BASELINE ENVIRONMENTAL ASSESSMENT CONDUCTED PURSUANT TO SECTION 20126(1)(C) OF 1994 PA 451, AS AMENDED AND THE RULES PROMULGATED THEREUNDER AT FORMER FISHER BROTHERS PROPERTY 301 NORTH WATER STREET BAY CITY, MICHIGAN

Prepared for

CITY OF BAY CITY
BAY CITY, MICHIGAN

MARCH 29, 2002
AKT PEERLESS PROJECT NO. 3550F

CONTENTS

EQP 4446 i

1.0 IDENTIFICATION OF AUTHOR AND DATE OF BEA COMPLETION 1
2.0 INTRODUCTION 1
2.1 CATEGORY SELECTION 2
2.2 SITE HISTORY 2
2.3 SUMMARY OF PREVIOUS ENVIRONMENTAL WORK 3
2.3.1 Summary of ADL's Environmental Investigation 3
2.3.2 Summary of WESTON's Environmental Investigation 4
2.3.3 AKT Peerless' Historical Site Review 5
2.3.4 AKT Peerless' Phase II Environmental Investigations 7
3.0 PROPERTY DESCRIPTION AND INTENDED HAZARDOUS SUBSTANCE USE 8
3.1 PROPERTY DESCRIPTION 8
3.2 INTENDED LAND USE 8
3.3 INTENDED HAZARDOUS SUBSTANCE USE 9
4.0 KNOWN CONTAMINATION 11
4.1 HAZARDOUS SUBSTANCES AT THE FACILITY 12
4.2 IDENTIFICATION OF THE GENERAL LOCATIONS OF CONTAMINATION 14
4.2.1 Property Features (Buildings and Existing Underground Utilities) 14
4.2.2 Subsurface Soil Conditions 14
4.2.3 Groundwater 15
4.2.4 Media Affected at the Property 15
4.3 KNOWN ABANDONED CONTAINERS OF HAZARDOUS SUBSTANCES 15
5.0 LIKELIHOOD OF OTHER CONTAMINATION 16
6.0 CONCLUSIONS 16
7.0 REFERENCES 17
8.0 SIGNATURE PAGE 18

FIGURES

1. Topographic Site Location Map
2. Site Map
3. Site Map with Soil Boring Locations
4. Site Map with Soil Analytical Results above MDEQ Residential Cleanup Criteria
5. Site Map with Groundwater Analytical Results above MDEQ Residential Cleanup Criteria

TABLES

1. Summary of Soil Analytical Results-ADL
2. Summary of Groundwater Analytical Results-ADL
3. Summary of Soil Analytical Results-WESTON
4. Summary of Soil Analytical Results-AKT

APPENDICES

A. Legal Descriptions of Subject Property
B. ADL Investigation Report dated November 12, 1992
C. WESTON Site Investigation Report Dated January 1997
D. EDR Report
E. AKT Peerless Laboratory Analytical Results
F. AKT Peerless Soil Boring Logs
G. Material Data Safety Sheets
H. Environmental Professional Experience

BASELINE ENVIRONMENTAL ASSESSMENT CONDUCTED PURSUANT TO SECTION 20126(1)(C) OF 1994, PA 451, PART 201, AS AMENDED, AND THE RULES PROMULGATED THEREUNDER AT FORMER FISHER BROTHERS PROPERTY 301 NORTH WATER STREET BAY CITY, MICHIGAN

AKT PEERLESS PROJECT NO. 3550F

1.0 IDENTIFICATION OF AUTHOR AND DATE OF BEA COMPLETION

AKT Peerless Environmental Services, (AKT Peerless) prepared this Baseline Environmental Assessment (BEA) on behalf of the City of Bay City for the Former Fisher Brothers property located at 301 North Water Street, Bay City, Michigan. AKT Peerless' scope of work is based on Section 20126(1)(c) of Part 201 of the Natural Resources and Environmental Protection Act (NREPA), 1994 Public Act (PA) 451, as amended, and *Michigan Department of Environmental Quality (MDEQ) Instructions for Preparing and Disclosing Baseline Environmental Assessments and Section 7a Compliance* Analyses, effective March 11, 1999. This BEA was conducted by March 15, 2002 by Josh Bennett of AKT Peerless and completed on March 29, 2002.

2.0 INTRODUCTION

The City of Bay City retained AKT Peerless to complete a BEA for the properties located at 301 North Water Street in Bay City, Michigan. The subject property consist of two parcels totaling approximately 12.2 acres. A Consumers Power corridor exists between the two parcels. See

Figure 1 for a Topographic Site Location Map and Figure 2 for a Site Map of the subject property. See Attachment A for a Legal Description of the subject property.

The BEA was prepared to (1) provide an independent, professional evaluation and opinion regarding existing environmental conditions associated with the property and (2) maintain a liability exemption for cleanup of existing contamination at the property under Section 20126(1)(c).

2.1 CATEGORY SELECTION

The current lessee, Bay Aggregates, Inc., will continue to operate and utilize hazardous substances at the property for up to one year. However, the City of Bay City intends on future development of the subject property which may include residential, recreational, or commercial use. According to MDEQ's Instructions for Preparing and Submitting Baseline Environmental Assessments, a Category S BEA is appropriate for the subject property. Therefore, AKT Peerless has prepared a Category S BEA.

2.2 SITE HISTORY

According to a 1912 Sanborn Fire Insurance Company map, the subject property served as a dumping location. The subject property was then developed into a coal and aggregate storage yard sometime between 1912 and 1938. Coal storage continued through the 1960's at the subject property, while aggregate storage still remains on the subject property. The subject property was owned and operated by the Robert Gage Coal Storage Company from 1912 to somewhere between 1980 and 1983.

Between 1938 and 1950, the redi-mix concrete plant was built on the subject property. Approximately 7 buildings, which historically existed on the northern parcel, no longer exist. The use of these buildings is unknown, although 2 of the structures were coal bins. Three structures visible in a 1969 appear to be above ground storage tanks (ASTs).

A manufactured gas plant was located immediately north of the Robert Gage Coal Company from prior to 1912 until sometime between 1938 and 1950.

Between 1912 and 1987, the western portions of the subject property were gradually filled, increasing the shoreline. The northern parcel acquired its current shoreline prior to 1963, but the southern parcel was not filled to completion until after that time.

Fisher Brothers acquired the subject property from the Robert Gage Coal Company sometime between 1980 and 1983 and Bay Aggregates began operations on the subject property. After the Robert Gage Coal Company ceased operations, and before the Bay Aggregates began operations on the subject property, another aggregate company performed operations on the subject property. However, the exact dates of the operation are unknown.

2.3 SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

There have been two subsurface investigations performed on the subject property since 1992. Arthur D. Little (ADL) conducted an investigation in 1992. WESTON Environmental (WESTON) conducted an investigation on the subject property in 1993. The following sections summarize previous environmental work performed at the subject property. See Figure 2 for a Site Map of the subject property.

2.3.1 Summary of ADL's Environmental Investigation

An environmental investigation was performed at the subject property in 1992 by ADL. This investigation included a geophysical survey, soil sampling, and groundwater sampling.

The geophysical survey was able to delineate the boundary of the old dumping grounds. The geophysical survey also identified an area of suspected USTs in the northeastern portion of the property, as well as one unknown UST to the south of the known UST.

The subsurface investigation consisted of a total of seven soil borings and the installation of three monitoring wells. See Figure 3 for a site map with soil boring locations. Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds/petroleum hydrocarbons (SVOCs/TPH), and metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, selenium, silver, and zinc). Groundwater samples were analyzed for VOCs and metals. Analytical results indicated VOCs, metals, and petroleum hydrocarbons (TPH) in soil samples and VOCs and SVOCs in groundwater samples. See Tables 1 and 2 for a summary of soil and groundwater results from ADL's subsurface investigation. See Attachment B for ADL's November 12, 1992 Investigation Report.

2.3.2 Summary of WESTON's Environmental Investigation

WESTON conducted an environmental investigation at the subject property in 1993. The investigation consisted of drilling five soil borings and collecting five soil samples, and conducting a geophysical survey. See Figure 3 for a site map with soil boring locations.

Four of the soil borings were drilled downgradient of a former metal plating shop and near former on-site storage buildings. The fifth soil boring was drilled in the northwest corner of the parcel to evaluate the impact from the adjacent property to the north. Soil samples were analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCBs), and Michigan metals. Analytical results indicated VOCs, SVOCs, or PCBs were not detected above laboratory detection limits. Analytical results of the soil samples indicated the following parameters exceeded Part 201 MDEQ Residential Cleanup Criteria:

- Concentrations of arsenic in soil samples CS-SB-30, CS-SB-33, and CS-SB-35 exceeded Residential Direct Contact Criteria.
- Concentrations of chromium in soil samples CS-SB-30, CS-SB-33, CS-SB-35, and CS-SB-36 exceeded Residential Surface Water Interface Protection Criteria.
- Concentrations of lead in soil sample CS-SB-33 exceeded Residential Direct Contact Criteria.

- Concentrations of mercury in soil samples in CS-SB-30, CS-SB-33, and CS-SB-35 exceeded Residential Groundwater Surface Water Interface Protection Criteria.
- Concentrations of selenium in soil sample CS-SB-33 exceeded Residential Groundwater Surface Water Interface Protection Criteria.
- Concentrations of silver in soil samples CS-SB-30 and CS-SB-33 exceeded Residential Groundwater Surface Water Interface Protection Criteria.

See Table 3 for a summary of the results from WESTON's investigation

WESTON conducted a geophysical survey to further evaluate the dumping location and the suspect UST areas. WESTON determined that the extent of the dumping location was larger than ADL determined. Also, WESTON determined that the anomaly in the area of the suspect UST was due to buried utilities. See Attachment C for a copy of WESTON's investigation report (Appendix E of Part 2 of Vol 1 of 5 EPA CERT report)

2.3.3 AKT Peerless' Historical Site Review

Federal and State Databases

AKT Peerless retained Environmental Data Resources, Inc. (EDR), to compile federal and state environmental database information. The purpose of obtaining this data was to evaluate potential environmental risks associated with the subject property, adjoining sites, and nearby sites located within specified search parameters. See Attachment D for the EDR report.

Typically, sites at a distance greater than a 1/2-mile radius represent only a remote chance of affecting the subject property. However, the maximum search distance extends to a 1-mile radius for some databases in accordance with ASTM Approximate Minimum Search Distances.

The subject property, is located north of the property referred to as the "Former Industrial Brownhoist Site, 206 South Water Street, Bay City, Michigan," and the subject property was listed on the following databases:

1. Michigan Registered UST Facilities. This database includes facilities that have, or have had, registered UST systems. According to the EDR report the following UST is registered to Bay Aggregates, Inc. located at 301 N. Water Street:

TANK ID	CONTENTS	CAPACITY (GALLONS)	TANK MATERIAL	AGE (YEARS)	STATUS
1	Diesel	6,000	N/A	N/A	Removed from Ground

Fire Insurance Maps

AKT Peerless retained EDR to search for historical *Sanborn Fire Insurance Maps*. Fire insurance maps were found for the years 1895, 1912, 1950, and 1967. Information obtained from the reviewed fire insurance maps is summarized in the following tables:

Dates	Observations (Subject Property)
1895	The subject property is occupied by the ""F.E. Bradley & Co. Sawmill &Salt Block" which included a log boom on the northern portion of the subject property. Three rail lines are depicted traversing the subject property.
1912	The subject property is occupied by "Mac Kinnon Boiler & Machine Co." which included a "log boom". Two rail lines are depicted traversing the subject property.
1950	The subject property is occupied by "sand and gravel piles", "coal" storage, and a "cement warehouse". Two rail lines are depicted traversing the subject property.
1967	The subject property is occupied by "sand and gravel piles". Two rail lines are depicted traversing the subject property.

2.3.4 AKT Peerless' Phase II Environmental Investigations

On February 15, 2002, AKT Peerless conducted a site visit. The purpose of this site visit was to evaluate the potential sources of contamination associated with the current and historical use of the subject property as a coal and aggregate storage area.

Based on AKT Peerless' initial survey of the subject property, a limited subsurface investigation was performed on March 5, 2002. The subsurface investigation consisted of 10 soil borings to a maximum depth of 12 feet bgs. A total of 10 soil samples were collected and analyzed for selected parameters including VOCs, PNAs, lead, cadmium, and chromium. Analytical results of the soil samples indicated the following parameters exceeded Part 201 MDEQ Residential Cleanup Criteria:

- Concentrations of lead in soil samples B-1 (1-2), B-6 (3-4), and B-8 (2-4) exceeded Generic Residential Drinking Water Protection Criteria and Generic Residential Soil Direct Contact Criteria.
- Concentrations of benzene, total xylenes, and 1,2,4-trimethylbenzene in soil sample B-4 (1-2) exceeded Generic Residential Drinking Water Protection Criteria.
- Concentrations of benzo(a)pyrene in soil sample B-5 (3-4) exceeded Generic Residential Soil Direct Contact Criteria.
- Concentrations of phenanthrene and benzo(a)pyrene in soil sample B-6 (3-4) exceeded Generic Residential Soil Volatilization to Ambient Air Inhalation Criteria and Generic Residential Soil Direct Contact Criteria.
- Concentrations of benzo(a)pyrene in soil sample B-8(2-4) exceeded Generic Residential Soil Direct Contact Criteria.
- Concentrations of phenanthrene, acenaphthylene, and anthracene in soil sample B-10 (7-8) exceeded Generic Residential Drinking Water Protection Criteria. Concentrations of phenanthrene in soil sample B-10 (7-8) also exceeded Generic Residential Soil Volatilization to Ambient Air Inhalation Criteria. Concentrations of benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrne exceeded Generic Residential Soil Direct Contact Criteria.

See Attachment E for a copy of the laboratory analytical report. See Attachment F for AKT Peerless' soil boring logs.

3.0 PROPERTY DESCRIPTION AND INTENDED HAZARDOUS SUBSTANCE USE

The purpose of this section is to describe (1) the property, (2) intended land use and future site activities, and (3) proposed use of hazardous substances.

3.1 PROPERTY DESCRIPTION

The subject property consists of two separate parcels of land separated by a Consumers Power corridor. The northern parcel consists of 10.16 acres, and the southern parcel consists of 2.01 acres. Both parcels are located on North Water Street, between Water Street and the Saginaw River in Bangor Township, Bay County, Bay City, Michigan. The subject property is located within Sections 21 and 28 of Township 14 North, Range 5 East on the *Bay City Quadrangle Map*. Parcel Identification Number 09-13-28-101-001 and 09-13-28-101-002. See Appendix A for a Legal Description of the subject property. See Figure 1 for Topographic Site Location Map.

The subject property is abutted by Stress Con Industries to the south, a former Sears parking lot to the north, and a number of small business properties to the east. The Saginaw River is adjacent to the subject property to the west.

3.2 INTENDED LAND USE

Bay Aggregates currently operates a redi-mix cement and aggregate storage business at the property. Operations include the storage of aggregate and materials necessary for the manufacture and shipping of redi-mix concrete. Bay Aggregates also conducts maintenance activities on trucks used in the delivery of concrete. Bay Aggregates will likely continue operations at the property for up to one year. Future plans for the property by the City of Bay City include redevelopment for residential, recreational, or commercial purposes. Specific development plans have not been finalized.

3.3 INTENDED HAZARDOUS SUBSTANCE USE

Future use of the subject property will include industrial and possibly residential/recreational or commercial use. See Attachment G for the material safety data sheets for Bay Aggregates' intended hazardous substance use. The following hazardous substances will be used during daily operations by the Bay Aggregates in their daily operations:

Hazardous Substance	CAS #	Hazardous Substance	CAS #
Aliphatic polysocyanate resin	28182-81-2	Xylene	1330-20-7
Aliphatic polymeric isocyanate	3779-63-3	1,2,4-trimetylbenzene	95-63-6
Aromatic hydrocarbon-A	64742-95-6	1,6-hexamethylene diisocyanate	822-06-0
Aromatic hydrocarbon-B	64742-94-5	2(2-hydroxy-3, 5-diteramylpheny) benzotriazole	25979-55-1
Bis(1-2,2,6,6-pentamethyl-4-piperdinyl) sebacate	41556-26-7	Acetic acid ester	90438-79-2
Bis(2,2,6,6-Tetramethyl-4 Piperdinyl) sebacate	52829-07-9	Acetone	67-64-1
Butyl acetate	123-86-4	Cyclohexane	110-82-7
Cumene	92-82-8	Ethyl 3-ethoxy propionate	763-69-9
Dibutyl tin dilaurate	77-58-7	Heptane	142-82-5
Diethylene glycol monobutyl ether	112-34-5	Heavy mineral spirits	64742-96-7
Diisobutyl ketone	108-83-8	Isopropyl alcohol	67-63-0
Ethyl acetate	141-78-6	Lead naphthenate	61970-14-5
Ethylbenzene	100-41-4	Medium mineral spirits	64742-88-7
Ethylene glycol monobutyl ether acetate	112-07-2	Methyl amyl ketone	110-43-0
Hexyl acetate isomers	88230-35-7	Mixed dibasic esters	NA
Isophorone diisocyanate homopolymer	88230-35-7	n-Butyl alcohol	71-36-3
Methyl ethyl ketone	78-93-3	Petroleum naphtha	64742-89-8
Naphthalene	91-20-3	VM&P Naphtha	64742-89-9
Oxo-actyl acetate	108419-32-5	2,2,4 Trimethyl- 1,3 pentanediol monoisobutyrate	25265-77-4

Propylene glycol monomethyl ether acetate	108-65-6	Calcium nitrite	13780-06-8
Toluene	108-88-3	Alkyd resin A	66070-61-9
Trimer of hexamethylene diisocyanate	3779-63-3	Alkyd resin B	68083-25-0
Trixylenyl phosphate	25155-23-1	Alkyd resin C	68213-52-5
Acrylic polymer	96591-17-2	Alkyd resin D	66070-61-9
Carbon black	1333-86-4	Alkyd resin E	68083-25-0
Dioxazine carbozole pigment	4378-61-4	Alkyd resin F	66070-62-0
Ferric hexacyanoferrate	14038-43-8	Alkyd resin G	66070-93-7
Iron Oxide	1309-37-1	Alkyd resin H	67763-06-8
Lead chromate	18454-12-1	Alkyd resin I	NA
Lead chromate molybdate	12656-85-8	Alkyd resin J	NA
Lead naphthenate	61790-14-5	Iron oxide	13093-37-1
Perylene pigment	128-69-8	Titanium dioxide	13483-87-7
Phthalocyanine blue pigment	147-14-8	Calcium oxide	1309-47-4
Phthalocyanine green pigment	1328-53-6	Potassium oxide	12030-80-8
Quinacridone pigment	1047-16-1	Sulfure trioxide	7446-11-9
Tetrachloroisindolinone yellow pigment	5590-18-1	Phosphorus peroxide	1314-56-3
Titanium dioxide	13463-67-7	Arsenic	7440-38-2
Toluidine pigment	None	Calcium carbonate (calcite)	1317-65-3
Surfactant Mixture	61790-12-3, 68439-57-6, 25322-68-3	Dolomite	16389-88-1
Potassium hydroxide	1310-58-3	Calcium nitrate	10124-37-5
Calcium nitrate	10124-37-5	Resin soap	None
Sodium thyocyanate	540-72-7	Calcium chloride	010043-52-4
Naphthalene sulfonate salt	6419-19-8	Potassium chloride	007447-40-7
Sodium nitrate	7631-99-4	Sodium chloride	007647-14-5
Triethanolomine	102-71-6	Masonry cement	65997-15-1
Salt of naphthalenesulfonate	37293-74-6	Gypsum	7778-18-9
Triethanolamine	102-71-6	Gravel	1317-67-3
Copolymer mixture	proprietary	Ethylene glycol	107-21-1
Amorphous Silicon Dioxide (silica)	7631-88-9	Low sulfur#2 diesel fuel	68476-34-6
Silica crystalline - Quartz	14808-80-7	Rotella T 15W-40 with Advanced Soot Control	64742-54-7
Spirax Heavy Duty Gear Oil 85W-140	64742-18-3, 64742-52-5, 64742-57-0	Severly hydrotreated light naphthenic distillate	64842-53-6
Diethylene glycol	111-46-6	Solvent refined, hydrotreated, acid treated heavy naphthenic distillate	64742-18-3
Solvent dewaxed residual oil	64742-62-7	Severely hydrotreated heavy naphthenic distillate	64742-52-5

Solvent refined, hydrotreated middle distillate	64742-46-7	Nonylphenozypoly ethanol	9016-45-9
Solvent dewaxed heavy parffinic distillate	64742-65-0	Argon	7440-37-1
Hydrotreated residual oil	64742-57-0	Carbon dioxide	124-38-9
Lithium hydroxystearate	7620-77-1	Acetylene	74-86-2
Calcium hydroxystearate	3159-62-4	Oxygen	7782-44-7
Solvent refined, catalytic dewaxed heavy paraffinic oil	64742-70-7	Phosphorous pentoxide	1314-56-3
Potassium hydroxide	1310-58-3	Carbon	7440-44-0
Sodium metasilicate	10213-79-3	Magnesium oxide	1309-48-4
Sodium tripolyphosphate	7758-29-4	Sulfite	14265-45-3
Ethoxylated alcohol	9002-92-0	Acetic acid	64-19-7
Sodium xylene sulfonate	1300-72-7	Block polymer	25067-11-2
Hydrochloric acid	7647-01-00	Formaldehyde	50-00-0
Bis(tributyltin)oxide	unknown	Methyl isobutyl ketone	108-10-1
N-alkyl dimethyl benzyl amm. chloride	63891-01-5	Methyl n-propyl ketone	107-87-9
Mixed dibasic esters	NA	n-butyl alcohol	71-36-3

4.0 KNOWN CONTAMINATION

The following subsections present (1) known contamination at the property, (2) criteria for the defining the property as a facility, and (3) identification of the general locations of contamination.

As of 1992, there have been three subsurface investigations performed at the subject property:

- ADL investigation in 1992
- WESTON investigation in 1993
- AKT Peerless investigation in February, 2002

Analysis has been performed on soil samples for the following contaminants: VOCs, PNAs, PCBs, and Michigan metals. Based on compiled analytical results of the soil samples, the following compounds were detected at concentrations above MDEQ Generic Residential Cleanup Criteria.

Hazardous Substance	CAS #	Maximum Concentrations (µg/kg)
Arsenic	7440382	21,000
Lead	7439921	1,600,000
Mercury	7439976	3,100
Selenium	7782492	3,000
Silver	7440224	1,000
Benzene	71432	150
Xylene	1330207	6,200
1,2,4-Trimethylbenzene	95636	3,100
Phenanthrene	85018	420,000
Acenapthylene	208968	21,000
Anthracene	120127	120,000
Benzo(a)anthracene	56553	120,000
Benzo(b)fluoranthene	205992	69,000
Benzo(a)pyrene	50328	96,000
Indeno(1,2,3-cd)pyrene	193395	51,000
1,2 Dichloroethene	540-59-0	630
Trichloroethene	79-01-6	510

Therefore, the property meets the definition of a "facility," as defined in Part 201 of NREPA, Act 451 of 1994, as amended. See Figure 4 for a site map with soil results above MDEQ Cleanup Criteria. See Figure 5 for a site map with groundwater analytical results above MDEQ Generic Residential Cleanup Criteria. See Tables 1 through 4 for a summary of soil and groundwater analytical results. See Section 2.3 for a description of all subsurface investigation activities completed on the subject property.

4.1 HAZARDOUS SUBSTANCES AT THE FACILITY

Previous subsurface investigations evaluated potential impact to soil and groundwater from the historical use of the property. Based on compiled analytical results from AKT Peerless' subsurface investigation, as well as previous subsurface investigations by ADL and WESTON, the following

hazardous substances were detected above the laboratory method detection limits in soil and groundwater samples collected from the property:

Hazardous Substance	CAS #	Hazardous Substance	CAS #
Arsenic	7440382	Anthracene	120127
Barium	7440393	Chrysene	218019
Cadmium	7440439	1,3,5-Trimethylbenzene	108678
Chromium	18540229	Acenapthene	208968
Copper	7440508	Acenaphthylene	208968
Lead	7439921	Anthracene	120127
Selenium	7782492	Naphthalene	91203
Silver	7440224	2-Methylnaphthalene	91576
Zinc	7440666	Fluoranthene	206440
Benzene	71432	Fluorene	86737
Toluene	108883	Pyrene	206440
Ethylbenzene	100414	Benzo(a)anthracene	56553
Xylenes	1330207	Chrysene	218019
Tetrachloroethylene	127184	Benzo(b)fluoranthene	205992
n-Propylbenzene	103651	Benzo(k)fluoranthene	207089
n-Butylbenzene	104518	Benzo(a)pyrene	50328
sec-Butylbenzene	135998	Dibenzo(a,h)anthracene	53703
1,2,4-Trimethylbenzene	95636	Indeno(1,2,3-cd)pyrene	193395
2-Methylnaphthalene	91576	Benzo(g,h,i)perylene	191242

Hazardous Substance	CAS #	Hazardous Substance	CAS #
4-Methylphenol	106-44-5	Phenol	108-95-2
Acetone	67-64-1	1,2 Dichloroethene	107-06-2
Methylene chloride	75-09-2	Trichloroethene	79-01-6

4.2 IDENTIFICATION OF THE GENERAL LOCATIONS OF CONTAMINATION

The following subsections present (1) property features, (2) subsurface conditions, and (3) the media affected at the property.

4.2.1 Property Features (Buildings and Existing Underground Utilities)

The subject property consists of two separate parcels of land separated by a Consumers Power corridor. There are currently four buildings on the property (1) batch plant and operations office, (2) maintenace garage, and (3) two miscellaneous storage buildings. There is also a truck wash bay onsite. Drinking water, sanitary sewer, and natural gas are all provided by underground municipal services.

4.2.2 Subsurface Soil Conditions

According to the Michigan Geological Survey Division's publication, *Quaternary Geology of Southern Michigan*, soils in this area are described as pale brown to pale reddish brown quartz sand and igneous and metamorphic gravel. These soils may include intercalated lacustrine clays. These soils occur as former beaches and near-offshore littoral deposits of glacial Great Lakes. The thickness of the soil ranges from 1 to 30 meters.

According to the United States Department of Agriculture, *Soil Survey of of Bay County, Michigan,* the soils in the area are classified as the Tappan-Belleville association. These soils are described as "*nearly level, poorly drained soils that formed in loamy and sandy material on till plains modified by lake waters.*"

During AKT Peerless' subsurface investigation, all 10 boring locations had approximately 8 inches to one foot of concrete on the surface. AKT Peerless observed from 1 foot below ground surface (bgs) to approximately 5 feet bgs a fine to medium-grained, black, moist, trace fine-grained gravelly sand unit; and from approximately 5 feet bgs to 8 feet bgs a medium-soft, gray to brown, dry, trace graveled clay unit. Some brick and concrete debris was identified in soil borings B-1, B-2, B-6, and B-8 at depths ranging from 1-foot bgs to 5 feet bgs.

The subsurface soils at the property are consistent with the description of sand and gravelly glacial till reported in the *Quaternary Geology of Southern Michigan.*

4.2.3 Groundwater

Based on the topographic contours, the regional surface water discharge appears to be to the west, toward the Saginaw River. Typically, the water table aquifer flows toward a major drainage feature or in the same direction as the drainage basin. Therefore, it is likely that groundwater in the area of the property flows to the west.

Based on a review of ADL's boring logs, groundwater has been observed on the subject property at depths ranging from 4.25 feet bgs to 13.25 feet bgs.

4.2.4 Media Affected at the Property

Based on the analytical results, the media affected at the property is limited to surface and shallow subsurface soil and groundwater.

4.3 KNOWN ABANDONED CONTAINERS OF HAZARDOUS SUBSTANCES

A geophysical investigation conducted by ADL in 1992 at the subject property indicated the presence of two USTs near the northeast corner of the subject property. A geophysical investigation conducted by WESTON in 1993 at the subject property was used to determine that the area of

suspected USTs in the northeast portion of the subject property contained no USTs as originally determined in the ADL geophysical survey.

The subject property is listed on the Michigan Registered UST facilities list. One 6,000-gallon diesel UST was registered to the property. The current status of the UST is listed as removed from the ground. The subject property is not listed on the Michigan Leaking Underground Storage Tank list.

5.0 LIKELIHOOD OF OTHER CONTAMINATION

Identified recognized environmental concerns associated with the subject property have been identified within previous environmental investigations. Previous subsurface investigations, along with AKT Peerless' recent subsurface investigation, have been conducted to address the recognized environmental concerns.

6.0 CONCLUSIONS

AKT Peerless was retained to prepare a Category S BEA for the property located at 301 North Water Road in Bay City, Michigan. The purpose of the BEA is to: (a) provide an independent, professional evaluation, and opinion regarding existing environmental conditions associated with the property; and (b) maintain a liability exemption for cleanup of existing contamination.

The analytical results of the subsurface investigations indicate concentrations of arsenic, chromium, lead, mercury, selenium, silver, benzene xylenes, 1,2,4-trimethylbenzene, phenanthrene, acenapthylene, anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, 1,2 Dichloroethane, and trichloroethene are present in the soil and groundwater at the subject property above MDEQ Residential Cleanup Criteria. Based on this information, the subject property is defined as a "facility" in accordance with Part 201 of the NREPA, 1994 Public Act 451, as amended.

8.0 SIGNATURE PAGE

AKT Peerless Environmental Services prepared this BEA on behalf of the City of Bay City for 301 North Water Road in Bay City, Michigan. AKT Peerless' scope of work is based on Section 20126(1)(c) of Part 201 of the NREPA, 1994 PA 451, as amended, and MDEQ Instructions for Preparing and Disclosing Baseline Environmental Assessments and Section 7a Compliance Analyses, dated March 11, 1999.

AKT PEERLESS ENVIRONMENTAL SERVICES

Josh Bennett
Geologist
AKT Peerless Environmental Services

Scott G. Klipa, P.E.
Senior Environmental Engineer
AKT Peerless Environmental Services

March 29, 2002

FIGURES

BAY CITY QUADRANGLE

MICHIGAN – BAY COUNTY

7.5 MINUTE SERIES (TOPOGRAPHIC)

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

MICHIGAN
QUADRANGLE LOCATION

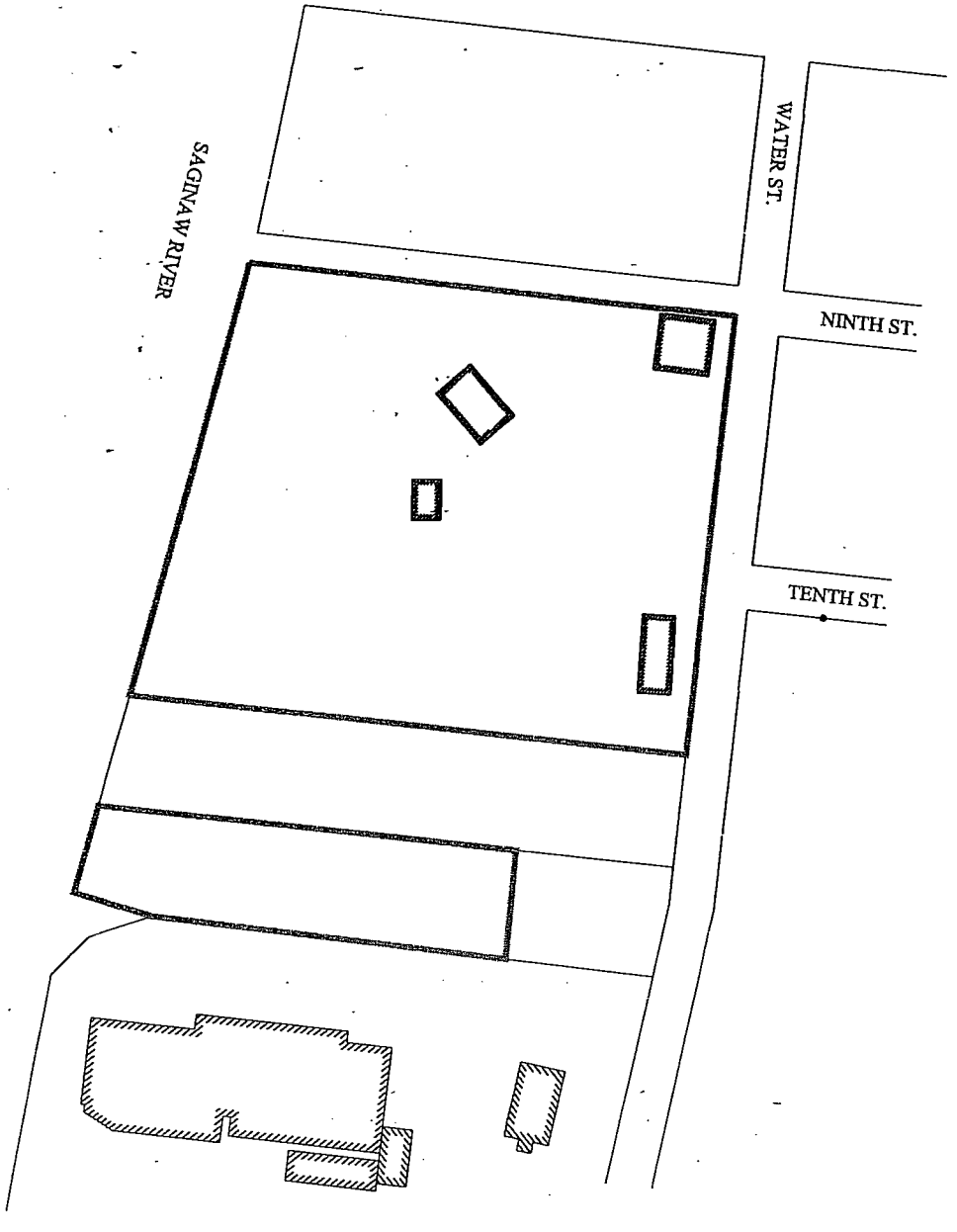
IMAGE TAKEN FROM 1975 U.S.G.S. TOPOGRAPHIC MAP
PHOTOREVISED 1976

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
phone: (248) 615-1333 fax: (248) 615-1334

TOPOGRAPHIC SITE LOCATION MAP
IB PROPERTY
BAY CITY, MICHIGAN
PROJECT NUMBER : 3522F
TSLM

DRAWN BY: *JB*
DATE: *3-15-02*

FIGURE 1



LEGEND

= PROPERTY LINE

= GAS LINE

AKTPEERLESS
environmental services

24073 Research Drive, Farmington Hills, MI 48335
phone: (248) 615-1333 fax: (248) 615-1334

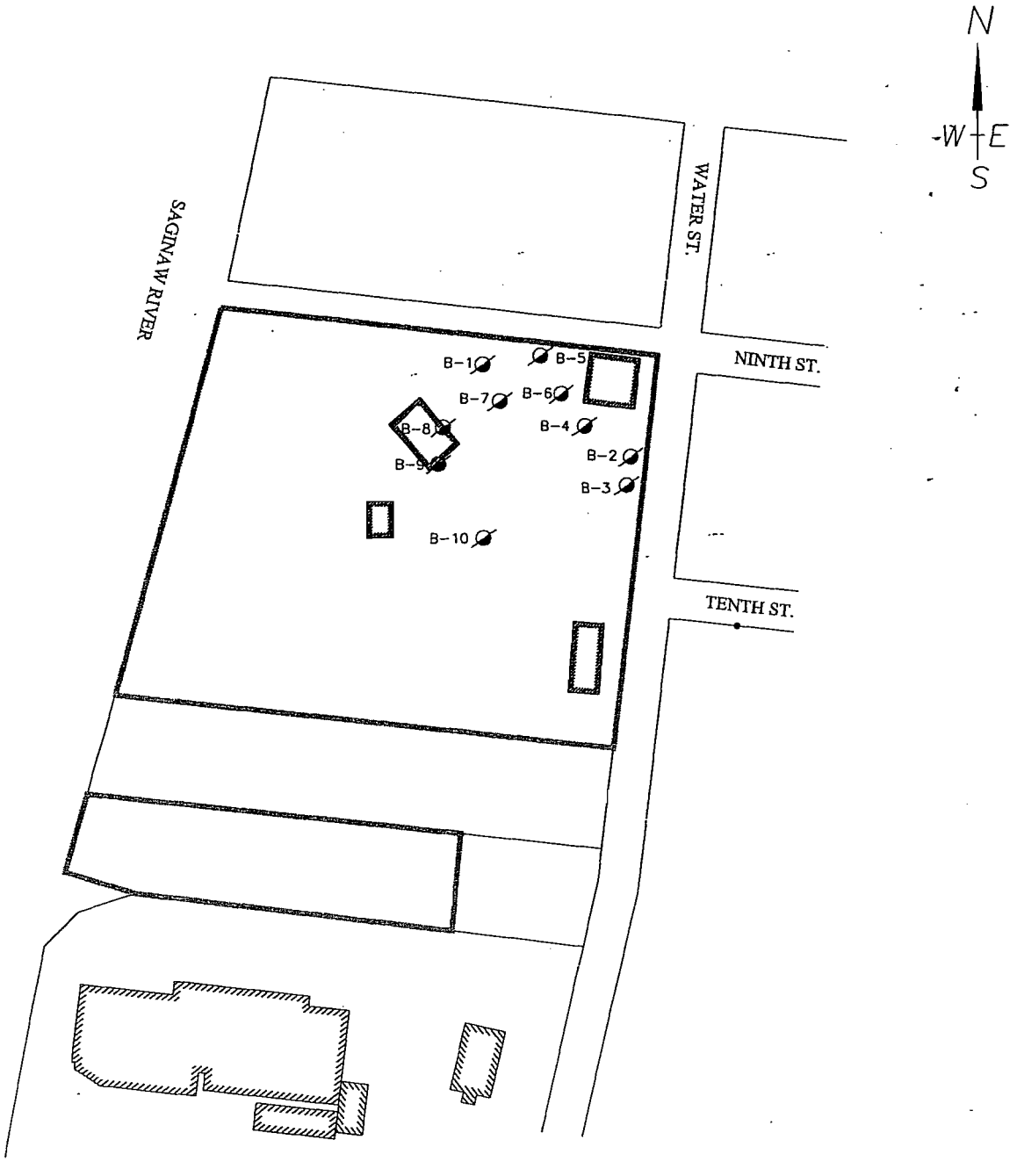
SITE MAP
FISHER IB AND FISHER PROPERTIES
BAY CITY, MICHIGAN

PROJECT NUMBER : 3550F
DRAWING NUMBER : PM2

DRAWN BY: PAF
DATE: 01-08-01

0 0 0
SCALE: 1"= 250'±

FIGURE 2



LEGEND

= SOIL BORING

= PROPERTY LINE

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
phone: (248) 615-1333 fax: (248) 615-1334

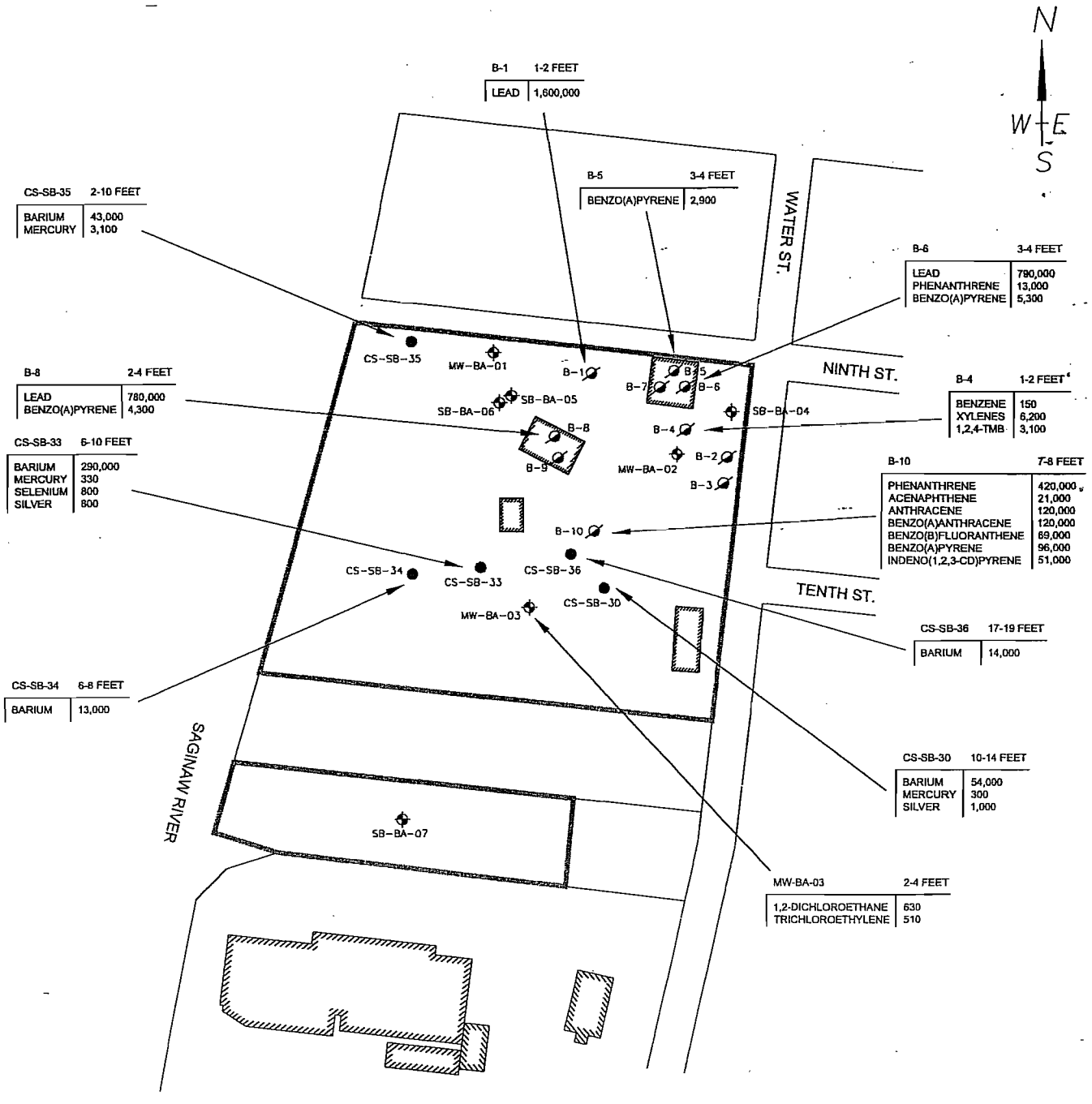
SITE MAP WITH SOIL BORINGS
FORMER FISHER BROS. PROPERTY
BAY CITY, MICHIGAN

PROJECT NUMBER : 3550F
DRAWING NUMBER : PM2

DRAWN BY: PAF
DATE: 01-08-01

0 0 0
SCALE: 1"= 250'±

FIGURE 3



note: all results are in µg/kg

AKTPEERLESS
environmental services

22725 Orchard Lake Rd, Farmington, MI 48336
phone: (248) 615-1333 fax: (248) 615-1334

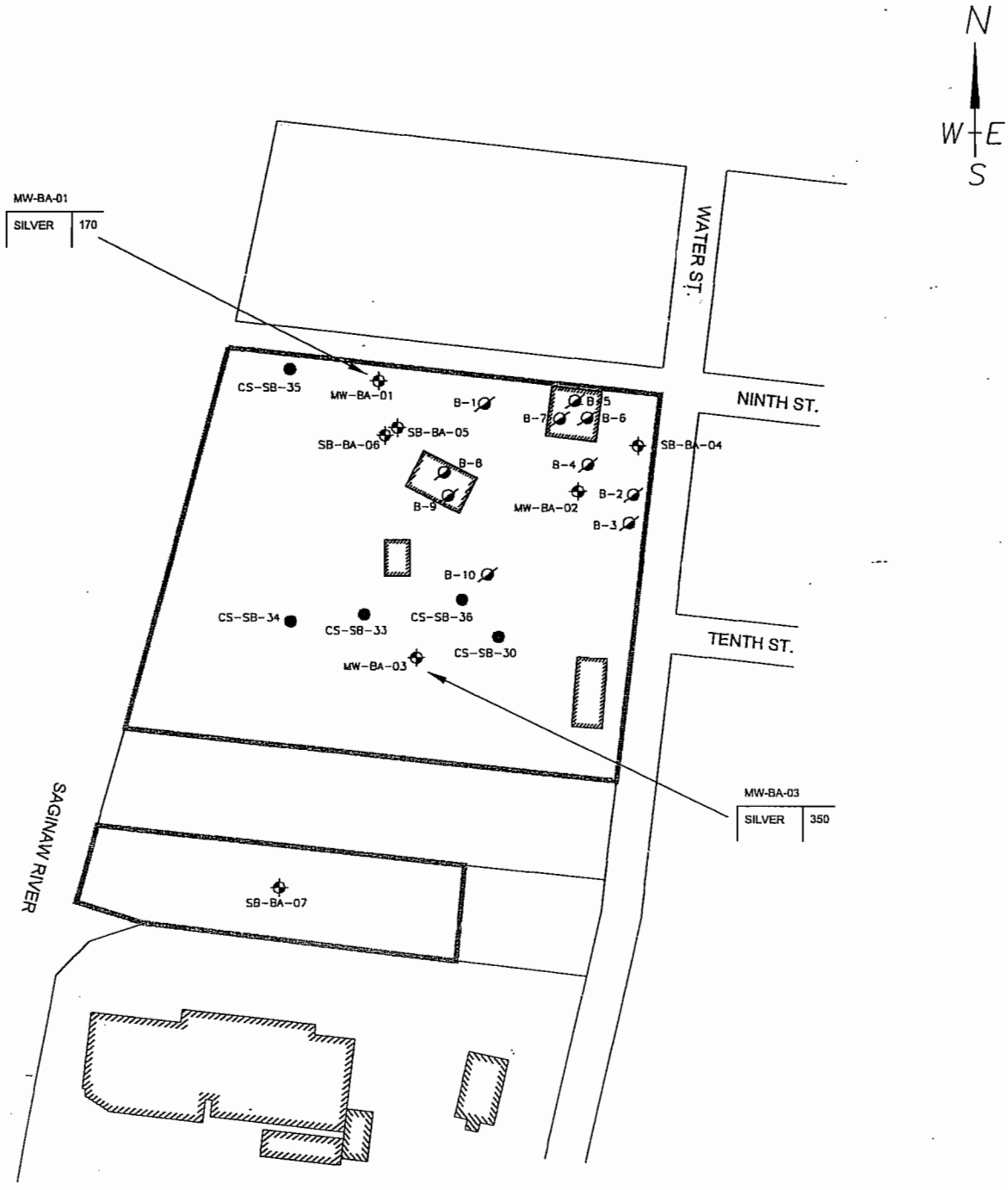
SITE MAP WITH SOIL ANALYTICAL RESULTS ABOVE MDEQ CLEANUP CRITERIA

FISHER BROTHERS
BAY CITY, MICHIGAN
PROJECT NUMBER : 3550F
DRAWING NUMBER : PM2

DRAWN BY: PAF
DATE: 01-08-01

SCALE: 1"= 250'±

FIGURE 4



note: all results are in µg/L

AKTPEERLESS
environmental services

22725 Orchard Lake Rd, Farmington, MI 48336
phone: (248) 615-1333 fax: (248) 615-1334

SITE MAP WITH GROUNDWATER ANALYTICAL RESULTS ABOVE MDEQ CLEANUP CRITERIA

FISHER BROTHERS
BAY CITY, MICHIGAN
PROJECT NUMBER : 3550F
DRAWING NUMBER : PM2

DRAWN BY: PAF
DATE: 01-08-01

0 0 0
SCALE: 1"= 250'±

FIGURE 5

TABLES

Table 1
Summary of Soil Analytical Results ADL
Fisher Bros , Bay City, Mi
AKT Peerless Project Number 3522F-2-20

Sample Identification and Date		MW-BA-01 (2.5-4.4)	MW-BA-01 (10-12)	MW-BA-02 (2-4)	MW-BA-02 (18-21)	MW-BA-03 (2-4)	MW-BA-03 (10-12)	SB-BA-03 (2-4)	SB-BA-04 (2-4)	SB-BA-04 (21.5-23.5)	SB-BA-05 (8-10)	SB-BA-06 (17-19)	SB-BA-07 (2-4)	SB-BA-07 (10-12)	MDEQ Generic Residential Drinking Water Protection Criteria α	MDEQ Generic Residential Groundwater Surface Water Interface Protection Criteria	MDEQ Generic Residential Soil Direct Contact Criteria α	MDEQ Generic Residential Soil Volatilization to Ambient Air Inhalation Criteria α	MDEQ Generic Residential Soil Volatilization to Indoor Air Inhalation Criteria α
Gasoline Parameters (µg/kg)	**CAS#**																		
Acetone	67641	ND	ND	ND	ND	ND	ND	ND	100	ND	100	ND	ND	ND	15,000	34,000	23,000,000	130,000,000	110,000,000
1,2-Dichloroethane	107062	ND	ND	ND	ND	**630**	60	**630**	ND	ND	ND	ND	ND	ND	**100**	7,200	91,000	6,200	2,100
Methylene chloride	75092	ND	ND	ND	ND	NA	ND	ND	ND	ND	ND	10	40	ND	100	19,000	1,300,000	210,000	45,000
Toluene	108883	ND	ND	ND	ND	120	ND	120	ND	ND	ND	ND	ND	ND	16,000	2,800	250,000	2,800,000	250,000
Trichloroethylene	79016	ND	ND	ND	ND	**510**	50	**510**	ND	ND	ND	ND	ND	ND	**100**	4,000	500,000	78,000	7,100
Other VOCs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Michigan Metals (µg/kg)	**CAS#**																		
Arsenic	7440382	ND	ND	NA	NA	ND	ND	NA	NA	NA	NA	NA	6,000	3,000	23,000	70,000	7,600	NLV	NLV
Barium	7440393	**35000**	**19000**	NA	NA	**46,000**	**39,000**	NA	NA	NA	NA	NA	**40,000**	**11,000**	1,300,000	**1,900**	37,000,000	NLV	NLV
Cadmium	7440439	ND	ND	NA	NA	ND	300	NA	NA	NA	NA	NA	800	200	6,000	G	550,000	NLV	NLV
Chromium (total)	18540229	7,000	4,000	NA	NA	9000	8,000	NA	NA	NA	NA	NA	6,000	3,000	30,000	G	2,500,000	NLV	NLV
Copper	7440508	7000	4000	NA	NA	11,000	16,000	NA	NA	NA	NA	NA	150,000	7,000	5,800,000	G	20,000,000	NLV	NLV
Lead	7439921	10000	ND	NA	NA	12,000	36,000	NA	NA	NA	NA	NA	55,000	7,000	700,000	G	400,000	NLV	NLV
Mercury (inorganic)	7439976	ND	ND	NA	NA	300	600	NA	NA	NA	NA	NA	100	ND	1,700	100	160,000	NLV	NLV
Selenium	7782492	**3000**	**1000**	NA	NA	ND	ND	NA	NA	NA	NA	NA	ND	ND	4,000	**400**	2,600,000	NLV	NLV
Silver	7440224	ND	ND	NA	NA	ND	ND	NA	NA	NA	NA	NA	ND	ND	4,500	500	2,500,000	NLV	NLV
Zinc	7440666	24000	4000	NA	NA	24,000	54,000	NA	NA	NA	NA	NA	55,000	17,000	2,400,000	G	170,000,000	NLV	NLV
PNAs and PCBs (µg/kg)	**CAS#**																		
Naphthalene	91203	NA	NA	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	NA	35,000	870	16,000,000	300,000	250,000
4-Methylphenol	106445	NA	NA	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	NA	7,400	1,400	11,000,000	NLV	NLV
Phenol	108952	NA	NA	ND	NA	ND	ND	NA	ND	NA	ND	ND	ND	NA	88,000	4,200	12,000,000	NLV	NLV
TPH		NA	NA	40000	NA	50,000	20,000	NA	50,000	NA	**360,000**	40,000	**200,000**	NA	-	-	-	-	-
Other PNAs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note:

(µg/kg) - Micrograms per kilogram
"<" - Less than the laboratory method detection limit
NA - Not analyzed
ND - Not detected above laboratory method detection limits
NLV - Not likely to volatilize
ID - Inadequate data to develop criteria
IP - Development in process
NLL - Not likely to leach
NA - Not available
α – MDEQ Operational Memorandum #18: Part 201Generic Cleanup Criteria and Screening Levels, June 7, 2000
β – MDEQ Operational Memorandum #4: Part 213 Tier I Risk-Based Screening Levels (RBSLs), June 2000
bold - concentration exceeds MDEQ Criteria

Table 2
Summary of Groundwater Analytical Results ADL
Fisher Bros., Bay City, Mi
AKT Peerless Project Number 3522F-2-20

Sample Identification and Date		MW-BA-01	MW-BA-02	MW-BA-03	MDEQ Generic Residential Drinking Water Protection Criteria α	MDEQ Generic Residential Groundwater Volatilization to Indoor Air Inhalation Criteria	Groundwater Contact Criteria
Gasoline Parameters (µg/kg)	**CAS#**						
Acetone	67641	100	ND	ND	730	100,000,000	31,000,000
Benzene	71432	4	ND	ND	5	5,600	11,000
Bromodichloromethane	75274	ND	1	ND	100	4,800	14,000
Chloroform	67663	ND	5	ND	100	28,000	150,000
Methylene chloride	75092	ND	1	2	5	220,000	220,000
Styrene	100425	1	ND	ND	100	170,000	9,700
Toluene	108883	6	ND	ND	790	530,000	530,000
Other VOCs	-	-	-	-	-	-	-
Michigan Metals (µg/kg)	**CAS#**						
Arsenic	7440382	ND	NA	11	50	NLV	4,300
Barium	7440393	650	NA	190	2,000	NLV	14,000,000
Cadmium	7440439	ND	NA	ND	5	NLV	190,000
Chromium (total)	18540229	31	NA	23	100	NLV	460,000
Copper	7440508	44	NA	55	1,000	NLV	7,400,000
Lead	7439921	ND	NA	**24**	**4**	NLV	ID
Mercury (inorganic)	7439976	0.7	NA	**4**	**2**	NLV	56
Selenium	7782492	ND	NA	ND	50	NLV	970,000
Zinc	7440666	ND	NA	ND	2,400	NLV	110,000,000
Silver	7440224	**170**	NA	**350**	**34**	NLV	1,500,000
PNAs and PCBs (µg/kg)	**CAS#**						
Naphthalene	91203	1100	NA	NA	520	31,000	31,000
4-Methylphenol	106445	20	NA	NA	370	NLV	810,000
Phenol	108952	30	NA	NA	4,400	NLV	2,900,000
TPH		ND	NA	NA	-	-	-
Other PNAs	-	-	NA	NA	-	-	-

Note:

(µg/kg) - Micrograms per kilogram
"<" - Less than the laboratory method detection limit
NA - Not analyzed
ND - Not detected above laboratory method detection limits
NLV - Not likely to volatilize
ID - Inadequate data to develop criteria
IP - Development in process
NLL - Not likely to leach
NA - Not available
α – MDEQ Operational Memorandum #18: Part 201Generic Cleanup Criteria and Screening Levels, June 7, 2000
β – MDEQ Operational Memorandum #4: Part 213 Tier I Risk-Based Screening Levels (RBSLs), June 2000
bold - concentration exceeds MDEQ Criteria

Table 3
Summary of Soil Analytical Results WESTON
Fisher Bros , Bay City, Mi
AKT Peerless Project Number 3522F-2-20

Sample Identification and Date		CS-SB-30 (10-14)	CS-BS-33 (6-10)	CS-BS-34 (6-8)	CS-BS-35 (2-10)	CS-BS-36 (17-19)	MDEQ Generic Residential Drinking Water Protection Criteria α	MDEQ Generic Residential Groundwater Surface Water Interface Protection Criteria	MDEQ Generic Residential Soil Direct Contact Criteria α	MDEQ Generic Residential Soil Volatilization to Ambient Air Inhalation Criteria α	MDEQ Generic Residential Soil Volatilization to Indoor Air Inhalation Criteria α
Michigan Metals (µg/kg)	**CAS#**										
Arsenic	7440382	**15000**	**21000**	4,900	**11,000**	7,600	23,000	70,000	**7,600**	NLV	NLV
Barium	7440393	**54000**	**290000**	**13,000**	**43,000**	**14,000**	1,300,000	1,900	37,000,000	NLV	NLV
Cadmium	7440439	2400	2200	80	1300	1000	6,000	G	550,000	NLV	NLV
Chromium (total)	18540229	16,000	12,000	ND	13,000	9000	30,000	G	2,500,000	NLV	NLV
Copper	7440508	28000	110000	3,000	20,000	6,000	5,800,000	G	20,000,000	NLV	NLV
Lead	7439921	42000	**590000**	6,000	37,000	8,000	700,000	G	**400,000**	NLV	NLV
Mercury (inorganic)	7439976	**300**	**330**	60	**3,100**	60	**1,700**	**100**	160,000	NLV	NLV
Selenium	7782492	ND	**800**	ND	ND	ND	4,000	**400**	2,600,000	NLV	NLV
Silver	7440224	1000	**800**	ND	ND	ND	4,500	**500**	2,500,000	NLV	NLV
Zinc	7440666	80000	440000	140,000	70,000	16,000	2,400,000	G	170,000,000	NLV	NLV

Note:

(µg/kg) - Micrograms per kilogram

"<" - Less than the laboratory method detection limit

NA - Not analyzed

ND - Not detected above laboratory method detection limits

NLV - Not likely to volatilize

ID - Inadequate data to develop criteria

IP - Development in process

NLL - Not likely to leach

NA - Not available

α – MDEQ Operational Memorandum #18: Part 201Generic Cleanup Criteria and Screening Levels, June 7, 2000

β – MDEQ Operational Memorandum #4: Part 213 Tier I Risk-Based Screening Levels (RBSLs), June 2000

bold - concentration exceeds MDEQ Criteria

Table 4
Summary of Soil Analytical Results AKT Peerless
Fisher Brothers, Bay City, Mi
AKT Peerless Project Number 3522F-2-20

Sample Identification and Date		B-1 (1-2) 3-5-02	B-2 (4-5) 3-5-02	B-3 (3-4) 3-5-02	B-4 (1-2) 3-5-02	B-5 (3-4) 3-5-02	B-6 (3-4) 3-5-02	B-7 (3-4) 3-5-02	B-8 (2-4) 3-5-02	B-9 (2-3) 3-5-02	B-10 (7-8) 3-5-02	MDEQ Generic Residential Drinking Water Protection Criteria α	MDEQ Generic Residential Soil Direct Contact Criteria α	MDEQ Generic Residential Soil Volatilization to Ambient Air Inhalation Criteria α	MDEQ Generic Residential Soil Volatilization to Indoor Air Inhalation Criteria α	MDEQ Generic Industrial Soil Direct Contact Value a	MDEQ Generic Industrial Soil Volatilization to Ambient Air Inhalation Criteria a	MDEQ Generic Industrial Soil Volatilization to Indoor Air Inhalation Criteria a
Gasoline Parameters (µg/kg)	**CAS#**																	
Benzene	71432	<50	<50	<50	**150**	<50	<50	<50	<50	<50	<50	**100**	180,000	13,000	1,600	400,000	45,000	8,400
Toluene	108883	270	<50	<50	1,900	<50	120	<50	<50	<50	<50	16,000	250,000	2,800,000	250,000	250,000	3.3E+06	250,000
Ethylbenzene	100414	<50	<50	<50	500	<50	<50	<50	<50	<50	<50	1,500	140,000	9,500,000	140,000	140,000	11,000,000	140,000
Tetrachloroethylene	127184	<50	<50	<50	<50	<50	620	<50	<50	<50	<50	100	88,000	180,000	11,000	88,000	600,000	60,000
n-Propylbenzene	103651	<100	NA	NA	290	<100	<100	<100	<100	<100	<100	1,600	2,500,000	ID	ID	10,000,000	ID	ID
Xylenes	1330207	420	<150	<150	**6,200**	<150	230	<150	<150	<150	<150	**5,600**	150,000	46,000,000	150,000	150,000	54,000,000	150,000
n-Butylbenzene	104518	<50	NA	NA	260	<50	<50	<50	<50	<50	<50	1,600	2,500,000	ID	ID	10,000,000	ID	ID
sec-Butylbenzene	135998	<50	NA	NA	69	<50	<50	<50	<50	<50	<50	1,600	2,500,000	ID	ID	10,000,000	ID	ID
1,2,4-Trimethylbenzene	95636	110	<100	<100	**3,100**	<100	110	<100	<100	<100	<100	**2,100**	110,000	21,000,000	110,000	110,000	25,000,000	110,000
1,3,5-Trimethylbenzene	108678	<100	<100	<100	1,400	<100	<100	<100	<100	<100	<100	1,800	94,000	16,000,000	94,000	94,000	19,000,000	94,000
Other VOCs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Michigan Metals (µg/kg)	**CAS#**																	
Cadmium	7440439	350	NA	NA	230	1,100	3,100	990	490	310	370	6,000	550,000	1,700,000	NLV	4,100,000	NLV	NLV
Chromium (total)	18540229	9,300	NA	NA	13,000	19,000	27,000	12,000	24,000	9,300	8,800	30,000	2,500,000	260,000	NLV	17,000,000	240,000	NLV
Lead	7439921	**1,600,000**	NA	NA	84,000	350,000	**790,000**	290,000	**780,000**	130,000	120,000	**700,000**	**400,000**	100,000,000	NLV	**900,000**	NLV	NLV
PNAs and PCBs (µg/kg)	**CAS#**																	
Phenanthrene	85018	<330	<330	<1,700*	490	5,500	**13,000**	340	4,900	2,700	**420,000**	**56,000**	1,600,000	**9,300**	1,800,000	8,000,000	**11,000**	3,300,000
Acenaphthene	83329	<330	<330	<1,700*	<330	<330	1,000	<330	<330	<330	34,000	300,000	41,000,000	81,000,000	190,000,000	200,000,000	97,000,000	350,000,000
Acenaphthylene	208968	<330	<330	<1,700*	<330	<330	<330	<330	<330	<330	**21,000**	**5,900**	1,600,000	2,200,000	1,600,000	8,000,000	2,700,000	3,000,000
Anthracene	120127	<330	<330	<1,700*	<330	1,300	3,400	<330	1,300	<1,700*	**120,000**	**41,000**	230,000,000	1,400,000,000	1,000,000,000	1,000,000,000	1,600,000,000	1,000,000,000
Naphthalene	91203	<330	<330	<1,700*	380	<330	1,100	<330	<330	<330	27,000	35,000	16,000,000	300,000	250,000	80,000,000	350,000	470,000
2-Methylnaphthalene	91576	<330	<330	<1,700*	720	<330	510	<330	<330	<330	31,000	57,000	8,100,000	ID	ID	40,000,000	ID	ID
Fluoranthene	206440	<330	<330	<1,700*	1,000	8,100	14,000	680	8,900	4,600	320,000	730,000	46,000,000	740,000,000	1,000,000,000	180,000,000	890,000,000	1,000,000,000
Fluorene	86737	<330	<330	<1,700*	<330	350	960	<330	420	<330	78,000	390,000	27,000,000	130,000,000	580,000,000	130,000,000	150,000,000	1,000,000,000
Pyrene	206440	<330	<330	<1,700*	900	6,100	12,000	610	7,900	4,100	240,000	480,000	29,000,000	650,000,000	1,000,000,000	110,000,000	780,000,000	1,000,000,000
Benzo(a)anthracene	56553	<330	<330	<1,700*	640	3,200	6,000	360	3,700	2,400	**120,000**	NLL	**20,000**	NLV	NLV	**100,000**	NLV	NLV
Chrysene	218019	<330	<330	<1,700*	770	3,400	5,300	410	4,200	2,700	120,000	NLL	2,000,000	ID	ID	10,000,000	ID	ID
Benzo(b)fluoranthene	205992	<330	<330	<1,700*	710	2,900	4,500	350	3,500	2,200	**69,000**	NLL	**20,000**	NLV	NLV	100,000	NLV	NLV
Benzo(k)fluoranthene	207089	<330	<330	<1,700*	580	1,800	3,900	<330	3,000	1,700	81,000	NLL	200,000	NLV	NLV	1,000,000	NLV	NLV
Benzo(a)pyrene	50328	<330	<330	<1,700*	700	**2,900**	**5,300**	<330	**4,300**	2,500	**96,000**	NLL	**2,000**	1,500,000	NLV	**10,000**	NLV	NLV
Dibenzo(a,h)anthracene	53703	<330	<330	<1,700*	<330	<330	<1,700*	<330	<1,700*	<1,700*	<33,000*	NLL	2,000	NLV	NLV	10,000	NLV	NLV
Indeno(1,2,3-cd)pyrene	193395	<330	<330	<1,700*	530	1,600	3,400	<330	2,700	<1,700*	**51,000**	NLL	**20,000**	NLV	NLV	100,000	NLV	NLV
Benzo(g,h,i)perylene	191242	<330	<330	<1,700*	510	1,500	3,300	<330	2,700	<1,700*	45,000	NLL	2,500,000	800,000,000	NLV	9,100,000	NLV	NLV
Other PNAs	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note:

(µg/kg) - Micrograms per kilogram

"<" - Less than the laboratory method detection limit

NA - Not analyzed

ND - Not detected above laboratory method detection limits

NLV - Not likely to volatilize

ID - Inadequate data to develop criteria

IP - Development in process

NLL - Not likely to leach

NA - Not available

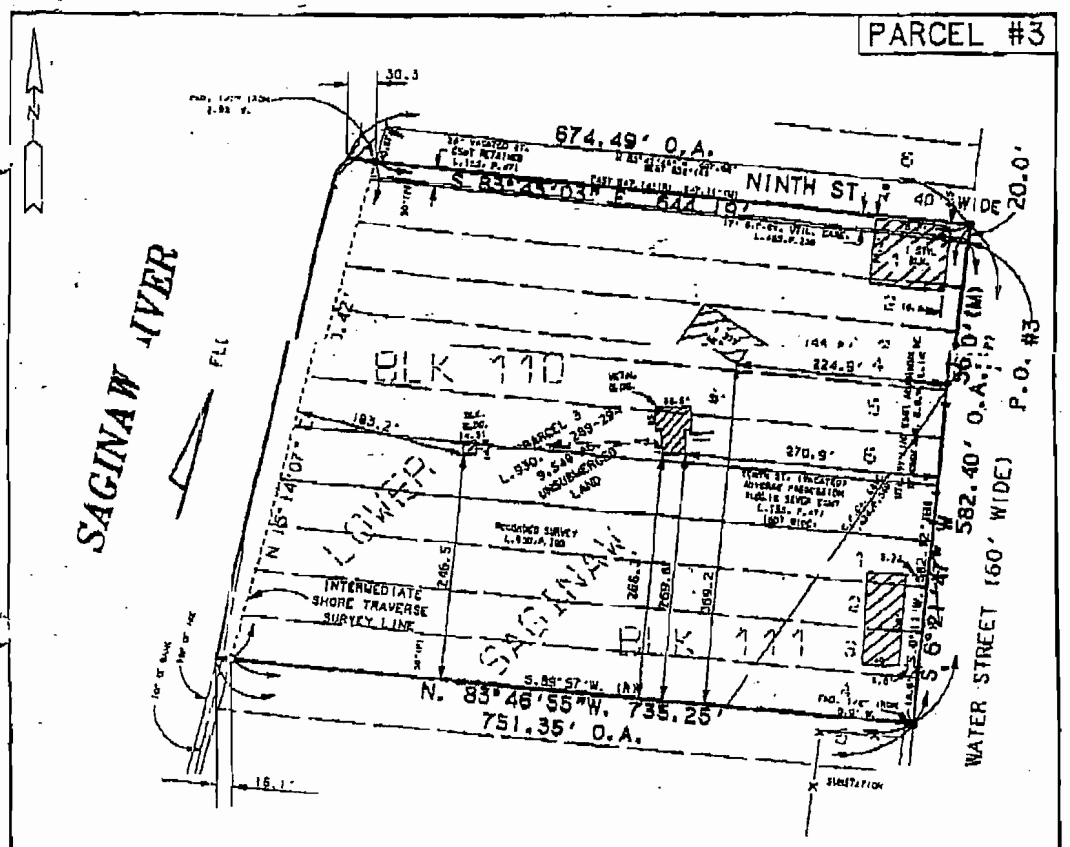
α – MDEQ Operational Memorandum #18: Part 201Generic Cleanup Criteria and Screening Levels, June 7, 2000

β – MDEQ Operational Memorandum #4: Part 213 Tier I Risk-Based Screening Levels (RBSLs), June 2000

bold - concentration exceeds MDEQ Criteria

Appendix A
Legal Descriptions of Subject Property

PARCEL #3



SURVEY ON PARCEL #3 FOR:
ELLIS, NAEYAERT, GENHEIMER ASSOC., INC.
3290 WEST BIG BEAVER ROAD - SUITE 500
TROY, MICHIGAN 48084-2965
ATTENTION: DONALD F. RIHA, AIA
PROJECT MANAGER

REQUESTED BY:
ENVIRONMENTAL PROTECTION AGENCY
FACILITIES MANAGEMENT AND SERVICES DIVISION
REAL ESTATE AND SPACE MANAGEMENT BRANCH
401 M STREET SOUTHWEST (PM-215)
WASHINGTON, D.C. 20460
ATTENTION: BUCKY GREEN

PROPERTY OWNER:
ARTHUR J. FISHER, JAMES O. FISHER
& RALPH FISHER, JR.
c/o BAY AGGREGATE
301 NORTH WATER STREET
BAY CITY, MICHIGAN 48708

FIRST OF AMERICA - MID MICHIGAN
P.O. BOX 111
210 MAIN STREET
FRANKENMUTH, MICHIGAN 48734

ATTENTION: DAVID IVES

REV. TO REMOVE 10' WIDE C. OF B.C. ESM'T. 12-8-94 RTP
REV. TO SHOW PARCEL TO WATERS EDGE, AND REVISED DESCRIPTION AND TO SHOW ENCUMBERANCES PER FILE ET-94-13408 6-3-94 OPW
REV. TO SHOW DIM. FROM THE POINT TO EDGE OF ICE 4-15-92

BEARING NOTE: Bearings are referenced to the Corps of Engineers Datum Referencing Monuments - Sta. 29 and Bay City Department of Public Works on the Saginaw River being North 6°41'06" East on Transverse Mercator Projection, East Zone (2101) 1927 North American Datum.
Distance Note-All distances are horizontal distance (No Grid Factor).

