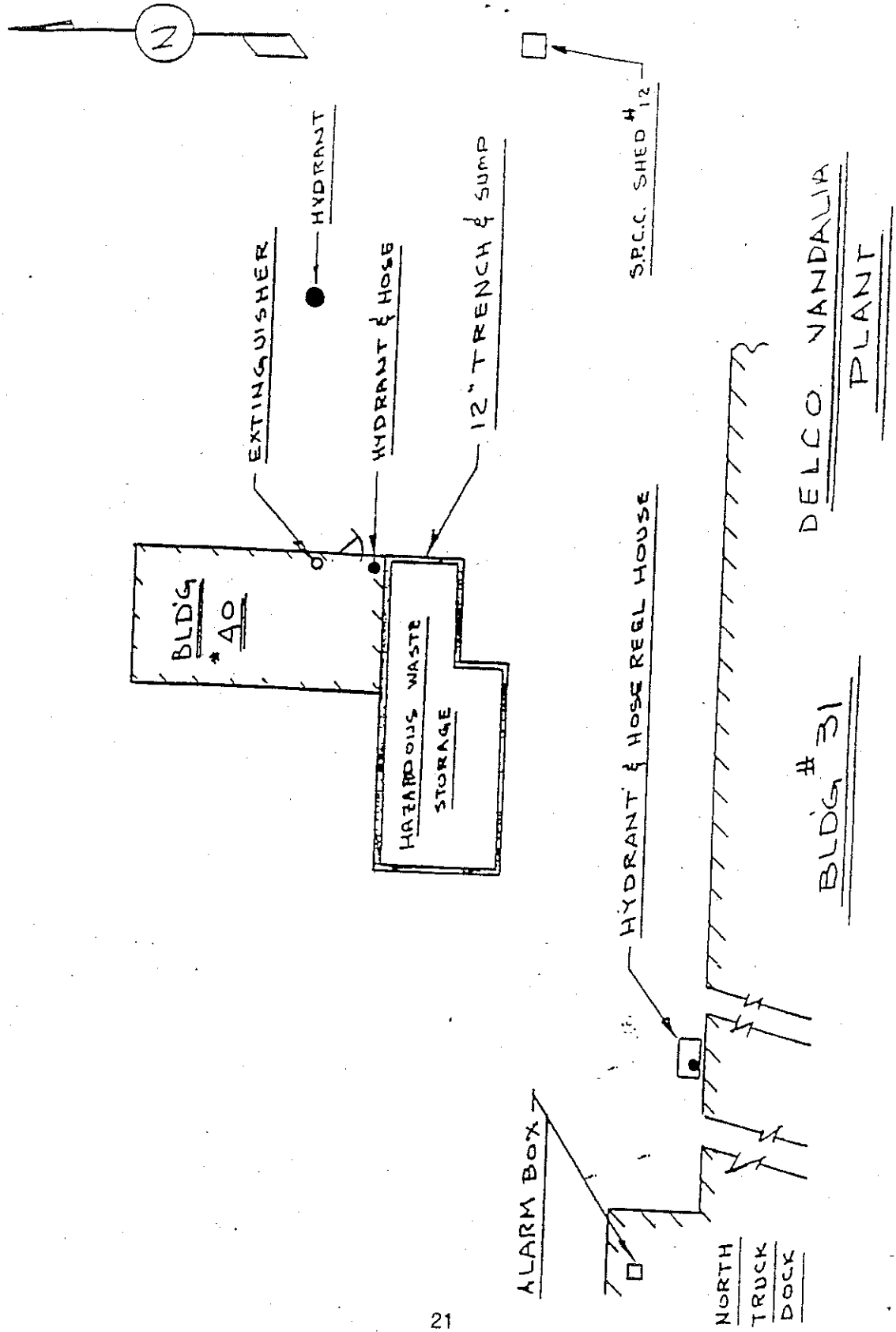
DELCO CHASSIS HOME AVENUE WASTE MANAGEMENT EMERGENCY EVACUATION ROUTE



DELCO CHASSIS VANDALIA SITE PLAN



DELCO CHASSIS VANDALIA HAZARDOUS WASTE SITE LAYOUT



WASTES: HAZARDS AND QUANTITIES IN STORAGE

WASTE	PRIMARY HAZARD	SECONDARY HAZARDS	DAYTON	VANDALIA
Cements (adhesives) Cement & Oil Cement & Solvent	Ignitable Toxic	Contain chlorinated solvents - vapors are irritants to eyes and skin. Thermal decomposition may yield toxic vapors including hydrochloric acid (HCl)	0-10 drums	0
Paints Paint Sludge	Ignitable Toxic	Thermal decomposition could yield toxic fumes including HCl and traces of hydrocyanic acid (HCN)	0-10 drums	0-80 drums
Paints & Solvents	Ignitable	Thermal decomposition could yield toxic fumes, including carbon monoxide (CO).	Included with paints above	
Polyol	Ignitable	Thermal decomposition. Products would include CO		0-10 drums
Grinding Sludge	Ignitable, may contain traces of metals	Contain various hydrocarbons that would yield CO upon burning.	0-5	0-5 drums

WASTES: HAZARDS AND QUANTITIES IN STORAGE

WASTE	PRIMARY HAZARD	SECONDARY HAZARDS	DAYTON	VANDALIA
Isocyanates	Reactive, toxic, very strong irritants. Exposure to vapors may cause permanent sensitization to respiratory illness.	Reacts with water, alcohols, or amines to create gases that may cause closed containers to rupture violently. Thermal decomposition products include HCN.	0	0-10 drums
Cleaning Liquid	Ignitable	Thermal decomposition could yield ACl and phosgene gas.	0-5 drums	0-5 drums
Brake Resins	Ignitable, contains phenols	Evaporation or decomposition could yield hazardous fumes	0	0-32 drums
Catalysts	Ignitable	Thermal decomposition. Products	0-4 drums	0-4 drums
Caustics	Chemical burns	Vapors are irritants to eyes and skin	0-40 drums	0-25 drums

SECTION H

PERSONNEL TRAINING

The information contained in this section outlines the Personnel Training Program for Delco Products Dayton Operations' Hazardous Waste Storage Facility in accordance with the requirements of OAC 3745-50-44(A)(12) and 3745-54-16 and 40 CFR 264.16 and 270.14(b)12.

H.1 OUTLINE OF TRAINING PROGRAM

H.1.a Job Titles and Duties

Delco Products is primarily a manufacturing concern and generator of hazardous waste materials involving several departments. The foremen and group leaders of the various departments are responsible for placing the generated wastes into containers (55-gallon drums) provided by the Waste Management Department, and proper labeling and securing of drum lids. The material handling personnel transport the drums to the Hazardous Waste Storage area. The names of the personnel currently handling the above responsibilities are on file in the Personnel Department. These are employees directly involved with the handling of waste in the Waste Management Department: the General Foreman of Waste Management and two operators. Management responsibilities involving compliance with RCRA regulations but not involving actual handling of the wastes are split between the Supervisor of the Environmental Engineering Section of the Plant Engineering Department and the General Foreman of the Waste Management Department. Job titles and descriptions of these personnel are contained in Appendix H-1. Maintenance personnel (i.e., electricians, plumbers, etc.) work in the Waste Management area, but they do not handle wastes directly.

H.1.b Training, Content, Frequency, and Technique

Because of the magnitude and variety of chemicals and chemical compounds used in the manufacturing processes at Dayton Operations and their related health and safety concerns, Delco Products has had an ongoing training program for many years. This program has been under the direction of the Health and Safety Department. All employees, through monthly departmental safety meetings, are given instruction on the proper

handling, safety precautions, and disposal requirements of hazardous materials and/or waste and the initiation of emergency procedures when required.

The Supervisor of Environmental Engineering and the General Supervisor of the Waste Management Department have attended the RCRA training seminars presented by General Motors Environmental Activities personnel and other seminars sponsored by groups outside the Corporation.

The supervision of the waste generating departments have been instructed in the proper methods of filling containers, labeling, and preparation to the hazardous waste storage area. Material handling personnel have been instructed in the safe handling of hazardous materials, not to move improperly prepared or labeled drums, and the emergency procedures for accidents and spills.

Outside certified training courses include those provided by HazTrain, Inc. for managers and supervisors and for hourly workers involved in the hazardous waste activities. In addition, hazardous waste personnel have had training provided by hazardous communication tapes (8 tapes), General Motors Hazardous Material/Waste Training, 24-hour SARA Spill Response, and Hazardous Waste/Materials Transportation. Table H-1 provides a summary of the recent training courses Delco Products personnel have participated in.

The content of the basic training includes:

- Brief introduction to RCRA regulations
- Nature and characteristics of hazardous wastes
- Hazardous wastes handled at Delco Products
- Accumulation requirements
- Empty drum procedures
- Contingency plan
- Definitions

Outlines of the basic training courses are contained in Appendix H-2.

In addition to the above, Dayton Operations has a trained fire brigade under the direction of the Chief of Plant Security. Dayton Operations also has a volunteer spill control and cleanup team trained and directed by the Safety and Health Department, who has also held spill control training sessions for all maintenance personnel.

H.1.c Training Director

At Dayton Operations, the duties of Training Director are carried out as a dual responsibility of the Health and Safety Department and the Supervisor of Environmental Engineering.

The minimum qualifications for individuals coordinating the training program include a B.S. degree in one of the following disciplines:

Engineering
Chemistry
Industrial Hygiene

Coordinators also attend available seminars on the safe management of hazardous wastes. Examples of such seminars are those listed in Table H-1.

H.1.d Relevance of Training to Job Position

The training will vary on a job requirement basis.

A. All employees are given a general program covering the hazardous involved, precautions to be observed, and emergency procedures.

B. The departmental supervision and group leaders in the departments generating hazardous waste will be trained in the proper handling and container filling procedures, such as lid securing, labeling, etc., safety precautions, and emergency procedures.

C. Material handling personnel receive training in the proper handling of hazardous materials and/or wastes, safety precautions, and emergency procedures especially involving accidents or spills.

