INITIAL ASSESSMENT REPORT
NAO FLINT OPERATIONS
Flint, Michigan

Tank #050/88-058/88
Facility ID No. 0-002763

Global Environmental Engineering Inc.

Global Project Number F174
June 9, 1997

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

DEQ

LEAKING UNDERGROUND STORAGE TANK
INITIAL ASSESSMENT REPORT

INSTRUCTIONS: COMPLETION OF THIS REPORT WITH ALL APPLICABLE INFORMATION IS MANDATORY. Complete this form with all applicable information. The Certified Underground Storage Tank Professional (CP) MUST sign below. Failure to submit a report within the stated time period may result in Administrative Penalties as provided for in Part 213, Section 21321 of Act 451, P.A. 1994 as amended.

FACILITY NAME: NAO FLINT OPERATIONS (Tanks 050/88 - 058/88)	FACILITY ID NUMBER: 0-002763
ADDRESS: 902 East Hamilton Avenue, Flint, Michigan 48420 COUNTY: Genesee	MERA SITE ID NUMBER:
DATE(S) RELEASE DISCOVERED:	CONFIRMED RELEASE NUMBER(S):
O/O NAME: General Motors Corporation	MUSTFA CLAIM NUMBER:
O/O ADDRESS: 902 East Hamilton Avenue, Flint, MI 48550	
CONTACT PERSON: Mr. Dan Harrett	PHONE NUMBER: (810) 236-3436

ANSWER ALL QUESTIONS. (DO NOT LEAVE BLANKS):

1. Has the UST been emptied? __X__ Yes ____ No (If no, explain why):

2. Free product present: a. Currently? ____ YES __X__ NO If YES, total gallons recovered since last report:

   b. Previously? ____ YES __X__ NO If YES, total gallons recovered to date:

3. Have vapors been identified in any confined spaces (basement, sewers)? ___ YES __X__ NO

4. State the number of homes where drinking water is or was affected as a result of a release from this facility: None

5. Estimated distance and direction from point of release to nearest:

   a. Private well: > 1/2 mile b. Municipal well: > 1/2 mile c. Surface water/wetland: Flint River, > 3000 ft East

6. Since last report: a. cubic yards of soil remediated: 0 b. gallons of groundwater remediated: 0

7. Totals to date: a. cubic yards of soil remediated: 1,344 b. gallons of groundwater remediated: Unknown

8. Michigan RBCA Site Classification (1-4): 4

CERTIFICATION OF REPORT COMPLETION

I, the undersigned CP, hereby attest to the best of my knowledge and belief that the statements in this document and all attachments are true, accurate and complete. I certify that it was submitted to the USTD on June 9, 1997 (date submitted-Required).

CP Original Signature - Required / June 9, 1997 Date	Amanda L. Kurzman PRINT QC Project Manager's Name
Christopher J. Griffin, P.E. PRINT CP's Name	Global Environmental Engineering Inc. CONSULTANT
5467 Hill 23 Drive, Ste. B, Flint, Michigan 48507 ADDRESS	(810) 238-9190 PHONE NO. / (810) 238-9195 FAX NO.

PLEASE RETURN THIS COMPLETED REPORT AND ASSOCIATED ATTACHMENTS TO THE APPROPRIATE USTD DISTRICT OFFICE, LISTED ON THE BACK OF THIS PAGE.

UNDERGROUND STORAGE TANK DIVISION OFFICES AND LOCATIONS

Determine in which county the UST release occurred. Return all completed forms and associated reports to the USTD office listed next to that county in the following table. Addresses for the USTD offices are listed below.

COUNTY	USTD OFFICE	COUNTY	USTD OFFICE	COUNTY	USTD OFFICE	COUNTY	USTD OFFICE
Alcona	Grayling	Dickinson	Marquette	Lake	Grayling	Oceana	Grand Rapids
Alger	Marquette	Eaton	Shiawassee	Lapeer	Shiawassee	Ogemaw	Grayling
Allegan	Plainwell	Emmet	Grayling	Leelanau	Grayling	Ontonagon	Marquette
Alpena	Grayling	Genesee	Shiawassee	Lenawee	Jackson	Osceola	Grayling
Antrim	Grayling	Gladwin	Grayling	Livingston	Shiawassee	Oscoda	Grayling
Arenac	Grayling	Gogebic	Marquette	Luce	Marquette	Otsego	Grayling
Baraga	Marquette	Grand Traverse	Grayling	Mackinac	Marquette	Ottawa	Grand Rapids
Barry	Plainwell	Gratiot	Shiawassee	Macomb	SE Michigan	Presque Isle	Grayling
Bay	Saginaw-Bay	Hillsdale	Jackson	Manistee	Grayling	Roscommon	Grayling
Benzie	Grayling	Houghton	Marquette	Marquette	Marquette	Saginaw	Saginaw-Bay
Berrien	Plainwell	Huron	Saginaw-Bay	Mason	Grayling	Sanilac	Saginaw-Bay
Branch	Jackson	Ingham	Shiawassee	Mecosta	Grand Rapids	Schoolcraft	Marquette
Calhoun	Jackson	Ionia	Grand Rapids	Menominee	Marquette	Shiawassee	Shiawassee
Cass	Plainwell	Iosco	Grayling	Midland	Saginaw-Bay	St Clair	SE Michigan
Charlevoix	Grayling	Iron	Marquette	Missaukee	Grayling	St Joseph	Plainwell
Cheboygan	Grayling	Isabella	Saginaw-Bay	Monroe	SE Michigan	Tuscola	Saginaw-Bay
Chippewa	Marquette	Jackson	Jackson	Montcalm	Grand Rapids	Van Buren	Plainwell
Clare	Grayling	Kalamazoo	Plainwell	Montmorency	Grayling	Washtenaw	Jackson
Clinton	Shiawassee	Kalkaska	Grayling	Muskegon	Grand Rapids	Wayne	SE Michigan
Crawford	Grayling	Kent	Grand Rapids	Newaygo	Grand Rapids	Wexford	Grayling
Delta	Marquette	Keweenaw	Marquette	Oakland	SE Michigan		

CADILLAC OFFICE ROUTE #1 8015 MACKINAW TRAIL CADILLAC MI 49601 616-775-9727 (PHONE) 616-775-9671 (FAX)	**JACKSON OFFICE** 301 E LOUIS GLICK HIGHWAY JACKSON MI 49201 517-780-7900 (PHONE) 517-780-7855 (FAX)	**SAGINAW BAY OFFICE** 503 N EUCLID AVE SUITE 9 BAY CITY MI 48706 517-684-9141 (PHONE) 517-684-9799 (FAX)
GAYLORD OFFICE P0 BOX 667 GAYLORD MI 49735 517-732-3541 (PHONE) 517-732-0794 (FAX)	**MARQUETTE OFFICE** 1990 US 41 SOUTH MARQUETTE MI 49855 906-228-6561 (PHONE) 906-228-5245 (FAX)	**SHIAWASSEE OFFICE** 10650 BENNETT DR MORRICE MI 48857-9792 517-625-4600 (PHONE) 517-625-5000 (FAX)
GRAND RAPIDS OFFICE 350 OTTAWA ST NW GRAND RAPIDS MI 49503 616-456-5071 (PHONE) 616-456-1239 (FAX)	**PLAINWELL OFFICE** 1342 SR-89 SUITE B PLAINWELL MI 49080-1915 616-692-2120 (PHONE) 616-692-3050 (FAX)	**SE MICHIGAN OFFICE** 38980 SEVEN MILE RD LIVONIA MI 48152 313-953-0241 (PHONE) 313-953-0243 (FAX)
GRAYLING OFFICE 1955 NORTH I-75 BL GRAYLING MI 49738 517-348-6371 (PHONE) 517-348-8825 (FAX)		

TABLE OF CONTENTS

LIST OF ATTACHMENTS

(Include as Required and Check Box if Attached)

Attachments 1, 2, 3, 4, 5, 9, 10 11, 12, 13, 14, 15, 16, 20, 21, 22, 23, 27, 28, and 29 are to be submitted if applicable.

Attachments 6, 7, 8, 17, 18, 19, 24, 25, and 26 are found in the back of this document and should be completed and submitted when necessary.

ATTACHMENT NUMBER		DESCRIPTION
1.	☐	Site Map Showing Extent of Remaining Free Product
2.	☐	Free Product Recovery System Schematic
3.	☑	Area Map Showing Site Boundaries in Relation to Nearby Area
4.	☑	Site Map Highlighting Principal Physical Features and Sampling Locations
5.	☐	Schedule for Delineation of Off-Site Soil Impacts
6.	☑	Field Screening Results Table for Soils - (See Attachment 12 - Soil Boring Logs)
7.	☑	Laboratory Results Table for Soils
8.	☑	Tier I RBSL / Tier II SSTL Comparison Table for Soils
9.	☑	Site Map Showing Soil Sampling Locations, Maximum Contaminant Concentrations, and Sampling Depths
10.	☑	Site Map(s) Showing Vertical and Horizontal Distribution of Contaminants in Soil
11.	☑	Cross Sections Showing the Vertical and Horizontal Distribution of Soil Contaminants
12.	☑	Soil Boring Logs
13.	☑	Well Construction Diagrams
14.	☑	Groundwater Flow Map Showing Water Level Measurement Locations
15.	☐	Description of Hydrogeologic Factors That Could Influence Groundwater Flow
16.	☐	Schedule for Delineation of Off-Site Groundwater Impacts
17.	☐	Field Screening Results Table for Groundwater
18.	☑	Site Map Showing Groundwater Sampling Locations and Maximum Contaminant Concentrations
19.	☑	Laboratory Results Table for Groundwater (Including Time Series Presentation)
20.	☑	Tier I RBSL / Tier II SSTL Comparison Table for Groundwater
21.	☑	Cross Sections Showing the Vertical and Horizontal Distribution of Groundwater Contaminants
22.	☐	Presentation of Time Series Groundwater Results
23.	☐	Schedule for Delineation of Off-Site Impacts in Other Media
24.	☐	Field Screening Results Tables for Other Media
25.	☐	Laboratory Results Tables for Other Media
26.	☐	Tier I RBSL / Tier II SSTL Comparison Tables for Other Media
27.	☐	Site Map Showing Sampling Locations and Maximum Contaminant Concentrations for Other Media
28.	☐	Calculations Supporting the Tier II SSTLs and Evaluation
29.	☑	Work Plan for Further Site Characterization and Assessment Activity

1.0 IMMEDIATE RESPONSE TO SPILLS AND RELEASES

1.1 REPORTING AND RESPONSE TO RELEASES

A. Date and Time Release Discovered: 07 / 12 / 89 _____ AM / PM

B. Date and Time Release Reported: 07 / 12 / 89 _____ AM / PM

C. From what portion of the underground storage tank system did the release occur or is the release believed to have likely occurred?

- ☐ Piping
- ☑ Underground storage tank
- ☐ Overfill of underground storage tank (delivery of fuel from supplier)
- ☐ Other *(Specify):* _____

D. Briefly describe how the release was discovered: Records indicate that tank removal activities commenced in June of 1989. Tanks 050/88, 053/88, and 054/88, which were located partially beneath the railroad tracks, were closed in place after a tank boring analysis indicated level of contaminants including BTEX and lead were equal to or below background. On 7/12/89, soil and groundwater samples collected in the area of Tank 58 indicated petroleum impact to both soil and groundwater.

E. Has there been tank tightness testing performed in response to this release? *(If data is not available, answer "No".)* ☐ Yes ☑ No

If "Yes", complete questions F, G and H; otherwise skip to question I.

F. Date of the testing: _____/_____/_____

G. Method of testing: _____

_____

_____

_____

H. Results of the testing: _____

_____

_____

I. List the underground storage tanks at this facility and identify the tank(s) associated with this release by placing an "X" in the "LUST" column. *(Complete the last two columns for the LUST entries only)*:

1.1 REPORTING AND RESPONSE TO RELEASES (Continued)

TANK ID NUMBER	CONTENTS (Regulated Substances) - Specify grade if gasoline -		LUST?	HAS THE TANK BEEN EMPTIED?	HAS THE TANK BEEN REMOVED?
(As Registered)	At Time of Release	Previous Contents	(Yes or No)	(Yes/Date or No [See J below])	(Yes/Date or No [See J below])
050/88	Oleum	Oleum	Yes	Yes/July 1989	Closed in Place/July 89
051/88	Oleum	Oleum	Yes	Yes/August 1989	Yes/August 1989 89
052/88	S-7 Quench	S-7 Quench	Yes	Yes/August 1989	Yes/August 1989
053/88	S-7 Quench	S-7 Quench	Yes	Yes/July 1989	Closed in Place/July 89
054/88	Used Oil	Used Oil	Yes	Yes/July 1989	Closed in Place/July 89
055/88	LSC 110	LSC 110	Yes	Yes/August 1989	Yes/August 1989
056/88	LCO 231	LCO 231	Yes	Yes/August 1989	Yes/August 1989
057/88	LK 402	LK 402	Yes	Yes/August 1989	Yes/August 1989
058/88	Gasoline	Thinner (?)	Yes	Yes/August 1989	Yes/August 1989

J. If "No" was specified in either of the last two columns for any leaking underground storage tank, provide an explanation below:_____

K. What initial response actions were performed at this site?

PURPOSE OF INITIAL RESPONSE ACTIONS	WERE ACTIONS TAKEN? (Yes/Date or No)	IF "Yes", DESCRIBE THE ACTIONS TAKEN AND THEIR RESULTS. IF "No", INDICATE WHY NOT.
To identify and mitigate fire, explosion and vapor hazards (e.g., relating to free product, vapors in nearby buildings) [324.21307(2)(a)] [324.21307(2)(c)(iii)]	No	Neither free product nor vapors were identified.
To prevent further release and migration into the soil or groundwater, including removing product from the UST [324.21307(2)(b)] [324.21307(2)(c)(i) and (ii)]	Yes/89	Each UST was emptied.
To excavate and contain, treat, or dispose of visibly contaminated soil above the water table that are likely to cause a fire hazard or spread and increase the cost of corrective action [324.21307(2)(d)]	Yes/89	According to file documents, 1,344 cubic yards of soil were removed from the site on September 16, 1989 and disposed of at Citizen's Disposal.

REPORTING AND RESPONSE TO RELEASES (Continued)

PURPOSE OF INITIAL RESPONSE ACTIONS	WERE ACTIONS TAKEN? (Yes/Date or No)	IF "Yes", DESCRIBE THE ACTIONS TAKEN AND THEIR RESULTS. IF "No", INDICATE WHY NOT.
To abate an immediate threat to public health, safety, or welfare, or the environment [324.21307(2)(e)]	Yes/89	The tanks were emptied and removed (or closed in place), removing the source of the contamination.

L. Has free product ever been discovered as a result of the release? ☐ Yes ☑ No

NOTE: If "No", skip to Section 2.0; if "Yes", complete questions "M" through "S":

M. Date and Time Free Product Was Discovered: ____/___/____ ____ AM / PM
N. Date and Time Free Product Fax Transmittal Sheet Submitted: ____/____/____ ____ AM / PM
O. Has there ever been free product in the on-site or off-site soils? ☐ Yes ☐ No
P. Is there currently free product in the on-site or off-site soils? ☐ Yes ☐ No
Q. Is there currently free product in or around buried underground utilities? ☐ Yes ☐ No
R. Has there ever been free product on/in the groundwater? ☐ Yes ☐ No
S. Is there currently free product on/in the groundwater? ☐ Yes ☐ No

1.2 REPORTING AND RESPONSE TO RELEASES INVOLVING FREE PRODUCT

A. What initial response actions were performed at this site to address the presence of free product?

PURPOSE OF INITIAL RESPONSE ACTIONS	WERE ACTIONS TAKEN? (Yes/Date or No)	IF "Yes", DESCRIBE THE ACTIONS TAKEN AND THEIR RESULTS. IF "No", INDICATE WHY NOT.
To identify the presence of free product [324.21307(2)(c)]		
To recover free product in a manner that minimizes the spread of contamination into previously uncontaminated zones [324.21307(2)(c)(i)]		
To utilize recovery and disposal techniques appropriate to site conditions [324.21307(2)(c)(i)]		

1.2 REPORTING AND RESPONSE TO RELEASES INVOLVING FREE PRODUCT (Continued)

PURPOSE OF INITIAL RESPONSE ACTIONS	WERE ACTIONS TAKEN? (Yes/Date or No)	IF "Yes", DESCRIBE THE ACTIONS TAKEN AND THEIR RESULTS. IF "No", INDICATE WHY NOT.
To properly treat recovery by-products as required by law (identify the type of treatment applied and the expected effluent quality) [324.21307(2)(c)(i)]		
To properly discharge recovery by-products as required by law (identify the location of all on-site and off-site discharge points and all steps taken to obtain necessary permit) [324.21307(2)(c)(iv)		
To properly dispose of recovery by-products as required by law [324.21307(2)(c)(i)]		
To handle any flammable products in a safe and competent manner to prevent fires and explosions [324.21307(2)(c)(iii)]		

B. Complete the following table relating to free product recovery:

LOCATION OF OBSERVED FREE PRODUCT (Specify ID No.)	THICKNESS OF FREE PRODUCT OBSERVED (nearest 1/8")	TYPE OF FREE PRODUCT OBSERVED	LNAPL OR DNAPL*?	QUANTITY OF FREE PRODUCT RECOVERED (gallons)
IN WELLS				
IN BOREHOLES				
IN EXCAVATIONS				
OTHER LOCATIONS (Specify)				
TOTAL FREE PRODUCT RECOVERED TO DATE				

*LNAPL = Light Non-Aqueous Phase Liquid; DNAPL = Dense Non-Aqueous Phase Liquid

1.2 REPORTING AND RESPONSE TO RELEASES INVOLVING FREE PRODUCT (Continued)

C. Has the extent of any remaining free product been defined? ☐ Yes ☐ No

D. If "Yes", include the extent of the remaining free product on the site map included as Attachment 1.

E. Describe the free product recovery system that was or is being used ☐ or is proposed ☐ *(Include a schematic as Attachment 2 if appropriate)*: _____

_____

_____

F. If "proposed", what is the planned installation date? _____/_____/_____

G. Has the recovered free product been properly disposed? ☐ Yes ☐ No

H. If "No", provide an explanation: _____

_____

_____

I. Provide the name of the person or persons responsible for implementing the free product removal measures:

Company Name _____
Company Address _____
_____
_____
Company Telephone No. ___(_____)_____
Contact Person _____
Contact Telephone No. ___(_____)_____

2.0 SITE CHARACTERIZATION INFORMATION

2.1 SITE AND AREA MAPS

A. Attach an area map (Attachment 3) and a site map (Attachment No. 4), drawn to scale, which include the following if applicable. *(If it is not possible to include all required information on one map, additional maps may be used. Use of multiple maps should be minimized.)*

- Site boundaries in relation to the surrounding area and the nearest major roads (area map)
- Location of each underground storage tank and associated piping in the leaking underground storage tank system (*prior to excavation if tanks have been removed*)
- Location of the release and the component of the underground storage tank system from which the release occurred
- Location of any other existing and former underground storage tanks at the site
- Approximate location of fill ports, dispensers, and other pertinent system component
- Location of nearby buildings, roadways, paved areas, or other structures
- Location of nearby surface waters or wetlands
- Location and possible depth of nearby underground sewers and utility lines
- Location of all wells on-site and off-site within 100 feet of the property line
- Soil, groundwater, surface water, sediment or air sample locations, as applicable

2.2 SOIL CONDITIONS AND CHARACTERISTICS

A. Is soil contamination present? ☑ Yes ☐ No

If "Yes", complete this Section; if "No", skip to Section 2.3.

B. Total volume of soil remediated or disposed to date: 1,344 yds^3

C. Describe any soil remediation or disposal activities performed to date: Soils were excavated down to groundwater level (approximately 13 feet below ground surface). Approximately 1,344 cubic yards of soil were removed and disposed of at Citizen's Disposal. Records indicate that fill in the area of the USTs is foundry sand which emanated from the foundry that formerly operated on site until 1981.

D. Describe steps that have been taken, or will be taken, to secure access to off-site properties, including easements and right-of-ways, to complete the delineation of the extent of the off-site impact of the release to soil: Off-site impact has not been indicated. If further investigation indicates off-site impact has occurred, off-site access will be obtained at that time.

STEPS TAKEN OR PLANNED TO SECURE ACCESS TO OFF-SITE PROPERTIES	OFF-SITE PROPERTY OWNER'S NAME	OFF-SITE PROPERTY OWNER'S ADDRESS

2.2 SOIL CONDITIONS AND CHARACTERISTICS (Continued)

E. Provide the schedule for completing the delineation of the extent of the off-site impact of the release to soil (*indicate here or include as Attachment No. 5*): NA

F. Attach Field Screening Results (Attachment No. 6) and Laboratory Results (Attachment No. 7) tables showing the results of all soil sampling performed to date for the listed parameters. *(NOTE: The USTD may request copies of the laboratory data sheets, chain-of-custody forms, and all available QA/QC information.)*

G. Provide in the Comparison Table for Soils (Attachment No. 8) the maximum contaminant concentrations detected to date in all soils for each listed parameter. *(NOTE: Enter "ND" with the appropriate method detection limit when the parameter was not detected, and enter "NA" when the chemical was not analyzed. In areas where remediation has occurred, do not include sample results for areas where the soil has been subsequently removed or the characteristics of the soil left in place have been altered due to the remediation.)*

H. Show the maximum concentrations, sample depths, and estimated horizontal extent of contamination in relation to the soil sampling locations on the site map included as Attachment No. 9.

I. Describe the estimated vertical extent and distribution of the soil contaminants using depth-coded site maps (Attachment No. 10), cross sections (Attachment No. 11), and/or boring logs (Attachment No. 12): Contaminants have been noted in the soil at depths ranging from 4-17 feet below ground surface. Cross sections, soil boring logs, and depth-coded site maps have been included as attachments to this report.

J. If there is known soil contamination not related to the release, complete the following:

ON-SITE CONTAMINANTS NOT RELATED TO THE RELEASE	SOURCE OF THIS CONTAMINATION (If Known)	LOCATION OF THIS CONTAMINATION

2.3 GROUNDWATER CONDITIONS AND CHARACTERISTICS

A. Has groundwater been encountered at the site? ☑ Yes ☐ No

B. If "No", provide the total depth investigated and the date of investigation:
Depth of Investigation: _____ ft BGS
Date of Investigation: ____/____/____

If "No", skip to Section 2.4; if "Yes", continue with Section 2.3.

C. Is the groundwater potable? ☐ Yes ☑ No
D. Is the groundwater currently a source of drinking water? ☐ Yes ☑ No
E. Is groundwater being used for a purpose other than potable drinking use? ☐ Yes ☑ No
F. Is more than one groundwater unit present beneath the site? ☐ Yes ☐ No ☑ Unknown

Hydrogeologic Characteristics (*if appropriate and where available*):

G. Average depth to groundwater (as measured in site well(s)): 8.29 ft BGS
H. Depth to bottom of water-bearing layer: Unknown ft BGS*
I. Depth to a potable groundwater unit: Unknown ft BGS*

*Within Genesee County, the majority of private wells are located within the Saginaw Formation. The City of Flint is serviced by a municipal water system.

J. Attach copies of boring logs (Attachment No. 12) and well construction diagrams (Attachment No. 13) for all monitoring wells.

Groundwater Flow Rate and Direction:

K. Predominant soil type in water-bearing stratum (*e.g., sand, silt*): Fill Sand
L. Effective porosity of water-bearing stratum: .20 $cm^{3\ void}/cm^{3\ soil}$
M. Hydraulic conductivity (☑ measured ☐ estimated): .0022 ft/min
N. Lateral hydraulic flow gradient (attach a site map with groundwater flow direction and elevation data as Attachment No. 14 - USGS datum preferred): ____ft/ft to _____(direction)
O. Effective groundwater flow rate: _____ ft/yr

P. Identify hydrogeologic conditions that could influence flow direction *(describe here or attach description as Attachment No. 15):* Foundations of buildings formerly located on site still remain. The presence of these subsurface structures may restrict groundwater flow and cause mounding and other localized phenomena.

Q. Is there any indication of a vertical flow gradient? ☐ Yes ☑ No
R. If "Yes", describe: _____

2.3 GROUNDWATER CONDITIONS AND CHARACTERISTICS (Continued)

S. Has the groundwater quality been affected by the release? ☑ Yes ☐ No

If "No", skip to Section 2.4; if "Yes", continue with Section 2.3.

T. Has the groundwater quality in more than one groundwater unit been affected by the release? ☐ Yes ☑ No

U. Describe any groundwater remediation activities performed to date: In 1989, a groundwater remediation system was installed. The system consists of a sump which pumps impacted groundwater to the process waste system in Building 66. Currently, the system is not running. Information regarding the length of time the system was operational or the number of gallons treated was not available at the time this report was generated.