Wade-Trim/Edmands
P.O. Box 680
Bay City, Michigan 48707
1501 West Thomas
Tele. (517) 686-3100
Telecopier (517) 686-4329

Scale 1" = 150'
Job # ETS225B.01
Book # IN Page #FILE
Date 2-92 6-7-94
Surveyed PMC
Checked LDM

Re: EPA Center for Ecology Research and Training **PARCEL 3**

SURVEY ON PARCEL #3 FOR:

Ellis, Naeyaert, Genheimer Assoc., Inc.
3290 West Big Beaver Road - Suite 500
Troy, Michigan 48084-2965

Attention: Donald F. Riha, AIA
Project Manager

PROPERTY OWNER:

Arthur J. Fisher, James O. Fisher
& Ralph J. Fisher, Jr.
c/o Bay Aggregate
301 North Water Street
Bay City, Michigan 48708

Attention: David Ives

REQUESTED BY:

Environmental Protection Agency
Facilities Management and Services Div.
Real Estate and Space Management Branch
401 M Street Southwest (PM-215)
Washington, D.C. 20460
Attention: Bucky Green

First of America - Mid Michigan
P.O. Box 111
Frankenmuth, Michigan 48734

TITLE DESCRIPTION: Parcel 3
Situated in the City of Bay City.
Entire Block 110, also Lots 1, 2, 3, and 4, Block 111, Lower Saginaw, as per plat recorded in Liber 1 of Plats at Page 4 of Bay County Records, also the South 20 feet of vacated Ninth Street West of Water Street, also vacated Tenth Street West of Water Street, all in Plat of Lower Saginaw; said premises being bounded on the North side by the South line of Ninth Street as now located, on the East side by the West line of Water Street, on the South side by the South line of Lot 4, Block 111 extended West to the Saginaw River, and on the West side by the Saginaw River.

SURVEY DESCRIPTION: Parcel 3
A parcel of land being Block 110, Lot 1, 2, 3, and 4 of Block 111 and vacated Ninth and Tenth Street, Lower Saginaw, City of Bay City, Michigan, described as follows:

Beginning at the Northeast corner of Block 110, Lower Saginaw, as per plat thereof recorded in Liber 1 of Plats, Page 4 of Bay County Records; thence South 6°21'47" West 562.40 feet along the Westerly Right of Way line of Water Street to the Southeast corner of Lot 4, Block 111 of said plat; thence North 83°46'55" West 735.25 feet along the South line of said Lot 4, if extended Westerly to the intermediate shore traverse survey line of the Saginaw River; thence North 15°14'07" East 590.42 feet along the intermediate shore traverse survey line of the Saginaw River; thence South 83°43'03" East 644.19 feet along a line parallel to, 20 feet North of, and at right angles to the North line of said Block 110 to the intersection with the Westerly Right of Way line of Water Street; thence South 6°21'47" West 20.0 feet along the Westerly Right of Way line of Water Street to the Point of Beginning. Including all land from the intermediate shore traverse survey line and the waters edge of the Saginaw River between the North and South parcel lines extended Westerly. Subject to Rights of Way, easements, and restrictions, if any, of record. Containing 9.548 acres of unsubmerged land more or less.

P-Plat	M-Measured	D-Description	R-Record	C.M.-City Map
O-Set Iron	●-Found Iron	⊖-P.K. Nail	⊙-Monument	x--x--x Existing Fence

This survey was made from the legal description of the parcel furnished to us. Both map and description should be compared with the Abstract or Title or Title Policy for any exceptions, easements or differences in description.

I hereby certify that this survey and descriptions shown hereon complies with the requirements of Public Act 132 of 1970 as amended. That the ratio of closure on the boundary of said survey exceeds 1' in 5000' and is within the acceptable limits of the surveying profession. There are no encroachments on said survey.

Lloyd D. McGinnis, PS #18999

Wade-Trim/Edmands
P.O. Box 580
Bay City, Michigan 48707
1501 West Thomas
Tele. (517) 686-3100
Telecopier (517) 686-4329

Scale	N/A	Date	2-92 6-7-94
Job #	ETS 2258.01	Surveyed	PMC
Book #	IN	Page #	FICE
Checked	LDM		
Drawn	RTP	Sheet	2 of 2

kg 0214par5

Re: EPA Center for Research and Training **PARCEL 5**

SURVEY ON PARCEL #5 FOR:

Ellis, Naeyaert, Genheimer Assoc., Inc.
3290 West Big Beaver Road - Suite 500
Troy, Michigan 48084-2965

Attention: Donald F. Riha, AIA
Project Manager

REQUESTED BY:

Environmental Protection Agency

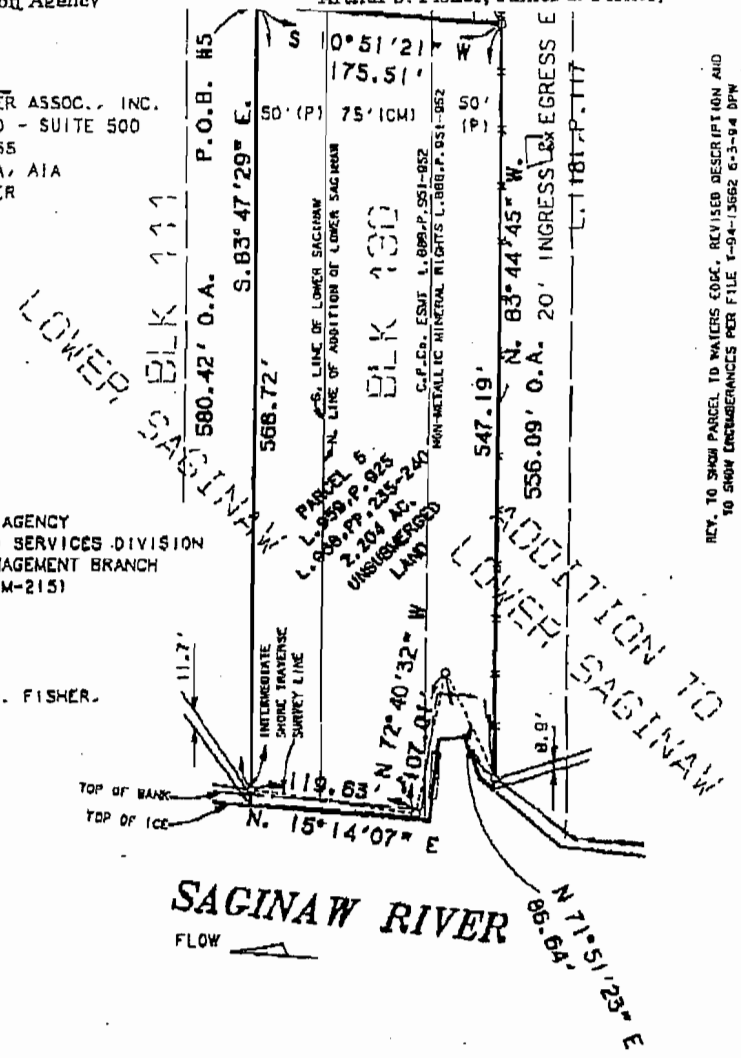
PROPERTY OWNER:

Arthur J. Fisher, James I. Fisher,

SURVEY ON PARCEL #5 FOR:
ELLIS, NAEYAERT, GENHEIMER ASSOC., INC.
3290 WEST BIG BEAVER ROAD - SUITE 500
TROY, MICHIGAN 48084-2965
ATTENTION: DONALD F. RIHA, AIA
PROJECT MANAGER

REQUESTED BY:
ENVIRONMENTAL PROTECTION AGENCY
FACILITIES MANAGEMENT AND SERVICES DIVISION
REAL ESTATE AND SPACE MANAGEMENT BRANCH
401 M STREET SOUTHWEST (PM-215)
WASHINGTON, D.C. 20460
ATTENTION: BUCKY GREEN

PROPERTY OWNER:
ARTHUR J. FISHER, JAMES D. FISHER,
RALPH J. FISHER, JR.
C/O BAY AGGREGATE
301 NORTH WATER STREET
BAY CITY, MICHIGAN 48708



REV. TO SHOW PARCEL TO WATERS EDGE, REVISED DESCRIPTION AND TO SHOW ENCUMBERANCES PER FILE V-94-13662 6-3-94 DPW
REV. TO SHOW DIM. FROM TIE PT. TO EDGE OF ICE 4-15-92

BEARING NOTE: Bearings are referenced to the Corps of Engineers Datum Referencing Monuments - Sta. 29 and Bay City Department of Public Works on the Saginaw River being North 6° 41' 06" East on Transverse Mercator Projection, East Zone (2101) 1927 North American Datum. Distance Note--All distances are horizontal distance (No Grid Factor).

Wade-Trim/Edmonds
P.O. Box 580 — 1501 West Thomas
Bay City, Michigan 48707 — Tele. (517) 686-3100
Telecopier (517) 686-4329

Scale 1" = 100'	Date 2-92 6-7-94
Job # ETS2258.01	Surveyed PMC
Book # IN Page # FILE	Checked LDM
Drawn RTP	Sheet 1 of 2

Facilities Management
Real Estate and Space Management Branch
401 M Street Southwest (PM-215)
Washington, D.C. 20460

Attention: Bucky Green

c/o Bay Aggregate
301 North Water Street
Bay City, Michigan 48708

Attention: David Ives

TITLE DESCRIPTION: Parcel #5

Situated in the City of Bay City.
Lot 8, except the Easterly 190 feet thereof, Block 111, Lower Saginaw, as per plat thereof recorded in Liber 1 of Plats, Page 4 of Bay County Records; and Lots 1 and A, except the Easterly 190 feet thereof, Block 130, Addition to Lower Saginaw, as per plat thereof recorded in Liber 1 of Plats, Page 8 of Bay County Records.

SURVEY DESCRIPTION: Parcel #5

A parcel of land being a part of Lot 8, Block 111, Lower Saginaw and Lot A and 1, Block 130, Addition to Lower Saginaw, City of Bay City, Michigan, described as follows:
Commencing at the Northeast corner of Block 110, Lower Saginaw as per plat thereof recorded in Liber 1 of Plats, Page 4 of Bay County Records; thence South 6°21'47" West 712.60 feet along the Wasterly Right of Way line of Water Street to the Northeast corner of Lot 8, Block 111 Lower Saginaw; thence North 83°47'29" West 190.00 feet along the North line of said Lot 8 to the Point of Beginning; thence South 10°51'21" West 175.51 feet to a point on the South line of Lot 1, Block 130, Addition of Lower Saginaw as per plat thereof recorded in Liber 1 of Plats, Page 8 of Bay County Records, said point being 190 feet North 83°44'45" West of the Southeast corner of said Lot 1; thence North 83°44'45" West 547.19 feet along the South line of said Lot 1, if extended Westerly to the intermediate shore traverse survey line of the Saginaw River; thence North 71°51'23" East 86.64 feet along the intermediate shore traverse survey line of the Saginaw River; thence North 72°40'32" West 107.01 feet; thence North 15°14'07" East 119.63 feet along the intermediate shore traverse survey line of the Saginaw River; thence South 83°47'29" East 568.72 feet along the North line if extended Westerly, of Lot 8, Block 111, Lower Saginaw, to the Point of Beginning. Including all land from the intermediate shore traverse survey line and the waters edge of the Saginaw River between the North and South parcel lines extended Westerly. Subject to Rights of Way, easements, and restrictions, if any, of record. Containing 2.204 acres of unsubmerged land more or less.

P-Plat	M-Measured	D-Description	R-Record	C.M.-City Map
o-Set Iron	●-Found Iron	⊖-P.K. Nail	⊙-Monument	x--x--x Existing Fence

This survey was made from the legal description of the parcel furnished to us. Both map and description should be compared with the Abstract or Title or Title Policy for any exceptions, easements or differences in description.

I hereby certify that this survey and descriptions shown hereon complies with the requirements of Public Act 132 of 1970 as amended. That the ratio of closure on the boundary of said survey exceeds 1' in 5000' and is within the acceptable limits of the surveying profession. There are no encroachments on said survey.

Lloyd D. McGinnis, PS #18999

Wade-Trim/Edmands
P.O. Box 580
Bay City, Michigan 48707
1501 West Thomas
Tele. (517) 686-3100
Telecopier (517) 686-4329

Scale NA
Date 2-92 6-7-94
Job # ETS 22 58.01
Surveyed PMC
Book # IN Page # FILE
Checked LDM
Drawn RTP
Sheet 2 of 2

APPENDIX B

ADL Investigation Report Dated November 12, 1992

Arthur D Little

Final Site Investigation Report for EPA Bay City Michigan CERT Project

Fisher Brothers Property

Submitted to

U.S. Environmental Protection Agency

November 12, 1992

Arthur D. Little, Inc.
Acorn Park
Cambridge, Massachusetts
02140-2390

Reference 40291

Table of Contents

1.0 Site-Specific Setting and History C1

2.0 Objectives of the Field Work C1
2.1 Demolished Equipment Storage Buildings C2
2.2 Underground Storage Tank and Former Above Ground Tank Location . . C2
2.3 Dumping Grounds C2
2.4 Northern Boundary C2
2.5 Backfill Area C3

3.0 Field Investigation C3
3.1 Geophysical Surveying C3
3.2 Soil Investigation C3
3.2.1 Demolished Equipment Storage Buildings C3
3.2.2 Underground Storage Tank and Former Above Ground Tank Location C3
3.2.3 Dumping Grounds C4
3.2.4 Northern Boundary C4
3.2.5 Backfill Area C4
3.3 Ground Water Investigations C4

4.0 Investigation Results C5
4.1 Geophysical Survey C5
4.1.1 Northwest Corner C5
4.1.2 Former City Dumping Grounds C5
4.1.3 Area of Present and Former Storage Tanks C5
4.2 Soil Characteristics C5
4.2.1 Demolished Equipment Storage Buildings C5
4.2.2 Underground Storage Tank and Former Above Ground Tank Location C5
4.2.3 Dumping Grounds C6
4.2.4 Northern Boundary C6
4.2.5 Backfill Area C6
4.3 Chemical Results of Soil Analysis C7
4.3.1 Demolished Equipment Storage Buildings C7
4.3.2 Underground Storage Tank and Former Above Ground Tank Location C7
4.3.3 Dumping Grounds C7
4.3.4 Northern Boundary C8
4.3.5 Backfill Area C8
4.4 Chemical Results of Water Analysis C8
4.4.1 Demolished Equipment Storage Buildings C8
4.4.2 Underground Storage Tank and Former Above Ground Tank Location C8
4.4.3 Northern Boundary C8

5.0 Conclusions C9

List of Tables

Table C-1 Samples Collected/Analyses Performed
Table C-2 Chemical Results
Table C-3 MDNR Type B Cleanup Criteria
Table C-4 Average Concentration of Metals in Soil

List of Figures

Figure C-1 Property Location
Figure C-2 Suspected Areas of Contamination
Figure C-3 Sample Locations
Figure C-4 Geophysical Coverage

List of Appendices

Appendix A Soil Boring Logs
Appendix B Monitoring Well Design
Appendix C Monitoring Well Development Sheets
Appendix D Monitoring Well Sampling Sheets
Appendix E Soil Sample Logs
Appendix F Chemical Data
Appendix G Geophysics Reports

Tab C Fisher Brothers Properties

1.0 Site-Specific Setting and History

The Fisher Brothers Properties (Parcels No. 3 and No. 5 on Figure C-1) are located on North Water Street, between Water Street and the Saginaw River. Parcel No. 3 covers an area of 10.16 acres and Parcel No. 5, 2.01 acres. The properties are currently leased by Bay Aggregate, Inc., an aggregate and redi-mix cement business. Abutters to the parcels are Industrial Brownhoist to the south, the former Sears parking lot to the north, and a number of small business properties to the east comprised of Consumers Power Company, Magline, Weld Rite and electrical and water substations.

According to a 1912 Sanborn Fire Insurance Company map, the property was once used as the city dumping ground. Sometime between 1912 and 1938 the land was developed for use as a coal and aggregate storage yard. Coal storage appears to have continued into the 1960s; aggregate storage is still one of the primary land uses. The Robert Gage Coal Company operated the yard beginning between 1912 and 1931 (dates of Sanborn maps), and continued until the 1980s.

The redi-mix concrete plant was built between 1938 and 1950. Approximately seven building structures previously located on the northern parcel are no longer present. Except for the two coal bins, the building uses are unknown. Three structures visible on a 1969 photograph appear to be above ground storage tanks (SE of the garage, NE of the miscellaneous storage building, and near the current underground storage tanks). A manufactured gas plant was located immediately north of the Robert Gage Coal Company from prior to 1912, until sometime between 1938 and 1950.

The western portions of the property were gradually filled beginning prior to 1912 and ending in 1987. The northern parcel approximated its current shoreline prior to 1963 but the southern parcel was not completely filled until after that time.

Robert Gage owned the property until sometime between 1980 and 1983, at which time it was obtained by Fisher Brothers, and the Bay Aggregate Company began operations. Another aggregate company briefly operated on the property between the occupancy of Robert Gage Coal Company and Bay Aggregate, but present facility personnel were unsure of the dates.

2.0 Objectives of the Field Work

The overall objective of the field investigation is to verify and characterize, in a very limited extent, any contamination or other environmental liabilities associated with the properties. This additional sampling and analysis would allow the EPA to more definitively determine costs associated with these liabilities.

The objective of the sampling program was to specifically evaluate the following:

- The environmental impacts of historical activities
- The environmental impacts of present day activities
- Possible sources of contamination from adjacent properties

Figure C-2 shows the areas of potential contamination within this property.

The initial phase of the field sampling program was designed to delineate the extent of the old city dumping grounds and the location of the former old equipment storage buildings, together with locating any additional undocumented underground storage tanks. This was to be achieved by conducting a geophysical survey on selected areas of the property. Results of the survey were made immediately available to allow the positioning of the soil boring locations and the locations for ground water monitoring wells.

Due to the variable nature of the property in terms of its industrial use, the property was divided into five individual sections for planning the field sampling program.

2.1 Demolished Equipment Storage Buildings

The actual use of the demolished buildings is unknown. To evaluate potential soil and ground water contamination, a soil boring was proposed within the general area of the demolished storage buildings, and a monitoring well was planned for installation.

2.2 Underground Storage Tank and Former Above Ground Tank Location

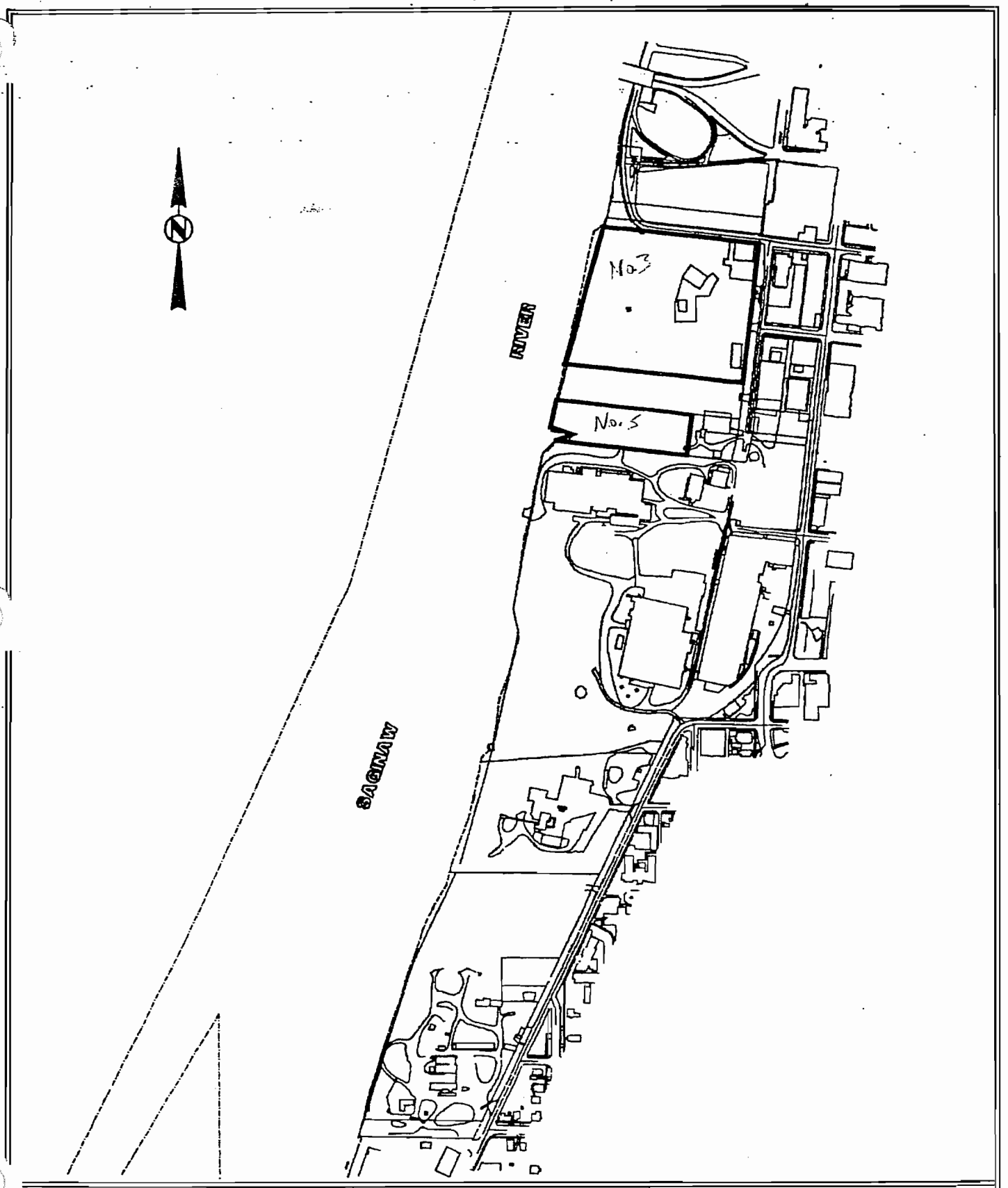
A geophysical survey was planned to locate the position of the existing underground storage tank, and to locate any possible buried hazards to drilling. To evaluate potential contamination from the current above and underground tanks, it was proposed to perform two soil borings within the vicinity of the present tank, and to install a monitoring well.

2.3 Dumping Grounds

A geophysical survey was proposed to delineate the extent of the former city dumping grounds, and to locate any possible hazards to drilling. It was proposed to perform one soil boring within the dumping area.

2.4 Northern Boundary

No geophysical survey was proposed for this section of the property. Within this area, it was proposed to perform one soil boring, and to install one monitoring well to evaluate the potential for migration of contaminants onto the site from adjacent properties to the north.



PREPARED FOR:
ODELL ASSOCIATES

DATE:	SCALE:	DWG. NO.:
NOV. 1992	AS SHOWN	ODL_PROP

TITLE:
Fisher Brothers Property Locations

Figure C-1

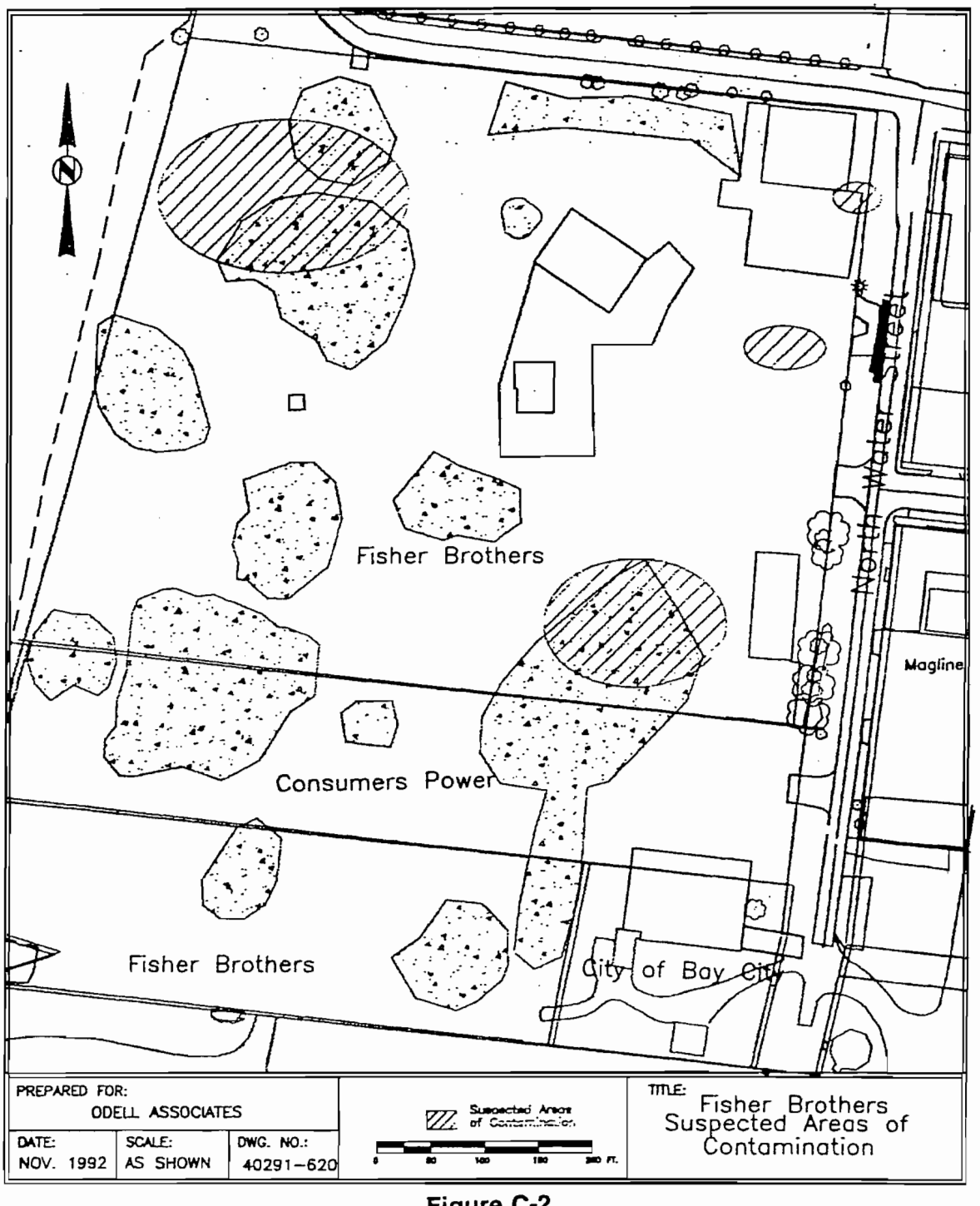

Fisher Brothers
Consumers Power
Fisher Brothers
City of Bay City
Magline
PREPARED FOR:
ODELL ASSOCIATES
DATE:
NOV. 1992
SCALE:
AS SHOWN
DWG. NO.:
40291-620
Suspected Areas of Contamination
0
50
100
150
200 FT.
TITLE:
Fisher Brothers
Suspected Areas of
Contamination

Figure C-2

2.5 Backfill Area

To evaluate possible contamination entering this property from the Industrial Brownhoist property immediately to the south, one soil boring was proposed on this portion of the property.

3.0 Field Investigation

The field investigation was divided into three phases: geophysical surveying, soil sampling, and water sampling. The geophysical surveying was conducted on September 3 and 4, 1992 prior to the soil and water sampling, using the results of the survey to locate the exact boring locations. Soil and water sampling occurred between September 21 and October 2, 1992. Figure C-3 shows the locations of all samples collected. Table C-1 shows the total number of samples collected and the types of analyses performed on each sample.

3.1 Geophysical Surveying

The geophysical surveying on this property was divided into three sections:

- The northwestern corner of the property in order to locate the western extent of the former city dumping grounds
- The vicinity of the former city dumping grounds
- The northeastern corner of the property where an underground tank is currently located, and where an above ground tank was formerly located

Within each of the sections, ground penetrating radar (GPR) and electromagnetic (EM) terrain conductivity were performed to locate underground tanks and foundations, and to characterize the nature of the fill material.

Figure C-4 shows the extent of the geophysical surveying.

3.2 Soil Investigation

The extent of the soil investigations varied between each section of the property.

3.2.1 Demolished Equipment Storage Buildings. Results of the geophysical survey located the position of the demolished buildings; however, the exact boring location was dictated by the presence of numerous piles of aggregate within this section of the property and the need to avoid heavy equipment traffic during drilling activities. One soil boring, MWBA03, was completed to a depth of 16 feet with chemistry samples being collected from two to four feet and from 10 to 12 feet. There were no deviations from the original sampling plan.

3.2.2 Underground Storage Tank and Former Above Ground Tank Location. The geophysical survey located the position of the underground storage tank. One soil boring, MWBA02, was completed to a depth of 12 feet adjacent to the tank.

Table C-1 Fisher Brothers: Samples Collected/Analyses Performed.

Sample Location	Sample Number	Matrix	Depth (ft)	Analyses					
				VOC	SVOC	TPH	PCB	Metals	TCLP
MWBA-01	BA-092192-018	Soil	2.5 - 4.5	X	X	--	--	X	--
MWBA-01	BA-092192-020	Soil	10 - 12	X	X	--	--	X	--
MWBA-01	BA-100-292-102	Water	--	X	X	--	--	X	--
MWBA-02	BA-092192-033	Soil	2 - 4	X	--	X	--	--	--
MWBA-02	BA-092192-035	Soil	18 - 21	X	--	X	--	--	--
MWBA-02	BA-092992-080	Water	--	X	--	--	--	--	--
MWBA-03	BA-029192-029	Soil	2 - 4	X	--	X	--	X	--
MWBA-03	BA-092192-031	Soil	10 - 12	X	--	X	--	X	--
MWBA-03	BA-092992-078	Water	--	X	--	X	--	X	--
SBBA-04	BA-092192-022	Soil	2 - 4	X	--	X	--	--	--
SBAA-04	BA-092192-024	Soil	21.5 - 23.5	X	--	X	--	--	--
SBBA-05	BA-092192-026	Soil	8 - 10	X	--	X	--	--	--
SBBA-06	BA-092292-030	Soil	17 - 19	X	--	X	--	--	--
SBAA-07	BA-092292-037	Soil	2 - 4	X	--	X	--	X	--
SBBA-07	BA-092292-039	Soil	10 - 12	X	--	X	--	X	--

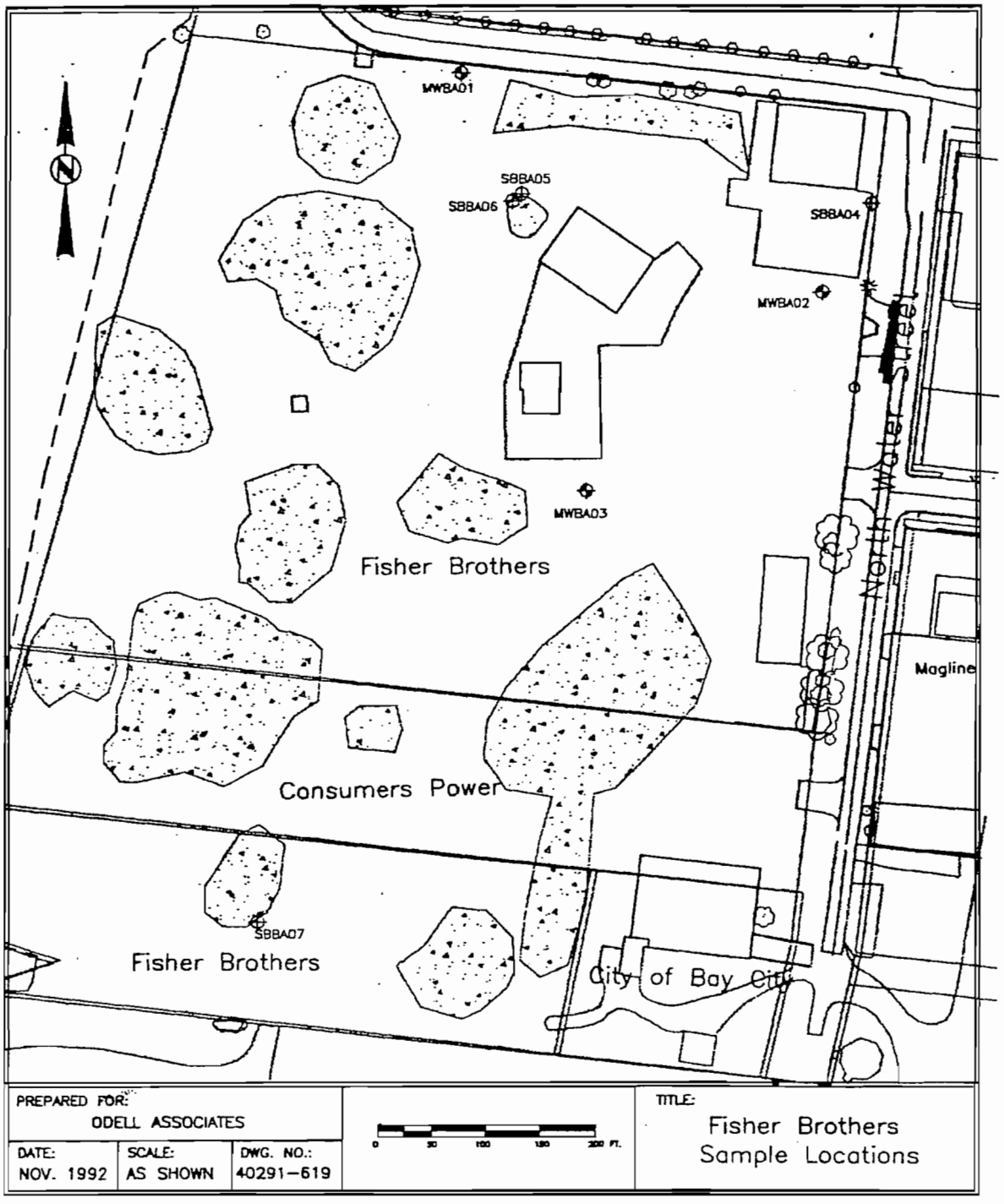

MWBA01
SBBA05
SBBA06
SBBA04
MWBA02
MWBA03
Fisher Brothers
Consumers Power
SBBA07
Fisher Brothers
City of Bay City
North Water Street
Magline
PREPARED FOR:
ODELL ASSOCIATES
DATE:
NOV. 1992
SCALE:
AS SHOWN
DWG. NO.:
40291-619
0 50 100 150 200 FT.
TITLE:
Fisher Brothers
Sample Locations

Figure C-3

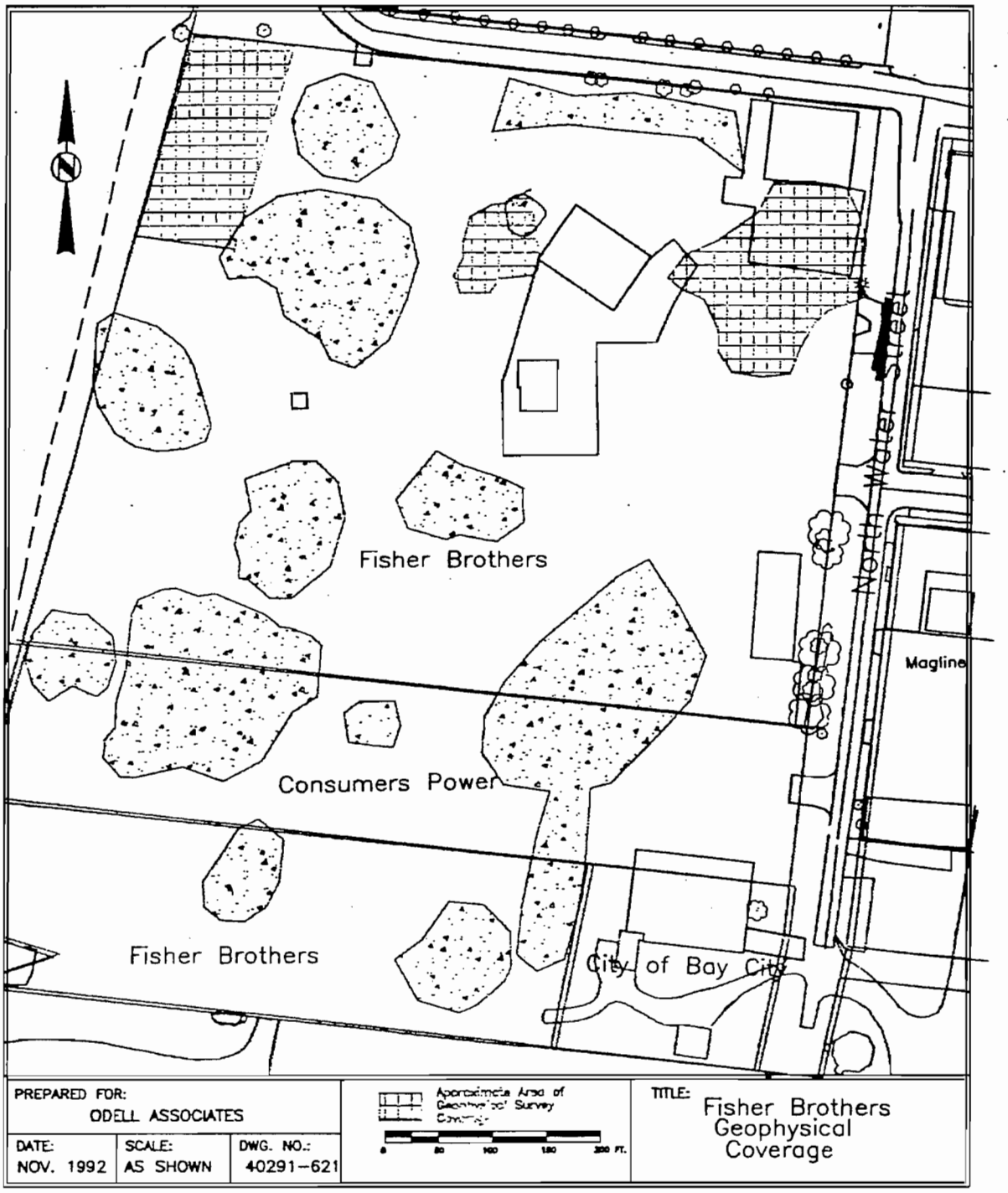

Fisher Brothers
Consumers Power
Fisher Brothers
City of Bay City
North Water Street
Magline
PREPARED FOR:
ODELL ASSOCIATES
DATE:
NOV. 1992
SCALE:
AS SHOWN
DWG. NO.:
40291-621
Approximate Area of Geophysical Survey Coverage
0
50
100
150
200 FT.
TITLE:
Fisher Brothers
Geophysical
Coverage

Figure C-4

Analytical samples were collected from 2.5 to 4.5 feet and from 10 to 12 feet. One soil boring, SBBA04, was completed to a depth of 12 feet in the area where an above ground tank was formerly located. Samples for chemical analysis were collected from two to four feet, and from 21.5 to 23.5 feet. There were no deviations from the original sampling plan.

3.2.3 Dumping Grounds. The extent of the former dumping grounds was delineated by the geophysical survey. Due to the numerous subsurface anomalies detected during the survey, it was decided to complete an additional boring within this area of the property. Therefore, two borings were completed to a depth of 17 feet. Soil boring SBBA05 was located on the north side of the dumping grounds and SBBA06 on the south side. Soil samples for chemical analysis were collected from eight to 10 feet in boring SBBA05, and from 17 to 19 feet in boring SBBA06.

3.2.4 Northern Boundary. One soil boring, SBBA01, was completed on this section of the property with samples collected for chemical analysis collected from 2.5 to 4.5 feet, and from 10 to 12 feet. There were no deviations from the original sampling plan.

3.2.5 Backfill Area. One soil boring, SBBA07, was completed on this section of the property with samples collected for chemical analysis from two to four feet and from 10 to 12 feet. There were no deviations from the original sampling plan.

3.3 Ground Water Investigations

Ground water investigations did not take place on all sections of the property. Monitoring wells were installed, developed, and sampled on the following sections of the property:

- Demolished Equipment Storage Buildings
- Underground Storage Tank and Former Above Ground Tank Locations
- Northern Boundary

Table C-1 shows the analyses performed on each of the water samples collected. There were deviations from the proposed sampling techniques and in the number of samples collected due the limited amount of water within one of the three wells installed. The well installed within the vicinity of the demolished equipment storage buildings was developed and sampled in accordance with the standard operating procedures and the proposed scope of work. The well installed within the vicinity of the underground and former above ground tanks showed a extremely slow recharge time. The original scope of work called for the collection of samples for VOC and total petroleum hydrocarbon (TPH) analysis; however, due to the limited volume of water extracted from the well, only the VOC sample was collected. During the development of the well located on the northern boundary of the property, a bailer became jammed in the well, limiting development of the well. It was, however, possible to collect the proposed range of samples from this well. The limited

development did not affect the quality or representativeness of the ground water sampling.

4.0 Investigation Results

4.1 Geophysical Survey

A complete geophysical report is included as Appendix G of this report. This section is a brief summary of the survey results for each of the areas surveyed.

4.1.1 Northwest Corner. The geophysical survey results indicated that the soils within this area do not consist of fill material similar to that found within the area of the former city dumping grounds. The survey within this area was affected by the adjacent steel piling along the banks of the Saginaw River and the presence of overhead power lines.

4.1.2 Former City Dumping Grounds. Due to the presence of an overhead conveyor belt, only GPR was conducted in this area. The extent of the dumping grounds was delineated, and numerous metallic targets were identified during the survey, leading to the addition of an extra soil boring to be completed in this area.

4.1.3 Area of Present and Former Storage Tanks. The known underground tank in this area was located using GPR. An additional target was located south of the active tank, possibly an old abandoned tank.

4.2 Soil Characteristics

Based on observations made during soil boring, soils were characterized within each section of the property. All Soil Boring Logs are included in Appendix A.

4.2.1 Demolished Equipment Storage Buildings. One soil boring, MWBA03, which reached a depth of 16 feet, was completed in this area . Generally, the soil within the boring was comprised of fill material consisting of poorly sorted, fine to medium grained, brown silty sand, containing concrete clasts, brick fragments, and wood. Below six feet, the soil became more silty with an increased moisture content. The soil boring at this location was completed in the rain, causing the PID to become inoperable for recording total volatile organics in the split spoon samples; however, headspace readings ranged from 382 ppm in the upper two feet, decreasing with depth to 74.9 ppm in the 14 to 16 foot sample. Blow counts to collect each split spoon decreased with depth, indicating a reduction in soil compaction with depth associated with the increased moisture content.

4.2.2 Underground Storage Tank and Former Above Ground Tank Location. Two soil borings were completed in this area. Soil boring MWBA02 was situated next to the active underground storage tank. This boring reached a depth of 21 feet and consisted of fill material. The soil consisted mostly of poorly sorted fine to medium grained, gray to black sand, with some gravel. Fill material consisted of brick, concrete, and wood. Due to rain, the PID was inoperable during drilling;

however, headspace values were measured later, and generally increased with depth from 106 ppm at the surface to 400 ppm from the sample collected from 18 to 20 feet. Blow counts to collect split spoon samples averaged 19 blows per six inches over the top four feet of the bore hole, to five blows per six inches from between four feet and 15 feet. Blow counts increased slightly in the bottom two feet of the bore hole. Soil boring SBBA04 was located in the vicinity of the former AGT and reached a depth of 23.5 feet. Generally, the soil was comprised of fill material consisting of poorly sorted, fine to coarse grained sands, grading into light gray sandy silts with depth. Fill material consisted of mostly wood, glass, and brick material with a black slag-like material in the top four feet of the bore hole. Due to rain, the PID was inoperable during drilling and headspace values measured later were below 12 ppm for all samples. Blow counts for all split spoon samples were mostly below five from the surface to 12 feet, indicating poor compaction. Counts increased to a maximum of 17 per six inches from 14 feet to the bottom of the bore hole, indicating a slight increase in soil compaction.

4.2.3 Dumping Grounds. Two soil borings were completed within this area. Soil boring SBBA05 was located to the north of the dumping ground reaching a depth of 19 feet and were comprised mostly of fill material. Generally, the soil consisted of poorly sorted, dark gray to black silty sand, with a trace of coarse grained sand. Fill material comprised mostly of wood, glass and brick. No field PID readings were recorded due to rain. Headspace readings reached a peak of 25.5 ppm between six and eight feet and between 12.5 and 14.4 feet. All other readings were below 10 ppm. During the drilling of borehole SBBA05, a blue sheen of possible hydrocarbons was observed on the drill spoils. Blow counts from zero to two feet averaged 20 counts per six inches. All other counts averaged below 10. Soil boring SBBA06 was located to the south of the dumping grounds and reached a depth of 19 feet. Soil from this boring is identical to that of SBBA05 with similar fill material. All headspace PID readings were below 10 ppm. Blow counts were elevated in the top four feet of the bore hole, averaging 16 blows per six inches, below four feet blow counts averaged below five.

4.2.4 Northern Boundary. One bore hole, MWBA01, was completed in this area and reached a depth of 14 feet. The soil was mostly comprised of fill material consisting of poorly sorted, olive to gray, fine to coarse grained sand. Concrete formed the majority of fill material, notably in the top eight feet of the borehole. Head space values using the PID were all below 10 ppm. Due to concrete material, blow counts were high in the top eight feet of the bore hole with minimal recovery in the split spoons.

4.2.5 Backfill Area. One soil boring was completed in this area, SBBA07, and reached a depth of 14 feet. Generally, the soil was composed of fill material consisting of well sorted, brown to black, sandy silt with occasional fine grained gravel and brick material. Generally, the soil ranged from loosely to moderately compact, with blow counts decreasing with depth. Total volatile organic values were variable, reaching a peak of 249 ppm in the split spoon sample taken from between six and eight feet.

4.3 Chemical Results of Soil Analysis

All results from chemical analyses performed on soil samples are included in Appendix F of this report. A summary of chemical results is presented in Table C-2. Cleanup requirements for soil are based on 20 times drinking water values as described in Michigan Department of Natural Resources MERA Operational Memorandum #8, Revision 1, dated March 16, 1992. Table C-3 shows the Michigan Type B Cleanup Criteria. Concentrations of metals are reported as elevated when compared to an average concentration of each individual metal in soil. Average values of metals in soil used in this report are taken from the USGS Professional Paper 1270 for soils in the eastern United States. Table C-4 summarizes the various metal concentrations in soil for the eastern United States.

4.3.1 Demolished Equipment Storage Buildings. Analysis for volatile organic compounds (VOCs) revealed a concentration of 630 ug/kg of 1,2-dichloroethene, 510 ug/kg of trichloroethene, and 120ug/kg of toluene within the sample taken between two and four feet. All are commonly used solvents. Concentrations decrease with depth. The sample from between 10 and 12 feet contained 60 ug/kg of 1,2-dichloroethene and 50 ug/kg of trichloroethene. Toluene was absent at this depth. The trichloroethene value exceeds the Type B Cleanup Criteria.

Metal concentrations in the soil sample taken from two to four feet are generally low. Mercury, at a concentration of 0.3 mg/kg, was the only metal exceeding the Type B Criteria concentration in soil. It was, however, within the observed range of concentrations. Concentrations of mercury exceeded the Type B Criteria average levels in the sample taken from 10 to 12 feet; however, the concentration was within the observed range.

Total petroleum hydrocarbons (TPH) was detected at concentrations of 50 mg/kg in the sample taken from two to four feet, and 20 mg/kg from 10 to 12 feet. TPH concentrations observed here are low and not indicative of significant contamination.

4.3.2 Underground Storage Tank and Former Above Ground Tank Location. Analyses for the samples taken next to the present underground storage tank revealed an absence of VOCs within the soil. A TPH concentration of 40 mg/kg was detected in the sample taken from two to four feet; however, absent from the sample taken from 18 to 21 feet. Analysis of soils taken from within the vicinity of the former location of the above ground tank showed a concentration of 100ug/kg of acetone, a common laboratory contaminant, and a TPH concentration of 50 mg/kg within the sample taken from the two to four foot interval. The sample taken from 21.5 to 23.5 feet contained no detectable contaminants. These data indicate that there is a low likelihood of contamination associated with the storage tanks.

4.3.3 Dumping Grounds. VOC analysis for the soil samples collected from eight to 10 feet on the north side of the dumping grounds, and from 17 to 19 feet on the south side revealed a complete absence of any detectable contaminants. Acetone was detected at a concentration of 100 ug/kg; however, this is considered a common laboratory contaminant and, therefore, may or may not be indicative of site

Table C-2A Fisher Brothers Property: VOC Chemical Analysis Results for Water.

ADL Sample Number			BA-100292-102	BA-092992-080	BA-092992-078
Sample Location			MWBA01	MWBA02	MWBA03
Matrix			Water	Water	Water
Start Depth(ft)			-	-	-
End Depth(ft)	Units	Type B Criteria*	-	-	-
Compound					
Acetone	ug/L	500	100	--	--
Benzene	ug/L	60	4	--	--
Bromodichloromethane	ug/L	24	--	1	--
Chloroform	ug/L	43	--	5	--
Methylene Chloride	ug/L	59	--	1	2
Styrene	ug/L	19	1	--	--
Toluene	ug/L	110	6	--	--

* Type B Cleanup Criteria taken from MDNR MERA Operational Memorandum #8, dated March 16, 1992 for Ground Water/Surface Water Interface.

Table C-2B Fisher Brothers: VOC Chemical Analysis Results for Soil.

ADL Sample Number			BA-092192-029	BA-092992-031	BA-092192-022	BA-092192-026	BA-092292-030	BA-0922292-037
Sample Location			SBBA03	MWBA03	SBBA04	SBBA05	SBBA06	SBBA07
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Start Depth(ft)			2	10	2	8	17	2
End Depth(ft)	Units	Type B Criteria*	4	12	4	10	19	4
Compound								
Acetone	ug/kg	14000	--	--	100	100	--	--
1,2-Dichloroethene	ug/kg	6000	630	60	--	--	--	--
Methylene Chloride	ug/kg	100	--	--	--	--	10	40
Toulene	ug/kg	16000	120	--	--	--	--	--
Trichloroethene	ug/kg	60	510	50	--	--	--	--

* Type B Cleanup Criteria for soil taken from MDNR MERA Operational Memorandum #8, dated March 16, 1992 for Protection of Drinking Water 20 times drinking water value). Note that the values for protection of surface water (not enforceable) may be lower for some compounds.

Table C-2C Fisher Brothers: Metals Chemical Analysis Results for Soil.

ADL Sample Number			BA-092192-018	BA-092192-020	BA-092192-029	BA-092192-031	BA-092292-037	BA-0922292-039
Sample Location			MWBA01	MWBA01	MWBA03	MWBA03	SBBA07	SBBA07
Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Start Depth(ft)			2.5	10	2	10	2	10
End Depth(ft)	Units	Type B Criteria*	4.4	12	4	12	4	12
Compound								
Arsenic	mg/kg	0.0004	--	--	--	--	6	3
Barium	mg/kg	40	35	19	46	39	40	11
Cadmium	mg/kg	0.08	--	--	--	0.3	0.8	0.2
Chromium	mg/kg	2	7	4	9	8	6	3
Copper	mg/kg	20	7	4	11	16	150	7
Lead	mg/kg	400	10	--	12	36	55	7
Mercury	mg/kg	0.04	--	--	0.3	0.6	0.1	--
Selenium	mg/kg	0.8	3	1	--	--	--	--
Silver	mg/kg	0.8	--	--	--	--	--	--
Zinc	mg/kg	20	24	4	24	54	55	17

* Type B Cleanup Criteria for soil taken from MDNR Mera Operational Memorandum #8, dated March 16, 1992 for protection of drinking water (20 times drinking water value). Note that cleanup criteria may be below method detection limits.

Table C-2D Fisher Brothers: Metals Chemical Analysis Results for Water.

ADL Sample Number			BA-100292-102	BA-092992-078
Sample Location			MWBA01	MWBA03
Matrix			Water	Water
Start Depth(ft)			--	--
End Depth(ft)	Units	Type B Criteria*	--	--
Compound				
Arsenic	mg/kg	0.18	--	0.011
Barium	mg/kg	N/A	0.65	0.19
Cadmium	mg/kg	0.0006	--	--
Chromium	mg/kg	0.0017	0.031	0.023
Copper	mg/kg	0.018	0.044	0.055
Lead	mg/kg	0.008	--	0.24
Mercury	mg/kg	0.0000013	0.0007	0.0036
Selenium	mg/kg	0.02	--	--
Silver	mg/kg	0.0001	--	--
Zinc	mg/kg	0.081	0.17	0.35

* Type B Cleanup Criteria for ground water taken from MDNR Mera Operational Memorandum #8, dated March 16, 1992 for Ground Water/Surface Water Interface. Note that cleanup criteria may be below method protection limits.

Table C-2E Fisher Brothers: SVOC/TPH Chemical Analysis Results for Soil and Water

ADL Sample Number			BA100292-102	BA092192-033	BA092192-029	BA092192-031	BA092292-192	BA0922192-026	BA092292-030	BA092292-037
Sample Location			MWBA01	MWBA02	MWBA03	MWBA03	SBBA04	SBBA05	SBBA06	SBBA07
Matrix			Water	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Start Depth(ft)			--	2	2	10	2	8	17	2
End Depth(ft)	Units	Type B Criteria*	--	4	4	12	4	10	19	4
Compound										
Naphthalene	ug/kg	29	1100	--	--	--	--	--	--	--
4-Methylphenol	ug/kg	24	20	--	--	--	--	--	--	--
Phenol	ug/kg	1100	30	--	--	--	--	--	--	--
TPH	mg/kg	No Criteria	--	40	50	20	50	360	40	200

* Type B Cleanup Criteria for Ground Water taken from MDNR MERA Operational Memorandum #8, dated March 16, 1992 for Ground Water/Surface Water Interface. Type B Cleanup Criteria for soil for protection of drinking water (20 times drinking water value).

Table C-3 Type B Cleanup Criteria
Volatile Organic Compounds

Chemical	Health-Based Drinking Water Value	Ground Water/ Surface Water Interface	Soil (20X Drinking Water Value)	Soil (20X GSI)
Acetone	700	500	14000	10000
Benzene	1	60	20	1200
Bromodichloromethane	0.3	24	6	480
Bromoform	4	65	80	1300
Bromomethane	10	11	200	220
2-Butanone	400	4100	8000	82000
Carbon disulfide	700	N/A	14000	N/A
Carbon tetrachloride	0.3	21	6	420
Chlorobenzene	100	71	2000	1400
Chloroethane	9	N/A	180	N/A
Chloroform	6	43	120	860
Chloromethane	3	N/A	60	N/A
Dibromochloromethane	0.4	29	8	580
1,1-Dichloroethane	700	N/A	14000	N/A
1,2-Dichloroethane	0.4	560	8	11000
1,1-Dichloroethene	7	67	140	140
1,2-Dichloroethene (total)	(1)	(1)	(1)	(1)
1,2-Dichloropropane	0.5	64	10	1300
cis-1,3-Dichloropropene	0.2	N/A	4	N/A
trans-1,3-Dichloropropene	0.2	N/A	4	N/A
Benzene	700	31	1400	620
2-Hexanone	ID	N/A	ID	N/A
Methylene chloride	5	59	100	1200
4-Methyl-2-pentanone	400	N/A	8000	N/A
Styrene	1	19	20	380
1,1,2,2-Tetrachloroethane	0.2	32	4	640
Tetrachloroethene	0.7	16	14	320
Toluene	1000	110	16000	2200
1,1,1-Trichloroethane	200	120	4000	2400
1,1,2-Trichloroethane	0.6	65	12	1300
Trichloroethene	3	94	60	1880
Vinyl Chloride	0.02	3.1	0.4	62
Total Xylenes	10000	59	6000	1200

Notes:

(1) cis-1,2-Dichloroethene = 70 Healt-Based Drinking Water Value, N/A Ground Water/Surface Water Interface, and N/A for Soil (20X GSI).
trans-1,2-Dichlorethene = 100 Health-Based Drinking Water Value, 300 Ground Water/Surface Water Interface, and 6000 Soil (20X GSI).

(2) Chemical not expected to leach through soil, direct contact value presented.

ID = Insufficient Data

N/A = Not Available

Data summarized from "Michigan Department of Natural Resources, MERA Operational Memorandum #8, Revision 1 - Type B Criteria Rules 299.5709, 299.5711(2), 299.5711(5), and 299.5713", dated March 6, 1992.

All values in parts per billion (ug/L for water, ug/kg for soil)

-+ Values for Chromium VI

Taken from "Supplement to Operational Memorandum #8" dated Aug. 18, 1992.

Table C-3 (Continued)
Semi-Volatile Organic Compounds

Chemical	Health-Base Drinking Water Value	Ground Water/ Surface Water Interface	Soil (20X Drinking Water Value)	Soil (20X GSI)
Acenaphthene	400	N/A	8000	N/A
Acenaphthylene	ID	N/A	ID	N/A
Anthracene	2000	N/A	40000	N/A
Benzo(a)anthracene	0.006	N/A	200(2)	N/A
Benzo(b)fluoranthene	0.006	N/A	200(2)	N/A
Benzo(k)fluorathene	0.006	N/A	200(2)	N/A
Benzo(a)pyrene	0.006	N/A	200(2)	N/A
Benzo(g,h,i)perylene	ID	N/A	ID	N/A
Benzyl alcohol	10000	22	2E + 5	440
Bis(2-chloroethyl)ether	0.03	4.2	0.6	84
Bis(2-chloroethoxy)methane	N/A	N/A	N/A	N/A
Bis(2-chloroisopropyl)ether	N/A	N/A	N/A	N/A
Bis(2-ethylhexyl)phthalate	2	N/A	40	N/A
4-Bromophenyl-phenylether	N/A	N/A	N/A	N/A
Butylbenzylphthalate	1000	N/A	20000	N/A
4-Chloroaniline	N/A	N/A	N/A	N/A
2-Chloronaphthalene	N/A	N/A	N/A	N/A
4-Chlorophenyl-phenylether	N/A	N/A	N/A	N/A
Chrysene	0.006	N/A	200(2)	N/A
Dibenz(a,h)anthracene	0.006	N/A	200(2)	N/A
Dibenzofuran	ID	N/A	ID	N/A
Di-n-butylphthalate	700	N/A	14000	N/A
1,2-Dichlorobenzene	600	7	12000	140
1,3-Dichlorobenzene	600	180	12000	3600
1,4-Dichlorobenzene	1	15	20	300
3,3'-Dichlorobenzidine	0.08	0.063	1.6	1.3
Diethylphthalate	6000	N/A	1.2E+5	N/A
Dimethylphthalate	N/A	N/A	N/A	N/A
2,4-Dinitrotoluene	0.05	N/A	1	N/A
2,6-Dinitrotoluene	N/A	N/A	N/A	N/A
Di-n-octylphthalate	100	N/A	2000	N/A
Fluoranthene	300	N/A	6000	N/A
Fluorene	300	N/A	6000	N/A
Hexachlorobenzene	0.02	0.0018	0.4	0.036
Hexachlorobutadiene	0.4	N/A	8	N/A
Hexachlorocyclopentadiene	50	0.54	1000	11
Hexachloroethane	2	13	40	260
ndeno(1,2,3-cd)pyrene	0.006	N/A	200(2)	N/A
sophorone	8	860	160	13000
2-Methylnaphthalene	10	N/A	200	N/A
Naphthalene	30	29	600	580
2-Nitroaniline	N/A	N/A	N/A	N/A
3-Nitroaniline	N/A	N/A	N/A	N/A
4-Nitroaniline	N/A	N/A	N/A	N/A
Nitrobenzene	4	N/A	80	N/A
N-Nitrosodiphenylamine	7	N/A	140	N/A

Table C-3 (Continued)
Metals/Cyanides

Metal/Cyanide	Health-Base Drinking Water Value	Ground Water/ Surface Water Interface	Soil (20X Drinking Water Value)	Soil (20X GSI)
Arsenic	0.02	180	0.4	3600
Barium	2000	N/A	40000	N/A
Cadmium	4	0.6	80	12
Chromium++	100	1.7	2000	34
Copper	1000	18	20000	360
Cyanide	100	3.6	2000	72
Lead	4	8	600000	160
Mercury	2	0.0013	40	0.026
Selenium	40	20	800	400
Silver	40	0.1	800	2
Zinc	1000	81	20000	1600

Table C-3 (Continued)
Semi-Volatile Organic Compounds

Chemical	Health-Base Drinking Water Value	Ground Water/ Surface Water Interface	Soil (20X Drinking Water Value)	Soil (20X GSI)
Phenanthrene	ID	N/A	ID	N/A
Pyrene	200	N/A	4000	N/A
1,2,4-Trichlorobenzene	9	22	180	440
Benzoic Acid	30000	N/A	6E+5	N/A
4-Chlorophenol-3-methylphenol	N/A	N/A	N/A	N/A
2-Chlorophenol	40	9.8	800	200
2,4-Dichlorophenol	20	34	400	680
2,4-Dimethylphenol	400	31	8000	620
2,4-Dinitrophenol	N/A	N/A	N/A	N/A
4,6-Dinitro-2-methylphenol	N/A	N/A	N/A	N/A
2-Methylphenol	400	38	8000	760
4-Methylphenol	400	24	8000	480
2-Nitrophenol	N/A	N/A	N/A	N/A
4-Nitrophenol	N/A	N/A	N/A	N/A
2,4,5-Trichlorophenol	700	N/A	14000	N/A
2,4,6-Trichlorophenol	3	1.5	60	300
Phenol	4000	1100	80000	22000
PCB	0.02	2E - 5	1000 (2)	0.0004

contamination. A concentration of 360 mg/kg of TPH was detected in the sample from eight to 10 feet, which corresponds to the sheen observed on the spoils during the drilling of this borehole. In the sample collected from 17 to 19 feet, the concentration of TPH is 40 mg/kg.

The elevated TPH value may be due to natural sources, or to components in the dump. The value does not indicate significant contamination.

4.3.4 Northern Boundary. Analyses of the soil samples collected from 2.5 to 4.5 feet and from 10 to 12 feet showed the complete absence of detectable VOCs. Generally, low metal concentrations were detected within the soil with only selenium at a concentration of 3 mg/kg in the sample taken from 2.5 to 4.5 feet, and 1 mg/kg in the sample taken from 10 to 12 feet, exceeding the average concentration in soil. All metal values fell within the average concentration range for soils. There was no detectable SVOC contamination within the soil samples. The soil quality data for the northern boundary area indicate no environmental liability.

4.3.5 Backfill Area. Analyses performed to detect the presence of VOCs showed a complete absence of these contaminants at detectable concentrations within the soil sample. Levels of total petroleum hydrocarbons peaked at 200 mg/kg in the soil taken from two to four feet; however, these compounds were absent from 10 to 12 feet. Metal concentrations from the two to four foot sample were higher than the average level in soil for cadmium, copper, lead, mercury, and zinc, but were within the range of observed concentrations. Metal concentrations were significantly reduced in the sample collected from 10 to 12 feet. None of the metal concentrations exceeded the Type B Criteria Values.

4.4 Chemical Results of Water Analysis

To describe the degree of contamination in ground water, concentrations in the water sample were compared to the Type B Cleanup Criteria for Ground Water/Surface Water Interface, as described in Michigan Dept. of Natural Resources MERA Operational Memorandum #8, Revision 1, dated March 16, 1992. The Type B Cleanup Criteria area summarized in Table C-3.

4.4.1 Demolished Equipment Storage Buildings. Analyses performed on water samples collected from the monitoring well located on this section of the property indicated the absence of detectable VOCs and TPH contamination in the ground water. Chromium, copper, lead, mercury, and zinc concentrations exceeded the Type B Criteria water standards. An off-site, upgradient source may be responsible for the elevated metals in the ground water at this location.

4.4.2 Underground Storage Tank and Former Above Ground Tank Location. Analysis of the sample collected in the vicinity of the underground tank showed no detectable VOC contamination. No other analyses were performed on this sample.

4.4.3 Northern Boundary. VOC analyses showed low concentrations of benzene at 4 ug/L, styrene at 1 ug/L, toluene at 5 ug/L, and total xylenes at 2 ug/L. Additional

concentrations of acetone and methylene chloride were identified at 100 ug/L and 4 ug/L, respectively, although these are considered to be common laboratory contaminants, and may not be representative of site contamination. While these concentrations do not exceed the Type B Criteria, they are indicative of a local contamination source. Analysis for SVOC contamination in the ground water revealed the presence of 20 ug/l of 4-methylphenol and a concentration of 30 ug/l of phenol. A high concentration of naphthalene appeared in the sample at a level of 1100 ug/l. The naphthalene value exceeds the Type B Criteria and the 4-methylphenol value is within 20% of the criteria. Chromium, copper, mercury, and zinc exceed the Type B Criteria.

The contaminants identified in the water are components of manufactured gas plant residuals and may have been transported via dispersive ground water flow.

5.0 Conclusions

The results from the field sampling program and the laboratory analysis revealed areas of contamination within the property. The types and degrees of contamination vary throughout the property as follows:

- The geophysical survey indicated the potential for an additional, previously unknown, underground storage tank near the known tank location.

- The presence of contamination within the section of the property that was formerly occupied by equipment storage buildings was confirmed by the presence of commonly used solvents within the shallow and deep soil and elevated levels of metals within the ground water. The source of the contaminants as well as the maximum contaminant level in the area, is not known at this time. This area may require additional investigation and remediation.

- The section of the property that currently contains an underground storage tank, and formerly was the location of an above ground tank, does show the presence of low levels of TPH contamination in the soil. It is unlikely that this area will require additional investigation and remediation.

- In the area of the former dumping grounds, the highest concentrations of TPH on the property were recorded at 360 mg/kg in the soil. The geophysical survey showed the area of the dumping grounds to be extensive with numerous subsurface anomalies, indicating the potential for more widespread contamination.

- The northern boundary of the property contains some evidence of VOC, metal, and SVOC contamination in the ground water with generally low metal concentrations in the soil, except for an elevated selenium concentration near

the surface. There is likely an off-site source for the ground water contamination.

- The southern most area of the property contains evidence of TPH contamination in the soil with elevated metal concentrations; however, the levels are likely due to poor quality fill material and not expected to require remediation.

Appendix A Soil Boring Logs

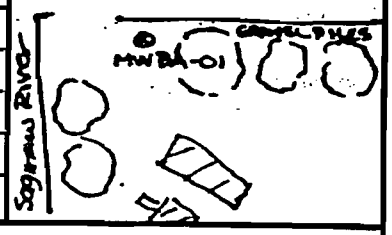
Arthur D Little

Soil Boring Log

Boring No. MWBA-01
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Start 9-21-92	Contractor GREAT LAKES DRILLING
Date Complete 9-21-92	Drill Method 4 1/4" HSA
Hole Diameter 8"	Type Of Rig ACKER AD-2
Casing Size –	Drilling Additives –
Boring Depth 14.0'	Geologist L. KAHN / T. GOLDTHWAITE
Sampling Method 2" Ø / 24" SPLIT SPOON	

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0	SS-01	0-2'	14"	6 4 50/6"	IS: – HS: 6.2	0-4" [GW] olive gray, coarse sand to fine gravel, poorly sorted, loose, dry; 4-14" [SM] Light to yellowish brown, silty very fine sand, trace coarse grains, loose, dry, black staining & organics throughout (FILL)
2	–	2-2.5'	–	50/3"	–	CONCRETE & CONCRETE CHUNKS ONLY (FILL)
3	SS-02 BA-092192-010	2.5-3.5'	10"	45/6" 50/6"	IS: – HS: –	FILL - light olive gray, fine to coarse sand & gravel, rock fragments, concrete fragments, wood, loose, dry [SW]
	SS-03 BA-092192-011	3.5-4.5'	12"	45/6" 50/6"	IS: – HS: –	FILL - same as above with definite black staining from 8-9". color varying from light olive to dark olive throughout, wood & concrete fragments. [SW]
5	SS-04	4.5-5.0'	3"	50/3"	IS: – HS: 4.0	FILL - same as above [SW]
	SS-05	5.0'-6.0'	6"	40/6"	IS: – HS: –	FILL - light olive gray, fine to med sand, poorly sorted, some coarse grains, loose, dry, concrete chunks, ground concrete & rock fragments. [SW]
6 7	SS-06	6.0'-8.0'	8"	50/8"	IS: – HS: 5.5	FILL - same as above, moist, color varying from light olive gray to dark olive gray throughout. Brown staining from 6-7", concrete chunks throughout [SW]
8 9	SS-07	8.0'-10.0'	8"	30 5 1 6	IS: – HS: 9.2	FILL - same as above, light olive gray, wood from 2-3", moist, concrete chunks throughout. [SW]
10 11	SS-08 BA-092192-020	10.0'-12.0'	20"	10 3 2 3	IS: – HS: –	FILL - same as above, wet (water table at 10.0'), concrete chunks throughout. [SW]
12 13						

IS: headspace inside split spoon
HS: headspace inside geologic sample

No geologic samples for SS-02, 03, 05, 08 due to low recovery.

Arthur D Little

Soil Boring Log
Continuation Page

Boring No. MWBA-01
Client ODELL ASSOC
Project ODELL
Case No. 40291-00

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
12						
13						
14						END OF BORING 14.0'
15						NO DRILL SPOILS WERE DRUMMED
						MONITOR WELL INSTALLED.
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						

Arthur D Little

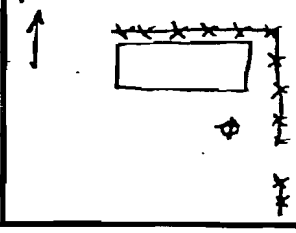
Soil Boring Log

Boring No. MWBAØ2
Client Odell Assoc.
Project EPA CERT
Case No: 40291-02

Date Start	9/21/92	Contractor	Great Lakes Drilling Co.
Date Complete	9/21/92	Drill Method	Hollow Stem Auger
Hole Diameter	8.25"	Type Of Rig	CME-55
Casing Size	NA	Drilling Additives	None
Boring Depth	21'	Geologist	M. Greenwood / K. Ellingwood

Sampling Method 2"x24" split spoon, continues to 12', intermittent

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0 1.0 2.0	SSØ1	0-2'	15.5"	18 20 21 23	HS 106	[SP] 0-12" grey, poorly sorted fine to medium sand, some gravel, dry, medium dense [ML] 12-15.5" mottled, primarily olive gray, Poorly sorted fine to medium grain with some gravel and bricks, trace clay, dry, medium dense
3.0 4.0	SSØ2 Chem. Samp. BA-092192-033	2-4'	14"	20 15 15 16	HS 200	[GM] Grayish black N2 to Dusky Brown 5YR 2/2 silt to medium sand, Poorly sorted, some gravel, Dry, compact. Brick, metal scraps at 3'.
5.0 6.0	SSØ3	4-6'	15'	7 5 6 5	HS 170	[GM] Primarily same as above: Fill, bricks, concrete
7.0 8.0	SSØ4	6-8'	2"	4 5 5 5	HS 260	[GM] Same as above: Moist, mottled
9.0 10.0	SSØ5	8-10'	4"	3 5 4 5	HS 259	[GM] Same as above: Wood fragments
11.0	SSØ6	10-12'	3"	8 5 4 5	HS 273	[GM] Same as above: Organic material

NO IN SPOON MEASUREMENTS REPORTED BECAUSE THE PID WAS INOPERABLE DUE TO THE RAIN

Arthur D Little	Soil Boring Log Continuation Page	Boring No. MWBA Ø2 Client Odell Assoc. Project Case No.