D. Maintenance personnel, Plant Security, fire brigade, and spill team members receive further training in emergency procedures, fire prevention and control, spill control and cleanup, and contingency plan implementation.

E. Waste Management Department personnel receive training in all areas of hazardous waste management procedures, including the implementation of the contingency plan.

H.1.e Training for Emergency Response

Delco Products' training program is designed to ensure that personnel not only handle hazardous materials and/or wastes in a safe manner, but also respond to emergency situations. The program trains hazardous waste handling/management personnel to maintain compliance under both normal operating conditions and emergency situations.

Training elements addressing non-routine or emergency situations include:

- Procedure for response to fire or explosions
- Response to spills and procedures for containment and control
- Emergency communication procedures and alarm systems
- Procedure for locating and using facility emergency equipment

As previously mentioned, in addition to the Hazardous Waste Management personnel, the Dayton Operations Maintenance, Security, Fire brigade, and spill control personnel are on standby for response when required for plant emergencies.

H.2 IMPLEMENTATION OF TRAINING PROGRAM

The Supervisor of Environmental Engineering and the General Supervisor of Waste Management have been trained, the the Waste Management Supervisor has provided training for all current waste handling personnel prior to this submittal. As explained previously, other involved areas of plant personnel have received various degrees of training. All new employees will receive training within 6 months of assignment to the Waste Management Area as per the RCRA requirements.

Employees will have an annual review and update of their training program.

Records documenting the job title for each position, job descriptions, names of employees, and completed training programs (both introductory and review) will be kept onsite in the personnel office of Delco Products. 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.

TABLE H-1

TRAINING COURSES
HAZARDOUS WASTE MANAGEMENT PERSONNEL

Course	Year of Training	
	Supervisors	Material Handlers
Hazard communication tapes	1986	1986, 1987
HazTrain, Inc. hazardous waste handling	1987	1988
SARA Title III	1988	-
GM hazardous material/waste training	1988	1988
24-hour SARA spill response	1988	1988
EPA/DOT hazardous waste training	1988	-
Transportation/hazardous waste	1988	-
Advanced hazardous waste transportation	1989	-
GM/Purdue University environmental management	1988	-

APPENDIX H-1

JOB TITLES/JOB DESCRIPTIONS OF PERSONNEL INVOLVED WITH HAZARDOUS WASTE MANAGEMENT

Position Title Supervisor, Environmental Engineering

Name of Employee Tim Wojdacz

Responsibilities and Duties

- Supervises the personnel in the Environmental Engineering Section of the plant Engineering Department
- Responsible for the design, purchase, installation, and monitoring of all air, water, and solid waste control systems onsite
- Assists the divisional Safety and Health Department in engineering requirements of the Noise Abatement Program and ventilation systems for hazardous materials
- Assists the Emergency Coordinator for all hazardous waste activities
- Obtains all required permits and licenses or modifications of same from local, state, and federal regulatory agencies
- Assists the Health and Safety Department in the preparation and presentation of training materials involving environmental concerns
- Notifies proper authorities in emergency situations involving environmental areas
- Environmental Department personnel regularly inspect plant grounds and facilities for status of air, water, and solid/hazardous waste emissions and control
- Consults with Maintenance supervision, Plant Security, and/or Safety and Health Department personnel (safety engineers and industrial hygienists) in emergency situations
- Drafts and submits to the General Manager all required reports to local, state, or federal EPA agencies
- Serves as member of the Hazardous Material Review Committee with representatives of the Chemical Engineering, Safety and Health, Transportation, and Waste Management Departments to review all new material requests for use, all existing material in use, and issue "use" documents to concerned departments covering proper handling, safety precautions, and disposal requirements
- Reports to the Administrator of Plant Engineering

Experience and Qualifications

- B.S. degree in engineering is required

- 1 to 3 years of experience in industrial pollution control
- Training and/or experience in hazardous waste management is desirable

Position Title General Supervisor, Waste Management Department

Name of Employee Gail Spears

Responsibilities and Duties

- Overall operation of Delco Products' Waste Management Department, including the Hazardous Waste Storage area
- Maintains facility compliance with RCRA and other permits
- Supervises operators and reviews their performance
- Trains operators to: operate materials/drum handling equipment safely and effectively and handle leaks, spills, and emergency situations, including personnel safety procedures and protective equipment
- Maintains operating log, monitoring records, maintenance records, inspection records, personnel training records, hazardous waste manifests, and all other required records
- Notifies the Emergency Coordinator, Environmental Engineering, and if so directed, proper authorities in emergency situations
- Schedules all maintenance and repairs to structures and equipment in the waste management facility
- Oversees Maintenance personnel doing both schedule and unscheduled maintenance and repair work to be sure he is not releasing hazardous waste to the environment or contaminating himself
- Serves as member of the Hazardous material Review Committee (see Environmental Engineering responsibilities for details)
- Visits and evaluates waste disposal facilities used by Inland
- Reports to the Superintendent of Quality Assurance

Experience and Qualifications

- B.S. degree or equivalent in-plant experience
- Previous supervisor experience at first line or higher or equivalent managerial experience in other staff areas
- Hazardous waste management experience helpful but not required

- Special training in the functions and operation of a hazardous waste handling and storage facility will be provided by Dayton Operations

Position Title Operators

Name of Employees Current employees on file

Position Responsibilities

- Reports to the General Foreman of the Waste Management Department
- Operates waste handling equipment
- Reviews incoming wastes and segregates to proper storage location
- Inspects tanks, drums, and other equipment as required for proper operation and structural integrity
- Inspects drum storage area for evidence of leaks and spills and improperly located drums
- Makes appropriate entries into operating log, monitoring records, inspection records, and maintenance records, and files them as per the established system
- Notifies the General Foreman and other plant authorities as required in emergency situations

Experience and Qualifications

- Based on contractual union agreement

APPENDIX H-2

OUTLINES OF BASIC TRAINING COURSES

HAZARDOUS WASTE TRAINING
MANAGERS AND SUPERVISORS

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HAZARDOUS WASTE TRAINING

HOURLY WORKERS

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SECTION I

CLOSURE

In accordance with Title 40 of the Code of Federal Regulations (CFR) Part 264.111 and 112, 264.178, 270.14(b)(13) and Ohio Administrative Code (OAC) 3745-55-10, -11, and -12, and 3745-50-44(A)(B), a closure plan has been prepared for the hazardous waste management facility (HWMF) at the General Motors Corporation Delco Products Dayton Operations located in Dayton, Ohio. It identifies all steps necessary to close the HWMF at any point during its operating life, or at the end of its intended operating life. Delco Products does not expect to conduct a partial closure of its facility. This plan, therefore, provides for complete closure at any time, with no date of closure anticipated.

The Supervisor of Environmental Engineering will maintain a copy of the approved closure plan and all plan revisions until certification of closure has been submitted to and accepted by OEPA.

The closure methodology for the HWMF includes the following activities:

- Closure preparation, including establishment of a decontamination area, if necessary, and inventory removal.
- Cleaning the container storage area, tanks, and tank containment area with cleaning solution and high-pressure, low-volume wash and triple rinsing.
- Sampling and analysis to evaluate decontamination.
- Decontamination of equipment used in closure activities.
- Closure certification.
- Request to withdraw Part A and Part B permits

CLOSURE PERFORMANCE STANDARD

This closure plan has been prepared in accordance with the closure performance standard specified in 40 CFR 264.111 and OAC 3745-55-11, in that closure will:

- Minimize the need for further maintenance.
- Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, post-closure escape of hazardous material, hazardous constituents, leachate, contaminated runoff, or hazardous material decomposition products to the ground or surface waters or to the atmosphere.

Closure activities will be conducted in such a manner as to protect human health and the environment. All activities will take place on Delco Products Dayton Operations property which is secured by a chainlink fence and monitored by 24-hour security guards. Access to the closure area will be restricted to authorized personnel only. A health and safety plan will be prepared and implemented for all personnel involved in closure activities. A copy will be maintained at the site at all times during closure.

Closure of the storage units as outlined in this plan is intended to minimize the release of hazardous substances by removing any remaining residues. In addition, rinsewater resulting from cleaning will be disposed of at an appropriate disposal facility.

ADMINISTRATIVE PROCEDURES

The approved plan will be amended whenever:

- Changes in the operating plans or facility design affect the closure plan
- There is a change in the expected year of closure
- There are unexpected events during closure that require plan modification

Any changes to the closure plan will be requested in writing. The request will be submitted to U.S. EPA, Regional Administrator at Region V and to OEPA at least 60 days prior to the proposed change in the facility or operation, or no later than 60 days after an unexpected event has occurred which has affected the closure plan.

PLAN FORMAT

The format of this plan follows a checklist "Closure Plan Checklist, Container Storage and Handling Units" and "Closure Plan Checklist, Tank Storage, and Treatment Systems" that appear in U.S. EPA publication EPA/530-SW-87-010, OSWER Policy Directive No. 9476.00-5 as referenced by OEPA Closure Plan Review Guidance. One checklist incorporating the two was prepared and followed for this plan. Repetitive items between the two checklists were not repeated, such as facility description, description of security systems, etc.

Additional sections have been included in the plan format to incorporate requirements described in OEPA Closure Plan Review Guidance and appropriate state and federal regulations.

I.1 FACILITY DESCRIPTION

This section provides a general description of Delco Products Dayton Operations and its hazardous waste management facility. It has been prepared to acquaint the reviewer with the waste generating processes and to provide a general understanding of site conditions.

I.1.1 General Description

Delco Products Dayton Operations is located on approximately 67 contiguous acres within the city limits of Dayton, Ohio, in Montgomery County, at the following addresses:

2701 Home Avenue Dayton, OH 45417	or	P.O. Box 1224 Dayton, OH 45401

Figure I-1 shows the vicinity of the site. Primary operations at the plant are the manufacture of plastic and rubber automobile components, many of which have metal inserts. The product line includes steering wheels, motor and transmission mounts, weatherseals, brake hose, and liteflex springs. Hazardous wastes are generated in these manufacturing processes from molding, curing, and cementing of rubber and plastics; from painting, cleaning, grinding, and etching processes; and from general maintenance and laboratory activities. The hazardous wastes are stored in a container and tank storage area (see Figures I-2 and I-3) until they are shipped offsite for final disposal.