V. Total volume of groundwater remediated to date: Unknown gallons

W. Does the known plume currently extend off-site? ☐ Yes ☑ No ☐ Unknown

X. Describe steps that have been taken, or will be taken, to secure access to off-site properties, including easements and right-of-ways, for the purpose of completing the delineation of the extent of the release to groundwater: There is no evidence to suggest off-site impact has occurred as a result of this release.

STEPS TAKEN OR PLANNED TO SECURE ACCESS TO OFF-SITE PROPERTIES	OFF-SITE PROPERTY OWNER'S NAME	OFF-SITE PROPERTY OWNER'S ADDRESS

Y. Provide the schedule for completing the delineation of the extent of the off-site impact of the release to groundwater *(indicate here or include as Attachment No. 16):* _____

_____

_____

Z. Attach Field Screening Results (Attachment No. 17) and Laboratory Results (Attachment No. 18) tables showing the results of all groundwater sampling performed to date for the listed parameters. *(NOTE: The USTD may request copies of the laboratory data sheets, chain-of-custody forms, and all available QA/QC information.)*

2.3 GROUNDWATER CONDITIONS AND CHARACTERISTICS

AA. Provide in the Comparison Table for Groundwater (Attachment No. 19) the maximum contaminant concentrations detected to date in the on-site or off-site groundwater for each listed parameter. *(NOTE: Enter "ND" with the appropriate method detection limit when the parameter was not detected, and enter "NA" when the chemical was not analyzed.)*

BB. Show the maximum concentrations and the estimated aerial horizontal extent of the contaminated plume in relation to the groundwater sampling locations on the site map and include as Attachment No. 20.

CC. Describe the estimated vertical extent and distribution of the groundwater contaminants using depth-coded cross sections (Attachment No. 21) that show screened intervals of the monitoring wells. Cross sections locations should be included on the site map: Cross sections have been included as attachments with this report.

DD. Were multiple groundwater sampling events conducted at the site? ☐ Yes ☑ No

EE. If "Yes", include a chronological summary of the results for each sampling location using the data tables provided in Attachment No. 18 and include as Attachment No. 22.

2.4 CONDITIONS AND CHARACTERISTICS IN OTHER ENVIRONMENTAL MEDIA

A. Is contamination present in any environmental media other than soil or groundwater?
☐ Yes ☑ No

NOTE: If "Yes", complete this Section; if "No", skip to Section 3.0.

B. What other environmental media were investigated as part of this corrective action? (*Check all that apply*):

- ☐ Air
- ☐ Surface Water
- ☐ Sediments
- ☐ Biota
- ☐ Other (*Specify*):_____

NOTE: For each environmental media checked, answer questions "C" through "K".

C. Total volume of each of the other specified media remediated or disposed to date (*Specify units*):_____

2.4 CONDITIONS AND CHARACTERISTICS IN OTHER ENVIRONMENTAL MEDIA (Continued)

D. Describe any remediation, treatment or disposal activities performed to date relative to each of the other specified media: _____

E. Describe steps that have been taken, or will be taken, to secure access to off-site properties, including easements and right-of-ways, to complete the delineation of the extent of the off-site impact of the release to the other specified environmental media:

STEPS TAKEN OR PLANNED TO SECURE ACCESS TO OFF-SITE PROPERTIES	OFF-SITE PROPERTY OWNER'S NAME	OFF-SITE PROPERTY OWNER'S ADDRESS

F. Provide the schedule for completing the delineation of the extent of the off-site impact of the release to the other specified environmental media (*indicate here or include as AttachmentNo.23*): _____

G. Attach Field Screening Results (Attachment No. 24) and Laboratory Results (Attachment No. 25) tables showing the results of all sampling performed to date for the listed parameters in the other specified environmental media. *(NOTE: The USTD may request copies of the laboratory data sheets, chain-of-custody forms, and all available QA/QC information.*

H. Provide in the Comparison Table for Other Environmental Media (Attachment No. 26) the maximum contaminant concentrations detected to date in each other specified environmental media for each listed parameter. *(NOTE: Enter "ND" with the appropriate method detection limit when the parameter was not detected, and enter "NA" when the chemical was not analyzed. In areas where remediation has occurred, do not include sample results for areas where the material has been subsequently removed or the characteristics of the material left in place have been altered due to the remediation.)*

2.4 CONDITIONS AND CHARACTERISTICS IN OTHER ENVIRONMENTAL MEDIA (Continued)

I. Show the maximum concentrations, sample depths, and estimated extent of contamination in the other specified environmental media *(as appropriate)* in relation to the sampling locations on the site map included as Attachment No. 27.

J. Describe the extent and distribution of the contaminants in the other specified media:_____

_____

_____

_____

_____

K. If there is known contamination in the other specified media not related to the release, complete the following:

ON-SITE CONTAMINANTS NOT RELATED TO THE RELEASE	SOURCE OF THIS CONTAMINATION (If Known)	LOCATION OF THIS CONTAMINATION

3.0 SITE CLASSIFICATION

A. Indicate the current Site Classification Level *(See Attachment No. 10 of the "Guidance Document for Risk-Based Corrective Action at Leaking Underground Storage Tanks"):*

- ☐ Class 1: Immediate threat to human health, safety, or sensitive environmental receptors
- ☐ Class 2: Short-term threat to human health, safety, or sensitive environmental receptors
- ☐ Class 3: Long-term threat to human health, safety, or sensitive environmental receptors
- ☑ Class 4: No demonstrable long-term threat to human health, safety, or sensitive environmental receptors

NOTE: Regardless of the classification level, all reports must be submitted within the legislative time frame unless an alternate schedule is approved in writing by the USTD.

3.0 SITE CLASSIFICATION (Continued)

B. If "Class 1" is checked above, complete the following table using the instructions contained in the heading as it applies to each of the conditions or scenarios described:

CHECK BOX IF CONDITION IS CURRENTLY PRESENT	DATE OF CLASSIFICATION
IDENTIFY THE EVIDENCE USED TO CONFIRM THAT THE CONDITION IS OR IS NOT PRESENT AND, IF PRESENT, DESCRIBE ALL ACTIONS THAT ARE CURRENTLY BEING PERFORMED TO MITIGATE THE CONDITION	
☐ Explosive levels or concentrations of vapors that could cause acute health effects are present in a residence or facility	_____/_____/_____
☐ Explosive levels of vapors are present in subsurface utility system(s), but no building or residences are impacted	_____/_____/_____
☐ Free product is present	_____/_____/_____
☐ An active public or private water supply well, public water supply line, or public surface water intake is impacted or immediately threatened	_____/_____/_____
☐ Ambient vapor/particulate concentrations exceed concentrations of concern from an acute exposure, or safety viewpoint	_____/_____/_____
☐ Sensitive habitat or sensitive resources (sport fish, economically important species, threatened and endangered species, surface water, wetlands, etc.) are impacted and affected	_____/_____/_____

3.0 SITE CLASSIFICATION (Continued)

C. If "Class 2", "Class 3", or "Class 4" is checked above, complete the following table with respect to the current site classification level using the criteria and prescribed scenarios presented in Attachment No. 10 of the "Guidance Document for Risk-Based Corrective Action at Leaking Underground Storage Tanks":

IDENTIFY THE CURRENT CONDITION(S) THAT LED TO THE CLASSIFICATION	IDENTIFY THE PRESCRIBED INITIAL RESPONSE ACTION AND THE DATE THE ACTION WAS IMPLEMENTED
No demonstrable long term threat to human health, safety or sensitive environmental receptors. Groundwater not in an aquifer has been impacted, and impacted soils are located greater than 3 feet below ground surface and greater than 50 feet above the nearest aquifer.	Comply with statutory reporting requirements.

4.0 RESULTS OF THE TIER I OR TIER II EVALUATION

4.1 EXPOSURE PATHWAY CHARACTERIZATION

A. Check all that apply to this site:

Potential Source(s)

- ☑ Impacted Soils
- ☑ Dissolved Groundwater Plume
- ☐ Free Phase Liquid Plume
- ☐ Impacted Sediments or Surface Water
- ☐ Other *(Specify)*: _____

Potential Transport Mechanism(s)

- ☐ Wind Erosion and Atmospheric Dispersion
- ☐ Volatilization and Atmospheric Dispersion
- ☐ Volatilization and Enclosed-Space Accumulation
- ☑ Leaching and Groundwater Transport
- ☐ Mobile Free-Liquid Migration
- ☐ Stormwater/Surface Water Transport
- ☐ Utility Corridors
- ☐ Other *(Specify)*: _____

Potential Exposure Routes(s)

- ☐ Soil Ingestion
- ☐ Direct Contact of Soil with Skin
- ☐ Inhalation of Airborne Particulates
- ☐ Inhalation of Volatiles
- ☐ Potable Water Use
- ☐ Use of Non-Potable Water
- ☑ Other: Utility maintenance - direct contact of soil and/or groundwater with skin

Potential Receptor(s)

- ☐ Resident
- ☐ Commercial Worker III*
- ☐ Commercial Worker IV*
- ☑ Industrial Worker
- ☐ Construction Worker
- ☐ Sensitive Habitat
- ☐ Structures
- ☑ Utilities
- ☐ Surface Waters
- ☐ Water Supply Wells
- ☐ Other *(Specify)*: _____

* As defined in Attachment No. 11 to the "Guidance Document for Risk-Based Corrective Action at Leaking Underground Storage Tanks"

NOTE: A pathway must include three necessary elements:

1) a source (e.g., contamination);

2) a mechanism by which the contamination can become available to result in exposures at the source or via migration to other locations (e.g., free product and contaminated groundwater movement along a buried utility corridor); and

3) an individual who may come into contact, ingest, or inhale the contamination at the point of exposure (e.g., a utility maintenance worker digging to repair the line).

Examples of a complete pathway include:

1. *inhalation of impacted soils by an on-site construction worker*
2. *impacted soils leaching into potable ground water and being used by a nearby resident for drinking and bathing*
3. *inhalation of vapors resulting from the migration of free product by a neighboring industrial worker*
4. *impacted groundwater discharging to wetlands*

B. List the most plausible potential residential exposure pathway(s) for the site: No plausible potential residential exposure pathways have been identified.

4.1 EXPOSURE PATHWAY CHARACTERIZATION (Continued)

C. List the most plausible potential commercial exposure pathway(s) for the site: No plausible potential commercial exposure pathways have been identified.

D. List the most plausible potential industrial exposure pathway(s) for the site: The entire area is currently paved. If subsurface soils remain undisturbed, exposure is not anticipated. If subsurface soils are disturbed in the event of utility maintenance/installation or construction activities, exposure to impacted soils and/or groundwater may result.

E. List the most plausible potential sensitive habitat exposure pathway(s) for the site: No plausible potential residential exposure pathways have been identified.

4.2 OPTIONAL TIER II EVALUATION

A. Has a site-specific Tier II evaluation been conducted for this Initial Assessment Report?

☐ Yes ☑ No

B. If "Yes", identify and justify where alternate assumptions or site-specific information was used in place of the default assumptions as defined in Attachment No. 11 of "Guidance Document For Risk-Based Corrective Action At Leaking Underground Storage Tanks":

ASSUMPTION	DEFAULT USTD TIER I SELECTION	ALTERNATE SELECTION	JUSTIFICATION OR BASIS FOR SUBSTITUTION *(Attach sheets if needed)*

C. Include the calculations supporting the development of Tier II SSTLs as Attachment No. 28.

4.3 IDENTIFICATION OF TIER I RISK-BASED SCREENING LEVELS OR TIER II SITE-SPECIFIC TARGET LEVELS AND COMPARISON TO SITE DATA

A. For each contaminated medium, complete a Tier I RBSL / Tier II SSTL Comparison Table (Attachment No. 8 for soil, Attachment No. 19 for groundwater or Attachment No. 26 for other media, as appropriate) by:

Checking the box associated with the applicable land use scenario;

Checking the boxes associated with the contaminants currently present at the site;

Entering the current maximum detected on-site or off-site concentration for each selected contaminant, along with the corresponding sample identification number and date of sampling;

Entering the lowest applicable RBSL value for soil or groundwater from the Tier I Look-Up Tables (*refer to Attachment No. 11 of the "Guidance Document For Risk-Based Corrective Action At Leaking Underground Storage Tanks"*) for the specific exposure routes present and environmental medium being considered or a corresponding optional Tier II SSTL. [*NOTE: Include the exposure route code that identifies the basis for each applicable criterion noted. For example, 12 ug/kg (A) for a cleanup goal based on the direct contact with soil exposure route, and 12 ug/kg (B) for a cleanup goal based on the soil leaching to groundwater exposure route*];

Comparing the contaminant-specific maximum concentration to the corresponding RBSL or SSTL criterion; and Identifying and recording whether or not there is an exceedence of the RBSL or the SSTL.

B. Tier I RBSL / Tier II SSTL Comparison Tables are attached for the following: *(Check all that apply)*

	ENVIRONMENTAL MEDIUM		
LAND USE	**SOIL**	**GROUNDWATER**	**OTHER** *(Specify)*
Residential	☐	☐	
Commercial III	☐	☐	
Commercial IV	☐	☐	
Industrial	☑	☑	

4.4 PROPOSED FOLLOW-UP ACTIVITIES

A. Based on the results of the Tier I or optional Tier II evaluation, indicate the follow-up activities proposed for the site:

☐ Site conditions do not exceed Tier I RBSLs or Tier II SSTLs	Proceed with site closure
☐ Site conditions exceed some or all Tier I RBSLs or Tier II SSTLs	Propose interim corrective action and subsequent reevaluation of the site **(Complete Section 5.0)**
☐ Site conditions exceed some or all Tier I RBSLs or Tier II SSTLs	Propose final corrective action to achieve Tier I RBSLs or Tier II SSTLs **(Complete Section 5.0)**
☑ Site conditions exceed some or all Tier I RBSLs or Tier II SSTLs	Perform further site-specific Tier II or Tier III evaluation to establish alternative SSTLs that meet the target risk goals **(Complete Section 5.0)**

4.4 PROPOSED FOLLOW-UP ACTIVITIES (Continued)

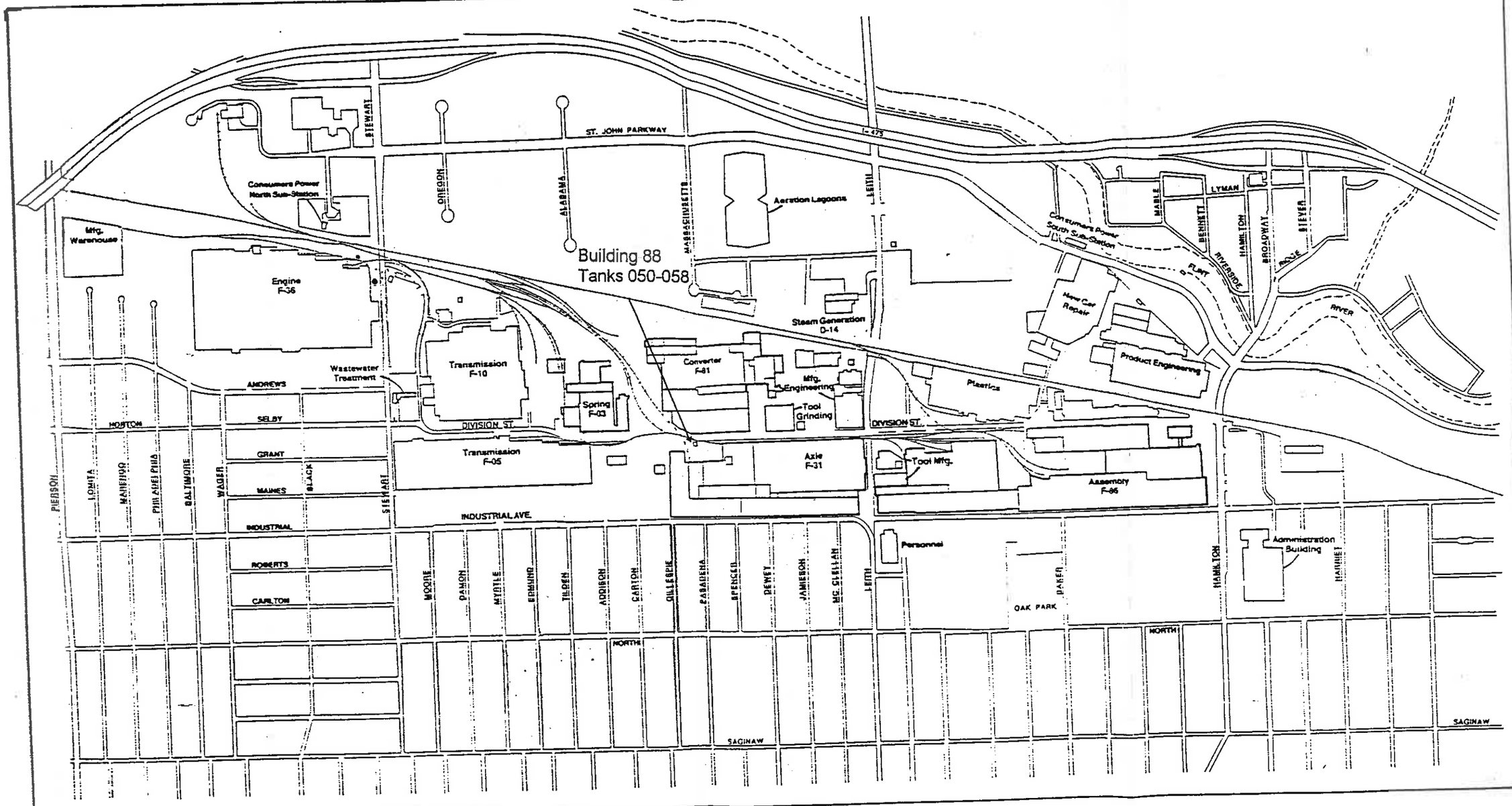
B. Provide justification for the option chosen *(attach additional sheets, if needed):* Further investigation is necessary to fully define the extent of impacted groundwater. Upon completion of additional field work, a review of the data will be conducted to determine the feasibility of establishing site specific SSTLs or invoking the use of institutional controls to obtain a restricted industrial closure.

5.0 WORK PLAN FOR FURTHER SITE CHARACTERIZATION AND ASSESSMENT ACTIVITY

If an interim or final corrective action or a further Tier II evaluation is proposed, additional on-site or off-site characterization work may be required to obtain the information needed to establish alternate protective clean-up levels or to select and implement a cost-effective corrective action program. In these cases, a Work Plan must be developed to describe the proposed additional site characterization activities.

A. Provide a brief Work Plan and implementation schedule (Attachment No. 29) that describes the proposed site characterization activities to be performed to determine the horizontal and vertical extent of contamination, and establish the site conditions needed to prepare a Corrective Action Plan.

ATTACHMENT 3



LEGEND

F-36	Factory Number
D-14	Division Number
□	Hazardous Waste Storage Area
38	Building Number
—	Property Line
■	Gate House
●	Pedestrian Entrance
—x—x—	Fence

0 400 800 1200
Scale in Feet

Adapted from

EDI Engineering & Science

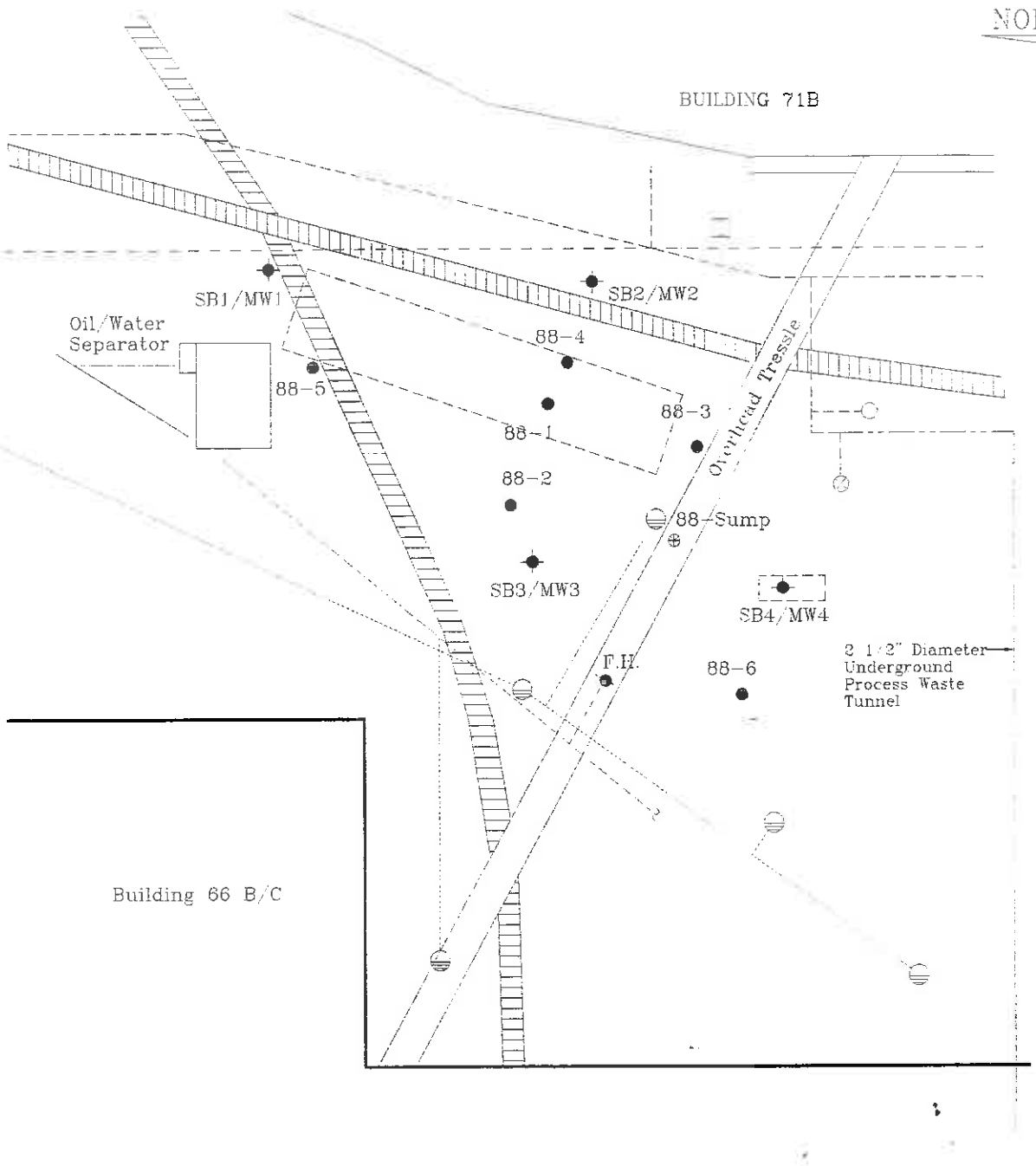
BOC FLINT OPERATIONS (BUICK SITE)

Area Map/Site Boundaries
Attachment 3

June, 1989

21080

ATTACHMENT 4



LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant
- Former UST Locations

GM-CLCD NORTH

TITLE: PRINCIPAL/PHYSICAL FEATURES
AND SAMPLE LOCATIONS
BUILDING 88 - TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 1
	PROJECT NUMBER: F174

ATTACHMENT 6

ATTACHMENT 6

SEE SOIL BORING LOGS
ATTACHMENT 12

ATTACHMENT 7

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	Bldg 88-1 (7-8')		Bldg 88-2 (7-9')		Bldg 88-2 (15-17')		Bldg 88-3 (7-9')		Bldg 88-3 (13-15')	
Sample Depth (feet BGS)	7-8		7-9		15-17		7-9		13-15	
Date Collected	07/22/96		07/22/96		07/22/96		07/22/96		07/22/96	
Date Extracted	07/25/96		07/25/96		07/25/96		07/25/96		07/25/96	
Date Analyzed	07/25/96		07/25/96		07/25/96		07/25/96		07/25/96	
Analytical Method No.	8020		8020		8020		8020		8020	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Toluene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Ethylbenzene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Total Xylenes	ND	10	ND	10	ND	10	ND	10	ND	10
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene										
☐ Acenaphthylene										
☐ Anthracene										
☐ Benzo(a)anthracene										
☐ Benzo(a)pyrene										
☐ Benzo(b)fluoranthene										
☐ Benzo(g,h,i)perylene										
☐ Benzo(k)fluoranthene										

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= **Method Detection Limit**