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
13.0	SSØ7	13-15'	4"	5 4 3 5	HS 312	4" of fibrous wood fragments
14.0						
15.0						
16.0						
17.0						
18.0	SSØ8 Chem. Samp. BA-0121-U35 (19-21')	18-20'	12"	6 9 18 14	HS 400	Olive gray, clayey silt with poorly sorted fine sand, some gravel and bricks, trace wood, trace organic material, moist, stiff, a petroleum odor was observed.
19.0						
20.0						
21.0						
22.0						
23.0						

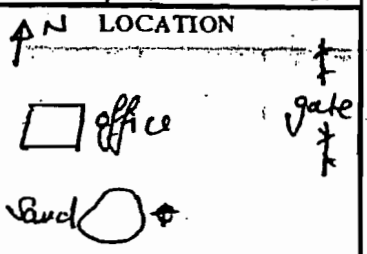
Arthur D Little

Soil Boring Log

Boring No. MW BA03
Client odell
Project EPA CERT
Case No. 40291-02

Date Start	9-21-92	Contractor	Gt Lakes Dr.
Date Complete	9-21-92	Drill Method	HSA
Hole Diameter	8¼"	Type Of Rig	CME-55
Casing Size	—	Drilling Additives	—
Boring Depth	16'	Geologist	K. Ellingwood
Sampling Method	2" ø 24" Split Spoons (steel)		

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0 1.0 2.0	SS-01	0-2'	21"	8 51 92 41	HS 382	[SW] 18" Lt brown/olive med/coarse sand, some gravel dry, compact [SW] 3" Dk brown/black fine sand well sorted, gravel dry compact
3.0	SS02 BA-092192-029	2-4'	24"	11 14 19 12	HS 335	[SW] 0-9.5" Same as above concrete 8-9.5" 9.5-20 Same as above 20-24" mottled sand, w/silt, dry compact.
5.0 6.0	SS03	4-6'	24"	6 3 3 4	HS 271	[SM] 0-5" brown fine sand w/pebbles. [MC] 5-11" mottled clay/silt, moist. [SP] 11-19" mottled w/fine sand [MC] 19-24 Sand, some wood.
7.0 8.0	SS04	6-8'	9"	4 3 3 7	HS 121	[MC] @-6" Dark brown fine sand less compact. [OL] 6-9" Medium gravel, wood some fine sand.
9.0 10.0	SS05	8-10'	19"	3 3 3 8	HS 89	0-9 Same as above, some organics 9-19" brown fine sand slag wood. very moist.
11.0	SS06 BA-072192 031	10-12'	10"	4 4 8 9	HS —	[SM] brown sand, silt, wood moist.
13.0	SS07	12-14'	9"	8 7 5 4	HS 77.	[SM] olive sandy silt, some gravel.

Arthur D Little

Soil Boring Log
Continuation Page

Boring No. HWBA03
Client odeU
Project EPA CERT
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
13.0						2-6" brown sandy silt, wood, well sorted, moderate compaction Slight sheen. [SM]
14.0	SS-08	14-16'	14"	2 2 2 1	HS 74.9	[SM] Light olive/dark grey fine sand wood fibers. wet. poor compaction.
15.0						
16.0						

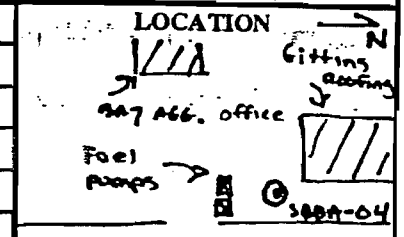
Arthur D Little

Soil Boring Log

Boring No.	SBBA-04
Client	ODELL ASSOC.
Project	ODELL
Case No.	40291-02

Date Start	9-21-92	Contractor	Great Lakes Drilling
Date Complete	9-21-92	Drill Method	4.25" HSA
Hole Diameter	8"	Type Of Rig	ACKER (AD-2)
Casing Size	—	Drilling Additives	—
Boring Depth	21.5'	Geologist	T. Goldthwaite / L. Kahn
Sampling Method			

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0	SS-01	0-2'	11"	5 6 7	— HS = 5.8	0-2", Light Brown, [SW], Fine to coarse sands. Loose. Dry. 2-11", Black slag type material w/some silt/organics @ depth. NOTE: ~ 4" concrete slab @ surface.
1						
2						
3	SS-02 BA-04TR-022	2-4'	12"	3 2 2 2	— HS = 5.4	0-12", Black slag type material w/ glass fragments, brick fragments, and ashy material. Well stratified w/ fine-medium sands and silty sands, displaying distinct color variations.
4						
5	SS-03	4-6'	12"	3 2 2 4	— HS = 6.5	0-5", Light tan-brown, [SW], fine to coarse sands w/ black silty / organic layer @ 3". 5-12", wood chips.
6						
7	SS-04	6-8'	14"	3 3 3 4	— HS = 6.6	0-14", wood chips, w/ top ~ 5" being dark gray silty organic material w/ fine-coarse sands.
8						
9	SS-05	8-10'	22"	5 3 4 3	— HS = 11.8	0-8", Black, [OL], organic silt 8-14", wood chips.
10						
11	SS-06	10-12'	14"	2 4 5 4	— HS = 8.4	0-10", wood chips. 10-14", light gray, [SM], silty fine sand, loose,
13						

Arthur D Little	Soil Boring Log Continuation Page	Boring No. SBBA-04 Client ODELL ASSOC. Project ODELL Case No. 40291-02

Scale in Feet	SAMPLE Type and number	SAMPLE Interval	SAMPLE Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
13 14	SS-07	12.5-14.5'	18"	5 6 15 17	— HS=5.9	0-10", wood chips. 10-18", light gray, [ML], V. Fine sandy silt w/trace clay and coarse sands throughout. MOIST, V. STIFF
15 16						
17 18 19	SS-08	17-19'	8"	12 14 15 15	— HS=7.3	0-8", SAME AS ABOVE (10-18")
20 21						
22 23	SS-09 BA-092192-024	21.5-23.5'	18"	6 8 13 15	— HS=5.1	0-18", light gray, [ML], V. Fine sandy silt w/some clay and coarse sands throughout. V. STIFF. WET
24 25 26 27 28 29						

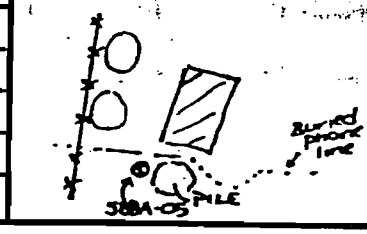
Arthur D Little

Soil Boring Log

Boring No. SBBA-05
Client ODELL ASSOC.
Project ODELL
Case No. 40891-02

Date Start 9-21-92	Contractor GREAT LAKES DRILLING
Date Complete 9-21-92	Drill Method 4 1/4" HSA
Hole Diameter 8"	Type Of Rig ACKER AD-2
Casing Size –	Drilling Additives –
Boring Depth 17' (EOH 19')	Geologist L. KAHN, J. FORTNER
Sampling Method 2Ø/24" SPLIT SPOON	

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)		GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0							
1	SS-01	0.0 - 2.0'	5"	10 22 28 22	IS: – HS: 6.8	FILL	0-3" [SW] Light Brown, fine to coarse sand, poorly sorted, loose, moist (rain). 3-5" GRAY TO BROWN, silty sand, trace coarse sand, [SM] med. compaction, moist (rain).
2 3	SS-02	2.0 - 4.0'	13"	8 6 7 6	IS: – HS: 5.3	FILL	0-3" Same as above 3-13" Black to dark gray, silty sand, trace organics, [SM] brick, wood, no odors, loose, moist (rain)
4 5	SS-03	4.0 - 6.0'	4.5"	5 6 3 5	IS: – HS: 4.2	FILL	0-4.5" med olive gray with black mottling throughout, [SM] silty sand, trace coarse grains, brick, ⊛ no odors, med compaction, moist (rain). ⊛ paintbrush-like fibers
6 7 8	SS-04	6.0 - 8.0'	10"	3 4 3 3	IS: – HS: 25.5	FILL	0-6" Dark gray to black, silty sand, some coarse grains & organics, trace wood, paint brush-like [SM] fibers, large coarse grain from 4-5", med. compaction, moist (rain). 6-10" med olive gray, very fine sandy silt, trace [ML] coarse grains, soft, moist
9 10	SS-05 BA-092192-026	8.0 - 10.0'	12"	6 3 2 3	IS: – HS: 6.4	FILL	WATER TABLE AT 8.5' 0-2" same as above [ML] 2-12" Black to dark gray, silty sand, some coarse grains, poorly sorted, glass, wood, organics, [SM] white plastic plug, loose, wet.
11							
13							

IS: headspace inside split spoon
HS: headspace inside geologic sample

Arthur D Little

Soil Boring Log
Continuation Page

Boring No. SBBA-05
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
12						
13	SS-06	12.5 to 14.5'	16"	5 5 6 13	IS: - HS: 255	0-16" dark gray to black, silty sand, some coarse grains, poorly sorted, paint-brush-like fibers, red & yellow brick, glass, wood, white china plate-like material, med compaction, wet [SM] FILL
14						
15						
16						
						END OF BORING 17.0'
17	SS-07	17.0 to 19.0'	10"	7 3 5 4	IS: - HS: 5.8	0-7" Same as above, brick, wood, china-like material, blue glass, paint brush-like fibers [SM] FILL END OF FILL 7-10" Greenish to olive gray, very fine sandy silt, well sorted, med compaction, wet (natural river bottom material) [ML]
18						
19						END OF HOLE 19.0'
20						BORING ABANDONED WITH A BENTONITE POWDER / CEMENT SLURRY
21						NO DRILL SPOILS WERE DRUMMED.
22						
23						
24						
25						
26						
27						
28						

Arthur D Little

Soil Boring Log

Boring No. SB3A-06
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Start 9-22-92	Contractor GREAT LAKES DRILLING
Date Complete 9-22-92	Drill Method 4 1/4" HSA
Hole Diameter 8"	Type Of Rig ACKER AD-2
Casing Size –	Drilling Additives –
Boring Depth 17' (EOH 19')	Geologist L. KAHN, J. FORTNER
Sampling Method 2"ϕ/24" steel split spoon	

LOCATION

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0	SS-01	0.0 to 2.0'	17"	14 16 13 14	IS: – HS: 4.0	0-2" Light brown, fine to coarse sand, poorly sorted, loose, moist [SW] FILL 2-17" Black, silty sand, some coarse grains, trace brick, glass, very poorly sorted, very loose, very dry [SM]
2 3	SS-02	2.0 to 4.0'	19.5'	22 16 18 14	IS: – HS: 5.9	0-6" Same as above, also wood & cement fragments [SM] FILL 6-10" Light gray, fine to med sand, some rock fragments & cement-like fragments, med compaction, dry [SW] 10-19.5" Same as 0-6" interval, brick [SM]
5	SS-03	4.0 to 6.0'	16"	5 3 4 3	IS: – HS: 5.5	0-12" Dark grey to black, silty sand, trace coarse grains, China-like material, brick, med compaction, moist [SM] FILL 12-16" chunks of wood
6 7	SS-04	6.0 to 8.0'	14"	5 3 3 4	IS: – HS: 4.5	0-6.5" Same as previous 0.0-12" interval, with a trace more silt content, no brick or china-like material, moist [SM] FILL 6.5-8" wood chunks 8-14" olive gray, very fine sandy silt, trace coarse grains & shell-like material, & wood chips, soft, moist [ML]
8 9 10	SS-05	8.0 to 10.0'	18"	3 2 3 3	IS: – HS: 5.0	0-18" Dark gray to black, silty sand, trace coarse grains, wood, paint-brush-like material, brick, loose ~~terra~~, top 6" wet, 6-18" moist, coal from 7 to 9" [SM] FILL (Same as previous 0-6.5" interval)
11 13						

IS = headspace inside split spoon
HS = headspace inside geologic sample
(NOTE: Shutdown equipment down - sent for repair)

Arthur D Little

Soil Boring Log
Continuation Page

Boring No. SBBA-06
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
12						
13	SS-06	12.5 to 14.5'	20"	4 4 3 2	IS: - HS: 5.9	0-12" same as above, wet, organics, wood, glass, & [SM] metal (FILL) 12-14" wood chunks END OF FILL 14-20" Greenish to med olive gray, very fine sandy silt, well sorted, med compaction, wet (natural river bottom) [ML]
14						
15						
16						
17						END OF BORING 17.0'
18	SS-07 BA-092292-030	17.0 to 19.0'	10"	5 3 2 3	IS: - HS: 6.0	0-4" olive gray, very fine sandy silt, well sorted, med com to stiff compaction, wet [ML] 4-10" same as previous 14-20" interval, wet [ML]
19						END OF HOLE 19.0'
20						NO DRILL SPOILS DRUMMED
22						BORING ABANDONED WITH A BENTONITE POWDER/ CEMENT SLURRY
23						
24						
25						
26						
27						
28						
29						

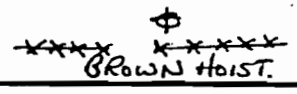
Arthur D Little

Soil Boring Log

Boring No. SBBA Ø7
Client odell
Project EPA CERT
Case No. 40291-02

Date Start	9-22-92	Contractor	Gt Lakes Dr
Date Complete	9-22-92	Drill Method	HSA
Hole Diameter	8¼"	Type Of Rig	CME-55
Casing Size	—	Drilling Additives	—
Boring Depth	14'	Geologist	Greenwood / Ellingwood
Sampling Method	2" Ø 24" Steel Split Spoon.		

LOCATION



Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
0.0 1.0 2.0	SS-01	0-2'	17.5"	6 10 14 19	1.S. 31.4 H.S 57.7	mottled brown/black - occ olive grey well sorted, some gravel med. compaction
3.0 0	SS-02 BA 092292 037	2-4'	24"	14 10 16 15	1.S 11.6 H.S 52	brown/black well sorted, fine sandy silt. some gravel, med. compaction.
5.0 6.0	SS-03	4-6'	21.5"	14 9 18 8	1.S. 168 H.S 112	0-7" as above 7-14" gray. well sorted dry sand. 14-21.5 brown/black well sorted fine sand, gravel, brick, moist.
7.0 8.0	SS-04	6-8'	15"	16 4 4 4	1.S. 249 H.S. 139	0-12" Same as above 12-15" mottled gray clayey silt loose compaction.
9.0 10.0	SS-05	8-10'	Ø	4 6 8 7	1.S — H.S —	No recovery.
11.0 12.0 0	SS-06 BA 092292 039	10-12'	11"	11 2 2 4	1S 0 H.S 207.	brown/black well sorted fine sand some gravel, loose compaction

Arthur D Little

Soil Boring Log
Continuation Page

Boring No. SBBA07
Client Odell Associates
Project EAA Cert
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	Interval	Recovery	Blows Per 6"	Total Organics (ppm)	GEOLOGIC DESCRIPTION Unified Soil Class ID, color (Munsell System), grain size, sorting, moisture, compaction, indication of contaminants (unusual odor or sheen), and general stratigraphic description
12.0	SS07	12-14'	22"	3 2 2 1	15. 0.0 H.S. 104	0-12" Brownish black, well sorted fine grained sandy silt with some gravel, trace bricks, wet, loose compaction 12-22" Olive gray (1gy) with some brownish black (bottom 1/2 of spoon) clayey silt with trace fine sand, moist-wet, loose compaction. The clayey silt had a petroleum odor.
13.0						
14.0						

Appendix B Monitoring Well Design

Arthur D Little

Monitoring Well Design

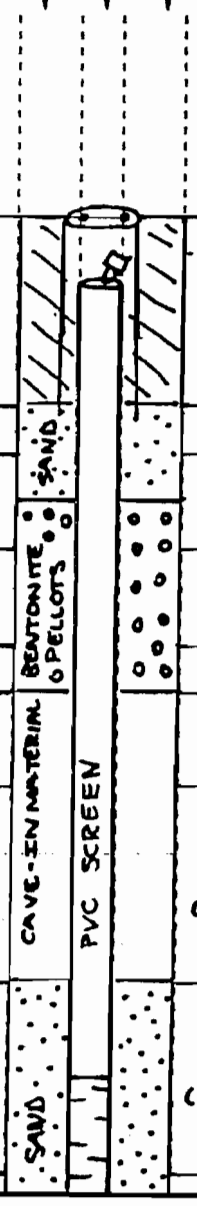
Boring No.	MWBA-01
Client	ODELL ASSOC.
Project	ODELL
Case No.	40291-02

Date Start 9-21-92	Date Complete 9-21-92	Hole Diameter 8"	Casing Size –

Contractor GREAT LAKES DRILLING	Geologist L. KAHN, J. FORTNER
Drill Method 4 1/4" HSA	Boring Depth 14.0'
Type Of Rig ACKER AD-2	Grout method –
Datum DOUBLE NOTCH PVC RISER	Development Method TO BE DEVELOPED

Notes

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	(See Boring Log for detail)
0.0	SS-01	IS: – HS: 6.2		GW / SM (FILL)
2	–	–		
3	SS-02 (BA-092192-013)	–		SW (FILL)
4	SS-03	–		SW (FILL)
5	SS-04	IS: – HS: 4.0		SW (FILL)
	SS-05	–		SW (FILL)
6	SS-06	IS: – HS: 5.5		SW (FILL)
7				
8	SS-07	IS: – HS: 9.2		SW (FILL)
10				



Construction Specifications

Elevation Top Of Casing _____

Elevation Top Of Riser Pipe _____

Elevation Ground Surface 584.868

(surveyed elevations)

(depth from ground surface)

Type of Surface Casing 11" Aluminum Roadbox

I.D. Surface Casing 9"

Type Of Riser Pipe Schedule 40 PVC

I.D. Riser Pipe 2"

Diameter Of Borehole 8"

Type Of Backfill –

Type Of Seal Bentonite Pellots

Depth To Top Of Seal 3'

cave-in from 5.0 - 8.0'

Type Of Sand Pack Filter Sand

Depth To Top Of Sand Pack 8.0'

Type Of Screen Schedule 40 PVC

Slot Size 2"

I.D. Screen 0.010

Screened Interval 9.0'

Depth To Bottom Of Well 14.0'

Depth To Bottom Of Borehole 14.0'

Arthur D Little

Monitoring Well Design
(Continuation Page)

Boring No. MWBA-01
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	Notes and Comments
10	SS-08	IS: -		
11	BA-092192-020	HS: -	SW	
12			SCREEN	
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				

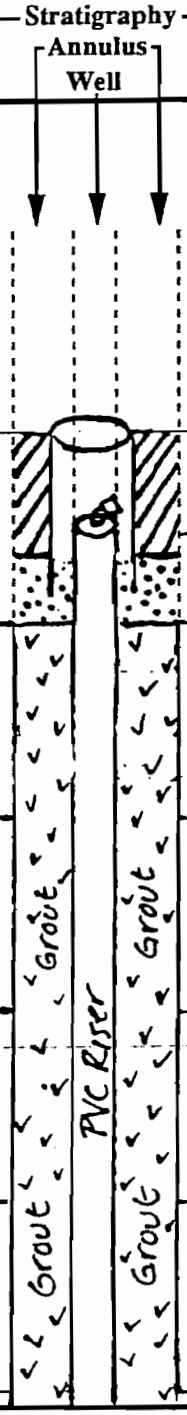
Arthur D Little

Monitoring Well Design

Boring No. MWBA02
Client Odell Assoc.
Project Odell
Case No. 42091-02

Date Start 9/21/92	Date Complete 9/21/92	Hole Diameter 8.25"	Casing Size –
Contractor Great Lakes Drilling Co.		Geologist M. Greenwood / K. Ellingwood	
Drill Method Hollow Stem Auger		Boring Depth 21'	
Type Of Rig CME-55		Grout method Bentonite/Portland mix pumped thru tig	
Datum Double notch on PVC riser		Development Method To be developed	
Notes			

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	Stratigraphy
0.0	SS01			SP
1.0				
2.0				Mc
	SS02 BA-092192-033			
3.0				GM
4.0				
	SS03			
5.0				Gm
6.0				
	SS04			
7.0				GM
8.0				
	SS05			
10.0				Gm



Construction Specifications

Elevation Top Of Casing _____

Elevation Top Of Riser Pipe _____

Elevation Ground Surface 607.849

(surveyed elevations)

(depth from ground surface)

Type of Surface Casing _____

I.D. Surface Casing _____

Type Of Riser Pipe Schedule 40 PVC

I.D. Riser Pipe 2" Ø

Diameter Of Borehole 8.25"

Type Of Backfill None

Type Of Seal Bentonite chip

Depth To Top Of Seal 13

Type Of Sand Pack Filter sand

Depth To Top Of Sand Pack 15'

Type Of Screen Schedule 40 PVC

Slot Size .010

I.D. Screen 2" Ø

Screened Interval 16 - 21'

Depth To Bottom Of Well 21'

Depth To Bottom Of Borehole 21

Arthur D Little

Monitoring Well Design
(Continuation Page)

Boring No. MWBA Ø2
Client Odell Assoc.
Project Odell
Case No. 42091-02

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	Notes and Comments
10.0				
	SS Ø6			
11.0			GROUT	Gm
12.0				
13.0				
	SS Ø7		BENT. SEAL	
14.0			PVC RISER	
15.0				
16.0			SAND PACK	
17.0			PVC SCREEN	
18.0				
	SS Ø8 chemical sample BA-092192-035 (19-21')			
19.0				
20.0				
21.0				
22.0				
23.0				
24.0				

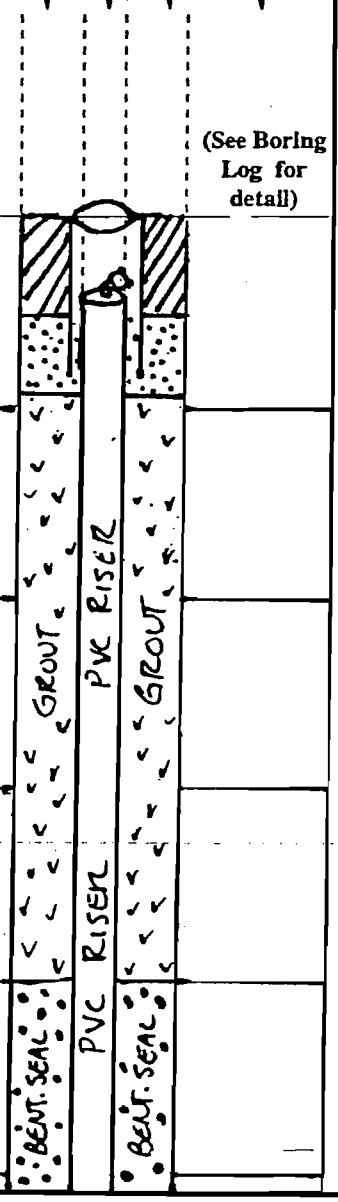
Arthur D Little

Monitoring Well Design

Boring No.	MWBA 03
Client	Odell Assoc.
Project	Odell
Case No.	40291-02

Date Start 9/28/92	Date Complete 9/21/92	Hole Diameter 8.25	Casing Size –
Contractor Great Lakes Drilling Co		Geologist M. Greenwood / K. Ellingwood	
Drill Method Hollow Stem Auger		Boring Depth 16'	
Type Of Rig CME-55		Grout method Bentonite/Portland mix pumped thru rig	
Datum Double notch on PVC riser		Development Method To be developed	
Notes			

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	Construction Specifications
0.0	SS01			
2.0	SS02 Chemical Sample			
4.0	SS03			
6.0	SS04			
8.0	SS05			
10.0				



Elevation Top Of Casing _____

Elevation Top Of Riser Pipe _____

Elevation Ground Surface 586.72 s

(surveyed elevations)
(depth from ground surface)

Type of Surface Casing _____

I.D. Surface Casing _____

Type Of Riser Pipe Schedule 40 PVC

I.D. Riser Pipe 2" ø

Diameter Of Borehole 8.25"

Type Of Backfill NONE

Type Of Seal BENTONITE CHIPS

Depth To Top Of Seal _____

Type Of Sand Pack Filter Sand

Depth To Top Of Sand Pack _____

Type Of Screen Schedule 40 PVC

Slot Size .010

I.D. Screen 2" ø

Screened Interval 11-16'

Depth To Bottom Of Well 16'

Depth To Bottom Of Borehole 16'

Arthur D Little

Monitoring Well Design
(Continuation Page)

Boring No. MWBA03
Client Odell Assoc.
Project Odell
Case No. 40291-02

Scale in Feet	SAMPLE Type and number	SAMPLE Total Organics (ppm)	Well Construction Diagram (Stratigraphy, Annulus, Well)	Notes and Comments
10.0				
11.0	SS06 Chemical Sample BA-092192-031		SAND PACK, SCREENED PVC, SAND PACK	Sm
12.0				
13.0	SS07			Sm
14.0				
15.0	SS08			Sm
16.0				
17.0				

Page ____ of ____

Appendix C Monitoring Well Development Sheets

Arthur D Little

Monitoring Well Development Data Sheet

Well No: MWBA01
Client: ODELL ASSOC
Project: ODELL
Case No. 40291-02

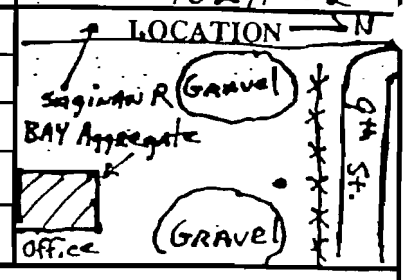
Date Developed: 9-23-92 | Developed By: R. Sullivan / T. Goldthwaite

Depth to Water: 4.25 | Total Depth: 14.05

O^2 20.8% | LEL 2% | HNu —

Measuring Point: Double notch in PVC Riser.

Notes: Weather: Clear and warm (~75°F)



WELL VOLUME (* use appropriate values in table for each code letter)

V well 0.17 x [(Depth Screen Bottom 13.75 - Depth Water 4.25)] = Gallons of Water (well) 1.62

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annalus 0.79 x [(Depth Screen Bottom 13.75 - Depth Bottom of Seal 7.75)] = Gallons of Water (annalus) 4.74

WATER TO BE REMOVED

x 5 = 31.8

[(Gallons of Water (well) 1.62 + Gallons of Water (annulus) 4.74)] x Removal Multipler 3 = Total Gallons to be Removed 19.1

Actual Gallons Removed 40

MEASUREMENTS

Time	Number of Gallons Removed 0.0 gallons	pH	Conductivity	Temperature	Turbidity
1350		12.48	1.86	18.8 °C	571
1325	10	13.11	8.07	12.4	7800

TABLE

Well	Annalus *	
V well	dia	V annalus
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

Depth to Sediment: Before 0" After —

Type/Capacity of pump 1 3/4" Teflon Bailer

Pumping Rate — | Recharge Time Good

Time to Develop Well: Start 1350 Finish — Duration —

COMMENTS (include description of water removed)

Purged water was dark brown in color.

Bailer was lost down the well after approx 40 gal of water had been removed.

* Assumes 30% porosity for sand pack

Arthur D Little

Monitoring Well Development Data Sheet

Well No. MWBA-02
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Developed: 9-23-92 | Developed By: B. Sullivan / T. Goldthwaite
Depth to Water: 13.25 | Total Depth: 20.65
O^2 20.9 | LEL 3% | HNu —
Measuring Point: Double notch in PVC riser.
Notes: Weather: Clear, cool (~65°F)

Water St. LOCATION
Fuel Pump
N
Bay Aggregate

WELL VOLUME (* use appropriate values in table for each code letter)

V well 0.17 x [(Depth Screen Bottom 20.25 - Depth Water 13.25)] = Gallons of Water (well) 1.19

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annalus 0.79 x [(Depth Screen Bottom 20.25 - Depth Bottom of Seal 14.25)] = Gallons of Water (annalus) 4.74

WATER TO BE REMOVED

x 5 = 29.7

[(Gallons of Water (well) 1.19 + Gallons of Water (annulus) 4.74)] x Removal Multiplier 3 = Total Gallons to be Removed 17.8 | Actual Gallons Removed 4

MEASUREMENTS

Time	Number of Gallons Removed	pH	Conductivity	Temperature	Turbidity
0905	0.0 gallons	7.63	1.20	8.9°C	7800
0910	3.0	7.65	1.35	8.6	7800
1004	4.0	—	DRY	—	—

TABLE

Well	Annalus *	
V well	dia	V annalus
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

Depth to Sediment: Before 0" After 0"
Type/Capacity of pump 1 3/4" Ø Teflon Bailer
Pumping Rate — | Recharge Time Poor to Very Poor
Time to Develop Well: Start 0905 Finish 1004 Duration 59 min

COMMENTS (include description of water removed)

Purged water was dark brown in color.
0915: Allowed well to recharge for two 15 min intervals. Recharge was poor.
940: Began bailing again and removed 1 gal of water.
004: Well went dry.

* Assumes 30% porosity for sand pack

Arthur D Little

Monitoring Well Development Data Sheet

Well No. MNBA 03
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Developed: 9-23-92 | Developed By: B. Sullivan / T. Goldthwaite

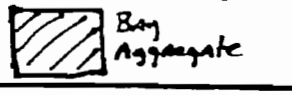
Depth to Water: 4.4 | Total Depth: 14.2

0^2 20.9% | LEL 5% | HNu —

Measuring Point: Double notch in PVC Riser.

Notes: Detected a sulfur like odor similar to rotten eggs.

N ← LOCATION



WELL VOLUME (* use appropriate values in table for each code letter)

V well 0.17 x [(Depth Screen Bottom 13.9 - Depth Water 4.4)] = Gallons of Water (well) 1.62

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annalus 0.79 x [(Depth Screen Bottom 13.9 - Depth Bottom of Seal 7.9)] = Gallons of Water (annalus) 4.74

WATER TO BE REMOVED

x 5 = 31.8

[(Gallons of Water (well) 1.62 + Gallons of Water (annulus) 4.74)] x Removal Multiplier 3 = Total Gallons to be Removed 19.1 | Actual Gallons Removed 27

MEASUREMENTS

Time	Number of Gallons Removed	pH	Conductivity	Temperature	Turbidity
1052	0.0 gallons	6.91	1.57	12.9°C	>800
1055	3	6.82	1.64	11.5	>800
1101	6	6.74	1.45	13.3	>800
1106	9	6.79	1.53	12.6	>800
1110	12	6.81	1.47	13.4	>800
1113	15	6.79	1.51	11.7	>800
1118	18	6.74	1.47	12.2	>800

TABLE

Well	Annalus *	
V well	dia	V annalus
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

Depth to Sediment: Before 0" After 0"

Type/Capacity of pump 1 3/4" Ø Teflon Bailer

Pumping Rate — | Recharge Time Very Good

Time to Develop Well: Start 1052 Finish 1136 Duration 44 min

COMMENTS (include description of water removed)

Purged water was dark brown in color.

MEASUREMENTS (cont)

Time	# of Gal.	pH	Cond.	Temp.	Turb.
1124	21	6.75	1.50	10.5	>800
1131	24	6.76	1.52	11.0	>800
1136	27	6.77	1.51	10.6	>800

* Assumes 30% porosity for sand pack

Appendix D Monitoring Well Sampling Sheets

Arthur D Little

Monitoring Well Sampling Data Sheet

Well No. MWBA01
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

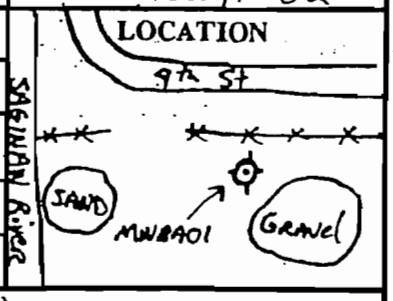
Date Sampled: 10/2/92 | Sampled By: B. Sullivan
Depth to Water: — | Total Depth: —

O_2 20.9% | LEL 0.0% | PID Background 0.0, During Purge 3.2

Measuring Point: —

Equipment: Microtip MX251 LEL/O_2 Meter, Toriba Water Quality Meter, 1 3/4" Teflon Bailer

LOCATION



WELL VOLUME (* use appropriate values in table for each code letter)

V well [ ] x [(Depth Screen Bottom [ ] - Depth Water [ ])] = Gallons of Water (well) [—]

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annulus [ ] x [(Depth Screen Bottom [ ] - Depth Bottom of Seal [ ])] = Gallons of Water (annulus) [—]

WATER TO BE REMOVED

[(Gallons of Water (well) [ ] + Gallons of Water (annulus) [ ])] x Removal Multiplier [ ] = Total Gallons to be Removed [—] Actual Gallons Removed [1]

MEASUREMENTS

Well Purging

Time	Number of Gallons Removed	pH	Conductivity	Temperature	Turbidity
0910	0	12.43	11.60	12.8	111
Post Sampling 0930	1	12.73	12.60	13.0	>800

W.S

Well V well	Annulus* dia	Annulus* V annulus
1.5" 0.10gal/ft	4.0	0.29gal/ft
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

SAMPLING

Sample ID	Analysis	Volume (ml)	Filtered (Y/N)	Preservation	Container	Time
BA-100292-102	VOA	80	N	HCL, ICE	(2x) 40ml glass	0930
↓	SVOA	4000	N	ICE	4000 ml glass	↓
↓	METALS	1000	N	H_2SO_4, ICE	1000 ml polyethylene	↓

W.S

Notes (include data on floaters/sinkers with measuring device, well condition, etc.)
A bailer was lost down this well and could not be removed. Therefore, this well could not be developed before taking a sample.

* Assumes 30% porosity

Signature William Sullivan Date 10/2/92 No. of Bottles 4

Arthur D Little

Monitoring Well Sampling Data Sheet

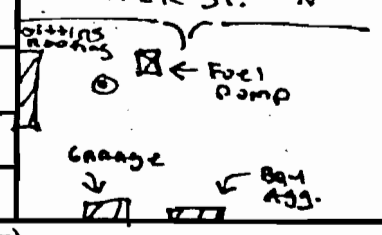
Well No. MWBA-02
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Sampled: 9-29-92
Sampled By: T. Goldthwaite / B. Sullivan
Depth to Water: 1.92'
Total Depth: 20.62'

O_2 20.6%
LEL 0%
PID —

Measuring Point: DOUBLE NOTCH PVC RISER
Equipment: 1 3/4" Ø TEFLON BAILER
HORIBA WATER QUALITY METER / MX251 LEL/O_2 METER

LOCATION
WATER ST. N



WELL VOLUME (* use appropriate values in table for each code letter)

V well [0.17] x [([20.32] - [18.92])] = Gallons of Water (well) [0.24]

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annulus [0.79] x [([20.32] - [14.32])] = Gallons of Water (annulus) [4.74]

WATER TO BE REMOVED

[(Gallons of Water (well) [0.24] + Gallons of Water (annulus) [4.74])] x Removal Multiplier [3] = Total Gallons to be Removed [14.9]

x 5 = 24.9

Actual Gallons Removed [0.24]

MEASUREMENTS

Well Purging

Time	Number of Gallons Removed	pH	Conductivity (mS/cm)	Temperature (°C)	Turbidity
1409	0.0	6.95	2.26	11.7	257
Post Sampling					

T.G.

Well V well	Annulus* dia	Annulus* V annulus
1.5" 0.10gal/ft	4.0	0.29gal/ft
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

SAMPLING

Sample ID	Analysis	Volume (ml)	Filtered (Y/N)	Preservation	Container	Time
BA-092992-080	VOA	40	N	HCL	(x1) 40ml GLASS	1615

T.G.

Notes (include data on floaters/sinkers with measuring device, well condition, etc.)

well went dry after ~ 1/4 gal. removed

* Assumes 30% porosity

Signature [signature] Date 9-29-92 No. of Bottles 1

Arthur D Little

Monitoring Well Sampling Data Sheet

Well No. MWBA-03
Client ODELL ASSOC.
Project ODELL
Case No. 40291-02

Date Sampled: 9-29-92 | Sampled By: T. Goldthwaite / B. Sullivan

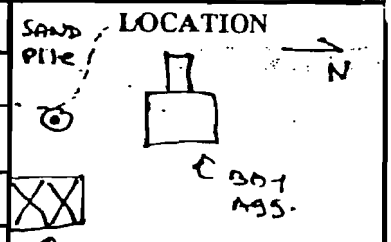
Depth to Water: 8.42' | Total Depth: 14.22'

O_2 20.5% | LEL 1% | PID —

Measuring Point: Double Notch PVC Riser

Equipment: 1 3/4" Ø Teflon Bailer
Horiba water quality meter / MX251 LEL/O_2 Meter

LOCATION



WELL VOLUME (* use appropriate values in table for each code letter)

V well 0.17 x [(Depth Screen Bottom 13.92 - Depth Water 8.42)] = Gallons of Water (well) 0.94

ANNULAR VOLUME (ASSUME 30% POROSITY)

V annulus 0.79 x [(Depth Screen Bottom 13.92 - Depth Bottom of Seal 7.92)] = Gallons of Water (annulus) 4.74

WATER TO BE REMOVED

[(Gallons of Water (well) 0.94 + Gallons of Water (annulus) 4.74)] x Removal Multiplier 3 = Total Gallons to be Removed 17.0 (x 5 = 28.4)

Actual Gallons Removed 18

MEASUREMENTS

Well Purging

Time	Number of Gallons Removed	pH	Conductivity (mS/cm)	Temperature (°C)	Turbidity
1521	0	6.47	1.88	15.1	2800
1524	3	6.48	1.87	15.1	↓
1529	6	6.50	1.87	14.41	
1532	9	6.49	1.88	13.1	
1536	12	6.47	1.87	13.3	
1540	15	6.45	1.84	13.3	
1544	18	6.44	1.85	13.9	

Post Sampling

Well V well	Annulus* dia	Annulus* V annulus
1.5" 0.10gal/ft	4.0	0.29gal/ft
2" 0.17gal/ft	6.5	0.46gal/ft
	7.25	0.59gal/ft
	7.75	0.69gal/ft
	8.25	0.79gal/ft
4" 0.66gal/ft	8.25	0.64gal/ft
	10.25	1.06gal/ft
	12.25	1.63gal/ft
6" 1.5gal/ft	12.25	1.41gal/ft

SAMPLING

Sample ID	Analysis	Volume (ml)	Filtered (Y/N)	Preservation	Container	Time
BA-092992-078	VOA	80	N	HCL	(x2) 40ml glass	1546
↓	T. METALS	1000	N	HNO_3	(x1) 1l plastic	↓
	TPH	1000	N	H_2SO_4	(x1) 1l glass	

(I-6)

Notes (include data on floaters/sinkers with measuring device, well condition, etc.)
* Rotten-Egg smell (H_2S) odor prevalent during purging/sampling.
* well Recharge → Good.
* Assumes 30% porosity

Signature [signature] Date 9-29-92 No. of Bottles 4

Appendix E Soil Sample Logs

Not Applicable For This Property.

Appendix F Chemical Data

Fisher Brothers Semivolatile Organics Data

ADL Sample Number	BA-092192-018		BA-092192-020		BA-100292-102	
Boring	MWBA-01		MWBA-01		MWBA-01	
Matrix	SOIL		SOIL		WATER	
Start/End Depth (ft)	2.5-4.5		10-12			
Sample Date	21-Sep-92		21-Sep-92		02-Oct-92	
Analysis Date	05-Oct-92		05-Oct-92		24-Oct-92	
Method Code	SMVOC		SMVOC		SMVOC	
Data Unit	ug/kg	MDL	ug/kg	MDL	ug/L	MDL
Acenaphthene	U	200	U	200	U	20
Acenaphthylene	U	200	U	200	U	20
Anthracene	U	200	U	200	U	20
Benzo(a)anthracene	U	200	U	200	U	20
Benzo(b)fluoranthene	U	200	U	200	U	20
Benzo(k)fluoranthene	U	200	U	200	U	20
Benzo(a)pyrene	U	200	U	200	U	20
Benzo(g,h,i)perylene	U	200	U	200	U	20
Benzyl alcohol	U	200	U	200	U	20
Bis(2-chloroethyl)ether	U	200	U	200	U	20
Bis(2-chloroethoxy)methane	U	200	U	200	U	20
Bis(2-chloroisopropyl)ether	U	200	U	200	U	20
Bis(2-ethylhexyl)phthalate	U	200	U	200	U	20
4-Bromophenyl-phenylether	U	200	U	200	U	20
Butylbenzylphthalate	U	200	U	200	U	20
4-Chloroaniline	U	700	U	900	U	60
2-Chloronaphthalene	U	200	U	200	U	20
4-Chlorophenyl-phenylether	U	200	U	200	U	20
Chrysene	U	200	U	200	U	20
Dibenz(a,h)anthracene	U	200	U	200	U	20
Dibenzofuran	U	200	U	200	U	20
Di-n-butylphthalate	U	200	U	200	U	20
1,2-Dichlorobenzene	U	200	U	200	U	20
1,3-Dichlorobenzene	U	200	U	200	U	20
1,4-Dichlorobenzene	U	200	U	200	U	20
3,3'-Dichlorobenzidine	U	700	U	900	U	60
Diethylphthalate	U	200	U	200	U	20
Dimethylphthalate	U	200	U	200	U	20
2,4-Dinitrotoluene	U	200	U	200	U	20
2,6-Dinitrotoluene	U	200	U	200	U	20
Di-n-octylphthalate	U	200	U	200	U	20
Fluoranthene	U	200	U	200	U	20
Fluorene	U	200	U	200	U	20
Hexachlorobenzene	U	200	U	200	U	20
Hexachlorobutadiene	U	200	U	200	U	20
Hexachlorocyclopentadiene	U	200	U	200	U	20
Hexachloroethane	U	200	U	200	U	20
Indeno(1,2,3-cd)pyrene	U	200	U	200	U	20
Isophorone	U	200	U	200	U	20
2-Methylnaphthalene	U	200	U	200	U	20
Naphthalene	U	200	U	200	1100	20
2-Nitroaniline	U	700	U	900	U	60
3-Nitroaniline	U	700	U	900	U	60
4-Nitroaniline	U	700	U	900	U	60
Nitrobenzene	U	200	U	200	U	20
N-Nitroso-di-n-propylamine	U	200	U	200	U	20
N-Nitrosodiphenylamine	U	200	U	200	U	20
Phenanthrene	U	200	U	200	U	20
Pyrene	U	200	U	200	U	20
1,2,4-Trichlorobenzene	U	200	U	200	U	20
Benzoic Acid	U	2000	U	2000	U	200
4-Chlorophenol-3-methylphenol	U	200	U	200	U	20
2-Chlorophenol	U	200	U	200	U	20
2,4-Dichlorophenol	U	200	U	200	U	20
2,4-Dimethylphenol	U	200	U	200	U	20
2,4-Dinitrophenol	U	700	U	900	U	60
4,6-Dinitro-2-methylphenol	U	700	U	900	U	60
2-Methylphenol	U	200	U	200	U	20
4-Methylphenol	U	200	U	200	20	20
2-Nitrophenol	U	200	U	200	U	20
4-Nitrophenol	U	700	U	900	U	60
Pentachlorophenol	U	200	U	200	U	60
Phenol	U	200	U	200	30	20
2,4,5-Trichlorophenol	U	2000	U	2000	U	200
2,4,6-Trichlorophenol	U	200	U	200	U	20
Percent Moisture	9 %		24 %			

Fisher Brothers Volatile Organic Data

ADL Sample Number	BA-100292-102		BA-092992-080		BA-092992-078	
Boring	MWBA-01		MWBA-02		MWBA-03	
Matrix	WATER		WATER		WATER	
Start/End Depth (ft)						
Sample Date	02-Oct-92		29-Sep-92		29-Sep-92	
Analysis Date	15-Oct-92		05-Oct-92		05-Oct-92	
Method Code	VOC		VOC		VOC	
Data Unit	ug/L	MDL	ug/L	MDL	ug/L	MDL
Acetone	100	50	U	50	U	50
Benzene	4	1	U	1	U	1
Bromodichloromethane	U	1	1	1	U	1
Bromoform	U	1	U	1	U	1
Bromomethane	U	1	U	1	U	1
2-Butanone	U	50	U	50	U	50
Carbon disulfide	U	50	U	50	U	50
Carbon tetrachloride	U	1	U	1	U	1
Chlorobenzene	U	1	U	1	U	1
Chloroethane	U	1	U	1	U	1
Chloroform	U	1	5	1	U	1
Chloromethane	U	1	U	1	U	1
Dibromochloromethane	U	1	U	1	U	1
1,1-Dichloroethane	U	1	U	1	U	1
1,2-Dichloroethane	U	1	U	1	U	1
1,1-Dichloroethene	U	1	U	1	U	1
1,2-Dichloroethene (total)	U	1	U	1	U	1
1,2-Dichloropropane	U	1	U	1	U	1
cis-1,3-Dichloropropene	U	1	U	1	U	1
trans-1,3-Dichloropropene	U	1	U	1	U	1
Ethylbenzene	U	1	U	1	U	1
2-Hexanone	U	50	U	50	U	50
Methylene chloride	U	1	1	1	2	1
4-Methyl-2-pentanone	U	50	U	50	U	50
Styrene	1	1	U	1	U	1
1,1,2,2-Tetrachloroethane	U	1	U	1	U	1
Tetrachloroethene	U	1	U	1	U	1
Toluene	6	1	U	1	U	1
1,1,1-Trichloroethane	U	1	U	1	U	1
1,1,2-Trichloroethane	U	1	U	1	U	1
Trichloroethene	U	1	U	1	U	1
Vinyl Chloride	U	1	U	1	U	1
Total Xylenes	U	1	U	1	U	1
Percent Moisture						

Fisher Brothers Volatile Organic Data

ADL Sample Number	BA-092192-022		BA-092192-024		BA-092192-026		BA-092292-030		BA-092292-037		BA-092292-039	
Boring	SBBA-04		SBBA-04		SBBA-05		SBBA-06		SBBA-07		SBBA-07	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Start/End Depth (ft)	2-4		21.5-23.5		8-10		17-19		2-4		10-12	
Sample Date	21-Sep-92		21-Sep-92		21-Sep-92		22-Sep-92		22-Sep-92		22-Sep-92	
Analysis Date	25-Sep-92		24-Sep-92		25-Sep-92		03-Oct-92		01-Oct-92		01-Oct-92	
Method Code	VOC		VOC		VOC		VOC		VOC		VOC	
Data Unit	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL
Acetone	100	100	U	100	100	100	U	100	U	100	U	100
Benzene	U	10	U	10	U	10	U	10	U	10	U	10
Bromodichloromethane	U	10	U	10	U	10	U	10	U	10	U	10
Bromoform	U	10	U	10	U	10	U	10	U	10	U	10
Bromomethane	U	10	U	10	U	10	U	10	U	10	U	10
2-Butanone	U	100	U	100	U	100	U	100	U	100	U	100
Carbon disulfide	U	100	U	100	U	100	U	100	U	100	U	100
Carbon tetrachloride	U	10	U	10	U	10	U	10	U	10	U	10
Chlorobenzene	U	10	U	10	U	10	U	10	U	10	U	10
Chloroethane	U	10	U	10	U	10	U	10	U	10	U	10
Chloroform	U	10	U	10	U	10	U	10	U	10	U	10
Chloromethane	U	10	U	10	U	10	U	10	U	10	U	10
Dibromochloromethane	U	10	U	10	U	10	U	10	U	10	U	10
1,1-Dichloroethane	U	10	U	10	U	10	U	10	U	10	U	10
1,2-Dichloroethane	U	10	U	10	U	10	U	10	U	10	U	10
1,1-Dichloroethene	U	10	U	10	U	10	U	10	U	10	U	10
1,2-Dichloroethene (total)	U	10	U	10	U	10	U	10	U	10	U	10
1,2-Dichloropropane	U	10	U	10	U	10	U	10	U	10	U	10
cis-1,3-Dichloropropene	U	10	U	10	U	10	U	10	U	10	U	10
trans-1,3-Dichloropropene	U	10	U	10	U	10	U	10	U	10	U	10
Ethylbenzene	U	10	U	10	U	10	U	10	U	10	U	10
2-Hexanone	U	100	U	100	U	100	U	100	U	100	U	100
Methylene chloride	U	10	U	10	U	10	10	10	40	10	U	10
4-Methyl-2-pentanone	U	100	U	100	U	100	U	100	U	100	U	100
Styrene	U	10	U	10	U	10	U	10	U	10	U	10
1,1,2,2-Tetrachloroethane	U	10	U	10	U	10	U	10	U	10	U	10
Tetrachloroethene	U	10	U	10	U	10	U	10	U	10	U	10
Toluene	U	10	U	10	U	10	U	10	U	10	U	10
1,1,1-Trichloroethane	U	10	U	10	U	10	U	10	U	10	U	10
1,1,2-Trichloroethane	U	10	U	10	U	10	U	10	U	10	U	10
Trichloroethene	U	10	U	10	U	10	U	10	U	10	U	10
Vinyl Chloride	U	10	U	10	U	10	U	10	U	10	U	10
Total Xylenes	U	30	U	30	U	30	U	30	U	30	U	30
Percent Moisture	18 %		13 %		28 %		22 %		8 %		18 %	

Fisher Brothers Volatile Organic Data

ADL Sample Number	BA-092192-018		BA-092192-020		BA-092192-033		BA-092192-035		BA-092192-029		BA-092192-031	
Boring	MWBA-01		MWBA-01		MWBA-02		MWBA-02		MWBA-03		MWBA-03	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Start/End Depth (ft)	2.5-4.5		10-12		2-4		18-21		2-4		10-12	
Sample Date	21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92	
Analysis Date	24-Sep-92		24-Sep-92		25-Sep-92		25-Sep-92		24-Sep-92		24-Sep-92	
Method Code	VOC		VOC		VOC		VOC		VOC		VOC	
Data Unit	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL	ug/Kg	MDL
Acetone	U	100	U	100	U	100	U	100	U	400	U	100
Benzene	U	10	U	10	U	10	U	10	U	40	U	10
Bromodichloromethane	U	10	U	10	U	10	U	10	U	40	U	10
Bromoform	U	10	U	10	U	10	U	10	U	40	U	10
Bromomethane	U	10	U	10	U	10	U	10	U	40	U	10
2-Butanone	U	100	U	100	U	100	U	100	U	400	U	100
Carbon disulfide	U	100	U	100	U	100	U	100	U	400	U	100
Carbon tetrachloride	U	10	U	10	U	10	U	10	U	40	U	10
Chlorobenzene	U	10	U	10	U	10	U	10	U	40	U	10
Chloroethane	U	10	U	10	U	10	U	10	U	40	U	10
Chloroform	U	10	U	10	U	10	U	10	U	40	U	10
Chloromethane	U	10	U	10	U	10	U	10	U	40	U	10
Dibromochloromethane	U	10	U	10	U	10	U	10	U	40	U	10
1,1-Dichloroethane	U	10	U	10	U	10	U	10	U	40	U	10
1,2-Dichloroethane	U	10	U	10	U	10	U	10	U	40	U	10
1,1-Dichloroethene	U	10	U	10	U	10	U	10	U	40	U	10
1,2-Dichloroethene (total)	U	10	U	10	U	10	U	10	630	40	60	10
1,2-Dichloropropane	U	10	U	10	U	10	U	10	U	40	U	10
cis-1,3-Dichloropropene	U	10	U	10	U	10	U	10	U	40	U	10
trans-1,3-Dichloropropene	U	10	U	10	U	10	U	10	U	40	U	10
Ethylbenzene	U	10	U	10	U	10	U	10	U	40	U	10
2-Hexanone	U	100	U	100	U	100	U	100	U	400	U	100
Methylene chloride	U	10	U	10	U	10	U	10	U	40	U	10
4-Methyl-2-pentanone	U	100	U	100	U	100	U	100	U	400	U	100
Styrene	U	10	U	10	U	10	U	10	U	40	U	10
1,1,2,2-Tetrachloroethane	U	10	U	10	U	10	U	10	U	40	U	10
Tetrachloroethene	U	10	U	10	U	10	U	10	U	40	U	10
Toluene	U	10	U	10	U	10	U	10	120	40	U	10
1,1,1-Trichloroethane	U	10	U	10	U	10	U	10	U	40	U	10
1,1,2-Trichloroethane	U	10	U	10	U	10	U	10	U	40	U	10
Trichloroethene	U	10	U	10	U	10	U	10	510	40	50	10
Vinyl Chloride	U	10	U	10	U	10	U	10	U	40	U	10
Total Xylenes	U	30	U	30	U	30	U	30	U	100	U	30
Percent Moisture	9 %		24 %		11 %		15 %		18 %		43 %	

Fisher Brothers Total Petroleum Hydrocarbon Data

ADL Sample Number	BA-092192-026		BA-092292-030		BA-092292-037		BA-092292-039		BA-092992-078	
Boring	SBBA-05		SBBA-06		SBBA-07		SBBA-07		MWBA-03	
Matrix	SOIL		SOIL		SOIL		SOIL		WATER	
Start/End Depth	8-10		17-19		2-4		10-12			
Sample Date	21-Sep-92		22-Sep-92		22-Sep-92		22-Sep-92		29-Oct-92	
Analysis Date	12-Oct-92		20-Oct-92		19-Oct-92		20-Oct-92		24-Oct-92	
Data Unit	mg/kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/L	MDL
Total Petroleum	360	30	40	30	200	30	U	30	U	30
Percent Moisture	28 %		22 %		8 %		18 %			

11-Nov-92,BATPH.WC

Fisher Brothers Total Petroleum Hydrocarbon Data

ADL Sample Number	BA-092192-033		BA-092192-035		BA-092192-029		BA-092192-031		BA-092192-022		BA-092192-024	
Boring	MWBA-02		MWBA-02		MWBA-03		MWBA-03		SBBA-04		SBBA-04	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Start/End Depth	2-4		18-21		2-4		10-12		2-4		21.5-23.5	
Sample Date	21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92	
Analysis Date	12-Oct-92		12-Oct-92		12-Oct-92		12-Oct-92		12-Oct-92		12-Oct-92	
Data Unit	mg/kg	MDL	mg/Kg	MDL	mg/kg	MDL	mg/kg	MDL	mg/kg	MDL	mg/kg	MDL
Total Petroleum	40	30	U	30	50	30	20	30	50	30	U	30
Percent Moisture	11 %		15 %		18 %		43 %		18 %		13 %	

11-Nov-92,BATPH.WC

Fisher Brothers Ir Data

ADL Sample Number	BA-092992-078		
Boring	MWBA-03		
Matrix	WATER		
Start/End Depth (ft)			
Sample Date	29-Sep-92		
Analysis Date	20-Oct-92		
Method Code	METALS		
Data Units	mg/L		MDL
Arsenic	0.011		0.005
Barium	0.19		0.01
Cadmium		U	0.001
Chromium	0.023		0.005
Copper	0.055		0.005
Lead	0.24		0.002
Mercury	0.0036		0.0005
Selenium		U	0.005
Silver		U	0.005
Zinc	0.35		0.01
Percent Moisture			

11-Nov-92,BAMET.WC

Fisher Brothers Inorganics Data

ADL Sample Number	BA-092192-018		BA-092192-020		BA-092192-029		BA-092192-031		BA-092292-037		BA-092292-039		BA-1002292-102	
Boring	MWBA-01		MWBA-01		MWBA-03		MWBA-03		SBBA-07		SBBA-07		MWBA-01	
Matrix	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		WATER	
Start/End Depth (ft)	2.5-4.5		10-12		2-4		10-12		2-4		10-12			
Sample Date	21-Sep-92		21-Sep-92		21-Sep-92		21-Sep-92		22-Sep-92		22-Sep-92		02-Oct-92	
Analysis Date	07-Oct-92		07-Oct-92		07-Oct-92		07-Oct-92		06-Oct-92		06-Oct-92		20-Oct-92	
Method Code	METALS		METALS		METALS		METALS		METALS		METALS		METALS	
Data Units	mg/Kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/Kg	MDL	mg/L	MDL
Arsenic	U	0.005	U	0.005	U	0.005	U	0.005	6	0.005	3	0.005	U	0.005
Barium	35	0.01	19	0.01	46	0.01	39	0.01	40	0.01	11	0.01	0.65	0.01
Cadmium	U	0.001	U	0.001	U	0.001	0.3	0.001	0.8	0.001	0.2	0.001	U	0.001
Chromium	7	0.005	4	0.005	9	0.005	8	0.005	6	0.005	3	0.005	0.031	0.005
Copper	7	0.005	4	0.005	11	0.005	16	0.005	150	0.005	7	0.005	0.044	0.005
Lead	10	0.002	U	0.002	12	0.002	36	0.002	55	0.002	7	0.002	U	0.002
Mercury	U	0.0005	U	0.0005	0.3	0.0005	0.6	0.0005	0.1	0.0005	U	0.0005	0.0007	0.0005
Selenium	3	0.005	1	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
Silver	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005	U	0.005
Zinc	24	0.01	4	0.01	24	0.01	54	0.01	55	0.01	17	0.01	0.17	0.01
Percent Moisture	9 %		24 %		18 %		43 %		8 %		18 %			

Appendix G Geophysics Reports

Parcel 3

GPR and EM terrain conductivity were employed at Parcel 3 to detect a suspected UST and to delineate general soil conditions, the nature and extent of a former city dump, and possible source areas.

Due to site obstacles such as sand piles, Parcel 3 was subdivided into Areas A through C (Figure 2, property name: Fisher Bros./Bay Aggregate). Area A was located by the Saginaw River near a "seawall"; EM terrain conductivity, EM in-phase, and GPR data were collected at this area. Area B was positioned by Water Street near a pump island and was surveyed using GPR and EM techniques. Area C was located under a metal conveyor; therefore, only GPR could be performed since the EM and magnetic instruments would be affected by aboveground metal. Magnetic data were also acquired at Parcel 3, but were adversely affected by overhead power lines.

Several EM and GPR traverses were acquired throughout Parcel 3, in addition to Areas A through C, in an attempt to determine landfill boundaries. These traverses were highly irregular in orientation, due to many obstacles including aggregate piles and conveyors. Weston's field personnel marked these traverses such that the on-site civil survey crew could accurately locate these traverses on plan maps that could be included in Weston's final report. Such accurate plan maps are necessary to best distinguish EM anomalies due to the landfill from anomalies caused by powerlines, conveyors, and other metal objects. Should survey control for these traverses be available at a later date, Weston can interpret the EM data to further resolve the landfill boundaries. Also, the interpretated finding from GPR traverse 5+00N are presented on Table 2; survey control for that traverse is also unavailable. The remaining GPR traverses lacking survey control did not disclose any subsurface features.

Ground Penetrating Radar

GPR interpretations for Parcel 3 are presented on Figures 11 (Area B) and 14 (Area C) and are summarized by area in Table 2. Two tanks were interpreted at Area B; the UST interpreted at Line 4+35N (Table 2, item 5) may be related to the adjacent pump island. In addition to possible excavated areas, and isolated metal objects and zones of probable buried metal interpreted at each area, a former landfill was delineated at Area C (Figure

14). The landfill boundary was dashed in areas where the GPR coverage did not establish the landfill's maximum extent. Figure 3 presents example GPR records at known and suspected UST's at Parcel 3 Area B.

EM Terrain Conductivity - Area A

EM in-phase data collected at Area A (Figure 9) exhibited a steep gradient along Lines 0+20E and 0+40E and a large anomaly centered approximately at Station 0+80E/4+00N. The steep gradient is likely due to the metal seawall to the west; a confident interpretation of adjacent buried objects could not be made due to interference from the seawall. EM terrain conductivity data (Figure 11) were similarly affected; however, electrical conductivities away from the seawall are relatively low, indicating an absence of landfill materials. The in-phase anomaly centered at 0+80E/4+00N may not be related to the seawall, and could represent another buried metallic feature.

Additonal EM-31 data were acquired along survey lines designated as Lines: 1+90N, 5+00N, 4+00N, 0+00N, 1+80N, 2+00N, 0+20E, 5+60N, 0+00E, and 5+70N. These data were also adversely affected by surface metal such as weigh scales, the metal seawall, etc. and overhead power lines. Despite this interference, buried metal was confidently interpreted at Line 5+60N from Stations 2+50E to 2+60E. Also, a zone of very high electrical conductivity was detected at Lines 5+00N and 5+20N between Stations 2+80E to 3+10E.

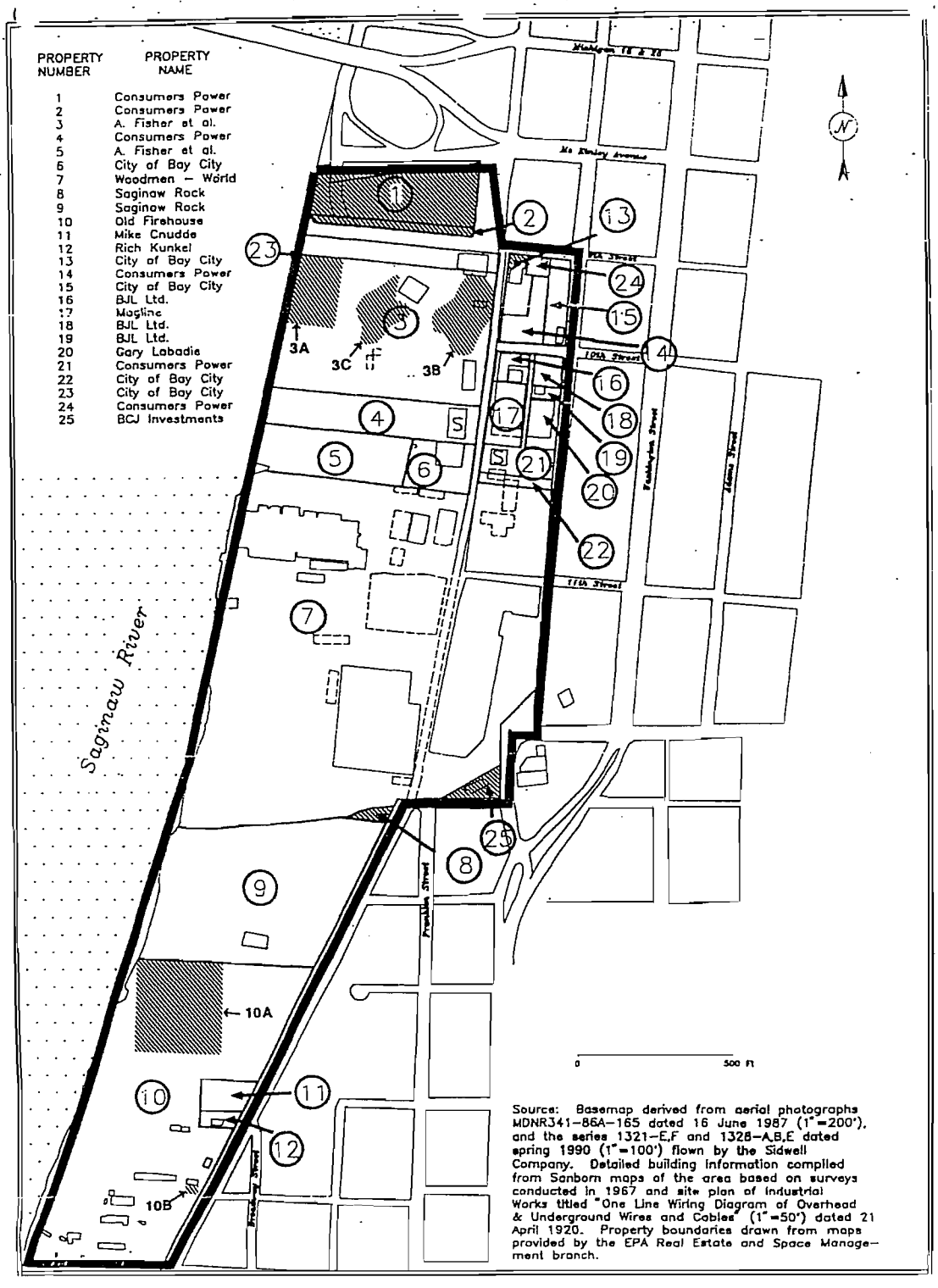
EM Terrain Conductivity - Area B

EM-31 data were adversely affected by the pump island and parked trucks at Area B (Figures 12 and 13). However, a possible utility was interpreted along Line 3+62N between Stations 5+10E and 6+20E. Although large trucks were parked near this feature it's linear trend is significant enough not to be discounted. This utility may be related to the GPR-interpreted tank at Line 6+30E (Table 2, item 4). EM terrain conductivities were relatively high at Parcel B, possibly due to salt storage in the area.