I.1.2 Topographic Map

A copy of the U.S. Geological Survey topographic map for the plant site and its vicinity is presented in Figure I-1.

I.1.3 List of Other Hazardous Waste Management Units and Wastes Handled in Each

There are no other RCRA hazardous waste management units located at Dayton Operations.

I.1.4 Hydrogeologic Information

The container storage and tank storage units are not land-based units (landfills, surface impoundments, etc.); therefore, hydrogeologic information is not applicable to this closure plan.

I.1.5 Container Storage Unit Description

I.1.5.1 Wastes Managed

The hazardous wastes stored include:

- Cements and solvents
- Paints, paint solvents, paint sludges
- Etching solution for copper
- Solvents
- Cleaning caustics and solvents
- Grinding sludge
- Hypalon (coating for latex weatherstrips)
- Epoxy resins
- Polyol
- Isocyanates
- Mold release
- Curative

These wastes are classified as:

- Wastes that exhibit characteristics of ignitability (D001-U.S. EPA identification number)

- Wastes that exhibit the characteristics of corrosivity (D002)
- Wastes that exhibit the characteristics of EP-toxicity for cadmium (D006), chromium (D007), lead (D008), and silver (D011)
- Spent halogenated solvents (F001, F002)
- Spent non-halogenated solvents (F003, F005)
- Isocyanates (U223)

In reference to the above list, (1) the majority of the wastes are hazardous because of ignitability (D001) and RCRA solvents (F001, F002, F003, F005), and (2) the isocyanates (U223) are accumulated and then sold for reuse.

I.1.5.2 Capacity

The container storage area has the capacity to store ~~112~~ 228 55-gallon drums of hazardous wastes. OF THESE 228 DRUMS, HOWEVER, THE MAXIMUM AMOUNT CONTAINING LIQUID HAZARDOUS WASTE IS NOT EXPECTED TO EXCEED 112 DRUMS DURING NORMAL OPERATION.

I.1.5.3 Container Storage Area Design

The container storage area consists of approximately 3,150 square feet, of which approximately 540 square feet is used for actual storage, 450 square feet is processing area, and approximately 2,160 square feet is aisle space (see Figure I-3). The entire area is a poured concrete slab under a 12-foot-high roof and is protected by a 30-inch-tall concrete berm on all sides but the south entrance. The entire ~~paid~~ pad is surrounded by a 10-inch-wide by 10-inch minimum depth concrete trench to contain runon and/or spilled material. The capacity (minimum) of the containment trench, which totals 242 feet in length, is in excess of 1,260 gallons. The flow from this trench is to a subsurface containment structure with a capacity of 2,000 gallons. This combined quantity (3,260 gallons) is greater than 10 percent of the maximum capacity of the containers (228 drums x 55-gallon/drum x 10 percent = 1,254 gallons) as required in OAC 3745-55-75(3) and 40 CFR 264.175(b)(3).

The maximum amount of hazardous liquid waste stored in containers at any one time is not expected to exceed 112 drums during normal operations. The remaining storage area inside the primary containment system is used for storage of reclaimable liquids and non-hazardous waste.

The drummed waste consists chiefly of ignitable wastes which are to be transferred to the 7,000-gallon waste tank prior to removal in bulk for offsite incineration. The remaining liquid waste storage consists of wastes that are not suitable for placement in the bulk tank, generally because they are too viscous to be pumped or contain excessive insolubles.

The material storage area is separated into zones designated for storage of the various hazardous wastes and materials. Surplus materials are stored in the north end of the pad. They are picked up six times yearly, and transported to the buyer's plant. Bulkable wastes are temporarily stored adjacent to the barrel dumper facility until they can be added to the bulk tank. Non-bulkable wastes are stored across the main aisle. At the entrance to the HWM pad are two drop areas on the west side of the main aisle. Incoming pallets are deposited in this area until they can be logged in, identified if necessary, and directed to the proper individual storage area. Any drums containing unknown wastes that must be analyzed are held in the drop area on the east side of the entrance.

Any unusual wastes that are known or are found through analysis to contain wastes that are incompatible with other wastes stored on the pad, are stored in a separate area surrounded by a 5-foot buffer area. Any such incompatible waste will be removed for disposal offsite as quickly as arrangements can be made with an appropriate disposal site.

The remaining storage area includes a row of re-salable iso-cyanates, which is a reactive material. They are kept separate from the ignitable liquids and are sold approximately every 60 days.

I.1.6 Tank Storage Area Description

Storage of hazardous waste in tanks at Dayton Operations is facilitated by two existing tanks: a 500-gallon mixing tank (No. 1) and a 7,000-gallon storage tank (No. 2). The tanks provide storage for a variety of wastes from adhesive and coating operations. Drums containing ignitable wastes are upended by a barrel dumper and emptied into the 500-gallon tank No. 1. Tank No. 1 is used to assess the suitability of the wastes to be pumped and stored in Tank No. 2. After thorough mixing, the contents of Tank No. 1 are pumped into Tank No. 2, the 7,000-gallon bulk storage tank.

The dimensions and capacity of each tank are shown below and in the engineering drawings in Appendix I-1.

	Configuration	Dimensions	Capacity (gallons)	Materials	Specs.
Tank No. 1	Rectangular See Appendix I-1	9' - 6" x 2' - 6" x 2' - 11" deep	500	316 stainless, 11 ga. bottom, 14 ga. walls, w/3 x 3 1/4 stainless angle frame	Machinery's Handbook 16th Edition, p. 418
Tank No. 2	Cylindrical Vertical Dish-Bottom See Appendix I-1	12'-4" straight Side 9'-6" diameter	7,000	5/16" 1020 HRS 56,000-65,000 psi	ASME Fab. Std.

The secondary containment system for the Dayton Operations' hazardous waste tanks is designed, installed, and operated to prevent any migration of waste or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and capable of detecting and collecting any releases and accumulated liquids until the collected material is removed. The secondary containment system is constructed of concrete. The wastes contained in the tanks are primarily considered hazardous because of ignitability; these wastes are compatible with concrete.

The containment system construction consists of a concrete vault with a 6-inch-thick base and 8-inch-thick walls (curbing). This construction is designed, installed, and operated to contain in excess of 100 percent of the capacity of the largest tank, and to be of sufficient strength and thickness to prevent failure due to pressure gradients (e.g., static head and external hydrological forces), physical contact with the waste, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic). The base of the system is capable of providing support to the system and is resistant to pressure gradients (above and below the system), and capable of preventing failure due to settlement, compression, or uplift.

The leak detection system at Dayton Operations is designed to detect the failure of either the tanks (primary containment) or the secondary containment structure, or the presence of accumulated liquids or any releases of hazardous waste in the secondary containment within 24 hours. The leak detection system employs the operational control of daily visual inspection for releases into the secondary containment system in accordance with OAC 3745-50-10(59) and 40 CFR 260.10.

The secondary containment system is sloped from south to north (a drop of approximately 1 foot over the entire containment vault). Any liquids in the containment system drain to and are collected in a containment sump at the low end where they can be removed.

I.1.7 References to Other Environmental Permits

Environmental permits held by the Dayton Operations include:

Permit No.:

0857140927B001
B002
B003
P001

0857040928P001

0857040929P002
P003
P004
P005
P006
P007

0857040930P002

0857040931P001
P002
P006
P007
P009
P011

0857040933P001
P002

0857040934P001

0857040936P001
P004
P005
P007
P010
P013
P014
R001

0857041160R001
R002
P006

Registration Notification:

0857040923P002

0857040931P003
P004
P005
P008

0857040935B001
B002
0857040936P008
P009
P011
P012

0857040932N001	0857041160P001
P001	P002
P002	P003
	P004
0857040933B001	P005
0857040934P002	

I.1.8 Anticipated Waivers or Exemptions

It is not presently anticipated that there will be a need for waivers or exemptions.

I.2 CLOSURE PROCEDURES

The following is a description of the procedures and activities associated with closure.

I.2.1 Estimates of Maximum Quantity of Inventory

I.2.1.1 Container Storage Area

The maximum estimated drum inventory at the time of closure is ~~112~~ 228, 55-gallon drums. No bulk waste or residues are anticipated. This is estimated to be composed of D001, D002, ~~D006~~, D007, D008, ~~D011~~, F001, F002, F003, and F005.

I.2.1.2 Tanks

The maximum estimated inventory at the time of closure is 500 gallons in the mixing tank and 7,000 gallons in the second tank. The waste is estimated to be composed of the same waste as listed above for the container storage area.

I.2.2 Procedures for Handling Removed Inventory

Waste inventory from the container storage area and tanks will not be treated or disposed onsite. The waste inventory will be removed and disposed by shipping it offsite for recycling, reuse, or disposal in an environmentally acceptable manner at an appropriately permitted facility.

I.2.3 Procedures for Decontamination and/or Disposal

I.2.3.1 Equipment/Structures Decontamination

The specific procedures and materials to be used in the decontamination of the container storage pad and storage tank will be dependent on the decontamination contractor. Therefore, details of the decontamination are not included in the closure plan. However; prior to decontamination, Dayton Operations will make available to Ohio EPA, SWDO the following:

- Size and thickness of polyethylene sheeting to be used to prevent overspray contamination
- Procedures to be used to prevent rinsate from migrating to clean areas
- List of equipment to be decontaminated (e.g., personal protective gear, equipment,vehicles)
- Criteria for determining the equipment is to be decontaminated
- The number and layout of equipment decontamination stations
- Decontamination methods
- Cleaning agents (suitable for the stored wastes)
- Methods of decontaminating equipment
- Health and safety plan including:
  - air monitoring
  -protective clothing
- Emergency decontamination measures
- Measures to be used to collect, contain, and handle rinsate and residues

While the specifics of decontamination will not be determined until a contractor is procured, the general procedures for decontamination are described below.