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7 (Continued page 2 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Chrysene										
☐ Dibenzo(a,h)anthracene										
☐ Fluoranthene										
☐ Fluorene										
☐ Indeno(1,2,3- cd)pyrene										
☐ Naphthalene										
☐ Phenanthrene										
☐ Pyrene										
☐ 2-Methylnaphthalene										
METALS										
Sample ID	Bldg 88-1 (7-8')		Bldg 88-2 (7-9')		Bldg 88-2 (15-17')		Bldg 88-3 (7-9')		Bldg 88-3 (13-15')	
Sample Depth (feet BGS)	7-8		7-9		15-17		7-9		13-15	
Date Collected	07/22/96		07/22/96		07/22/96		07/22/96		07/22/96	
Date Extracted	07/29/96		07/25/96		07/25/96		07/25/96		07/25/96	
Date Analyzed	07/29/96		07/25/96		07/25/96		07/25/96		07/25/96	
Analytical Method No.	6020		6020		6020		6020		6020	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium	ND	50	970	50	130	50	ND	50	ND	50
☐ Total Chromium	1900	1000	1900	1000	3500	1000	1700	1000	4500	1000
☐ Total Lead	2400	1000	4200	1000	4700	1000	1900	1000	5700	1000

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
If Other (OT), Specify here: _____
MDL= **Method Detection Limit**

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7 (Continued page 3 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

PCBs										
Sample ID	Bldg 88-1 (7-8')		Bldg 88-2 (7-9')		Bldg 88-2 (15-17')		Bldg 88-3 (7-9')		Bldg 88-3 (13-15')	
Sample Depth (feet BGS)	7-8		7-9		15-17		7-9		13-15	
Date Collected	07/22/96		07/22/96		07/22/96		07/22/96		07/22/96	
Date Extracted	07/24/96		07/24/96		07/24/96		07/24/96		07/24/96	
Date Analyzed	07/25/96		07/25/96		07/25/96		07/25/96		07/25/96	
Analytical Method No.	8081		8081		8081		8081		8081	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1221	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1232	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1242	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1248	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1254	ND	330	ND	330	ND	330	ND	330	ND	330
☐ Aroclor 1280	ND	330	ND	330	ND	330	ND	330	ND	330
HALOGENATED HYDROCARBONS										
Sample ID	Bldg 88-1 (7-8')		Bldg 88-2 (7-9')		Bldg 88-2 (15-17')		Bldg 88-3 (7-9')		Bldg 88-3 (13-15')	
Sample Depth (feet BGS)	7-8		7-9		15-17		7-9		13-15	
Date Collected	07/22/96		07/22/96		07/22/96		07/22/96		07/22/96	
Date Extracted	07/26/96		07/26/96		07/26/96		07/26/96		07/26/96	
Date Analyzed	07/26/96		07/26/96		07/26/96		07/26/96		07/26/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,2-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7 (Continued page 4 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS (Cont.)										
Sample ID	Bldg 88-1 (7-8')		Bldg 88-2 (7-9')		Bldg 88-2 (15-17')		Bldg 88-3 (7-9')		Bldg 88-3 (13-15')	
Sample Depth (feet BGS)	7-8		7-9		15-17		7-9		13-15	
Date Collected	07/22/96		07/22/96		07/22/96		07/22/96		07/22/96	
Date Extracted	07/26/96		07/26/96		07/26/96		07/26/96		07/26/96	
Date Analyzed	07/26/96		07/26/96		07/26/96		07/26/96		07/26/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ cis-1,2-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ trans-1,2- Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Tetrachloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1,2-Trichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
OTHER *(Specify)*										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐										
☐										
☐										
☐										
☐										
☐										
☐										

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	Bldg 88-3 (19-21')		Bldg 88-4 (7-9')		Bldg 88-4 (11-13')		Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)	19-21		7-9		11-13		7-9		11-13	
Date Collected	07/22/96		07/22/96		07/22/96		11/12/96		11/12/96	
Date Extracted	07/25/96		07/25/96		07/25/96		11/16/96		11/16/96	
Date Analyzed	07/25/96		07/25/96		07/25/96		11/16/96		11/16/96	
Analytical Method No.	8020		8020		8020		8020		8020	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	10	ND	10	ND	10	ND	10	100	100
☐ Toluene	ND	10	ND	10	ND	10	ND	10	ND	100
☐ Ethylbenzene	ND	10	ND	10	700	10	ND	10	1600	100
☐ Total Xylenes	ND	10	7000	10	3400	10	ND	10	4400	100
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID							Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)							7-9		11-13	
Date Collected							11/12/96		11/12/96	
Date Extracted							11/16/96		11/16/96	
Date Analyzed							11/16/96		11/16/96	
Analytical Method No.							8270		8270	
Collection Method*							GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene							ND	300	700	300
☐ Acenaphthylene							ND	300	ND	300
☐ Anthracene							ND	300	1400	300
☐ Benzo(a)anthracene							ND	300	2400	300
☐ Benzo(a)pyrene							ND	300	2300	300
☐ Benzo(b)fluoranthene							ND	300	2300	300
☐ Benzo(g,h,i)perylene							ND	300	1600	300
☐ Benzo(k)fluoranthene							ND	300	2200	300

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 4 (Continued page 2 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID							Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)							7-9		11-13	
Date Collected							11/12/96		11/12/96	
Date Extracted							11/16/96		11/16/96	
Date Analyzed							11/16/96		11/16/96	
Analytical Method No.							8270		8270	
Collection Method*							GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Chrysene							ND	300	2900	300
☐ Dibenzo(a,h)anthracene							ND	300	ND	300
☐ Fluoranthene							ND	300	3900	300
☐ Fluorene							ND	300	900	300
☐ Indeno(1,2,3- cd)pyrene							ND	300	ND	300
☐ Naphthalene							ND	300	2600	300
☐ 2-Methylnaphthalene							ND	300	4200	300
☐ Phenanthrene							ND	300	3800	300
☐ Pyrene							ND	330	9000	300
METALS										
Sample ID	Bldg 88-3 (19-21')		Bldg 88-4 (7-9')		Bldg 88-4 (11-13')		Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)	19-21		7-9		11-13		7-9		11-13	
Date Collected	07/22/96		07/22/96		07/22/96		11/12/96		11/12/96	
Date Extracted	07/29/96		07/25/96		07/25/96		11/20/96		11/20/96	
Date Analyzed	07/29/96		07/25/96		07/25/96		11/20/96		11/20/96	
Analytical Method No.	6020		6020		6020		6020		6020	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium	100	50	ND	50	ND	50				
☐ Total Chromium	18,400	1000	1300	1000	1900	1000	1100	1000	4500	1000
☐ Total Lead	9500	1000	418,000	1000	89,900	1000	2100	1000	77,200	1000

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 4 (Continued page 3 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

PCBs										
Sample ID	Bldg 88-3 (19-21')		Bldg 88-4 (7-9')		Bldg 88-4 (11-13')					
Sample Depth (feet BGS)	19-21		7-9		11-13					
Date Collected	07/22/96		07/22/96		07/22/96					
Date Extracted	07/24/96		07/24/96		07/24/96					
Date Analyzed	07/25/96		07/25/96		07/25/96					
Analytical Method No.	8081		8081		8081					
Collection Method*	GP		GP		GP					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016	ND	330	ND	330	ND	330				
☐ Aroclor 1221	ND	330	ND	330	ND	330				
☐ Aroclor 1232	ND	330	ND	330	ND	330				
☐ Aroclor 1242	ND	330	ND	330	ND	330				
☐ Aroclor 1248	ND	330	ND	330	ND	330				
☐ Aroclor 1254	ND	330	ND	330	ND	330				
☐ Aroclor 1280	ND	330	ND	330	ND	330				
HALOGENATED HYDROCARBONS										
Sample ID	Bldg 88-3 (19-21')		Bldg 88-4 (7-9')		Bldg 88-4 (11-13')		Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)	19-21		7-9		11-13		7-9		11-13	
Date Collected	07/22/96		07/22/96		07/22/96		11/12/96		11/12/96	
Date Extracted	07/26/96		07/26/96		07/26/96		11/16/96		11/16/96	
Date Analyzed	07/26/96		07/26/96		07/26/96		11/16/96		11/16/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,2-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 4 (Continued page 4 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS										
Sample ID	Bldg 88-3 (19-21')		Bldg 88-4 (7-9')		Bldg 88-4 (11-13')		Bldg 88-6 (7-9')		Bldg 88-6 (11-13')	
Sample Depth (feet BGS)	19-21		7-9		11-13		7-9		11-13	
Date Collected	07/22/96		07/22/96		07/22/96		11/12/96		11/12/96	
Date Extracted	07/26/96		07/26/96		07/26/96		11/16/96		11/16/96	
Date Analyzed	07/26/96		07/26/96		07/26/96		11/16/96		11/16/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	GP		GP		GP		GP		GP	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ cis-1,2-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ trans-1,2- Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Tetrachloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1,2-Trichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
OTHER *(Specify)*										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐										
☐										
☐										
☐										
☐										
☐										
☐										

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
If Other (OT), Specify here: _____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Date Analyzed	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Analytical Method No.	8020		8020		8020		8020		8020	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	10	ND	10	ND	10	ND	10	ND	100
☐ Toluene	ND	10	ND	10	ND	10	ND	10	ND	100
☐ Ethylbenzene	ND	10	ND	10	ND	10	ND	10	ND	100
☐ Total Xylenes	ND	10	ND	10	ND	10	ND	10	ND	100
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/14/96		11/14/96		11/14/96		11/14/96		11/14/96	
Date Analyzed	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
Analytical Method No.	8270		8270		8270		8270		8270	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Acenaphthylene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Anthracene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Benzo(a)anthracene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Benzo(a)pyrene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Benzo(b)fluoranthene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Benzo(g,h,i)perylene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Benzo(k)fluoranthene	ND	1200	ND	300	ND	300	ND	300	ND	300

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

ATTACHMENT NO. 4 (Continued page 2 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/14/96		11/14/96		11/14/96		11/14/96		11/14/96	
Date Analyzed	11/26/96		11/26/96		11/26/96		11/26/96		11/26/96	
Analytical Method No.	8270		8270		8270		8270		8270	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Chrysene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Dibenzo(a,h)anthracene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Fluoranthene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Fluorene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Indeno(1,2,3- cd)pyrene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Naphthalene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ 2-Methylnaphthalene	2100	1200	ND	300	ND	300	ND	300	ND	300
☐ Phenanthrene	ND	1200	ND	300	ND	300	ND	300	ND	300
☐ Pyrene	ND	1200	ND	300	ND	300	ND	330	ND	300
METALS										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/20/96		11/20/96		11/20/96		11/20/96		11/20/96	
Date Analyzed	11/20/96		11/20/96		11/20/96		11/20/96		11/20/96	
Analytical Method No.	6020		6020		6020		6020		6020	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium										
☐ Total Chromium	4400	1000	10,300	1000	11,200	1000	2300	1000	1400	1000
☐ Total Lead	19,600	1000	7600	1000	69,800	1000	7800	1000	2400	1000

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 4 (Continued page 3 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

PCBs										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016										
☐ Aroclor 1221										
☐ Aroclor 1232										
☐ Aroclor 1242										
☐ Aroclor 1248										
☐ Aroclor 1254										
☐ Aroclor 1280										
HALOGENATED HYDROCARBONS										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Date Analyzed	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,2-Dichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

ATTACHMENT NO. 4 (Continued page 4 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Date Analyzed	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ cis-1,2-Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ trans-1,2- Dichloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Tetrachloroethylene	ND	10	ND	10	ND	10	ND	10	ND	10
☐ 1,1,2-Trichloroethane	ND	10	ND	10	ND	10	ND	10	ND	10
OTHER *(Specify)*										
Sample ID	SB1/MW1 (5-7')		SB1/MW1 (13-15')		SB2/MW2 (4-6')		SB2/MW2 (14-16')		SB3/MW3 (4-6')	
Sample Depth (feet BGS)	5-7		13-15		4-6		14-16		4-6	
Date Collected	11/07/96		11/07/96		11/07/96		11/07/96		11/07/96	
Date Extracted	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Date Analyzed	11/17/96		11/17/96		11/17/96		11/17/96		11/17/96	
Analytical Method No.	8010		8010		8010		8010		8010	
Collection Method*	SS		SS		SS		SS		SS	
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Bis(2-ethylhexyl)phthalate	ND	10	ND	10	1800	10	1100	10	600	10
☐										
☐										
☐										
☐										
☐										
☐										

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 7
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/17/96		11/17/96		11/17/96					
Date Analyzed	11/17/96		11/17/96		11/17/96					
Analytical Method No.	8020		8020		8020					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	10	ND	10	ND	10				
☐ Toluene	ND	10	ND	10	ND	10				
☐ Ethylbenzene	ND	10	ND	10	ND	10				
☐ Total Xylenes	ND	10	ND	10	ND	10				
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/14/96		11/14/96		11/14/96					
Date Analyzed	11/26/96		11/26/96		11/26/96					
Analytical Method No.	8270		8270		8270					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene	ND	300	ND	300	ND	300				
☐ Acenaphthylene	ND	300	ND	300	ND	300				
☐ Anthracene	ND	300	ND	300	ND	300				
☐ Benzo(a)anthracene	ND	300	ND	300	ND	300				
☐ Benzo(a)pyrene	ND	300	ND	300	ND	300				
☐ Benzo(b)fluoranthene	ND	300	ND	300	ND	300				
☐ Benzo(g,h,i)perylene	ND	300	ND	300	ND	300				
☐ Benzo(k)fluoranthene	ND	300	ND	300	ND	300				

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

ATTACHMENT NO. 4 (Continued page 2 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/14/96		11/14/96		11/14/96					
Date Analyzed	11/26/96		11/26/96		11/26/96					
Analytical Method No.	8270		8270		8270					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Chrysene	ND	300	ND	300	ND	300				
☐ Dibenzo(a,h)anthracene	ND	300	ND	300	ND	300				
☐ Fluoranthene	ND	300	ND	300	ND	300				
☐ Fluorene	ND	300	ND	300	ND	300				
☐ Indeno(1,2,3- cd)pyrene	ND	300	ND	300	ND	300				
☐ Naphthalene	ND	300	ND	300	ND	300				
☐ 2-Methylnaphthalene	ND	300	ND	300	ND	300				
☐ Phenanthrene	ND	300	ND	300	ND	300				
☐ Pyrene	ND	300	ND	300	ND	300				
METALS										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/20/96		11/20/96		11/20/96					
Date Analyzed	11/20/96		11/20/96		11/20/96					
Analytical Method No.	6020		6020		6020					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium										
☐ Total Chromium	2500	1000	3800	1000	1800	1000				
☐ Total Lead	3900	1000	5300	1000	3400	1000				

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 4 (Continued page 3 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

PCBs										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Analytical Method No.										
Collection Method*										
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016										
☐ Aroclor 1221										
☐ Aroclor 1232										
☐ Aroclor 1242										
☐ Aroclor 1248										
☐ Aroclor 1254										
☐ Aroclor 1280										
HALOGENATED HYDROCARBONS										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/17/96		11/17/96		11/17/96					
Date Analyzed	11/17/96		11/17/96		11/17/96					
Analytical Method No.	8010		8010		8010					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	10	ND	10	ND	10				
☐ 1,1-Dichloroethane	ND	10	ND	10	ND	10				
☐ 1,2-Dichloroethane	ND	10	ND	10	ND	10				
☐ 1,1-Dichloroethylene	ND	10	ND	10	ND	10				

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
*If Other (OT), Specify here:*_____
MDL= Method Detection Limit

ATTACHMENT NO. 4 (Continued page 4 of 4)
LABORATORY RESULTS SOIL
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/17/96		11/17/96		11/17/96					
Date Analyzed	11/17/96		11/17/96		11/17/96					
Analytical Method No.	8010		8010		8010					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ cis-1,2-Dichloroethylene	ND	10	ND	10	ND	10				
☐ trans-1,2- Dichloroethylene	ND	10	ND	10	ND	10				
☐ Tetrachloroethylene	ND	10	ND	10	ND	10				
☐ 1,1,2-Trichloroethane	ND	10	ND	10	ND	10				
OTHER *(Specify)*										
Sample ID	SB3/MW3 (13-15')		SB4/MW4 (8-10')		SB4/MW4 (10-12')					
Sample Depth (feet BGS)	13-15		8-10		10-12					
Date Collected	11/07/96		11/07/96		11/07/96					
Date Extracted	11/17/96		11/17/96		11/17/96					
Date Analyzed	11/17/96		11/17/96		11/17/96					
Analytical Method No.	8010		8010		8010					
Collection Method*	SS		SS		SS					
CONSTITUENT (ug/kg)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Bis(2-ethylhexyl)phthalate	ND	10	ND	10	ND	10				
☐										
☐										
☐										
☐										
☐										
☐										

BGS=Below Ground Surface
*Collection Method Codes (list all that apply); Grab Sample (GS), Split Spoon(SS), Hand Auger(HA), Geoprobe(GP), Continuous Corer (CC), Soil Gas (SG), Cone Penetrometer (CP), Hydropunch(HP)
If Other (OT), Specify here: _____
MDL= Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 8
TIER I RBSL/TIER II OR TIER III SSTL COMPARISON TABLE FOR SOILS
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

☐ **Residential** ☐ **Commercial III** ☐ **Commercial IV** ☑ **Industrial**
Exposure Codes

A. Direct Contact **B. Soil Leaching to Potable Groundwater**

Contaminant	Sample ID with Maximum Detected Concentration	Corresponding Sample Date	Maximum Detected Concentration (ug/kg)	Applicable Criterion with Exposure Codes (ug/kg)		Criterion Exceeded? (Yes or No)	
				Tier I RBSL	Tier II/III SSTL	Tier I RBSL	Tier II/III SSTL
VOLATILES							
☐ Benzene	Bldg 88-6 (11-13')	11/12/96	100	100		No	
☐ Toluene			ND	1600		No	
☐ Ethylbenzene	Bldg 88-6 (11-13')	11/12/96	1600	1500		Yes	
☐ Total Xylenes	Bldg 88-4 (7-9')	11/12/96	7000	5600		Yes	
☐ MTBE							
POLYNUCLEAR AROMATICS							
☐ Acenaphthene	Bldg 88-6 (11-13')	11/12/96	700	300,000		No	
☐ Acenaphthylene			ND	520		No	
☐ Anthracene	Bldg 88-6 (11-13')	11/12/96	1400	6,900,000		No	
☐ Benzo(a)anthracene	Bldg 88-6 (11-13')	11/12/96	2400	E		No	
☐ Benzo(a)pyrene	Bldg 88-6 (11-13')	11/12/96	2300	E		No	
☐ Benzo(b)fluoranthene	Bldg 88-6 (11-13')	11/12/96	2300	E		No	
☐ Benzo(g,h,i)perylene	Bldg 88-6 (11-13')	11/12/96	1600	E		No	
☐ Benzo(k)fluoranthene	Bldg 88-6 (11-13')	11/12/96	2200	E		No	
☐ Chrysene	Bldg 88-6 (11-13')	11/12/96	2900	E		No	
☐ Dibenzo-(a,h)anthracene			ND	E		No	
☐ Fluoranthene	Bldg 88-6 (11-13')	11/12/96	3900	3,000,000		No	
☐ Fluorene	Bldg 88-6 (11-13')	11/12/96	900	390,000		No	
☐ Indeno(1,2,3- cd)pyrene			ND	E		No	
☐ Naphthalene	Bldg 88-6 (11-13')	11/12/96	2600	1700		No	
☐ Phenanthrene	Bldg 88-6 (11-13')	11/12/96	3800	12,000		No	
☐ Pyrene	Bldg 88-6 (11-13')	11/12/96	9000	1,800,000		No	
☐ 2-Methylnaphthalene	Bldg 88-6 (11-13')	11/12/96	4200	5200		No	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

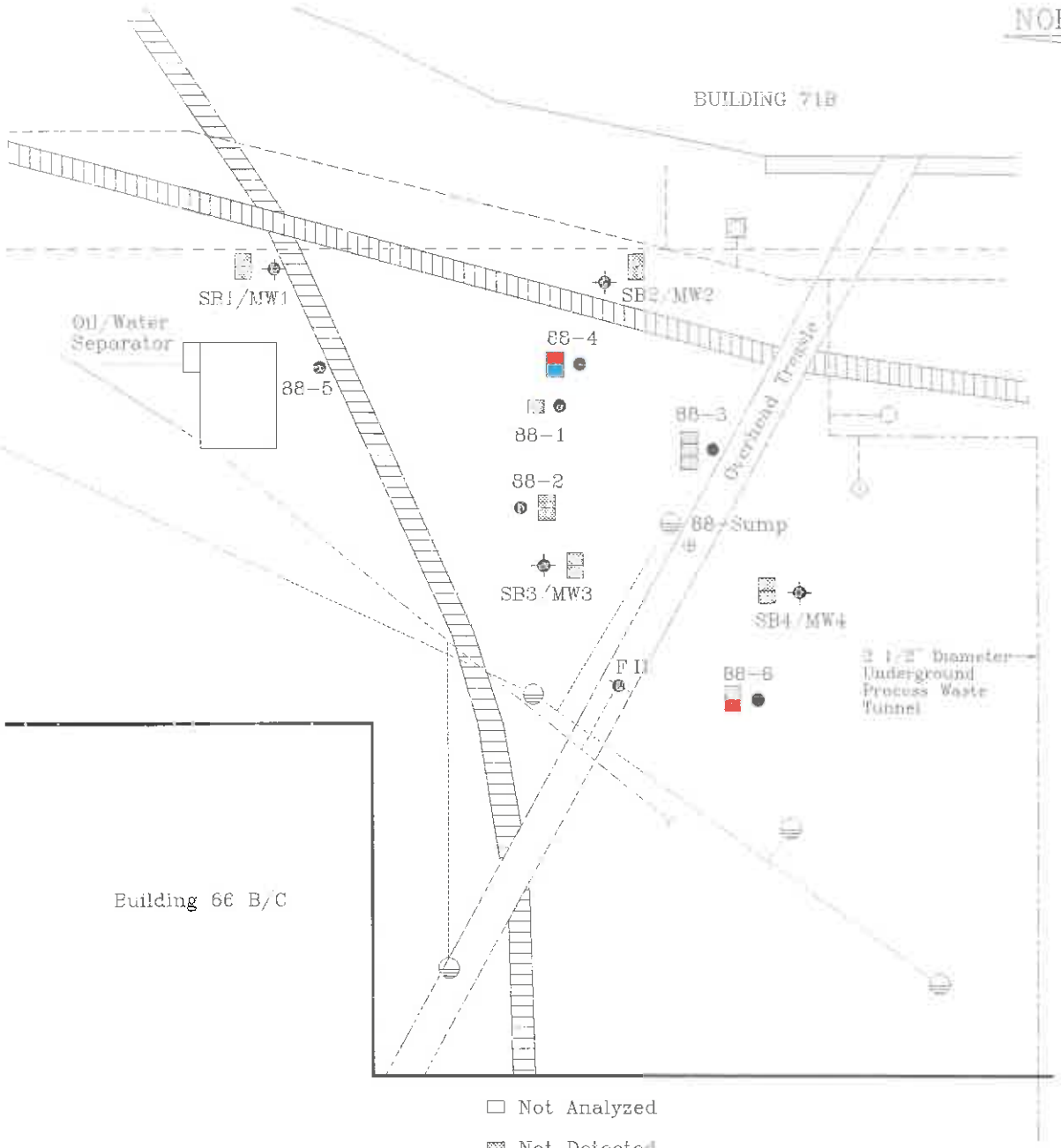
ATTACHMENT NO. 8 (Continued Page 2 of 2
TIER I RBSL/TIER II OR TIER III SSTL COMPARISON TABLE FOR SOILS
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

Contaminant	Sample ID with Maximum Detected Concentration	Corresponding Sample Date	Maximum Detected Concentration (ug/kg)	Applicable Criterion with Exposure Codes (ug/kg)		Criterion Exceeded? (Yes or No)	
				Tier I RBSL	Tier II/III SSTL	Tier I RBSL	Tier II/III SSTL
METALS							
☐ Cadmium	Bldg 88-2 (15-17')	7/22/96	130	1200		No	
☐ Total Chromium	Bldg 88-3 (19-21')	7/22/96	18,400	18,000		Yes	
☐ Total Lead	Bldg 88-4 (7-9')	7/22/96	418,000	21,000		Yes	
PCBs							
☐ Aroclor 1016			ND			No	
☐ Aroclor 1221			ND			No	
☐ Aroclor 1232			ND			No	
☐ Aroclor 1242			ND			No	
☐ Aroclor 1248			ND			No	
☐ Aroclor 1254			ND			No	
☐ Aroclor 1280			ND			No	
HALOGENATED HYDROCARBONS							
☐ Carbon Tetrachloride			ND			No	
☐ 1,1-Dichloroethane			ND			No	
☐ 1,2-Dichloroethane			ND			No	
☐ 1,1-Dichloroethylene			ND			No	
☐ cis-1,2-Dichloroethylene			ND			No	
☐ trans-1,2-Dichloroethylene			ND			No	
☐ Tetrachloroethylene			ND			No	
☐ 1,1,2-Trichloroethane			ND			No	
OTHER*							
☐ Bis (2-ethylhexyl)phthalate	SB2/MW2 (4-6')	11/7/96	1800	E		No	
☐							
☐							