Table 2

GPR Interpretation Summary for Parcel 3

Area	Description	Item No.	Approximate Station Location
A	Zones of closely-spaced GPR reflectors indicative of buried metal objects	1	Line 5+00N (2+47E to 2+52E, 2+90E to 3+03E, 4+60E to 4+90E, 5+83E to 5+90E)
B	"	2	Line 6+60E (3+63N to 3+74N)
C	Possible former landfill	3	Southern half of survey grid
B	Large metal objects, possibly UST's	4	Line 6+30E (3+35N to 3+50N)
		5	Line 4+35N (6+54E to 6+80E)
B	Utility	6	Line 3+65N (6+40E to 6+70E)
A	Possible excavation	7	Line 5+00N (4+00E to 4+30E)
C	"	8	Line 3+90E (4+40N to 4+70N)
A	Small, possibly metallic object(s)	9	5+00N/2+20E
B	"	10	Across survey grid
C	"	11	Across survey grid



Note: Basemap is taken from DWG. No. 40291-002 prepared by Arthur D. Little, Inc. and titled "Investigation Area and Property Names", January 1992

------ Removed Buildings

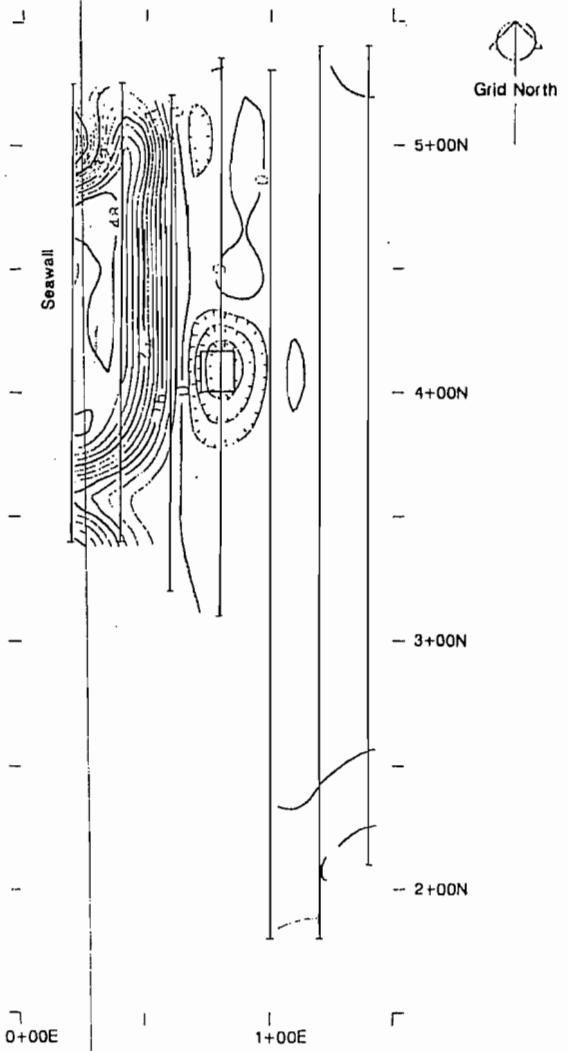
——— Property Boundaries

S Electrical Substation

Approximate Area of Geophysical Survey Coverage

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC.	Generalized Geophysical Coverages
checked by MB		Weston Geophysical — Figure 2
reviewed by MB		

11/92



EXPLANATION

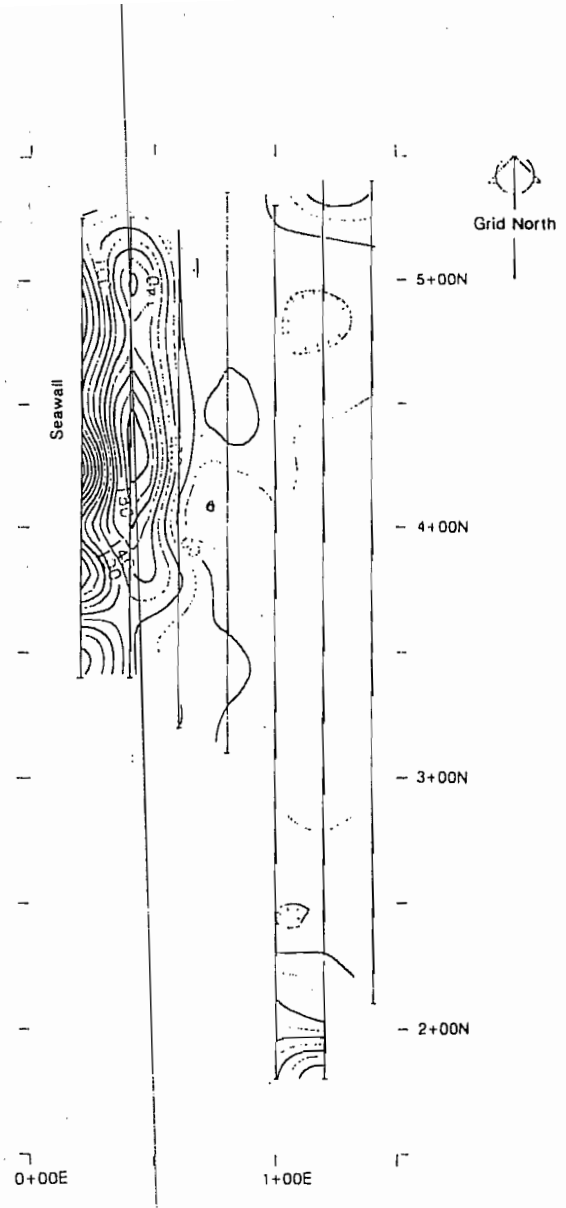
EM-31 Survey Coverage

In-Phase Contour
Contour Interval: 4 Units
(See Section 1)

Suggested Test Pit Location

0 50 100
Scale - Feet

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC.	Parcel 3/Area A: EM In-Phase Contour Map
checked by MB		Weston Geophysical — Figure 9
reviewed by MB		



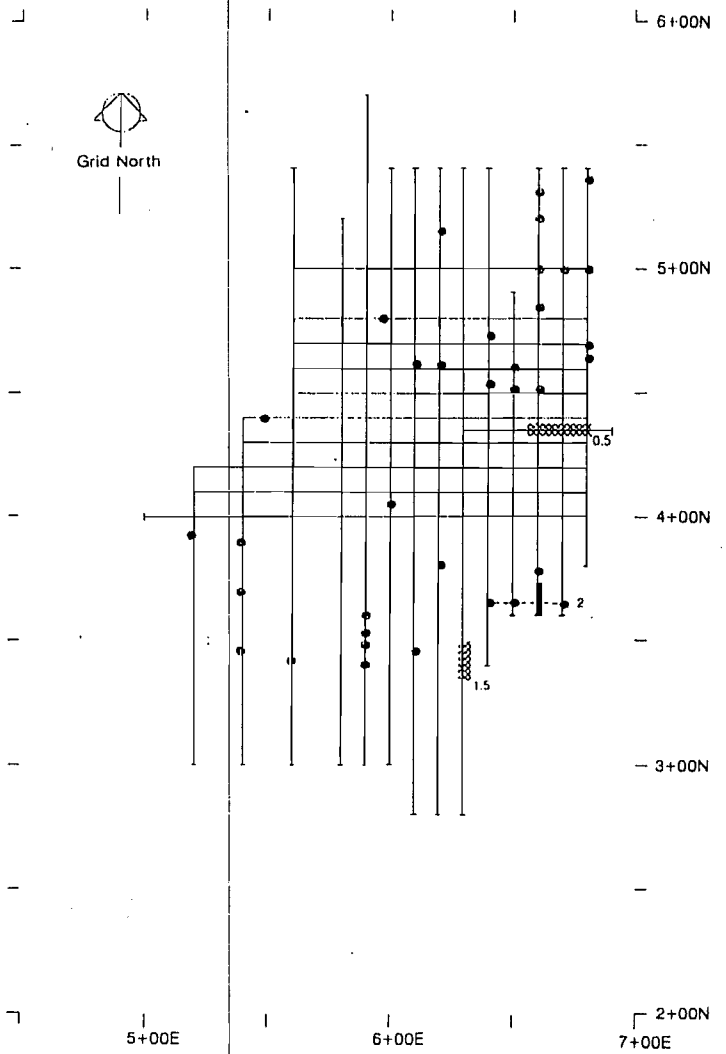
EXPLANATION

EM-31 Survey Coverage

60 Terrain Conductivity Contour
Contour Interval: 20 mmhos/m

0 50 100
Scale - Feet

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC	Parcel 3/Area A: EM Terrain Conductivity Contour Map
checked by MB		Weston Geophysical — Figure 10
reviewed by MB		



EXPLANATION

GPR Survey Coverage

Small Object, Possibly Metallic (1-3 Feet Below Grade)

2 Interpreted Buried Utility and Approximate Depth in Feet

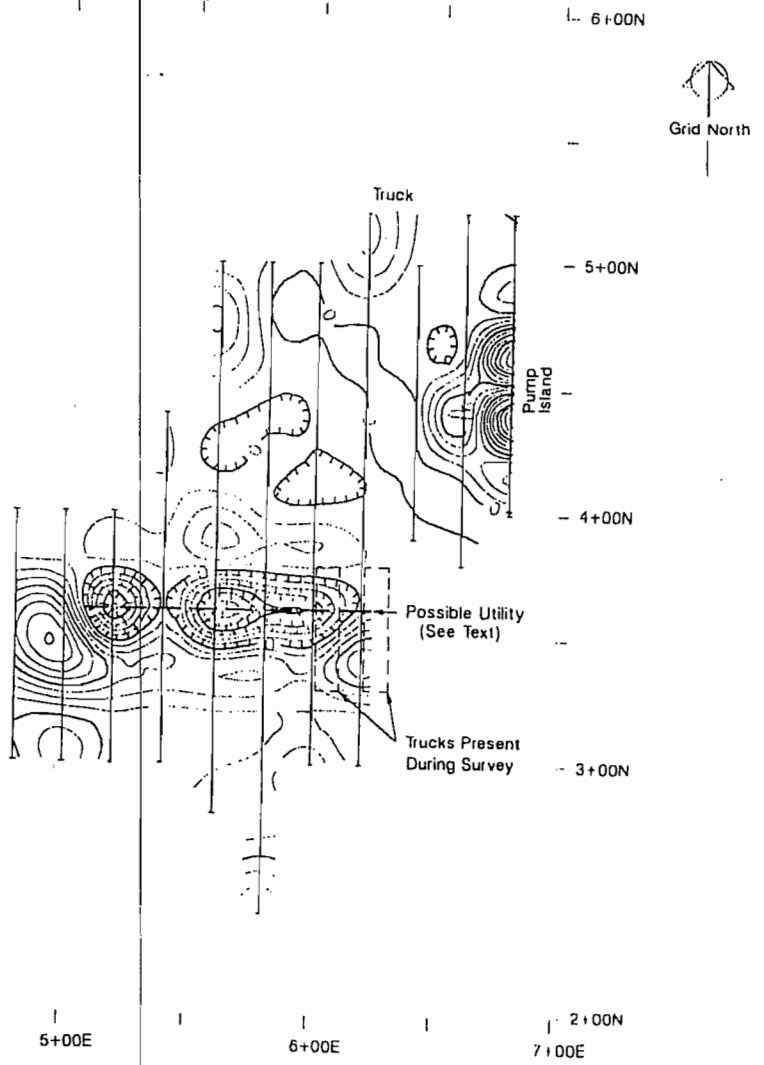
Zone of Closely-Spaced GPR Reflectors (Possible Metal)

1 Metallic Object (Possible Tank) and Approximate Depth in Feet

0 50 100
Scale - Feet

prepared by F.F. checked by MB reviewed by MB	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC	Parcel 3/Area B: GPR Anomaly Map and Suggested Test Pit Locations Weslon Geophysical — Figure 11

11/92



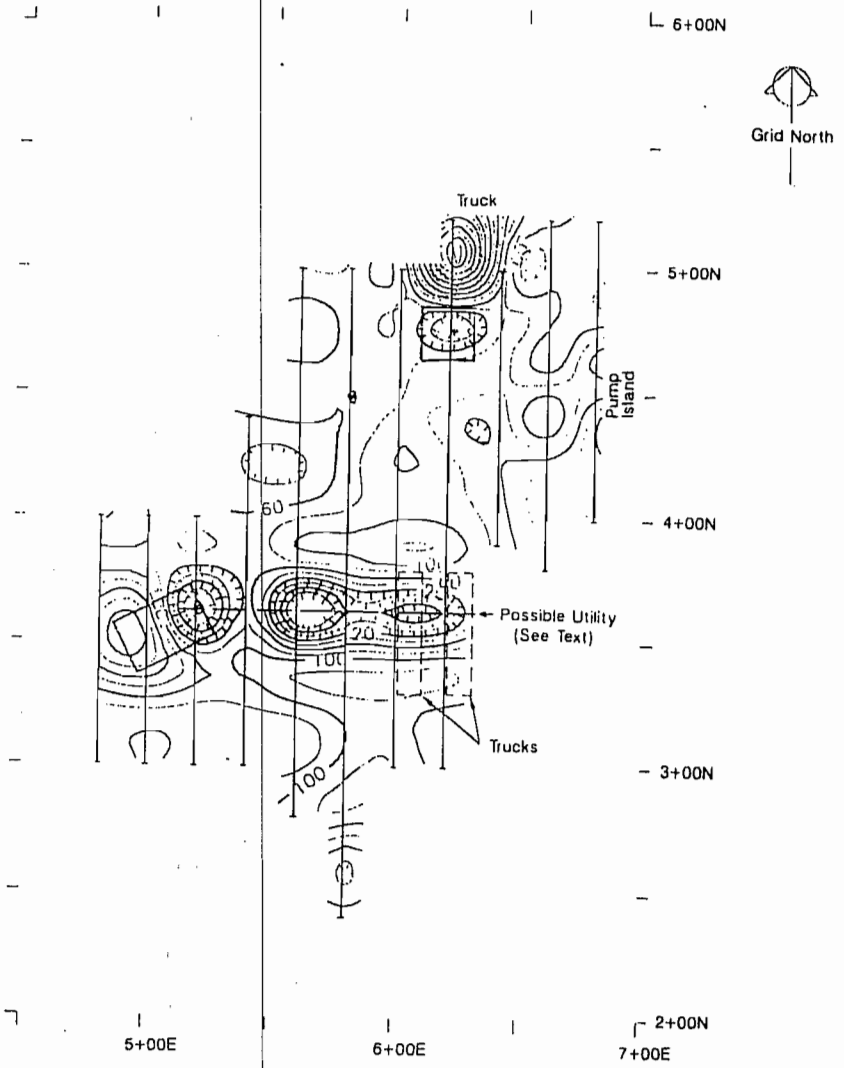
EXPLANATION

EM-31 Survey Coverage

In-Phase Contour
Contour Interval: 4 Units
(See Section 1)

0 50 100
Scale - Feet

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC.	Parcel 3/Area B: EM In-Phase Contour Map
checked by MB		Weston Geophysical — Figure 12
reviewed by MB		



EXPLANATION

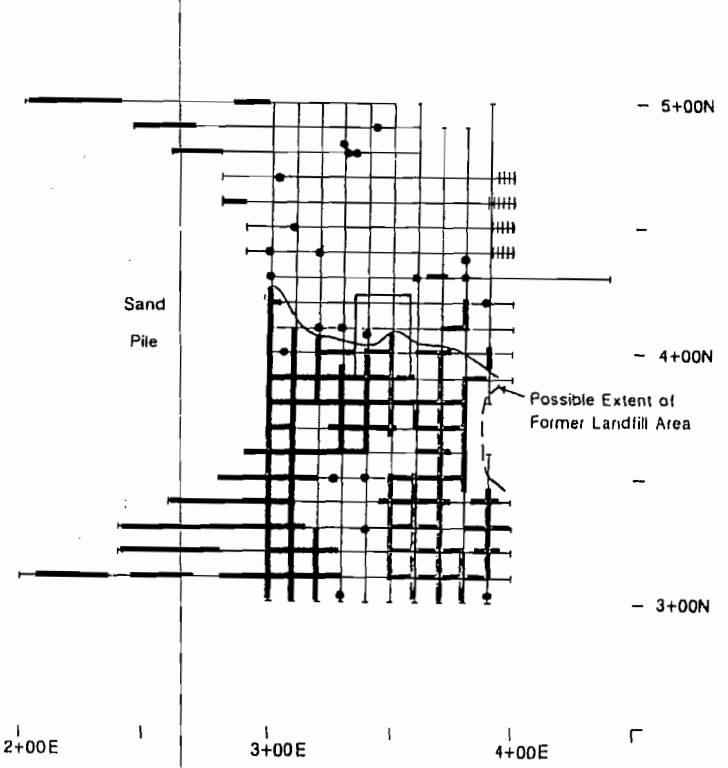
EM-31 Survey Coverage

60 Terrain Conductivity Contour
Contour Interval: 20 mmhos/m

Suggested Test Pit Location

0 50 100
Scale - Feet

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D. LITTLE, INC.	Parcel 3/Area B: EM Terrain Conductivity Contour Map
checked by MB		Weslon Geophysical — Figure 13
reviewed by MB		



EXPLANATION

- GPR Survey Coverage
- Small Object, Possibly Metallic (1-3 Feet Below Grade)
- Zone of Closely-Spaced GPR Reflectors (Possible Metal)
- Disturbed Material (Possible Excavation)
- Suggested Test Pit Location

0 50 100
Scale - Feet

prepared by F.F.	GEOPHYSICAL INVESTIGATION PROPOSED CENTER FOR ENVIRONMENTAL RESEARCH AND TRAINING BAY CITY, MICHIGAN prepared for ARTHUR D LITTLE, INC	Parcel 3/Area C: GPR Anomaly Map and Suggested Test Pit Locations
checked by MB		Weston Geophysical — Figure 14
reviewed by MB		

APPENDIX C

WESTON Site Investigation Report Dated January 1997

WESTON
MANAGERS DESIGNERS/CONSULTANTS
Roy F. Weston, Inc.
Suite 270
2125 University Park Drive
Okemos, Michigan 48864-3975
517-349-8255 • Fax 517-349-0798

14 February 1997

RECEIVED
FEB 18 1997
MDEQ - ERD
SAGINAW - BAY

Mr. Andrew Avel
Director, Office of the Senior Official
for Research and Development
U.S. Environmental Protection Agency
26 W. Martin Luther King Drive
Cincinnati, Ohio 45268

Part II
of
Part I
of 5 Vol.

U.S. EPA Contract No.: 68-W8-0089
Work Assignment No.: 55-5AED/Bay City CERT Site
Document Control No.: 4500-55-ANKR
Re: Final Site Summary Report and Appendices

Dear Mr. Avel:

Please find attached three copies of the final Site Summary Report for the Bay City Center for Ecological Research and Training (CERT) site in Bay City, Michigan. The report was prepared by Roy F. Weston, Inc. (WESTON®) and your comments have been incorporated. One complete set of report appendices has also been provided. Per your request, one copy of the report and appendices has also been sent to Mr. Richard Lemley of the U.S. EPA and Ms. Rhonda Klann of the Michigan Department of Environmental Quality (MDEQ). The compact disks containing the Final Report will be forwarded to you within the next two weeks, once they have been prepared.

If you have any questions or require additional information, please feel free to contact me.

Very truly yours,

ROY F. WESTON, INC.

Sally Bartz

Sally Bartz
Site Manager

Attachment

cc: Ms. Patricia Vogtman, U.S. EPA, Project Officer, HSM-5J (letter only)
Ms. Peggy Hendrixson, U.S. EPA, Contracting Officer, MCC-10J (letter only)
Mr. Richard Lemley, U.S. EPA
Ms. Rhonda Klann, MDEQ

OMI\PROJECTS\04500055.100\FLSUMRPT1.LTR

RECEIVED
FEB 18 1997
MDEQ - ERD
SAGINAW - BAY

REGION

V

Remedial Planning Activities At Selected Uncontrolled Disposal Sites

U.S. EPA Contract No. 68-W8-0089

Roy F. Weston, Inc.
Dames & Moore
Engineers International, Inc.
Life Systems, Inc.
Hubbell, Roth & Clark, Inc.
Reid, Quebe, Allison, Wilcox & Associates, Inc.
Mary Sexton Associates

94P-2481

RECEIVED
FEB 18 1997
MDEQ - ERD
SAGINAW - BAY

FINAL
SITE SUMMARY REPORT
CENTER FOR ECOLOGICAL RESEARCH AND TRAINING
BAY CITY, MICHIGAN

January 1997

This document was prepared in accordance with U.S. EPA Contract No. 68-W8-0089, WESTON Region V Alternative Remedial Contract Strategy (ARCS).

Work Assignment No.: 55-5AED Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (U.S. EPA) was authorized by Congress to purchase property for the construction of a Center for Ecological Research and Training (CERT) in Bay City, Bay County, Michigan in 1991. The CERT site is located west of Saginaw Street, between 18th and 9th Streets in Bay City, Bay County, Michigan. The site is bordered to the north by the Consumers Power property, to the west by the Saginaw River, to the south by the Bay City Department of Public Works, and to the east by Saginaw Street.

Prior to acquiring the property an environmental assessment of the approximate 90 acres (25 parcels) was required. Initially, Roy F. Weston, Inc. (WESTON®) was authorized under the U.S. EPA Region V Alternative Remedial Contract Strategy (ARCS) contract to perform a preliminary site characterization of one, 31-acre parcel. Following completion of the preliminary site characterization, WESTON was directed to conduct Phase I assessments of eight previously unaddressed parcels and perform additional site characterization activities at 15 other parcels. WESTON was to review all environmental characterization work previously conducted on all parcels and recommend any additional work that WESTON believed was required to adequately characterize all parcels.

The CERT site contained five properties that at the time of the investigative activities were listed on the Michigan Sites of Environmental Contamination List (the State Superfund equivalent). The CERT site also contained two properties that at the time of the investigative activities were listed on the Michigan Sites of Environmental Contamination - Leaking Underground Storage Tanks List. All CERT activities were conducted in accordance with Michigan Department of Environmental Quality (MDEQ) [formerly the Michigan Department of Natural Resources (MDNR)] requirements.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express. written permission of U.S. EPA.

The project objectives were as follows:

- Determine whether site activities (past and current) have impacted the soil and/or groundwater at the CERT site.
- Provide limited characterization of the overall CERT site.
- Provide a site summary report for the CERT site.

The specific site investigative activities at the CERT site included:

- Health and safety monitoring program
- Decontamination program
- Geophysical surveys
- Radiation surveys and sampling
- Building investigations
- Phase I environmental site assessments
- Soil investigation
- Groundwater investigation
- Sediment sampling and river coring
- Polychlorinated biphenyl (PCB) investigation and sampling
- Sample location/elevation survey

It is important to note that the investigative activities conducted at the CERT site were not intended to encompass the full scope of a remedial investigation, but the validity and quality of the data collected was to be such that it would be acceptable by state and federal agencies in support of additional investigations or remediation activities.

The local geology description for the CERT site is based on field observations made by WESTON during the installation of soil borings and monitoring wells, and on previous investigative findings. Three basic stratigraphic units were identified during the subsurface soils investigation: fill material, native alluvial deposits deposited by surface water action, and glacial till. The laterally discontinuous alluvial material thickens toward the river and appears to pinch out locally on the eastern side of the site. The glacial till underlies the alluvium toward the river on the west side of the site, but is shallower and often directly underlies the fill material on the eastern side of the site where the alluvium is absent.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

The site is located within the Saginaw River drainage basin. Site-wide shallow groundwater flow is in a westerly direction toward the Saginaw River; however, localized flow varies from the northwest to the southwest.

WESTON initiated the field investigation at the CERT site in October 1992. The 1992 and 1993 field investigation activities are referred to as the Phase II characterization. A Phase III characterization was performed in October through December 1994, February 1995, April 1995, September 1995 and December 1995. Following the completion of each phase of investigative activities, WESTON subcontracted for the characterization, transportation, and disposal of all generated investigative derived waste.

Results of the investigations showed that localized areas at the CERT site have been impacted by past on-site and off-site land usage and related activities. Analytical parameters detected in soil and/or groundwater in exceedance of applicable MDEQ regulatory criteria include volatile organic compounds, semi-volatile organic compounds, polychlorinated biphenyls, and metals. Throughout the course of the investigative and reporting activities at the CERT site, WESTON has evaluated the analytical results in comparison to MDEQ regulatory criteria. WESTON has also identified potential environmental liabilities at the CERT site and costs associated with remediation of the liabilities.

In July 1995, Congress rescinded the authorization and funding to U.S. EPA and the construction of the CERT was halted. At that time, U.S. EPA had acquired six of the initial 25 parcels.

Following the U.S. EPA acquisition of the six parcels associated with the CERT site, WESTON researched closure requirements for the parcels in accordance with federal, state and local regulations. WESTON also prepared an overview of potential closure scenarios (residential, commercial and industrial) for the six U.S. EPA owned parcels.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Throughout the 1995 investigative activities, WESTON identified the presence of miscellaneous drums deposited by unknown parties on two of the U.S. EPA owned parcels. As of the time of writing of this report, three drums are believed to remain at the CERT site.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE OF CONTENTS

Section		Page
	EXECUTIVE SUMMARY	
1	INTRODUCTION	1-1
2	CERT PROJECT CHRONOLOGY	2-1
3	SITE LOCATION AND HISTORY	3-1
	3.1 Site Location	3-1
	3.2 Site Area Description	3-1
	3.3 Parcel Descriptions	3-2
	3.3.1 Fisher Brothers (Parcels 3 and 5)	3-2
	3.3.2 Consumers Power - Switching Station (Parcel 4)	3-2
	3.3.3 Weld-Rite (Parcel 6)	3-3
	3.3.4 Industrial Brownhoist (Parcels 7 and 8)	3-3
	3.3.5 Saginaw Rock (Parcel 9)	3-3
	3.3.6 Midland (Parcel 10)	3-4
	3.3.7 Cnudde (Parcel 11)	3-4
	3.3.8 Kunkel (Parcel 12)	3-4
	3.3.9 City of Bay City - Former Sears Automotive (Parcel 13)	3-4
	3.3.10 Consumers Power - Vacant Lot (Parcel 14)	3-5
	3.3.11 City of Bay City - Substation (Parcel 15)	3-5
	3.3.12 Labadie - Vacant Lot (Parcel 18)	3-5
	3.3.13 Labadie - Lube Shop (Parcel 19)	3-5
	3.3.14 Labadie - Body Shop (Parcel 20)	3-6
	3.3.15 City of Bay City - Water Street Substation (Parcel 21)	3-6
	3.3.16 Easy Handling (Parcel 25)	3-6
	3.3.17 Consumers Power - Vacant Lot (Parcel 26)	3-6
	3.3.18 Residential Parcels (Parcel 29)	3-7
	3.4 Previous Site Investigation (ADL)	3-7
	3.4.1 Fisher Brothers (Parcels 3 and 5)	3-7
	3.4.2 Consumers Power - Switching Station (Parcel 4)	3-8
	3.4.3 Weld-Rite (Parcel 6)	3-8
	3.4.4 Industrial Brownhoist (Parcels 7 and 8)	3-8
	3.4.5 Saginaw Rock (Parcel 9)	3-10
	3.4.6 Midland (Parcel 10)	3-10
	3.4.7 Cnudde (Parcel 11)	3-10
	3.4.8 Kunkel (Parcel 12)	3-11
	3.4.9 City of Bay City - Former Sears Automotive (Parcel 13)	3-11

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE OF CONTENTS (CONTINUED)

Section			Page
	3.4.10	Consumers Power - Vacant Lot (Parcel 14)	3-11
	3.4.11	City of Bay City - Substation (Parcel 15)	3-11
	3.4.12	Labadie - Vacant Lot (Parcel 18)	3-12
	3.4.13	Labadie - Lube Shop (Parcel 19)	3-12
	3.4.14	Labadie - Body Shop (Parcel 20)	3-12
	3.4.15	City of Bay City - Water Street Substation (Parcel 21)	3-13
	3.4.16	Easy Handling (Parcel 25)	3-13
	3.4.17	Consumers Power - Vacant Lot (Parcel 26)	3-13
	3.4.18	Residential Parcels (Parcel 29)	3-13
4	**GEOLOGY AND HYDROGEOLOGY**		**4-1**
	4.1	Regional Geology	4-1
	4.2	Site Geology	4-2
	4.3	Site Hydrogeology	4-20
	4.3.1	Groundwater Occurrence	4-23
	4.3.2	Estimated Aquifer Parameters	4-23
	4.3.3	Discussion of Groundwater Flow	4-24
5	**FIELD INVESTIGATION**		**5-1**
	5.1	Health and Safety	5-9
	5.2	Decontamination	5-17
	5.3	Geophysical Surveys	5-17
	5.3.1	Fisher Brothers (Parcels 3 and 5)	5-17
	5.3.2	Industrial Brownhoist (Parcels 7 and 8)	5-19
	5.4	Radiation Survey and Sampling	5-20
	5.4.1	Weld-Rite (Parcel 6)	5-20
	5.4.2	Industrial Brownhoist (Parcels 7 and 8)	5-20
	5.5	Building Investigations - Industrial Brownhoist (Parcels 7 and 8)	5-23
	5.5.1	Powerhouse	5-23
	5.5.2	Storage Building	5-23
	5.5.3	Boom Shop	5-25
	5.5.4	Sand-Blasting Building	5-25
	5.5.5	Building 42	5-25
	5.5.6	Building 41	5-25
	5.6	Phase I Assessments - New Parcels	5-26
	5.6.1	Residential Parcels (Parcel 29)	5-26
	5.6.2	Labadie Dealership	5-28

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE OF CONTENTS (CONTINUED)

Section			Page
	5.6.3	National Environmental Supercomputer Center Building	5-28
5.7	Soil Assessment		5-30
	5.7.1	Fisher Brothers (Parcels 3 and 5)	5-31
	5.7.2	Consumers Power - Switching Station (Parcel 4)	5-33
	5.7.3	Weld-Rite (Parcel 6)	5-33
	5.7.4	Industrial Brownhoist (Parcels 7 and 8)	5-34
	5.7.5	Saginaw Rock (Parcel 9)	5-51
	5.7.6	Midland (Parcel 10)	5-53
	5.7.7	Cnudde (Parcel 11)	5-55
	5.7.8	Kunkel (Parcel 12)	5-55
	5.7.9	City of Bay City - Former Sears Automotive (Parcel 13)	5-56
	5.7.10	City of Bay City - Substation (Parcel 15)	5-56
	5.7.11	Labadie - Parking Lot(Parcel 18)	5-57
	5.7.12	Labadie - Lube Shop (Parcel 19)	5-58
	5.7.13	City of Bay City - Water Street Substation (Parcel 21)	5-58
	5.7.14	Consumers Power - Vacant Lot (Parcel 26)	5-59
	5.7.15	Residential Parcels (Parcel 29)	5-60
5.8	Groundwater Assessment		5-60
	5.8.1	Monitoring Well Installation	5-60
	5.8.2	Monitoring Well Sampling	5-61
	5.8.3	Monitoring Well Locations and Analyses	5-62
		5.8.3.1 Industrial Brownhoist (Parcels 7 and 8)	5-62
		5.8.3.2 Saginaw Rock (Parcel 9)	5-66
		5.8.3.3 Midland (Parcel 10)	5-67
		5.8.3.4 Kunkel (Parcel 12)	5-68
		5.8.3.5 City of Bay City - Former Sears Automotive (Parcel 13)	5-68
5.9	Sediment Sampling		5-69
5.10	PCB Sampling		5-69
5.11	Site Survey		5-70
5.12	Investigative Derived Waste Disposal		5-70
5.13	Miscellaneous Drum Disposal		5-71
5.14	Expert Testimony Oversight		5-72
	5.14.1	Saginaw Rock (Parcel 9)	5-73
	5.14.2	Midland (Parcel 10)	5-73
6	**ANALYTICAL RESULTS**		**6-1**
7	**REMEDIAL ACTIONS PLANS**		**7-1**

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF TABLES

Table		Page
5-1	Summary of Samples Collected and Analyses Performed - November 1992	5-2
5-2	Summary of Samples Collected and Analyses Performed - May-June 1993	5-6
5-3	Summary of Samples Collected and Analyses Performed - October-December 1994/April 1995	5-10
5-4	Summary of Samples Collected and Analyses Performed - February, March, May and December 1995	5-12
5-5	Summary of Samples Collected and Analyses Performed - April 1995	5-16
5-6	PCB Screening Results	5-35
6-1	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Areas 1 and 2	6-2
6-2	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 4	6-3
6-3	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 5	6-4
6-4	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 5A	6-5
6-5	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 6	6-6
6-6	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 7	6-7
6-7	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Areas 8	6-8
6-8	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 8/9	6-9
6-9	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 10	6-10

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF TABLES (CONTINUED)

Table		Page
6-10	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 11	6-11
6-11	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 12	6-12
6-12	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 13	6-13
6-13	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Areas 14 and 15	6-14
6-14	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Areas 15/16A, 16/17A and 17	6-15
6-15	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 18	6-16
6-16	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 18A	6-17
6-17	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 19	6-18
6-18	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 20	6-20
6-19	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Areas 22 and 23	6-21
6-20	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 25	6-22
6-21	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) Area 25A	6-23
6-22	Summary of Detected Parameters in Soil Samples - Industrial Brownhoist (Parcels 7 and 8) No Specific Area	6-24

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF TABLES (CONTINUED)

Table		Page
6-23	Summary of Detected TCLP/EP Toxicity Parameters - Industrial Brownhoist (Parcels 7 and 8)	6-26
6-24	Summary of Detected Radiation Parameters - Industrial Brownhoist (Parcels 7 and 8)	6-27
6-25	Summary of Detected Aroclors - PCB Sampling - Industrial Brownhoist (Parcels 7 and 8)	6-28
6-26	Summary of Detected Parameters in Soil Samples - Fisher Brothers (Parcels 3 and 5)	6-29
6-27	Summary of Detected Parameters in Soil Samples - Consumers Power - Switching Station (Parcel 4)	6-30
6-28	Summary of Detected Parameters in Soil Samples - Weld-Rite (Parcel 6)	6-31
6-29	Summary of Detected Parameters in Soil Samples - Saginaw Rock (Parcel 9)	6-32
6-30	Summary of Detected Parameters in Soil Samples - Midland (Parcel 10)	6-33
6-31	Summary of Detected Parameters in Soil Samples - Cnudde (Parcel 11)	6-38
6-32	Summary of Detected Parameters in Soil Samples - Kunkel (Parcel 12)	6-39
6-33	Summary of Detected Parameters in Soil Samples - City of Bay City - Former Sears Automotive (Parcel 13)	6-40
6-34	Summary of Detected Parameters in Soil Samples - City of Bay City - Substation (Parcel 15)	6-42
6-35	Summary of Detected Parameters in Soil Samples - Labadie (Parcels 18, 19 and 20)	6-43
6-36	Summary of Detected Parameters in Soil Samples - City of Bay City - Water Street Substation (Parcel 21)	6-46
6-37	Summary of Detected Parameters in Soil Samples - Consumers Power - Vacant Lot (Parcel 26)	6-47

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF TABLES (CONTINUED)

Table		Page
6-38	Summary of Detected Parameters in Soil Samples - Residential Parcels (Parcel 29)	6-48
6-39	Summary of Detected Parameters in Product Sample and Radiation in Brick Samples Weld-Rite (Parcel 6)	6-49
6-40	Summary of Detected Parameters in Groundwater Samples	6-50
6-41	Summary of Detected Parameters in Soil Samples - Midland (Parcel 10)	6-58
6-42	Analytical Results of Disposal Parameters Sampling - Midland (Parcel 10)	6-60
6-43	Analytical Results of Disposal Parameters Sampling - Saginaw River Sediment	6-61
6-44	Analytical Results of Waste Characterization of River Sediments - Saginaw River Sediment	6-63
6-45	Summary of Detected Parameters in Test Pit Samples - Saginaw Rock (Parcel 9)	6-64
6-46	Summary of Detected Parameters in Test Pit Samples - Midland (Parcel 10)	6-65

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF FIGURES

Figure		Page
1-1	Site Location Map	1-2
1-2	Parcel Map	1-3
1-3	U.S. EPA Owned Parcel Map	1-7
3-1	Identified Areas for Additional Investigation	3-9
4-1	Fill Thickness Map	4-3
4-2	Cross-Section Location Map	4-4
4-3	Cross-Section A-A'	4-5
4-4	Cross-Section B-B'	4-6
4-5	Cross-Section C-C'	4-7
4-6A	Cross-Section D-D'	4-8
4-6B	Cross-Section D-D'	4-9
4-7A	Cross-Section E-E'	4-10
4-7B	Cross-Section E-E'	4-11
4-8	Cross-Section F-F'	4-12
4-9	Cross-Section G-G'	4-13
4-10	Cross-Section H-H'	4-14
4-11	Cross-Section I-I'	4-15
4-12	Cross-Section J-J'	4-16
4-13	Cross-Section K-K'	4-17
4-14	Cross-Section L-L'	4-18

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF FIGURES (CONTINUED)

Figure		Page
4-15	Cross-Section M-M'	4-19
4-16	Top of Clay Elevation Map	4-21
4-17	Potentiometric Surface Map	4-22
5-1	Geophysical Survey Area Map	5-18
5-2	Radiation Survey and Sampling Area Map	5-21
5-3	IB Building Location Map	5-24
5-4	Phase I Assessment Parcels Location Map	5-27
5-5A	Soil Boring and Monitoring Well Location Map (North Site)	5-32
5-5B	Soil Boring and Monitoring Well Location Map (Central Site)	5-36
5-5C	Soil Boring and Monitoring Well Location Map (South Site)	5-52

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF APPENDICES

Appendix

A Draft Technical Memoranda - Study of Background Chemical Concentrations for Site Fill and Groundwater - U.S. EPA Center for Ecological Research and Training, Bay City, Michigan - March 1994

B Field Sampling Plan-Predesign Characterization - U.S. EPA Center for Ecological Research and Training, Bay City, Michigan - March 1994

C Draft Quality Assurance Project Plan - Predesign Characterization - U.S. EPA Center for Ecological Research and Training, Bay City, Michigan - March 1994

D Draft Health & Safety Plan - Predesign Characterization - U.S. EPA Center for Ecological Research and Training, Bay City, Michigan - March 1994

E Final Site Investigation Report for EPA Bay City Michigan CERT Project-Fisher Brothers Property, November 12, 1992

F Final Site Investigation Report for EPA Bay City Michigan CERT Project-Consumers Power Properties-Tab D2-Switching Station; Tab D3-Gas Regulator Station, December 30, 1992

G Final Site Investigation Report for EPA Bay City Michigan CERT Project-City of Bay City Property - Tab E1 - Water Street Substation; Tab E2-Weld-Rite; Tab E3 - Former Sears Automotive, December 8, 1992

H Draft Field Sampling Plan for EPA Bay City, Michigan CERT Project - Phase I Industrial Brownhoist (IB) and Easy Handling (BCJ) Properties, August 4, 1992

I Final Site Investigation Report for EPA Bay City Michigan CERT Project - Saginaw Rock Property, November 20, 1992

J Final Site Investigation Report for EPA Bay City Michigan CERT Project - Old Firehouse Property, December 31, 1992

K Final Site Investigation Report for EPA Bay City Michigan CERT Project - Cnudde Property, November 10, 1992

L Final Site Investigation Report for EPA Bay City Michigan CERT Project - Kunkel Property, December 1, 1992

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

LIST OF APPENDICES (CONTINUED)

Appendix

M Final Site Investigation Report for EPA Bay City Michigan CERT Project - BJL Properties - Tab K2 - Lube Shop; Tab K3 - Body Shop, December 1, 1992

N Final Site Investigation Report for EPA Bay City Michigan CERT Project - Easy Handling - Tab M; November 17, 1992

O WESTON Soil Boring logs

P Calculated Exposure Rates for Weld-Rite (Parcel 6) Office

Q Monitoring Well Construction Diagrams

R Data Validation Summary

S References

T Remedial Action Plan, Saginaw Rock (Parcel 9), 300 South Water Street, Bay City, Michigan, May 1995

U Remedial Action Plan, Midland Contracting (Parcel 10), 612 South Water Street, Bay City, Michigan, August 1995

V Remedial Action Plan, Saginaw Rock (Parcel 9), 300 South Water Street, Bay City, Michigan, May 1996

W Remedial Action Plan, Midland Contracting (Parcel 10), 612 South Water Street, Bay City, Michigan, June 1996 - Volumes I and II

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 1
INTRODUCTION

The U.S. Environmental Protection Agency (U.S. EPA) was authorized by Congress to purchase property for the construction of a Center for Ecological Research and Training (CERT) in Bay City, Bay County, Michigan. Prior to acquiring the property an environmental assessment of the approximate 90 acres (25 parcels) was required (Figures 1-1 and 1-2). Initially, Roy F. Weston, Inc. (WESTON®) was authorized under the U.S. EPA Region V Alternative Remedial Contract Strategy (ARCS) contract to perform a preliminary site characterization of one, 31-acre parcel known as Industrial Brownhoist (IB) (Parcels 7 and 8). Following completion of the preliminary site characterization, WESTON was directed to conduct Phase I assessments of eight previously unaddressed parcels and to perform additional site characterization activities at 15 other parcels. WESTON was to review all environmental characterization work previously conducted on all parcels and recommend any additional work that WESTON believed was required to adequately characterize all parcels. The eight previously unaddressed parcels (Phase I Assessment parcels) included:

- 101 17th Street
- 200 Broadway
- 206 Broadway
- 216 Broadway
- 105 18th Street (Parcel 29)
- 613 South Water Street (Parcel 29)
- Labadie Oldsmobile Cadillac, Inc. (Labadie) Dealership
- National Environmental Supercomputer Center Building

The additional site characterization parcels included:

- Fisher Brothers (Parcels 3 and 5)
- Consumers Power - Switching Station (Parcel 4)
- City of Bay City - Weld-Rite (Weld-Rite) (Parcel 6)
- Saginaw Rock (Parcel 9)
- Midland Contracting (Midland) (Parcel 10)
- Cnudde (Parcel 11)
- Mr. Towing - Kunkel (Kunkel) (Parcel 12)
- City of Bay City - Former Sears Automotive (Parcel 13)

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

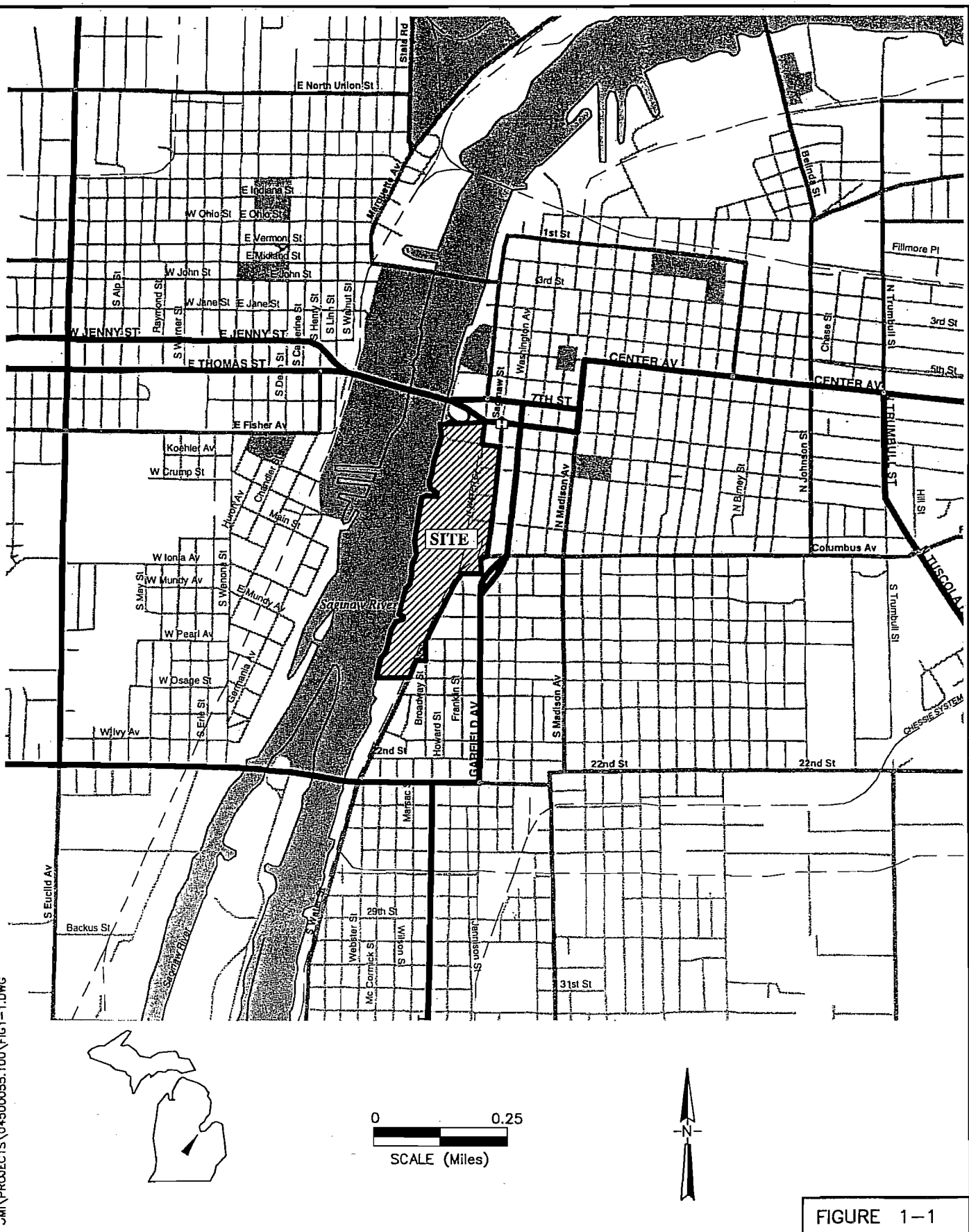
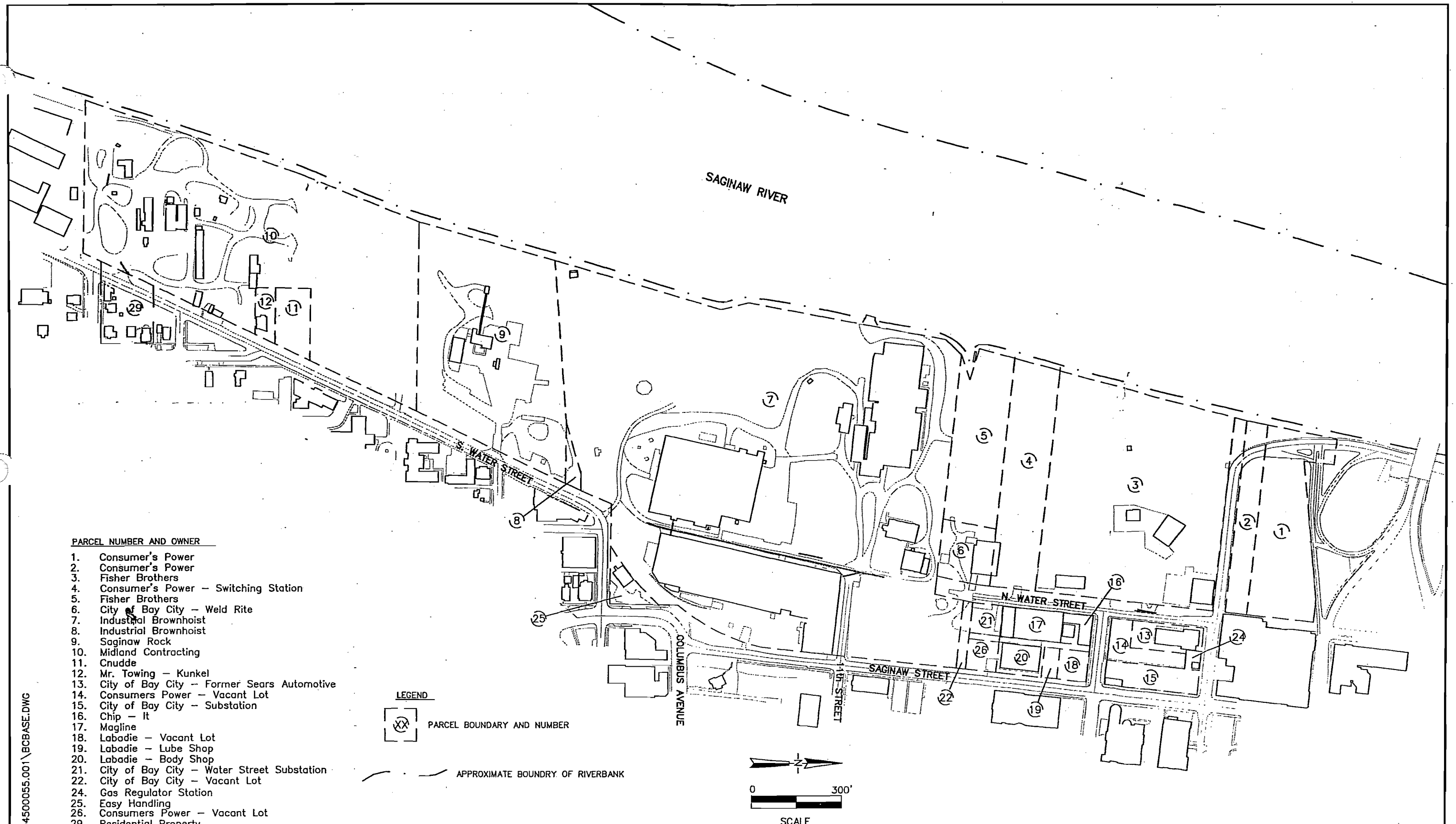


FIGURE 1–1

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

SITE LOCATION MAP
BAY CITY CERT SITE
Bay City, Michigan



PARCEL NUMBER AND OWNER

1. Consumer's Power
2. Consumer's Power
3. Fisher Brothers
4. Consumer's Power – Switching Station
5. Fisher Brothers
6. City of Bay City – Weld Rite
7. Industrial Brownhoist
8. Industrial Brownhoist
9. Saginaw Rock
10. Midland Contracting
11. Cnudde
12. Mr. Towing – Kunkel
13. City of Bay City – Former Sears Automotive
14. Consumers Power – Vacant Lot
15. City of Bay City – Substation
16. Chip – It
17. Magline
18. Labadie – Vacant Lot
19. Labadie – Lube Shop
20. Labadie – Body Shop
21. City of Bay City – Water Street Substation
22. City of Bay City – Vacant Lot
24. Gas Regulator Station
25. Easy Handling
26. Consumers Power – Vacant Lot
29. Residential Property

OMI\PROJECTS\04500055.001\BCBASE.DWG

FIGURE 1–2

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

PARCEL MAP
BAY CITY CERT SITE
Bay City, Michigan

- Consumers Power - Vacant Lot (Parcel 14)
- City of Bay City - Substation (Parcel 15)
- Labadie - Parking Lot (Parcel 18)
- Labadie - Lube Shop (Parcel 19)
- Labadie - Body Shop (Parcel 20)
- City of Bay City - Water Street Substation (Parcel 21)
- Consumers Power - Vacant Lot (Parcel 26)
- Residential Parcels (Parcel 29)

The CERT site contained five properties that at the time of the investigative activities were listed on the Michigan Sites of Environmental Contamination List (the State Superfund equivalent). They included:

- Fisher Brothers (Parcels 3 and 5) - Site ID 090216
- IB (Parcels 7 and 8) - Site ID 090045
- Labadie Body Shop (Parcel 20) - Site ID 090017
- Magline (Parcel 17) - Site ID 090018
- Midland (Parcel 10) - Site ID 090218

The CERT site also contained two properties that at the time of the investigative activities were listed on the Michigan Sites of Environmental Contamination - Leaking Underground Storage Tanks List. They included:

- IB (Parcels 7 and 8) - Site ID 090045
- Saginaw Rock (Parcel 9) - Site ID 090179

All CERT activities were conducted in accordance with Michigan Department of Environmental Quality (MDEQ) [formerly the Michigan Department of Natural Resources (MDNR)] requirements.

The project objectives were as follows:

- Determine whether site activities (past and current) have impacted the soil and/or groundwater at the CERT site.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- Provide limited characterization of the overall CERT site.
- Provide a site summary report for the CERT site.

The specific site investigative activities at the CERT site included:

- Health and safety monitoring program
- Decontamination program
- Geophysical surveys
- Radiation surveys and sampling
- Building investigations (Industrial Brownhoist)
- Phase I environmental site assessments
- Soil investigation
- Groundwater investigation
- Sediment sampling and river coring
- Polychlorinated biphenyl (PCB) investigation and sampling
- Sample location/elevation survey

WESTON submitted a Work Plan and a Health and Safety Plan (HASP) to the U.S. EPA in October 1992. Modifications to the existing Arthur D. Little, Inc. (ADL) Sampling and Analysis Plan (SAP), and Quality Assurance Project Plan (QAPP) were also submited to the U.S. EPA in October 1992. Following approval of these plans, WESTON initiated field activities at the IB site in October 1992 and completed the activities in December 1992. The Work Plan, SAP, QAPP, and HASP were modified in April 1993 to include the additional CERT site characterization activities and submitted to the U.S. EPA. Following U.S. EPA approval, WESTON initiated a second field effort in May 1993 and completed the activities in August 1993.

In October 1994 at the request of the U.S. EPA, WESTON submitted a Revised SAP to further characterize the five properties comprising the Working Dock Parcels (WDP) which include Saginaw Rock (Parcel 9), Cnudde (Parcel 11), Kunkel (Parcel 12), Midland (Parcel 10), and the Residential parcels (Parcel 29). In addition to the WDP characterization, additional site characterization activities were performed in the Saginaw River and at parcels north of the WDP which included IB (Parcels 7 and 8), Weld-Rite (Parcel 6), Consumers Power - Vacant Lot (Parcel

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

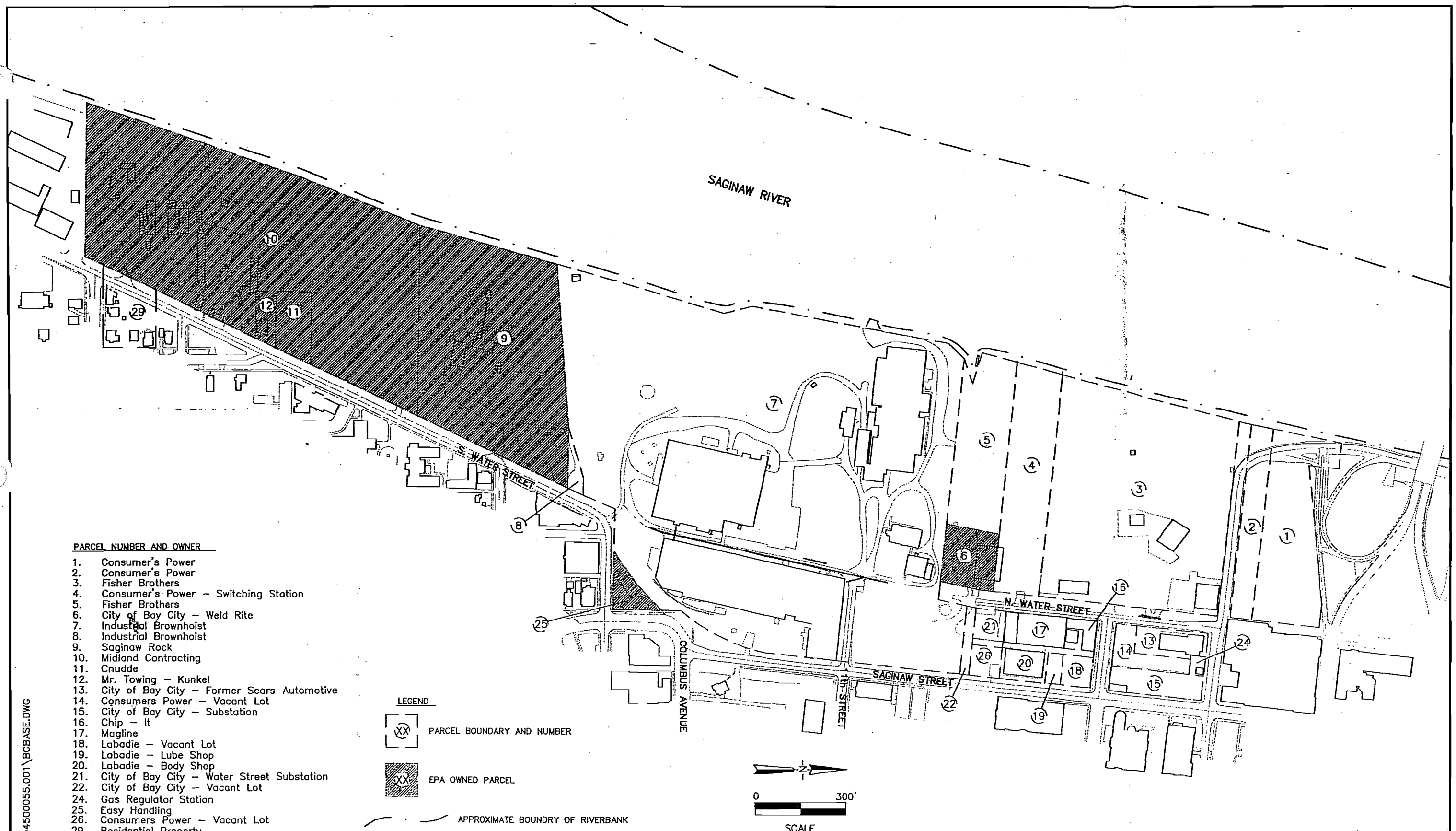
26), Labadie - Parking Lot (Parcel 18) and Labadie - Lube Shop (Parcel 19). Following approval of the plan, the field activities were performed in November/December 1994 and April 1995.

In July 1995, Congress rescinded the authorization and funding to U.S. EPA and the construction of the CERT was halted. At that time, U.S. EPA had acquired six of the initial 25 parcels (Figure 1-3). They included:

- Weld-Rite (Parcel 6)
- Saginaw Rock (Parcel 9)
- Midland (Parcel 10)
- Cnudde (Parcel 11)
- Kunkel (Parcel 12)
- Easy Handling (Parcel 25)

Section 2 presents a chronology of the overall CERT project. Section 3 of this report provides information regarding the CERT site location and history. Section 4 presents site geology and hydrogeology. Sections 5 and 6 describe the field activities and analytical results of the investigation. Section 7 discusses the Remedial Action Plans (RAPs) prepared by WESTON for select parcels.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.



PARCEL NUMBER AND OWNER

1. Consumer's Power
2. Consumer's Power
3. Fisher Brothers
4. Consumer's Power – Switching Station
5. Fisher Brothers
6. City of Bay City – Weld Rite
7. Industrial Brownhoist
8. Industrial Brownhoist
9. Saginaw Rock
10. Midland Contracting
11. Cnudde
12. Mr. Towing – Kunkel
13. City of Bay City – Former Sears Automotive
14. Consumers Power – Vacant Lot
15. City of Bay City – Substation
16. Chip – It
17. Magline
18. Labadie – Vacant Lot
19. Labadie – Lube Shop
20. Labadie – Body Shop
21. City of Bay City – Water Street Substation
22. City of Bay City – Vacant Lot
24. Gas Regulator Station
25. Easy Handling
26. Consumers Power – Vacant Lot
29. Residential Property

FIGURE 1–3

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

U.S. EPA OWNED PARCEL MAP
(as of July, 1995)
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.001\BCBASE.DWG

SECTION 2

CERT PROJECT CHRONOLOGY

Congress authorized the U.S. EPA to purchase property for the construction of the CERT in fiscal year 1991. The U.S. EPA Office of Administration and Resource Management preliminarily investigated eleven locations and selected a site in Bay City, Michigan. Prior to acquiring the site property, an environmental assessment of the approximate 90 acres (25 parcels) was required. U.S. EPA contracted Odell Associates Inc. (Odell) who sub-contracted ADL to conduct Phase I Environmental Assessments of the parcels in December 1991. The Phase I Environmental Assessments addressed the following parcels:

- Consumers Power - Former Sears Parking Lot (Parcels 1 and 2)
- Fisher Brothers (Parcels 3 and 5)
- Consumers Power - Switching Station (Parcel 4)
- Weld-Rite (Parcel 6)
- IB (Parcels 7 and 8)
- Saginaw Rock (Parcel 9)
- Midland (Parcel 10)
- Cnudde (Parcel 11)
- Kunkel (Parcel 12)
- City of Bay City - Former Sears Automotive (Parcel 13)
- Consumers Power - Vacant Lot (Parcel 14)
- City of Bay City - Substation (Parcel 15)
- Labadie - Chip It (Parcel 16)
- Magline (Parcel 17)
- Labadie - Parking Lot (Parcel 18)
- Labadie - Lube Shop (Parcel 19)
- Labadie - Body Shop (Parcel 20)
- City of Bay City - Water Street Substation (Parcel 21)
- City of Bay City - Vacant Lot (Parcel 22)
- Consumers Power - Vacant Lot (Parcel 24)
- Easy Handling (Parcel 25)
- Consumers Power - Vacant Lot (Parcel 26)

Following completion of the Phase I Environmental Assessments, the decision was made by U.S. EPA Senior Management that the proposed CERT site was suitable to justify expenditure of funds to conduct further investigations for the purpose of determining the potential environmental

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

liabilities associated with the site. Results from audits conducted by ADL between December 1991, and May 1992, indicated the potential for soil and groundwater contamination at many of the properties.

During the Phase I activities, areas of concern for each parcel were identified. The U.S. EPA conducted Phase II investigations to address the concerns identified in the Phase I assessments.

Because of insurance requirements by the owners of the IB parcels (Parcels 7 and 8), the U.S. EPA retained WESTON in October 1992 to perform a preliminary site characterization at the IB parcels. The project objectives were to:

- Determine if site activities (past and current) had impacted the soil and/or groundwater at the parcels.
- Determine the extent of any identified contamination (soil and groundwater).
- Provide a preliminary site characterization report and associated cost estimate for remediation of the parcels.

WESTON prepared and submitted a Work Plan for the proposed activities. The Work Plan was based upon the information provided in Phase I reports prepared by ADL for the IB parcels. The Work Plan was also based on decisions reached during the 5 October 1992 kick-off meeting and subsequent discussions with U.S. EPA Work Assignment Manager (WAM), Mr. Andrew Avel. WESTON implemented the ADL SAP and QAPP and provided documentation to address modifications, as necessary. Field activities completed during 1992 included the advancement of 50 soil borings and the installation of 14 temporary monitoring wells. Soil and water samples were collected from the parcels. All sample locations were surveyed and a parcel map was developed. Additionally, WESTON inspected each of the buildings on the parcels and performed geophysical surveys. A Draft Site Investigation Report was prepared based on the results of this investigation and submitted to the U.S. EPA in January 1993.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Substantial information on the presence or absence of contamination in the soil and groundwater of the CERT site was provided through investigative activities conducted by WESTON during November and December 1992, at the twenty five potential source areas on the IB parcels (Parcels 7 and 8) and by ADL at the other properties. The U.S. EPA determined that the CERT site would be considered as one large parcel for the purpose of environmental assessment activities. U.S. EPA met with the MDEQ to discuss additional investigative approaches and potential remediation activities for each of the parcels. Following completion of the Phase II activities, investigative activities at the Consumers Power - Former Sears Parking Lot parcels (Parcels 1 and 2) were halted because of the potential for extensive contamination from former operations. Consumers Power indicated they would conduct additional investigative activities themselves. WESTON provided a review of the ADL reports and the IB report and identified data gaps for the overall CERT site. In April 1993, the U.S. EPA requested that WESTON conduct additional site characterization activities to:

- Determine if site activities (past and current) had impacted the soil and/or groundwater at the CERT site.
- Provide additional characterization of the identified impacted area of the CERT site.
- Provide a preliminary CERT site characterization report and associated cost estimate for remediation of the CERT site.

WESTON prepared and submitted a Work Plan Revision for the proposed activities. The Work Plan Revision was based upon the information provided in reports prepared by ADL for the CERT site and on the Preliminary Site Characterization Report prepared for the IB parcels by WESTON. The Work Plan Revision was also based on decisions reached during a 31 March 1993 meeting with WAM Avel and on subsequent discussions with WAM Avel and the MDEQ. WESTON implemented the ADL SAP and QAPP and provided documentation to address modifications, as necessary. Field activities completed under the April 1993 Work Plan Revision included an additional geophysical survey at the IB parcels (Parcels 7 and 8) and a geophysical survey at the Fisher Brothers parcels (Parcels 3 and 5). A radiation survey was performed at the IB parcels

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

(Parcels 7 and 8) and soil samples were collected for radiation analyses. Preliminary site characterization activities were performed at the following parcels:

- Fisher Brothers (Parcels 3 and 5)
- Consumers Power - Switching Station (Parcel 4)
- Weld-Rite (Parcel 6)
- Midland (Parcel 10)
- Cnudde (Parcel 11)
- Kunkel (Parcel 12)
- City of Bay City - Former Sears Automotive (Parcel 13)
- Consumers Power - Vacant Lot (Parcel 14)
- City of Bay City - Substation (Parcel 15)
- Labadie - Parking Lot (Parcel 18)
- City of Bay City - Water Street Substation (Parcel 21)
- Consumers Power - Vacant Lot (Parcel 26)
- Residential Parcels (Parcel 29)

To further characterize the site an additional 19 soil borings were advanced at the IB parcels (Parcels 7 and 8) in May/June 1993. A focused investigation in and around Building 41 on the IB parcels (Parcels 7 and 8) was conducted to verify the location of a former coal gasification plant. A total of 17 soil borings were advanced on the 13 other parcels and 3 monitoring wells were installed and sampled to provide additional information for characterization of the CERT site soil and groundwater. Phase I Environmental Assessments were also conducted at eight additional properties. Following completion of the field work, all of the investigative derived waste (IDW) was characterized and appropriately disposed. A Site Summary Report was prepared by WESTON and submitted to the U.S. EPA in October 1993. The Site Summary Report included a remediation evaluation for the CERT site and remediation cost estimates for select parcels.

In the latter months of 1993, U.S. EPA entered into an Interagency agreement with the U.S. Army Corps of Engineers - Omaha District (USACE - Omaha) to provide environmental services including characterization, remedial design and remedial construction for the CERT site.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

In January 1994, RUST Environment and Infrastructure (RUST) under contract to the USACE - Omaha submitted a Draft Technical Memorandum Literature Review for the Proposed CERT Site. The Draft Technical Memorandum presented "a review of previous investigation reports, and studies for the purpose of determining the appropriateness of the information and its suitability for use during negotiations with the property owners and for evaluating remedial technologies. RUST identifies data gaps and expresses its level of confidence in data gathered to date at the site. This level of confidence is an indication of RUST's opinion as to whether the data will be useful in defining the extent of potential contamination for a particular parcel." In March of 1994, RUST developed the following documents for the CERT site:

- Draft Technical Memorandum - Study of Background Chemical Concentrations for Site Fill and Groundwater (Appendix A)
- Field Sampling Plan - Redesign Characterization (Appendix B)
- Draft Quality Assurance Project Plan - Redesign Characterization (Appendix C)
- Draft Health and Safety Plan - Redesign Characterization (Appendix D)

RUST did not conduct any investigative activities at the CERT site.

In July 1994, the U.S. EPA requested that WESTON conduct additional site characterization activities at the CERT site. The project objectives were to:

- More fully characterize impacted areas of the CERT site.
- Provide a preliminary CERT site characterization report and associated cost estimate for remediation of the CERT site.

WESTON prepared and submitted to the U.S. EPA in August 1994, a Technical Memorandum which identified proposed additional investigative efforts necessary to adequately characterize the CERT site. WESTON then prepared a Work Plan Revision that was based on a review of the existing site information and on the August 1994 Technical Memorandum. The Work Plan

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Revision was also based on decisions reached during a 23 August 1994 meeting with WAM Avel and the MDEQ. WESTON continued to implement the ADL SAP and QAPP and provided documentation to address modifications, as necessary. Tasks completed under the August 1994 Work Plan Revision included additional soil and groundwater sampling on the following parcels:

- Saginaw Rock (Parcel 9)
- Midland (Parcel 10)
- Cnudde (Parcel 11)
- Kunkel (Parcel 12)
- Residential Parcels (Parcel 29)

These parcels comprised the area where the proposed working dock was to be constructed and as such were referred to as the WDP. A total of 58 soil borings and 11 monitoring wells were completed during the site characterization activities. Sediment samples were collected from the Saginaw River adjacent to the WDP. In addition to the WDP characterization, field investigative activities were completed on the following parcels associated with the CERT site:

- Weld-Rite (Parcel 6)
- IB (Parcels 7 and 8)
- Labadie - Parking Lot (Parcel 18)
- Labadie - Lube Shop (Parcel 19)
- Labadie - Body Shop (Parcel 20)
- Consumers Power - Vacant Lot (Parcel 26)

A total of 28 soil borings and 9 monitoring wells were completed. A radiation survey and radiation sampling of solid material was also conducted at the Weld Rite parcel (Parcel 6).

In March 1995, U.S. EPA requested that WESTON conduct additional activities associated with the CERT site. The project objectives were to:

- Provide an interim report for the characterization activities completed at the WDP.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- Provide expert testimony support to the U.S. EPA and Department of Justice (DOJ) in regard to the investigative work conducted at the CERT site.

- Provide additional characterization of the proposed excavation area associated with the WDP including the proposed dredging area in the adjacent Saginaw River.

- Provide a project database for the data generated by WESTON associated with the CERT site.

WESTON prepared a Work Plan Revision to address these objectives. WESTON continued to implement the ADL SAP and QAPP and provided documentation to address modifications, as necessary. Tasks completed under the March 1995 Work Plan Revision included:

- Advancement of four land cores and six river cores on the WDP to characterize material that was to be excavated or dredged during the installation of the proposed working dock.

- Sampling of the previously installed monitoring wells on the Saginaw Rock (Parcel 9) and Midland (Parcel 10) parcels to provide data for the preparation of site specific RAPs.

- Construction of a project database that compiled all analytical and geologic data. The database was utilized to construct a Geographic Information System (GIS) for the CERT site.

- Development of cost estimates for potential remediation of the parcels associated with the CERT site.

In July 1995, Congress rescinded the authorization and funding to U.S. EPA and the construction of the CERT was halted. At that time, U.S. EPA had acquired six of the initial 25 parcels. They included:

- Weld-Rite (Parcel 6)
- Saginaw Rock (Parcel 9)
- Midland (Parcel 10)
- Cnudde (Parcel 11)
- Kunkel (Parcel 12)
- Easy Handling (Parcel 25)

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

It is important to note that the investigative activities conducted at the CERT site were not intended to encompass the full scope of a remedial investigation, but the validity and quality of the data collected was to be such that it would be acceptable by state and federal agencies in support of additional investigations or remediation activities.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 3
SITE LOCATION AND HISTORY

3.1 SITE LOCATION

The CERT site is located west of Saginaw Street, between 18th and 9th Streets in Bay City, Bay County, Michigan (Figure 1-1). The site is bordered to the north by the Consumers Power property, to the west by the Saginaw River, to the south by the Bay City Department of Public Works, and to the east by Saginaw Street. Recent activities at the CERT site have included: asphalt manufacturing (Midland); aggregate storage and transfer (Fisher Brothers, IB, Saginaw Rock, and Midland); and various small companies that own or lease buildings and land.

3.2 SITE AREA DESCRIPTION

The Saginaw River Valley has a long history of industrial activity dating back to the early to middle 1800s. Early industries on the Saginaw River included lumber, fishing and trapping. The area of investigation was originally occupied by a number of sawmills and storage yards. In the 1800s, numerous industrial operations were present, including the Industrial Works (later IB), several small foundries, a manufactured gas plant, and a grain mill. These operations were dependent on the river for the transportation of raw and finished products, as well as for a source of process water.

As the lumber industry slowed down, the log booms and boat slips were filled to create room for growing industrial operations. Early maps of the area show that the edge of the river was approximately 100 feet from Water Street. By 1950, the distance between the river and Water Street was over 700 feet and no boat slips or log booms were present. The fill material used to create the new land was a mixture of dredged material from the channel, waste from industrial operations (sawdust, wood, and foundry sand), and material brought in from local sources

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

(demolition debris, foundry sands, and domestic trash). Evidence of these materials was identified in soil borings and excavations near the river.

The current environmental condition of the Saginaw River Valley in Bay City is a result of its long history. The MDEQ has identified numerous properties along the Saginaw River in Bay City as known or suspected hazardous material release sites. These sites include gas stations, former manufactured gas plants, foundries, landfills, tank farms, large manufacturing facilities, and utilities. They contain a wide variety of environmental pollutants including PCBs, metals, volatile organic compounds (VOCs), and petroleum compounds that have been released to the soil, groundwater and surface water. State regulations require notification of releases and also require that investigations and cleanups be performed. The Saginaw River has been designated as an area of concern by the MDEQ because of poor surface water quality and sediment contamination. Primary contaminants include PCBs, metals, and phenols. A remedial action plan has been developed for the river.

3.3 PARCEL DESCRIPTIONS

3.3.1 Fisher Brothers (Parcels 3 and 5)

The Fisher Brothers parcels (Parcels 3 and 5) are located on North Water Street, between Water Street and the Saginaw River. Parcel 3 covers an area of 10.16 acres and Parcel 5 is comprised of 2.01 acres. The parcels are currently leased by Bay Aggregate, Inc., a redi-mix cement and aggregate business.

3.3.2 Consumers Power - Switching Station (Parcel 4)

The Consumers Power - Switching Station parcel (Parcel 4) covers an area of 2.60 acres and is located on North Water Street between the two Fisher Brothers parcels (Parcels 3 and 5). The western portion of the parcel is used for aggregate storage and is bordered to the west by the

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Saginaw River. The eastern portion of the parcel houses an electrical substation operated by Consumers Power.

3.3.3 Weld-Rite (Parcel 6)

The Weld-Rite parcel (Parcel 6) is located at 221 North Water Street, immediately north of the IB parcels (Parcels 7 and 8) and was owned by the City of Bay City. The parcel is one acre in size and contains one building which covers an area of approximately 10,000 square feet. According to ADL, the parcel was most recently used for welding operations. In November 1994, the U.S. EPA entered into a settlement for the Weld-Rite parcel.

3.3.4 Industrial Brownhoist (Parcels 7 and 8)

The IB parcels (Parcels 7 and 8) occupy 31 acres and are located west of Water Street between 11th and 13th Street. The IB parcels consisted of a former foundry (until early 1960's) and manufacturing facility for large cranes (until 1983). Recent activities at the IB parcels include metal fabrication and sheet work, rebar form fabrication, miscellaneous storage and aggregate storage. In January 1996, I.B. Industrial Park, Inc., purchased the IB parcels.

3.3.5 Saginaw Rock (Parcel 9)

The Saginaw Rock parcel (Parcel 9) occupies approximately 7 acres and is located between the IB parcels (Parcels 7 and 8) and the Midland parcel (Parcel 10) on South Water Street. It abuts the Saginaw River on the western side. According to ADL, the parcel was used for a concrete mixing operation. In May 1994, the U.S. EPA took possession of the Saginaw Rock parcel and in August 1994 the U.S. EPA took title to parcel 9. In December 1996, the U.S. EPA entered into a settlement for the Saginaw Rock parcel.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.3.6 Midland (Parcel 10)

The Midland parcel (Parcel 10) is comprised of 13.43 acres and is located at the southern boundary of the CERT site. The parcel was used for asphalt manufacturing. In May 1994, the U.S. EPA took possession of the Midland Contracting parcel and in August 1994 the U.S. EPA took title to parcel 10. In December 1996, the U.S. EPA entered into a settlement for the Midland parcel.

3.3.7 Cnudde (Parcel 11)

The Cnudde parcel (Parcel 11) is comprised of ½-acre and is located at the west central portion of the WDP along South Water Street. The parcel was used to store road construction materials. In January 1995, the U.S. EPA took title to the Cnudde parcel and in May 1995 the U.S. EPA took possession of the Cnudde parcel.

3.3.8 Kunkel (Parcel 12)

The Kunkel parcel (Parcel 12) is less than ¼-acre and is located just south of the Cnudde parcel (Parcel 11). According to ADL, this parcel was used to store junk cars, trucks, boats and motorcycles. In September 1994, the U.S. EPA entered into a settlement for the Kunkel parcel.