Container Storage Area

Prior to pad decontamination, polyethylene sheeting will be placed around the perimeter and all routes of runoff from the pad sealed to prevent possible migration of cleaning or rinsate solutions to clean areas. The container storage area will be decontaminated by mechanically removing any loose residues from the pad, using stiff-bristle brooms and shovels. These residues will be containerized and disposed of as hazardous waste. The surface of the container pad will then be washed with a high-pressure, low-volume wash or suitable cleaning agent. The pad will be rinsed three times with clean water after the cleaning solution wash.

Storage Tank

The storage tank will be decontaminated by rinsing the insides with a high-pressure, low-volume washer and suitable cleaning agent. A cleaning solution will be selected based on specific vendor recommendations; however, the solution generally will consist of nonalkali detergent. It will be rinsed three times with clean water after having been washed. General procedures for tank closure are presented in Appendix I-2. The containment structure will be decontaminated as described for the container storage area (Section I.2.3.1).

It is not anticipated that decontamination of cleaning equipment will be needed because it is unlikely that it will have come into contact with the storage units or they will be self-decontaminated. However, if it is necessary, decontamination will be accomplished with the same type of cleaning solution used on the storage units. The equipment will then be triple rinsed with clean water. This will be conducted within the unit and/or decontamination station.

I.2.3.2 Cleaning Agents/Rinsewater Disposal

All cleaning solutions and rinsates will be collected simultaneously with the cleaning operations. The collected wastewater will be sampled and analyzed for those hazardous constituents stored at the HWMF. If the wastewater is determined to be a hazardous waste, it will be shipped offsite for disposal as hazardous waste. If the wastewater is not considered to be hazardous waste, it will be transported to an offsite batch wastewater treatment plant.

I.2.3.3 Equipment/Structures Demolition and Removal

There are no structures or major equipment to demolish and/or remove from the facility.

I.2.3.4 Contaminated Soil Removal

If the soils beneath the pad are identified as contaminated, Dayton Operations will conduct additional soil sampling and analysis using the Ohio EPA guidance (February 8, 1988) to determine the extent of contamination. Once the extent of contamination is determined, Dayton Operations will submit an amended closure plan pursuant to 40 CFR 264.112(c)(1)(iii), to describe how the contaminated soil will be removed. The soil excavation methods will be chosen using the guidance in Section 7.1 of the Handbook on Remedial Action at Waste Disposal Sites (U.S.EPA, 1985). The amended closure plan will include the following:

- A description of the excavation and removal equipment and procedures to be used to remove the concrete pad and contaminated soil.
- A description of the temporary staging area(s) which will be used, including details on the design, construction materials, and operation of the staging area(s).
- A description of the onsite air monitoring which will be conducted for particulates during excavation.
- A description of the dust suppression techniques (i.e., tarpaulins or wetting agents) which will be used during excavation.
- A description of methods which will be used to prevent cross-contamination of soils during excavation and removal of contaminated soils.

The contaminated soil will be removed and disposed of properly. If it meets the definition of a hazardous waste, it will be placed in open head drums, sealed and treated or disposed at a commercial hazardous waste treatment or disposal facility.

The amended closure plan will also include a soil sampling and testing plan based on Ohio EPA closure plan review guidance (February 8, 1988) to be used to demonstrate that all contaminated soils have been successfully removed. The sampling and testing plan will include the number of soil samples to be obtained and the rationale for their selection.

The soils will be considered clean ~~as follows:~~ WHEN IT MEETS THE HIGHER OF THE FOLLOWING:

- HEALTH/RISK-BASED LEVELS
- BACKGROUND
- PRACTICAL QUANTITATION LIMITS

- ~~For naturally occurring elements or compounds, when the concentrations in the soil are less than the mean of the background samples plus two standard deviations, or when the concentrations in the soil are less than the upper limit of the range for Ohio farm soils as specified in Ohio EPA closure plan guidance.~~

- ~~For Appendix VIII constituents not naturally occurring in the soil, when the concentrations in the soil are below analytical detection limits using methods in U.S. EPA's SW-846 (third edition).~~

The Ohio EPA will be notified at least 5 days prior to any sampling of the soils for demonstration that the contaminated soils have been removed.

I.2.4 Description of Security Systems

The units are located within manufacturing facility property which is enclosed by a chainlink fence topped by barbed wire and monitored by security guards 24 hours a day. In addition, both storage units are equipped with warning signs.

I.2.5 Closure Certification

Certification of closure will be conducted at its completion by an independent, registered, professional engineer and the owner/operator of Dayton Operations. It will certify that closure was conducted in accordance with the approved closure plan and will be submitted within 60 days to the Regional Administrator by registered mail.

The certification will be signed by both the owner/operator and the independent registered professional engineer. The owner/operators and independent registered professional engineer's certifications of closure will follow the signature requirements found in OAC 3745-50-42. The owner/operator's certification statement will follow the exact wording found in OAC 3745-50-41(D). Documentation supporting the independent registered professional engineers certification will be furnished to the Director of Ohio EPA

upon request until the Director of Ohio EPA releases the owner/operator from the financial assurance requirements for closure under OAC 3745-66-43(H).

Certification of closure and required documentation shall be submitted to the Director of Ohio EPA as stated in OAC 3745-~~66~~55-15.

An inspector will be present during closure activities to conduct the QA/QC program. The inspector may be the actual independent professional engineer completing the closure certification or his qualified representative. All observations and determinations of the QA/QC program will be recorded in a daily log of activities, and a final report will be prepared summarizing these activities. The daily log includes identification of contractors, equipment, work conducted, samples collected, etc. Copies of all laboratory reports for testing described below will be presented in the final report.

I.2.5.1 Activities to be Conducted

The activities to be conducted as part of closure include:

- Collection of soil samples underlying and adjacent to the container storage area pad
- Visual inspection of areas surrounding the container storage area pad
- Collection of water samples from container storage area pad rinsate after decontamination
- Collection of water samples from tank rinsate after decontamination and tank containment pad rinsate

A description of each of these activities is provided below.

Collection of Soil Samples

Storage Tank

As described in Section I.1.6.4, the hazardous waste storage tank has secondary containment to prevent migration of liquids from the tank area in the event of a spill. Because of the design and maintenance of the secondary containment, any spillage inside the containment area is prevented from migration to underlying soil. Therefore, no

sampling is planned for the soils underlying or adjacent to the hazardous waste tank containment pad.

Container Storage Area

The evaluation of soil underlying the container storage unit will be conducted. If soil is identified as contaminated, an amended closure plan including details of further sampling and site remediation, as appropriate, will be prepared. If the soil is identified as not contaminated, only the closure activities identified above will be conducted. The Ohio EPA will be notified at least five business days prior to any sampling.

Sample Containers and Sample Handling

Sample containers will be selected and prepared by the analytical laboratory. Sample containers will be supplied to the cleanup contractor under appropriate chain-of-custody. Receipt of the sample containers will be formally acknowledged on chain-of-custody records. A typical chain-of-custody path is shown in Appendix I-3.

Each sample container will have a waterproof label and will contain the sample location, date and time of sampling, sampler's identification, and sample container identification number. All samples will be placed in a cold insulated shipping container and will be sent to the laboratory via overnight delivery service on the day that they are collected. Chain-of-custody documentation will accompany the samples.

Prior to use in the field, all sampling equipment will be cleaned with a solution of 2 percent trisodium phosphate (TSP) or equivalent solution in distilled water followed by a triple rinse with distilled water. Sampling equipment will be decontaminated between collection of samples using the same procedure. Rinsate from the decontamination of sampling equipment will be collected, combined with, and disposed of in the same manner as the cleanup decontamination rinsates.

Visual Inspection

A visual inspection of the area surrounding the container storage area pad will be conducted to identify any evidence of spills or releases. The area is paved with concrete.

Any areas displaying staining will be decontaminated using procedures described for the container storage area pad.

Collection of Rinsate Samples from the Container Storage Area

The container storage area pad will be evaluated for adequacy of decontamination by collecting and analyzing the final rinsate. The sample will be collected with a dedicated or precleaned glass or stainless steel container and quickly transferred to the laboratory-supplied container. Sample containers and sample handling will be as described above for soil sample collection. A duplicate sample will be collected and a trip blank will be analyzed as QA/QC measures.

Collection of Rinsate Samples from the Storage Tank

The storage tanks will be evaluated for adequacy of contamination by collecting and analyzing final rinsate. The sample will be collected with a dedicated or precleaned glass or stainless steel container and quickly transferred to the laboratory supplied container. Sample container and sample handling will be as described above for soil sample collection. A duplicate sample will be collected and a trip blank will be analyzed as QA/QC measures.

I.2.5.2 Testing and Analysis to be Performed

Samples collected from each unit and the soil will be analyzed for all RCRA-regulated wastes reported to have been stored there.

Analyses for organic wastes and the hazardous characteristics of corrosivity and EP-toxicity will be conducted using methods found in U.S. EPA publication SW-846, *Test Methods for Evaluating Solid Wastes*, November 1986, third edition. Where more than one analytical method is specified for the soil sample analysis, the method with the lowest detection limit will be used. Determination of the hazardous characteristics of ignitability will be conducted in accordance with methods and criteria specified in 40 CFR 261.21.

I.2.5.3 Criteria for Evaluating Adequacy

Criteria for evaluating adequacy will be divided into two parts: unit decontamination and the identification or lack of identification of releases to the environment. Unit decontamination will be based on rinsate sample analyses, the identification of releases will be based on soil analyses.

Soil Sample Evaluation

The soil samples will be evaluated using Ohio EPA guidance (February 8, 1988). The soil will be considered clean when the concentrations in the soil are below analytical detection limits using methods in U.S. EPA's SW-846 (third edition). The method with the lowest detection will be used where more than one analytical method is specified.

Rinsate Sample Analysis

The following Ohio EPA guidance (Ohio EPA interoffice memo, October 6, 1988) will be used to demonstrate the success of decontamination of the concrete storage pad, storage tank and equipment. Ohio EPA guidance specifies that the pad, tank, and equipment will be considered clean when the rinsate from cleaning each item contains no more than the following for each hazardous constituent of concern:

- The public drinking water maximum contaminant level (MCL) for hazardous waste constituents as promulgated in 40 CFR 141.11 and OAC 3745-81-11 for inorganics and 40 CFR 141.12 and OAC 3745-81-12 for organics.