ATTACHMENT 9

ATTACHMENT 10

-- SEE ATTACHMENT 9 --



* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

- Not Analyzed
- Not Detected
- Below Tier 1 Industrial Soil Leaching to Groundwater RBSLs
- Above Tier 1 Industrial Soil Leaching to Groundwater RBSLs

LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP: BTEX
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'

DATE: 8/13/96

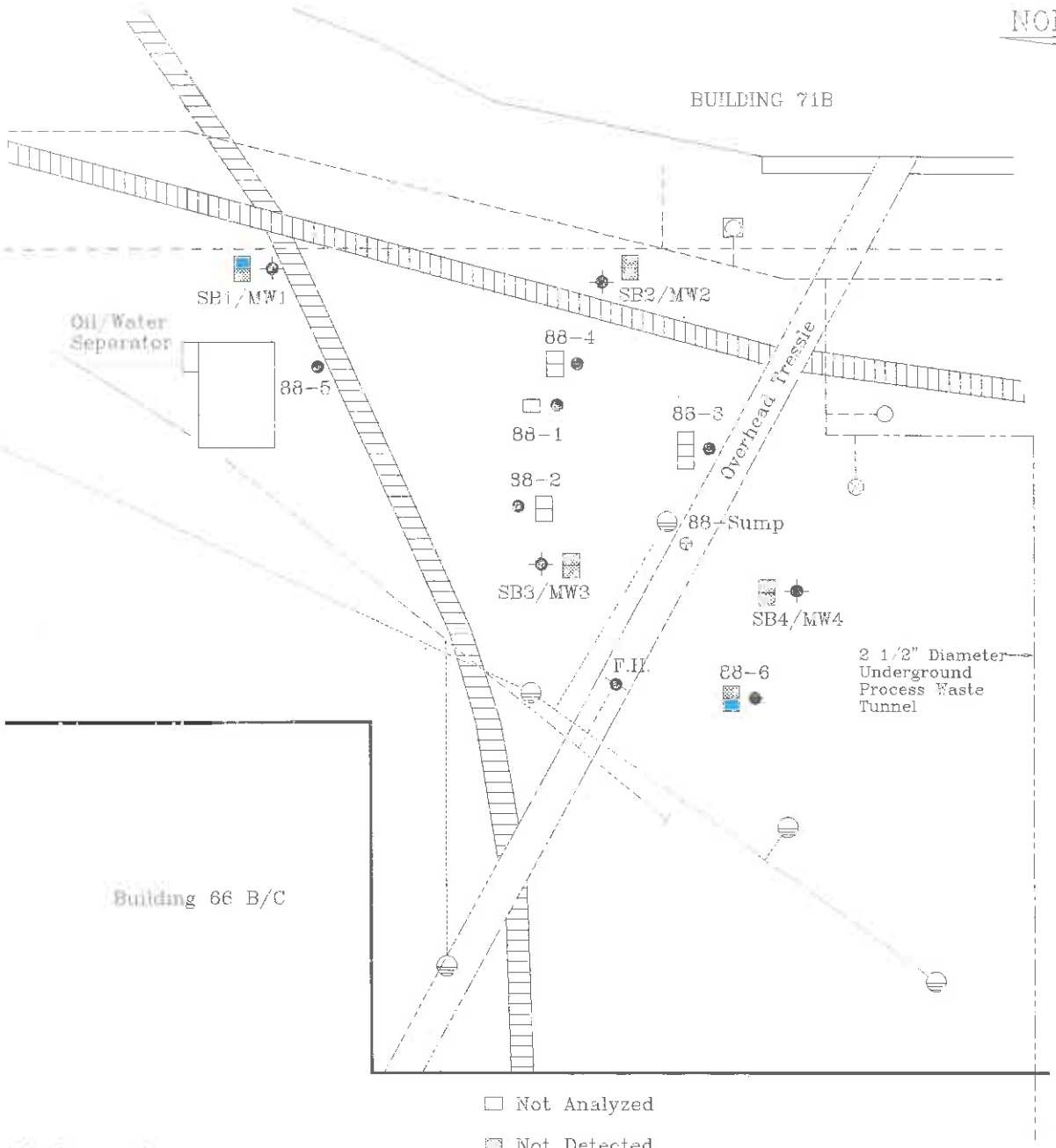
APPROVED BY: A.L.K.

PREPARED BY: C.G.S.

ATTACHMENT NUMBER: 9a

PROJECT NUMBER: F174

Global Environmental Engineering Inc.



- Not Analyzed
- Not Detected
- Below Tier I Industrial Soil Leaching to Groundwater RBSLs
- Above Tier I Industrial Soil Leaching to Groundwater RBSLs

* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

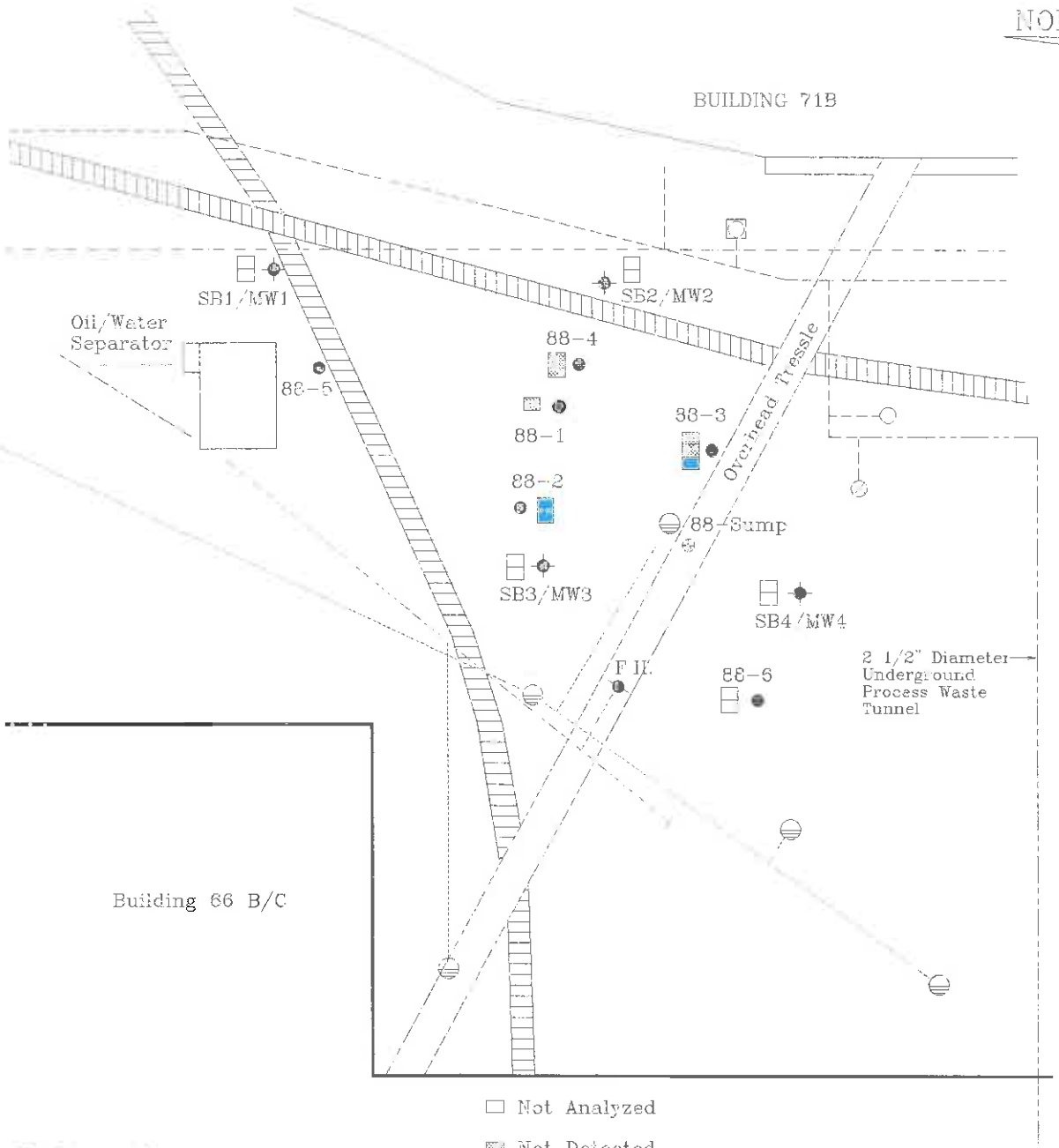
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP: PNAHs
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9b
	PROJECT NUMBER: F174



* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

- Not Analyzed
- Not Detected
- Below Tier I Industrial Soil Leaching to Groundwater RBSLs
- Above Tier I Industrial Soil Leaching to Groundwater RBSLs

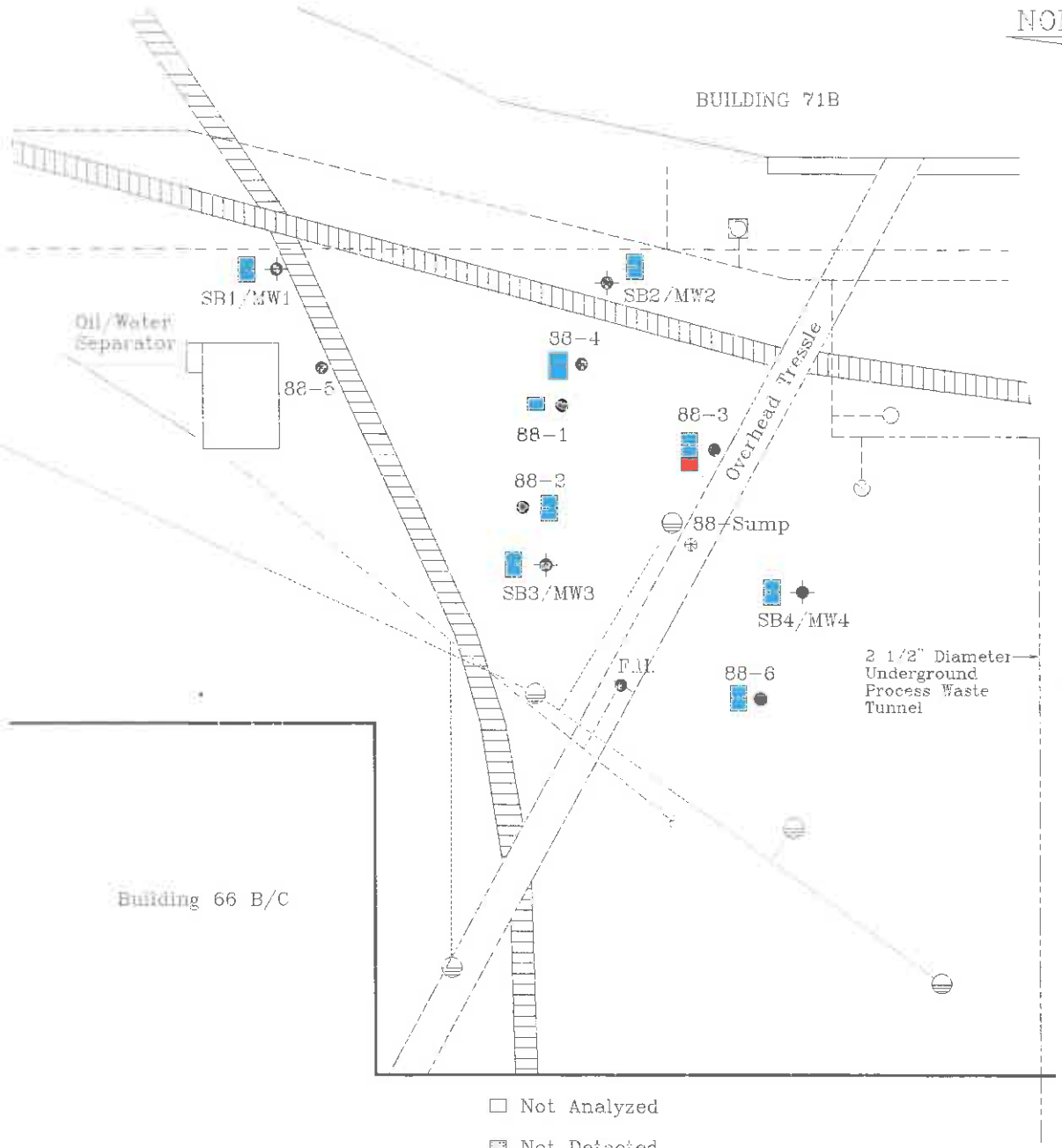
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE. SOIL CONCENTRATION MAP: CADMIUM
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9c
	PROJECT NUMBER: F174



* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

□ Not Analyzed

▨ Not Detected

■ Below Tier I Industrial Soil Leaching to Groundwater RBSLs

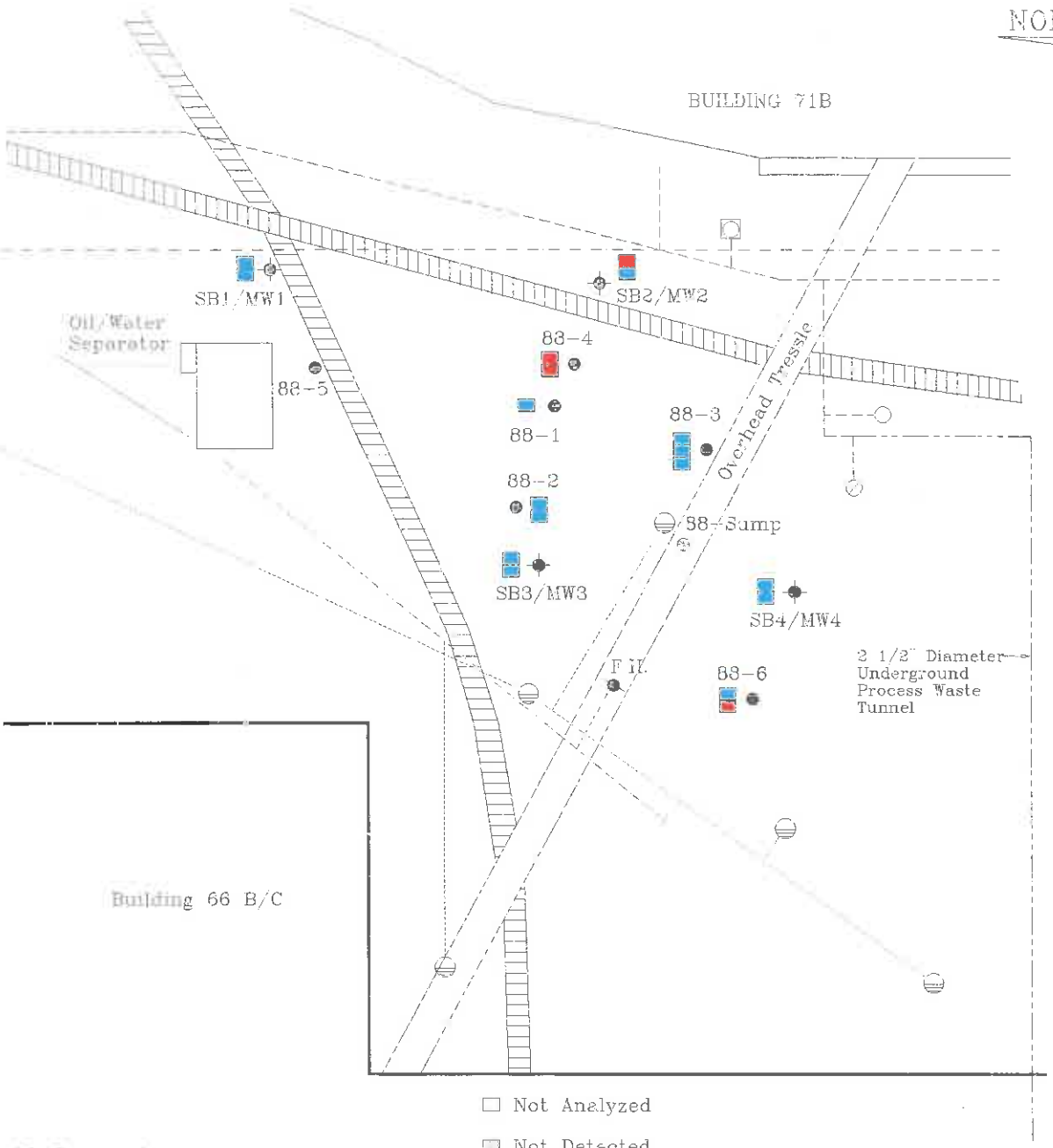
■ Above Tier I Industrial Soil Leaching to Groundwater RBSLs

LEGEND:

- ⊕ Monitoring Well/Soil Boring
- ● Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- ⊕ Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP: CHROMIUM BUILDING 88 TANKS 050/88 - 058/88	
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9d
	PROJECT NUMBER: F174



* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

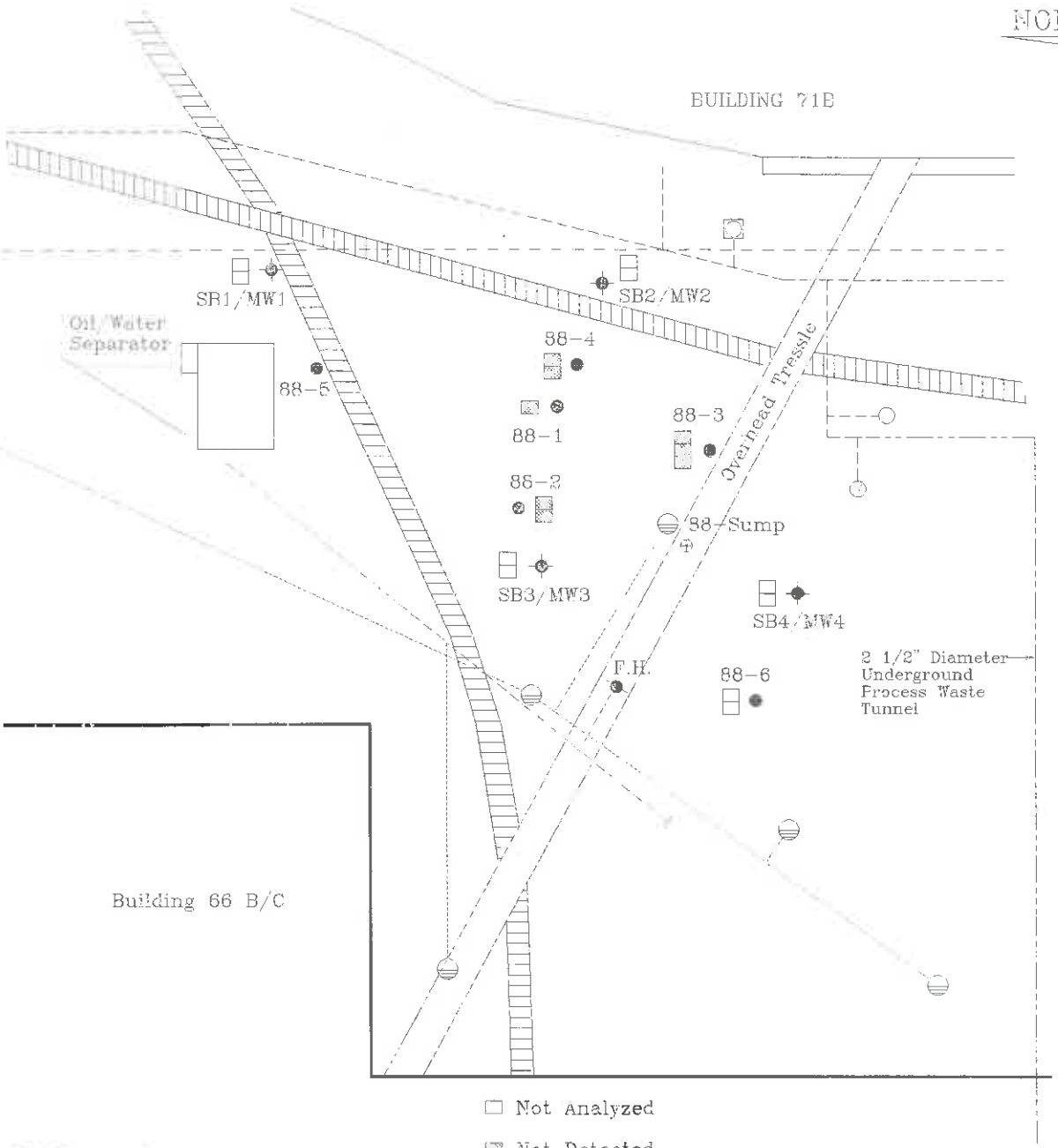
- ☐ Not Analyzed
- ☐ Not Detected
- Below Tier I Industrial Soil Leaching to Groundwater RBSLs
- Above Tier I Industrial Soil Leaching to Groundwater RBSLs

LEGEND

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP: LEAD BUILDING 88 TANKS 050/88 - 058/88	
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9e
	PROJECT NUMBER: F174



□ Not Analyzed

▨ Not Detected

▨ Below Tier I Industrial Soil Leaching to Groundwater RBSLs

■ Above Tier I Industrial Soil Leaching to Groundwater RBSLs

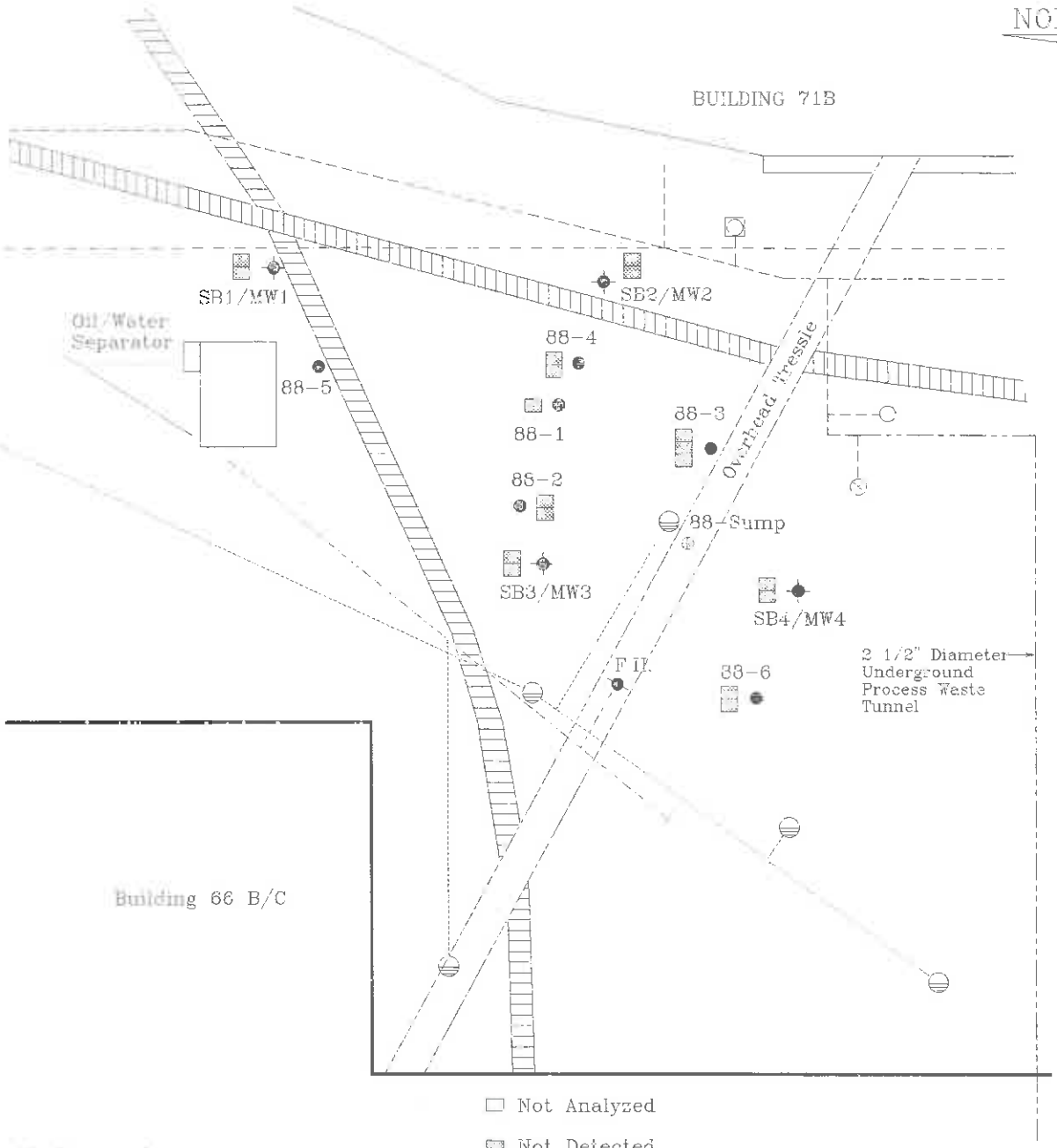
* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

LEGEND:

- ⊕ Monitoring Well/Soil Boring
- ● Geoprobe Sample Locations
- ----- Fire Protection Line
- ——— Storm Sewer Line
- – – – City Water Line
- ⊕ Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP. PCBs BUILDING 88 TANKS 050/88 - 058/88	
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9f
	PROJECT NUMBER: F174



* Boring 88-5 was abandoned due to an obstruction at 5' below ground surface.