3.3.9 City of Bay City - Former Sears Automotive (Parcel 13)

The City of Bay City - Former Sears Automotive parcel (Parcel 13) is located at 310 North Water Street, encompasses 0.47 acres, and is currently owned by the City of Bay City. According to ADL, the parcel was used for approximately 25 years for auto parts sales and auto service. It is currently used for storage associated with the U.S. EPA Great Lakes research vessels.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.3.10 Consumers Power - Vacant Lot (Parcel 14)

The Consumers Power - Vacant Lot (Parcel 14) is the L-shaped parcel adjacent to the southern boundary of City of Bay City - Former Sears Automotive parcel (Parcel 13). The parcel covers an area of 0.2 acres and is currently used as a parking lot. According to ADL the parcel was formerly associated with the gas regulator station located on Ninth Street.

3.3.11 City of Bay City - Substation (Parcel 15)

The City of Bay City - Substation parcel (Parcel 15) is located adjacent to Saginaw Street between 9th and 10th Street and occupies 0.55 acres. The north end of the parcel is presently used as an overflow parking lot for City Hall, and the southern end of the parcel houses an electrical substation and support building.

3.3.12 Labadie - Vacant Lot (Parcel 18)

The Labadie - Vacant Lot parcel (Parcel 18) is approximately 0.92 acres in size and adjacent to the north end of the Labadie - Lube Shop parcel (Parcel 19). The property was used as a parking lot for the Labadie Dealership, but is currently vacant.

3.3.13 Labadie - Lube Shop (Parcel 19)

The Labadie - Lube Shop parcel (Parcel 19) is 0.11 acres in size and adjacent to the north end of the Labadie - Body Shop parcel (Parcel 20). One small building is located on the parcel and was used for a rapid oil change business. The building is currently vacant.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.3.14 Labadie - Body Shop - (Parcel 20)

The Labadie - Body Shop parcel (Parcel 20) occupies approximately 0.34 acres and is located south of the Labadie - Lube Shop parcel (Parcel 19). One large building is present on the parcel which was formerly used as an automobile maintenance and repair shop.

3.3.15 City of Bay City - Water Street Substation (Parcel 21)

The City of Bay City - Water Street Substation parcel (Parcel 21) is located at 231 Saginaw Street and occupies 0.46 acres between Saginaw Street and Water Street. The substation was formerly owned by Consumers Power, but was sold to the City of Bay City in 1990.

3.3.16 Easy Handing (Parcel 25)

The Easy Handling parcel (Parcel 25) occupies approximately 0.5 acres at 201 Thirteenth Street which is located adjacent to the southeast corner of the IB parcels (Parcels 7 and 8). The site was formerly used as a warehouse and distribution center of packing materials and hand trucks to local businesses. In December 1994, the U.S. EPA entered into a settlement for the Easy Handling parcel.

3.3.17 Consumers Power - Vacant Lot (Parcel 26)

The Consumers Power - Vacant Lot parcel (Parcel 26) occupies approximately 1.61 acres and is adjacent to the southern boundary of the Labadie - Body Shop parcel (Parcel 20). The site was formerly used for new automobile parking.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.3.18 Residential Parcels (Parcel 29)

The Residential parcels (Parcel 29) occupy an area of roughly 3.5 acres and are located to the east of the Midland parcel (Parcel 10). The buildings on the residential parcels include 4 houses, 3 unattached garages and one shed which are situated on 9 lots. The zoning for Parcel 29 is residential.

3.4 PREVIOUS SITE INVESTIGATIONS (ADL)

ADL performed preliminary environmental site assessments of 25 of the parcels initially under consideration for purchase of the CERT site in 1992. Based on the findings of the preliminary assessments, field investigations were performed at 22 of the 25 parcels between 1 September and 12 October 1992. Soil samples were collected at all of the investigated properties and groundwater monitoring wells were installed at six of the properties. A brief summary of the results of the ADL field investigations at the sites where WESTON performed additional investigations is presented in the remainder of this subsection.

3.4.1 Fisher Brothers (Parcels 3 and 5)

Investigative and analytical results compiled by ADL at the Fisher Brothers parcels (Parcels 3 and 5) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Fisher Brothers Property, November 12, 1992 (Appendix E). The report indicates that the location of a former city dumping grounds was confirmed, but the extent of the dumping grounds were not defined. A known underground storage tank (UST) location was confirmed and an additional, unknown UST was identified. VOCs and semi-VOCs (SVOCs) were detected in groundwater, and VOCs and total petroleum hydrocarbons (TPH) were detected in soils.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.4.2 Consumers Power - Switching Station (Parcel 4)

Investigative and analytical results compiled by ADL at the Consumers Power - Switching Station parcel (Parcel 4) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Consumers Power Properties - Tab D2 Switching Station, December 30, 1992 (Appendix F). A total of 4 soil samples were collected on the parcel for PCB analysis. PCBs were detected in 3 of the 4 samples.

3.4.3 Weld-Rite (Parcel 6)

Investigative and analytical results compiled by ADL at the Weld-Rite parcel (Parcel 6) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - City of Bay City Property - Tab E2, Weld-Rite, December 8, 1992 (Appendix G). Soil samples were collected from inside and to the south of the on-site building and analyzed for PCBs and TPH. Two wipe samples were collected inside the building to determine if PCBs were associated with the electrical equipment. PCBs were only detected in the soil samples.

3.4.4 Industrial Brownhoist (Parcels 7 and 8)

ADL identified twenty-five areas which they determined should be investigated further (Figure 3-1) in a Draft Field Sampling Plan for EPA Bay City Michigan CERT Project - Phase I Industrial Brownhoist (IB) and Easy Handling (BCJ) Properties, August 4, 1992 (Appendix H). ADL recommended soil and groundwater investigations be performed to verify the nature and extent of contamination in several areas of known contamination and to determine if contaminants were present in areas where investigations had not been performed. In addition, ADL recommended investigating areas where suspected abandoned USTs were believed to exist as well as further investigating nine identified transformer locations and removing asbestos containing material (ACM). Finally, ADL recommended dye testing five tile drains to determine if discharges into the river were occurring.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

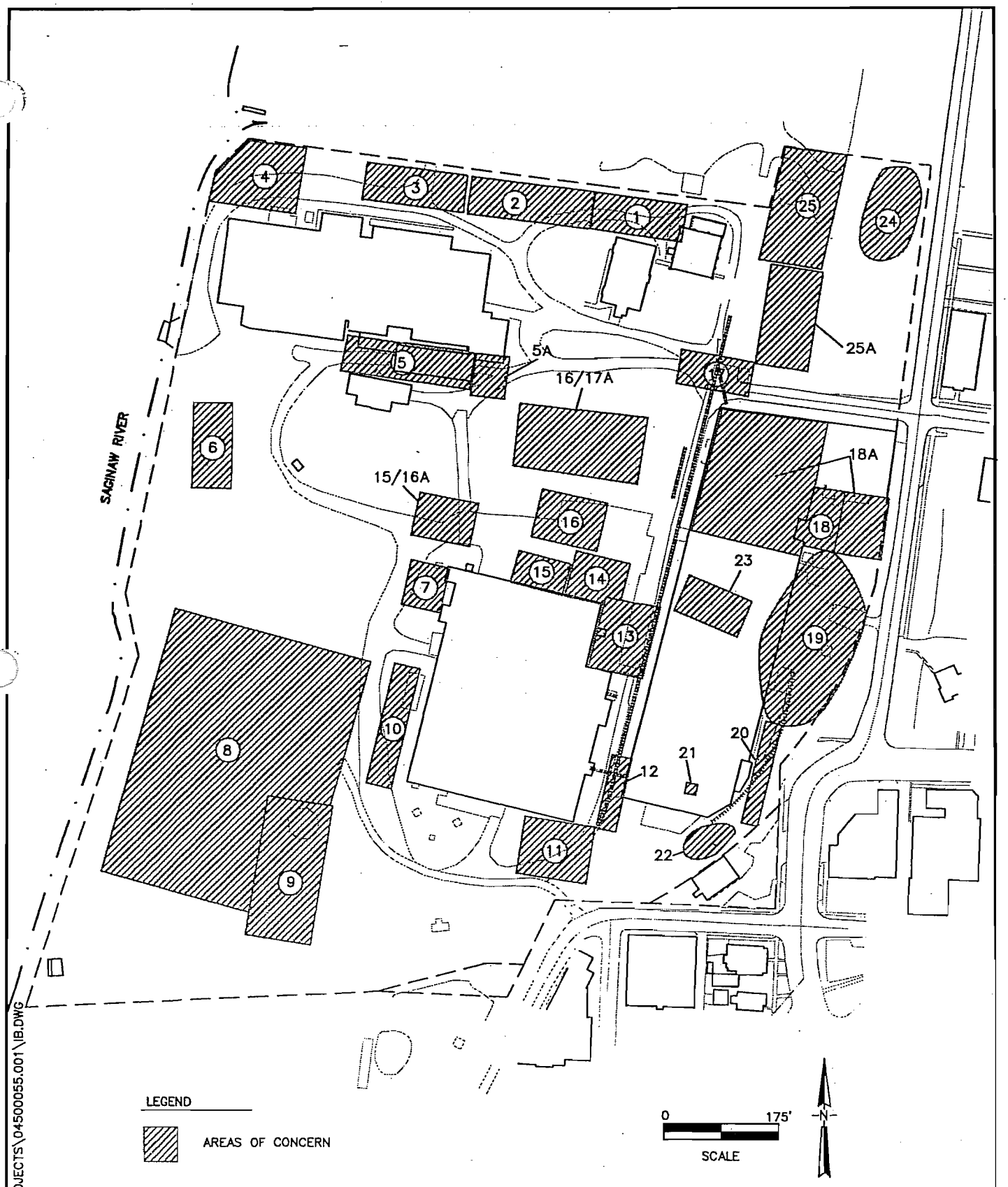


FIGURE 3-1

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

IDENTIFIED AREAS FOR ADDITIONAL INVESTIGATION
INDUSTRIAL BROWNHOIST PARCELS (parcels 7&8)
BAY CITY CERT SITE
Bay City, Michigan

A review of the 1906 Sanborn maps for the site indicated the potential presence of a gas holder associated with a coal gasification plant in one area of the site.

3.4.5 Saginaw Rock (Parcel 9)

Investigative and analytical results compiled by ADL at the Saginaw Rock parcel (Parcel 9) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Saginaw Rock Property, November 20, 1992 (Appendix I). Soil and groundwater samples were collected and analyzed for VOCs and TPH. VOCs were detected in both soil and groundwater.

3.4.6 Midland (Parcel 10)

Investigative and analytical results compiled by ADL at the Midland parcel (Parcel 10) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project -Old Firehouse Property, December 31, 1992 (Appendix J). Soil and groundwater samples were collected and analyzed for VOCs, SVOCs, TPH, PCBs, and metals. Significant VOC and SVOC contamination associated with fuel distribution and asphalt manufacturing was confirmed in various areas of the property. Low levels of PCB were detected in soils in the area where river dredging equipment was formerly stored.

3.4.7 Cnudde (Parcel 11)

According to ADL, one soil boring was advanced and a soil sample was collected to evaluate the fill material and to determine the potential for migration of contaminants from the adjacent parcels. Investigative and analytical results are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Cnudde Property, November 10, 1992 (Appendix K). The sample was collected for TPH, VOCs and metals. Metals were detected in the sample.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.4.8 Kunkel (Parcel 12)

Investigative and analytical results are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Kunkel Property, December 1, 1992 (Appendix L). Three soil samples were collected and analyzed for VOCs, SVOCs, TPH, PCBs and metals. VOCs, SVOCs, TPH and PCBs were all detected.

3.4.9 City of Bay City - Former Sears Automotive (Parcel 13)

ADL indicated that a 1,500 gallon UST had been recently removed from the property. Investigative and analytical results compiled by ADL at the City of Bay City - Former Sears Automotive parcel (Parcel 13) are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - City of Bay City Property - Tab E3, Former Sears Automotive, December 8, 1992 (Appendix G). Soil samples were collected and analyzed for VOCs, SVOCs, TPH, PCBs and metals. Analytical results showed detectable levels of SVOCs and TPH in the on-site soil.

3.4.10 Consumers Power - Vacant Lot (Parcel 14)

Investigative and analytical results are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Consumers Power Properties - Tab D3, Gas Regulator Station, December 30, 1992 (Appendix F). Two soil samples were collected from this parcel and analyzed for VOCs, SVOCs, TPH and metals. TPH was detected in both samples.

3.4.11 City of Bay City - Substation (Parcel 15)

ADL observed no significant stains or patches on the adjacent parking lot and noted 16 active transformers and one spare transformer in the substation. ADL recommended that stained soil

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

adjacent to a stained transformer be sampled and one soil sample be collected to assess background soil quality. However, these activities were not completed by ADL.

3.4.12 Labadie - Vacant Lot (Parcel 18)

ADL did not investigate this parcel during their characterization activities.

3.4.13 Labadie - Lube Shop (Parcel 19)

Investigative and analytical results are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - BJL Properties - Tab K2 - Lube Shop, December 1, 1992 (Appendix M). Two shallow soil samples were collected and analyzed for VOCs and TPH. TPH was detected.

3.4.14 Labadie - Body Shop (Parcel 20)

Investigative and analytical results compiled by ADL are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - BJL Properties - Tab K3, Body Shop, December 1, 1992 (Appendix M). ADL completed a soil gas survey south of the body shop building and drilled one soil boring south of the westernmost garage door to determine the extent of contamination at the parcel. Two soil samples were collected and analyzed for VOCs and TPH. The soil gas survey revealed low concentrations of VOCs within the soil with a maximum concentration of 5.4 parts per million (ppm) which they concluded was indicative of background conditions. Analytical results indicated that there were no detectable levels of VOCs or TPH in the soil.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

3.4.15 City of Bay City - Water Street Substation (Parcel 21)

Investigative and analytical results compiled by ADL are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - City of Bay City Property - Tab E1, Water Street Substation, December 8, 1992 (Appendix G). Four soil samples from four hand auger locations were collected and analyzed for VOCs, PCBs and metals. High concentrations of PCBs and metals were detected along the northern boundary of the property outside the substation fence.

3.4.16 Easy Handling (Parcel 25)

Investigative and analytical results compiled by ADL are presented in the Final Site Investigation Report for EPA Bay City Michigan CERT Project - Easy Handling - Tab M, November 17, 1992 (Appendix N). Seven soil samples and two groundwater samples were collected and analyzed for VOCs, TPH and metals. Trace concentrations of VOCs and TPH were detected.

3.4.17 Consumers Power - Vacant Lot (Parcel 26)

ADL did not characterize the Consumers Power - Vacant Lot parcel (Parcel 26) during their site investigation activities.

3.4.18 Residential Parcels (Parcel 29)

ADL did not characterize the Residential parcels (Parcel 29) during their site investigation activities.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 4

GEOLOGY & HYDROGEOLOGY

4.1 REGIONAL GEOLOGY

The Bay City area lies within the Great Central Lowland Physiographic Province. The landscape of this province was dominated by the effects of Pleistocene glacial processes when the Lake Huron Lobe of the Wisconsin Ice Sheet retreated from the area during the Wisconsinan stage between 15,000 and 12,000 years ago. The dominant unconsolidated sediments in Bay County were deposited as glacial till, lacustrine material, and alluvium. Some of this material has been reworked by the subsequent action of water and wind. The glacial till is calcareous and is friable or firm in consistence. The lacustrine material was deposited in still or ponded glacial melt water and consists of fine grain materials such as fine sand and silt. The alluvium material was recently deposited by the flood water of streams and rivers, and varies in texture depending on the stream characteristics. Glacial deposits in the area range in thickness from 50 to 100 feet.

Native modern soils in the area belong to the Tappan-Belleville association, characterized by nearly level, poorly drained soils that formed in loamy and sandy material on till plains modified by lake water (Soil Survey of Bay County, Michigan, USDA, 1980).

The bedrock underlying the region is composed of Pennsylvanian age shale and sandstone of the Saginaw Formation. The Parma Sandstone is a major sandstone unit within the Saginaw Formation. Also present within this formation are coal beds and the Verne Limestone.

The primary aquifer that provides a source of water to the region is the Parma Sandstone. This aquifer is widespread in the region and is characterized by thin, medium to coarse grained, well-rounded gravel zones. Importantly however, municipal potable water for Bay City is provided by the city from Saginaw Bay.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

4.2 SITE GEOLOGY

The local geology description for the CERT site is based on field observations made by WESTON during the installation of soil borings and monitoring wells, and on previous investigative findings. During the WESTON soil boring installation activities, soil was continuously sampled using 2-foot long split-spoon samplers. The soil was classified according to the modified Unified Soil Classification System (USCS) and logged by WESTON. The soil boring logs are presented in Appendix O.

Three basic stratigraphic units were identified during the subsurface soils investigation: fill material, native alluvial deposits deposited by surface water action, and glacial till. Generally, the fill material thickens closer to the river where backfilling of the former shoreline and boat docks was conducted. The primary consistency of the fill is a mixture of sand, silt, and gravel, although it sometimes contains cinders, brick, wood, glass and foundry sand. Color ranges from dark olive gray to black to brown. Near the river the fill is 6 to 20 feet thick. On the eastern side of the site the fill is 2 to 12 feet thick. A fill thickness map for the CERT site is illustrated on Figure 4-1. Cross-section locations are shown in plan view on Figure 4-2, and cross-sections across the CERT site are illustrated on Figures 4-3 through 4-15.

Organic odors were noted in the fill at the IB (Parcels 7 and 8), Fisher Brothers (Parcels 3 and 5), Cnudde (Parcel 11), and Midland (Parcel 10) parcels. The fill material sampled in soil borings CS-SB-33 and CS-SB-36 at Fisher Brothers (Parcels 3 and 5) was extremely organic and contained abundant debris material. Petroleum odors were noted in the fill at the IB (Parcels 7 and 8), Midland (Parcel 10), and Fisher Brothers (Parcels 3 and 5) parcels. Creosote-like odors were noted at the IB parcels (Parcels 7 and 8), and ammonia-like odors were observed at the Consumers Power - Switching Station parcel (Parcel 4).

This document was prepared by Roy F. Weston. Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

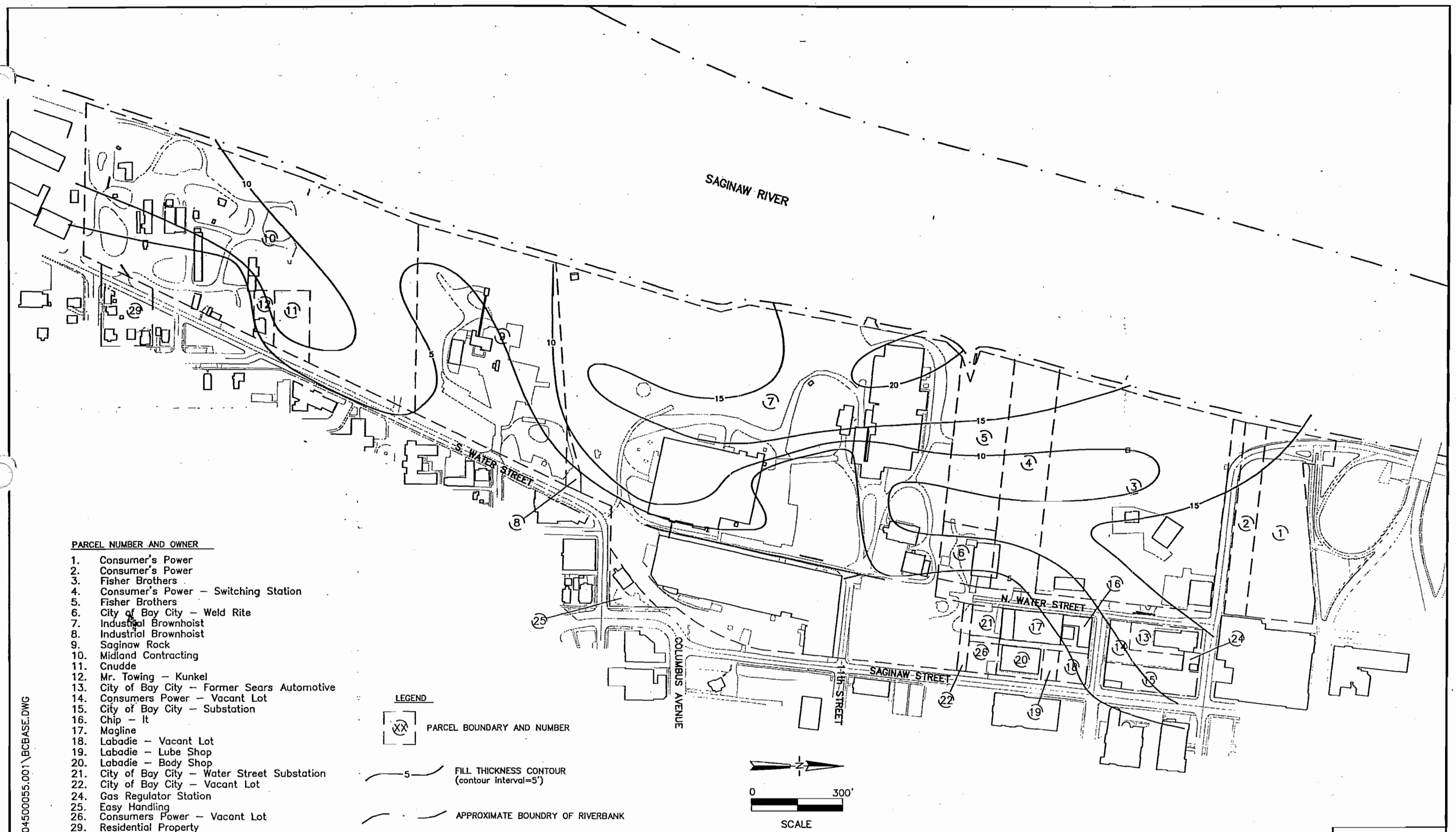
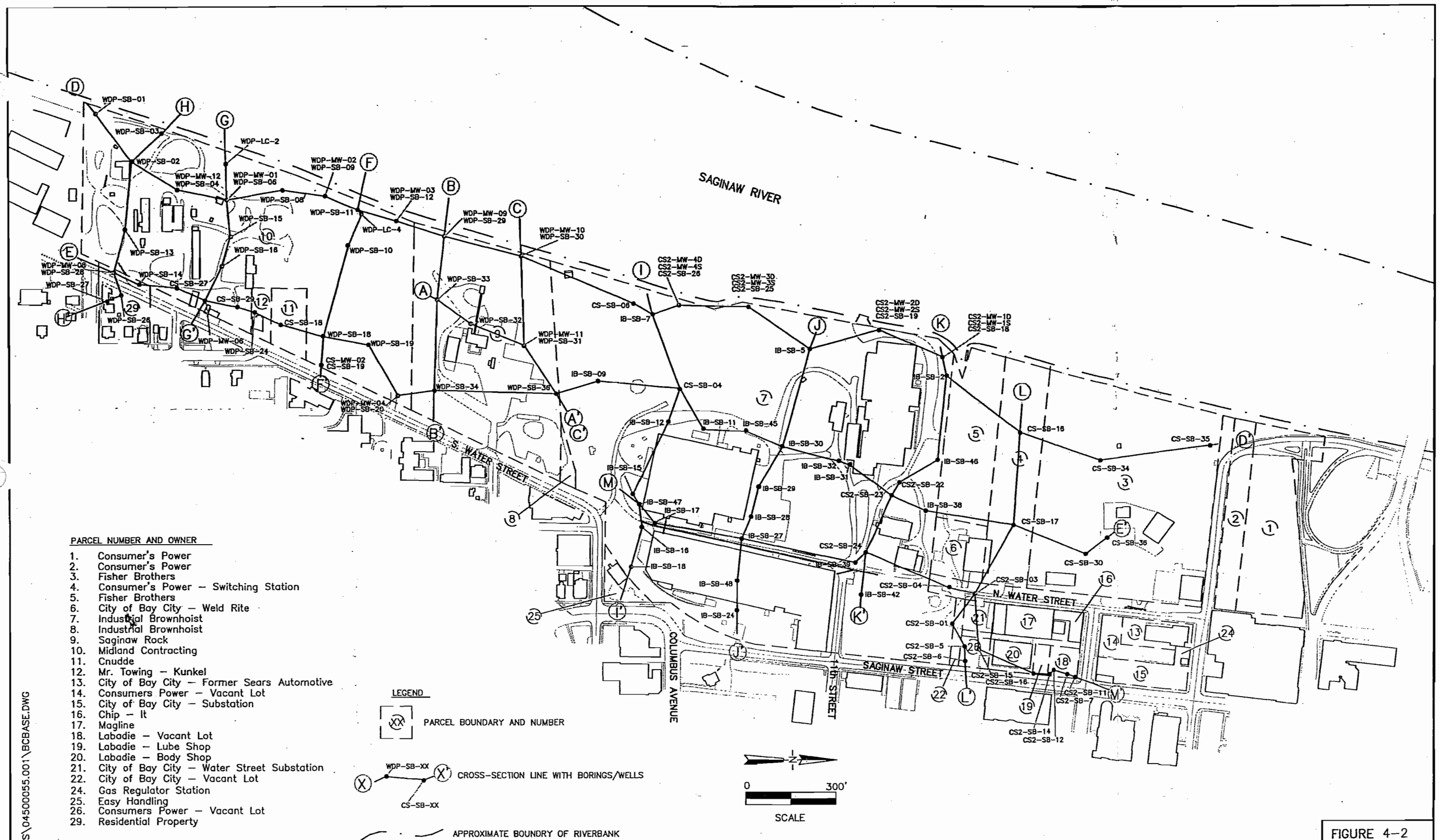


FIGURE 4–1

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

FILL THICKNESS MAP
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.001\BCBASE.DWG



PARCEL NUMBER AND OWNER

1. Consumer's Power
2. Consumer's Power
3. Fisher Brothers
4. Consumer's Power – Switching Station
5. Fisher Brothers
6. City of Bay City – Weld Rite
7. Industrial Brownhoist
8. Industrial Brownhoist
9. Saginaw Rock
10. Midland Contracting
11. Cnudde
12. Mr. Towing – Kunkel
13. City of Bay City – Former Sears Automotive
14. Consumers Power – Vacant Lot
15. City of Bay City – Substation
16. Chip – It
17. Magline
18. Labadie – Vacant Lot
19. Labadie – Lube Shop
20. Labadie – Body Shop
21. City of Bay City – Water Street Substation
22. City of Bay City – Vacant Lot
24. Gas Regulator Station
25. Easy Handling
26. Consumers Power – Vacant Lot
29. Residential Property

OMI\PROJECTS\04500055.001\BCBASE.DWG

FIGURE 4–2

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

CROSS–SECTION LOCATION MAP
BAY CITY CERT SITE
Bay City, Michigan

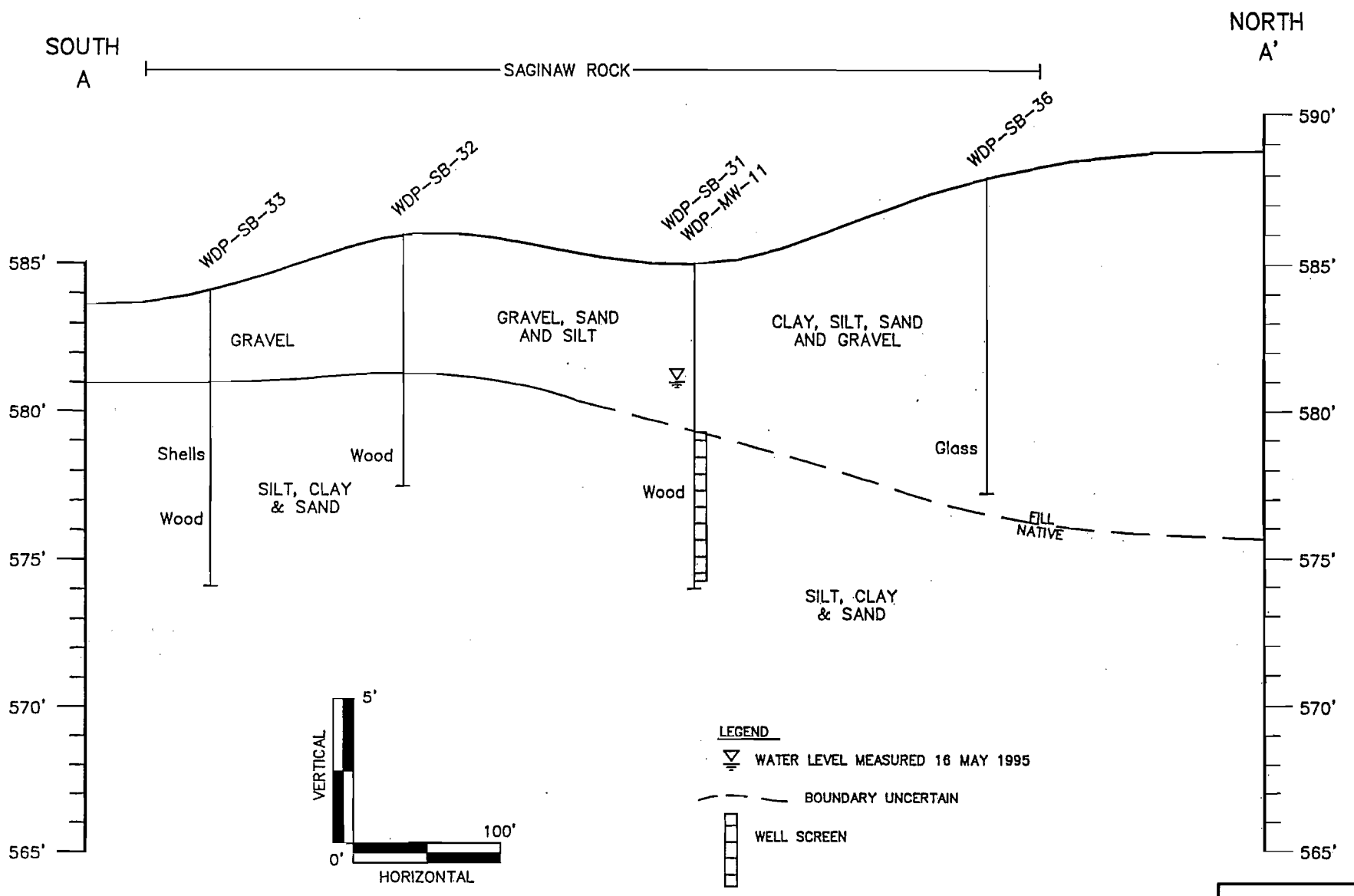


FIGURE 4-3

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION A-A'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECAA.DWG

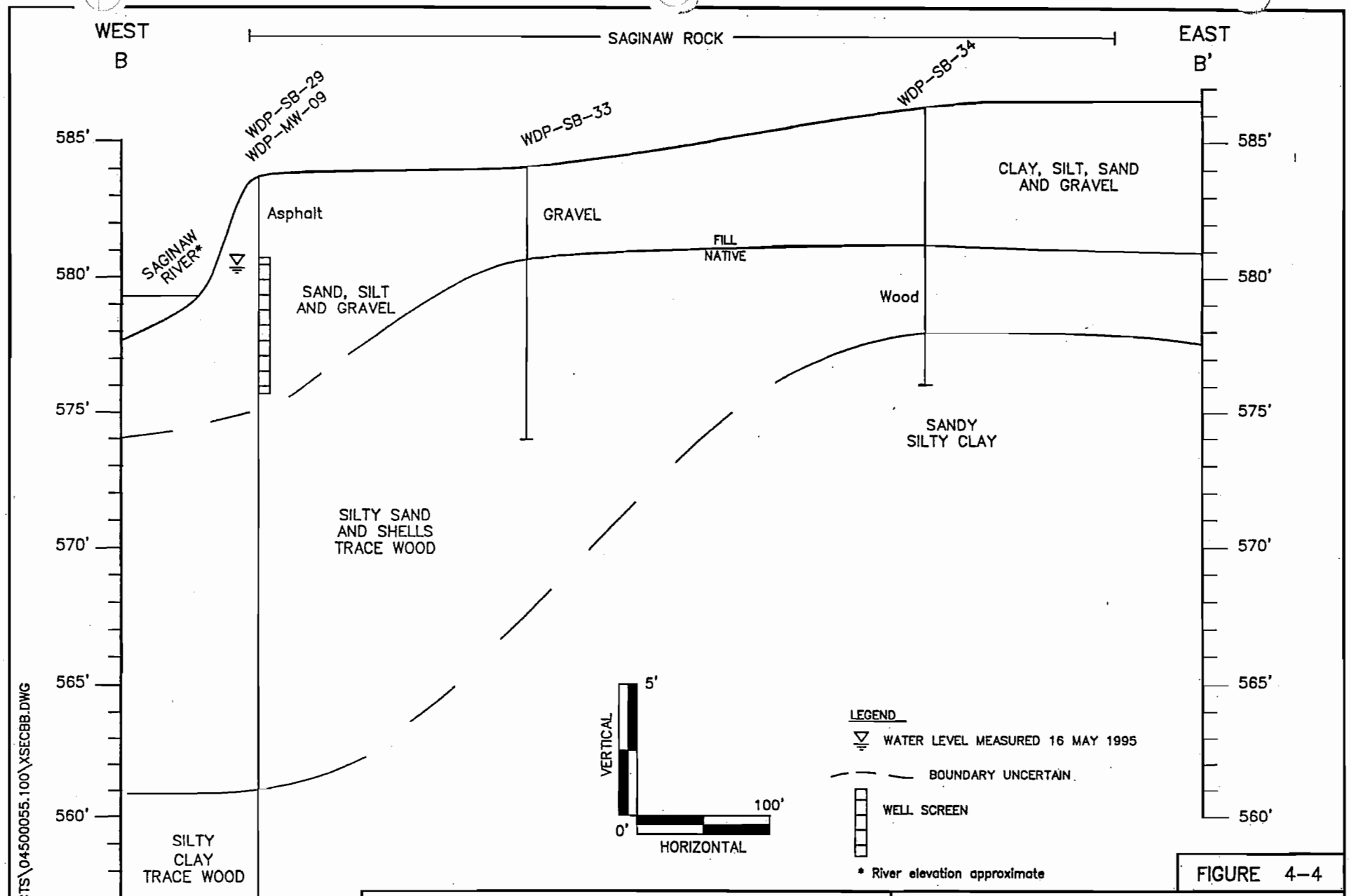


FIGURE 4-4

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION B-B'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECBB.DWG

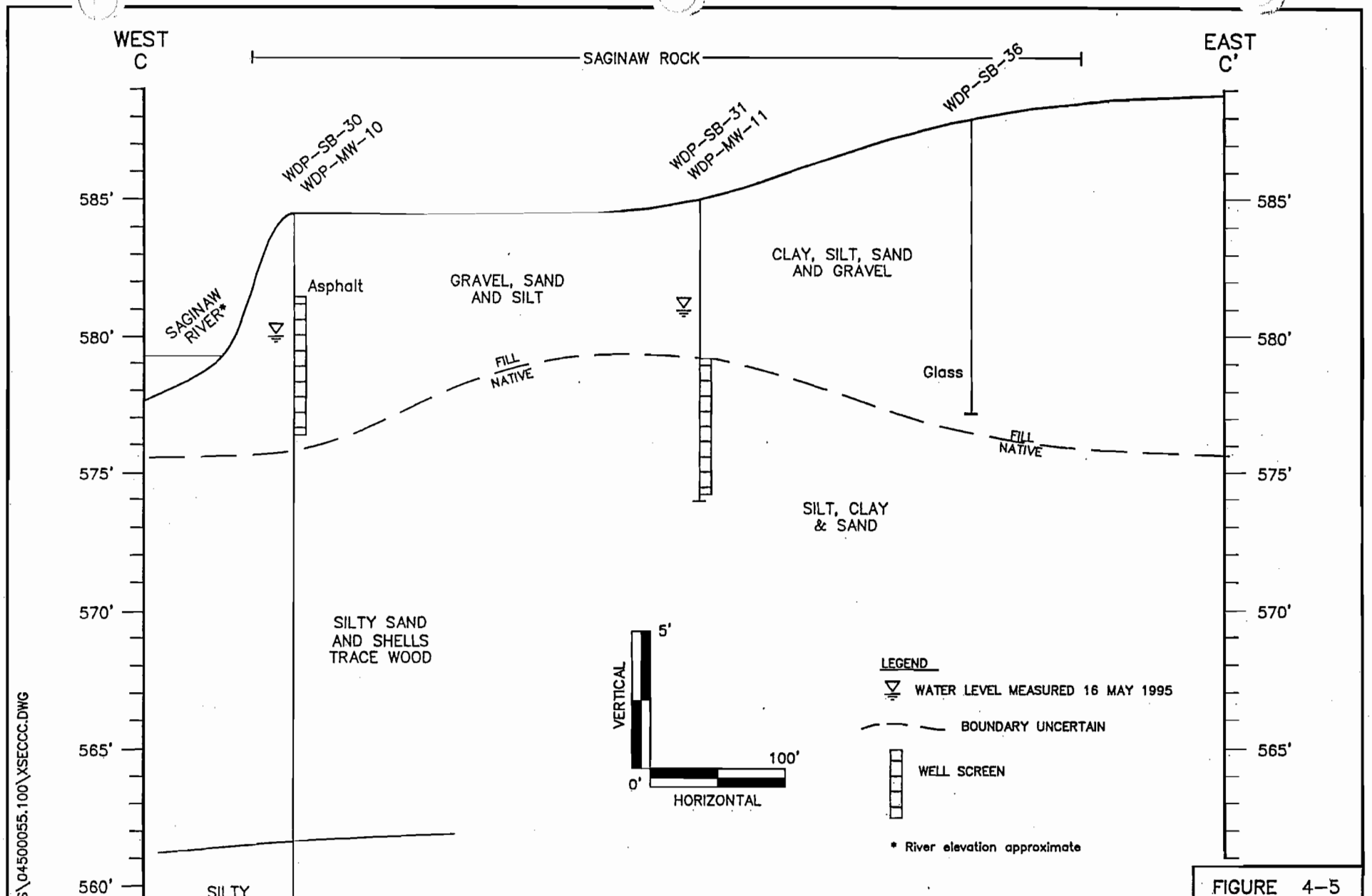
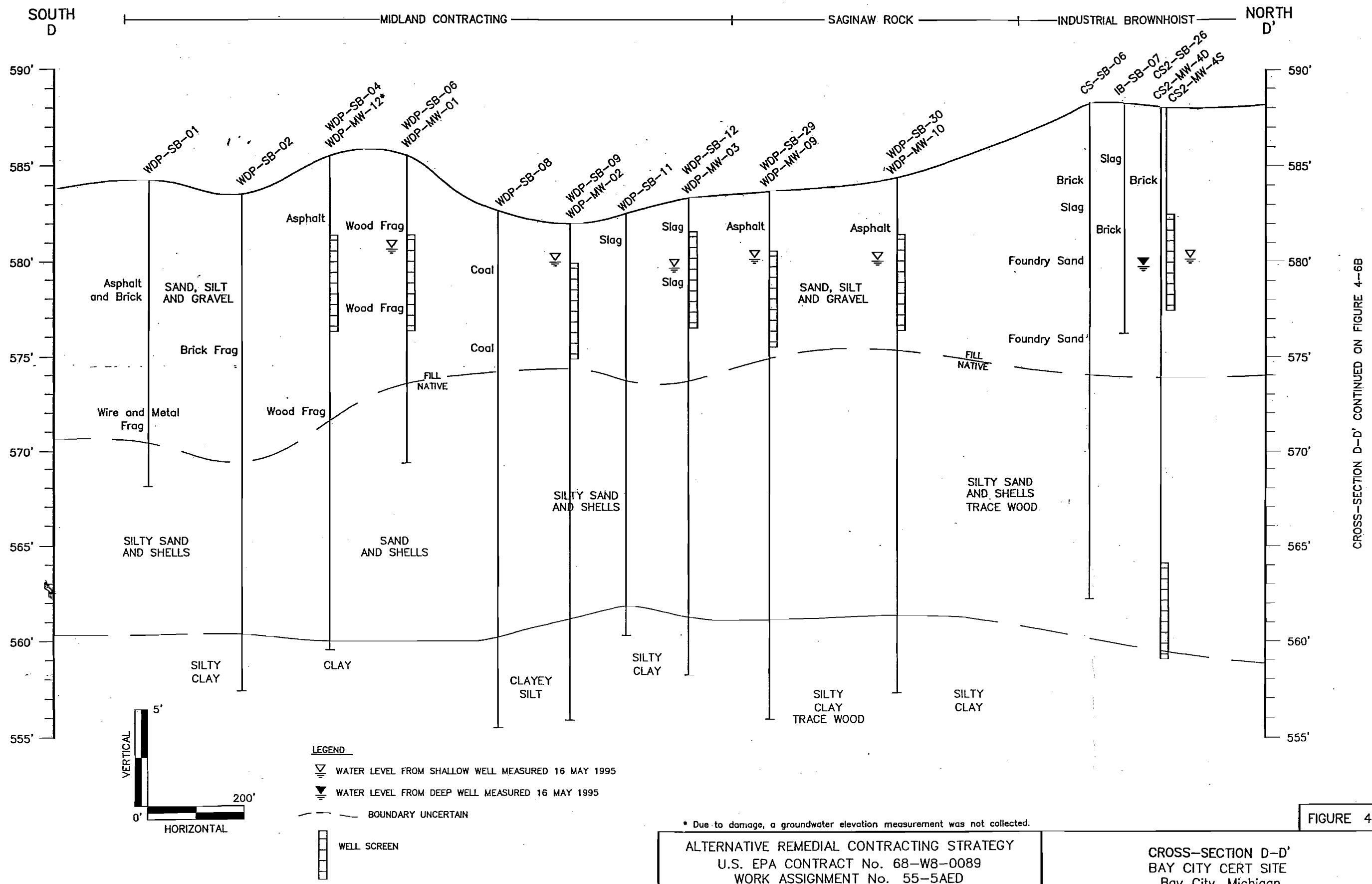


FIGURE 4-5

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION C-C'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECCC.DWG



CROSS-SECTION D-D' CONTINUED ON FIGURE 4-6B

* Due to damage, a groundwater elevation measurement was not collected.

FIGURE 4-6A

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION D-D'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECDDA

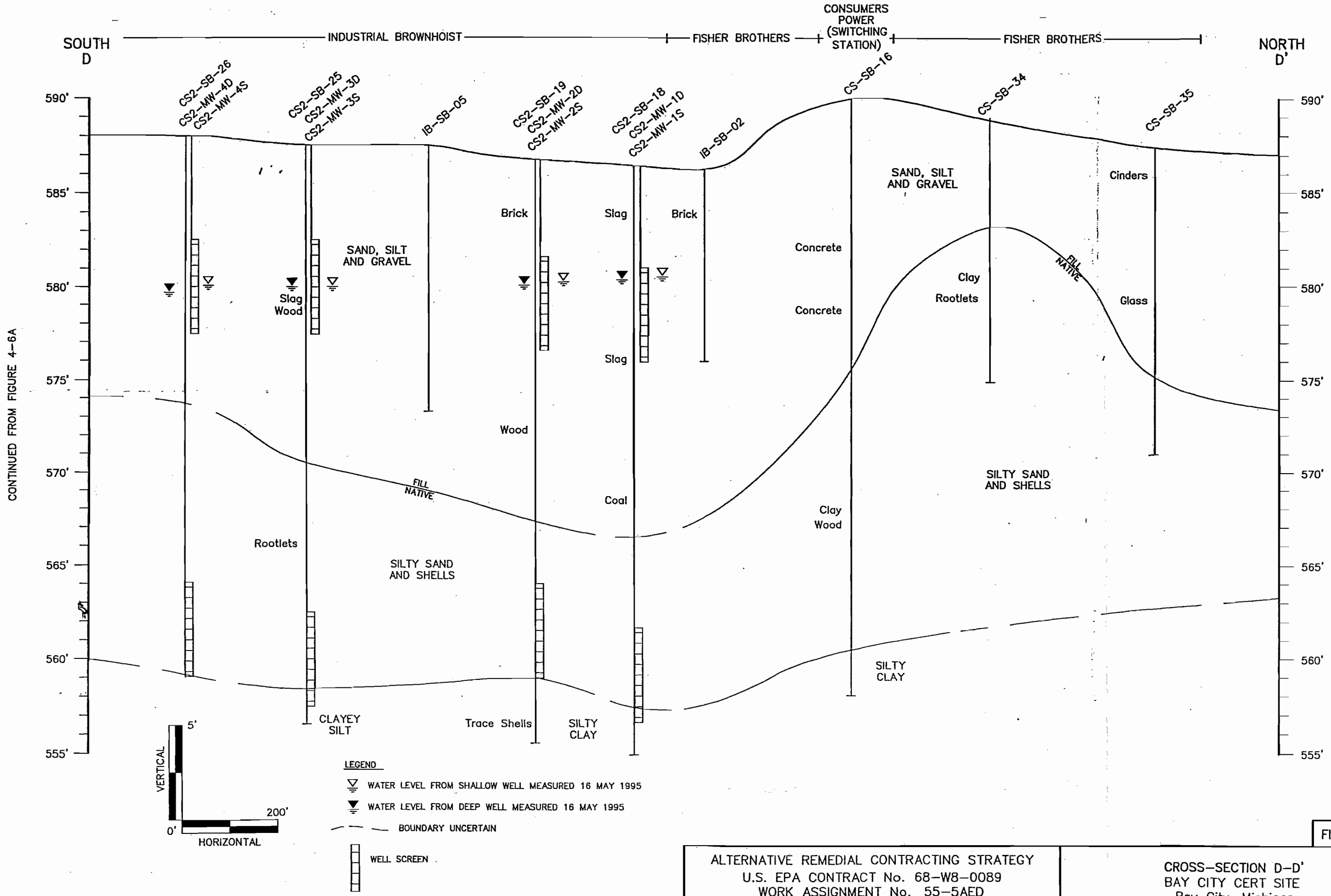
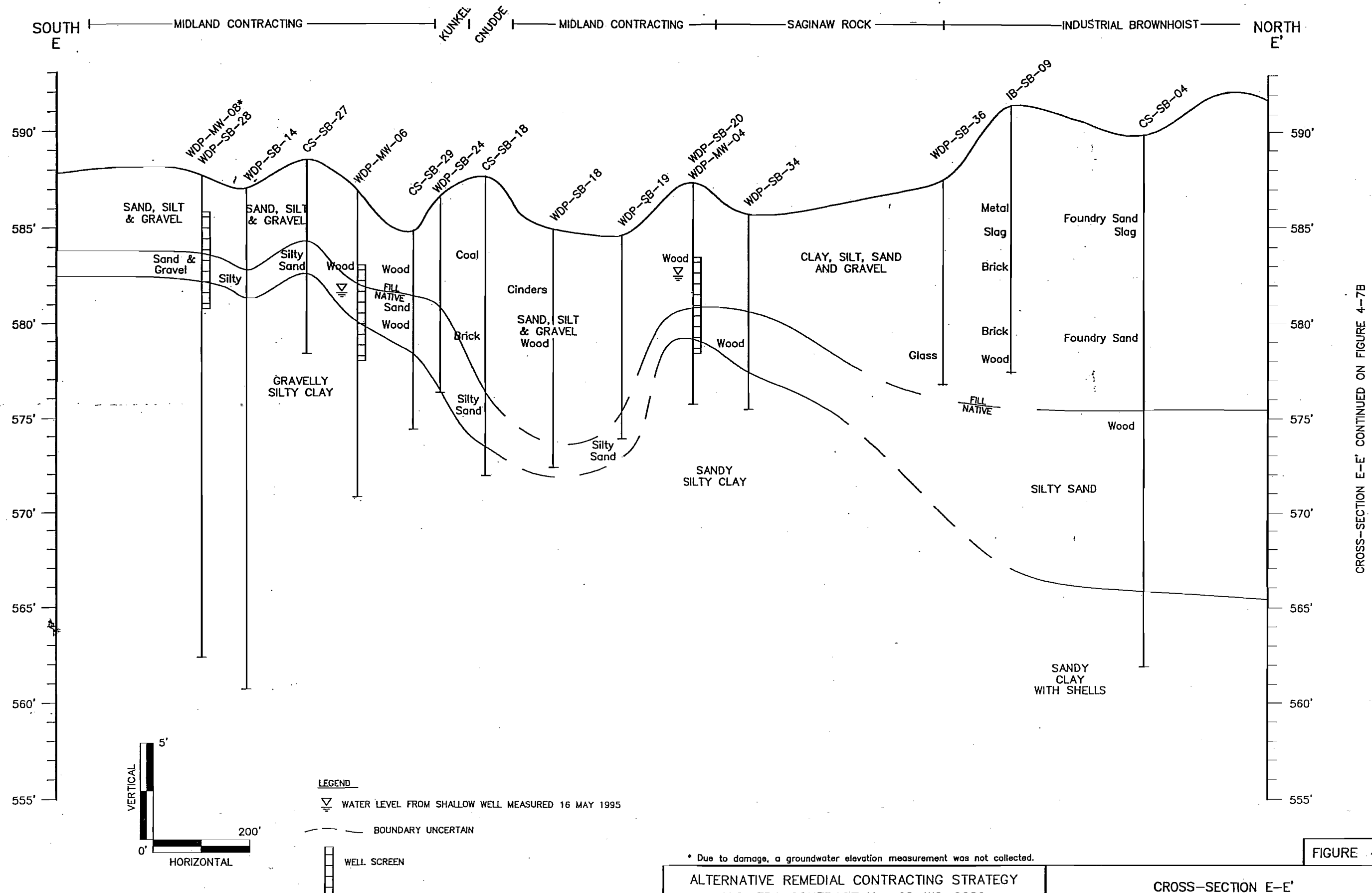


FIGURE 4-6B

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION D-D'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECDDB



CROSS-SECTION E-E' CONTINUED ON FIGURE 4-7B

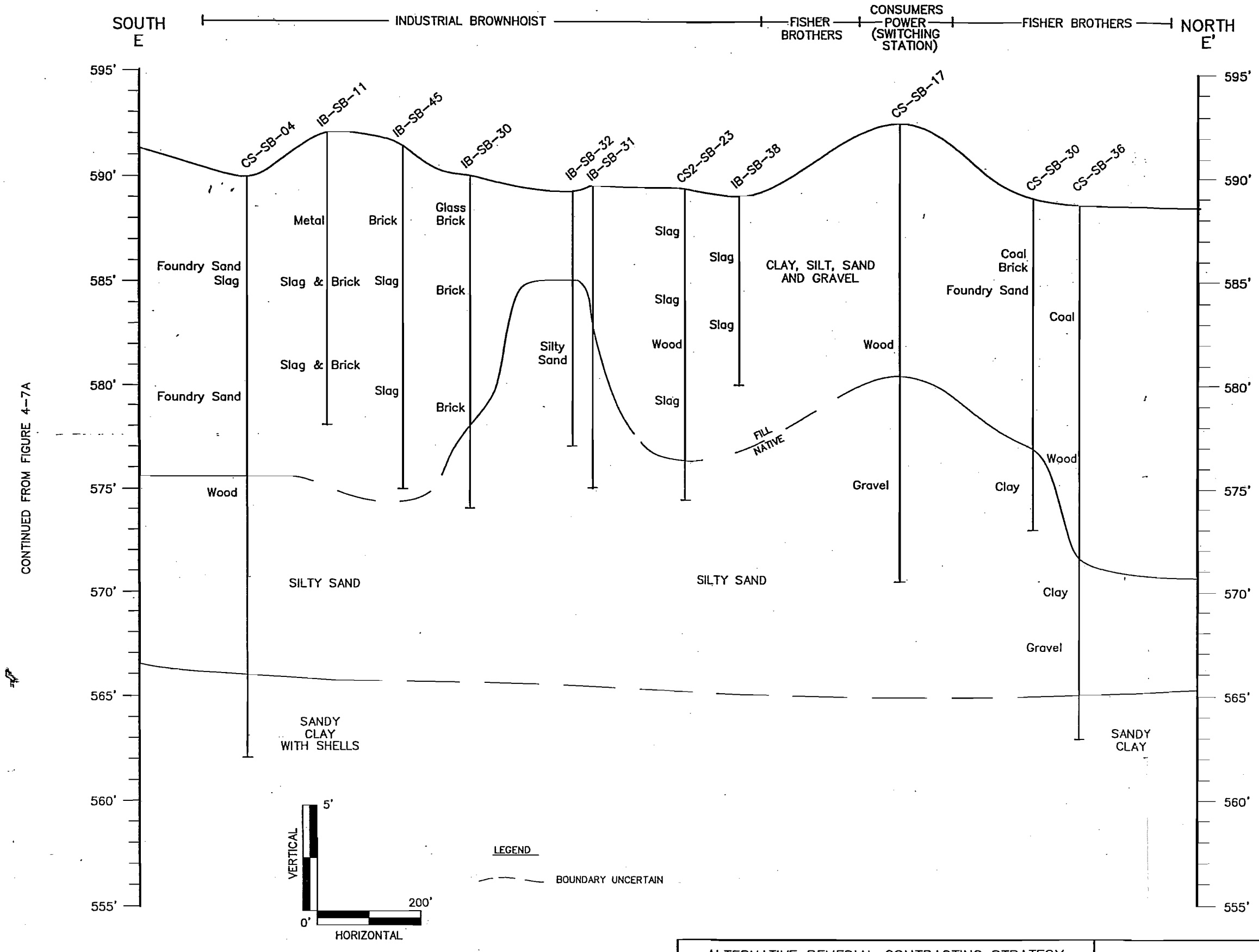
* Due to damage, a groundwater elevation measurement was not collected.

FIGURE 4-7A

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION E-E'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECEEA.DWG



CONTINUED FROM FIGURE 4-7A

FIGURE 4-7B

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION E-E'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECEEB.DWG

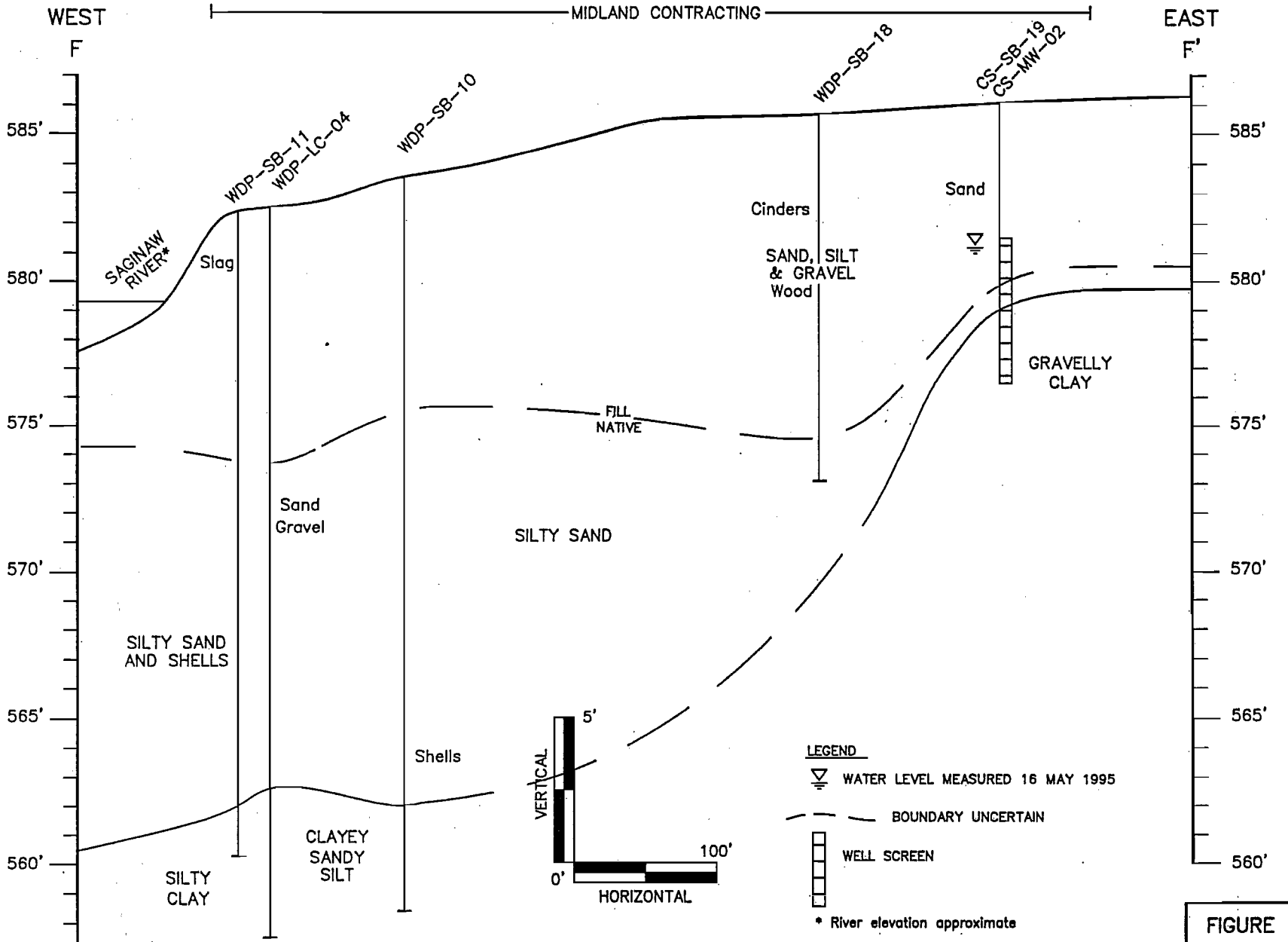


FIGURE 4-8

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION F-F'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECFF.DWG

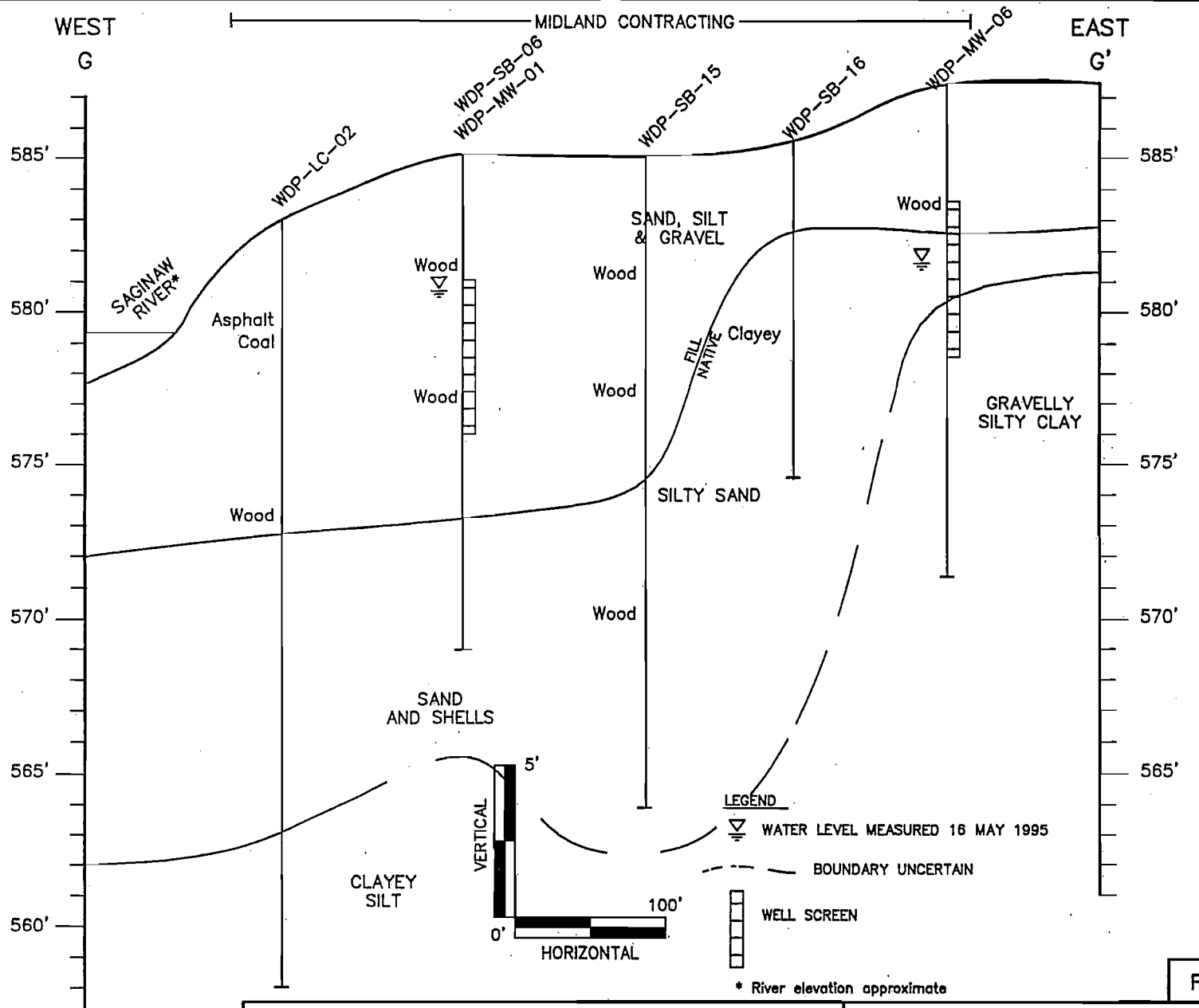
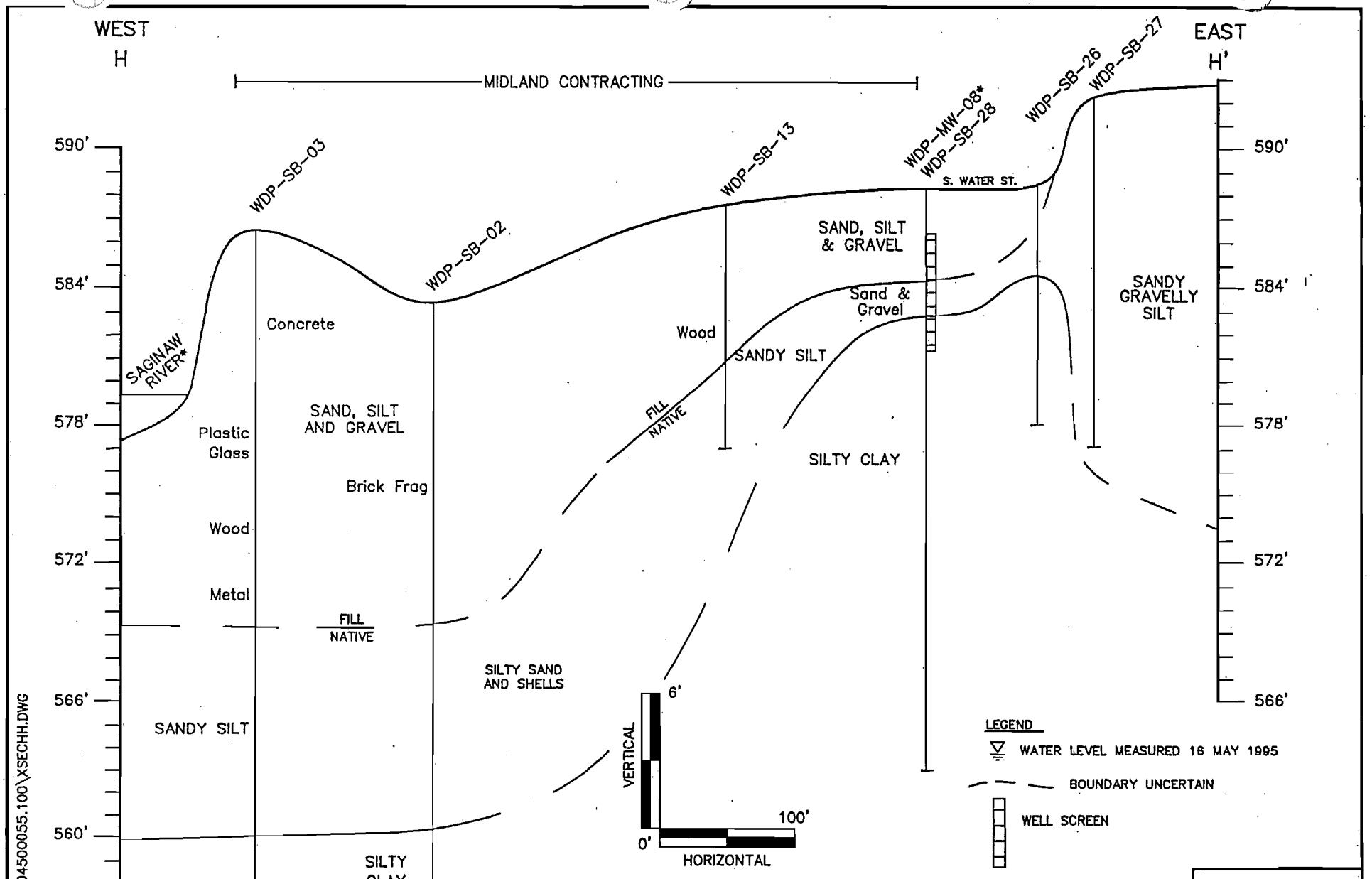


FIGURE 4-9

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION G-G'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECGG.DWG



* Due to damage, a groundwater elevation measurement was not collected, river elevation approximate.