- If an MCL is not available, then the maximum contaminant level goal (MCLG) as promulgated in 40 CFR 141.50 will be used.

- If neither a MCL or MCLG is available, 1 mg/l will be used.

- If the MCL or MCLG is less than the contaminant's analytical detection limit using methods found in U.S. EPA's SW-846 (third edition), the SW-846 analytical detection limit will be used as the clean standard.

- For characteristic wastes, the rinsate will not be hazardous by characteristics specified in 40 CFR 261 and OAC 3745-51.

I.2.5.4 Schedule of Inspections

Decontamination of the container storage unit and tank storage unit will be observed by an independent, Ohio-registered engineer or his qualified representative. The collection of samples to verify decontamination will be observed or conducted by the engineer or his qualified representative.

I.2.5.5 Types of Documentation

Documentation of closure procedures will be provided in a certification report. The report will contain a statement of certification by an independent, registered professional engineer. It will certify that the facility has been closed in accordance with the specifications in the approved plan. The report will include daily QA/QC logs and all laboratory analysis reports.

I.3 SCHEDULE OF CLOSURE

I.3.1 Expected Year of Closure

It is anticipated that closure will commence at the end of the facility's operating life; however, no closure date is anticipated at this time.

I.3.2 Frequency of Partial Closure

This plan calls for complete closure of the Dayton Operations hazardous waste management facilities, therefore there will be no partial closures.

I.3.3 Milestone Chart

A schedule of closure activities is presented below and is in accordance with 40 CFR 264.112(b)(6) and OAC 3745-55-12(A)(4),. The estimated time to complete closure is approximately 90 days.

Days Following OEPA Approval Of Closure	Activity
0 - 10	Removal of inventory
10	Soil sampling
10 - 40*	Sample analyses
40 - 45	Decontamination of HWMF
45	Collection of final rinsate samples
45 - 75**	Analyses of rinsate samples
75 - 89	Preparation of closure report
90	Certification of closure

* If soil samples indicate contamination, an amended closure plan will be prepared.

** If final rinsate indicates contamination, a second decontamination will be conducted. Decontamination procedures will be continued until rinsate samples are below closure standard.

I.3.4 Request for Extension

A request for extension of the closure schedule is not anticipated. However, if due to weather delay or any unforeseen event, one is required it will be requested pursuant to 3745-66-13(B).

I.4 COST

I.4.1 Estimated Cost of Complete Closure

The estimated total cost to complete the closure requirements of this amended closure plan is $~~47,200~~55,652. Table I-1 presents a summary of cost by tasks.

I.5 POST-CLOSURE PLAN

A post-closure plan is not required because hazardous waste or hazardous waste constituents will not remain following certification of closure completion.

I.6 NOTICE IN DEED TO PROPERTY AND LOCAL LAND AUTHORITY

A notice in the deed to the property and a notice to the local land use authority will not be required because hazardous waste and hazardous waste constituents will not remain following certification of closure completion.

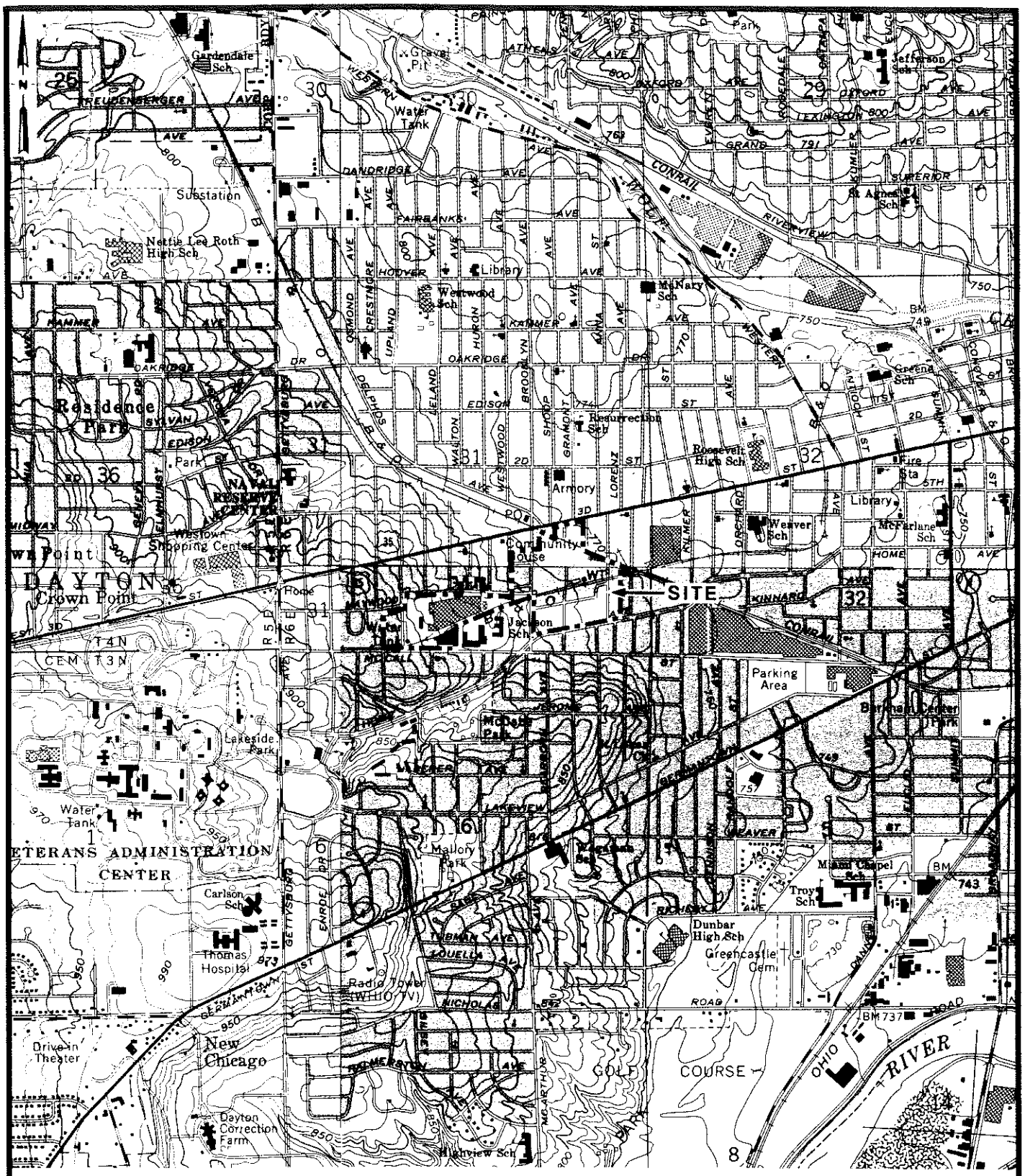
I.7 FINANCIAL ASSURANCE MECHANISM FOR CLOSURE AND LIABILITY REQUIREMENTS

General Motors Corporation has chosen the financial test specified under OAC 3745-66 to demonstrate financial assurance for closure of the Dayton Operations. The documentation is presented in Appendix I-4. Demonstration for financial responsibility for sudden liability coverage is also presented in Appendix I-4.

TABLE I-1

CLOSURE COST ESTIMATES
HAZARDOUS WASTE TANK AND CONTAINER STORAGE UNITS

Description	Units	Unit Price	Total ($)
1. Preparation	20 hours	$40/hour	800
2. Disposal of existing wastes	20,040 ~~13,660~~ gallons	$1.10/gallon	~~15,000~~ 22,044
3. Decontamination	40 hours	$200/hour	8,000
4. Collection of verification samples:			
Laboratory	8 hours	$50/hour	400
Supplies	lump sum	$533	533
5. Disposal of contaminated equipment:			
Clothing	2 drums	$100/drum	200
Miscellaneous brooms, brushes, pails, plastic sheeting, etc.	4 drums	$100/drum	400
6. Laboratory analysis of samples:			
Soil	3 samples	$1,000/sample	3,000
Rinsate	3 samples	$1,000/sample	3,000
QA/QC	3 samples	$1,000/sample	3,000
7. Certification			
Technical Assistant	60 hours	$50/hour	3,000
Registered Engineer	12 hours	$160/hour	2,000
	Subtotal		~~39,333~~ 46,377
	20 percent contingency		~~7,867~~ 9,275
	Total		~~$47,200~~ 55,652



BASE MAP SOURCE: Compiled from the following USGS 7 1/2 minute topographic quadrangle maps: Dayton North, Ohio 1965, photorevised 1981; Dayton South, Ohio 1966, photorevised 1981; Miamisburg, Ohio 1965, photorevised 1987; Trotwood, Ohio 1965, photorevised 1982.