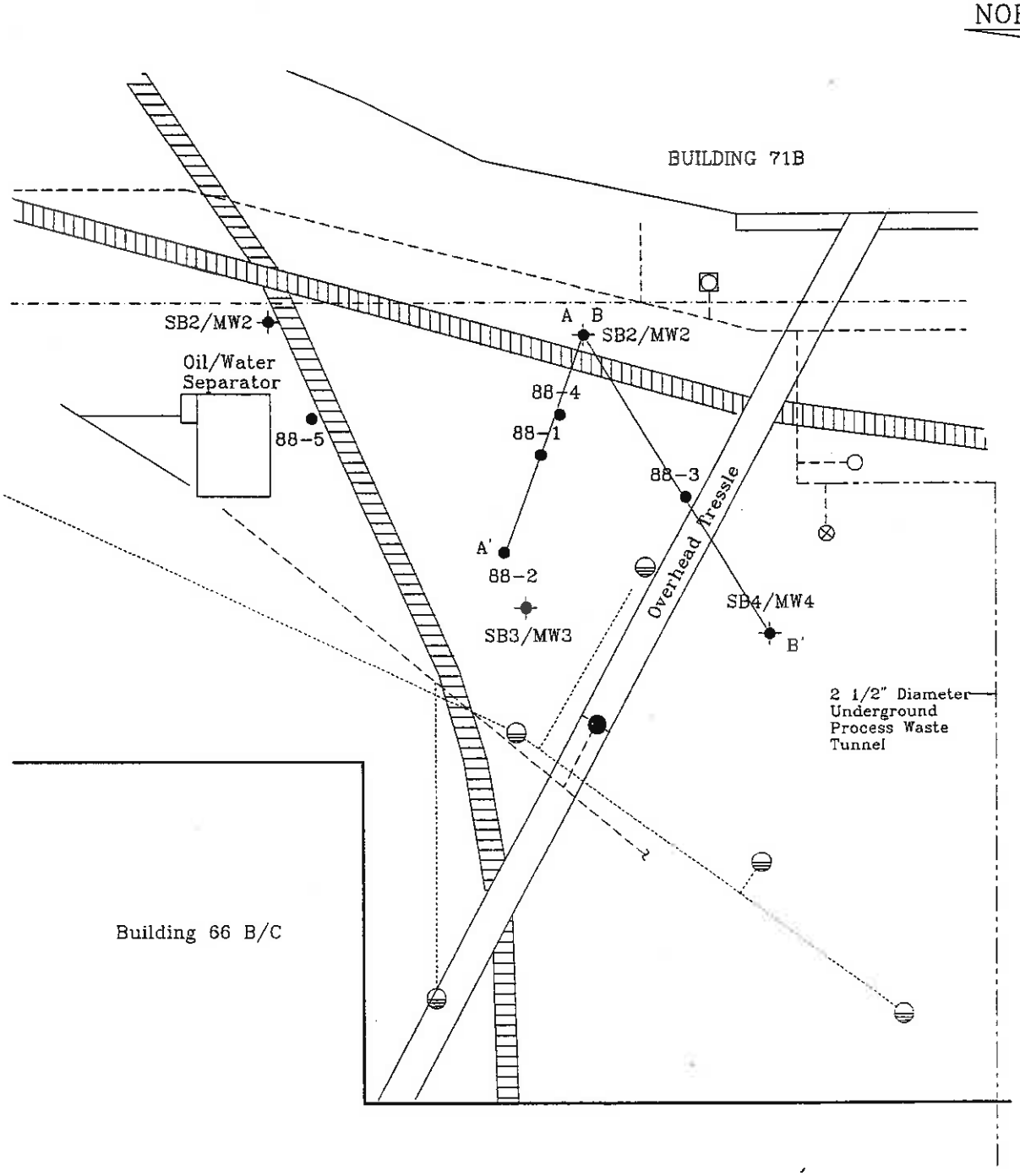
- Not Analyzed
- Not Detected
- Below Tier I Industrial Soil Leaching to Groundwater RBSLs
- Above Tier I Industrial Soil Leaching to Groundwater RBSLs

LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: SOIL CONCENTRATION MAP: HALOGENATED HYDROCARBONS – BUILDING 88 TANKS 050/88 – 058/88	
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 9g
	PROJECT NUMBER: F174



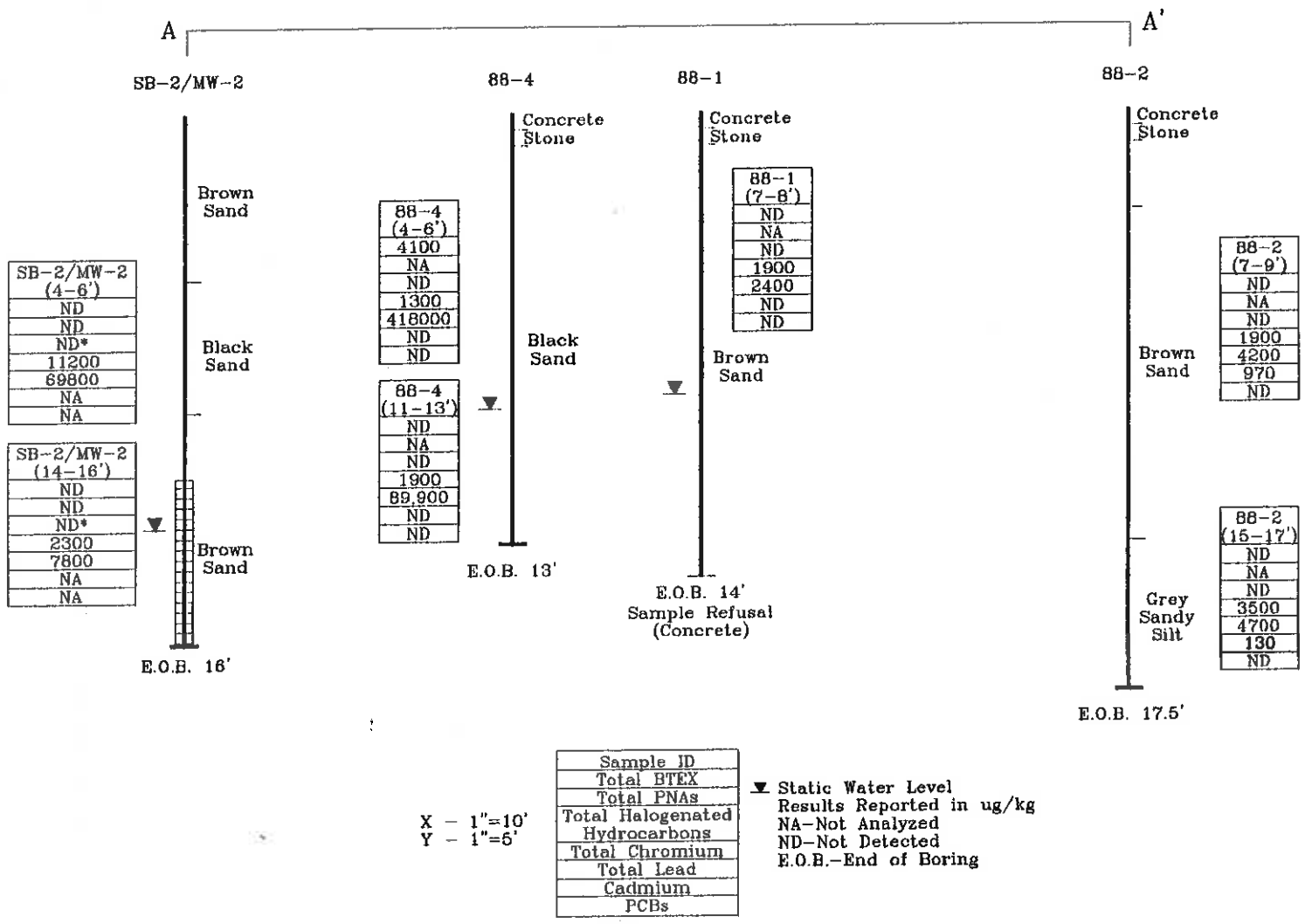
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line

GM CLCD NORTH

TITLE: CROSS SECTIONAL LOCATION DIAGRAM
BUILDING 88 – TANKS 050/88 – 058/88

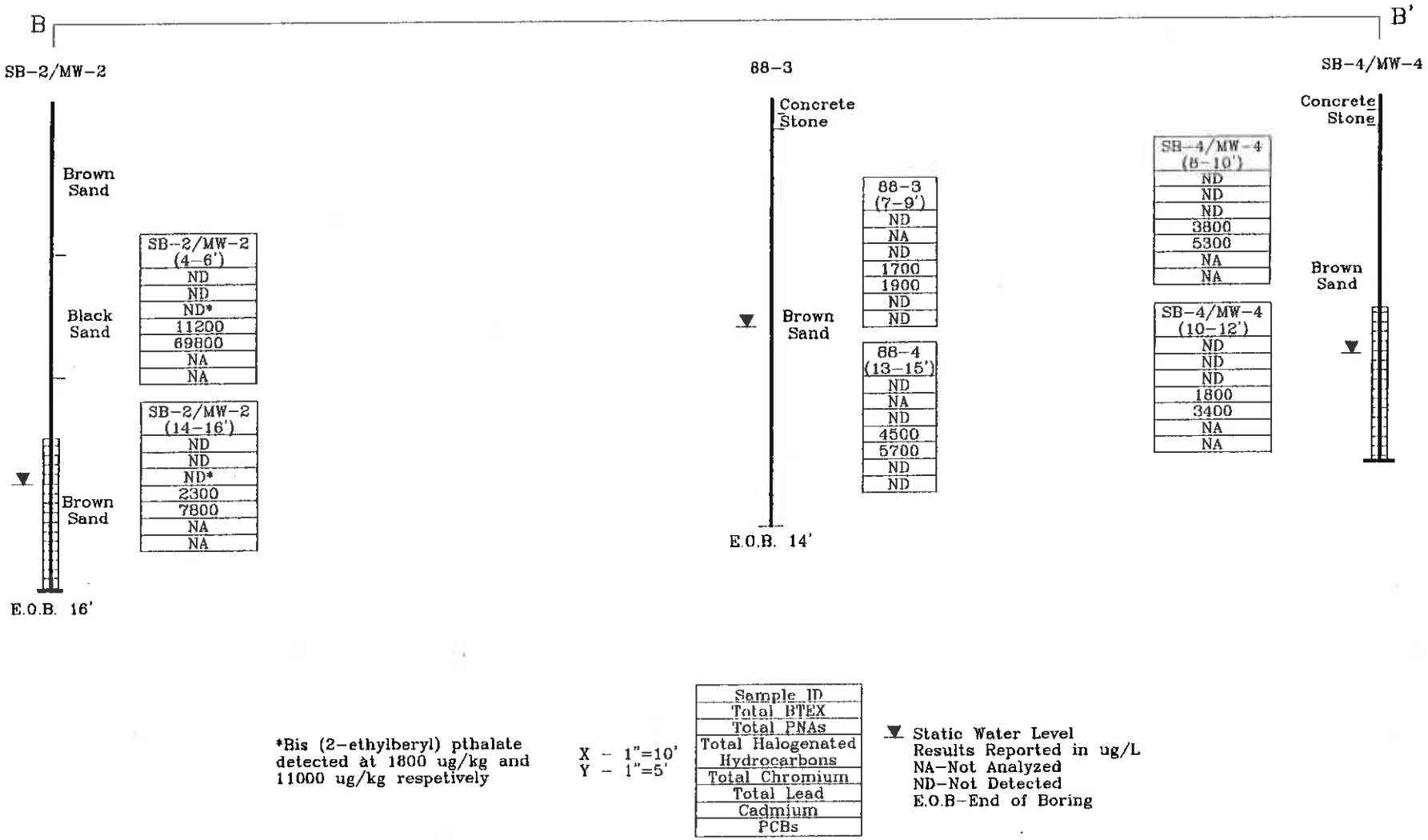
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 11a
	PROJECT NUMBER: F174



Global Environmental Engineering Inc.

East to West Cross Sectional Diagram A-A'
GMCLCD North - Building 88 Tank Farm
Flint, Michigan

Date: 1/14/97
Prepared By: C.G.S.
Attachment Number: 11b
Project Number: F174



Global Environmental Engineering Inc.

East to West Cross Sectional Diagram A-A'
GMCLCD North - Building 88 Tank Farm
Flint, Michigan

Date: 1/14/97
Prepared By: C.G.S.
Attachment Number: 11c
Project Number: F174

ATTACHMENT 12

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	Bldg 88-1	**Project:**	GM CLCD North UST Closure
Date:	7/22/96	**Project #:**	F174
Drilling Contractor:	YECI	**Location:**	Hamilton & Industrial Ave.
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	9:30	**Depth Drilled:**	14'
Time Completed:		**Hole Diameter:**	2"
Length Coring Device:	2'	**Coring Device:**	2"
Fluid Used:	None		
Driller:	Ken		
Helper:	N/A		
Weight/Drop:	N/A		

Boring Methods	
	Hollow Stem Auger
	Hand Auger
X	Geoprobe

Groundwater Information	
GW Encountered at	
Monitor Wells Installed	
Yes	No

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	FID	GC
				Concrete			
		1		Stone			
	GP-1		SP	Sand	Brown, Moist, Fine/Medium		
		2					
		3				ND	
		4					
		5				ND	
	GP-2						
		6					
		7				ND	
		8					
	[X]	9			Wet	95.0	
	GP-3						
		10					
		11				ND	
		12					
		13				ND	
	GP-4						
		14			Sample Refusal (Concrete)	ND	
			E.O.B	End of Boring 14'			
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	Bldg 88-2	**Project:**	GM CLCD North UST Closure
Date:	7/22/96	**Project #:**	F174
Drilling Contractor:	YECI	**Location:**	Hamilton & Industrial Ave.
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	10:25	**Depth Drilled:**	17'
Time Completed:		**Hole Diameter:**	2"
Length Coring Device:	2'	**Coring Device:**	2"
Fluid Used:	None		
Driller:	Ken		
Helper:	N/A		
Weight/Drop:	N/A		

Boring Methods

	Hollow Stem Auger
	Hand Auger
X	Geoprobe

Groundwater Information

GW Encountered at	
Monitor Wells Installed	
Yes	No

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	FID	GC
				Concrete			
		1		Stone			
	GP-1		SP	Sand/Coal	Brown/Black, Moist, Fine/Medium		
		2					
		3					
				Sand	Brown	ND	
		4					
		5					
	GP-2					ND	
		6					
		7					
						ND	
		8					
	[X]	9				75.0	
	GP-3						
		10					
		11				50.0	
		12					
		13				65.0	
	GP-4		SM	Sandy Silt	Gray		
		14					
		15				75.0	
		16					
	[X]	17				125.0	
			E.O.B	End of Boring 17'			
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	Bldg 88-3	**Project:**	GM CLCD North UST Closure
Date:	7/22/96	**Project #:**	F174
Drilling Contractor:	YECI	**Location:**	Hamilton & Industrial Ave.
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	13:20	**Depth Drilled:**	21'
Time Completed:		**Hole Diameter:**	2"
Length Coring Device:	2'	**Coring Device:**	2"

Boring Methods		Groundwater Information			
	Hollow Stem Auger	GW Encountered at		**Fluid Used:**	None
	Hand Auger	Monitor Wells Installed		**Driller:**	Ken
X	Geoprobe	Yes	No	**Helper:**	N/A
				Weight/Drop:	N/A

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	PID	GC
				Concrete			
		1		Stone			
	GP-1		SP	Sand	Brown, Moist, Fine/Medium		
		2					
		3					
				Sand	Brown	ND	
		4					
		5					
	GP-2					ND	
		6					
		7					
					Wet	75	
		8					
	[X]	9					
	GP-3						
		10					
		11				180	
		12					
		13				250	
	GP-4						
		14					
			SM	Sandy Silt	Gray, Moist		
	[X]	15				>1000	
	GP-5			Silty Sand	Wet		
		16					
					No Recovery (16'-18')		
	[X]	17				NA	
	GP-6						
		18					
		19				150	
	GP-7	20	CL	Clay	Moist		
	[X]	21				ND	
			E.O.B	End of Boring 21'			
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	Bldg 88-4	**Project:**	GM CLCD North UST Closure
Date:	7/22/96	**Project #:**	F174
Drilling Contractor:	YECI	**Location:**	Hamilton & Industrial Ave.
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	13:20	**Depth Drilled:**	13'
Time Completed:		**Hole Diameter:**	2"
Length Coring Device:	2'	**Coring Device:**	2"

Boring Methods		Groundwater Information			
	Hollow Stem Auger	**GW Encountered at**		**Driller:**	Ken
	Hand Auger	**Monitor Wells Installed**		**Helper:**	N/A
X	**Geoprobe**	**Yes**	**No**	**Weight/Drop:**	N/A

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	FID	GC
				Concrete			
		1		Stone			
	GP-1		SP	Sand	Black, Moist, Fine/Medium		
		2					
		3					
						ND	
		4					
		5					
	GP-2					4.0	
		6					
		7					
						50.0	
		8					
		9			Wet		
	GP-3[X]					>1000	
		10					
		11					
						>1000	
		12					
	[X]	13				>1000	
			E.O.B	End of Boring 13'			
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

Global Environmental Engineering Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring	SB88-6	**Project:**	GMCLCD N. - UST Closures
Date:	11/12/96	**Project #:**	F174
Drilling Contractor:	YECI	**Location:**	Building 88
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	9:05	**Total Depth Drilled:**	13'
Time Completed:		**Hole Diameter:**	2"
Length Coring Device:	5'	**Dia. Coring Device:**	2"
Drilling Fluid Used:			None
Driller:			Scott
Helper:			N/A
Hammer Weight/Drop:			N/A

Boring Methods

	Hollow Stem Auger
	Hand Auger
X	Geoprobe

Ground Water Observations

GW Encountered at	
Monitor Wells Installed	
Yes	No

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	OVA	GC
				Concrete			
		1.					
	GP-1		SP	Sand	Brown, Moist, Fine/Medium		
		2.					
		3.				ND	
		4.					
						8.0	
		5.					
	GP-2						
		6.					
						125.0	
		7.					
		8.					
	[X]	9.			Black, Wet	>1000	
	GP-3						
		10.					
		11.			Brown/Gray		
		12.					
		13.					
	[X]		E.O.B.	End of Boring 13'		>1000	
		14.					
		15.					
		16.					
		17.					
		18.					
		19.					
		20.					
		21.					
		22.					
		23.					

SS-Split Spoon | HA-Hand Auger Sample | PID-Photoionization Detector (ppm) | AL-Acetate Liner
NR-No Recovery | [X]-Laboratory/Jar Sample | GC-Gas Chromatograph (ppb) | FS-Field Screening Container

Global Environmental Engineering, Inc.
352 South Saginaw St., Suite 600
Flint, Michigan 48502
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	SB1/MW1	**Project:**	GMCLCD N. – UST Closures
Date:	11/6/96	**Project #:**	F174
Drilling Contractor:	GEEI	**Location:**	Building 88
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	8:30	**Depth Drilled:**	17'
Time Completed:		**Hole Diameter:**	8.25"
Length Coring Device:	5'	**Coring Device:**	4.5"

Boring Methods		Groundwater Information			
	Hollow Stem Auger	GW Encountered at		**Fluid Used:**	None
	Hand Auger	Monitor Wells Installed		**Driller:**	Lisa
X	Geoprobe	Yes X	No	**Helper:**	NA
				Weight/Drop:	140#/30"

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	OVA	GC
		1					
		2					
		3					
		4					
		5					
	SS	6	SP	Sand	Black, Moist, Fine/Medium		
	SS	7					
	SS–[X]	8	SM	Silt	Gray	>1000	
	SS	9				200	
	SS	10					
	SS	11					
	SS	12	CL	Silty Clay		100	
	SS	13	SM	Silt	Wet	8.0	
	SS	14					
	SS	15				8.0	
	SS–[X]	16					
		17					
		18	E.O.B.	End of Boring 17'			
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS–Split Spoon
NR–No Recovery
HA–Hand Auger Sample
[X]–Laboratory/Jar Sample
PID–Photoionization Detector (ppm)
GC–Gas Chromatograph (ppb)
AL–Acetate Liner
FS–Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	SB2/MW2	**Project:**	GMCLCD N. – UST Closures
Date:	11/6/96	**Project #:**	F174
Drilling Contractor:	GEEI	**Location:**	Building 88
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	11:45	**Depth Drilled:**	16'
Time Completed:		**Hole Diameter:**	8.25"
Length Coring Device:	5'	**Coring Device:**	4.5"
Groundwater Information		**Fluid Used:**	None
GW Encountered at		**Driller:**	Lisa
Monitor Wells Installed		**Helper:**	NA
Yes X	**No**	**Weight/Drop:**	140#/30"

Boring Methods

X	**Hollow Stem Auger**
	Hand Auger
	Geoprobe

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	OVA	GC
		1					
		2					
	SS		SP	Sand	Brown, Moist, Fine/Medium		
	SS	3					
	SS						
	SS	4				500	
	SS						
	SS	5			Black		
	SS						
	SS-[X]	6				>1000	
	SS						
	SS	7					
	SS					>1000	
	SS	8					
	SS				Brown		
	SS	9					
	SS						
	SS	10				280	
	SS						
	SS	11					
	SS						
	SS	12				320	
	SS				Wet		
	SS	13					
	SS						
	SS	14					
	SS						
	SS	15					
	SS						
	SS-[X]	16					
			E.O.B.	End of Boring 16'			
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS–Split Spoon
NR–No Recovery
HA–Hand Auger Sample
[X]–Laboratory/Jar Sample
PID–Photoionization Detector (ppm)
GC–Gas Chromatograph (ppb)
AL–Acetate Liner
FS–Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	SB3/MW3	**Project:**	GMCLCD N. – UST Closures
Date:	11/7/96	**Project #:**	F174
Drilling Contractor:	GEEI	**Location:**	Building 88
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	11:45	**Depth Drilled:**	15'
Time Completed:		**Hole Diameter:**	8.25"
Length Coring Device:	5'	**Coring Device:**	4.5"
Fluid Used:			None
Driller:			Lisa
Helper:			NA
Weight/Drop:			140#/30"

Boring Methods		Groundwater Information
X	Hollow Stem Auger	GW Encountered at
	Hand Auger	Monitor Wells Installed
	Geoprobe	Yes X No

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	OVA	GC
		1					
		2					
	SS		SP	Sand	Brown, Moist, Fine/Medium		
	SS	3					
	SS				Brown		
	SS	4				2.0	
	SS						
	SS	5					
	SS						
	SS-[X]	6				2.0	
	SS						
	SS	7					
	SS					>1000	
	SS	8				2.0	
	SS						
	SS	9					
	SS						
	SS	10				ND	
	SS						
	SS	11			Wet		
	SS						
	SS	12				3.0	
	SS						
	SS	13					
	SS						
	SS	14				2.0	
	SS						
	SS-[X]	15					
			E.O.B.	End of Boring 15'			
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

Global Environmental Engineering, Inc.
5467 Hill 23 Dr., Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Soil Boring:	SB4/MW4	**Project:**	GMCLCD N. – UST Closures
Date:	11/18/96	**Project #:**	F174
Drilling Contractor:	GEEI	**Location:**	Building 88
Prepared By:	JCW	**Twp/Sec.:**	
Time Started:	8:25	**Depth Drilled:**	12'
Time Completed:		**Hole Diameter:**	8.25"
Length Coring Device:	5'	**Coring Device:**	4.5"
		Fluid Used:	None
		Driller:	Lisa
		Helper:	NA
		Weight/Drop:	140#/30"

Boring Methods		Groundwater Information
X	Hollow Stem Auger	GW Encountered at
	Hand Auger	Monitor Wells Installed
	Geoprobe	Yes X No

Penetration Tons/Sq ft.	Sample Type	Depth (ft.)	USCS Code	SOIL DESCRIPTION	REMARKS	OVA	GC
		1					
		2					
	SS		SP	Sand	Brown, Moist, Fine/Medium		
	SS	3					
	SS						
	SS	4				ND	
	SS						
	SS	5					
	SS				Trace of Gravel		
	SS	6				1.0	
	SS						
	SS	7					
	SS						
	SS	8				12.0	
	SS				Wet		
	SS	9					
	SS						
	SS-[X]	10				750	
	SS						
	SS	11					
	SS						
	SS-[X]	12				>1000	
			E.O.B.	End of Boring 12'			
		13					
		14					
		15					
		16					
		17					
		18					
		19					
		20					
		21					
		22					
		23					
		24					
		25					