FIGURE 4-10

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION H-H'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECHH.DWG

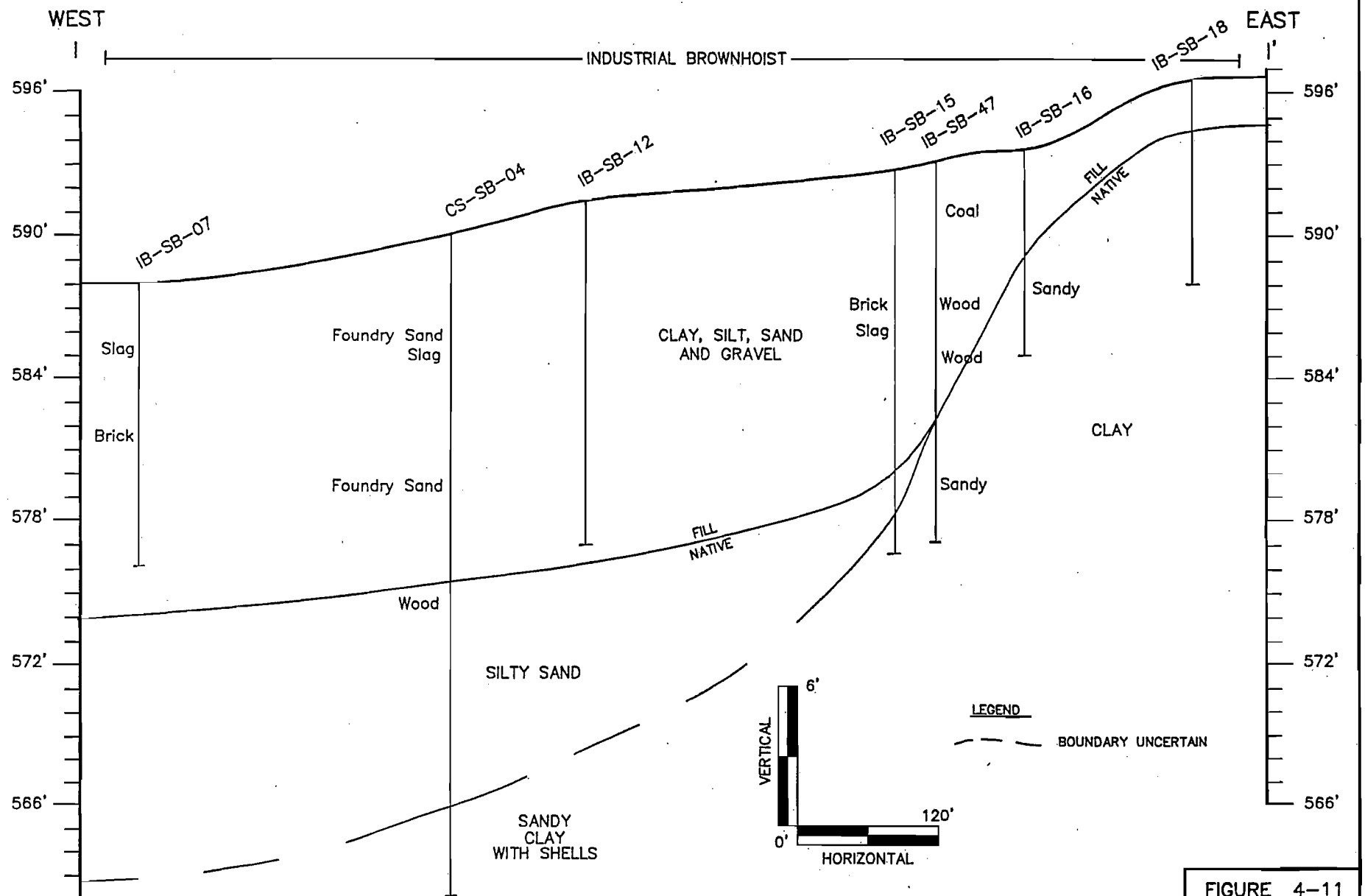


FIGURE 4-11

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION I-I'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECII.DWG

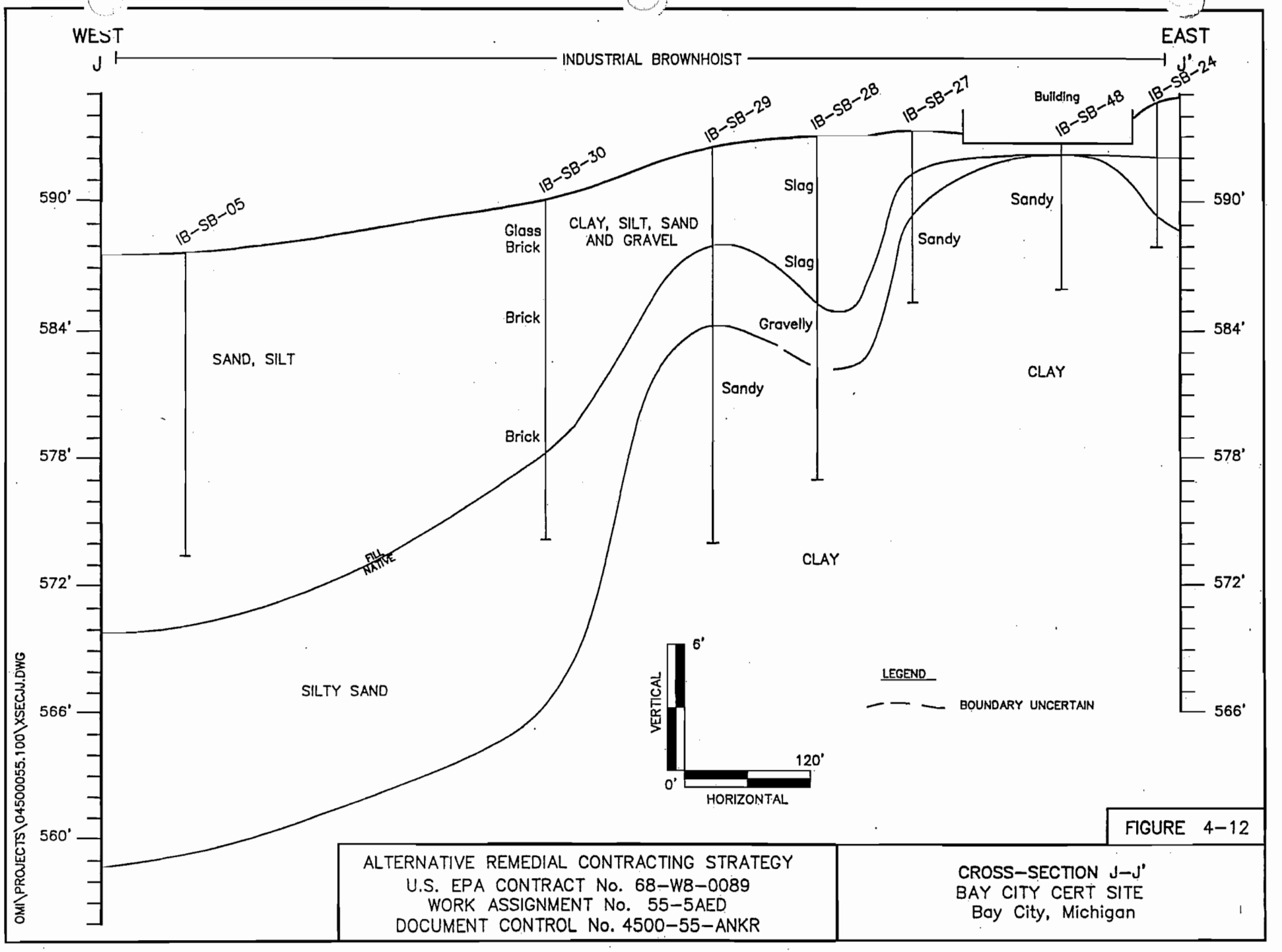


FIGURE 4-12

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION J-J'
BAY CITY CERT SITE
Bay City, Michigan

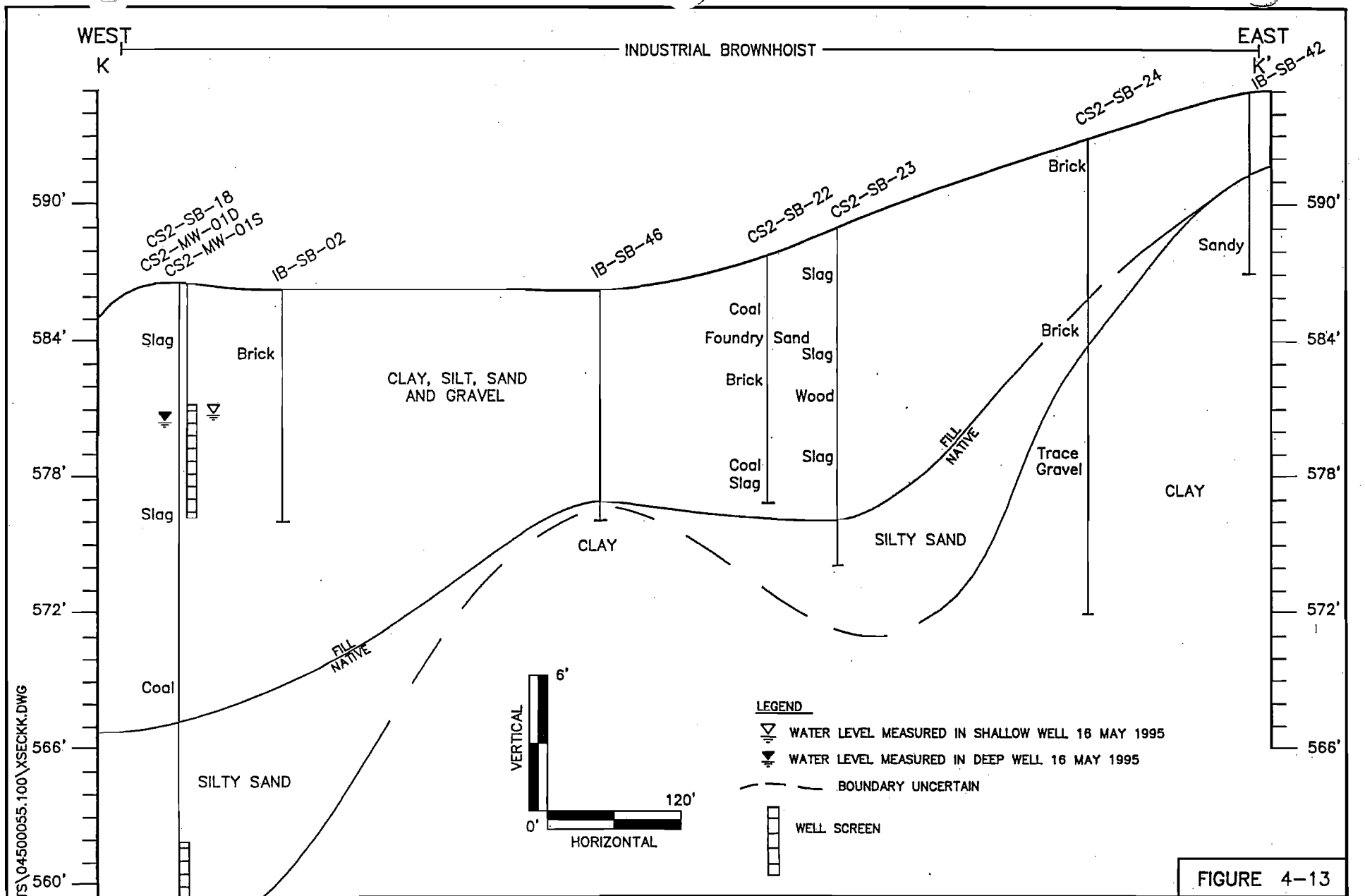
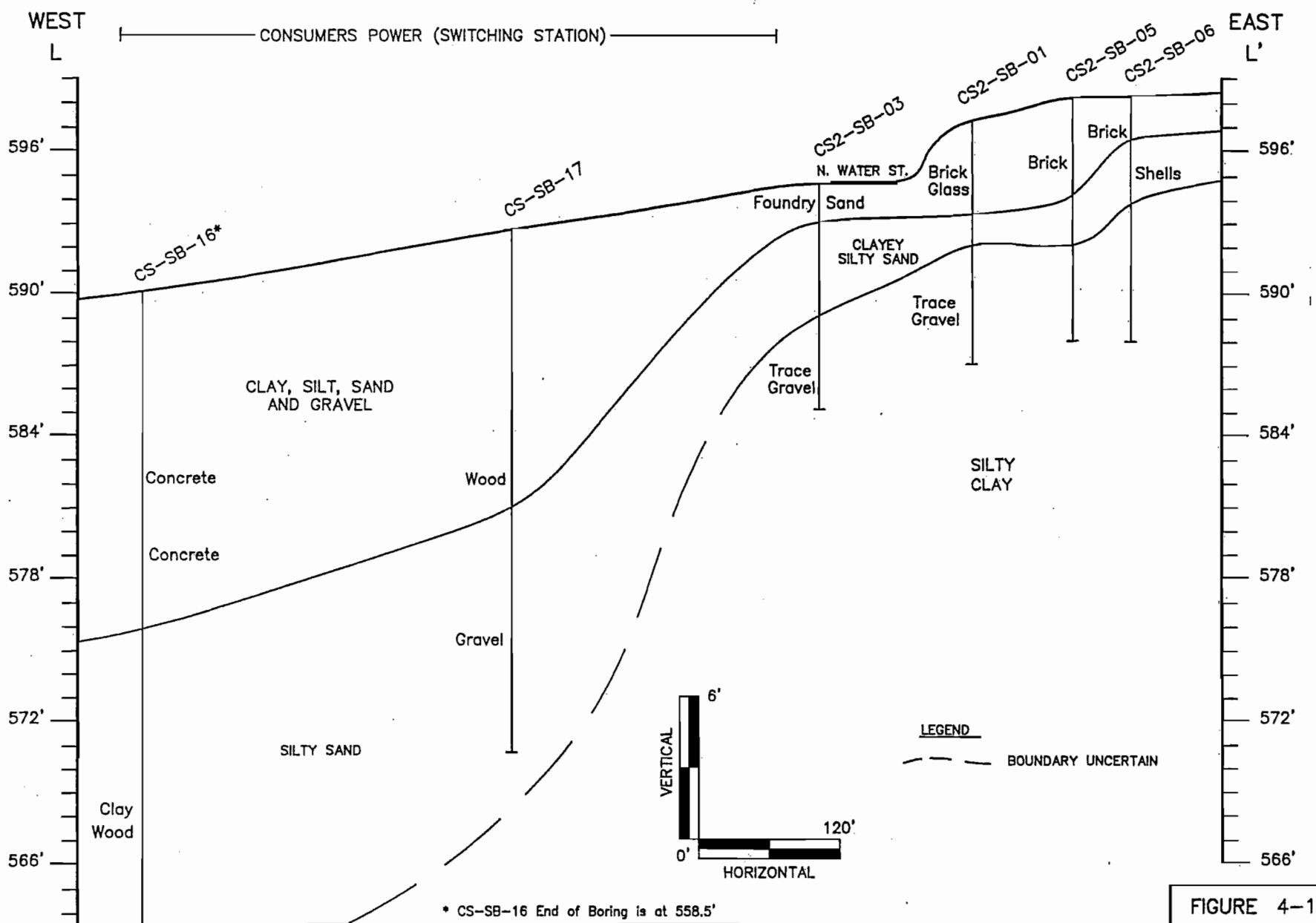


FIGURE 4-13

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION K-K'
BAY CITY CERT SITE
Bay City, Michigan



* CS-SB-16 End of Boring is at 558.5'

FIGURE 4-14

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

CROSS-SECTION L-L'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECLL.DWG

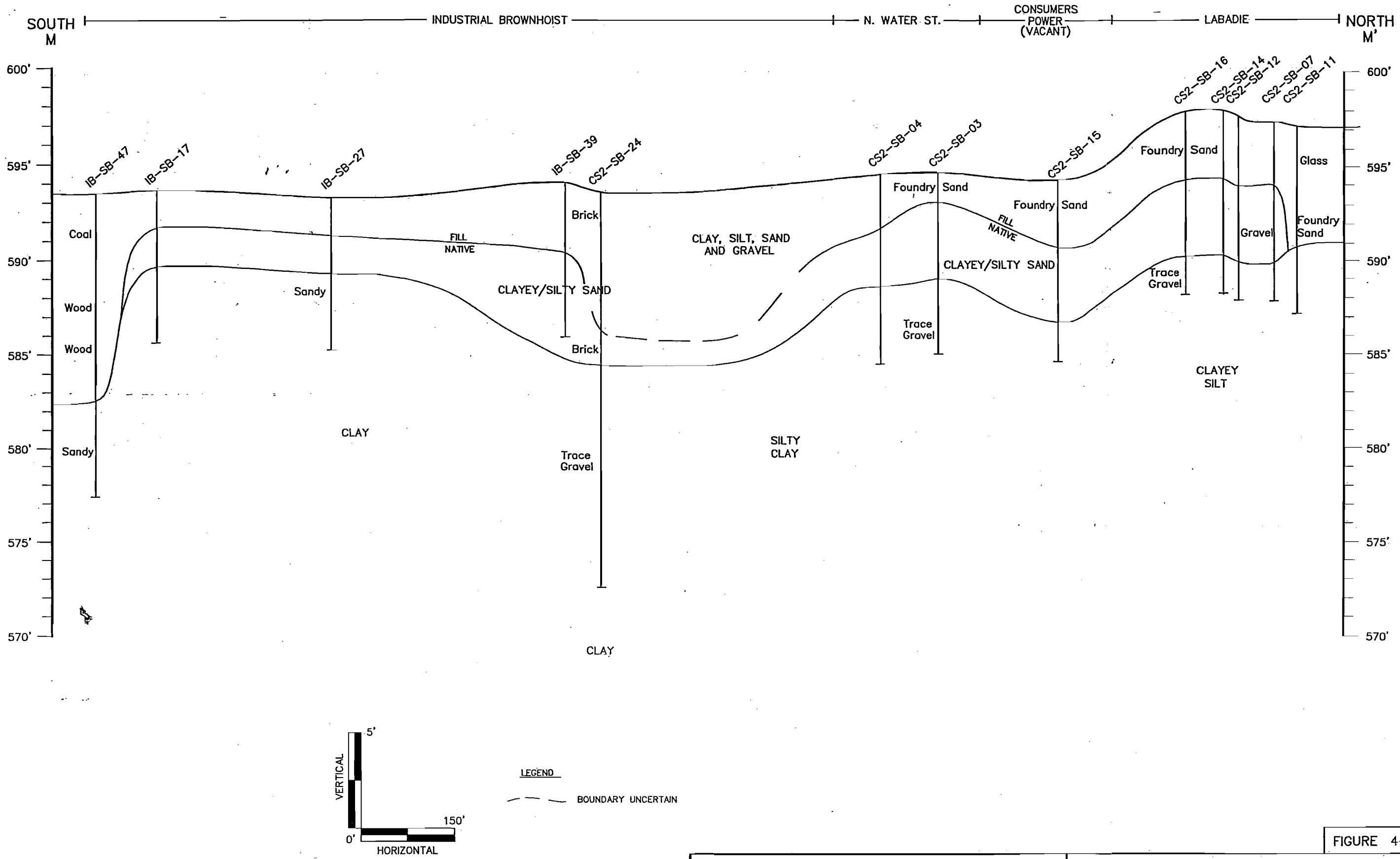


FIGURE 4–15

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

CROSS–SECTION M–M'
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.100\XSECMM.DWG

The laterally discontinuous alluvial material thickens toward the river and appears to pinch out locally on the eastern side of the site. The alluvium displays typical stream deposit stratigraphy, including mixed or interbedded sand, silty sand, and clay, with finer grained units becoming more prevalent at depth. All of these deposits contain organic material. Pieces of wood and shells are often mixed into the alluvium. Sand units vary from gray to brown with well sorted subangular grains. Bedding thickness varies significantly from less than 0.25 inches to 2 feet. The organic clay is generally soft and very dark gray. Near the river the clay unit is approximately 24 feet below the ground surface. The sand and silt units pinch out to the east away from the river.

The glacial till underlies the alluvium toward the river on the west site of the site, but is shallower and often directly underlies the fill material on the eastern side of the site where the alluvium is absent. The clay till is firm to stiff with some angular gravel and sand. The clay till is mottled and has a massive structure. Its color varies from grayish brown to dark gray. Site drilling activities characterized the lithology to a maximum depth of 60 feet. No other stratigraphic units were identified. A top of clay elevation map is depicted in Figure 4-16.

4.3 SITE HYDROGEOLOGY

The site is located within the Saginaw River drainage basin. The temporary groundwater monitoring wells installed at the IB parcels (Parcels 7 and 8) in November of 1992 indicated that groundwater flow within the uppermost unconsolidated soils was toward the west and the Saginaw River. On 16 and 17 May 1995, water levels were collected from all of the permanent monitoring wells that were still present on the CERT site. A potentiometric surface map for the shallow aquifer is illustrated in Figure 4-17. Water elevation data from all of the wells installed above the clay till confining zone was used to construct the map.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

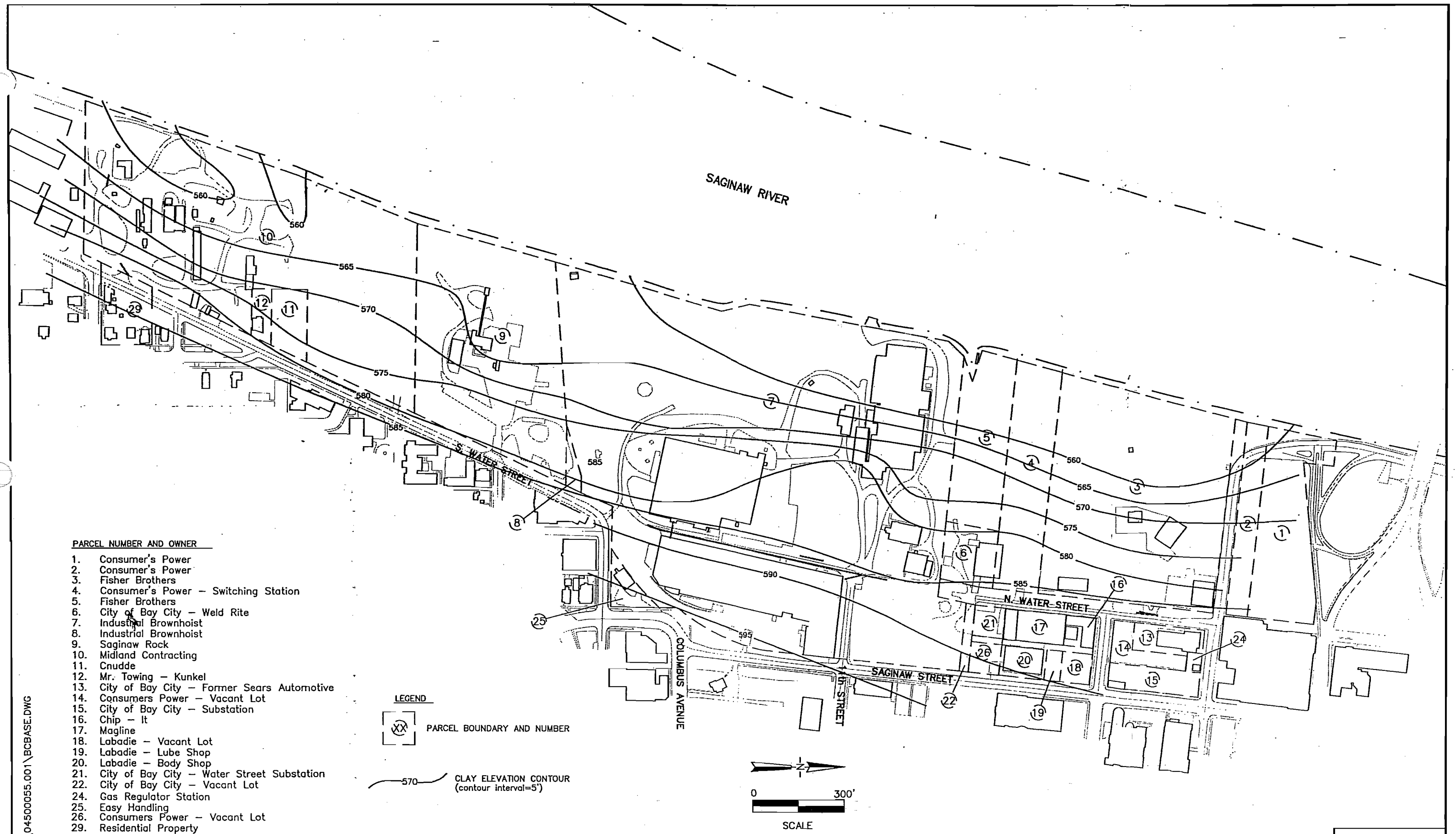
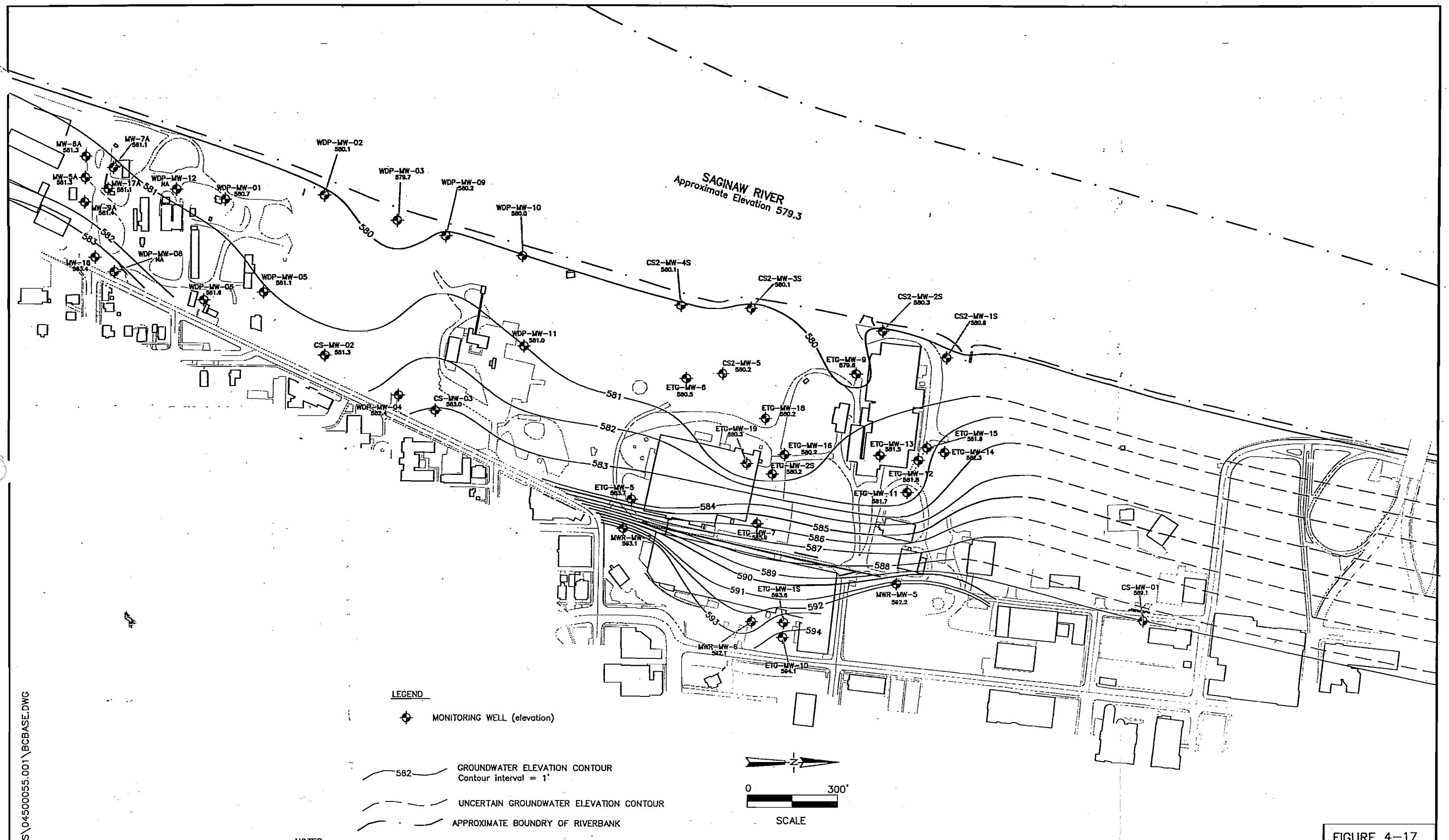


FIGURE 4–16

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

TOP OF CLAY ELEVATION MAP
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.001\BCBASE.DWG



NOTES

Groundwater elevations collected on 16 & 17 May 1995
Due to damage, groundwater elevation were not collected from WDP-MW-08 & WDP-MW-12
ETG & MWR well locations are approximate

FIGURE 4-17

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

POTENTIOMETRIC SURFACE MAP

BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.001\BCBASE.DWG

4.3.1 Groundwater Occurrence

Site-wide shallow groundwater flow is in a westerly direction toward the Saginaw River; however, localized flow varies from the northwest to the southwest. Throughout most of the site, shallow groundwater occurs within the fill at depths ranging from approximately 2 to 8 feet below the ground surface. In the eastern portion of the site where the fill material and alluvium are absent, shallow groundwater was not encountered in the glacial till. Additionally, groundwater was not encountered within deeper portions of the clay till in any of the areas where soil borings extended into the till.

4.3.2 Estimated Aquifer Parameters

The average horizontal hydraulic gradient across the site based on groundwater levels measured on 16 and 17 May 1995 is approximately 0.009 feet per foot (ft/ft). Groundwater generally flows in a westerly direction toward the Saginaw River with some localized flow varying from the northwest to the southwest.

Vertical gradients were calculated at each of the well nests at the IB parcels (Parcels 7 and 8). The vertical gradient between CS2-MW-1S and CS2-MW-1D was calculated to be 0.01 ft/ft downward. The vertical gradient between CS2-MW-2S and CS2-MW-2D was calculated to be 0.009 ft/ft downward. The vertical gradient between CS2-MW-3S and CS2-MW-3D was calculated to be 0.002 ft/ft upward, but the measured elevation variance in the MW-3 well nest was only 0.03 ft, within the margin of measuring error. Therefore, the vertical gradient at this location is considered negligible. The vertical gradient between CS2-MW-4S and CS2-MW-4D was calculated to be 0.01 ft/ft downward. The site-wide average downward vertical gradient (for areas nearest the river) based on measurements at each of these well nests was calculated to be approximately 0.01 ft/ft downward.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Although there were no aquifer tests performed by WESTON at the CERT site, an estimated shallow groundwater velocity was calculated by estimating the following aquifer parameters:

- Average effective porosity (n) = 30 percent (%)
- Average horizontal hydraulic gradient (i) = 0.009 ft/ft
- Average hydraulic conductivity (K) = 0.283 feet per day (ft/day) to 283 ft/day, from Freeze and Cherry, 1979, for silty sand.

Based on the following equation,

$$\text{Average linear velocity (V)} = Ki/n$$

the average linear velocity for the CERT site is estimated to range from approximately 0.008 ft/day to 8.5 ft/day.

4.3.3 Discussion of Groundwater Flow

The shallow groundwater flow system underlying the CERT site is influenced by a variety hydrogeologic factors, including stratigraphic heterogeneities, extensive and variable types of fill deposits, the undulating and sloping clay/till surface topography, river level fluctuations, and the discontinuity of the fill and alluvium course grain deposits. Shallow groundwater flow occurs almost entirely within the fill material and alluvium. Groundwater may also occur in localized, thin sand lenses which typically occur within glacial tills; however, no lenses were encountered during site drilling efforts.

Shallow groundwater flows in a westerly direction across the CERT site and discharges into the Saginaw River. The heterogeneities within the fill material and river sediment/alluvium, along with resultant changes in hydraulic conductivity, induce minor localized flow toward the northwest and southwest. Buried utility lines and storm sewers were not observed to have any significant

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

effects on site-wide groundwater flow. Also, there are no groundwater pumping activities in the area which would impact local flow conditions.

Horizontal hydraulic gradients are steeper at the eastern portion of the site and lessen toward the Saginaw River. The Saginaw River elevation historically rises and falls several feet during relatively short periods (e.g. a few hours) due to abrupt changes in wind direction and atmospheric pressure. The Saginaw River discharges to the Saginaw Bay, which is located approximately one mile downstream of the CERT site. During the CERT investigation, changes in river elevation may have affected water levels in monitoring wells located immediately adjacent to the river, but site-wide groundwater flow directions remained largely unchanged. There were no observed reversals in hydraulic communication between the river and the shallow aquifer related to fluctuating river levels or precipitation events. If bank storage did occur, it would likely be minimal due to the shallow depth to groundwater present along the riverbank throughout the year. The Saginaw River appears to consistently act as a groundwater discharge boundary near the CERT site. It should be noted that the nearest river gauging station is located near the mouth of the Saginaw River approximately one mile downstream of the site; therefore, the exact river elevation at the site was not recorded when monitoring well water levels were measured.

The vertical hydraulic gradients within the shallow groundwater aquifer appear to be consistent from north to south nearest the river, with all measurements showing flat to slightly downward gradients. Importantly, only one site-wide round of water level measurements was performed, so seasonal fluctuations of site-wide groundwater flow could not be quantified. Multiple rounds water levels were collected from individual parcels, however, and minimal effects were observed.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 5
FIELD INVESTIGATION

WESTON initiated the field investigation at the IB parcels (Parcels 7 and 8) in October 1992. Field activities were completed in December 1992. Also in December 1992, additional PCB sampling activities were conducted. Following authorization from the U.S. EPA, WESTON conducted field activities for the CERT project area between May 1993 and September 1993. These field activities included: a geophysical survey, a radiation survey and sampling, a soil quality assessment, a groundwater quality assessment, and Phase I assessments at seven previously unaddressed parcels. The 1992 and 1993 field investigation activities are referred to as the Phase II characterization in the remainder of this section.

All of the samples initially collected at the IB parcels (Parcels 7 and 8), except those collected for radiation, toxicity characteristic leaching procedure (TCLP) metals and extraction procedure (EP) toxicity metals analyses, were analyzed by Clayton Environmental Laboratory (Clayton) Novi, Michigan. The TCLP metals and EP toxicity metals were analyzed by Snell Environmental (Snell) Lansing, Michigan. The radiation samples were analyzed by Core Laboratories (Core) Casper, Wyoming. Table 5-1 summarizes the samples collected at the IB parcels (Parcel 7 and 8) in November of 1992 and the analyses performed on these samples. Tables 5-2 summarizes the samples that were collected during the May and September 1993 effort and the analyses performed on those samples.

Following the Phase II characterization activities, a Phase I assessment was conducted at one previously unaddressed parcel (National Environmental Supercomputer Center Building) in November 1994. A Phase III characterization was performed at the five parcels comprising the WDP in October through December 1994 and a Phase III characterization was performed at the IB parcels (Parcels 7 and 8), Weld-Rite (Parcel 6), Labadie (Parcels 18, 19 and 20) and Consumers Power (Parcel 26) parcels in February 1995. Additional river sediment characterization borings were advanced in April 1995 in the Saginaw River and on the riverbank

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Summary of Samples Collected and Analyses Performed
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan
November 1992

Area of Concern	Sample No.	Matrix	Sample Interval (feet)	Analyses Performed					
				VOC	SVOC	PAH	Metal	PCB	Cyanide
Area No. 1	IBSB3701	Soil	6-10	X	X			X	
	IBMW01	Water		X	X		X	X	X
Area No. 2	IBSB3801	Soil	4-6	X					
	IBSB3802	Soil	2-8 (composite)		X			X	
	IBSB4601	Soil	8-10	X	X			X	
	IBSB4602	Soil	4-6	X	X			X	
	IBMW02	Water		X	X		X	X	X
Area No. 3	No soil borings or monitoring wells were installed in this area. No samples were collected in this area.								
Area No. 4	IBSB0101	Soil	6-8	X	X		X	X	
	IBSB0102	Soil	8-10	X	X		X	X	
	IBSB0201	Soil	8-10	X	X		X		
	IBSB0301	Soil	6-8	X	X				
	IBSB0302	Soil	8-10	X	X				
	IBMW04	Water		X	X		X	X	X
Area No. 5	IBSB3301	Soil	6-8	X	X		X		
	IBSB3302	Soil	12-14	X	X		X		
	IBSB3401	Soil	4-6	X	X		X		
	IBMW13	Water		X	X		X	X	X
	IBHA1601	Soil	3-3.5	X					
	IBHA1602	Soil	1.5-2/3-3.5 (composite)		X		X	X	
Area No. 5A	IBSB3101	Soil	10-12	X	X		X		
	IBSB3201	Soil	4-6	X	X		X		
	IBSB3202	Soil	8-10	X	X		X		
	IBHA1701	Soil	1.5-2	X					
	IBHA1702	Soil	1.5-2		X		X	X	
	IBMW12	Water		X	X		X	X	X
Area No. 6	IBSB0401	Soil	16-18	X		X		X	
	IBSB0402	Soil	29-31	X		X		X	
	IBSB0501	Soil	10-12	X					
	IBSB0502	Soil	6-14			X		X	
	IBMW03	Water		X	X		X	X	X

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-1 (Continued)

Summary of Samples Collected and Analyses Performed
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan
November 1992

Area of Concern	Sample No.	Matrix	Sample Interval (feet)	Analyses Performed					
				VOC	SVOC	PAH	Metal	PCB	Cyanide
Area No. 7	IBSB4501	Soil	10-12	X		X	X	X	
	IBSB4502	Soil	12-14			X	X	X	
	IBSB4503	Soil	14-16	X					
	IBHA1001	Soil	3-3.5	X					
	IBHA1002	Soil	1.5-2/3-3.5 4-4.5 (composite)				X	X	
	IBHA1101	Soil	1.5-2	X					
	IBHA1102	Soil	1.5-2				X	X	
Area No. 8/9	IBSB0601	Soil	15-17	X					
	IBSB0602	Soil	7-17 (composite)		X		X	X	
	IBSB0701	Soil	8-10	X					
	IBSB0702	Soil	2-12 (composite)		X		X	X	
	IBSB0801	Soil	8-10	X	X		X	X	
	IBSB0802	Soil	10-12	X					
	IBSB0901	Soil	4-6	X	X		X	X	
	IBSB1001	Soil	8-10	X	X		X	X	
	IBMW05	Water		X	X		X	X	X
	IBMW08	Water		X	X		X	X	X
Area No. 10	IBSB1101	Soil	4-6	X		X	X		
	IBSB1102	Soil	12-14	X		X	X		
	IBSB1201	Soil	12-14	X		X	X		
	IBMW06	Water		X	X		X	X	X
Area No. 11	IBSB1301	Soil	4-6	X		X	X		
	IBSB1302	Soil	12-14	X		X	X		
	IBSB1401	Soil	8-10	X		X	X		
	IBSB1501	Soil	2-4	X		X	X		
	IBSB1502	Soil	8-10	X		X	X		
	IBSB4301	Soil	4-6	X		X	X		
	IBSB4701	Soil	4-6	X		X	X		
	IBSB4702	Soil	8-10	X		X	X		
	IBMW07	Water		X	X		X	X	X
	IBMW14	Water		X	X		X	X	X

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-[illegible]tinued)

Summary of Samples Collected and Analyses Performed
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan
November 1992

Area of Concern	Sample No.	Matrix	Sample Interval (feet)	Analyses Performed					
				VOC	SVOC	PAH	Metal	PCB	Cyanide
Area No. 12	IBSB1601	Soil	2-4	X		X	X		
	IBSB1602	Soil	4-6	X		X	X		
	IBSB1701	Soil	2-4	X					
	IBSB1702	Soil	4-6			X	X	X	
Area No. 13	IBSB2501	Soil	6-8	X		X	X	X	
	IBSB2502	Soil	10-12	X		X	X	X	
	IBSB2503	Soil	12-14	X		X	X	X	
	IBSB2601	Soil	6-8	X					
	IBSB2602	Soil	8-10			X	X	X	
	IBSB2701	Soil	2-4	X		X	X	X	
	IBSB2702	Soil	4-6	X		X	X	X	
	IBMW10	Water		X	X		X	X	X
Area No. 14	IBSB2801	Soil	10-12	X					
	IBSB2802	Soil	12-14			X	X	X	
	IBSB2803	Soil	14-16	X		X	X	X	
Area No. 15	IBSB2901	Soil	4-6	X		X	X	X	
	IBSB2902	Soil	12-14			X	X	X	
	IBSB2903	Soil	14-16	X					
Area No. 15/16A	IBSB3001	Soil	2-4	X					
	IBSB3002	Soil	12-14	X		X	X	X	
	IBMW11	Water		X	X		X	X	X
Area No. 16	No soil borings or monitoring wells were installed in this area. No samples were collected in this area.								
Area No. 16/17A	IBSB3501	Soil	6-8	X		X	X	X	
	IBSB3601	Soil	10-12	X		X	X	X	
Area No. 17	IBSB3901	Soil	6-8	X		X	X		
	IBMW09	Water		X	X		X	X	X
Area No. 18	IBSB4401	Soil	10-12	X					
	IBSB4402	Soil	20-22	X					
	IBSB4403	Soil	12-14	X		X			
	IBSB4404	Soil	22-24	X		X	X	X	

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-1 (Continued)

Summary of Samples Collected and Analyses Performed
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan
November 1992

IB - Areas of concern	Sample	Matrix	Sample Depth (ft)	Analyses Performed					
				VOC	SVOC	PAH	Metal	PCB	Cyanide
Area No. 19	IBSB1901	Soil	2-4	X		X	X	X	
	IBSB1902	Soil	6-8	X		X	X	X	
	IBSB2002	Soil	0-6 (composite)			X	X	X	
	IBSB2301	Soil	4-6	X	X		X		X
	IBSB2401	Soil	4-6	X	X		X		X
	IBHA1201	Soil	4-4.5	X					
	IBHA1202	Soil	1.5-2/3-3.5/ 4-4.5 (composite)			X	X	X	X
	IBHA1301	Soil	1.5-2	X					
	IBHA1302	Soil	1.5-2/3-3.5/ 4-4.5 (composite)			X	X	X	
	IBHA1401	Soil	3-3.5	X					
	IBHA1402	Soil	1.5-2/3-3.5 4-4.5 (composite)			X	X	X	
	IBHA1501	Soil	2.5-3	X					
	IBHA1502	Soil	1.5-2/2.5-3/3-3.5/ 4-4.5 (composite)			X	X	X	
Area No. 20	IBSB2101	Soil	0-2	X	X		X		X
	IBSB2102	Soil	2-4	X	X		X		X
	IBSB2201	Soil	4-6	X	X		X		X
	IBCC01	Concrete	Surface						X
	IBCC02	Concrete	Surface						X
	IBCC03	Concrete	Surface						X
Area No. 21	No soil borings or monitoring wells were installed in this area. No samples were collected in this area.								
Area No. 22	IBSB1801	Soil	2-4	X		X	X		
Area No. 23	IBSB4801	Soil	0-1 (surface)			X		X	
	IBSB4802	Soil	2-4	X		X		X	
	IBSB4901	Soil	0-2	X	X			X	
	IBSB4902	Soil	6-8	X	X			X	
Area No. 24	No soil borings or monitoring wells were installed in this area. No samples were collected in this area.								
Area No. 25	IBSB4001	Soil	4-6	X		X			
	IBHA0601	Soil	1.5-2	X					
	IBHA0602	Soil	1.5-2/3-3.5 (composite)		X		X	X	
	IBHA0701	Soil	1.5-2	X					
	IBHA0702	Soil	1.5-2/3-3.5/ 4-4.5 (composite)		X		X	X	
	IBHA0801	Soil	2.5-3	X					
	IBHA0802	Soil	1.5-2/2.5-3 (composite)		X		X	X	
Area No. 25A	IBSB4101	Soil	6-8	X		X			
	IBSB4201	Soil	6-8	X		X			
	IBHA0901	Soil	3-3.5	X					
	IBHA0902	Soil	1.5-2/3-3.5 4-4.5 (composite)		X		X	X	

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-2

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
May - June 1993

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed								
				VOC	SVOC	PAH	BTEX	Metals	PCB	Cyanide	TCLP/EP Tox.	Radiation
Industrial Brownhoist Area 5A	CS-SB-01	Soil	2-10								X	
Area 5	CS-SB-02	Soil	10-16								X	
Area 8	CS-SB-04	Soil	8-14	X	X			X	X			
	CS-SB-04	Soil	25-28		X							
	CS-SB-06	Soil	6-12	X	X			X	X			
	CS-SB-06 R	Soil	25-29	X	X				X			
	CS-HA-07	Soil	.5-1.5									X
Area 11	CS-SB-05	Soil	8-14								X	
	CS-HA-06	Soil	.5-1.5									X
Area 14	CS-SB-03	Soil	10-14								X	
Area 18	CS-SB-07	Soil	10-16			X						
	CS-SB-07	Soil	21-22	X		X						
Area 18A	CS-SB-13	Soil	3-7	X	X					X		
	CS-SB-14	Soil	5	X	X					X		
	CS-SB-15	Soil	5-7	X	X							
	CS-SB-22	Soil	5-9	X	X				X	X		
		Soil	9-11	X	X				X	X		
	CS-SB-25	Soil	5	X	X				X	X		
Area 25/25A	CS-HA-12	Soil	1.5								X	
	CS-HA-08	Soil	.5-1.5									X
	CS-HA-09	Soil	0.5-1						X			
	CS-HA-10	Soil	0.5-1						X			

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-2 (Continued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
May - June 1993

Parcels	Sample	Matrix	Sample Depth (ft)	VOC	SVOC	PAH	BTEX	Analyses Performed: Metals	PCB	Cyanide	TCLP/EP Tox.	Radiation
Fisher Brothers (Parcel 3)	CS-SB-30	Soil	10-14					X				
	CS-SB-33	Soil	6-10					X				
	CS-SB-34	Soil	6-8					X				
	CS-SB-35	Soil	2-10	X	X			X	X			
	CS-SB-36	Soil	17-19					X				
Former Sears Automotive (Parcels 13 and 14)	CS-SB-10	Soil	10-12			X						
	CS-SB-11	Soil	0-6			X						
	CS-MW-01	Soil	2-6			X						
	CS-MW-01	Water		X	X			X	X	X		
y of Bay City Substation (Parcel	CS-HA-13	Soil	.5-1						X			
	CS-HA-17	Soil	.5-1						X			
		Soil	2.5-3						X			
Weld-Rite (Parcel 6)	CS-HA-02	Soil	.5-1						X			
		Soil	2.5-3						X			
	CS-HA-11	Soil	.5-1						X			
		Soil	2.5-3						X			
Water St. Substation (Parcel 21)	CS-HA-01	Soil	.5-1						X			
		Soil	2.5-3						X			
	CS-HA-04	Soil	.5-1						X			
		Soil	2.5-3						X			
	CS-HA-05	Soil	.5-1						X			
		Soil	2.5-3						X			

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-2 (Continued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
May - June 1993

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed								
				VOC	SVOC	PAH	BTEX	Metals	PCB	Cyanide	TCLP/EP Tox.	Radiation
Labadie (Parcel 18)	CS-HA-14	Soil	.5-1						X			
		Soil	2.5-3						X			
onsumers Power Switching Stati	CS-HA-03	Soil	.5-1						X			
(Parcel 4)	CS-HA-16	Soil	.5-1						X			
		Soil	2.5-3						X			
	CS-SB-16	Soil	.5-1						X			
		Soil	14-16					X				
	CS-SB-17	Soil	.5-1						X			
Consumers Power Vacant Lot	CS-SB-08	Soil	4-6	X								
(Parcel 26)	CS-SB-09	Soil	2-4					X				
Cnudde (Parcel 11)	CS-SB-18	Soil	.5-1	X	X			X	X			
	CS-SB-18	Soil	4-6						X			
Kunkel (Parcel 12)	CS-SB-12	Soil	6-16	X	X			X	X			
Midland (Parcel 10)	CS-SB-26	Soil	1-4			X						
	CS-SB-27	Soil	4-6				X					
	CS-SB-28	Soil	.5-1						X			
	CS-SB-29	Soil	.5-1						X			
	CS-MW-02	Water		X	X			X	X	X		
	CS-MW-03	Water		X	X			X	X	X		

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

adjacent to the Midland parcel (Parcel 10). Additional well sampling activities at the WDP and IB parcels (Parcels 7 and 8) were conducted in September and December 1995.

All of the samples collected during the Phase III Characterization were analyzed by Clayton and/or Envirosystems, Inc. (Envirosystems) in Columbia, Maryland. Table 5-3 summarizes the Phase III sampling and analyses program conducted at the WDP in October through December 1994 and April 1995 and Table 5-4 summarized the Phase III sampling and analyses program conducted at the remainder of the CERT site. Table 5-5 summarizes the sampling and disposal parameters associated with the river and riverbank sediment samples.

The following subsections summarize the investigative activities and provide details of the field investigation.

5.1 HEALTH AND SAFETY

Prior to the initiation of field activities, a detailed site specific HASP was prepared to meet the requirements set forth by the Occupational Safety and Health Administration (OSHA) in 29 CFR (1910.120) for work conducted at hazardous waste sites. A copy of the HASP was presented to all personnel working on the site. All site personnel read and signed the HASP acknowledging their understanding and willingness to follow all procedures outlined in the HASP. The HASP was implemented at the site by the WESTON Site Health and Safety Coordinator (SHSC). Prior to initiating field work the SHSC directed a safety meeting with all on-site personnel, including subcontractor personnel, which addressed the potential safety hazards that may be encountered during the day's activities.

WESTON personnel monitored the breathing zone for VOCs, explosive atmospheres and oxygen content during drilling and sampling activities using a flame-ionization detector (FID) or photo-ionization detector (PID) for VOCs, and a combustible gas indicator (CGI) for flammability and oxygen content. WESTON also monitored with a radiation meter before, during, and after

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
October - December 1994/April 1995

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed									
				VOC	SVOC	PAH	PCB	Cyanide	Waste Char.	Metals (total)	Metals (sol.)	Metals (TCLP)	Metals (EP TOX)
Industrial Brownhoist (Parcel 7)	CS2-SB-28	Soil	4.5-6.5.5	X	X		X	X		X			
	WDP-SB-39	Soil	4.5-6.5	X	X		X	X		X			
Cnudde (Parcel 11)	WDP-SB-22	Soil	8.5-10.5			X				X			
			10.5-12.5			X				X			
Kunkel (Parcel 12)	WDP-SB-23	Soil	4.5-6.5							X			
			6.5-8.5							X			
	WDP-SB-24	Soil	2.5-4.5							X			
			4.5-6.5							X			
	WDP-SB-25	Soil	8.5-10.5							X			
			10.5-12.5							X			
	MDP-MW-05	Water			X						X		
Midland (Parcel 10)	WDP-SB-01	Soil	2-4	X									
			4-6		X		X		X			X	X
	WDP-SB-02	Soil	4-6	X									
			19-21		X		X		X	X		X	X
	WDP-SB-03	Soil	9-11	X	X		X		X			X	X
			29-31	X									
	WDP-SB-04	Soil	14-16	X	X		X		X			X	X
	WDP-SB-06	Soil	2-4	X									
			2-6		X		X		X			X	X
	WDP-SB-07	Soil	4.5-6.5	X									
			6-8		X		X		X			X	X
			22-24	X									
	WDP-SB-08	Soil	6-8	X	X		X		X			X	X
	WDP-SB-09	Soil	2.5-4.5		X		X		X			X	X
			9-11							X			
			14-16	X									
	WDP-SB-10	Soil	20-22	X	X		X		X	X		X	X
	WDP-SB-11	Soil	20-22	X	X		X		X			X	X
	WDP-SB-12	Soil	14-16	X	X		X		X			X	X
	WDP-SB-13	Soil	4-6	X		X				X			
			6-8	X		X				X			
	WDP-SB-14	Soil	19-21	X		X							
	WDP-SB-15	Soil	2-4							X			
			4-6			X				X			
	WDP-SB-16	Soil	6.5-8.5			X				X			
	WDP-SB-17	Soil	2.5-4.5			X				X			
			8.5-10.5			X				X			
	WDP-SB-18	Soil	0.5-2.5			X				X			
			4.5-6.5			X				X			

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-[illegible]tinued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
October - December 1994/April 1995

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed									
				VOC	SVOC	PAH	PCB	Cyanide	Waste Char.	Metals (total)	Metals (sol.)	Metals (TCLP)	Metals (EP TOX)
Midland (Cont.)	WDP-SB-19	Soil	2.5-4.5			X				X			
			8.5-10.5			X				X			
	WDP-SB-20	Soil	2.5-4.5			X				X			
			6.5-8.5			X				X			
	WDP-SB-28	Soil	4-6	X		X	X			X			
	WDP-SB-34	Soil	4.5-6.5		X		X						
	WDP-MW-01	Water		X	X		X	X			X		
	WDP-MW-02	Water		X	X		X	X			X		
	WDP-MW-03	Water		X	X		X	X			X		
	WDP-MW-04	Water		X	X						X		
	WDP-MW-06	Water		X	X						X		
	WDP-MW-08	Water		X	X		X				X		
	WDP-MW-12	Water		X	X		X	X			X		
Saginaw Rock (Parcel 9)	WDP-SB-29	Soil	5-7	X	X		X	X		X			
	WDP-SB-30	Soil	4.5-6.5	X	X		X	X		X			
	WDP-SB-31	Soil	4-6	X	X		X	X		X			
	WDP-SB-32	Soil	2.5-4.5	X	X		X	X		X			
	WDP-SB-33	Soil	4-6	X	X		X	X		X			
	WDP-SB-36	Soil	6.5-8.5	X	X		X	X		X			
	WDP-SB-37	Soil	0.5-2.5	X	X		X	X		X			
	WDP-MW-09	Water		X	X		X	X			X		
	WDP-MW-10	Water		X	X		X	X			X		
	WDP-MW-11	Water		X	X		X	X			X		
Residential (Parcel 29)	WDP-SB-26	Soil	6.5-8.5	X		X							
			8.5-10.5				X			X			
	WDP-SB-27	Soil	10.5-12.5	X		X	X			X			
	WDP-SB-38	Soil	8-10	X		X	X			X			
Saginaw River	WDP-RS-01	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-02	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-03	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-04	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-05	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-06	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-07	Soil	0-0.5	X	X		X	X	X			X	X
	WDP-RS-08	Soil	0-0.5	X	X		X	X	X			X	X

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
February, March, May and December 1995

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed						
				VOC	EP-TOX/TCLP	PAH	RAD	Metals	PCB	Cyanide
Labadie (Parcels 18 and 19)	CS2-SB-07	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-08	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-09	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-10	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-11	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-3.6)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-12	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						*	
		Soil	(8-10)						*	

* - Sample extracted but not analyzed.
** - WR-1 was also analyzed for flash point, and pH.

Document Control No.: 4500-55-ANKR
Page 1 of 4

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-4.wk4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-[illegible]ntinued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
February, March, May and December 1995

Parcel	Sample I.D.	Matrix	Depth below ground surface (ft)	Analyses						
				VOC	EP-TOX/TCLP	PAH	RAD	Metals	PCB	Cyanide
LABADIE (Parcels 18 and 19) con't.	CS2-SB-13	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-14	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						X	
		Soil	(8-10)						X	
	CS2-SB-16	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
CONSUMERS POWER (Parcel 26)	CS2-SB-5	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-6	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-17	Soil	(8-10)						*	
		Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
WELD-RITE (Parcel 6)	WR-1**	Product	Surface	X	X	X				
	WRO-E1	Brick	Surface				X			
	WRO-E2	Brick	Surface				X			
	WRO-E3	Brick	Surface				X			

* - Sample extracted but not analyzed.
** - WR-1 was also analyzed for flash point, and pH.

Document Control No.: 4500-55-ANKR
Page 2 of 4

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-4.wk4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5- (Continued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
February, March, May and December 1995

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed						
				VOC	EP-TOX/TCLP	PAH	RAD	Metals	PCB	Cyanide
Weld-Rite (Parcel 6)	CS2-SB-02	Soil	(0-1)						X	
		Soil	(1-2)						X	
		Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-03A	Soil	(0-1)						X	
		Soil	(1-2)						X	
	CS2-SB-03B	Soil	(2-4)						X	
		Soil	(4-6)						X	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
	CS2-SB-04	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
Industrial Brownhoist (Parcels 7 and 8) Area 25	CS2-SB-1	Soil	(0-1)						X	
		Soil	(1-2)						*	
		Soil	(2-4)						*	
		Soil	(4-6)						*	
		Soil	(6-8)						*	
		Soil	(8-10)						*	
Area 4	CS2-SB-18B	Soil	(25-27)	X		X		X		
No Specific Area	CS2-SB-19D	Soil	(17-19)	X		X		X		
		Soil	(27-29)	X		X		X		
	CS2-SB-20	Soil	(23-27)		X					
		Soil	(25-27)	X		X		X		
	CS2-SB-21	Soil	(11-17)		X					
		Soil	(15-17)	X		X		X		
	CS2-SB-22	Soil	(9-11)	X		X		X		
	CS2-SB-23B	Soil	(11-13)	X						
		Soil	(13-15)	X		X		X		
	CS2-SB-24	Soil	(9-11)	X		X		X		
	CS2-SB-25	Soil	(17-19)	X		X		X		
		Soil	(27-29)	X		X		X		
	CS2-SB-26	Soil	(9-11)	X		X		X		
Area 8	CS2-SB-27	Soil	(15-17)	X		X		X		
		Soil	(27-29)	X		X		X		
	CS2-SB-38	Soil	(8-10)	X		X		X	X	

* - Sample extracted but not analyzed.
** - WR-1 was also analyzed for flash point, and pH.

Document Control No.: 4500-55-ANKR
Page 3 of 4

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-4.wk4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-4 (Continued)

Summary of Samples Collected and Analyses Performed
CERT Site, Bay City, Michigan
February, March, May and December 1995

Parcels	Sample	Matrix	Sample Depth (ft)	Analyses Performed						
				VOC	EP-TOX/TCLP	PAH	RAD	Metals	PCB	Cyanide
Industrial Brownhoist (Parcels 7 and 8)	CS2-MW-1S	Water		X		X		X		
	CS2-MW-1D	Water		X		X		X		
	CS2-MW-2S	Water		X		X		X		
	CS2-MW-2D	Water		X		X		X		
	CS2-MW-3S	Water		X		X		X		
	CS2-MW-3D	Water		X		X		X		
	CS2-MW-4S	Water		X		X		X		X
	CS2-MW-4D	Water		X		X		X		X
	CS2-MW-5S	Water		X		X		X		

* - Sample extracted but not analyzed.
** - WR-1 was also analyzed for flash point, and pH.

Document Control No.: 4500-55-ANKR
Page 4 of 4

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-4.wk4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-5

Summary of Samples Collected and Analyses Performed
Disposal Parameters
CERT Site, Bay City, Michigan
April 1995

Sample I.D.	Matrix	Sample Interval (feet)	Analysis											
			PAHs	PCBs	Chlorinated Pesticides	TPH	TOC	COD	TVSS	Michigan 10 metals	Phosphorus	Grain Size	Specific Gravity	TKN
WDP-RC-1A	SOIL	0-11	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-1B	SOIL	11-14	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-2A	SOIL	0-7	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-2B	SOIL	7-10	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-3A	SOIL	0-1	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-3B	SOIL	1-4	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-4A	SOIL	0-4	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-5A	SOIL	0-9	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-5B	SOIL	9-12	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-6A	SOIL	0-6	X	X	X	X	X	X	X	X	X	X	X	X
WDP-RC-6B	SOIL	6-9	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-1A	SOIL	0-26	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-1B	SOIL	26-29	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-2A	SOIL	0-21	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-2B	SOIL	21-24	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-3A	SOIL	0-24	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-3B	SOIL	24-27	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-4A	SOIL	0-24	X	X	X	X	X	X	X	X	X	X	X	X
WDP-LC-4B	SOIL	24-27	X	X	X	X	X	X	X	X	X	X	X	X

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-5.wk4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

completion of site activities in each area. All monitoring data were recorded on individual boring log forms and in the field logbook.

5.2 DECONTAMINATION

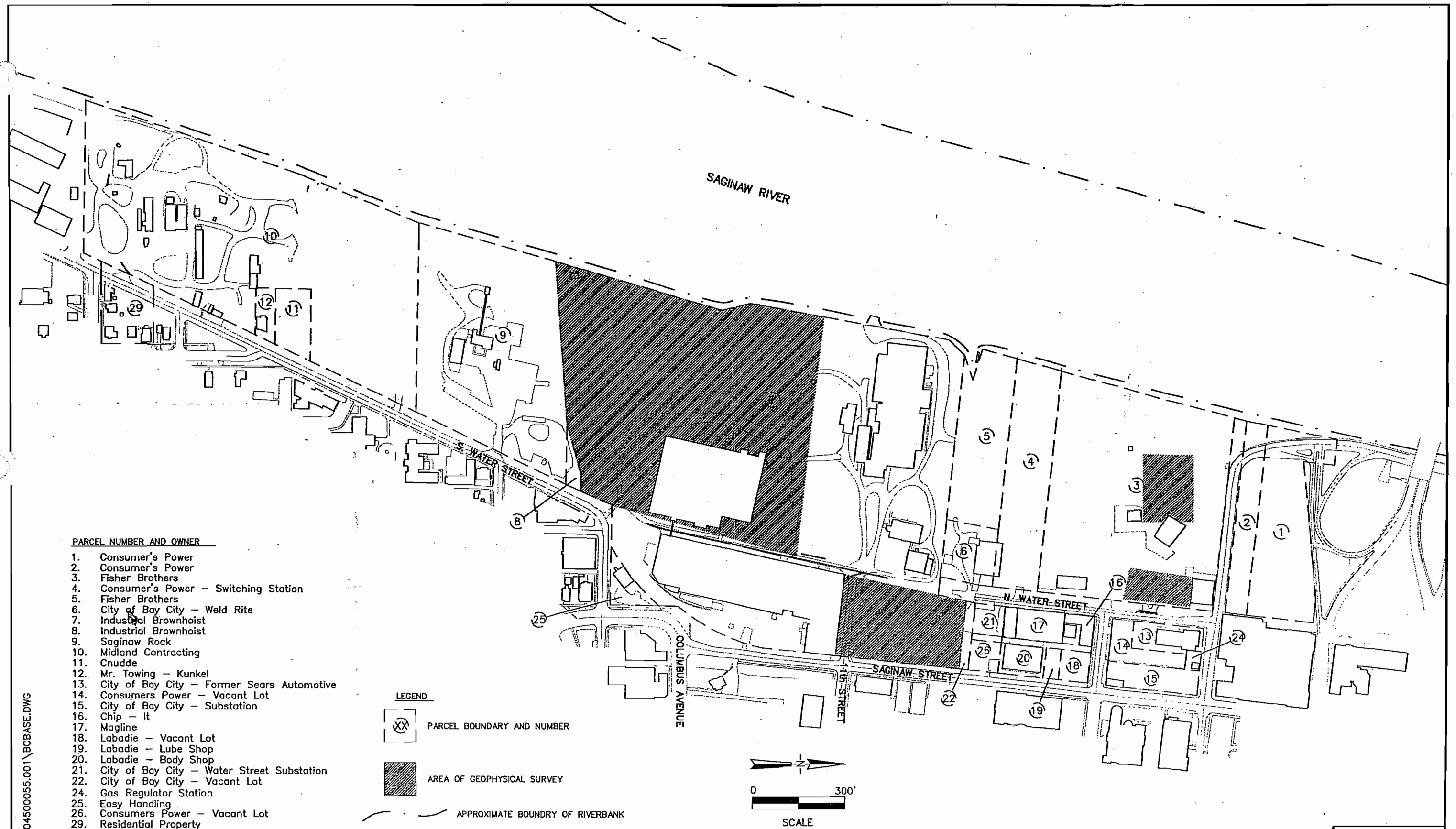
The hollow-stem augers (HSA), split-spoon samplers, and all other drilling equipment and associated tools were steam cleaned between use at each borehole and monitoring well location to prevent cross-contamination. All steam cleaning was performed on a decontamination pad equipped to contain all decontamination water within the dedicated decontamination area which was located at the IB parcels (Parcels 7 and 8) during the Phase II characterization and at the Kunkel parcel (Parcel 12) during the Phase III Characterization. The rinsate was collected and stored in a polytank. The split-spoon samplers were decontaminated between samples by washing with an alconox mixture and a scrub brush to remove any solids, and rinsing with potable water. An equipment blank was collected by allowing high grade laboratory distilled water to run through a decontaminated split-spoon sampler and collecting the water in a sample vial. The equipment blank was analyzed for VOCs. The decontamination water generated during the IB and Phase II field activities was disposed of in December 1993 and the decontamination water generated during the Phase III field activities was disposed of in June 1996.

5.3 GEOPHYSICAL SURVEYS

5.3.1 Fisher Brothers (Parcels 3 and 5)

WESTON conducted geophysical surveys at the Fisher Brothers parcel (Parcel 3) from 26 August 1993 to 01 September 1993. Two areas were targeted for survey activities (Figure 5-1): the former historical dumping ground in the northwest portion of the property and a potential UST area on the northeast border of the site. During the surveys, WESTON utilized a ground penetrating reader (GPR), and electromagnetic terrain conductivity meter (EM31) and a proton precession magnetometer. The survey information was used to verify that the former historic dumping ground was approximately twice the originally estimated size. WESTON also

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.



PARCEL NUMBER AND OWNER

1. Consumer's Power
2. Consumer's Power
3. Fisher Brothers
4. Consumer's Power – Switching Station
5. Fisher Brothers
6. City of Bay City – Weld Rite
7. Industrial Brownhoist
8. Industrial Brownhoist
9. Saginaw Rock
10. Midland Contracting
11. Cnudde
12. Mr. Towing – Kunkel
13. City of Bay City – Former Sears Automotive
14. Consumers Power – Vacant Lot
15. City of Bay City – Substation
16. Chip – It
17. Magline
18. Labadie – Vacant Lot
19. Labadie – Lube Shop
20. Labadie – Body Shop
21. City of Bay City – Water Street Substation
22. City of Bay City – Vacant Lot
24. Gas Regulator Station
25. Easy Handling
26. Consumers Power – Vacant Lot
29. Residential Property

OMI\PROJECTS\04500055.001\BCBASE.DWG

FIGURE 5–1

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

GEOPHYSICAL SURVEY AREA MAP
BAY CITY CERT SITE
Bay City, Michigan

determined through the use of the geophysical survey that the anomalous signals in the northeast portion of the property were not related to an UST but were most likely related to buried utilities.

5.3.2 Industrial Brownhoist (Parcels 7 and 8)

WESTON conducted geophysical surveys at the IB parcel (Parcel 7) (Figure 5-1) on 26 October through 6 November 1992. An EM31, a proton precession magnetometer and GPR were used during the geophysical surveys. The information collected during the geophysical investigation was utilized to identify potential underground utilities and the accessibility of potential soil boring locations.

Results of the geophysical surveys indicated that numerous underground utilities and foundations were present throughout the site, which restricted the placement of soil borings. Additionally, the surveys identified two potential USTs at the IB parcel (Parcel 7) in Areas 11 and 13 (Figure 3-1).

WESTON conducted additional geophysical surveys of the southwest portion of the IB parcel (Parcel 7) on 17 May 1993 through 21 May 1993. This area was formerly a swampy, low-lying area that had reportedly been used for the on-site disposal of unknown waste material. During the survey, WESTON utilized an EM31 and a proton precession magnetometer. The survey information identified the presence of buried ferromagnetic material and a buried trench. The survey information was also used to establish soil boring locations.

WESTON was scheduled to conduct additional geophysical survey activities in the southwest portion of the IB parcel (Parcel 7). However, these additional survey activities were subsequently canceled by the U.S. EPA WAM for the project when the aggregate piles present at the site could not be moved in a cost effective and timely manner by the parcel owner.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.4 RADIATION SURVEY AND SAMPLING

5.4.1 Weld-Rite (Parcel 6)

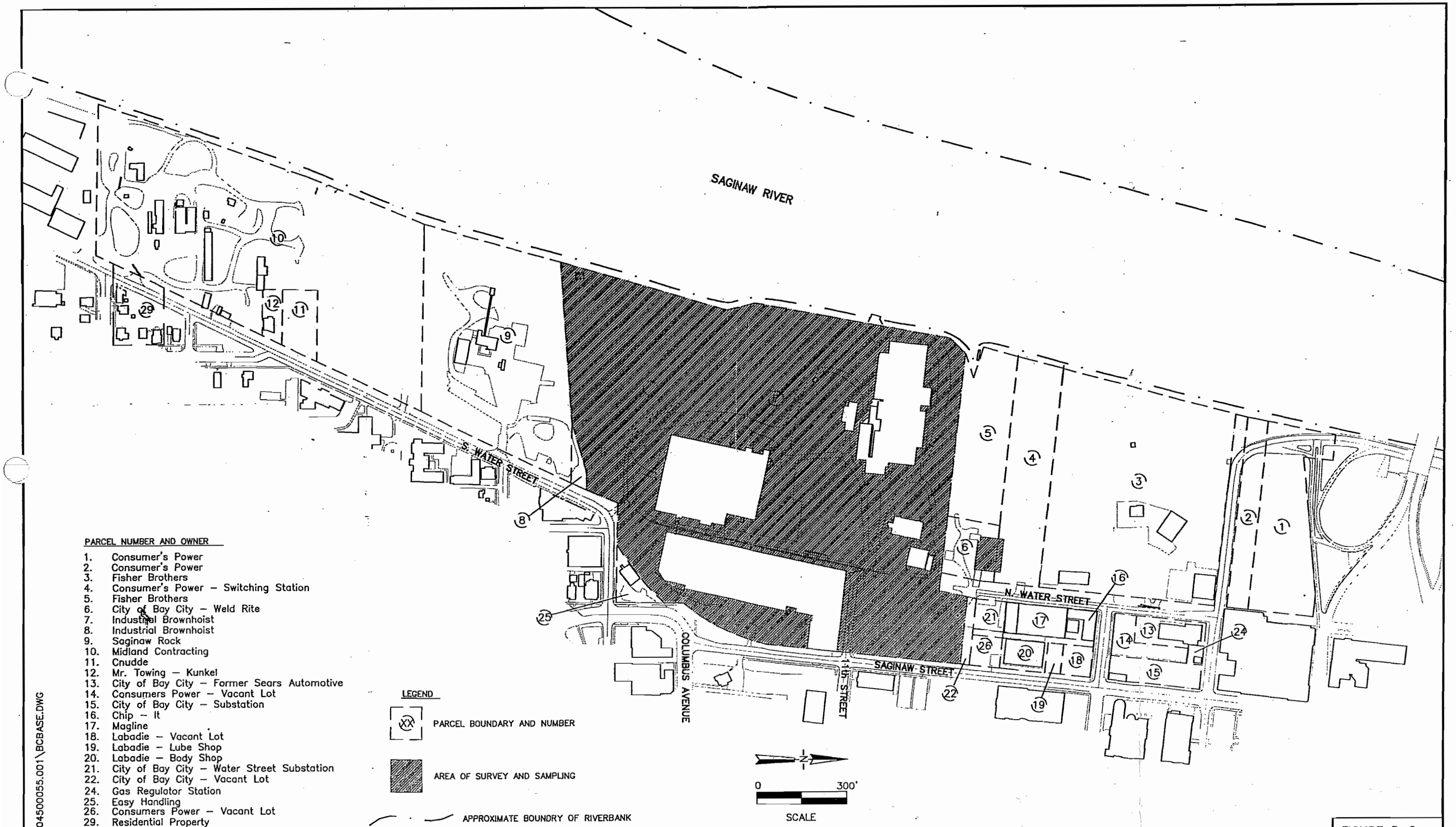
Based upon gamma radiation surveys conducted with a Ludlum Model 19 Micro-Roentgen meter (Micro-R meter) in the northern portion of the IB parcels (Parcels 7 and 8), background gamma radiation levels in the vicinity of the Weld-Rite parcel (Parcel 6), ranged from approximately 6 microroentgen per hour (μR/hr) to 9 μR/hr. WESTON conducted a gamma radiation walkover survey of the Weld-Rite office area (Figure 5-2) with a Micro-R meter. Within the office, gamma radiation levels ranged from 7 to 15 μR/hr. Due to the elevated gamma radiation in the building, WESTON collected three brick samples for gamma spectrometry analysis.

The results of the gamma spectrometry analyses indicated that Potassium 40 was the only significant isotope detected in the brick. Brick is composed of clays and according to Publication Number 94 of the National Council on Radiation Protection and Measurements (NCRP), shales contain approximately 35% clay minerals of which approximately 2.7% is potassium. Therefore, brick could easily contain significant levels of potassium, including K-40. Calculated exposure rates based upon 1 picoCurie/gram (pCI/g) of Potassium 40 would be approximately 3.1 μR/hr (Appendix P). The elevated gamma levels within the Weld-Rite office are probably due to Potassium 40 in the brick and the corners of the building would be expected to have higher levels of gamma radiation because two brick walls are contributing to the levels.

5.4.2 Industrial Brownhoist (Parcels 7 and 8)

WESTON conducted gamma radiation surveys in conjunction with soil sampling activities at the IB parcel (Parcel 7) 17 May 1993 through 20 May 1993 (Figure 5-2). Gamma radiation walkover surveys of all sampling locations were performed using a Micro-R meter held at waist level. Shallow subsurface soil samples were collected from locations that were identified as having elevated gamma radiation levels by the gamma radiation grid surveys.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.



PARCEL NUMBER AND OWNER

1. Consumer's Power
2. Consumer's Power
3. Fisher Brothers
4. Consumer's Power – Switching Station
5. Fisher Brothers
6. City of Bay City – Weld Rite
7. Industrial Brownhoist
8. Industrial Brownhoist
9. Saginaw Rock
10. Midland Contracting
11. Cnudde
12. Mr. Towing – Kunkel
13. City of Bay City – Former Sears Automotive
14. Consumers Power – Vacant Lot
15. City of Bay City – Substation
16. Chip – It
17. Magline
18. Labadie – Vacant Lot
19. Labadie – Lube Shop
20. Labadie – Body Shop
21. City of Bay City – Water Street Substation
22. City of Bay City – Vacant Lot
24. Gas Regulator Station
25. Easy Handling
26. Consumers Power – Vacant Lot
29. Residential Property

OMI\PROJECTS\04500055.001\BCBASE.DWG

FIGURE 5–2

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

RADIATION SURVEY AND SAMPLING AREA MAP
BAY CITY CERT SITE
Bay City, Michigan

Specific sampling locations were confirmed during field activities using the Micro-R meter. The suspected source of the contamination was foundry sand used for fill at the site. Shallow subsurface soil samples were collected from .5 to 1.5 feet at three locations observed to have elevated gamma radiation levels using a decontaminated bucket auger.

SAMPLE ID NUMBER	GAMMA RADIATION READING
CS-HA-06	11 μR/hr
CS-HA-07	24 μR/hr
CS-HA-08	22 μR/hr

These samples were analyzed for isotopic radium, thorium, uranium, natural uranium, gross gamma, gross beta and gross alpha.

Sample CS-HA-06 was the only sample to contain radium above limits established by the U.S. EPA. This sample had a radium 226 activity of 9.2 pCI/g with a gamma radiation reading of 11 μR/hr. This activity level marginally exceeded the limit established by the U.S. EPA in 40 CFR 192 for mill tailings which was set at 5 pCi/g above background averaged over 100 square meters (m^2) for the top 15 centimeters (cm) layer. Background radium 226 activity for the State of Michigan ranges from 0.46 to 2.0 pCi/g (Myrich, 1983).