0 2000 4000

SCALE IN FEET

OHIO

Quadrangle location

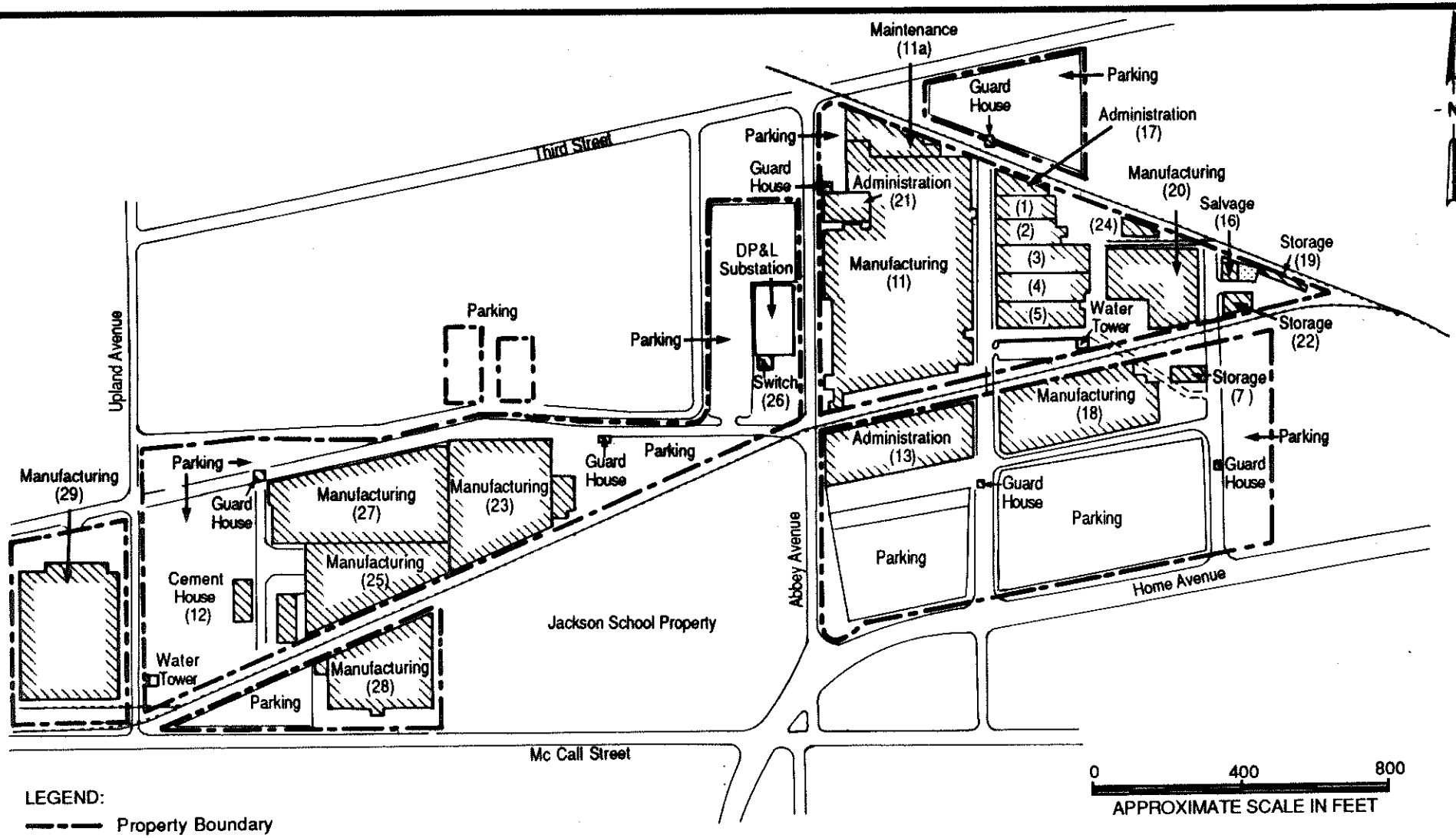
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE I-1

SITE VICINITY MAP

Dames & Moore
Job No. 299-175-122



LEGEND:

- Property Boundary
- (2) Building Designation
- Hazardous Waste Management Facility
- Railroad

BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1981.

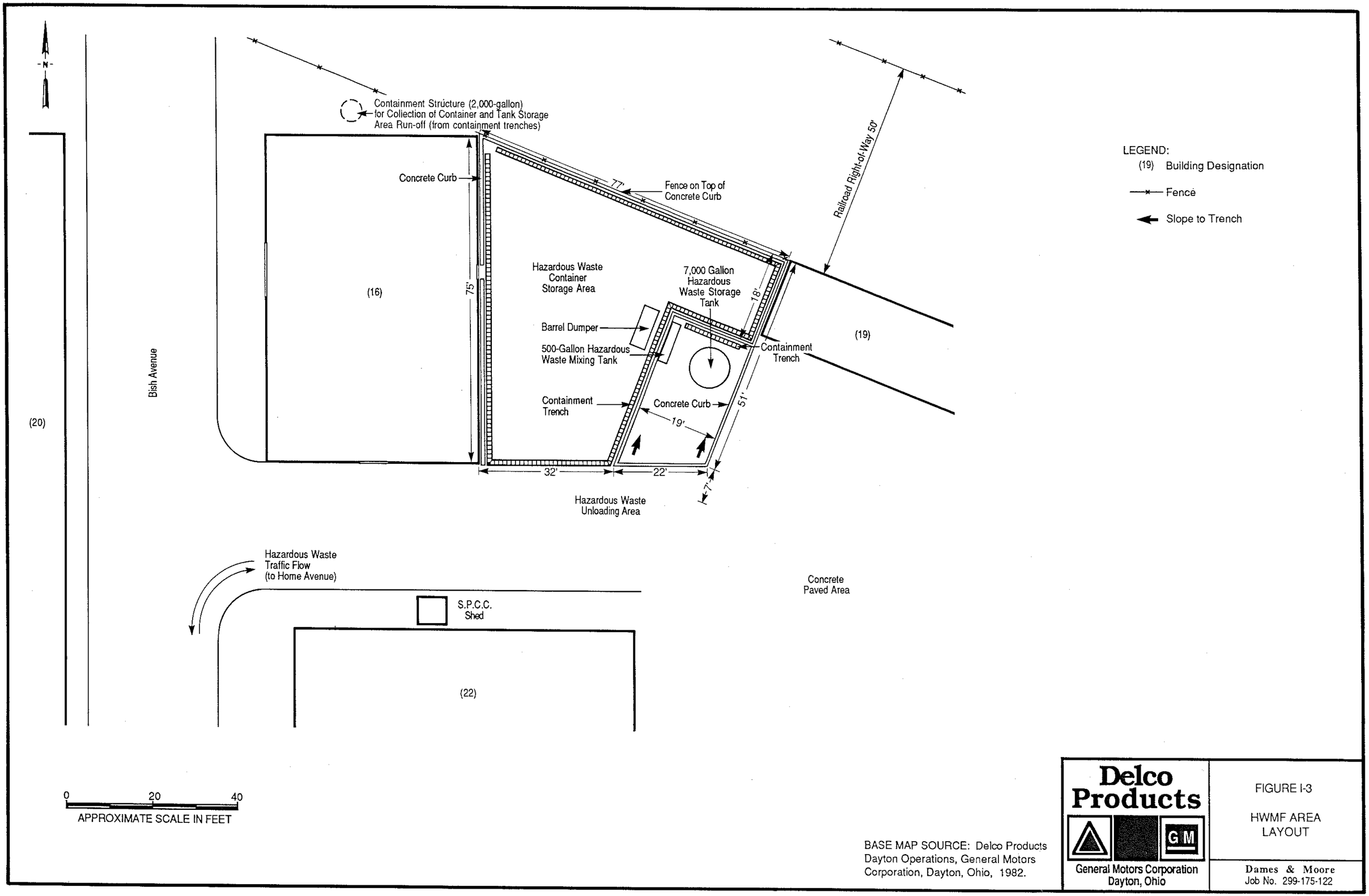
Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE I-2

DAYTON OPERATIONS PLANT LAYOUT

Dames & Moore
Job No. 299-175-122



BASE MAP SOURCE: Delco Products Dayton Operations, General Motors Corporation, Dayton, Ohio, 1982.

Delco Products

General Motors Corporation
Dayton, Ohio

FIGURE I-3

HWMF AREA LAYOUT

Dames & Moore
Job No. 299-175-122

APPENDIX I-1

ENGINEERING DRAWINGS OF TANKS NO. 1 AND NO. 2

APPENDIX I-2

GENERAL PROCEDURES FOR TANK CLOSURE

GENERAL TANK CLOSURE PROCEDURES

A. OUTLINE - TO SAFELY CLEAN ABOVE GROUND STORAGE TANK

1. Prepare and provide for access to each tank.

2. Remove remaining material from tanks and transport the material to a permitted disposal facility.

3. Rinse, scrape, and/or squeegee tank interiors.

4. Clean water rinse.

B. PHASE I - OPEN THE TANK

1. Depending on the type of opening and the condition of the equipment, a variety of tools may be used. Care must be exercised to minimize spark generation when working on the tank.

2. Prior to opening the tanks, the personnel should have full face respiratory protection and protective clothing. Once the tanks have been opened, they will be provided with positive ventilation. The tanks will then be inspected to determine the approximate quantity and physical conditions of the remaining material.

c. PHASE II - REMOVING WASTE AND CLEANING TANK

1. Before removing the waste from the tank, all piping and appurtenant equipment will be flushed first with clean mineral spirits followed by detergent solution.

2. The method to remove the waste material from the tanks will depend on the physical properties and quantities of that material. Prior to any person entering the tank, an effort will be made to remove as much liquid and sludge as possible.

3. Subsequent to vacuuming the majority of the material from the tanks, it may be necessary to use a high-pressure wash system using clean solvent and detergent solution to rinse residual material from the walls and bottom of the tanks. The evacuated material and the rinse solution will be sent to the local GM wastewater treatment plant before discharge into the local POTW. The quantity of wash fluid used will be kept to a minimum in order to limit the amount of unnecessary material.

4. Storage tanks are considered confined spaces (i.e., spaces open or closed having a limited means of egress in which poisonous gases or flammable vapors might accumulate or an oxygen deficiency might occur).

5. Confined space entry requires special operating procedures:

a. Tanks are to be washed, neutralized, and/or purged (where flammable atmosphere is present) prior to being entered.

b. Supply valves must be closed and "tagged" and bleeder valves left open; or supply piping should be disconnected.

c. Pumps or motors normally activated by automatic controls shall be operated manually to be sure they have been disconnected. Instrument power switches should be tagged "Off."

d. On tanks where flammable vapors may be present, all sources of ignition must be removed.

e. All tanks must be tested for flammable vapors, toxic gases, or oxygen deficiency in that order as applicable. The results of such tests should be displayed on the job site.

   1. In all tank-entering situations, an oxygen deficiency test shall be performed prior to tank entry.

   2. Under circumstances where "hot work" (welding, burning, grinding, etc.) is to be performed in or on the vessel, a test for combustible gases shall be taken. This is referred to as a "flash test."