SS-Split Spoon
NR-No Recovery
HA-Hand Auger Sample
[X]-Laboratory/Jar Sample
PID-Photoionization Detector (ppm)
GC-Gas Chromatograph (ppb)
AL-Acetate Liner
FS-Field Screening Container

ATTACHMENT 13

Global Environmental Engineering Inc.
5467 Hill 23 Drive, Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Monitoring Well:	SB1/MW1	Project Name:	GMCLCD N.
Date:	11/6/96	Project No.:	F174
Contractor:	GEEI	Location:	Building 88
Prepared By:	A.L.K.	Twp/Range/Sec.:	
Time Started:	8:30	Depth Drilled:	17'
Time Completed:	11:15	Hole Diamater:	8.25"
Coring Device:	5'	Inner Diamater:	4.5"
		Drilling Fluid:	None
		Driller:	Lisa
		Helper:	NA

Boring Methods

X	Hollow Stem Auger
	Hand Auger
	Geoprobe

Water Level Data

Date	SWL, Elevation

WELL SPECIFICATIONS

Well Casing Cover:

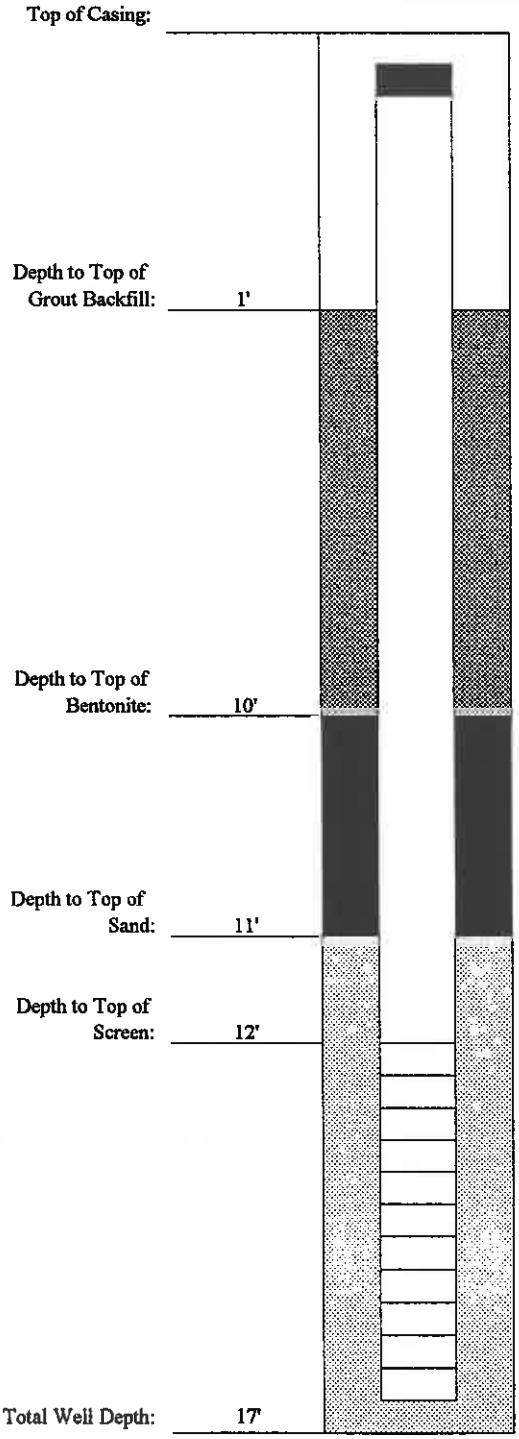
Material:	Steel
Diamater:	12"
Length:	12"
Lock:	No

Well Casing:

Diamater:	2"
Length:	17'
Material:	PVC
Cap:	Expandable
Locking:	Dolphin

Well Screen:

Diamater:	2"
Length:	5'
Slotsize:	0.01"
Material:	PVC
Well Screen Interval:	12'-17'
Filter Pack:	Sand



SOIL PROFILE

0'-6.5' - Sand

6.5' - 11' - Silt

11'-12' ; Silty Clay

12'-17' - Silt

Global Environmental Engineering Inc.
5467 Hill 23 Drive, Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Monitoring Well:	SB2/MW2	Project Name:	GMCLCD N.
Date:	11/6/96	Project No.:	F174
Contractor:	GEEI	Location:	Building 88
Prepared By:	A.L.K.	Twp/Range/Sec.:	
Time Started:	11:45	Depth Drilled:	16'
Time Completed:	4:05	Hole Diamater:	8.25"
Coring Device:	5'	Inner Diamater:	4.5"
		Drilling Fluid:	None
		Driller:	Lisa
		Helper:	NA

Boring Methods

X	Hollow Stem Auger
	Hand Auger
	Geoprobe

Water Level Data

Date	SWL Elevation

WELL SPECIFICATIONS

Well Casing Cover:

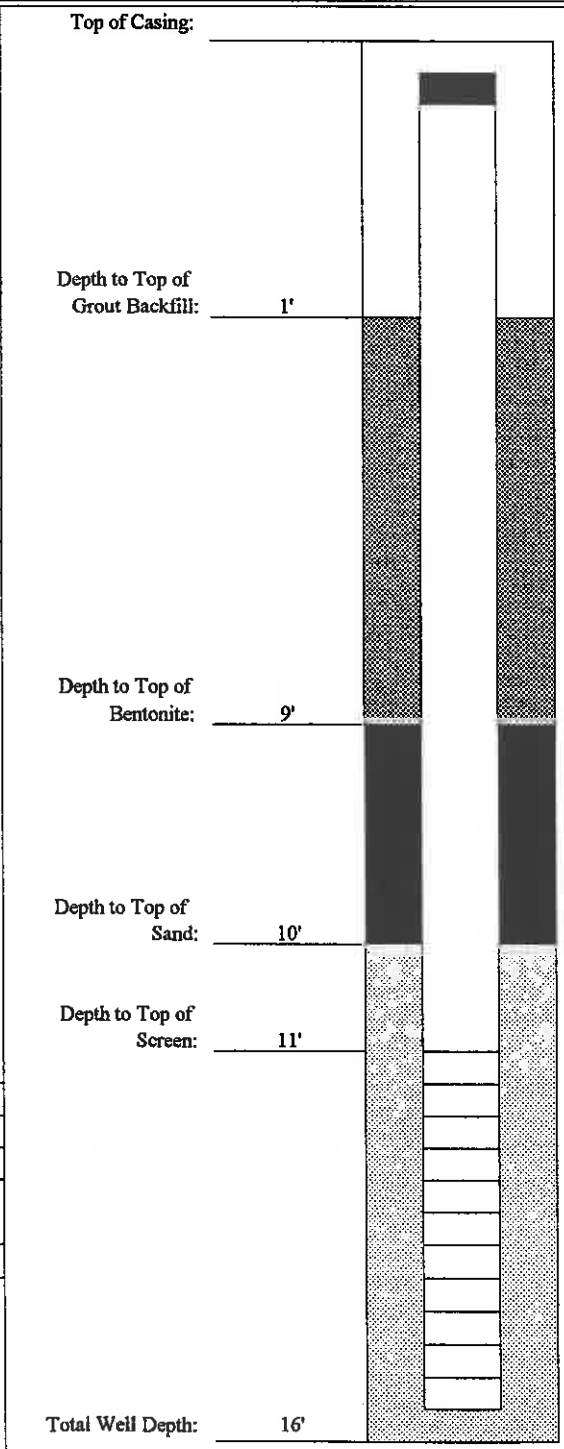
Material:	Steel
Diamater:	12"
Length:	12"
Lock:	No

Well Casing:

Diamater:	2"
Length:	16'
Material:	PVC
Cap:	Expandable
Locking:	Dolphin

Well Screen:

Diamater:	2"
Length:	5'
Slotsize:	0.01"
Material:	PVC
Well Screen Interval:	11'-16'
Filter Pack:	Sand



SOIL PROFILE

0'-16' - Sand

Global Environmental Engineering Inc.
5467 Hill 23 Drive, Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Monitoring Well:	SB3/MW3	Project Name:	GMCLCD N.
Date:	11/6/96	Project No.:	F174
Contractor:	GEEI	Location:	Building 88
Prepared By:	A.L.K.	Twp/Range/Sec.:	
Time Started:	14:45	Depth Drilled:	15'
Time Completed:		Hole Diamater:	8.25"
Coring Device:	5'	Inner Diamater:	4.5"
		Drilling Fluid:	None
		Driller:	Lisa
		Helper:	NA

Boring Methods		Water Level Data	
X	Hollow Stem Auger	Date	SWL Elevation
	Hand Auger		
	Geoprobe		

WELL SPECIFICATIONS

Well Casing Cover:

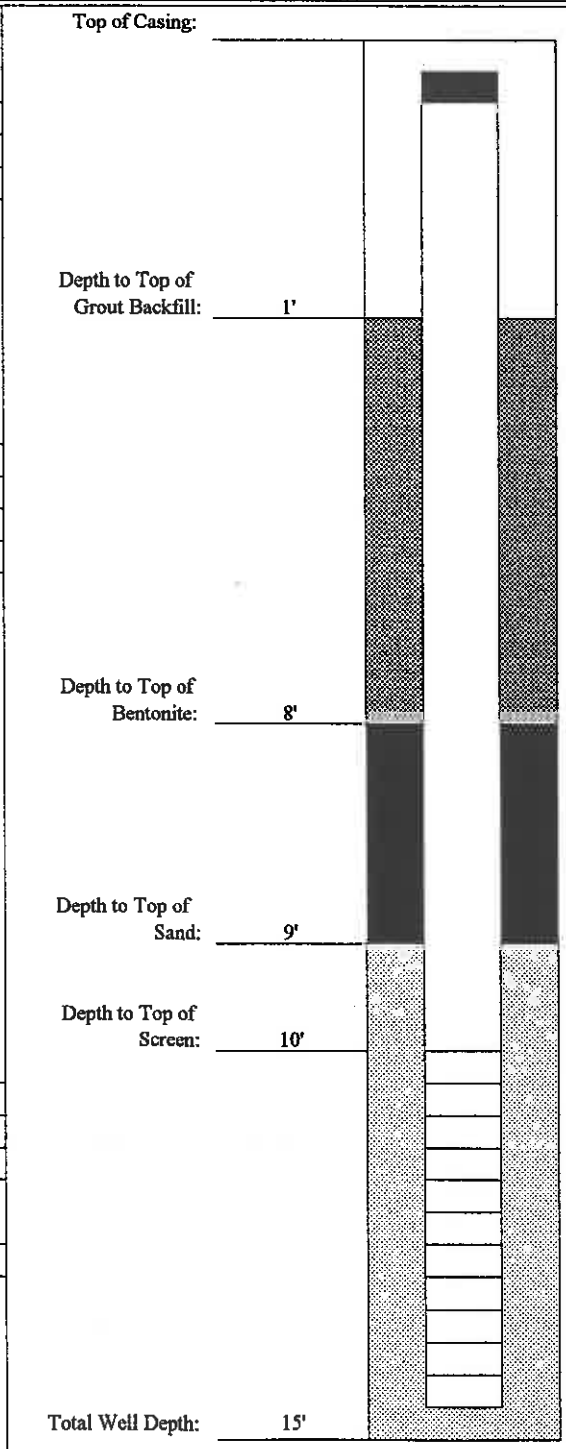
Material:	Steel
Diamater:	12"
Length:	12"
Lock:	No

Well Casing:

Diamater:	2"
Length:	15'
Material:	PVC
Cap:	Expandable
Locking:	Dolphin

Well Screen:

Diamater:	2"
Length:	5'
Slotsize:	0.01"
Material:	PVC
Well Screen Interval:	10'-15'
Filter Pack:	Sand



SOIL PROFILE

0'-15' - Sand

Global Environmental Engineering Inc.
5467 Hill 23 Drive, Suite B
Flint, Michigan 48507
Tel: (810) 238-9190
Fax: (810) 238-9195

Monitoring Well:	SB4/MW4	Project Name:	GMCLCD N.
Date:	11/8/96	Project No.:	F174
Contractor:	GEEI	Location:	Building 88
Prepared By:	A.L.K.	Twp/Range/Sec.:	
Time Started:	8:00	Depth Drilled:	12'
Time Completed:	10:30	Hole Diamater:	8.25"
Coring Device:	5'	Inner Diamater:	4.5"
		Drilling Fluid:	None
		Driller:	Lisa
		Helper:	NA

Boring Methods

X	Hollow Stem Auger
	Hand Auger
	Geoprobe

Water Level Data

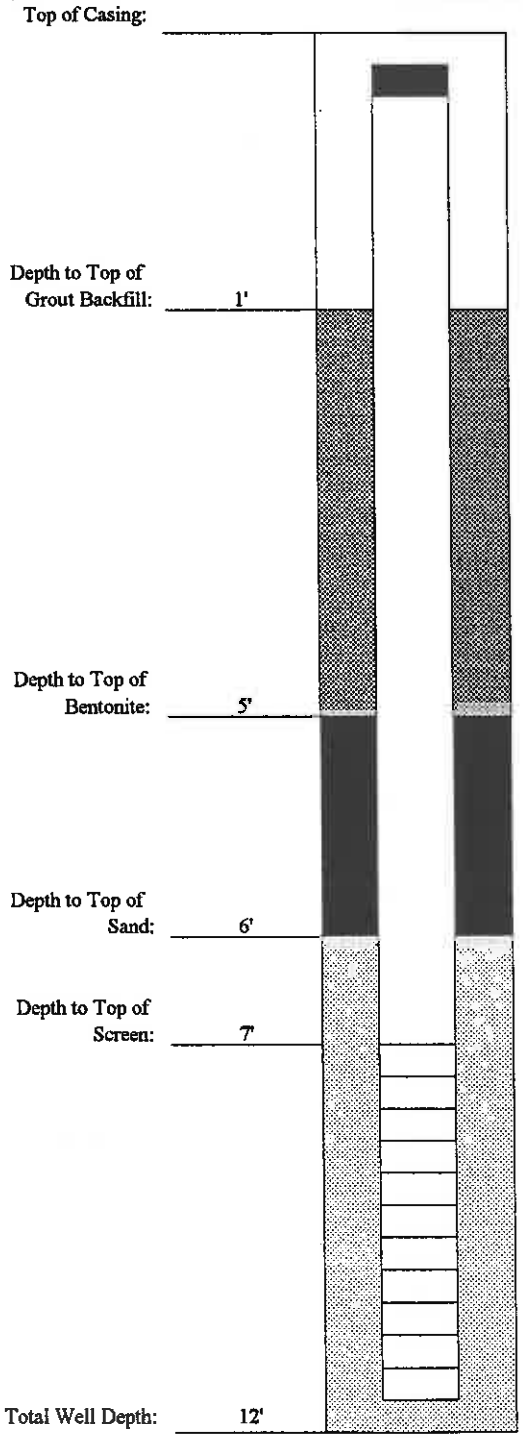
Date	SWL Elevation

WELL SPECIFICATIONS

Well Casing Cover:
- Material: Steel
- Diamater: 12"
- Length: 12"
- Lock: No

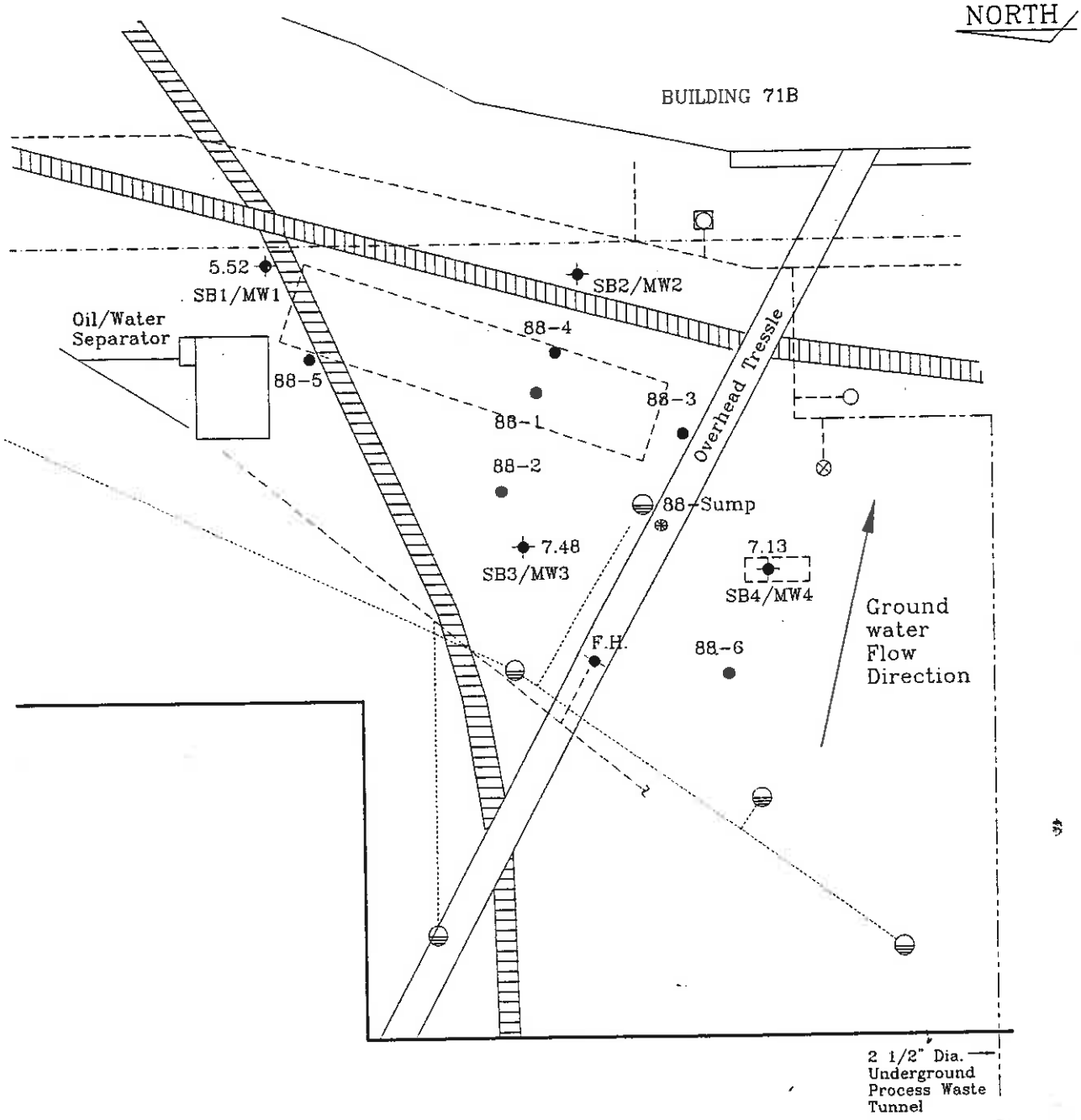
Well Casing:
- Diamater: 2"
- Length: 12'
- Material: PVC
- Cap: Expandable
- Locking: Dolphin

Well Screen:
- Diamater: 2"
- Length: 5'
- Slotsize: 0.01"
- Material: PVC
- Well Screen Interval: 7'-12'
- Filter Pack: Sand



SOIL PROFILE

0'-12' - Sand



LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant
- Former UST Locations

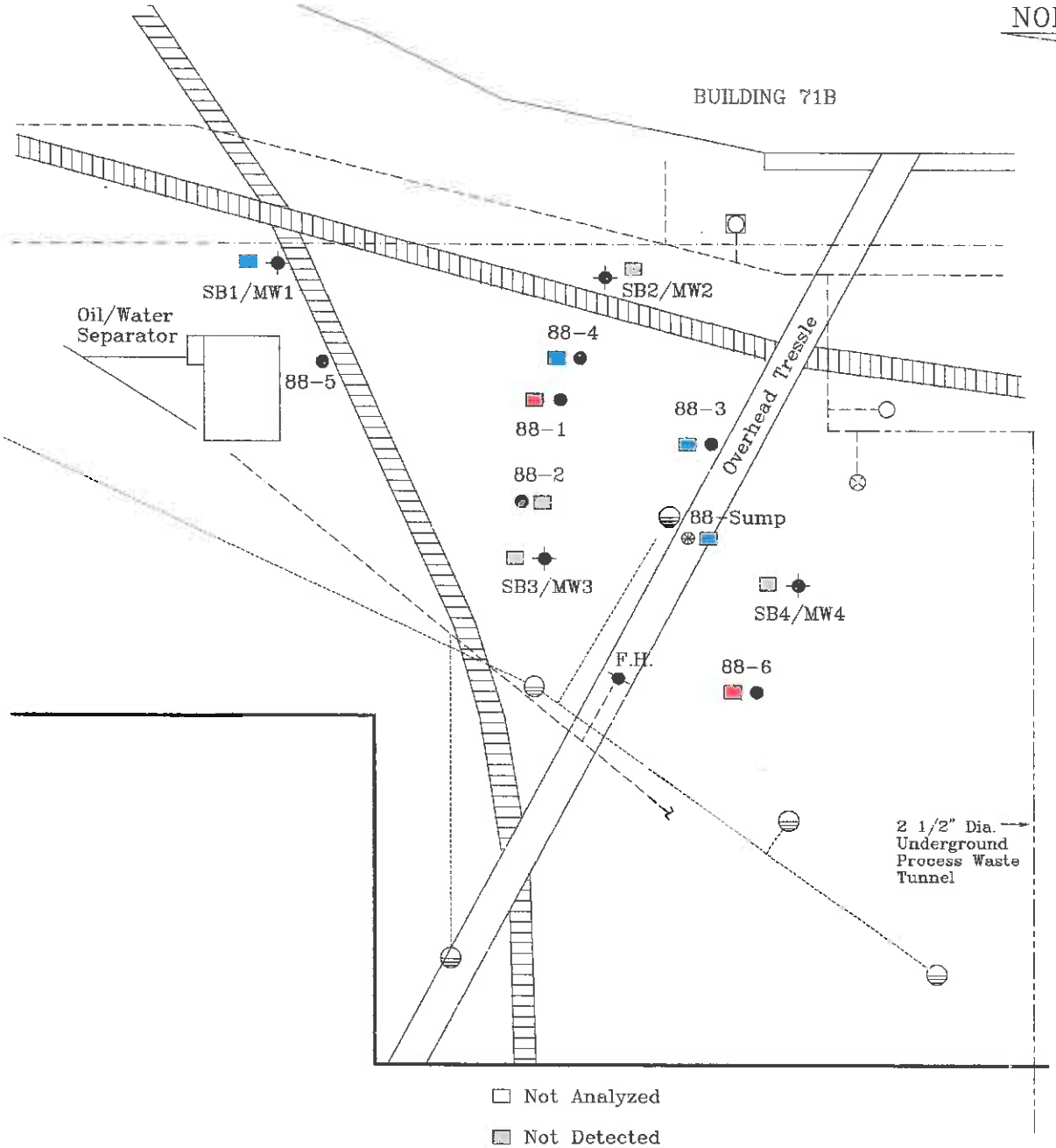
Static Water Level Data Obtained 2/24/97

GM-CLCD NORTH

TITLE: GROUNDWATER FLOW MAP
GM-CLCD NORTH
BUILDING 88 - TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 14
	PROJECT NUMBER: F174