Radium 226 is a member of the uranium 238 decay series. Radium 226 (half-life ($t_{½}$) of 1,600 years) is the daughter product of thorium 230 ($t_{½}$ = 80,000 years) which is the daughter of uranium 234 ($t_{½}$ = 230,000 years). The test to determine whether the radium contamination is natural relates to the decay equilibrium between the parent and the daughter. When the parent half-life is long compared to the daughter, the parent and daughter will reach a state of transient equilibrium in which the ratio of the number of atoms of each present in the system remains equal. Simply stated, over a sufficiently long period of time in a natural system, parent and daughter nuclides will reach a point where the parent and the daughter decay at the same rate. By comparing the activities of radium 226, thorium 230, and uranium 234, it can be shown that a

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

natural balance does not exist for sample CS-HA-06. However, CS-HA-07 and CS-HA-08 do tend to indicate that they are naturally occurring since the activities are approximately equal.

5.5 BUILDING INVESTIGATIONS - INDUSTRIAL BROWNHOIST (Parcels 7 and 8)

Investigation of the IB parcels on-site buildings (Figure 5-3) was conducted in 1992 to determine whether hazardous materials or wastes existed within the buildings, or if the subsurface material beneath the buildings had been impacted by the migration of contaminants through cracks in the floors or along the foundations. Locations of potential hazardous materials, observable spillage or staining and areas of suspect ACM were identified. The investigation also attempted to identify all related drains and sumps however dye tests were not used to trace the drains and sumps. Dye tests were not determined to be necessary for this investigation by the U.S. EPA. A summary of the observations made in each building on the IB parcels is provided below.

5.5.1 Powerhouse

A significant amount of oil staining was observed throughout the powerhouse. Oil-saturated wood flooring was observed on the first floor and oil-stained concrete walls were observed in the basement. PCB-labeled transformers were noted on the first floor of the building. Suspect ACM was observed on the boiler and on pipe-wrap located in the basement. Additionally, suspect ACM was observed on steam lines that entered the on-site tunnel system. Three drums of water treatment chemicals were also observed in the basement.

5.5.2 Storage Building

An abandoned laboratory on the second floor of the storage building was observed. All of the laboratory chemicals appeared to have been removed. No significant staining was observed. No visual evidence of spilled mercury was observed by WESTON.

This document was prepared by Roy F. Weston, Inc.. expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

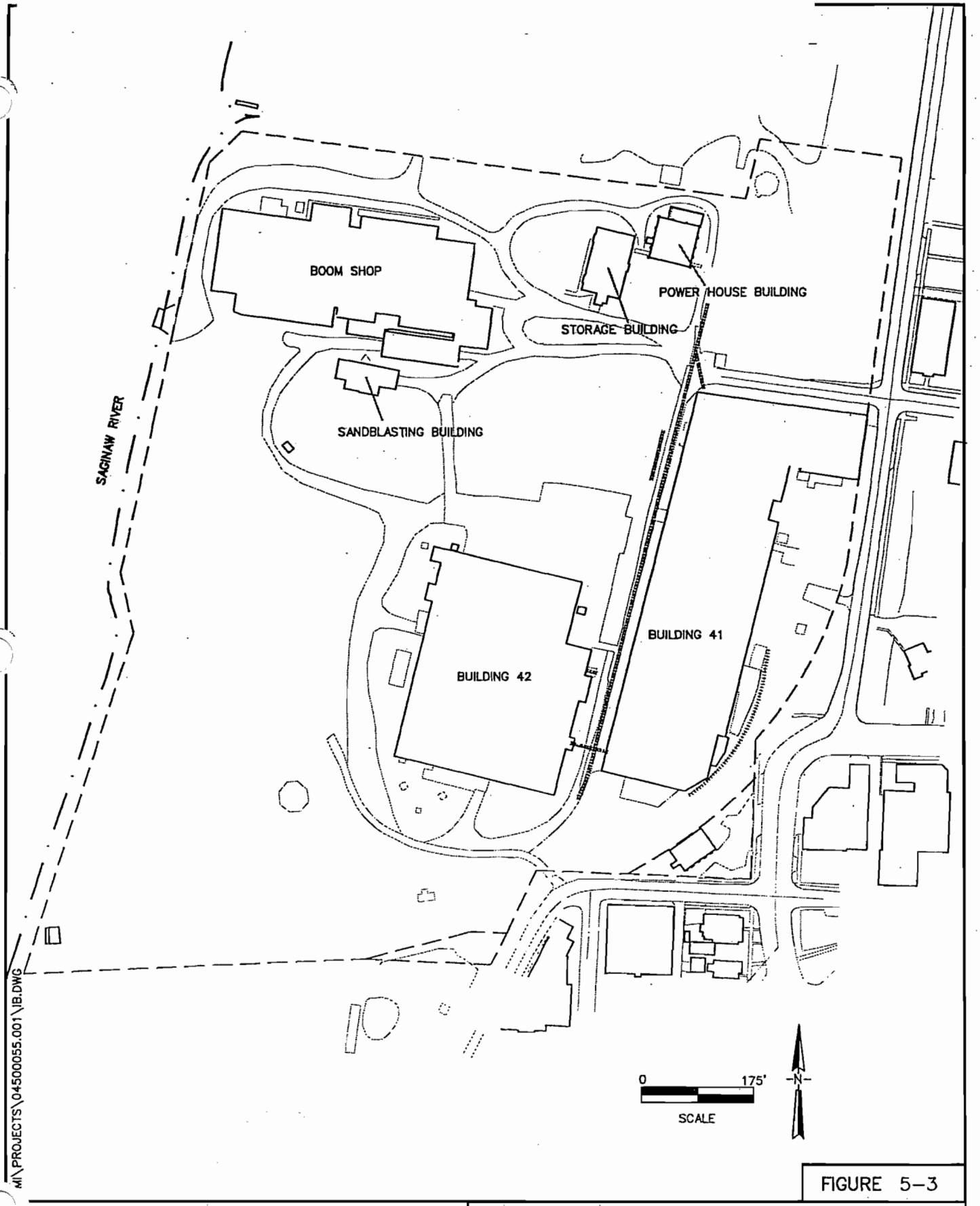


FIGURE 5-3

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

IB BUILDING LOCATION MAP

BAY CITY CERT SITE
Bay City, Michigan

5.5.3 Boom Shop

Oil-stained concrete was observed in the vacant compressor room of the boom shop.

5.5.4 Sand-Blasting Building

A 6 to 12-inch layer of sand blasting sand was observed throughout the building. No evidence of staining was observed.

5.5.5 Building 42

Isolated areas of oil-stained concrete were observed throughout the building. A pile of solidified metal debris was also observed immediately outside the northwest corner of the building. Suspect asbestos-containing floor tile was noted on the second floor within the office area of the building. Two drums of hydraulic oil were observed inside the building. Three drums of unknown contents were observed outside the building to the west on a concrete pad.

5.5.6 Building 41

Significant oil-staining was observed in the northwest portion of the building beneath a bank of PCB-labeled transformers. Additionally, isolated areas of oil-stained concrete and wood block flooring were noted throughout the building. Suspect ACM was observed on pipes that originated in the tunnel system. Staining of the floor within the former plating area was observed, but the concrete floor was noted to be in good condition. Approximately 500 to 700 bags of used insulating material was observed in the northeast portion of the building. The source of this material could not be determined. The majority of the former machine pits in this building appear to have been backfilled with concrete or sand.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.6 PHASE I ASSESSMENTS - NEW PARCELS

WESTON conducted Phase I assessment activities at eight previously unaddressed parcels associated with the CERT site (Figure 5-4). These parcels and the related Phase I assessment activities are discussed in the following subsections.

5.6.1 Residential Parcels (Parcel 29)

During the week of 1 June 1993, WESTON personnel completed a Phase I environmental assessment of six properties located in the Farmers' Trustees Plat (Village of Portsmouth), Bay City, Michigan. Property addresses include 101 17th Street, 200 Broadway Street, 206 Broadway Street, 216 Broadway Street, 613 S. Water Street, and 105 18th Street. The properties are bounded by the Water and Broadway Street intersection to the north, Broadway Street to the east, 18th Street to the south, and Water Street to the west (Figure 5-4). Current use of the properties is residential, however the properties have a history of commercial and residential use, circa 1879.

The purpose of the assessment was to identify potential environmental problems that could affect the environmental status of the properties. The assessment was conducted in accordance with the proposed 30 June 1992 American Society for Testing and Materials (ASTM) Standard Practices for Environmental Assessments with the exception of title searches. Property owners and lessees provided information to WESTON relative to current property use and length of occupancy. WESTON had access to all property buildings except 105 18th Street.

The results of the assessment activities were documented in the October 1993 Site Summary Report, Center for Ecological Research and Training, Bay City, Michigan, prepared by WESTON for the U.S. EPA.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

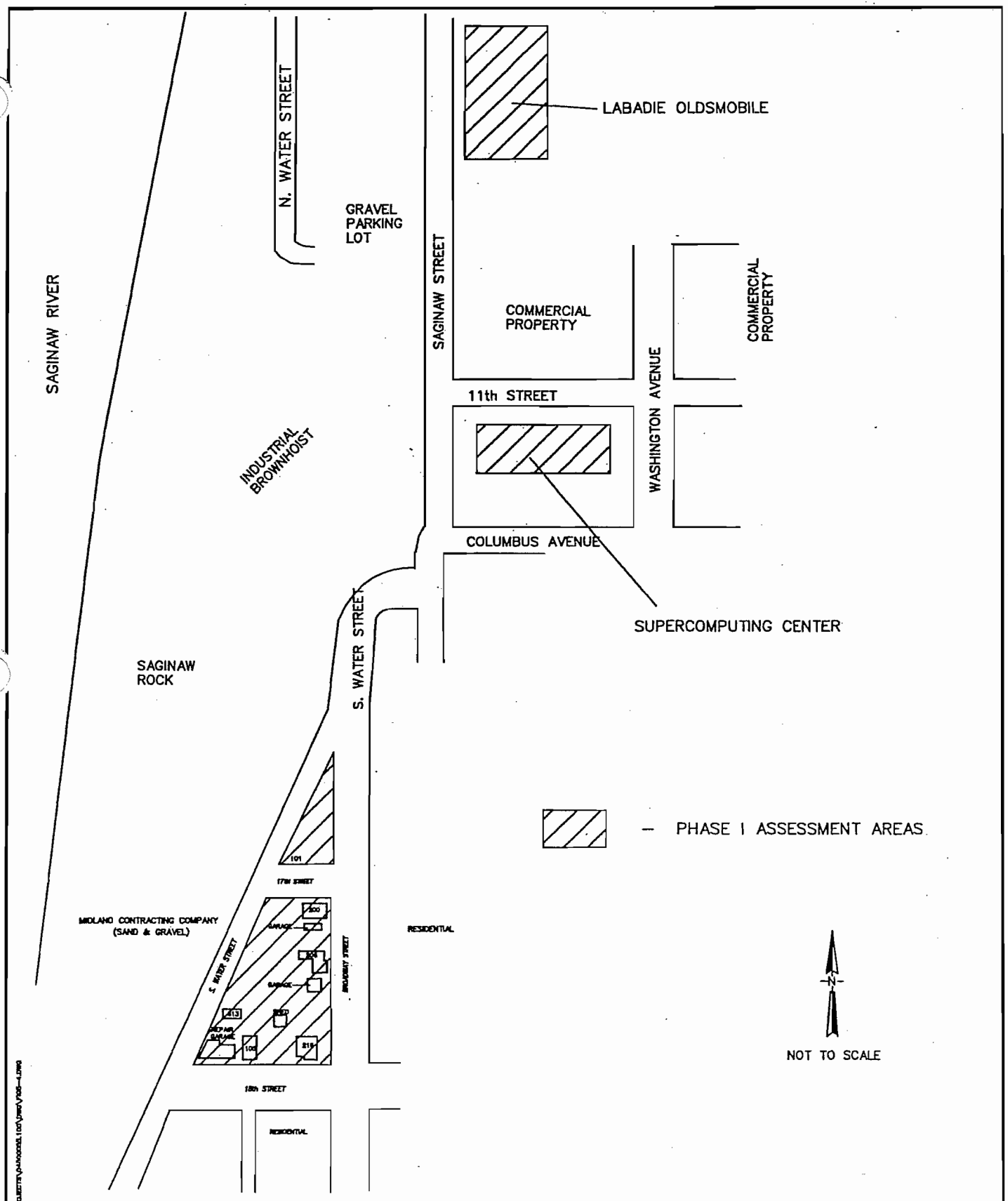


FIGURE 5-4

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

PHASE I ASSESSMENT PARCELS LOCATION MAP

BAY CITY CERT SITE
Bay City, Michigan

5.6.2 Labadie Dealership

During the week of 1 October 1993, WESTON conducted a Phase I environmental assessment of the Labadie Dealership property located at 244 Saginaw Street in Bay City, Michigan (Figure 5-4). The purpose of the assessment was to identify actual and potential environmental liabilities associated with the current and historical use of the property, and the current environmental status of the buildings, grounds and neighboring properties. During the assessment, WESTON utilized accepted environmental assessment procedures.

The results of the assessment activities were documented in the October 1993, Environmental Assessment Report Labadie Oldsmobile Cadillac, Inc., 244 Saginaw Street, Bay City, Michigan, prepared by WESTON for U.S. EPA.

5.6.3 National Environmental Supercomputer Center Building

On 28 November 1994, a WESTON representative visited the National Environmental Supercomputer Center Building located at 135 Washington Avenue in Bay City, Michigan (Figure 5-4) and completed the following preliminary Phase I Assessment activities:

- Meeting and interview with Mr. Ron Railey of the U.S. EPA and Mr. Ken Brink (building owner).
- Walk through and cursory inspection of the National Environmental Supercomputer Center Building.
- Review of available photographs of the 1991/1992 demolition and renovation activities.

The following is a brief summary of the findings during the preliminary Phase I Assessment activities.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Site History

According to Mr. Railey and Mr. Brink, the existing building was originally constructed in 1910. From 1910 to approximately 1981, the structure was the office building for the IB facility located across the street. Between 1981 and 1991, the building was vacant. In 1991, Dore and Associates (Dore) was hired by the building owner to conduct demolition activities throughout the interior of the building in preparation for renovations to house the supercomputer operation. Dore removed all the interior walls, floor tile, ceiling tile, duct work, plumbing fixtures, piping, etc. Included in the demolition was the removal and disposal of all suspect ACM.

Subsequent to the completion of the activities in 1992, the interior of the building was completely renovated including the addition of several structural support beams, new floor and ceiling tiles, new walls (drywall), new plumbing and piping, new heating and cooling system, and the installation of an elevator. The National Environmental Supercomputer Center, associated offices and training facilities have been in the building since 1992.

Building Walk-through

During a room by room walk-through of the building, WESTON was accompanied by Mr. Railey and Mr. Brink. WESTON noted several types of building materials which often contain asbestos (pipe insulation, ceiling tiles and floor tiles). However, since all these materials were installed new in 1992, it is unlikely that there are any ACM in the building. WESTON noted two areas in the building where potentially hazardous materials are used. The chiller room in the bottom floor of the building contained one 55-gallon drum of heat transfer fluid (ethylene glycol) and two small poly drums of a cooling fluid, which is used to prevent algae buildup in the cooling towers during the summer months. There were no signs of chemical spillage on the floor of the chiller room. The chiller room also contained several carbon dioxide (CO_2) cylinders which were properly labeled and chained. The CO_2 is used as a fire retardant for the main computer room.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Another room on the bottom floor of the building contained four large banks of batteries which service the supercomputer. The battery room was observed to be clean and well maintained and there was no evidence of battery fluid spillage on the floor.

Demolition/Renovation Photograph Reviews

Subsequent to the building walk-through, WESTON examined approximately 100 photographs taken during the 1991-1992 demolition/renovation. WESTON did not observe any photographs which would lead to concern for existing environmental problems in the building.

5.7 SOIL ASSESSMENT

As indicated earlier, the 1992 and 1993 field investigative activities are referred to as the Phase II characterization of the CERT site. Phase III characterization activities were completed October 1994 through December 1995.

During the soil assessment activities, samples were collected using a truck-mounted drill rig (B-57 or CME-75) or a skid rig (Dietrich 50) with a 4¼-inch inside diameter (ID) HSA. Soil samples were collected at each boring location in accordance with ASTM D-1586, using 2-inch diameter, 2-foot long stainless steel split-spoon samplers. River and riverbank cores were collected with a 3.25 inch ID 5-foot-long continuous sampler. Phase II drilling activities were performed by Burlington Environmental (Burlington), Columbia, Illinois and Phase III drilling activities were performed by Somat Engineering (Somat), Taylor, Michigan and Geotek Inc. (Geotek), Lowell, Michigan, each under subcontract to WESTON. A WESTON geologist/scientist collected and classified each of the soil boring samples according to the USCS. All of the samples were screened on-site with a FID or PID to aid in selecting samples for analysis. Because of accessibility problems for the truck-mounted drill rig at some locations, soil samples were collected using a stainless steel bucket hand auger. The bucket hand auger was decontaminated using the same methods described for the split-spoon samplers. All of the soil cuttings generated

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

during the drilling activities were containerized and stored on-site for disposal. The non-PCB soil cuttings generated during the IB and Phase II field activities were disposed of in October 1993 and the PCB-containing soil cuttings were disposed of in April 1994. The non-PCB soil cuttings generated during the Phase III field activities were disposed of in February 1996. The PCB-containing soil cuttings were disposed of in June 1996. Boreholes were backfilled using cement/bentonite grout and/or hydrated bentonite chips.

5.7.1 Fisher Brothers (Parcels 3 and 5)

Phase II Characterization

Five soil borings (CS-SB-30 and CS-SB-33 through CS-SB-36) were advanced at the Fisher Brothers parcels (Parcels 3 and 5) (Figure 5-5A). Four of these borings were advanced downgradient of a former metal plating shop and near the former on-site storage buildings. Soil samples were collected from the borings and analyzed for metals in order to determine if contamination had migrated from either the metal plating shop or the storage buildings. The fifth soil boring was advanced in the northwest corner of the site to evaluate the impact from the adjacent property to the north. Soil samples collected from this location were analyzed for selected parameters including VOCs, SVOCs, PCBs, and Michigan 10 metals. Petroleum odors and black staining were observed in soil boring CS-SB-33, in the central portion of the property, and in soil boring CS-SB-35 in the northwest corner of the site at shallow depths. Highly organic material mixed with debris (wood, glass, bricks, rubber) was observed in soil boring CS-SB-33 at a depth of 10 to 17 feet below the ground surface and in soil boring CS-SB-35 at 8 to 12 feet below the ground surface.

Phase III Characterization

Phase III characterization sampling was to be conducted at the Fisher Brothers parcels, however, site access delays and Congress rescinding the funding for the CERT project resulted in cancellation of this activity.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

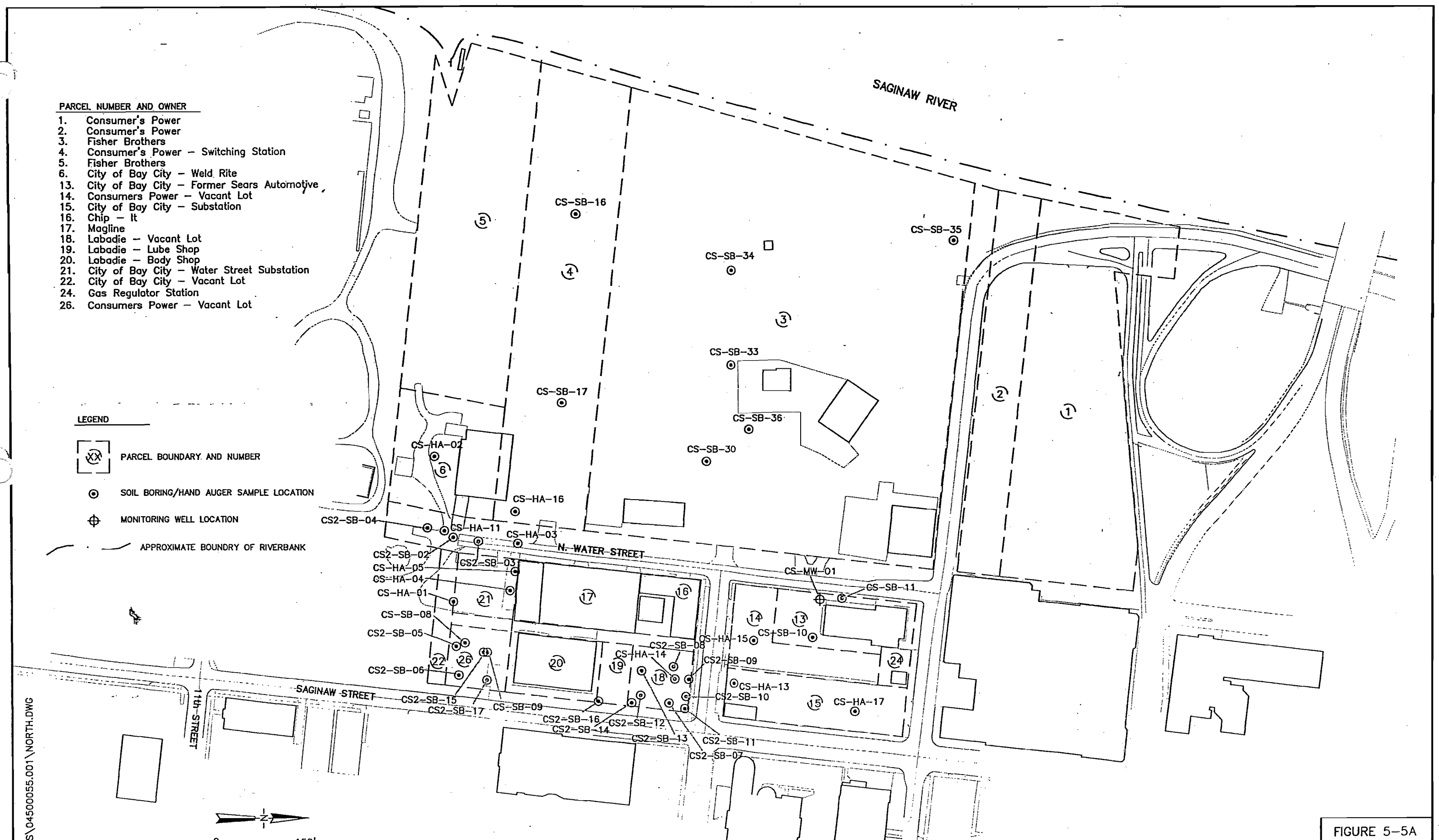


FIGURE 5–5A

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68–W8–0089
WORK ASSIGNMENT No. 55–5AED
DOCUMENT CONTROL No. 4500–55–ANKR

SOIL BORING AND MONITORING WELL LOCATION MAP
(North Site)
BAY CITY CERT SITE
Bay City, Michigan

OMI\PROJECTS\04500055.001\NORTH.DWG

5.7.2 Consumers Power - Switching Station (Parcel 4)

Phase II Characterization

Nine soil samples were collected from four locations at the Consumers Power-Switching Station parcel (Figure 5-5A). Two locations (CS-HA-03 and CS-HA-16) were sampled with a hand auger and two locations (CS-SB-16 and CS-SB-17) were sampled using a drill rig. One soil sample was collected from an area where PCB contamination was suspected because of evidence of past leakage from transformers. Two soil borings were also advanced west and downgradient of the substation. These borings were advanced to define the subsurface stratigraphy and to determine if PCBs may have migrated from the substation. Samples were collected from 0.5 to 1 foot below the ground surface and 3.5 to 4 feet below the ground surface in each boring. These borings extended through the fill material to either the river clay or the clayey till. An additional sample was collected from one boring and analyzed for Michigan 10 metals from 14 to 16 feet below the ground surface. This sample was collected from thinly stratified sand and silt layers that appeared to have been stained green possibly from metals contamination. Organic odors were noted in both of these borings.

Phase III Characterization

Phase III characterization sampling was to be conducted at the Consumers Power - Switching Station parcel, however, site access delays and Congress rescinding the funding for the CERT project resulted in cancellation of this sampling.

5.7.3 Weld-Rite (Parcel 6)

Phase II Characterization

Two locations (CS-HA-02 and CS-HA-11) were sampled at the Weld-Rite parcel (Parcel 6) (Figure 5-5A). The samples collected from the CS-HA-02 location were collected with a hand auger, and the samples collected from the CS-HA-11 location were collected using a drill rig.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Two samples were collected from the CS-HA-02 location at depths of 0.5 to 1 foot and 2.5 to 3 feet below the ground surface. Three samples were collected from the CS-HA-11 location at depths of 0.5 to 1 foot, 2.5 to 3 feet, and 9.5 to 10 feet below the ground surface. All samples were analyzed for PCBs.

Phase III Characterization

Three soil borings (CS2-SB-02 through CS2-SB-04) were advanced in the street to the east of the Weld-Rite parcel during the Phase III characterization. Soil samples were collected from six continuous intervals to a depth of 10 feet below the ground surface, submitted to the laboratory, and extracted for future PCB analysis. Samples were collected from near surface intervals and screened on-site using PCB D-TECH field test kits. Based on results of the field test kits all samples collected from the 0 to 1 foot interval were analyzed. The remainder of the samples were analyzed only if detectable levels of PCBs were reported in the previous interval. Table 5-6 summarizes the PCB screening results as compared to analytical results.

5.7.4 Industrial Brownhoist (Parcels 7 and 8)

Initial Phase II Characterization

Surface and subsurface soil sampling activities were initiated on 2 November 1992. Fifty (50) soil borings, ranging in depths from 6 to 60 feet below the ground surface, were advanced throughout the IB parcels (Parcel 7 and 8). The soil boring locations were selected to identify the presence of soil contamination in the 25 areas of concern previously identified by ADL. A total of 12 soil samples was collected from locations that were inaccessible to the drill rig because of overhead electrical lines, elevated radiation readings, or results of the geophysical survey. Samples were collected using a stainless steel bucket hand auger at depths 2 to 4 feet below the ground surface. The locations for soil borings, monitoring wells, and hand auger borings are presented on Figure 5-5B.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 5-6

PCB Screening Results
February 1995
CERT Site, Bay City, Michigan

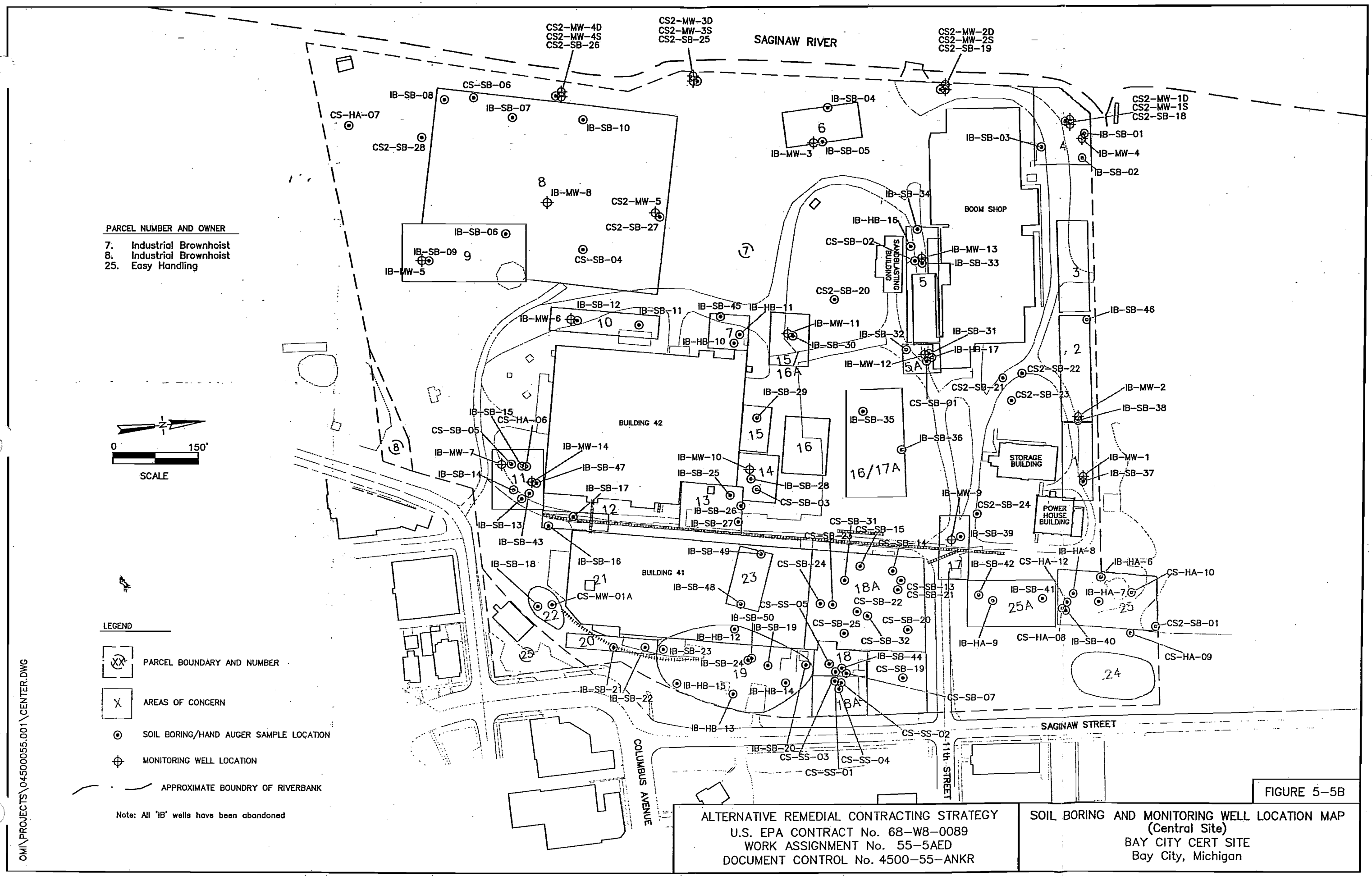
Parcel	Boring or Well Identification	Sample Depth Interval (in)	Date	Field Test Kit Result (ppm)	Laboratory Result (ppm)
Parcel 7 and 8	CS2-SB-01A	6 - 12	02/13/95	< 0.5	
	CS2-SB-01B	0 - 6	02/13/95	< 0.5	
Parcel 6	CS2-SB-02	0 - 6	02/13/95	~2	1.3 J (1248)
	CS2-SB-03A	12 - 24	02/13/95	~2	1.7 (1248)
	CS2-SB-04	2 - 8	02/14/95	~0.5-1	2.6 (1248) 2.3 (1260)
Parcel 18 and 19	CS2-SB-06	1 - 7	02/14/95	~1	ND (0.330)
	CS2-SB-07	5 - 11	02/15/95	~2	3.3 (1248)
	CS2-SB-08	5 - 11	02/15/95	~2	2.7 (1248)
	CS2-SB-09	4 - 10	02/15/95	~1	ND (0.330)
	CS2-SB-10	5 - 11	02/15/95	> 15	1000 (1248)
	CS2-SB-11	5 - 11	02/16/95	~0.5	0.600 (1248)
	CS2-SB-12	4 - 10	02/16/95	~1	980 (1248) 22 (1260)
	CS2-SB-13	5 - 11	02/16/95	~0.5-1	9.2 (1248) 1.3 (1260)
	CS2-SB-14	5 - 11	02/16/95	~30	2200 (1240) 60 (1260)
	CS2-SB-16	0 - 6	02/17/95	~0.5	ND(0.330)
Parcel 26	CS2-SB-05	0 - 6	02/14/95	~0.5-1	1.3 (1248) 0.6 (1260)
	CS2-SB-15	0 - 6	02/17/95	~0.5	ND (0.330)

Notes:
(1248)-Aroclor 1248
(1260) - Aroclor 1260
ND - Not detected above method detection limit.
( ) - Method detection limit.

Work Assignment No.: 55-5AED
OMI\PROJECTS\04500055.100\SUMTAB\TAB5-6.wk4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.



OMI\PROJECTS\04500055.001\CENTER.DWG

FIGURE 5-5B

ALTERNATIVE REMEDIAL CONTRACTING STRATEGY
U.S. EPA CONTRACT No. 68-W8-0089
WORK ASSIGNMENT No. 55-5AED
DOCUMENT CONTROL No. 4500-55-ANKR

SOIL BORING AND MONITORING WELL LOCATION MAP
(Central Site)
BAY CITY CERT SITE
Bay City, Michigan

During soil boring advancement, split-spoon samples were collected from 2 feet below the ground surface to the water table or until a clay layer was encountered. Samples were selected for analysis based on elevated VOC field screening results, and differences in the physical nature of the soil or other visual observations determined in the field. A total of 109 soil samples were analyzed for selected parameters including VOCs, polynuclear aromatic hydrocarbons (PAHs), PCBs, SVOCs, Michigan 10 metals, and cyanide. An overview of the samples collected and the analyses performed is summarized in Table 5-1.

Concrete chip samples were collected from three locations in the vicinity of the former plating area inside Building 41 to determine if the concrete had been impacted from former plating operations.

Selected Locations for Soil Borings

Fifty soil boring sample locations were selected based upon the areas of concern identified in the Preliminary Environmental Assessment Report prepared by ADL, as well as the results of the geophysical survey, radiation survey readings, overhead electrical lines and other site conditions. The potential contaminant source areas, the corresponding samples collected from each area and a brief description of field observations are summarized below.

Area 1

One soil boring (IB-SB-37) was advanced in this area based on limited accessibility and the results of the geophysical survey. The soils consisted of mostly fill material to a depth of at least 10 feet below the ground surface. The fill material consisted of black soil with metal slag and pieces of wood. The texture of the fill material consisted of gravel and sand-sized material in the first 6 feet and sand and silt sized material toward the bottom of the boring. The fill varied in color from black to brown (approximately 12 feet below the ground surface). Small amounts of a yellow silty material were also encountered at approximately 9.5 feet below the ground surface.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 2

Two soil borings were advanced in this location; one at the west end of the area of concern (IB-SB-46) and one at the east end (IB-SB-38). The overburden in Area 2 was characterized as fill material to a depth of 8 feet below the ground surface. The fill consisted primarily of a brown to black slag-like material. Sand, gravel, and small amounts of silt were also observed. The fill was loosely compacted throughout and became saturated at approximately 7 feet below the ground surface.

Area 3

No soil borings could be advanced in this area because of the presence of large piles of aggregate which covered the entire area of concern.

Area 4

Three soil borings were advanced in this location (IB-SB-01, IB-SB-02, IB-SB-03). Soils consisted of mostly fill material with pieces of brick observed in the spoon samples. Elevated FID readings (600 to 1,000 units) were observed at all of the borehole openings in this area at 6 to 10 feet below the ground surface. On the south side of the area near the Boom Shop building, the overburden consisted of a moderate brown to brownish gray sand with traces of silt, clay, gravel, and organic material. The sand unit was observed to be saturated at 8 feet below the ground surface and continued to a depth of 9 feet below the ground surface. On the north side of the area, sand and gravel were encountered to a depth of 4 feet below the ground surface. The unit varied in color from shades of gray to brown and black. Underlying the sand and gravel was a clay layer with some silt, a little sand, and a trace amount of gravel. The clay varied in color from olive gray to dark gray and was wet to saturated.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 5/5A

Two soil borings (IB-SB-33 and IB-SB-34) and one hand auger boring (IB-HA-16) were advanced in Area 5 and two soil borings (IB-SB-31, IB-SB-32) and one hand auger boring (IB-HA-17) were advanced in Area 5A. In both areas the fill material extended to a depth of at least 14 feet below the ground surface. The fill consisted primarily of a dark brown fine sand and gravel with traces of silt. Pieces of brick, slag-like material, and a yellow powder substance were also observed. A greenish gray silty fine sand with some organic material and traces of clay was observed at approximately 8.5 feet below the ground surface. Pieces of wood and a slight unidentifiable odor were encountered at 13 feet below the ground surface.

Area 6

Two soil borings (IB-SB-04 and IB-SB-05) were advanced in this area. This area was characterized by a sand unit that extended to a depth of at least 27 feet below the ground surface. The sand was fine-grained with varying amounts of gravel and silt and trace amounts of organic material (shell fragments, wood pieces). The sand unit was generally brownish gray in color and became saturated at 10 to 12 feet below the ground surface. A finer sandy silt layer was observed beneath the sand layer and contained traces of clay and organic matter. Elevated FID readings of greater than 1,000 units above background were observed at approximately 8 feet below the ground surface (water table), and FID readings of 100 to 700 units above background were recorded from the sample collected from 6 to 14 feet below the ground surface. Wood pieces were observed in split spoon samples from 2 to 24 feet below the ground surface. An oily sheen was observed on the water recovered in the split spoon sample from 10 to 12 feet and 12 to 14 feet below the ground surface.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 7

One soil boring (IB-SB-45) and two hand auger borings (IB-HA-10 and IB-HA-11) were advanced in this area. Elevated radiation readings were observed closer to the building and because of safety concerns limited available sample locations. This area was characterized by at least 16 feet of fill material consisting of gravel, sand, silt, broken pieces of brick and some slag-like material. An unidentifiable odor was documented at 2 to 4 feet and 10 to 16 feet below the ground surface. The overburden was wet at 11 feet below the ground surface and saturated at 13.5 feet.

Area 8

Three soil borings were advanced in this area (IB-SB-07, IB-SB-08, and IB-SB-10). The area was characterized by fill material to a depth of at least 12 feet below the ground surface. The fill material consisted of brick, ash, slag and wood. The fill varied in color from dusty brown to brownish black to grayish black. The fill material was wet at approximately 6 feet below the ground surface and saturated at 8 feet. Readings of 120 to 650 units above background were observed on the FID while screening samples from 8 to 10 feet below the ground surface (at water table). The borehole was screened at 12 feet below the ground surface with the CGI/oxygen meter. 20% of the Lower Explosive Limit (LEL) and 13% oxygen were recorded, which may have indicated the presence of methane in the subsurface.

Area 9

Two soil borings were advanced in this area (IB-SB-06 and IB-SB-09). The fill material extended to a depth of 23 feet below the ground surface and consisted primarily of silt, sand, and gravel-sized material and pieces of wood. The fill ranged in color from gray to black. The fill became saturated at 11 feet below the ground surface. A wet grayish brown clay layer was encountered beneath the fill. The clay layer contained traces of silt, sand, and organic material. FID readings

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

were observed from 72 to greater than 1,000 units above background during soil boring advancement.

Area 10

Two soil borings (IB-SB-11 and IB-SB-12) were advanced in this area. The area was characterized by fill material to a depth of at least 14 feet below the ground surface. Slag-like material and pieces of brick were encountered throughout the depth of the fill. Brownish black and brownish gray silt sand, and gravel were also encountered. The presence of organic material caused variations in the fill color from dark gray to grayish black. Elevated FID readings (greater than 1,000 units above background) were observed while screening samples from 12 to 14 feet below the ground surface, which may have indicated the presence of methane.

Area 11

Five soil borings (IB-SB-13, IB-SB-14, IB-SB-15, IB-SB-43 and IB-SB-47) were advanced in this area based on the results of the geophysical survey, which indicated the presence of a potential UST. Soil borings were advanced on four sides of the potential UST to determine the extent of contamination resulting from any potential leaks that may have occurred. The fill material in Area 11 varied in depth from 4 to 14 feet below the ground surface. A clay layer was observed directly below the fill. The fill consisted of organic material, slag-like material, pieces of wood, pieces of black coal-like material, broken pieces of glass, varying amounts of silt, sand and gravel. The clay varied in color from yellowish brown to brown to brownish gray and was firm, becoming stiff with depth. Soil screening results indicated 50 to 100 units above background on the FID from 6 to 10 feet below the ground surface. While advancing the soil boring at the west end of the potential UST (IB-SB-15), a strong diesel odor was observed when drilling from 2 to 4 feet below the ground surface. FID readings of 60 units above background were recorded at the top of the borehole. A strong sulfur odor was detected when grouting the borehole. Radiation readings of 14 μR/hr were observed in the area near the building.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 12

Two soil borings (IB-SB-16 and IB-SB-17) were advanced in this area. The auger was advanced through the concrete roadway before samples were collected. Fill material was observed to a depth of 2 to 4 feet below ground surface, consisting primarily of gravel-sized material with some fine sand and silt. A slight amount of organic material was observed at the 2 to 4 foot sampling interval. The material was generally dry to damp and ranged in color from a brownish or dusty orange to a brownish or medium light gray. Underlying the fill material was a dense clay layer. The color of the clay layer ranged from yellow-brown to brownish gray. The clay was primarily dry to moist, but a saturated lens was encountered at 6 to 6.5 feet below the ground surface. FID readings of up to 50 units above background were observed while screening the interval from 2 to 4 feet below the ground surface.

Area 13

Three soil borings (IB-SB-25, IB-SB-26 and IB-SB-27) were advanced in this area based on the results of the geophysical survey, which indicated the presence of a potential UST. Soil borings were advanced on three sides of the potential UST location to determine the extent of contamination resulting from potential leaks that may have occurred. No soil borings were advanced on the southeast corner (upgradient) because of insufficient clearance between the overhead power lines and the derrick of the drill rig. The area was characterized by 4 to 10 feet of fill material underlain by a dense clay unit. The fill material consisted of gravel and sand sized material as well as up to 4 feet of decaying material. Pieces of brick and slag-like material were also encountered within the fill layer. The material varied in color from brownish gray to grayish black. The underlying clay unit contained traces of gravel, sand, and silt, and ranged in color from dark yellow-brown to brownish gray. A strong diesel odor was observed in the split-spoon sample collected from 8 to 10 feet below the ground surface. A visible sheen was observed on the clay material inside the split-spoon sample collected from 12 to 14 feet below the ground surface.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 14

One soil boring (IB-SB-28) was advanced in this area. The soil boring was characterized by fill material to approximately 14.5 feet below the ground surface. A clay layer was observed directly beneath the fill. The fill consisted primarily of gravel with some sand and silt. Slag-like material and a layer of organic material was observed at 8 and 12 feet below the ground surface. A silt lens (2.5 inches) was observed at 10 feet below the ground surface. The fill was wet and became saturated at 10 feet below the ground surface. The light brown-gray clay layer had a trace of organic material and silt. A strong diesel odor was detected and a sheen was observed at 8 to 10 feet below the ground surface. FID readings of greater than 1,000 units above background were observed directly above the borehole when drilling from 10 to 12 feet below the ground surface. Elevated FID readings, greater than 10 units, were observed in the breathing zone when pulling the augers from the borehole.

Area 15

One soil boring (IB-SB-29) was advanced in this location to delineate the extent of contamination from the potential UST in Area 13. Approximately 12 to 14 feet of clay underlain by a sand layer was observed. The clay layer had occasional lenses of organic material and had small amounts of sand and silt and trace amounts of gravel. The clay ranged in color from tan to dark gray. The organic layers were dark gray, gray brown, and black. The underlying sand layer contained a small amount of silt and clay and was wet. Elevated PID and FID readings were observed from 2 to 16 feet below the ground surface. No visible or olfactory indications of contamination were noted throughout the boring.

Area 15/16A

One soil boring (IB-SB-30) was advanced in this location to delineate the extent of contamination from the potential UST in Area 13. Fill material was observed to a depth of approximately 7 feet

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

below the ground surface. The fill consisted of brick pieces and metallic slag-like material and was underlain by a clay layer. The clay was firm and moist just beneath the fill and contained small amounts of silt, sand, and gravel. Elevated FID and PID readings were observed at 12 to 14 feet below the ground surface.

Area 16/17A

Two soil borings (IB-SB-35 and IB-SB-36) were advanced in this area. Fill material which consisted of brick pieces and metallic slag-like material was observed to a depth of approximately 7 feet below the ground surface. The fill was underlain by a clay layer. The clay was firm and moist just beneath the fill and contained small amounts of silt, sand, and gravel.

Area 17

One soil boring (IB-SB-39) was advanced in this area. Fill material was encountered to a depth of approximately 3.5 feet below the ground surface. The material was damp and consisted of a firm silty clay with some fine sand. Underlying the fill material was a fine red-brown sand with a small amount of silt. The sand was saturated at 6 feet below the ground surface.

Area 18

One soil boring (IB-SB-44) was advanced in this area. The area is low-lying with respect to the rest of the site and was very swamp-like and not readily accessible with the drill rig. The area was characterized by dense, tall vegetation and standing, shallow water. Fill material was observed to a depth of approximately 22 feet. The fill was comprised of pieces of black slag-like material, pieces of wood, pieces of brick and broken rock. An oily sheen was encountered at 3 to 6 feet below the ground surface. A strong solvent-like odor was observed at approximately 5.5 feet and tapered off to a slight odor at 20 feet below the ground surface. Underlying the fill material was

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

a dense dry clay layer with some silt, fine to medium sand and fine gravel. The stiff clay was uniformly gray in color and high in plasticity.

Area 19

Five soil borings (IB-SB-19, IB-SB-20, IB-SB-23, IB-SB-24 and IB-SB-50) and four hand auger borings (IB-HA-12, IB-HA-13, IB-HA-14 and IB-HA-15) were advanced in this area. The area was characterized by a dense dry stiff clay to at least 60 feet below the ground surface. The clay contained small amounts of silt and fine sand and traces of fine gravel. At 15 feet below the ground surface the clay became softer and moist and changed color from a brown/yellow-brown to a uniform grayish brown at 15 feet below the ground surface.

Area 20

Since this area of concern was located inside the building and not readily accessible for sampling, the two soil borings (IB-SB-21 and IB-SB-22) were advanced immediately outside the building through the asphalt pad. The area was characterized by a dense dry stiff clay. The clay contained small amounts of silt and fine sand and traces of fine gravel.

Area 21

The area of concern was located inside the building and was inaccessible, therefore no soil borings were advanced in this location.

Area 22

Overhead power lines restricted access and only one soil boring (IB-SB-18) was advanced in Area 22. A light brown sand with a small amount of gravel and a trace of silt was observed in this area to a depth of approximately 2.5 feet below the ground surface. A dense clay with some silt and

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

a trace of sand and gravel was observed underlying the sand layer. The clay ranged in color from moderately yellow brown to light brown. The material was saturated from the ground surface (sand unit) and became progressively drier with depth.

Area 23

Two soil borings (IB-SB-48 and IB-SB-49) were advanced inside the building to determine if any contamination had migrated beneath the cement slab or through cracks in the floor. Approximately 3 feet of fill material was encountered which included the 5 inches of concrete floor. The fill material was a dry sand and gravel, light brown in color. Immediately below the fill layer was a dense, stiff clay layer. The clay was also dry and contained small amounts of fine to coarse sand, fine to coarse gravel, and silt.

Area 24

Results of the geophysical surveys indicated that this area was inaccessible for soil boring advancement because of the potential presence of underground utilities.

Area 25

One soil boring (IB-SB-40) and three hand auger borings (IB-HA-06, IB-HA-07 and IB-HA-08) were advanced in this area. The area was characterized by a dense, dry clay layer overlain by a loose, damp sand layer. The brown clay was stiff and contained small amounts of silt, sand and gravel. A gray brown silt seam was observed between the sand and clay layers.

Area 25A

Two soil borings (IB-SB-41 and IB-SB-42) and one hand auger boring (IB-HA-09) were advanced in this area. The area was characterized by a dense, dry clay layer overlain by a loose, damp sand

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

layer. The brown clay was stiff and contained small amounts of silt, sand and gravel. A gray brown silt seam was observed between the sand and clay layers.

Additional Phase II Characterization

A total of nineteen additional soil borings were completed at the IB parcels (Parcels 7 and 8) in May and June 1993, and 20 soil samples were collected for analysis. A summary of the samples collected and the requested analyses are presented in Table 5-2. Borings were installed in Areas 5, 5A, 8, 11, 14, 18, and 25A and in Building 41 (Area 18A).

Area 8

Two borings (CS-SB-04 and CS-SB-06) were advanced in the southwestern portion of the property in Area 8 to define the subsurface materials. Both of these borings extended through the fill material to a highly organic sandy clay which was encountered at a depth of approximately 25 feet below the ground surface. Two samples were collected from each soil boring. One from an interval of fill with elevated FID and/or PID readings, and one from the clay layer. Select samples were analyzed for VOCs, SVOCs, PCBs, and Michigan 10 metals analysis. Strong organic odors and elevated PID readings were noted in soil boring CS-SB-04. Elevated FID readings were observed in soil boring CS-SB-06.

Area 18

One soil boring (CS-SB-07), was advanced in Area 18 on the eastern side of the property to define the extent of contamination in the subsurface. Two samples were collected from this boring, one from the fill and one from the clay till, for VOC and PAH analysis. An oily sheen, solvent odor, and elevated FID and PID readings were observed in the soil boring. The area appears to be a former pit that was dug out of the native clay and then filled in. Five split-spoon samples were

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

advanced in this area to determine the horizontal extent of the fill. The fill appears to extend out from soil boring CS-SB-07 in a radius of approximately 30 feet.

Areas 5, 5A, 11, 14

One soil sample was collected from soil borings advanced in each of the following areas, 5 (CS-SB-02), 5A (CS-SB-01), 11 (CS-SB-05), and 14 (CS-SB-03), where elevated concentrations of metals had previously been detected. These samples were analyzed for TCLP and EP toxicity metals. Soil was composited from the intervals where previous sampling showed the metals concentrations to be the highest. Elevated FID readings were observed in soil borings CS-SB-02, CS-SB-03, and CS-SB-05. Soil boring CS-SB-01 had slightly elevated PID readings. Soil from soil boring CS-SB-02 also had a noticeable petroleum odor. One TCLP and EP toxicity metal sample (CS-HA-12) was also collected using a bucket auger from a depth of 1.5 feet below the ground surface from Area 25.

Building 41 (Area 18A)

Twelve soil borings were advanced in Building 41 using the truck-mounted rig or the skid rig. These borings were placed in areas where former aboveground storage tanks or a former coal gasification plant may have been located. Samples were collected from five of these borings. The samples were collected when elevated PID/FID readings were recorded or when any unusual subsurface material was encountered. Seven of the borings had elevated PID and/or FID readings. Organic odors were observed in soil boring CS-SB-14. Petroleum odors were encountered in soil borings CS-SB-15, CS-SB-21, and CS-SB-23. A tar-like product was observed in soil borings CS-SB-15 and CS-SB-23. Soil from soil boring CS-SB-25 had a naphthalene smell, and soil from soil boring CS-SB-22 had a creosote odor. A sample was also collected from native clay material which appeared to be uncontaminated.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Phase III Characterization

A total of 12 soil borings were advanced as part of the Phase III characterization at the IB parcels (Parcel 7 and 8). The Phase III characterization was performed to provide additional information on the parcel which could be used to obtain closure on the site from the MDEQ. A summary of samples collected and analyses performed is provided on Table 5-4.

Area 4

One soil boring was advanced in Area 4 (CS2-SB-18B) and converted to a monitoring well. One sample was collected from 25 to 27 feet below the ground surface which was analyzed for VOCs, SVOCs, and PAHs. Elevated FID readings from approximately 9 feet below the ground surface to the bottom of the borehole (31 feet below the ground surface) were recorded in this boring. Fill material was encountered in this boring to approximately 20 feet overlying approximately 4 feet of native silty sand (river sediments) overlying approximately nine feet of soft silty clay.

Area 8/9

One soil boring (CS2-SB-27) was advanced in Area 8 and converted to a monitoring well. Two soil samples were collected (15 to 17 and 27 to 29 feet below the ground surface) which were analyzed for VOCs, PAHs, and Michigan 10 metals. Elevated FID readings were encountered from approximately 11 to 29 feet below the ground surface. Fill material extended to 13 feet below the ground surface, sandy silt from 13 to 17 feet, sand from 17 to 23 feet and sandy silt from 23 to 29 feet below the ground surface.

Area 25

One soil boring (CS2-SB-1) was advanced in Area 25 south of an area previously defined as containing PCBs. A total of 5 soil samples were collected from continuous intervals to 10 feet

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Michigan 10 metals) and one sample from 15 to 17 feet below the ground surface (VOCs, PAHs and Michigan 10 metals). One sample was collected from CS2-SB-22 from 9 to 11 feet and analyzed for VOCs, PAHs and Michigan 10 metals and two samples were collected from CS2-SB-23B (11 to 13 and 13 to 15 feet below the ground surface) and analyzed for the same parameters. Each of the borings were advanced through foundry sand fill with slag, and wood chips.

One soil boring, CS2-SB-24, was advanced southwest of the powerhouse to a depth of 21 feet. One sample was collected from 9 to 11 feet and analyzed for VOCs, PAHs, and Michigan metals. This interval corresponded to the split-spoon interval with the highest recorded FID reading. Sandy fill material extended to nine feet overlying a stiff clay.

One soil boring, CS2-SB-28, was advanced southwest of the former crane testing pad. This boring was scheduled to be completed during the additional Phase II characterization, however, access was restricted due to the presence of a large gravel pile. This boring was advanced to 30.5 feet. One sample was collected from 8 to 10 feet which corresponded to the bottom of the fill material and analyzed for VOCs, PAHs, PCBs and Michigan 10 metals. The boring was advanced through 10 feet of fill sand and gravel and 18 feet of sand and silty alluvial material. Clay till was encountered approximately 29 feet below the ground surface.

5.7.5 Saginaw Rock (Parcel 9)

Phase II Characterization

Phase II characterization sampling was not performed at the Saginaw Rock (Parcel 9) parcel by WESTON.

Phase III Characterization

One soil sample was collected from each of eight soil borings (WDP-SB-29 through WDP-SB-34, WDP-SB-36 and WDP-SB-37) advanced at the Saginaw Rock parcel (Figure 5-5C). The samples

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

were collected to further characterize identified constituents in soils at the parcel and to further characterize the site geology. Soil sample depths varied from 0.5 feet below the ground surface to 8.5 feet below the ground surface. All soil samples were analyzed for VOCs, SVOCs, Michigan 10 metals, PCBs and cyanide. The borings which were advanced along the western portion of Saginaw Rock were characterized by interbedded clay, sand and gravel with an organic odor and usually a reading of greater than 1,000 ppm on the FID. The geologic material along the eastern portion of Saginaw Rock contained less sand and more clay.

5.7.6 Midland (Parcel 10)

Phase II Characterization

Four soil borings (CS-SB-26 through CS-SB-29) were advanced at the Midland parcel (Parcel 10) (Figure 5-5C). One soil boring (CS-SB-27) was advanced downgradient of a possible UST. The sample collected from 4 to 6 feet below the ground surface was analyzed for benzene, toluene, ethylbenzene and xylene (BTEX). Soil boring, CS-SB-26, was advanced east of the garage building. The soil sample collected from this boring was analyzed for PAHs. Soil from both soil borings CS-SB-26 and CS-SB-27 exhibited elevated FID readings up to 1,000 units and a petroleum odor. The alluvial deposits at the Midland parcel had an organic odor. PCB samples from 0.5 to 1 foot below the ground surface and 2.5 to 3 feet below the ground surface were collected from two of the soil borings (CS-SB-28 and CS-SB-29). PCB samples were collected at 0.5 to 1 foot below the ground surface and at 2.5 to 3 feet below the ground surface. The 2.5 to 3 foot interval samples were submitted to the laboratory, extracted and held for future analysis. The samples were analyzed only if detectable levels of PCBs were reported in the shallow (0.5 to 1 foot) samples. Each of the borings was advanced through 2 to 3 feet of fill which consisted of foundry sands and gravel and then approximately 2 to 3 feet of gravelly clay with wood fragments. Below the fill material were alluvial deposits consisting of silty clay with intermittent sand lenses.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Phase III Characterization

Thirty-six soil samples were collected from 21 soil borings (WDP-SB-01 through WDP-SB-04, WDP-SB-06 through WDP-SB-20, and WDP-SB-28) advanced throughout the Midland parcel during the 1994 sampling event. Soil sample depths are summarized on Table 5-3. The samples were collected to further characterize identified constituents in soils and determine waste disposal characteristics for soil in the area where the proposed working dock was to be located. Soil samples were analyzed for VOCs, SVOCs, PAHs, Michigan 10 metals, TCLP metals, EP toxicity metals, PCBs and waste characterization parameters, however, not all of the samples were analyzed for all of the parameters. Table 5-3 summarizes the analyses performed for each of the collected samples. Sample description from these borings indicate that the southwestern portion of the site contains asphalt-like material and petroleum odors up to a depth of approximately 10 feet below the ground surface. The remainder of the site is overlain with approximately 2 to 6 feet of fill sands and gravels.

In addition to the 21 borings advanced as part of the site characterization, 4 riverbank cores (WDP-LC-01 through WDP-LC-04) were advanced along the Saginaw river on the Midland parcel for disposal characterization of the material to be excavated during the construction of the proposed working dock. Two composite samples were collected from the top of the core to an elevation equal to the bottom of the proposed working dock excavation. The second composite sample was collected from an elevation equal to the bottom of the proposed working dock excavation to 3 feet below the bottom of the proposed working dock excavation. Eight soil samples were analyzed for chlorinated pesticides, PAHs, PCBs, TPH, total organic carbon (TOC), total volatile suspended solids (TVS), Michigan 10 metals, phosphorus, grain size, specific gravity, total Kjeldahl nitrogen (TKN) and percent moisture (Table 5-5).

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.7.7 Cnudde (Parcel 11)

Phase II Characterization

One soil boring, CS-SB-18, was advanced at the Cnudde parcel (Figure 5-5C) to determine the subsurface impact from on- and off-site activities. A soil sample was collected from 4 to 12 feet below the ground surface and analyzed for VOCs, SVOCs, PCBs, and Michigan 10 metals. Organic odors were noted in this boring, however PID readings were low. Fill material consisting of sandy silt and brick coal extended to approximately 11.5 feet below ground surface which overlaid river sediments.

Phase III Characterization

Two soil samples were collected from a soil boring (WDP-SB-22) advanced at the Cnudde parcel to define the extent of previously detected contamination. Soil samples were collected from 8.5 to 10.5 and 10.5 feet to 12.5 feet below the ground surface. The samples were analyzed for Michigan 10 metals and PAHs. The samples were collected below the fill material in a sandy silty clay.

5.7.8 Kunkel (Parcel 12)

Phase II Characterization

One soil boring, CS-SB-12, was advanced to determine the subsurface impact from on- and off-site activities (Figure 5-5C). Soil was collected from an interval of elevated FID and/or PID readings (6 to 16 feet below the ground surface) and analyzed for PCBs, VOCs, SVOCs, and Michigan 10 metals. Fill material extended to approximately 6 feet below the ground surface. River sediments consisting of sandy silt, shells and wood fragments extended from 6 to 18 feet below the ground surface overlying a gray silty till.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Phase III Characterization

Six soil samples were collected from three soil borings (WDP-SB-23 through WDP-SB-25) advanced at the Kunkel parcel (Parcel 12) to further characterize the geology and constituents in soils. Soil samples were collected at depths varying from 2.5 to 12.5 feet below the ground surface. All soil samples were analyzed for Michigan 10 metals. Fill materials extended from 2 to 6 feet below the ground surface overlying river sediments.

5.7.9 City of Bay City - Former Sears Automotive (Parcel 13)

Phase II Characterization

Three soil borings (CS-SB-10, CS-SB-11 and CS-MW-01) were advanced on the City of Bay City - Former Sears Automotive parcel (Parcel 13) (Figure 5-5A). One of these borings was converted to a monitoring well. One soil sample was collected from each of these borings and analyzed for PAHs which may have been present due to former on-site USTs. Samples were collected from intervals with elevated FID and/or PID readings. Only soil boring CS-MW-01 contained fill material which consisted of 6 feet of clean brown sand overlying a soft gray till.

Phase III Characterization

Phase III characterization was not performed at the City of Bay City - Former Sears Automotive parcel.

5.7.10 City of Bay City - Substation (Parcel 15)

Phase II Characterization

Three soil samples were collected from two locations (CS-HA-13 and CS-HA-17) (Figure 5-5A) with a bucket hand auger to determine if PCBs had migrated from the substation. PCB samples were collected at 6 to 12 inches below the ground surface and at 2.5 to 3 feet below the ground

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

surface. The 2.5 to 3 foot interval samples were submitted to the laboratory, extracted and held for future analysis. The samples were analyzed only if detectable levels of PCBs were reported in the shallow (6 to 12 inch) samples. The two samples from CS-HA-13 were collected from inside the substation underneath a transformer that appeared to have leaked in the past. One sample was collected from a location north of the substation. Both locations were overlain with coarse gravel to approximately 6 inches below the ground surface and the samples were collected from a fill sand unit.

Phase III Characterization

Phase III characterization was not performed at the City of Bay City - Substation parcel.

5.7.11 Labadie - Parking Lot (Parcel 18)

Phase II Characterization

Two soil samples were collected from one location (CS-HA-14) (Figure 5-5A) with a bucket auger to determine if PCBs were present. PCB samples were collected at 6 to 12 inches below the ground surface and at 2.5 to 3 feet below the ground surface. The 2.5 to 3 foot interval samples were submitted to the laboratory, extracted and held for future analysis. The samples were analyzed only if detectable levels of PCBs were reported in the shallow (6 to 12 inch) samples. The sample locations were overlain with asphalt and approximately 6 inches of coarse gravel.

Phase III Characterization

A total of eight soil borings (CS2-SB-07 through CS2-SB-14) were advanced on the Labadie - Parking Lot parcel (Parcel 18) as part of the Phase III characterization to define the extent of the previously detected PCB contamination. Soil samples were collected from six continuous intervals to a depth of 10 feet. All samples were submitted to the laboratory and extracted for future PCB analysis. All samples from the 0 to 1 foot interval were analyzed. Additional intervals were

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

analyzed if the interval above indicated detectable levels of PCBs. Select samples were screened on-site using a PCB D-TECH field test kit. Results of the PCB screening are summarized on Table 5-6. Fill material extended from 5 to 8 feet below the ground surface and consisted of black foundry sand or brown and overlaid brown silty clay.

5.7.12 Labadie - Lube Shop (Parcel 19)

Phase II Characterization

Phase II Characterization activities were not performed at the Labadie - Lube Shop parcel (Parcel 19) by WESTON.

Phase III Characterization

One soil boring (CS2-SB-16) was advanced on the Labadie - Lube Shop parcel (Figure 5-5A). Six soil samples were collected from continuous intervals to a depth of 10 feet. All samples were submitted to the laboratory and extracted for future PCB analysis. The sample from the 0 to 1 foot interval was analyzed. Additional intervals were analyzed if the interval above indicated detectable levels of PCBs. Select samples were screened on-site using a PCB D-TECH field test kit. Results of the PCB screening are summarized in Table 5-6. Fill sand extended to 5 feet below the ground surface.

5.7.13 City of Bay City - Water Street Substation (Parcel 21)

Phase II Characterization

A total of six soil samples were collected from three locations (CS-HA-01, CS-HA-04 and CS-HA-05) around the perimeter of the City of Bay City - Water Street Substation parcel (Parcel 21) (Figure 5-5A) using a bucket hand auger. PCB samples were collected at 6 to 12 inches below the ground surface and at 2.5 to 3 feet below the ground surface. The 2.5 to 3 foot interval samples were submitted to the laboratory, extracted and held for future analysis. The samples

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

were analyzed only if detectable levels of PCBs were reported in the shallow (6 to 12 inch) samples. The samples were collected to preliminarily define the extent of PCB contamination outside the fenced substation. The samples were collected from loose fill sand and gravel.

Phase III Characterization

Samples were not collected at the City of Bay City - Water Street Substation parcel (Parcel 21) as part of the Phase III characterization. However samples were collected at adjacent parcels to determine the extent of PCB contamination from the substation.

5.7.14 Consumers Power - Vacant Lot (Parcel 26)

Phase II Characterization

Two soil borings (CS-SB-08 and CS-SB-09) were advanced on the Consumers Power - Vacant lot (Parcel 26) east of the City of Bay City - Water Street Substation parcel (Parcel 21) (Figure 5-5A) to determine the subsurface impact from the adjacent property to the north. One soil sample was collected from each boring, one for VOC analysis and the other for Michigan 10 metals analysis. Fill sand and gravel extended to 4 to 6 feet below ground surface overlying a light olive to brown clay till.

Phase III Characterization

Four soil borings (CS2-SB-5, CS2-SB-6, CS2-SB-15 and CS2-SB-17) were advanced on the Consumers Power - Vacant lot parcel as part of the Phase III characterization to define the extent of the previously detected PCB contamination on the adjacent City of Bay City - Water Street Substation parcel (Parcel 21). Soil samples from six continuous intervals in each boring were collected, submitted to the laboratory and extracted. All samples from the 0 to 1 foot interval were analyzed for PCBs. Additional intervals were analyzed if the interval above indicated detectable levels of PCBs. Select samples were screened on-site using PCB D-TECH field test

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

kits. Results of the PCB screening are summarized on Table 5-6. Fill material extended up to 6 feet below ground surface overlying a stiff brown till.

5.7.15 Residential Parcels (Parcel 29)

Phase II Characterization

Four soil samples were collected from three soil borings (WDP-SB-26, WP-SB-27 and WDP-SB-38) advanced on the Residential parcels (Parcel 29) (Figure 5-5C). Samples were collected to characterize the geology and subsurface soils at the parcel and to determine if a release from a former tank had occurred. Soil samples were collected from depths varying from 6.5 feet below the ground surface to 12.5 feet below the ground surface. Soil sample parameters included VOCs, PCBs, PAHs, and Michigan 10 metals. Fill material extended to approximately 6 feet below the ground surface overlying saturated river sediments to approximately 25 feet below ground surface.

5.8 GROUNDWATER ASSESSMENT

5.8.1 Monitoring Well Installation

Phase II drilling and well installation activities were performed by Burlington and Phase III drilling and monitoring well installation was performed by Somat under the direct supervision of WESTON. Monitoring well locations were selected based on observations documented during soil boring installation. Locations were selected to address potentially impacted areas and areas potentially downgradient from impacted areas. All monitoring well locations are depicted on Figures 5-5A, 5-5B and 5-5C. Well screens were placed 1 foot above the water table and 4 feet into the water table. All wells were constructed of 2-inch polyvinyl chloride (PVC) well screen and PVC riser pipe with flush threads. The use of PVC was authorized by the U.S. EPA and MDEQ since the Phase I characterization wells were temporary and were removed following completion of the initial investigation in December 1992. The screen lengths were 5 feet with .007-inch slot openings. The annular space surrounding each well screen was filled with filter sand to an elevation approximately 2 feet above the top of the screen. A minimum of 1 foot

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

bentonite seal was placed above the sand. Auger flight cuttings were used to backfill the remainder of the annular space to the ground surface. A flush mount or stick-up protective steel casing with a bolted or locking cap was installed at the surface. In addition a cement grout collar was poured and formed around the steel casing. After the concrete grout had been allowed to harden for a minimum of 24 hours, the wells were developed using a surge block technique, and pumped until the water began to run clear. Well construction diagrams are presented in Appendix Q.

5.8.2 Monitoring Well Sampling

Well sampling was initiated on 30 November 1992. The following procedures were used to collect the samples:

- A depth to water level measurement relative to the top of the inner casing was obtained with an electronic water level indicator and recorded on the well sampling form.

- Based on the water level and depth of the well, the volume of standing water in the well was calculated.

- The well was purged of three times the volume of standing water using a disposable PVC bailer.

- Following initial well purging, measurements of pH, specific conductance, and temperature were made using field instruments and recorded on the well sampling form. Pre-measurement calibration of the instruments were performed prior to field screening.

- Purging continued until measurements for all three parameters stabilized (± 0.25 units for pH, $\pm 10\%$ for specific conductance, and $\pm 1.0^{\circ}$ C for temperature) for three consecutive readings or until five well volumes were removed. If the well was purged dry, it was allowed to recharge for 15 minutes before it was bailed dry again and then samples were collected.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- The samples were collected with the disposable bailer and poured directly into the sample containers supplied by the laboratory. Samples collected for metals analyses were filtered through a .45 micron (μ) disposable filter. Appropriate preservatives were added and the samples were stored on ice. Each well sample was analyzed for at least one of the following: VOCs, SVOCs, PCBs, PAHs, total Michigan 10 metals, dissolved Michigan 10 metals and cyanide.

Two types of quality control (QC) samples, duplicate samples and field blank samples, were also collected and submitted for analysis. Duplicate samples were analyzed to obtain information on the precision of laboratory analysis; and field blank samples were analyzed to obtain information on the effectiveness of the sample equipment decontamination. The duplicate groundwater samples were collected concurrently with the respective investigative sample. The field blank samples were collected by pouring distilled laboratory grade water through a disposable bailer directly into sample containers.

All groundwater samples were kept in coolers from the time of collection until delivery to the laboratory. A completed chain-of-custody form was placed inside each of the coolers, which were then sealed with strapping tape and custody seals. The analytical results of the monitoring well samples are presented in Section 6. The purge and development water was collected, containerized, labeled, and stored on-site until disposal was secured in December 1993.

5.8.3 Monitoring Well Locations and Analyses

5.8.3.1 Industrial Brownhoist (Parcels 7 and 8)

The locations selected for placement of the monitoring wells and observations made during well development and sampling activities are summarized below. Fourteen temporary overburden monitoring wells were installed on the IB parcels (Parcels 7 and 8) during Phase II and nine permanent (5 shallow and 4 deep) were installed on the IB parcels during Phase III activities.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Phase II

Area 1

One monitoring well was installed in this area (IB-MW-01) to access groundwater downgradient from the reported former outside storage area. Recovery of the well was sufficient during both the development and sampling events.

Area 2

One monitoring well was installed in this area (IB-MW-02) to assess groundwater downgradient from the reported former outside storage area and to assess water quality at the site boundary. A strong sewage-like odor was noted while developing and sampling the well.

Area 4

One monitoring well was installed in this area (IB-MW-04) to assess downgradient site water quality. No noticeable characteristics were observed when developing or sampling the well.

Area 5/5A

One monitoring well (IB-MW-12) was installed in Area 5A and one monitoring well (IB-MW-13) was installed downgradient of Area 5A. Slow recovery was noted while developing IB-MW-12. The water was observed during sampling to be dark brown with a strong sewage-like odor. Recovery was sufficient during both developing and sampling of IB-MW-13 and no color or odors were observed when sampling this well.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 6

One monitoring well (IB-MW-03) was installed in this area because a sheen was observed during soil boring installation. Although the well was very close to the river, slow recovery was noted during development and sampling of the well.

Area 8

One monitoring well (IB-MW-08) was installed in this area, downgradient of the former crane pad. No notable observations were made while developing or sampling the well.

Area 9

One monitoring well (IB-MW-05) was installed in this area, upgradient of site activities. Slow recovery was noted while developing and sampling the well.

Area 10

One monitoring well (IB-MW-06) was installed in this area to determine water quality near Building 42. Slow recovery was noted during sampling and development. The water was observed to be dark black and silty.