   3. In most circumstances, flash tests and oxygen deficiency tests will be performed by the supervisor of the area in which the work is being done.

f. There must be a set of wristlets of a rescue harness and sufficient rope at the job site to effect a rescue. Any other rescue equipment considered necessary must also be on the job site.

g. Workers should wear rescue harnesses if entering a tank with a large enough opening to easily effect a rescue. In tanks with small openings, only wristlets may be used. (However,. in cases where there are agitator shafts, drums or other hazards in which the person's lifeline would be entangled and the supervisor in charge feels that wearing the lifeline may entrap a person and increase the hazard, the waring of a harness or wristlets may be eliminated).

h. A constant source of fresh air must be provided to ensure a complete change of air every few minutes. In cases of *short-term entry* for inspection or removal of objects, an air mask is recommended. In cases of *long-term entry* (generally for repair), the use of an air mover should be considered.

j. Adequate illumination must be provided.

   1. A flashlight or other battery-operated light must also be on hand to provide illumination for safety exist in the event of an electrical power failure.

   2. In any tank used to store flammable liquids, explosion-proof lighting must be used.

k. All electrical equipment to be used inside the tank must be in good repair and grounded.

1. Others working in the immediate area shall be informed of the work being done; and they shall inform the watcher or supervisor immediately of any unusual occurrence that may make it necessary to evacuate the tank.

6. The buddy system (watcher or standby observer):

a. Personnel working inside a confined space must be under the constant observation of a fully instructed watcher.

b. Before anyone enters the tank, the watcher will be instructed by the person in charge of the entry that:

1. An entry authorization must be obtained from the person in charge by anyone entering the tank.

2. A rescue harness or wristlets must be on the job.

3. The watcher much know the location of the nearest:

i. Telephone (with emergency numbers posted)
ii. Safety eyewash/shower
iii. Fire extinguisher
iv. Oxygen inhalator

4. For all hot work inside a tank, the watcher must be instructed how to shutdown welding/burning equipment.

5. As long as anyone is inside the vessel, the watcher must remain in continuous contact with the worker. HE IS NOT TO LEAVE THE JOB SITE EXCEPT TO REPORT AN EMERGENCY.

6. UNDER NO CIRCUMSTANCES SHOULD THE WATCHER ENTER THE VESSEL. If the worker(s) in the tank becomes ill or is injured, the watcher is to effect the site contingency plan.

7. The watcher still DOES NOT ENTER THE TANK until help is available.

c. After being instructed in his responsibilities, the watcher will sign an instruction form indicating his understanding.

7. Welding and Burning Within a Tank

a. All welding and burning equipment must be provided with a shutoff under control of the watcher, and the watcher must be shown how to shutoff the equipment if it becomes necessary.

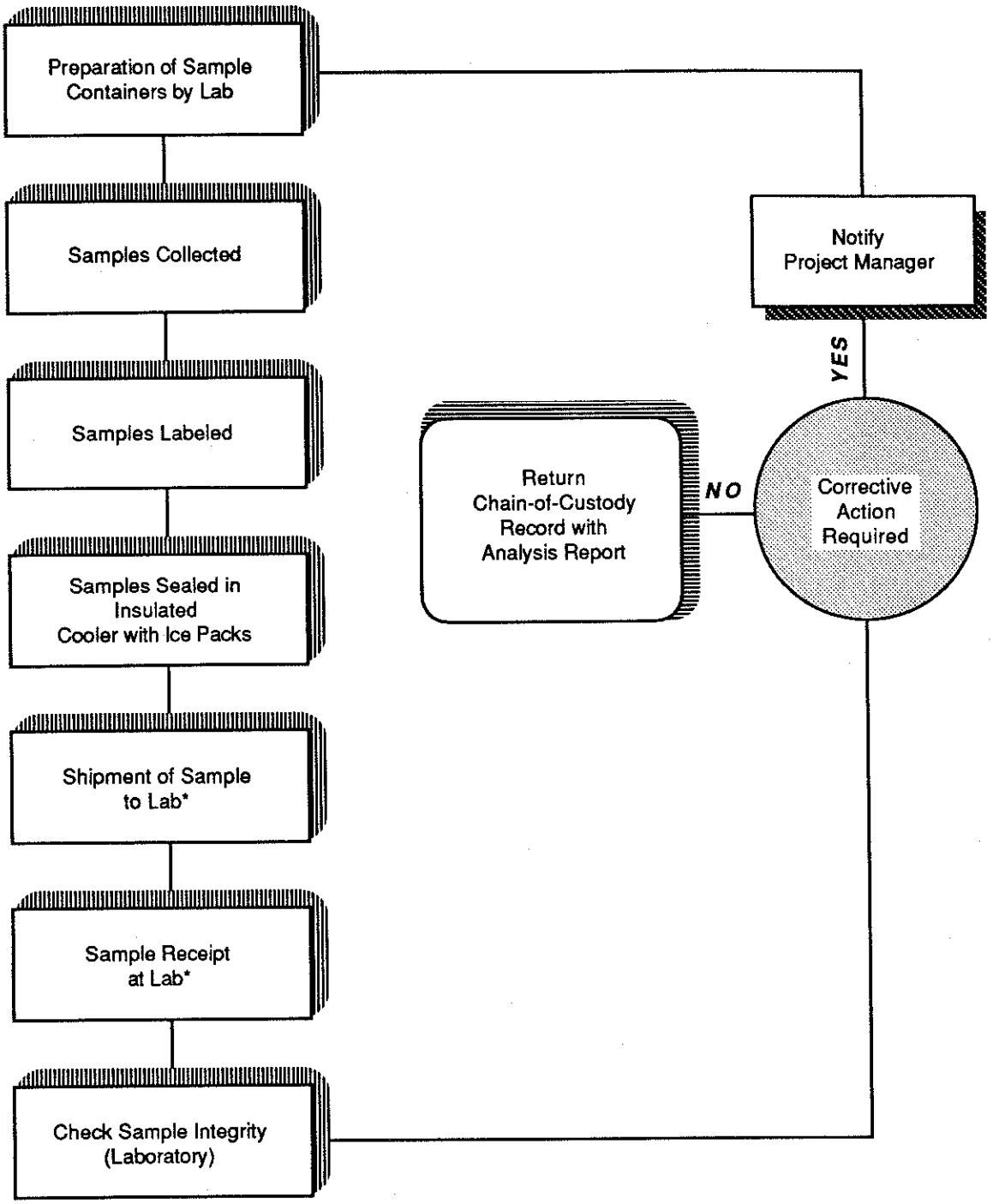
b. Welding and burning equipment will only be taken into a tank immediately prior to is use and must be removed from the tank immediately after the job is finished.

c. For all hot work inside a tank, a properly executed flame permit if needed must be displayed at the job site.

d. Standard welding and burning safety precautions will always be followed.

APPENDIX I-3

SAMPLE CHAIN-OF-CUSTODY PATH



*Requires sign-off on Chain-of-Custody form.

Delco Products

General Motors Corporation
Dayton, Ohio

APPENDIX I-3
SAMPLE
CHAIN-OF-CUSTODY
PATH

Dames & Moore
Job No. 299-175-122

APPENDIX I-4

FINANCIAL DEMONSTRATION FOR LIABILITY COVERAGE AND CLOSURE COSTS

General Motors Corporation

Mr. Warren W. Tyler, Director
Ohio Environmental Protection Agency
Post Office Box 1049
Columbus, Ohio 43215

Dear Mr. Tyler:

I am the Chief Financial Officer of General Motors Corporation, 3044 West Grand Boulevard, Detroit, Michigan 48202. This letter is in support of the use of the financial test to demonstrate financial responsibility for liability coverage and closure and/or post-closure care as specified in Chapters 3745-55 and 3745-66 of the Administrative Code.

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 Chapters 3745-55 and 3745-66 of the Administrative Code: See Attachment OH.

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 Chapters 3745-55 or 3745-66 of the Administrative Code. The current closure and/or post-closure cost estimates covered by the test are shown for each facility: See Attachment OH.

2. The owner or operator identified above guarantees, through the corporate guarantee specified in Chapters 3745-55 and 3745-66 of the Administrative Code, 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 U.S. EPA or a State so authorized is administrating the financial requirements of Subpart H of 40 CFR Parts 264 or 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 Chapters 3745-55 and 3745-66 of the Administrative Code. The current closure and/or post-closure cost estimates covered by such a test are shown for each facility: See Attachments A and B.

4. The owner or operator identified above owns or operates the following hazardous waste management facilities for which financial assurance for closure or, if a disposal facility, post-closure care, is not demonstrated to the Director through the financial test or any other financial assurance mechanism specified in Chapters 3745-55 or 3745-66 of the Administrative Code. The current closure and/or post-closure cost estimates not covered by such financial assurance are shown for each facility: None.

9275f-26

This owner or operator is required to file a Form 10-K 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, on the attached AlternativeII, 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, 1988.

I hereby certify that the wording of this letter is identical to the wording specified in Paragraph (G) of Rule 3745-55-51 of the Administrative Code as such regulations were constituted on the date shown immediately below.

R. T. O'Connell
Executive Vice President
March 30, 1989

9275f-27

Alternative II
($ in Millions)

1.	Sum of current closure and post-closure cost estimates (total of all cost estimates listed above).....	$ 82.4
2.	Amount of annual aggregate liability coverage to be demonstrated.....	$ 8.0
3.	Sum of lines 1 and 2.....	$ 90.4
4.	Current bond rating of most recent issuance and name of rating service.....Standard & Poors.....	AA-
5.	Date of issuance of bond.....	March 9, 1989
6.	Date of maturity of bond.....	March 9, 1992
*7.	Tangible net worth (if any portion of the closure or post-closure cost estimates is included in "total liabilities" on your financial statements you may add that portion to this line).....	30,279.9
*8.	Total assets in the U.S. (required only if less than 90% of assets are located in the U.S.).....	130,797.5

		YES	NO
9.	Is line 7 at least $10 million?.....	X	
10.	Is line 7 at least 6 times line 3?.....	X	
*11.	Are at least 90% of assets located in the U.S.? If not, complete line 12.....		X
12.	Is line 8 at least 6 times line 3?.....	X	

Deloitte Haskins+Sells

1114 Avenue of the Americas
New York, New York 10036-7778
(212) 790-0500
International Telex: 66262
ITT Telex: 4995707

General Motors Corporation:

We have audited, in accordance with generally accepted auditing standards, the Consolidated Balance Sheet of General Motors Corporation (the "Corporation") and consolidated subsidiaries as of December 31, 1988 and the related Statements of Consolidated Income and Consolidated Cash Flows for the year then ended, and have issued our report thereon dated February 13, 1989. We have not performed any auditing procedures beyond the date of our report on the 1988 financial statements; accordingly, this report is based on our knowledge as of that date and should be read with that understanding.