ATTACHMENT 18



☐ Not Analyzed

☐ Not Detected

■ Below Tier I Industrial Health-Based Drinking Water RBSLs

■ Above Tier I Industrial Health-Based Drinking Water RBSLs

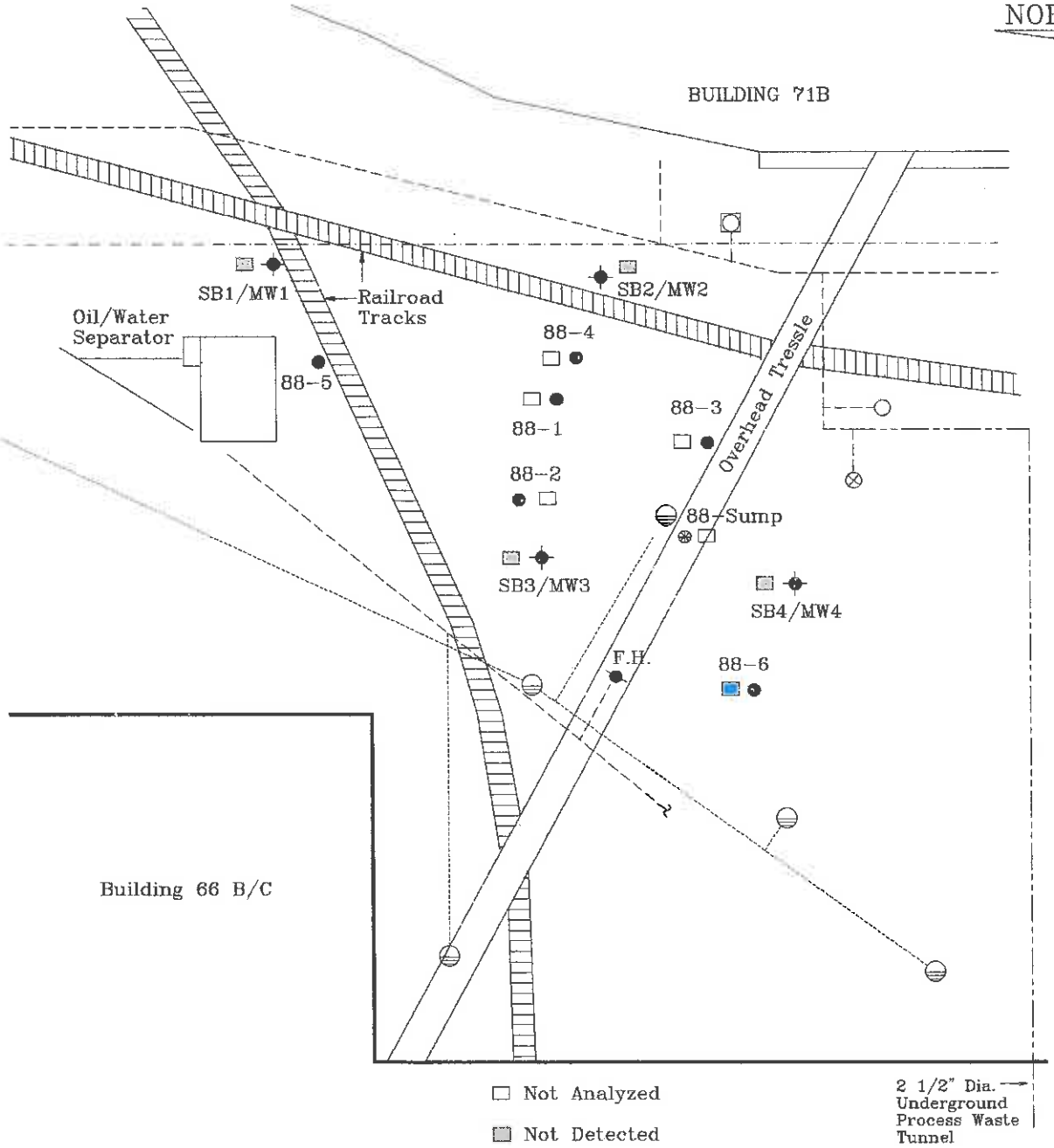
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP: BTEX
BUILDING 88
TANKS 050/88 - 058/88

SCALE. 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18a
	PROJECT NUMBER: F174



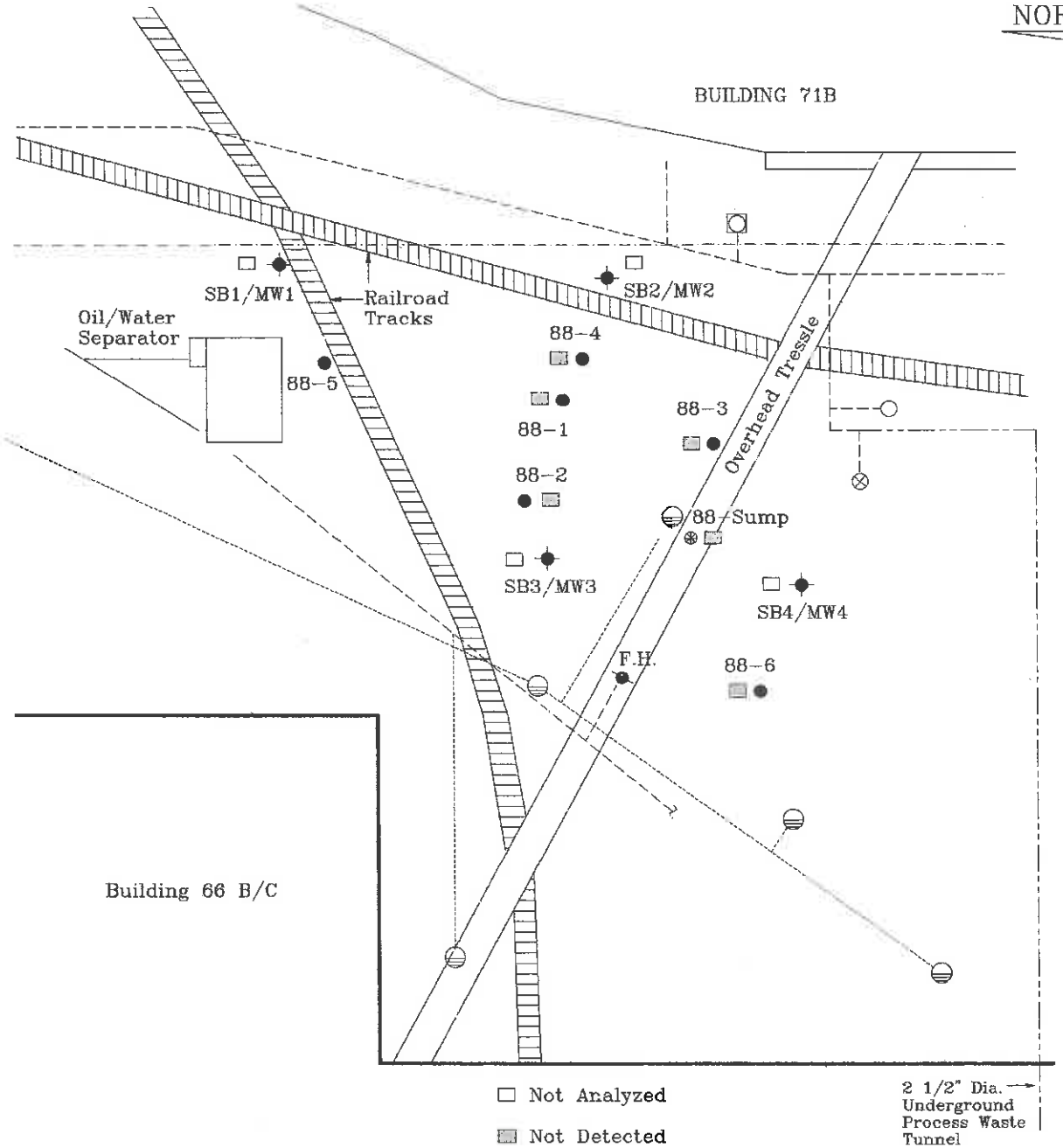
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP:PNAHs
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 4/29/97
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18b
	PROJECT NUMBER: F174



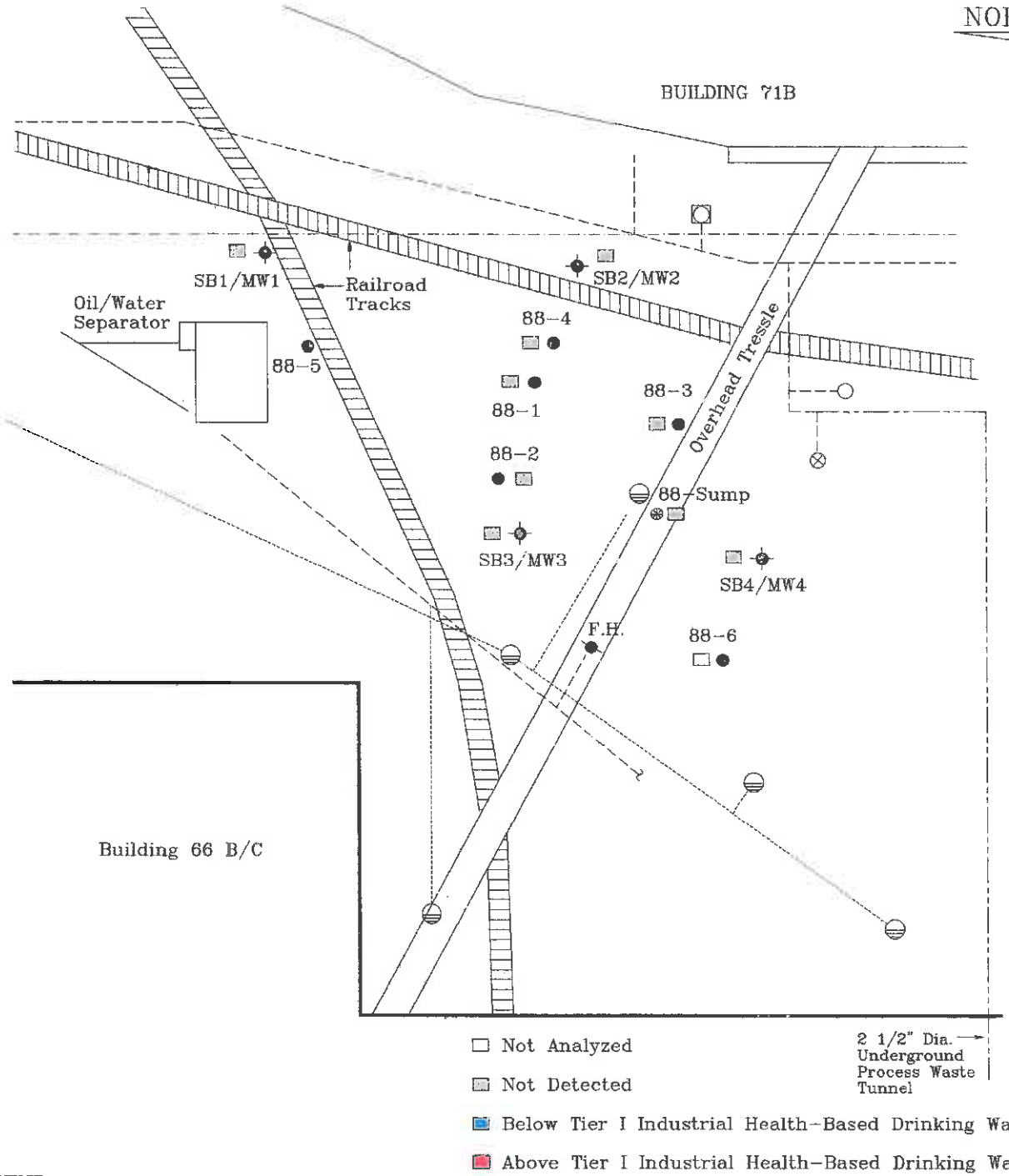
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP: CADMIUM
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 4/29/97
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18c
	PROJECT NUMBER: F174



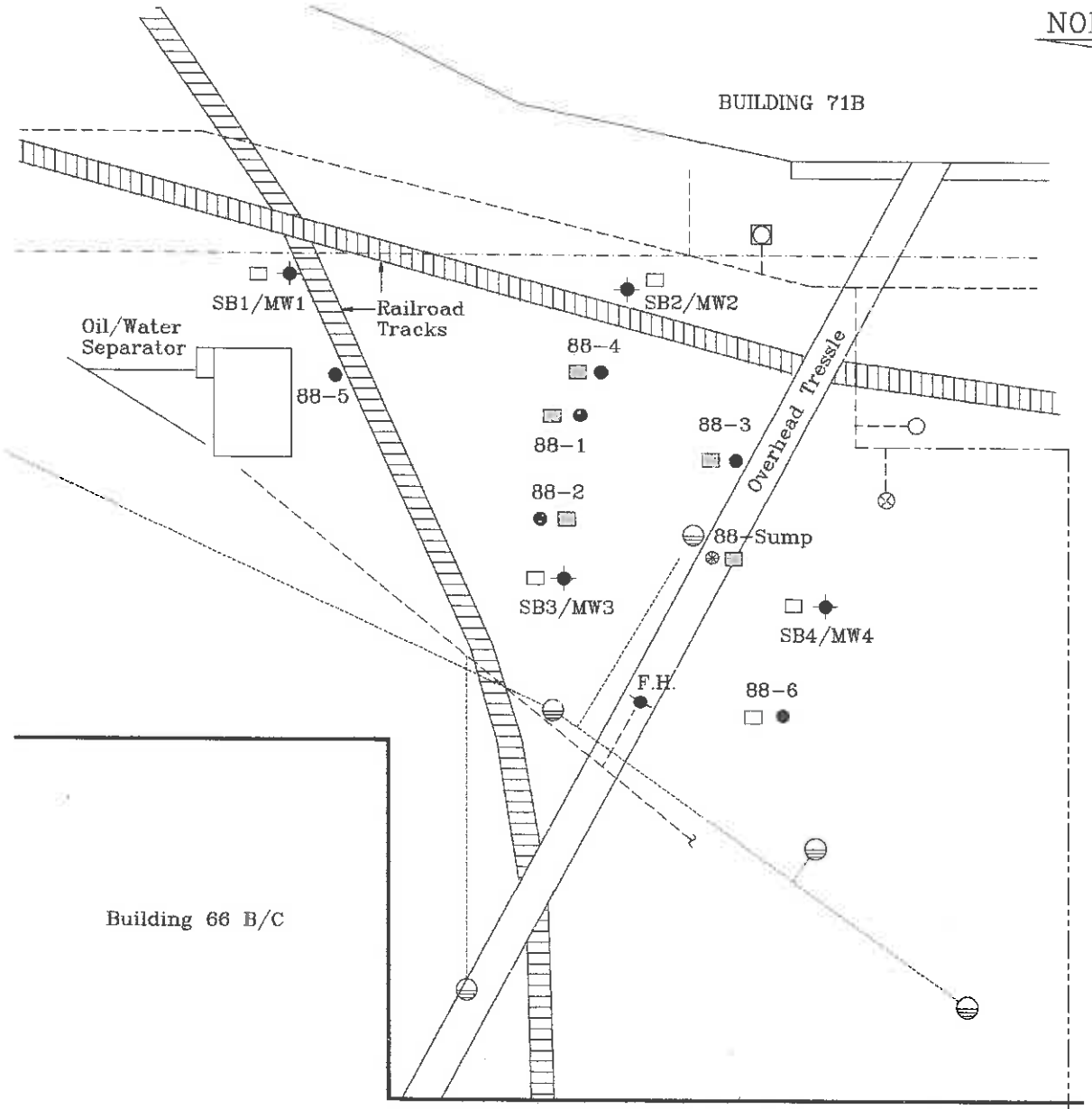
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP: LEAD
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 4/29/97
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18e
	PROJECT NUMBER: F174



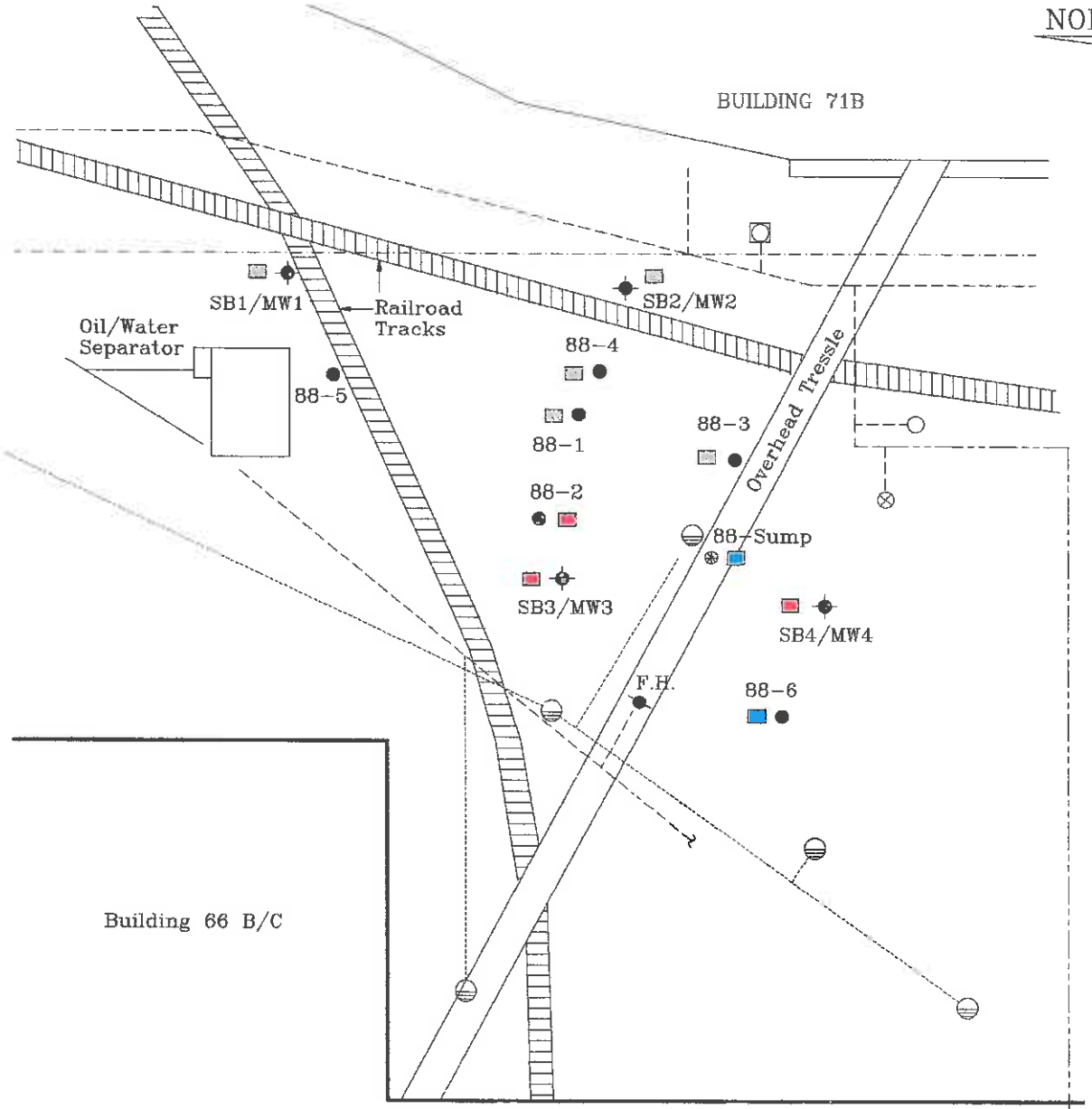
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP: PCBs
BUILDING 88
TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 4/29/97
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18f
	PROJECT NUMBER: F174



LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line
- Fire Hydrant

GM-CLCD NORTH

TITLE: GROUNDWATER CONCENTRATION MAP: HALOGENATED HYDROCARBONS - BUILDING 88 TANKS 050/88 - 058/88

SCALE: 1"=40'	DATE: 4/29/97
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 18g
	PROJECT NUMBER: F174

ATTACHMENT 19

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	Bldg 88 - Sump		Bldg 88 - 1		Bldg 88 - 2		Bldg 88 - 3		Bldg 88-4	
Sample Depth (feet BGS)	-		-		-		-		-	
Date Collected	7/22/96		7/22/96		7/22/96		7/22/96		7/22/96	
Date Extracted	7/26/96		7/26/96		7/26/96		7/26/96		7/26/96	
Date Analyzed	7/26/96		7/26/96		7/26/96		7/26/96		7/26/96	
Collection Method*	Bailer		GP		GP		GP		GP	
Analytical Method No.	602		602		602		602		602	
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	2	1	9	1	ND	1	3	1	ND	1
☐ Toluene	ND	1	ND	1	ND	1	ND	1	ND	1
☐ Ethylbenzene	ND	1	ND	1	ND	1	ND	1	1	1
☐ Total Xylenes	ND	1	ND	1	ND	1	ND	1	3	1
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene										
☐ Acenaphthylene										
☐ Anthracene										
☐ Benzo(a)anthracene										
☐ Benzo(a)pyrene										
☐ Benzo(b)fluoranthene										
☐ Benzo(g,h,i)perylene										
☐ Benzo(k)fluoranthene										
☐ Chrysene										
☐ Dibenzo(a,h)anthracene										

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table: _____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 2 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Fluoranthene										
☐ Fluorene										
☐ Indeno(1,2,3- cd)pyrene										
☐ Naphthalene										
☐ 2-Methylnaphthalene										
☐ Phenanthrene										
☐ Pyrene										
METALS - FILTERED										
Sample ID	Bldg 88 - Sump		Bldg 88 - 1		Bldg 88 - 2		Bldg 88 - 3		Bldg 88 - 4	
Sample Depth (feet BGS)	-		-		-		-		-	
Date Collected	7/22/96		7/22/96		7/22/96		7/22/96		7/22/96	
Date Extracted	7/29/96		7/29/96		7/29/96		7/29/96		7/29/96	
Date Analyzed	7/29/96		7/29/96		7/29/96		7/29/96		7/29/96	
Collection Method*	Bailer		GP		GP		GP		GP	
Analytical Method No.	200.8		200.8		200.8		200.8		200.8	
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium	ND	.2	ND	.2	ND	.2	ND	.2	ND	.2
☐ Total Chromium	ND	10	ND	10	ND	10	ND	10	ND	10
☐ Total Lead	ND	3	ND	3	ND	3	ND	3	ND	3

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 3 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)_
FACILITY NUMBER: 0-002763

PCBs										
Sample ID	Bldg 88 - Sump		Bldg 88 - 1		Bldg 88 - 2		Bldg 88 - 3		Bldg 88 - 4	
Sample Depth (feet BGS)	-		-		-		-		-	
Date Collected	7/22/96		7/22/96		7/22/96		7/22/96		7/22/96	
Date Extracted	7/24/96		7/24/96		7/24/96		7/24/96		7/24/96	
Date Analyzed	7/25/96		7/25/96		7/25/96		7/25/96		7/25/96	
Collection Method*	Bailer		GP		GP		GP		GP	
Analytical Method No.	608		608		608		608		608	
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1221	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1232	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1242	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1248	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1254	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
☐ Aroclor 1280	ND	.1	ND	.1	ND	.1	ND	.1	ND	.1
HALOGENATED HYDROCARBONS										
Sample ID	Bldg 88 - Sump		Bldg 88 - 1		Bldg 88 - 2		Bldg 88 - 3		Bldg 88 - 4	
Sample Depth (feet BGS)	-		-		-		-		-	
Date Collected	7/22/96		7/22/96		7/22/96		7/22/96		7/22/96	
Date Extracted	7/26/96		7/26/96		7/26/96		7/24/96		7/24/96	
Date Analyzed	7/26/96		7/26/96		7/26/96		7/25/96		7/25/96	
Collection Method*	Bailer		GP		GP		GP		GP	
Analytical Method No.	601		601		601		608		608	
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	1	ND	1	ND	1	ND	1	ND	1
☐ 1,1-Dichloroethane	ND	1	ND	1	2	1	ND	1	ND	1
☐ 1,2-Dichloroethane	ND	1	ND	1	ND	1	ND	1	ND	1
☐ 1,1-Dichloroethylene	ND	1	ND	1	2	1	ND	1	ND	1
☐ cis-1,2-Dichloroethylene	ND	1	ND	1	ND	1	ND	1	ND	1
☐ trans-1,2- Dichloroethylene	ND	1	ND	1	12	1	ND	1	ND	1

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 4 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS (Cont.)										
☐ Tetrachloroethylene	ND	1	ND	1	ND	1	ND	1	ND	1
☐ Trichloroethylene	2	1	ND	1	236	1	ND	1	ND	1
☐ 1,1,2-Trichloroethane	ND	1	ND	1	ND	1	ND	1	ND	1
☐ Vinyl Chloride	ND	1	ND	1	23	1	ND	1	ND	1
OTHER *(Specify)*										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										

BGS = Below Ground Surface
*** If Applicable**
**** Footnote and define all Collection Method Codes used in this table:**_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/15/96									
Date Analyzed	11/15/96									
Collection Method*	GP									
Analytical Method No.	602									
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	1								
☐ Toluene	ND	1								
☐ Ethylbenzene	90	1								
☐ Total Xylenes	ND	1								
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/19/96									
Date Analyzed	12/02/96									
Collection Method*	GP									
Analytical Method No.	8270									
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene	ND	10								
☐ Acenaphthylene	ND	10								
☐ Anthracene	ND	10								
☐ Benzo(a)anthracene	ND	10								
☐ Benzo(a)pyrene	ND	10								
☐ Benzo(b)fluoranthene	ND	10								
☐ Benzo(g,h,i)perylene	ND	10								
☐ Benzo(k)fluoranthene	ND	10								
☐ Chrysene	ND	10								
☐ Dibenzo(a,h)anthracene	ND	10								

BGS = Below Ground Surface
*** If Applicable**
**** Footnote and define all Collection Method Codes used in this table:** _____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 2 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/19/96									
Date Analyzed	12/02/96									
Collection Method*	GP									
Analytical Method No.	8270									
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Fluoranthene	ND	10								
☐ Fluorene	ND	10								
☐ Indeno(1,2,3- cd)pyrene	ND	10								
☐ Naphthalene	50	10								
☐ 2-Methylnaphthalene	ND	10								
☐ Phenanthrene	ND	10								
☐ Pyrene	ND	10								
METALS - FILTERED										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/20/96									
Date Analyzed	11/20/96									
Collection Method*	GP									
Analytical Method No.	200.8									
CONSTITUENT (ug/l)	`Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium										
☐ Total Chromium	ND	10								
☐ Total Lead	ND	3								

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 3 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)_
FACILITY NUMBER: 0-002763

PCBs										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016										
☐ Aroclor 1221										
☐ Aroclor 1232										
☐ Aroclor 1242										
☐ Aroclor 1248										
☐ Aroclor 1254										
☐ Aroclor 1280										
HALOGENATED HYDROCARBONS										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/15/96									
Date Analyzed	11/15/96									
Collection Method*	GP									
Analytical Method No.	601									
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	1								
☐ 1,1-Dichloroethane	ND	1								
☐ 1,2-Dichloroethane	ND	1								
☐ 1,1-Dichloroethylene	ND	1								
☐ cis-1,2-Dichloroethylene	ND	1								
☐ trans-1,2- Dichloroethylene	ND	1								

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 4 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS (Cont.)										
☐ Tetrachloroethylene	ND	1								
☐ Trichloroethylene	2	1								
☐ 1,1,2-Trichloroethane	ND	1								
☐ Vinyl Chloride	ND	1								
OTHER *(Specify)*										
Sample ID	Bldg 88-6									
Sample Depth (feet BGS)	-									
Date Collected	11/12/96									
Date Extracted	11/15/96									
Date Analyzed	11/15/96									
Collection Method*	GP									
Analytical Method No.	601									
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Chloroethane	50	1								
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table: _____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION

INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

VOLATILES										
Sample ID	MW-1		MW-2		MW-3		MW-4			
Sample Depth (feet BGS)	-		-		-		-			
Date Collected	11/12/96		11/12/96		11/12/96		11/12/96			
Date Extracted	11/15/96		11/15/96		11/15/96		11/15/96			
Date Analyzed	11/15/96		11/15/96		11/15/96		11/15/96			
Collection Method*	Bailer		Bailer		Bailer		Bailer			
Analytical Method No.	602		602		602		602			
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Benzene	ND	1	ND	1	ND	1	ND	1		
☐ Toluene	ND	1	ND	1	ND	1	ND	1		
☐ Ethylbenzene	6	1	ND	1	ND	1	ND	1		
☐ Total Xylenes	10	1	ND	1	ND	1	ND	1		
☐ MTBE										
POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	MW-1		MW-2		MW-3		MW-4			
Sample Depth (feet BGS)	-		-		-		-			
Date Collected	11/12/96		11/12/96		11/12/96		11/12/96			
Date Extracted	11/19/96		11/19/96		11/19/96		11/19/96			
Date Analyzed	12/02/96		12/02/96		12/02/96		12/02/96			
Collection Method*	Bailer		Bailer		Bailer		Bailer			
Analytical Method No.	8270		8270		8270		8270			
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Acenaphthene	ND	1	ND	1	ND	1	ND	1		
☐ Acenaphthylene	ND	1	ND	1	ND	1	ND	1		
☐ Anthracene	ND	1	ND	1	ND	1	ND	1		
☐ Benzo(a)anthracene	ND	1	ND	1	ND	1	ND	1		
☐ Benzo(a)pyrene	ND	1	ND	1	ND	1	ND	1		
☐ Benzo(b)fluoranthene	ND	1	ND	1	ND	1	ND	1		
☐ Benzo(g,h,i)perylene	ND	1	ND	1	ND	1	ND	1		
☐ Benzo(k)fluoranthene	ND	1	ND	1	ND	1	ND	1		
☐ Chrysene	ND	1	ND	1	ND	1	ND	1		
☐ Dibenzo(a,h)anthracene	ND	1	ND	1	ND	1	ND	1		

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table: _____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 2 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

POLYNUCLEAR AROMATICS (PNAs)										
Sample ID	MW-1		MW-2		MW-3		MW-4			
Sample Depth (feet BGS)	-		-		-		-			
Date Collected	11/12/96		11/12/96		11/12/96		11/12/96			
Date Extracted	11/19/96		11/19/96		11/19/96		11/19/96			
Date Analyzed	12/02/96		12/02/96		12/02/96		12/02/96			
Collection Method*	Bailer		Bailer		Bailer		Bailer			
Analytical Method No.	8270		8270		8270		8270			
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Fluoranthene	ND	1	ND	1	ND	1	ND	1		
☐ Fluorene	ND	1	ND	1	ND	1	ND	1		
☐ Indeno(1,2,3- cd)pyrene	ND	1	ND	1	ND	1	ND	1		
☐ Naphthalene	ND	1	ND	1	ND	1	ND	1		
☐ 2-Methylnaphthalene	ND	1	ND	1	ND	1	ND	1		
☐ Phenanthrene	ND	1	ND	1	ND	1	ND	1		
☐ Pyrene	ND	1	ND	1	ND	1	ND	1		
METALS - FILTERED										
Sample ID	MW-1		MW-2		MW-3		MW-4			
Sample Depth (feet BGS)	-		-		-		-			
Date Collected	11/12/96		11/12/96		11/12/96		11/12/96			
Date Extracted	11/20/96		11/20/96		11/20/96		11/20/96			
Date Analyzed	11/20/96		11/20/96		11/20/96		11/20/96			
Collection Method*	Bailer		Bailer		Bailer		Bailer			
Analytical Method No.	200.8		200.8		200.8		200.8			
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Cadmium										
☐ Total Chromium	ND	10	ND	10	ND	10	ND	10		
☐ Total Lead	ND	3	ND	3	ND	3	ND	3		

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 3 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)_
FACILITY NUMBER: 0-002763

PCBs										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Aroclor 1016										
☐ Aroclor 1221										
☐ Aroclor 1232										
☐ Aroclor 1242										
☐ Aroclor 1248										
☐ Aroclor 1254										
☐ Aroclor 1280										
HALOGENATED HYDROCARBONS										
Sample ID	MW-1		MW-2		MW-3		MW-4			
Sample Depth (feet BGS)	-		-		-		-			
Date Collected	11/12/96		11/12/96		11/12/96		11/12/96			
Date Extracted	11/15/96		11/15/96		11/15/96		11/15/96			
Date Analyzed	11/15/96		11/15/96		11/15/96		11/15/96			
Collection Method*	Bailer		Bailer		Bailer		Bailer			
Analytical Method No.	601		601		601		601			
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐ Carbon Tetrachloride	ND	1	ND	1	ND	1	ND	1		
☐ 1,1-Dichloroethane	ND	1	ND	1	ND	1	ND	1		
☐ 1,2-Dichloroethane	ND	1	ND	1	ND	1	ND	1		
☐ 1,1-Dichloroethylene	ND	1	ND	1	ND	1	ND	1		
☐ cis-1,2-Dichloroethylene	ND	1	ND	1	ND	1	ND	1		
☐ trans-1,2- Dichloroethylene	ND	1	ND	1	ND	1	ND	1		

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 19 (Continued Page 4 of 4)
LABORATORY RESULTS GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

HALOGENATED HYDROCARBONS (Cont.)										
☐ Tetrachloroethylene	ND	1	ND	1	ND	1	ND	1		
☐ Trichloroethylene	ND	1	ND	1	18	1	ND	1		
☐ 1,1,2-Trichloroethane	ND	1	ND	1	ND	1	ND	1		
☐ Vinyl Chloride	ND	1	ND	1	ND	1	133	1		
OTHER *(Specify)*										
Sample ID										
Sample Depth (feet BGS)										
Date Collected										
Date Extracted										
Date Analyzed										
Collection Method*										
Analytical Method No.										
CONSTITUENT (ug/l)	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL	Conc	MDL
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										
☐										

BGS = Below Ground Surface
* If Applicable
** Footnote and define all Collection Method Codes used in this table:_____
MDL = Method Detection Limit

ATTACHMENT 20

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 20
TIER I RBSL/TIER II OR TIER III SSTL
COMPARISON TABLE FOR GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

☐ **Residential** ☐ **Commercial** ☑ **Industrial**

Exposure Codes
A. Potable **B. Groundwater/Surface Water Interface**

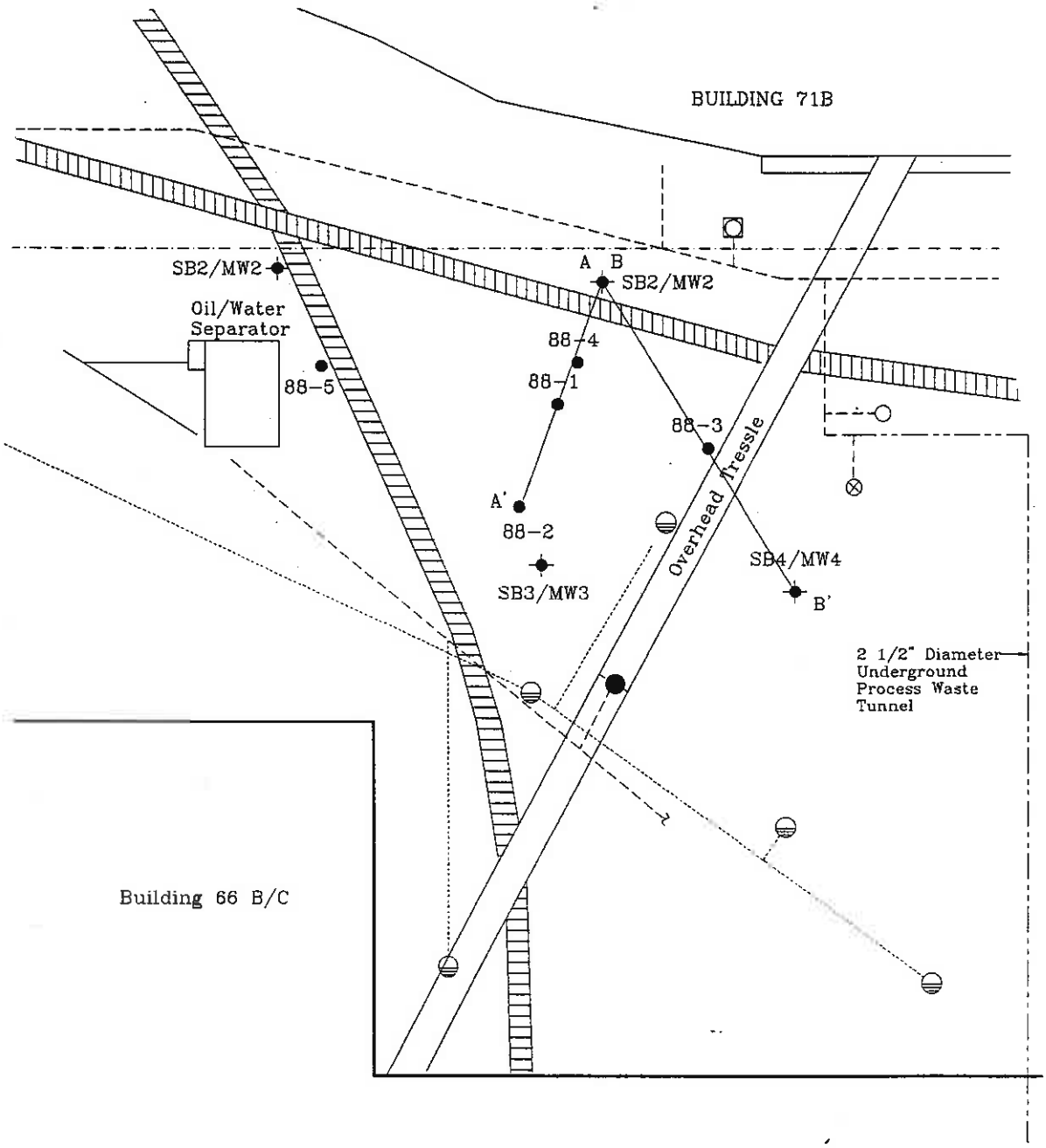
Contaminant	Sample ID with Maximum Detected Concentration	Corresponding Sample Date	Maximum Detected Concentration (ug/l)	Applicable Criterion with Exposure Code (ug/l)		Criterion Exceeded? (Yes or No)	
				Tier I RBSL (A)	Tier II/III SSTL	Tier I RBSL	Tier II/III SSTL
VOLATILES							
☐ Benzene	Bldg 88-1	07/22/96	9	5		Yes	
☐ Toluene			ND	790		No	
☐ Ethylbenzene	Bldg 88-6	11/12/96	90	74		Yes	
☐ Total Xylenes	MW-1	11/12/96	10	280		No	
☐ MTBE							
POLYNUCLEAR AROMATICS (PNAs)							
☐ Acenaphthene			ND	3800		No	
☐ Acenaphthylene			ND	75		No	
☐ Anthracene			ND	21,000		No	
☐ Benzo(a)anthracene			ND	4.8		No	
☐ Benzo(a)pyrene			ND	.2		No	
☐ Benzo(b)fluoranthene			ND	4.8		No	
☐ Benzo(g,h,i)perylene			ND	75		No	
☐ Benzo(k)fluoranthene			ND	48		No	
☐ Chrysene			ND	480		No	
☐ Dibenzo-(a,h)anthracene			ND	.48		No	
☐ Fluoranthene			ND	2500		No	
☐ Fluorene			ND	2500		No	
☐ Indeno(1,2,3-cd)pyrene			ND	4.8		No	
☐ Naphthalene	Bldg 88-6	11/12/96	50	750		No	
☐ Phenanthrene			ND	75		No	
☐ Pyrene			ND	1600		No	
☐ 2-Methylnaphthalene			ND	750		No	

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - UNDERGROUND STORAGE TANK DIVISION
INITIAL ASSESSMENT REPORT (Continued)

ATTACHMENT NO. 20
TIER I RBSL/TIER II OR TIER III SSTL
COMPARISON TABLE FOR GROUNDWATER
FACILITY NAME: NAO FLINT OPERATIONS (BLDG 88/TANKS 050/88 - 058/88)
FACILITY NUMBER: 0-002763

Contaminant	Sample ID with Maximum Detected Concentration	Corresponding Sample Date	Maximum Detected Concentration (ug/l)	Applicable Criterion with Exposure Code (ug/l)		Criterion Exceeded? (Yes or No)	
				Tier I RBSL	Tier II/III SSTL	Tier I RBSL	Tier II/III SSTL
METALS - FILTERED							
☐ Cadmium			ND	5		No	
☐ Total Chromium			ND	100 (B, C, J)		No	
☐ Total Lead			ND	4 (B, L)		No	
PCBs - Not Analyzed							
HALOGENATED HYDROCARBONS							
☐ Carbon Tetrachloride			ND	5		No	
☐ Chloroethane	Bldg 88-6	11/12/96	50	910		No	
☐ 1,1-Dichloroethane	Bldg 88-2	7/22/96	2	2500		No	
☐ 1,2-Dichloroethane			ND	5		No	
☐ 1,1-Dichloroethylene	Bldg 88-2	7/22/96	2	7		No	
☐ cis-1,2-Dichloroethylene			ND	70		No	
☐ trans-1,2-Dichloroethylene	Bldg 88-2	7/22/96	12	100		No	
☐ Tetrachloroethylene			ND	5		No	
☐ 1,1,2-Trichloroethane			ND	5		No	
☐ Trichloroethylene	Bldg 88-2	7/22/96	236	5		Yes	
☐ Vinyl Chloride	MW-4	11/12/96	133	2		Yes	
OTHER *							
☐ Ethlyene Glycol			ND	42,000		No	
☐ Propylene Glycol			ND	420,000		No	
☐ Di-n-butyl phthalate			ND	2500		No	
☐ Diethyl phthalate			ND	16,000		No	
☐ 4,6-Dinitro-2-methylphenol			ND	1000		No	

ATTACHMENT 21



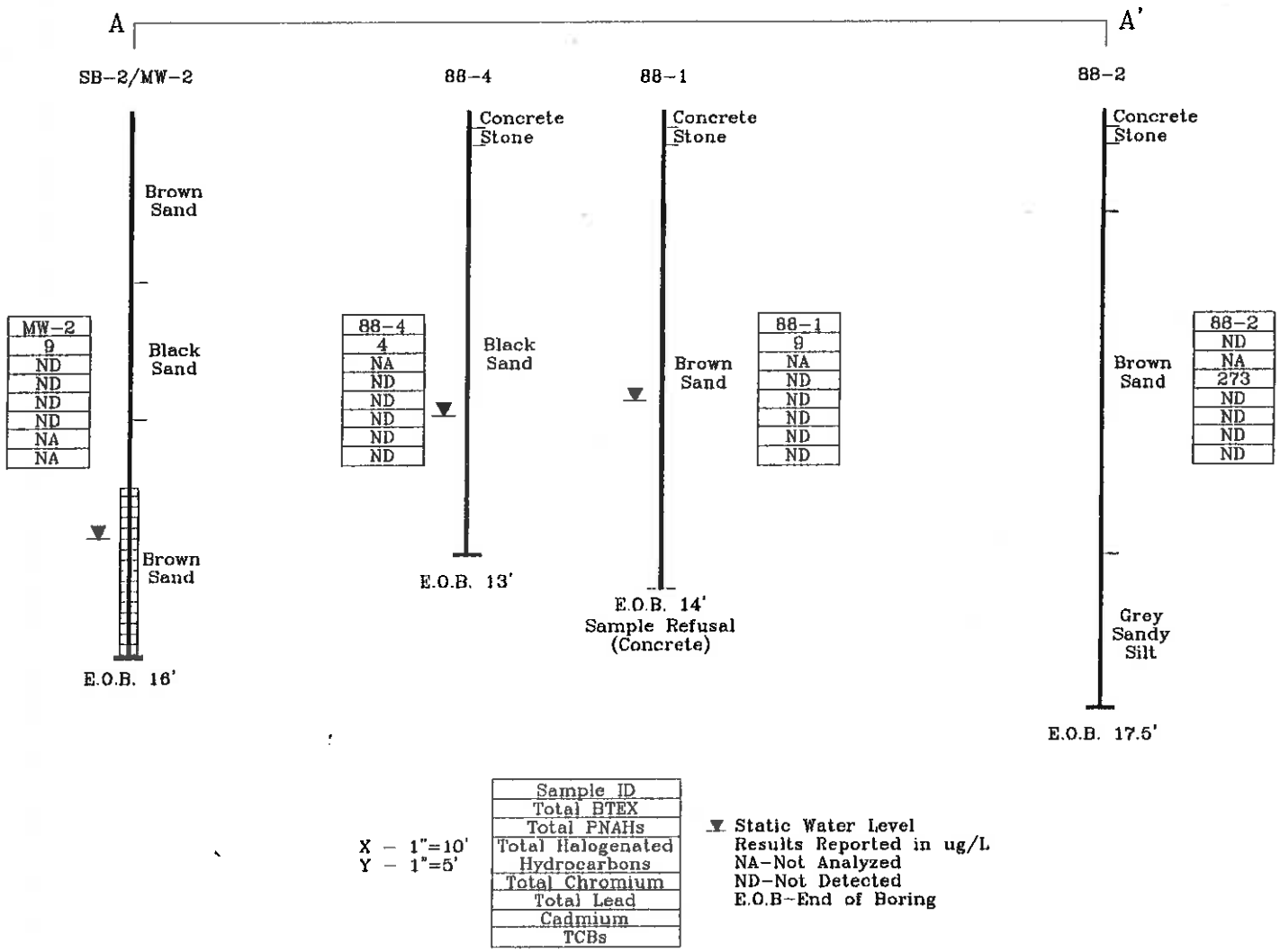
LEGEND:

- Monitoring Well/Soil Boring
- Geoprobe Sample Locations
- Fire Protection Line
- Storm Sewer Line
- City Water Line

GM CLCD NORTH

TITLE: CROSS SECTIONAL LOCATION DIAGRAM
BUILDING 88 – TANKS 050/88 – 058/88

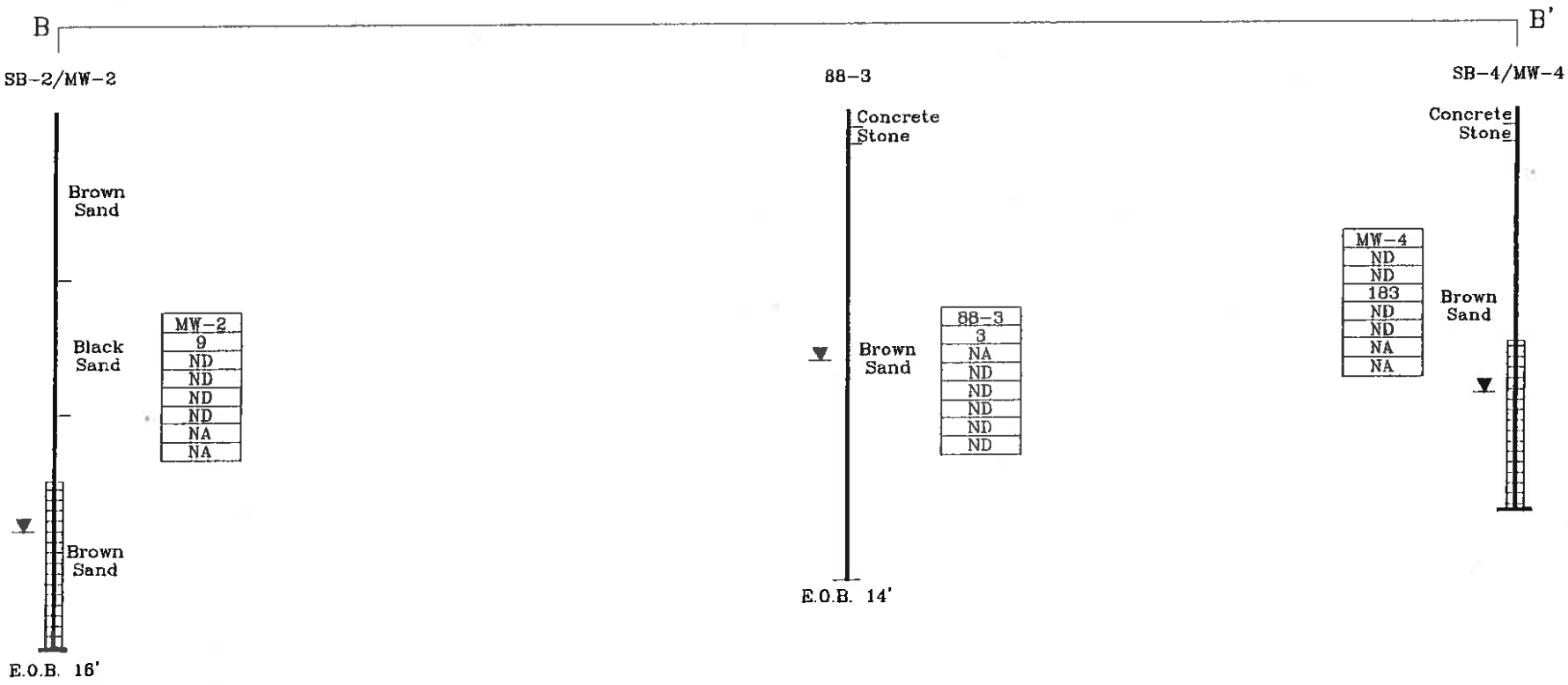
SCALE: 1"=40'	DATE: 8/13/96
Global Environmental Engineering Inc.	APPROVED BY: A.L.K.
	PREPARED BY: C.G.S.
	ATTACHMENT NUMBER: 2 1a
	PROJECT NUMBER: F174



Global Environmental Engineering Inc.

East to West Cross Sectional Diagram A-A'
GMCLCD North - Building 88 Tank Farm
Flint, Michigan

Date: 1/14/97
Prepared By: C.G.S.
Attachment Number: 21b
Project Number: F174



Global Environmental Engineering Inc.

East to West Cross Sectional Diagram A-A'
GMCLCD North – Building 88 Tank Farm
Flint, Michigan

Date: 1/14/97
Prepared By: C.G.S.
Attachment Number: 21c
Project Number: F174

ATTACHMENT 29
NAO FLINT OPERATIONS
TANKS 050/88-058/88

WORK PLAN AND IMPLEMENTATION SCHEDULE

Hydrogeologic Study

Three additional groundwater monitoring wells will be installed in an attempt to fully delineate the extent of groundwater impact. The wells will be developed, sampled, surveyed, and slug tested in accordance with applicable Michigan Department of Environmental Quality (MDEQ) standards to obtain information regarding the extent of impact, hydraulic gradient, hydraulic conductivity, and natural groundwater velocity. In addition, soil samples from each split-spoon will be field-screened, and two soil samples from each boring will be submitted for laboratory analysis. Based on the former UST contents and the past investigation, samples collected for laboratory analysis will be analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), polynuclear aromatic hydrocarbons (PNAs), halgenated hydrocarbons, lead and chromium.

The results of the hydrogeologic study will be included in a site-wide Remedial Action Plan (RAP). The site-wide RAP is currently being coordinated by Mr. Bob Metcalf of General Motors Corporation (GM), and questions regarding the RAP and implementation schedule should be directed to GM.