At your request, we have performed the procedures enumerated below with respect to the accompanying letter from Mr. R. T. O'Connell to the Director, Ohio Environmental Protection Agency, dated March 30, 1989. It is understood that this report is solely for filing with the addressee of the accompanying letter, and is not to be used for any other purpose. The procedures that we performed are summarized as follows:

1. We compared the amount included in item 8 under the caption, Alternative II in the letter referred to above with the corresponding amount in the financial statements referred to in the first paragraph.

2. We recomputed from, or reconciled to, the financial statements referred to in the first paragraph the information included in items 7 and 11 under the caption Alternative II in the letter referred to above.

Because the procedures referred to in the preceding paragraph were not sufficient to constitute an audit made in accordance with generally accepted auditing standards, we do not express an opinion on any of the information or amounts listed under the caption Alternative II in the aforementioned letter. In performing the procedures referred to above, however, no matters came to our attention that caused us to believe that the information or amounts included in items 7, 8 and 11 should be adjusted.

Deloitte Haskins & Sells

March 30, 1989

EPA ID: OHD004201091
Facility Name: GMC FISHER GUIDE: ELYRIA
Mailing Address: P.O. BOX 4025
ELYRIA, OH 44035
Facility Location: 1400 LOWELL STREET, County: LORAIN
Current closure cost estimate: $3,532,200
Current post-closure cost estimate: $776,800

EPA ID: OHD017958604
Facility Name: GMC HARRISON RADIATOR: DAYTON
Mailing Address: P.O. BOX 824
DAYTON, OH 45401
Facility Location: 300 TAYLOR STREET, County: MONTGOMERY
Current closure cost estimate: $761,900
Current post-closure cost estimate: $12,600

EPA ID: OHD000817577
Facility Name: GMC HARRISON RADIATOR: MORAINE
Mailing Address: P.O. BOX 824
MORAINE, OH 45439
Facility Location: 3600 DRYDEN ROAD, County: MONTGOMERY
Current closure cost estimate: $10,050,000
Current post-closure cost estimate: $250,000

EPA ID: OHD000817023
Facility Name: GMC INLAND: DAYTON
Mailing Address: P.O. BOX 1224
DAYTON, OH 45417
Facility Location: 2701 HOME AVENUE, County: MONTGOMERY
Current closure cost estimate: $47,200

EPA ID: OHD097622336
Facility Name: GMC INLAND: EUCLID
Mailing Address: 20001 EUCLID AVE.
CLEVELAND, OH 44117
Facility Location: 20001 EUCLID AVENUE, County: CUYAHOGA
Current closure cost estimate: $21,000

SECTION J

CORRECTIVE ACTION FOR SOLID WASTE MANAGEMENT UNITS

Delco Products has completed the U.S. EPA's questionnaire pursuant to RCRA Section 3004(u) for Dayton Operations. The questionnaire is titled "Information Regarding Potential Release from Solid Waste Management Units." The completed questionnaire is presented in Appendix J-1. Units identified are indicated on the topographic map (Figure B-4) in Section B.

It is Delco Products' understanding that OEPA may plan to conduct a RCRA Facility Assessment (RFA) of Dayton Operations. It will take into consideration this form and the plant's environmental history recorded in agency files. At the conclusion of the assessment, a summary will be issued to Delco Products indicating the need for any investigation of potential releases to the environment or the public. Delco Products will implement corrective action as necessary based on the needs identified in the RFA summary and the results of any investigations.

APPENDIX J-1

COMPLETED QUESTIONNAIRE

"Certification Regarding Potential Release from Solid Waste Management Units"

CERTIFICATION REGARDING POTENTIAL RELEASES FROM SOLID WASTE MANAGEMENT UNITS

FACILITY NAME: Delco Products Dayton Operations

EPA I.D. NUMBER: OHD 000817023

LOCATION CITY: Dayton

STATE: Ohio

1. Are there any of the following solid waste management units (existing or closed) at your facility? NOTE - DO NOT INCLUDE HAZARDOUS WASTE UNITS CURRENTLY SHOWN IN YOUR PART A APPLICATION

	YES	NO
• Landfill		X
• Surface Impoundment		X
• Land Farm		X
• Waste Pile		X
• Incinerator		X
• Storage Tank (Above Ground)		X
• Storage Tank (Underground)	X	
• Container Storage Area		X
• Injection Wells		X
• Wastewater Treatment Units		X
• Transfer Stations		X
• Waste Recycling Operations		X
• Waste Treatment, Detoxification		X
• Other _____	X	

2. If there are "Yes" answers to any of the items in Number 1 above, please provide a description of the wastes that were stored, treated or disposed of in each unit. In particular, please focus on whether or not the wastes would be considered as hazardous wastes or hazardous constituents under RCRA. Also include any available data on quantities or volume of wastes disposed of and the dates of disposal. Please also provide a description of each unit and include capacity, dimensions and location at the facility. Provide a site plan if available.

1) Waste oil underground storage tank--nonhazardous waste oil

2) Trash containment Bldg. 20, 10, 23, 25, 28, 29--nonhazardous waste

3) Powerhouse ash container--nonhazardous

4) Salvage yard metal turning containers--nonhazardous waste

Note: Hazardous wastes are those identified in 40 CFR 261. Hazardous constituents are those listed in Appendix VIII of 40 CFR Part 261.

3. For the units noted in Number 1 above and also those hazardous waste units in your Part A application, please describe for each unit any data available on any prior or current releases of hazardous wastes or constituents to the environment that may have occurred in the past or may still be occurring.

   Please provide the following information:

   a. Date of release
   b. Type of waste released
   c. Quantity or volume of waste released
   d. Describe nature of release (i.e., spill, overflow, ruptured pipe or tank, etc.)

   No releases to date

4. In regard to the prior or continuing releases described in Number 3 above, please provide (for each unit) any analytical data that may be available which would describe the nature and extent of environmental contamination that exists as a result of such releases. Please focus on concentrations of hazardous wastes or constituents present in contaminated soil or ground water.

   Not applicable

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 submittal is, to the best of my knowledge and believe, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations (40 U.S.C. 6902 *et seq.* and 40 CFR 270.11(d)).

David L. Mehall, Plant Manager
Typed Name and Title

David L. Mehall
Signature

8-16-89
Date

SECTION K

OTHER FEDERAL LAWS

In accordance with 40 CFR 270.3, the following federal laws have been reviewed for their applicability to the HWMF at Dayton Operations:

- The Wild and Scenic Rivers Act. 16 U.S.C. 1273 et seq.
- The National Historic Preservation Act of 1966. 16 U.S.C. 470 et seq.
- The Endangered Species Act. 16 U.S.C. 1531 et seq.
- The Coastal Zone Management Act. 16 U.S.C. 1451 et seq.
- The Fish and Wildlife Coordination Act. 16 U.S.C. 661 et seq.

The enforcement of these Acts will not affect the hazardous waste management facility at the Dayton Operations site, as described below.

K.1 THE WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act prohibits the Regional Administrator from assisting,a by license or other means, the construction of any water resource project that would have a direct and adverse effect on the values for which a national wide and scenic river was established. These provisions do not affect the hazardous waste management facility at Dayton Operations [1].

K.2 THE NATIONAL HISTORIC PRESERVATION ACT OF 1966

The National Historic Preservation Act of 1966 requires the Regional Administrator to adopt measures, when needed, that will mitigate potential adverse effects of a proposed licensed activity on properties listed or eligible for listing on the National Register of Historic Places. The provisions of this Act do not affect the hazardous waste management facility at Dayton Operations because there are no sites listed in the National Register as a historic place on or in proximity to the facility property [2], [3].

K.3 THE ENDANGERED SPECIES ACT

The Endangered Species Act requires the Regional Administrator to ensure that any actions authorized by the U.S. EPA are not likely to jeopardize the continued existence of any endangered or threatened species, or to adversely affect its critical habitat.

The Division of Natural Areas and Preserves of the Ohio Department of Natural Resources was contacted regarding this Act. The Division checked their database of endangered and/or special plants and animals and found no listings at or near the Dayton Operations [4]..

K.4 THE COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act and implementing regulations (15 CFR Part 930) prohibit the EPA from issuing permits for activities affecting land or water use in the coastal zone in question until the applicant certifies that the proposed activity complies with the State Coast Zone Management program. Dayton Operations is not located within a coastal zone and is, therefore, not affected by this ruling.

K.5 THE FISH AND WILDLIFE COORDINATION ACT

The Fish and Wildlife Coordination Act requires the Regional Administrator to consult with the appropriate state agency exercising jurisdiction over wildlife resource conservation before issuing a permit that authorizes the impoundment, diversion, or modification of any body of water. Since the HWMF at the Dayton Operations does not create impoundments, diversions, or modifications to any water bodies, these facilities are not affected by this provision [5].

K.6 REFERENCES

1. Chuck Divelbiss, Environmental and Public Project Review for Scenic Rivers, Ohio Department of Natural Resources; Personal Communication, August 9, 1989.

2. Federal Register; Department of the Interior; National Park Service, National Register of Historic Places; Annual Supplemental Listing of Historic Properties, 1979-1986.

3. Teresa Prosser, Senior Planner, Planning Department, City of Dayton; Personal Communication, August 8, 1989.

4. Pat Jones, Division of Natural Areas and Preserves, Ohio Department of Natural Resources; Personal Communication, August 9, 1989.

5. John Marshall, Ohio Department of Natural Resources; Personal Communication, January 5, 1988.

SECTION L

CERTIFICATION

In accordance with OAC 3745-50-42 and 40 CFR 270.11(d):

"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 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 possibility of fine and imprisonment for knowing violations."

Date: 8-16-89

Signature David L. Mehall
David L. Mehall, Plant Manager