Area 11

Two monitoring wells were installed in this area. One monitoring well (IB-MW-07) was installed upgradient of the potential UST and Building 42 and one monitoring well (IB-MW-14) was installed between the potential UST and Building 42. Very slow recovery was noted while developing IB-MW-07 and a slight sewage-like odor was also noted while sampling the well. A strong sewage odor was detected when sampling IB-MW-14 and the well had very slow recovery.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Area 14

One monitoring well (IB-MW-10) was installed in this area to determine groundwater quality downgradient of the potential UST in Area 13.

Areas 15/16A

One monitoring well (IB-MW-11) was installed in this area to characterize the water quality downgradient of the potential USTs and Building 42.

Area 17

One monitoring well (IB-MW-09) was installed in this area. The well was pumped dry during development and again during sampling operations. Sampling took place over a two day period to allow the well to recharge with sufficient water to collect samples.

In accordance with the requirements established for the site, all of the WESTON installed Phase II characterization wells (casings and screens) were removed after completion of the first round of groundwater sampling activities. The well holes were grouted to the surface with bentonite holeplug on 1 and 2 December 1992.

Non-Specified Area

One monitoring well was scheduled to be installed southeast of Building 41 on the IB parcels (Parcels 7 and 8). However, only dry clay till was encountered in the borehole to a depth of 18 ft below the ground surface. This soil boring was identified as CS-MW-01A because a shallow aquifer was not found, the well was not installed.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express. written permission of U.S. EPA.

Phase III

Non-Specified Area

Four monitoring well nests (CS2-MW1S&D through CS2-MW4S&D) were installed adjacent to the Saginaw river. The well nests were installed to evaluate the groundwater quality within the shallow groundwater unit discharging to the Saginaw River and to evaluate the vertical direction and gradient present within the shallow unit. The shallow wells were installed within gravelly and sandy fill material and the top of the alluvial unit, straddling the top of the water table. The deep wells were installed above the clay till, within the silty sandy alluvial deposits. In addition, one shallow well (CS2-MW5S) was installed near the center of the property. In March 1995, the wells were developed and in December 1995 the wells were sampled. The samples collected and analytical parameters are summarized in Table 5-4. At the request of the U.S. EPA, following receipt of the analytical results, the keys to the monitoring wells were turned over to the IB property owner.

5.8.3.2 Saginaw Rock (Parcel 9)

Phase II

One monitoring well was installed at the Saginaw Rock parcel (Parcel 9). The monitoring well was installed in order to determine groundwater quality upgradient of the proposed CERT site. The well was screened at a depth of 5 to 10 feet below the ground surface in a perched zone overlying the clay till. Groundwater samples from this well were analyzed for VOCs, SVOCs, Michigan 10 metals, PCBs and cyanide.

Phase III

Three monitoring wells (WDP-MW-09 through WDP-MW-11) were installed at the Saginaw Rock parcel during the Phase III characterization to assess the overall CERT site potentiometric surface and the chemical constituents present in groundwater at that parcel. Sand and gravel fill extended

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

to approximately 5 feet below the ground surface, roughly corresponding to the top of the water table. The wells were set straddling the water table near the top of the sandy silty alluvial unit. A summary of sample analyses is provided on Table 5-3.

5.8.3.3 Midland (Parcel 10)

Phase II

One monitoring well (CS-MW-02) was installed at the Midland parcel (Parcel 10). The monitoring well was installed in order to determine groundwater quality upgradient of the proposed CERT site. The well was screened at a depth of 5 to 10 feet below the ground surface in a perched zone overlying the clay till. Strong organic odors were observed while drilling CS-MW-02 from 4 to 8 feet below the ground surface. When this well was developed the water had a strong sulfur smell. Groundwater samples from this well were analyzed for VOCs, SVOCs, Michigan 10 metals, PCBs and cyanide.

Phase III

Seven monitoring wells (WDP-MW-1 through WDP-MW-4, WDP-MW-6, WDP-MW-8 and WDP-MW-12) were installed at the Midland parcel during the Phase III characterization. These wells were installed to assess the quality of water that would be encountered during installation of the proposed working dock. Two wells (WDP-MW-4 and WDP-MW-8) were placed near the southeast and northeast corners of the parcel to assess the quality of groundwater migrating on to the parcel. All wells were screened within the shallow fill and/or alluvium at depths less than 11 feet. All wells were sampled for VOCs, SVOCs and dissolved Michigan 10 metals. In addition, five of the wells were sampled for PCBs and four of the wells were sampled for cyanide. A second round of well sampling was conducted in September 1995. Seven wells (WDP-MW-1 through WDP-MW-4, WDP-MW-6, CS-MW-02, CS-MW-03) were sampled and analyzed for dissolved Michigan 10 metals and cyanide. Monitoring wells WDP-MW-08 and WDP-MW-12 were damaged and could not be sampled at that time.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.8.3.4 Kunkel (Parcel 12)

Phase II

Monitoring wells were not installed at the Kunkel parcel (Parcel 12) during the Phase II activities.

Phase III

One monitoring well (WDP-MW-5) was installed at the Kunkel parcel to determine if any chemical constituents were present in the on-site groundwater and to determine the overall CERT site potentiometric surface. The well was screened in the silty sand alluvial unit and the screen straddled the water table.

5.8.3.5 City of Bay City - Former Sears Automotive (Parcel 13)

Phase II

One shallow monitoring well (CS-MW-01) was installed at the former Sears automotive parcel (Parcel 13) during the Phase II characterization. One soil boring at the site was converted to a monitoring well to assess the potential impact by former on-site USTs, hydraulic lifts, and upgradient properties. The monitoring well was set 7.5 feet below the ground surface and screened at a depth from 2.5 to 7.5 feet below the ground surface. A perched zone was found overlying the clay till from 1 to 6 feet below the ground surface. During development and purging the well was slow to recharge.

Phase III

Additional wells were not installed by WESTON during the Phase III Characterization at the City of Bay City - Former Sears Automotive parcel.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.9 SEDIMENT SAMPLING

Eight sediment samples (WDP-RS-1 through WDP-RS-8) were collected from the Saginaw River during Phase III characterization activities. The samples were collected to determine if contaminants were present in river sediment in the area where dredging was planned during the proposed construction of the working dock. The samples were collected from a boat with a Ponar dredge sampler at equidistant locations along the proposed working dock. The sediment samples were collected approximately 25 feet from the shoreline in 18 to 22 feet of water. The Ponar dredge sampler was lowered from the boat to the bottom of the river where the sample was collected from the 0 to 0.5 feet sediment depth interval.

An additional six river cores (WDP-RC-01 through WDP-RC-06) were advanced in the Saginaw River adjacent to the Midland parcel (Parcel 10) for disposal characterization of the material to be excavated during the construction of the proposed working dock. Two composite samples were collected from the top of the core to an elevation equal to the bottom of the proposed working dock excavation. The second composite sample was collected from an elevation equal to the bottom of the proposed working dock excavation to 3 feet below the bottom of the proposed working dock excavation. Eleven soil samples were analyzed for chlorinated pesticides, PAHs, PCBs, TPH, TOC, TVS, Michigan 10 metals, phosphorus, grain size, specific gravity, TKN, and percent moisture.

5.10 PCB SAMPLING

A limited number of PCB samples were collected from areas within the Powerhouse and Building 41 on the IB parcels (Parcels 7 and 8) on 21 December 1992. The sampling was conducted to determine if PCB contamination was present in the significantly oil-stained areas of the IB parcel. A total of six samples (three wipe, two oil and one solid) were collected within the Powerhouse. A total of two samples (one wipe and one solid) were collected in the northwest portion of

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Building 41 in the vicinity of the PCB-labeled transformers. The analytical results are summarized in Section 6.

5.11 SITE SURVEY

WESTON subcontracted Wade-Trim/Edmands (Wade-Trim) of Bay City, Michigan to perform a site survey of the CERT site. The horizontal location and vertical elevations were determined for all the soil boring locations, the groundwater monitoring wells, and the hand auger boring locations. Wade-Trim referenced all elevations to two on-site USGS (National Geodetic Vertical Datum) benchmarks. The ground elevation and the elevation of the top of the riser pipe were determined at each well location. Surveying was performed after each of the sampling events.

5.12 INVESTIGATIVE DERIVED WASTE DISPOSAL

Following the completion of each phase of investigative activities, WESTON subcontracted Young's Environmental Cleanup Inc, (YOUNG's) of Flint, Michigan to characterize transport, and dispose of all generated IDW. The IDW included soil cuttings, decontamination water and well development water. Analytical results from soil and water samples were sent to disposal facilities for acceptance prior to disposal.

Drums containing cuttings from soil borings where PCBs were detected were segregated and transported for incineration. All remaining soil cuttings were consolidated into roll-off box for disposal. Empty drums were crushed and scrapped. Decontamination/well development water was transported off-site via tanker truck for treatment. The polytank used for containerizing the water prior to disposal was left on-site.

The following summarizes the types and volume of IDW disposed of from the CERT site by WESTON:

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

- 2,400 gallons of wastewater
- approximately 40 cubic yards (yds^3) of non-hazardous soil
- 15 drums of PCB-contaminated soil
- approximately 60 gallons of hazardous or flammable liquids
- approximately 40 yds^3 of scrap material

5.13 MISCELLANEOUS DRUM DISPOSAL

Throughout the 1995 investigative activities, WESTON identified the presence of miscellaneous drums on both the Midland (Parcel 10) and Saginaw Rock (Parcel 9) parcels. Three drums containing unknown liquids were identified on the Midland Parcel (Parcel 10) on 16 May 1995. Two of the drums were overpacked and subsequently sampled and transported off-site for disposal. The remaining red drum was partially buried and could not be extracted for overpacking. On 14 December 1995, the red drum was unearthed and staged for subsequent disposal. On 16 February 1996, the red drum was observed to have been removed from the site by an unknown source and could not be located; however, two additional drums were observed at Midland (Parcel 10) at that time. One drum, which contained oil was sampled and staged on the Kunkel (Parcel 12) parcel. The other drum was located between the Midland (Parcel 10) parcel security fence and an outbuilding and was frozen to the ground and could not be moved. The origin and contents of this drum was unknown.

One drum was identified on the Saginaw Rock parcel (Parcel 9) on 2 February 1996. This drum was located just inside the site security fence. The origin and contents of this drum was unknown. The drum was frozen to the ground and could not be moved. The following presents a summary and known current status of the drums:

Parcel	Drum Identified	Current Status
Midland (Parcel 10)	~ 33-gallon yellow drum containing unknown liquid	Overpacked and transported off-site for disposal.
Midland (Parcel 10)	~ 33-gallon black drum containing unknown liquid	Overpacked and transported off-site for disposal.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

Parcel	Drum Identified	Current Status
Midland (Parcel 10)	55-gallon red drum containing unknown liquid	Disappeared from site.
Midland (Parcel 10)	55-gallon drum containing oil	Sampled and staged at Kunkel (Parcel 12).
Midland (Parcel 10)	55-gallon drum containing unknown material	Frozen to ground upside down at Midland (Parcel 10) between site security fence and outbuilding.
Saginaw Rock (Parcel 9)	55-gallon drum containing unknown material	Frozen to ground on its side inside site security fence at Saginaw Rock (Parcel 9).

5.14 EXPERT TESTIMONY OVERSIGHT

On 15 December 1995, WESTON personnel provided oversight during test pit installation on the Saginaw Rock (Parcel 9) and Midland (Parcel 10) parcels of the CERT site. The test pit installation activities were requested by the former property owners for the parcels to provide information for the potential settlement of the parcels purchase by the U.S. EPA. Prior to the test pit installation activities, WAM Avel expressed concern to all parties that the work was scheduled to be conducted without the benefit of a U.S. EPA or MDEQ approved Work Plan. The attorney for the former owners of the parcels indicated that excavation activities would not be conducted deeper than the overlying aggregate material and that once natural subsurface material was encountered the excavation would be halted and the surface restored. WAM Avel concurred with this approach and the test pit activities were allowed to begin. Following the initiation of the excavating, WAM Avel and Mr. David Vollenweider (DOJ) proceeded to the district office of the MDEQ to inform them of the proposed activities.

The test pit activities have been summarized on a parcel by parcel basis.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

5.14.1 Saginaw Rock (Parcel 9)

The Saginaw Rock (Parcel 9) test pit activities were coordinated by Mr. James Cuthbertson of RC Associates, Inc. (RC), consultant for Saginaw Rock. Excavating activities were carried out by Rhode Environmental (Rhode) under the supervision of Mr. Cuthbertson. A total of 16 test pits were excavated. RC personnel measured the locations of the test pits from surveyed stakes. Water was encountered in five of the test pits. The depths of the test pits ranged from six inches to five feet. Soil, fill, aggregate, sand and clay were encountered in the test pits. In three of the test pits (#4, #6, and #14) on the south portion of the parcel, a blue colored, sand material was observed. A sample of this material was collected from each of the test pits and submitted for analysis. The samples were analyzed for Michigan 10 metals and cyanide at Clayton.

Detected parameters from the test pit samples are summarized in Section 6.

5.14.2 Midland (Parcel 10)

The Midland (Parcel 10) test pit activities were coordinated by Mr. Michael Kendall of Superior Environmental (Superior), consultant for Midland. Excavating activities were carried out by Rhode under the supervision of Mr. Kendall. A total of thirty-one test pits were excavated. Water was encountered in two of the test pits. The depths of the test pits ranged from three and one-half inches to eight feet. Sand, fill, aggregate, and asphalt were encountered in the test pits. In many of the test pits black stained subsurface material was excavated and left on the surface following backfilling of the pits. A sample of this material was collected from one of the pits (#17) and submitted for analysis to determine if PAHS were now present on the surface of the parcel. The sample was analyzed for PAHs at Clayton.

Detected parameters from the test pit sample are summarized in Section 6.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 6
ANALYTICAL RESULTS

All of the Phase I samples collected at the CERT site with the exception of the radiation, EP toxicity and TCLP samples, were analyzed by Clayton. The TCLP and EP toxicity metals samples were analyzed by Snell. The radiation samples were analyzed by Core. Tables 5-1 and 5-2 summarized the number of samples collected and the associated analyses for the samples collected during Phase II. All of the Phase III samples collected were analyzed by Clayton and/or Envirosystems. Tables 5-3 through 5-6 summarized the number of samples collected and associated analyses performed during the Phase III activities. Following receipt of the analytical results, the data were validated and tabulated. A summary of the data validation activities can be found in Appendix R.

A summary of the parameters detected in the soil borings collected in each area at the IB parcels (Parcels 7 and 8) is presented in Tables 6-1 through 6-22. When an analyte was not detected in a sample the symbol "ND" was used on the table followed by the detection limit in parentheses. A summary of the parameters detected from the TCLP and EP toxicity samples from the IB parcels is presented in Table 6-23. A summary of the parameters detected from the radiation samples from the IB parcels is presented in Table 6-24. A summary of the parameters detected from the additional PCB sampling at the IB parcels is presented in Table 6-25.

A summary of the parameters detected in the soil borings for the remaining parcels is presented in the following tables.

- Fisher Brothers (Parcels 3 and 5) - Table 6-26
- Consumers Power - Switching Station(Parcel 4) - Table 6-27
- Weld-Rite (Parcel 6) - Table 6-28
- Saginaw Rock (Parcel 9) - Table 6-29
- Midland (Parcel 10) - Table 6-30
- Cnudde (Parcel 11) - Table 6-31
- Kunkel (Parcel 12) - Table 6-32
- City of Bay City - Former Sears Automotive (Parcel 13) - Table 6-33

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-1
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Areas 1 and 2
CERT Site, Bay City, Michigan

	AREA 1	AREA 2			
Sample I.D.:	IBSB37-01	IBSB38-01	IBSB38-02	IBSB46-01	IBSB46-02
Sample Depth (ft):	(6-10)	(4-6)	(2-8)	(8-10)	(4-6)
Parameter					
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	500	300	NA	ND (100)	ND (100)
Methylene Chloride	40	30	NA	10	20
Polychlorinated Biphenyl (PCB)					
Aroclor-1248	ND (40)	NA	ND (40)	730	150
Aroclor-1260	ND (40)	NA	ND (40)	ND (500)	180
Semi-Volatile Compounds (SVOCs)					
Benzo(a)anthracene	200	NA	400	600	300
Benzo(b)fluoranthene	ND (200)	NA	500	700	200
Benzo(k)fluoranthene	ND (200)	NA	200	400	300
Benzo(a)pyrene	ND (200)	NA	400	500	ND (200)
Chrysene	200	NA	400	600	300
Fluoranthene	400	NA	700	1200	600
Fluorene	ND (200)	NA	ND (200)	ND (200)	300
2-Methylnaphthalene	ND (200)	NA	300	ND (200)	ND (200)
Phenanthrene	ND (200)	NA	800	600	1000
Pyrene	400	NA	700	1800	800

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-1.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-2
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 4
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB01-01 (6-8)	IBSB01-02 (8-10)	IBSB02-01 (8-10)	IBSB03-01 (6-8)	IBSB03-02 (8-10)	CS2-SB-18B (25-27)
Parameter						
INORGANIC (mg/kg)						
Arsenic	2.1	3.1	4.4	NA	NA	6.1
Barium	30	32	40	NA	NA	32
Cadmium	2.7	3.4	4.0	NA	NA	ND(0.1)
Chromium	10	12	14	NA	NA	7
Copper	18	11	23	NA	NA	6
Lead	16	13	17	NA	NA	4
Selenium	ND (0.1)	0.1	0.1	NA	NA	ND(0.6)
Silver	ND (0.2)	0.4	0.3	NA	NA	ND(0.7)
Zinc	26	18	28	NA	NA	28
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Acetone	100	ND (100)	ND (200)	ND (100)	ND (100)	ND (100)
1,1-Dichloroethane	ND (10)	ND (10)	ND (20)	10	ND (10)	ND (10)
Methylene Chloride	20	10	ND (20)	ND (10)	ND (10)	10
Toluene	ND (10)	ND (10)	ND (20)	ND (10)	ND (10)	20 J
1,1,1-Trichloroethane	ND (10)	ND (10)	ND (20)	120	10	ND (10)
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	ND (200)	ND (200)	400	ND (200)	ND (200)	ND(330)
Acenaphthylene	ND (200)	ND (200)	900	ND (200)	ND (200)	ND(330)
Anthracene	ND (200)	ND (200)	1500	ND (200)	ND (200)	ND(330)
Benzo(a)anthracene	ND (200)	ND (200)	3900	ND (200)	ND (200)	ND(330)
Benzo(b)fluoranthene	ND (200)	ND (200)	3100	ND (200)	ND (200)	ND(330)
Benzo(k)fluoranthene	ND (200)	ND (200)	1900	ND (200)	ND (200)	ND(330)
Benzo(a)pyrene	ND (200)	ND (200)	2600	ND (200)	ND (200)	ND(330)
Benzo(g,h,i)perylene	ND (200)	ND (200)	800	ND (200)	ND (200)	ND(330)
Chrysene	ND (200)	ND (200)	3200	ND (200)	ND (200)	ND(330)
Dibenzofuran	ND (200)	ND (200)	800	ND (200)	ND (200)	ND(330)
Fluoranthene	ND (200)	ND (200)	5700	ND (200)	ND (200)	ND(330)
Fluorene	ND (200)	ND (200)	800	ND (200)	ND (200)	ND(330)
Ideno(1,2,3-cd)pyrene	ND (200)	ND (200)	1600	ND (200)	ND (200)	ND(330)
2-Methylnaphthalene	ND (200)	ND (200)	300	ND (200)	ND (200)	ND(330)
Naphthalene	ND (200)	ND (200)	1000	ND (200)	ND (200)	ND(330)
Phenanthrene	ND (200)	ND (200)	4900	ND (200)	ND (200)	ND(330)
Pyrene	ND (200)	ND (200)	4900	ND (200)	ND (200)	ND(330)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

There were no detections of PCBs above method detection limits

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-2.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-3
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 5
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB33-01 (6-8)	IBSB33-02 (12-14)	IBSB34-01 (4-6)	IBHA16-01 (3-3.5)	IBHA16-02 (1.5-3.5)
Parameter					
INORGANIC (mg/kg)					
Arsenic	3.6	11	11	NA	9.2 J
Barium	19	140	87	NA	30 J
Cadmium	2.6	9.7	9.8	NA	8.2 J
Chromium	8	33	15	NA	24 J
Copper	9	93	110	NA	82
Lead	14	180	110	NA	70
Mercury	ND (0.1)	0.3	0.1	NA	1.6 J
Selenium	0.3	1.8	0.5	NA	ND (0.1) J
Silver	ND (0.5) J	ND (0.5) J	ND (0.5) J	NA	0.3
Zinc	130	1900	150	NA	200 J
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	300	12000	ND (100)	ND (100)	NA
1,1-Dichloroethane	30	ND (50)	ND (10)	ND (10)	NA
Methylene Chloride	20	70	ND (10)	10	NA
Toluene	ND (10)	ND (50)	20	ND (10)	NA
1,1,1-Trichloroethane	130	ND (50)	ND (10)	ND (10)	NA
Semi-Volatile Compounds (SVOCs)					
Acenaphthene	ND (200)	1300	ND (2000)	NA	ND (200)
Acenaphthylene	ND (200)	800	ND (2000)	NA	ND (200)
Anthracene	ND (200)	3200	3000	NA	ND (200)
Benzo(a)anthracene	200	11000	9000	NA	ND (200)
Benzo(b)fluoranthene	ND (200)	13000	6000	NA	300
Benzo(k)fluoranthene	ND (200)	7600	8000	NA	ND (200)
Benzo(a)pyrene	ND (200)	8400	9000	NA	ND (200)
Benzo(g,h,i)perylene	ND (200)	ND (600)	4000	NA	ND (200)
Chrysene	200	11000	11000	NA	ND (200)
Dibenzofuran	ND (200)	1400	ND (2000)	NA	ND (200)
Fluoranthene	500	18000	24000	NA	ND (200)
Fluorene	ND (200)	2100	2000	NA	ND (200)
2-Methylnaphthalene	ND (200)	900	ND (2000)	NA	ND (200)
Naphthalene	ND (200)	1300	ND (2000)	NA	ND (200)
Phenanthrene	400	14000	24000	NA	ND (200)
Pyrene	500	17000	20000	NA	ND (200)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-3.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-4
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 5A
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB31-01 (10-12)	IBSB32-01 (4-6)	IBSB32-02 (8-10)	IBHA17-01 (1.5-2)	IBHA17-02 (1.5-2)
Parameter					
INORGANIC (mg/kg)					
Arsenic	24	1.7	8.0	NA	34 J
Barium	20	4	8	NA	71 J
Cadmium	1.7	0.62	1.8	NA	11 J
Chromium	5	3	4	NA	75 J
Copper	6	3	4	NA	170
Lead	6	2	4	NA	290
Mercury	ND (0.1)	ND (0.1)	ND (0.1)	NA	0.1 J
Selenium	0.2	ND (0.1)	0.2	NA	0.3 J
Silver	ND (0.5) J	ND (0.5) J	ND (0.5) J	NA	0.5
Zinc	26	32	22	NA	4400 J
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	1800	1000	400	200	NA
1,2-Dichloroethene (total)	ND (10)	ND (10)	10	ND (10)	NA
Methylene Chloride	10	ND (10)	10	30	NA
1,1,1-Trichloroethane	ND (10)	ND (10)	ND (10)	10	NA
Polychlorinated Biphenyl (PCB)					
Aroclor-1260	NA	NA	NA	NA	300
Semi-Volatile Compounds (SVOCs)					
Benzo(a)anthracene	ND (200)	ND (200)	200	NA	ND (200)
Benzo(b)fluoranthene	ND (200)	ND (200)	ND (200)	NA	400
Bis(2-ethylhexyl)phthalate	ND (200)	ND (200)	300	NA	ND (200)
Chrysene	ND (200)	ND (200)	ND (200)	NA	300
Fluoranthene	ND (200)	ND (200)	300	NA	200
Phenanthrene	ND (200)	ND (200)	ND (200)	NA	300
Pyrene	ND (200)	ND (200)	300	NA	300

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-4.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-5
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 6
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	IBSB04-01 (16-18)	IBSB04-02 (29-31)	IBSB05-01 (10-12)	IBSB05-02 (6-14)
Parameter **ORGANIC (ug/kg)** Volatile Organic Compounds (VOCs) Methylene Chloride	ND (10)	ND (10)	10	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

There were no detections of PCBs or SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-5.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-6
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 7
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB45-01 (10-12)	IBSB45-02 (12-14)	IBSB45-03 (14-16)	IBHA10-01 (3-3.5)	IBHA10-02 (1.5-3.5)	IBHA11-01 (1.5-2)	IBHA11-02 (1.5-2)
Parameter							
INORGANIC (mg/kg)							
Arsenic	3.3	3.2	NA	NA	3.8	NA	3.5
Barium	34	34	NA	NA	180	NA	98
Cadmium	14	6.7	NA	NA	13 J	NA	18 J
Chromium	61	15	NA	NA	37 J	NA	49 J
Copper	170	1600	NA	NA	380 J	NA	270 J
Lead	85	230	NA	NA	82 J	NA	150 J
Mercury	0.2	6.2	NA	NA	0.18	NA	0.13
Selenium	ND (0.1) J	0.1 J	NA	NA	0.4 J	NA	0.3 J
Silver	1.6	1	NA	NA	ND (0.6) J	NA	ND (0.5) J
Zinc	32	57	NA	NA	91 J	NA	160 J
ORGANIC (ug/kg)							
Volatile Organic Compounds (VOCs)							
Acetone	100	NA	ND (600)	ND (100)	NA	ND (100)	NA
Methylene Chloride	10	NA	ND (60)	ND (10)	NA	20	NA
Polychlorinated Biphenyl (PCB)							
Aroclor-1260	ND (40)	ND (40)	NA	NA	ND (40)	NA	200
Semi-Volatile Compounds (SVOCs)							
Anthracene	1000	2200	NA	NA	NA	NA	NA
Benzo(a)anthracene	2700	4100	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	3500	3600	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	1500	4800	NA	NA	NA	NA	NA
Benzo(a)pyrene	2800	4800	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2300	2800	NA	NA	NA	NA	NA
Chrysene	2400	4300	NA	NA	NA	NA	NA
Fluoranthene	5500	8200	NA	NA	NA	NA	NA
Fluorene	1200	3000	NA	NA	NA	NA	NA
Ideno(1,2,3-cd)pyrene	2500	3400	NA	NA	NA	NA	NA
Naphthalene	200	1300	NA	NA	NA	NA	NA
Phenanthrene	4200	13000	NA	NA	NA	NA	NA
Pyrene	3700	6900	NA	NA	NA	NA	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-6.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-7
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 8
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-SB-04 (8-14)	CS-SB-04 (25-28)	CS-SB-06 (6-12)	CS-SB-06 (22-26)	CS-SB-06R (25-29)
Parameter					
INORGANIC (mg/kg)					
Arsenic	12	NA	11	NA	NA
Barium	36	NA	49	NA	NA
Chromium	51	NA	15	NA	NA
Copper	140	NA	140	NA	NA
Lead	65	NA	69	NA	NA
Mercury	0.1	NA	ND (0.1)	NA	NA
Silver	1.3	NA	ND (0.6)	NA	NA
Zinc	140	NA	54	NA	NA
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	200	NA	ND (100)	NA	ND (100)
2-Butanone	100	NA	ND (100)	NA	ND (100)
Methylene Chloride	110	NA	40	NA	10
Semi-Volatile Compounds (SVOCs)					
Benzo(a)anthracene	500	ND (200)	ND (200)	ND (200)	ND (200)
Benzo(b)fluoranthene	700	ND (200)	200	ND (200)	ND (200)
Benzo(k)fluoranthene	200	ND (200)	ND (200)	ND (200)	ND (200)
Benzo(a)pyrene	400	ND (200)	ND (200)	ND (200)	ND (200)
Benzo(g,h,i)perylene	400	ND (200)	ND (200)	ND (200)	ND (200)
Bis(2-ethylhexyl)phthalate	ND (500)	ND (200)	ND (200)	ND (400)	400
Chrysene	500	ND (200)	ND (200)	ND (200)	ND (200)
Fluoranthene	800	200	ND (200)	ND (200)	ND (200)
Ideno(1,2,3-cd)pyrene	300	ND (200)	ND (200)	ND (200)	ND (200)
Phenanthrene	500	400	300	ND (200)	ND (200)
Pyrene	600	ND (200)	ND (200)	ND (200)	ND (200)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-7.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-8
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Areas 8/9
CERT Site, Bay City, Michigan

Sample I.D.:	IBSB06-01	IBSB06-02	IBSB07-01	IBSB07-02	IBSB08-01	IBSB08-02	IBSB09-01	IBSB10-01	CS2-SB-27	CS2-SB-27
Sample Depth (ft):	(15-17)	(7-17)	(8-10)	(2-12)	(2-3)	(10-12)	(4-6)	(8-10)	(15-17)	(27-29)
Parameter										
INORGANIC (mg/kg)										
Arsenic	NA	3.7	NA	2.0	4.1	NA	4.4	11	3.8 J	5.3 J
Barium	NA	49	NA	34	34	NA	38	22	25	39
Cadmium	NA	16	NA	7.8 J	12 J	NA	10 J	11 J	0.4	0.4
Chromium	NA	32	NA	22 J	16 J	NA	14 J	8.9 J	5	8
Copper	NA	94	NA	110 J	150 J	NA	320 J	110 J	4	5
Lead	NA	45	NA	150 J	30 J	NA	81 J	25 J	4	4
Mercury	NA	ND (0.1)	NA	0.09	ND (0.06)	NA	0.09	ND (0.07)	ND(0.1)	9.3
Selenium	NA	0.1	NA	0.2 J	0.3 J	NA	0.2 J	0.4 J	ND(0.5)	ND(0.5)
Silver	NA	0.4	NA	ND (0.5) J	ND (0.6) J	NA	ND (0.6) J	ND (0.7) J	ND(0.6)	ND(0.7)
Zinc	NA	46	NA	45 J	55 J	NA	83 J	33 J	20	28
ORGANIC (ug/kg)										
Volatile Organic Compounds (VOCs)										
Acetone	ND (100)	NA	ND (100) J	NA	200	ND (100)	700	1100	ND(100)	ND(100)
Methylene Chloride	ND (10)	NA	10 J	NA	30	10	30	80	20	120
Styrene	ND (10)	NA	ND (10) J	NA	ND (10)	ND (10)	ND (10)	ND (60)	10	ND(10)
Toluene	ND (10)	NA	30 J	NA	ND (10)	ND (10)	ND (10)	ND (60)	10	20
Semi-Volatile Compounds (SVOCs)										
Benzo(a)anthracene	NA	300	NA	300	ND (200)	NA	400	300	ND(330)	ND(330)
Benzo(b)fluoranthene	NA	600	NA	700	300	NA	500	300	ND(330)	ND(330)
Benzo(k)fluoranthene	NA	ND (200)	NA	300	ND (200)	NA	400	ND (200)	ND(330)	ND(330)
Benzo(a)pyrene	NA	200	NA	300	ND (200)	NA	400	ND (200)	ND(330)	ND(330)
Chrysene	NA	400	NA	500	200	NA	500	500	ND(330)	ND(330)
Fluoranthene	NA	700	NA	400	ND (200)	NA	600	400	ND(330)	ND(330)
Ideno(1,2,3-cd)pyrene	NA	ND (200)	NA	300	ND (200)	NA	300	ND (200)	ND(330)	ND(330)
Phenanthrene	NA	600	NA	ND (200)	300	NA	300	600	ND(330)	ND(330)
Pyrene	NA	600	NA	300	ND (200)	NA	500	300	ND(330)	ND(330)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
) - Method detection limit.
- Estimated value.
here were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED
MI/PROJECTS/04500055.100/TAB6-8.WK4

Document Control No.: 4500-55-ANKR

his document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed whole or in part without the express, written permission of U.S. EPA.

TABLE 6-9
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 10
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	IBSB11-01 (4-6)	IBSB11-02 (12-14)	IBSB12-01 (12-14)
Parameter			
INORGANIC (mg/kg)			
Arsenic	9.5	1.4	9.7
Barium	64	20	180
Cadmium	13 J	1.0 J	12 J
Chromium	18 J	3.7 J	14 J
Copper	170 J	5.7 J	120 J
Lead	57 J	80 J	100 J
Mercury	ND (0.06)	ND (0.06)	0.31
Selenium	0.3 J	0.1 J	0.2 J
Silver	ND (0.6) J	ND (0.6) J	0.7 J
Zinc	56 J	27 J	120 J
ORGANIC (ug/kg)			
Volatile Organic Compounds (VOCs)			
Acetone	ND (100)	ND (100)	200
Methylene Chloride	ND (10)	10	10
Semi-Volatile Compounds (SVOCs)			
Anthracene	ND (200)	ND (200)	200
Chrysene	200	ND (200)	200
Fluoranthene	300	ND (200)	400
Phenanthrene	300	ND (200)	400
Pyrene	300	ND (200)	400

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-9.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-10
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 11
CERT Site, Bay City, Michigan

Sample I.D.:	IBSB13-01	IBSB13-02	IBSB14-01	IBSB15-01	IBSB15-02	IBSB43-01	IBSB47-01	IBSB47-02
Sample Depth (ft):	(4-6)	(12-14)	(8-10)	(2-4)	(8-10)	(4-6)	(4-6)	(8-10)
Parameter								
INORGANIC (mg/kg)								
Arsenic	2.2	1.8	1.6	1.5	8.1	0.1	2.5	0.5
Barium	26	39	39	32	94	34	190	27
Cadmium	4.0 J	4.8 J	5.2 J	2.9 J	3.2 J	2.9	3.9	1.2
Chromium	14 J	16 J	18 J	9.8 J	7.9 J	9	8	4
Copper	13 J	16 J	22 J	16 J	18 J	13	720	15
Lead	4.8 J	4.9 J	18 J	16 J	140 J	88	230	20
Mercury	ND (0.06)	ND (0.06)	ND (0.06)	ND (0.05)	0.15	ND (0.1)	ND (0.1)	ND (0.1)
Selenium	ND (0.1) J	ND (0.1) J	ND (0.1) J	ND (0.1) J	0.1 J	0.2 J	3.1 J	0.2 J
Silver	ND (0.6) J	ND (0.6) J	ND (0.6) J	ND (0.5) J	ND (0.6) J	ND (0.7)	1	ND (0.7)
Zinc	22 J	30 J	39 J	25 J	260 J	41	140	28
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	ND (100) J	ND (100)	200	ND (100)	ND (100)	400	ND (400)	ND (200)
Benzene	ND (10) J	ND (10)	30	ND (10)	ND (10)	ND (10)	ND (40)	ND (20)
1,1-Dichloroethane	ND (10) J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	300	ND (20)
Ethylbenzene	ND (10) J	ND (10)	ND (10)	4100	10	ND (10)	ND (40)	ND (20)
Methylene Chloride	ND (10) J	20	ND (10)	10	ND (10)	10	290	40
Toluene	ND (10) J	ND (10)	20	ND (10)	40	ND (10)	ND (40)	ND (20)
1,1,1-Trichloroethane	ND (10) J	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	ND (40)	130
Xylene (total)	ND (30) J	ND (30)	100	11000	40	ND (30)	ND (100)	ND (50)
Semi-Volatile Compounds (SVOCs)								
Acenaphthene	ND (200)	ND (200)	ND (200)	ND (200)	600	ND (200)	ND (300)	ND (200)
Acenaphthylene	ND (200)	ND (200)	ND (200)	ND (200)	1200	ND (200)	ND (300)	ND (200)
Anthracene	ND (200)	ND (200)	700	ND (200)	2600	200	1100	800
Benzo(a)anthracene	ND (200)	ND (200)	1200	ND (200)	8800	1200	1900	1900
Benzo(b)fluoranthene	ND (200)	ND (200)	1600	ND (200)	11000	1200	1200	1300
Benzo(k)fluoranthene	ND (200)	ND (200)	600	ND (200)	4700	700	900	1000
Benzo(a)pyrene	ND (200)	ND (200)	1000	ND (200)	8400	800	900	900
Benzo(g,h,i)perylene	ND (200)	ND (200)	400	ND (200)	3800	900	ND (300)	ND (200)
Chrysene	ND (200)	ND (200)	1200	ND (200)	6500	1200	1600	1600
Dibenzo(a,h)anthracene	ND (200)	ND (200)	500	ND (200)	3800	ND (200)	ND (300)	ND (200)
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	ND (200)	ND (200)	3800	ND (200)	15000	2800	4100	3800
Fluorene	ND (200)	ND (200)	300	ND (200)	1100	ND (200)	600	300
Ideno(1,2,3-cd)pyrene	ND (200)	ND (200)	1100	ND (200)	8100	900	700	600
Naphthalene	ND (200)	ND (200)	400	200	500	ND (200)	ND (300)	ND (200)
Phenanthrene	ND (200)	ND (200)	2500	ND (200)	7500	1000	3900	2700
Pyrene	ND (200)	ND (200)	2600	ND (200)	13000	2000	2700	2100

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

Document Control No.: 4500-55-ANKR

Work Assignment No.: 55-5AED

OMI/PROJECTS/04500055.100/TAB6-10.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-11
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 12
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth(ft):**	IBSB16-01 (2-4)	IBSB16-02 (4-6)	IBSB17-01 (2-4)	IBSB17-02 (4-6)
Parameter				
INORGANIC (mg/kg)				
Arsenic	2.8	2.9	NA	1.4
Barium	20	25	NA	33
Cadmium	3.6 J	3.5 J	NA	4.0 J
Chromium	12 J	12 J	NA	14 J
Copper	11 J	11 J	NA	13 J
Lead	4.6 J	4.1 J	NA	4.0 J
Silver	ND (0.6) J	ND (0.6) J	NA	0.4J
Zinc	20 J	20 J	NA	21 J
ORGANIC (ug/kg)				
Volatile Organic Compounds (VOCs)				
Methylene Chloride	ND (10)	ND (10)	20	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs or SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-11.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-12
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 13
CERT Site, Bay City, Michigan

Sample I.D.:	IBSB25-01	IBSB25-02	IBSB25-03	IBSB26-01	IBSB26-02	IBSB27-01	IBSB27-02
Sample Depth (ft):	(6-8)	(10-12)	(12-14)	(6-8)	(8-10)	(2-4)	(4-6)
Parameter							
INORGANIC (mg/kg)							
Arsenic	NA	3.5 J	3.9 J	NA	2.1 J	1.6 J	1.0 J
Barium	NA	46 J	37 J	NA	31 J	27 J	33 J
Cadmium	NA	3.0 J	3.5 J	NA	3.4 J	1.4 J	3.0 J
Chromium	NA	11 J	15 J	NA	13 J	5.3 J	11 J
Copper	NA	13	16	NA	15	18	11
Lead	NA	7.8	7.1	NA	6.1	25	4.4
Selenium	NA	0.2 J	0.1 J	NA	ND (0.1) J	0.1 J	0.2 J
Silver	NA	0.3	0.4	NA	0.4	ND (0.3)	0.3
Zinc	NA	25 J	26 J	NA	25 J	26 J	18 J
ORGANIC (ug/kg)							
Volatile Organic Compounds (VOCs)							
Benzene	ND (10) J	ND (10)	20	ND (10)	NA	ND (10)	ND (10)
Methylene Chloride	70 J	ND (10)	10	20	NA	20	10
Toluene	ND (10) J	ND (10)	10	ND (10)	NA	ND (10)	ND (10)
1,1,1-Trichloroethane	40 J	ND (10)	ND (10)	ND (10)	NA	ND (10)	ND (10)
Xylene (total)	ND (30) J	ND (30)	120	ND (30)	NA	ND (30)	ND (30)
Semi-Volatile Compounds (SVOCs)							
Acenaphthylene	600	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Anthracene	400	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Benzo(a)anthracene	2100	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Benzo(b)fluoranthene	1800	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Benzo(k)fluoranthene	800	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Benzo(a)pyrene	1600	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Benzo(g,h,i)perylene	700	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Chrysene	1900	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Fluoranthene	2900	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Ideno(1,2,3-cd)pyrene	1100	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Phenanthrene	1600	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)
Pyrene	2000	ND (200)	ND (200)	NA	ND (200)	ND (200)	ND (200)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-12.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-13
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Areas 14 and 15
CERT Site, Bay City, Michigan

	AREA 14			AREA 15		
Sample I.D. :	IBSB28-01	IBSB28-02	IBSB28-03	IBSB29-01	IBSB29-02	IBSB29-03
Sample Depth (ft):	(10-12)	(12-14)	(14-16)	(4-6)	(12-14)	(14-16)
Parameter						
INORGANIC (mg/kg)						
Arsenic	NA	11 J	1.3 J	19	15	NA
Barium	NA	54 J	19 J	73	29	NA
Cadmium	NA	1.4 J	1.6 J	11	5.3	NA
Chromium	NA	ND (3) J	8.1 J	36	13	NA
Copper	NA	30	7.1	65	45	NA
Lead	NA	39	3.4	31	29	NA
Selenium	NA	0.3 J	0.1 J	0.8	0.8	NA
Silver	NA	ND (0.7)	ND (0.3)	0.7 J	ND (0.5) J	NA
Zinc	NA	64 J	13 J	66	53	NA
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	200	NA	20	20	NA	ND (30)
Polychlorinated Biphenyl (PCB)						
Aroclor-1260	NA	ND (100)	ND (40)	130	110	NA
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	NA	ND (600)	ND (200)	3000	ND (200)	NA
Anthracene	NA	ND (600)	ND (200)	5600	400	NA
Benzo(a)anthracene	NA	ND (600)	ND (200)	12000	400	NA
Benzo(b)fluoranthene	NA	ND (600)	ND (200)	8500	300	NA
Benzo(k)fluoranthene	NA	ND (600)	ND (200)	10000	300	NA
Benzo(a)pyrene	NA	ND (600)	ND (200)	10000	300	NA
Benzo(g,h,i)perylene	NA	ND (600)	ND (200)	4700	200	NA
Chrysene	NA	ND (600)	ND (200)	12000	800	NA
Dibenzo(a,h)anthracene	NA	ND (600)	ND (200)	2800	ND (200)	NA
Fluoranthene	NA	ND (600)	ND (200)	34000	900	NA
Fluorene	NA	1600	ND (200)	2500	1000	NA
Ideno(1,2,3-cd)pyrene	NA	ND (600)	ND (200)	5300	ND (200)	NA
Naphthalene	NA	ND (600)	ND (200)	200	ND (200)	NA
Phenanthrene	NA	9000	ND (200)	23000	800	NA
Pyrene	NA	ND (600)	ND (200)	26000	900	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J -Estimated value.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-13.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-14
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Areas 15/16A, 16/17A and 17
CERT Site, Bay City, Michigan

	AREA 15/16A		AREA 16/17A		AREA 17
Sample I.D.:	IBSB30-01	IBSB30-02	IBSB35-01	IBSB36-01	IBSB39-01
Sample Depth:	(2-4)	(12-14)	(4-6)	(10-12)	(6-8)
INORGANIC (mg/kg)					
Arsenic	NA	1.9	2.2	2.5	0.5
Barium	NA	17	25	51	6
Cadmium	NA	1.4	2.0	4.9	ND (0.05)
Chromium	NA	4	9	8	2
Copper	NA	6	11	74	2
Lead	NA	6	6	42	ND (1)
Selenium	NA	0.1	ND (0.1)	0.2 J	ND (0.1) J
Zinc	NA	24	17	120	5
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	ND (100)	ND (100)	ND (100)	400	500
Methylene Chloride	ND (10)	ND (10)	ND (10)	10	20

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs or SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-14.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-15
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 18
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB44-01 (10-12)	IBSB44-02 (20-22)	IBSB44-03 (12-14)	IBSB44-04 (22-24)	CS-SB-07 (10-16)	CS-SB-07 (21-22)
Parameter						
INORGANIC (mg/kg)						
Arsenic	NA	NA	NA	4.0	NA	NA
Barium	NA	NA	NA	37	NA	NA
Cadmium	NA	NA	NA	3.3	NA	NA
Chromium	NA	NA	NA	13	NA	NA
Copper	NA	NA	NA	15	NA	NA
Lead	NA	NA	NA	8	NA	NA
Selenium	NA	NA	NA	0.1 J	NA	NA
Silver	NA	NA	NA	0.7	NA	NA
Zinc	NA	NA	NA	24	NA	NA
ORGANIC (ug/kg)						
Volatile Organic Compounds VOCs)						
Benzene	40	2000	100	5600	NA	14000
Ethylbenzene	20	ND (2000)	20	ND (10)	NA	50
Toluene	ND (10)	2000	ND (10)	20	NA	4300
Xylene (total)	60	7000	60	ND (30)	NA	170
Methylene Chloride	ND (10)	ND (2000)	ND (10)	ND (10)	NA	30
Styrene	ND (10)	ND (2000)	ND (10)	ND (10)	NA	10
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	NA	NA	ND (200)	ND (200)	200	ND (200)
Anthracene	NA	NA	ND (200)	ND (200)	300	ND (200)
Benzo (a) anthracene	NA	NA	ND (200)	ND (200)	500	ND (200)
Benzo (b) fluoranthene	NA	NA	ND (200)	ND (200)	600	ND (200)
Benzo (a) pyrene	NA	NA	ND (200)	ND (200)	300	ND (200)
Benzo (g,h,i) perylene	NA	NA	ND (200)	ND (200)	200	ND (200)
Chrysene	NA	NA	ND (200)	ND (200)	700	ND (200)
Fluoranthene	NA	NA	300	ND (200)	1500	ND (200)
Fluorene	NA	NA	ND (200)	ND (200)	600	ND (200)
Naphthalene	NA	NA	1300	600	2500	ND (200)
Phenanthrene	NA	NA	200	ND (200)	2800	ND (200)
Pyrene	NA	NA	200	ND (200)	1400	ND (200)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-15.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-16
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 18A
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-SB-13 (3-7)	CS-SB-14 (5)	CS-SB-15 (5-7)	CS-SB-22 (5-9)	CS-SB-22 (9-11)	CS-SB-25 (5)
Parameter						
INORGANICS (mg/kg)						
Cyanide (total)	ND (0.2)	0.2	NA	6.2	ND (0.2)	ND (0.2)
ORGANICS (ug/kg)						
Volatile Organic Compounds (VOCs)						
Benzene	ND (10)	ND (20)	ND (10)	ND (10)	110	ND (10)
Ethylbenzene	ND (10)	ND (20)	ND (10)	190	30	ND (10)
Methylene Chloride	10	40	ND (10)	20	10	ND (10)
Styrene	ND (10)	ND (20)	ND (10)	ND (10)	ND (10)	10
Toluene	ND (10)	ND (20)	ND (10)	10	ND (10)	ND (10)
Xylene (total)	ND (30)	ND (50)	ND (30)	240	130	90
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	ND (200)	ND (300)	1,900	1,200	ND (200)	700
Acenaphthylene	ND (200)	ND (300)	800	400	ND (200)	1,100
Anthracene	ND (200)	ND (300)	2,800	1,700	ND (200)	2,900
Benzo(a)anthracene	ND (200)	900	2,100	2,800	ND (200)	2,200
Benzo(b)fluoranthene	ND (200)	1,200	2,000	2,100	ND (200)	1,300
Benzo(k)fluoranthene	ND (200)	ND (300)	900	2,600	ND (200)	1,700
Benzo(a)pyrene	ND (200)	700	1,700	2,600	ND (200)	1,800
Benzo(g,h,i)perylene	ND (200)	900	700	1,300	ND (200)	600
Bis(2-ethylhexyl)phthalate	ND (200)	ND (300)	400	ND (200)	200	ND (200)
Chrysene	ND (200)	1,000	1,600	2,200	ND (200)	1,900
Dibenzo(a,h)anthracene	ND (200)	300	ND (200)	800	ND (200)	400
Fluoranthene	ND (200)	1,100	4,700	4,400	ND (200)	6,100
Fluorene	ND (200)	ND (300)	2,700	2,100	ND (200)	2,600
Ideno(1,2,3-cd)pyrene	ND (200)	800	700	1,700	ND (200)	900
Naphthalene	ND (200)	700	1,000	7,400	2,300	29,000
Phenanthrene	ND (200)	1,100	5,700	4,400	ND (200)	12,000
Pyrene	ND (200)	800	4,900	4,700	ND (200)	4,300

Notes:

( ) - Method detection limit.

NA - Not analyzed.

ND - Not detected at method detection limit.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-16.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-17
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 19
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB19-01 (2-4)	IBSB19-02 (6-8)	IBSB20-02 (0-6)	IBSB23-01 (4-6)	IBSB24-01 (4-6)	IBHA12-01 (4-4.5)
Parameter						
INORGANIC (mg/kg)						
Arsenic	0.7	2.8	1.3	2.1 J	4.1 J	NA
Barium	30	40	28	28 J	30 J	NA
Cadmium	3.3 J	3.8 J	2.9 J	2.5 J	2.4 J	NA
Chromium	13 J	14 J	11 J	11 J	11 J	NA
Copper	12 J	13 J	14 J	12	11	NA
Lead	3.3 J	4.9 J	9.1 J	4.4	6.0	NA
Selenium	ND (0.1) J	ND (0.1) J	ND (0.1) J	0.4 J	0.2 J	NA
Silver	ND (0.6) J	ND (0.6) J	0.6 J	0.3	0.4	NA
Zinc	17 J	23 J	21 J	19 J	17 J	NA
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Acetone	ND (100)	200	NA	ND (100)	ND (100)	ND (100)
Methylene Chloride	10	10	NA	20	ND (10)	20
Polychlorinated Biphenyl (PCB)						
Aroclor-1260	ND(40)	ND(40)	ND(40)	NA	NA	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of cyanide or SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-17.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-17 (Continued)
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 19
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBHA12-02 (1.5-4.5)	IBHA13-01 (1.5-2)	IBHA13-02 (1.5-4.5)	IBHA14-01 (3-3.5)	IBHA14-02 (1.5-4.5)	IBHA15-01 (2.5-3)	IBHA15-02 (1.5-4.5)
Parameter							
INORGANIC (mg/kg)							
Arsenic	2.3	NA	1.2	NA	1.3	NA	2.1
Barium	29	NA	31	NA	28	NA	78
Cadmium	3.6 J	NA	3.5 J	NA	3.3 J	NA	5.3 J
Chromium	13 J	NA	13 J	NA	12 J	NA	17 J
Copper	15 J	NA	13 J	NA	12 J	NA	180 J
Lead	4.8 J	NA	4.2 J	NA	4.0 J	NA	98 J
Selenium	0.1 J	NA	ND (0.1) J	NA	ND (0.1) J	NA	ND (0.1) J
Silver	1.5 J	NA	0.9 J	NA	0.6 J	NA	0.7 J
Zinc	21 J	NA	20 J	NA	18 J	NA	150 J
ORGANIC (ug/kg)							
Volatile Organic Compounds (VOCs)							
Acetone	NA	ND (100)	NA	600	NA	ND (100)	NA
Methylene Chloride	NA	ND(10)	NA	ND(10)	NA	ND(10)	NA
Polychlorinated Biphenyl (PCB)							
Aroclor-1260	ND (40)	NA	ND (40)	NA	ND (40)	NA	80

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of cyanide, PCBs or SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-17.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-18
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 20
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB21-01 (0-2)	IBSB21-02 (2-4)	IBSB22-01 (4-6)	IBCC01 (concrete chip)	IBCC02 (concrete chip)	IBCC03 (concrete chip)
Parameter						
INORGANIC (mg/kg)						
Arsenic	2.1 J	2.3 J	3.1 J	NA	NA	NA
Barium	33 J	29 J	26 J	NA	NA	NA
Cadmium	3.2 J	2.9 J	2.6 J	NA	NA	NA
Chromium	8.6 J	11 J	11 J	NA	NA	NA
Copper	15	12	13	NA	NA	NA
Lead	15	6.5	6.3	NA	NA	NA
Selenium	0.3 J	0.1 J	0.1 J	NA	NA	NA
Silver	ND (0.2)	0.5	0.4	NA	NA	NA
Zinc	27 J	23 J	21 J	NA	NA	NA
Cyanide (total)	ND (0.1) J	ND (0.1) J	ND (0.1) J	1.8 J	0.1 J	0.5 J
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	10	10	ND (10)	NA	NA	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J -Estimated value.

There were no detections of SVOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-18.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-19
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Areas 22 and 23 (inside building)
Cert Site, Bay City, Michigan

	AREA 22	AREA 23			
Sample I.D.:	IBSB18-01	IBSB48-01	IBSB48-02	IBSB49-01	IBSB49-02
Sample Depth (ft):	(2-4)	(0-1)	(2-4)	(0-2)	(6-8)
Parameter					
INORGANIC (mg/kg)					
Arsenic	1.2	NA	NA	NA	NA
Barium	31	NA	NA	NA	NA
Cadmium	3.2 J	NA	NA	NA	NA
Chromium	12 J	NA	NA	NA	NA
Copper	11 J	NA	NA	NA	NA
Lead	3.0 J	NA	NA	NA	NA
Zinc	16 J	NA	NA	NA	NA
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Acetone	200	NA	ND (100)	ND (100)	ND (100)
Methylene Chloride	ND (10)	NA	30	10	ND (10)
1,1,1-Trichloroethane	ND (10)	NA	30	ND (10)	ND (10)
Trichloroethene	ND (10)	NA	10	ND (10)	ND (10)
Semi-Volatile Compounds (SVOCs)					
Benzo(a)anthracene	ND (200)	ND (300)	ND (200)	300	ND (200)
Benzo(b)fluoranthene	ND (200)	ND (300)	ND (200)	800	ND (200)
Benzo(k)fluoranthene	ND (200)	ND (300)	ND (200)	600	ND (200)
Benzo(a)pyrene	ND (200)	ND (300)	ND (200)	600	ND (200)
Chrysene	ND (200)	300	ND (200)	300	ND (200)
Fluoranthene	ND (200)	ND (300)	ND (200)	700	ND (200)
Phenanthrene	ND (200)	1800	ND (200)	300	ND (200)
Pyrene	ND (200)	400	ND (200)	700	ND (200)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-19.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-20
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 25
CERT Site, Bay City, Michigan

Sample I.D.:	IBSB40-01	IBHA06-01	IBHA06-02	IBHA07-01	IBHA07-02	IBHA08-01	IBHA08-02	CS2-SB-01	CS-HA-09	CS-HA-10
Sample Depth (ft):	(4-6)	(1.5-2)	(1.5-4.5)	(1.5-2)	(3-3.5/4-4.5)	(2.5-3)	(1.5-2/2.5-3)	(0-1)	(0.5-1)	(0.5-1)
Parameter										
INORGANIC (mg/kg)										
Arsenic	NA	NA	2.5	NA	1.9	NA	9.6	NA	NA	NA
Barium	NA	NA	30	NA	55	NA	65	NA	NA	NA
Cadmium	NA	NA	2.7 J	NA	6.0 J	NA	14 J	NA	NA	NA
Chromium	NA	NA	7.5 J	NA	13 J	NA	18 J	NA	NA	NA
Copper	NA	NA	26 J	NA	70 J	NA	70 J	NA	NA	NA
Lead	NA	NA	33 J	NA	66 J	NA	130 J	NA	NA	NA
Mercury	NA	NA	0.10	NA	0.13	NA	0.10	NA	NA	NA
Selenium	NA	NA	0.1 J	NA	0.1 J	NA	0.4 J	NA	NA	NA
Zinc	NA	NA	46 J	NA	66 J	NA	99 J	NA	NA	NA
ORGANIC (ug/kg)										
Volatile Organic Compounds (VOCs)										
Acetone	ND (100)	300	NA	200	NA	ND (100)	NA	NA	NA	NA
Methylene Chloride	ND (10)	20	NA	10	NA	ND (10)	NA	NA	NA	NA
Toluene	ND (10)	ND (10)	NA	ND (10)	NA	30	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)										
Acenaphthene	ND (200)	NA	300	NA	ND (200)	NA	ND (200)	NA	NA	NA
Acenaphthylene	ND (200)	NA	ND (200)	NA	ND (200)	NA	200	NA	NA	NA
Anthracene	ND (200)	NA	600	NA	300	NA	400	NA	NA	NA
Benzo(a)anthracene	ND (200)	NA	3100	NA	1100	NA	1300	NA	NA	NA
Benzo(b)fluoranthene	ND (200)	NA	3400	NA	900	NA	1000	NA	NA	NA
Benzo(k)fluoranthene	ND (200)	NA	2100	NA	900	NA	1000	NA	NA	NA
[illegible]nzo(a)pyrene	ND (200)	NA	2300	NA	800	NA	600	NA	NA	NA
[illegible]o(g,h,i)perylene	ND (200)	NA	500	NA	300	NA	ND (200)	NA	NA	NA
[illegible]ysene	ND (200)	NA	3100	NA	1100	NA	1300	NA	NA	NA
Dibenzo(a,h)anthracene	ND (200)	NA	900	NA	ND (200)	NA	ND (200)	NA	NA	NA
Dibenzofuran	ND (200)	NA	200	NA	ND (200)	NA	ND (200)	NA	NA	NA
Fluoranthene	ND (200)	NA	4700	NA	2100	NA	2300	NA	NA	NA
Fluorene	ND (200)	NA	300	NA	ND (200)	NA	200	NA	NA	NA
Ideno(1,2,3-cd)pyrene	ND (200)	NA	1600	NA	500	NA	400	NA	NA	NA
Phenanthrene	ND (200)	NA	3300	NA	1500	NA	1700	NA	NA	NA
Pyrene	ND (200)	NA	3700	NA	1600	NA	1500	NA	NA	NA

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-20.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-21
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) Area 25A
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	IBSB41-01 (6-8)	IBSB42-01 (6-8)	IBHA09-01 (3-3.5)	IBHA09-02 (1.5-4.5)
Parameter				
INORGANIC (mg/kg)				
Arsenic	NA	NA	NA	2.5
Barium	NA	NA	NA	32
Cadmium	NA	NA	NA	5.2 J
Chromium	NA	NA	NA	9.9 J
Copper	NA	NA	NA	17 J
Lead	NA	NA	NA	18 J
Mercury	NA	NA	NA	0.07
Selenium	NA	NA	NA	0.1 J
Zinc	NA	NA	NA	37 J
ORGANIC (ug/kg)				
Volatile Organic Compounds (VOCs)				
Acetone	200	2300	ND (100)	NA
Semi-Volatile Compounds (SVOCs)				
Anthracene	ND (200)	ND (200)	NA	200
Benzo(a)anthracene	ND (200)	ND (200)	NA	600
Benzo(b)fluoranthene	ND (200)	ND (200)	NA	400
Benzo(k)fluoranthene	ND (200)	ND (200)	NA	600
Benzo(a)pyrene	ND (200)	ND (200)	NA	500
Chrysene	ND (200)	ND (200)	NA	700
Fluoranthene	ND (200)	ND (200)	NA	1300
Ideno(1,2,3-cd)pyrene	ND (200)	ND (200)	NA	300
2-Methylnaphthalene	NA	NA	NA	300
Phenanthrene	ND (200)	ND (200)	NA	1000
Pyrene	ND (200)	ND (200)	NA	1100

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-21.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-22
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) No Specific Area
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS2-SB-19D (17-19)	CS2-SB-19D (27-29)	CS2-SB-20 (25-27)	CS2-SB-21 (15-17)	CS2-SB-22 (9-11)	CS2-SB-23B (11-13)
Parameter						
INORGANIC (mg/kg)						
Arsenic	11	6	7.1	8.4	15 J	NA
Barium	76	17	16	890	350	NA
Cadmium	0.6	0.1	ND(0.1)	0.7	0.6	NA
Chromium	15	8	4	16	5	NA
Copper	50	27	3	110	280	NA
Lead	51	15	1	430	200	NA
Mercury	0.4	ND(0.1)	ND(0.1)	ND(0.2)	43	NA
Selenium	ND(0.6)	ND(0.7)	ND(0.7)	ND(0.7)	ND(0.6)	NA
Silver	ND(0.7)	ND(0.6)	ND(0.6)	ND(0.8)	ND(0.8)	NA
Zinc	120	33	15	180	97	NA
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	10 J	ND(10)	ND(10)	10	170	80
Toluene	20 J	10	20	10	ND(70)	ND(10)
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	ND(330)	ND(330)	ND(330)	ND(330)	2300 J	NA
Anthracene	ND(330)	ND(330)	ND(330)	1000	1700 J	NA
Benzo(a)anthracene	400	720	ND(330)	2900	1500 J	NA
Benzo(a)pyrene	ND(330)	470	ND(330)	1600	ND(1300)	NA
Benzo(b)fluoranthene	340	510	ND(330)	1500	ND(1300)	NA
Benzo(g,h,i)perylene	ND(330)	420	ND(330)	920	ND(1300)	NA
Benzo(k)fluoranthene	ND(330)	550	ND(330)	1700	ND(1300)	NA
Chrysene	560	740	ND(330)	2900	3800 J	NA
Fluoranthene	880	1500	430	6200	2000 J	NA
Fluorene	ND(330)	ND(330)	ND(330)	360	3300 J	NA
Ideno(1,2,3-cd)pyrene	ND(330)	380	ND(330)	930	ND(1300)	NA
Naphthalene	ND(330)	ND(330)	ND(330)	ND(330)	4200 J	NA
Phenanthrene	730	1200	ND(330)	2300	3000 J	NA
Pyrene	960	1500	400	5300	2000 J	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of cyanide or PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-22.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-22 (Continued)
Summary of Detected Parameters in Soil Samples
Industrial Brownhoist (Parcels 7 and 8) No Specific Area
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS2-SB-23B (13-15)	CS2-SB-24 (9-11)	CS2-SB-25 (17-19)	CS2-SB-25 (27-29)	CS2-SB-26 (9-11)	WDP-SB-39 (4.5-6.5)
Parameter						
INORGANIC (mg/kg)						
Arsenic	52 J	ND(0.4)	1.4 J	7.5 J	5.1 J	0.8J
Barium	730	31	5	69	51	11
Cadmium	ND(0.1)	ND(0.1)	0.1	ND(0.2)	ND(0.1)	0.37J
Chromium	ND(1)	15	3	14	24	10
Copper	3	12	3	8	550	31
Lead	1	ND(1)	5	8	130	9
Mercury	ND(0.1)	0.1	ND(0.1)	0.2	12	ND(0.1)
Selenium	ND(0.6)	ND(0.4)	ND(0.5)	0.8	ND(0.5)	ND(0.6)J
Silver	ND(0.7)	ND(0.6)	ND(0.6)	ND(1)	ND(0.7)	ND(0.6)J
Zinc	630	29	19	45	51	20J
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	130	90	ND(10)	ND(10)	ND(10)	30
Toluene	ND(10)	ND(10)	ND(10)	ND(10)	20	ND(10)
Semi-Volatile Compounds (SVOCs)						
Acenaphthene	NA	NA	NA	NA	NA	ND(330)
Anthracene	NA	NA	NA	NA	NA	ND(330)
Benzo(a)anthracene	NA	NA	NA	NA	NA	ND(330)
Benzo(a)pyrene	NA	NA	NA	NA	NA	400
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	570
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	450
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	460
Chrysene	NA	NA	NA	NA	NA	340
Fluoranthene	NA	NA	NA	NA	NA	ND(330)
Fluorene	NA	NA	NA	NA	NA	ND(330)
Ideno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	400
Naphthalene	NA	NA	NA	NA	NA	ND(330)
Phenanthrene	NA	NA	NA	NA	NA	ND(330)
Pyrene	NA	NA	NA	NA	NA	ND(330)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

There were no detections of cyanide or PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-22.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-23
Summary of Detected TCLP/EP Toxicity Parameters
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan

Sample I.D.:	CS-SB-01	CS-SB-02	CS-SB-03	CS-SB-05	CS-HA-12	CS2-SB-20	CS2-SB-21
Parameter							
EP Toxicity (mg/L)							
Barium	ND (10)	ND (10)	ND (10)	ND (10)	ND (10)	0.3	0.9

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

There were no detections of TCLP metals above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-23.WK4

This document is prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-24
Summary of Detected Radiation Parameters
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan
(all results in pCi/g unless otherwise indicated)

Sample I.D.: **Sample Depth (in):**	CSHA-06 (6-18)	CSHA-07 (6-18)	CSHA-08 (6-18)
Parameter			
Uranium Natural Total (UNAT) (mg/gm)	0.002	0.014	0.003
Gross Alpha, Total	ND	1.9	46.6
Gross Alpha, Total, LLD	10.9	10.7	9.9
Gross Beta, Total	ND	14.1	21.8
Gross Beta, Total, LLD	8.4	8.5	8.3
Gross Gamma, Total (12.8-1947 KeV)	9.3	15.0	13.7
Radium, 226, Total	2.3	9.2	2.2
Radium, 226, Total, LLD	0.5	0.5	0.5
Radium, 228, Total	1.5	6.2	3.6
Radium, 228, Total, LLD	2.8	2.8	2.8
Thorium, 230, Total	2.0	6.8	2.6
Thorium, 230, Total, LLD	0.2	0.1	0.1
Thorium, 232, Total	1.0	4.7	0.7
Thorium, 232, Total, LLD	0.2	0.1	0.1
Uranium, 234, Total	1.7	4.7	1.1
Uranium, 234, Total, LLD	0.1	0.2	0.1
Uranium, 235, Total	0.1	0.2	ND
Uranium, 235, Total, LLD	0.1	0.1	0.1
Uranium, 238, Total	1.4	4.5	1.2
Uranium, 238, Total, LLD	0.1	0.1	0.2
Thorium, 228, Total	0.9	4.8	0.3
Thorium, 228, Total, LLD	0.2	0.2	0.3

Notes:

ND - Not detected.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-24.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-25
Summary of Detected Aroclors - PCB Sampling
Industrial Brownhoist (Parcels 7 and 8)
CERT Site, Bay City, Michigan

Sample I.D.: **Matrix:**	IB-PH-PCB-3 Solid (mg/kg)	IB-PH-PCB-4 Wipe (ug/100 sq cm)	IB-PH-PCB-5 Wipe (ug/100 sq cm)	IB-PH-PCB-6 Wipe (ug/100 sq cm)
Parameter				
ORGANIC				
Polychlorinated Biphenyl (PCB)				
Aroclor-1248	19J	6.4	2.0	2.7
Aroclor-1254	19J	ND(0.5)	ND(0.5)	ND(0.5)
Aroclor-1260	19J	2.1	ND(0.5)	ND(0.5)

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

( ) - Method detection limit.

J - Estimated value.

Work Assignment No.: 55-5AED

Document Control No.: 04500-055-ANKR

OMI/PROJECTS/04500055.100/TAB6-25.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-28
Summary of Detected Parameters in Soil Samples
Weld-Rite (Parcel 6)
CERT Site, Bay City, Michigan

ample I.D.:	CS-HA-02	CS-HA-11	CS-HA-11	CS2-SB-02	CS2-SB-02	CS2-SB-02	CS2-SB-02	CS2-SB-03A	CS2-SB-03A	CS2-SB-03B	CS2-SB-03B	CS2-SB-04
ample Depth (ft):	(0.5-1)	(0.5-1)	(2.5-3)	(0-1)	(1-2)	(2-4)	(4-6)	(0-1)	(1-2)	(2-4)	(4-6)	(0-1)
arameter												
RGANIC (ug/kg)												
olychlorinated Biphenyl (PCB)												
Aroclor-1248	ND (40)	2,000	ND (40)	1300 J	ND(330)J	ND(330)J	ND(330)J	1700	ND(330)J	ND(330)J	ND(330)	2600
Aroclor-1260	ND (40)	1,000	ND (40)	ND(330)J	ND(330)J	ND(330)J	ND(330)J	ND(330)	ND(330)J	ND(330)J	ND(330)	2300

otes:
D - Not detected at method detection limit.
A - Not analyzed.
) - Method detection limit.
- Estimated value

Document Control No.: 4500-55-ANKR

/ork Assignment No.: 55-5AED
MI/PROJECTS/04500055.100/TAB6-28.WK4

his document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written ermission of U.S. EPA.

TABLE 6-29
Summary of Detected Parameters in Soil Samples
Saginaw Rock (Parcel 9)
Cert Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	WDP-SB-29 (5-7)	WDP-SB-30 (4.5-6.5)	WDP-SB-31 (4-6)	WDP-SB-32 (2.5-4.5)	WDP-SB-33 (4-6)	WDP-SB-34 (4.5-6.5)	WDP-SB-36 (6.5-8.5)	WDP-SB-37 (0.5-2.5)
Parameter								
INORGANIC (mg/kg)								
Arsenic	4J	ND(0.7)J	8J	3J	6J	NA	4J	6J
Barium	39	18	56	20	250	NA	37	42
Cadmium	0.07J	0.11J	0.27J	0.08J	0.17J	NA	0.16J	0.12J
Chromium	10J	5J	8J	3J	8J	NA	6J	11J
Copper	13	8	15	9	7	NA	6	13
Lead	14	20	51	18	270	NA	6	17
Zinc	31J	15J	71J	15J	110J	NA	24J	41J
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	ND(100)	ND(100)	200	ND(100)	ND(100)	NA	ND(100)	ND(100)
Methylene Chloride	20	30	30	30	20	NA	20	20
Toulene	ND(100)	40	20	20	ND(10)	NA	ND(10)	10
Semi-Volatile Compounds (SVOCs)								
Acenaphthylene	ND(330)	ND(330)	1200	ND(330)	ND(330)	ND(330)	ND(400)	ND(330)J
Anthracene	ND(330)	ND(330)	1900	ND(330)	ND(330)	540	ND(400)	ND(330)J
Benzo(a)anthracene	ND(330)	ND(330)	5500	ND(330)	ND(330)	1700	ND(400)	ND(330)J
Benzo(b)fluoranthene	ND(330)	ND(330)	6700	ND(330)	ND(330)	2100J	ND(400)	370J
Benzo(k)fluoranthene	ND(330)	ND(330)	4400	ND(330)	ND(330)	1600J	ND(400)	ND(330)J
Benzo(a)pyrene	ND(330)	ND(330)	6600	ND(330)	ND(330)	1600J	ND(400)	ND(330)J
Benzo(g,h,i)perylene	ND(330)	ND(330)	1600	ND(330)	ND(330)	ND(330)J	ND(400)	ND(330)J
ysene	ND(330)	ND(330)	5300	ND(330)	ND(330)	2100	ND(400)	ND(330)J
oranthene	ND(330)	ND(330)	12000	ND(330)	ND(330)	2900	ND(400)	340J
Fluorene	ND(330)	ND(330)	570	ND(330)	ND(330)	ND(330)	ND(400)	ND(330)J
Ideno(1,2,3-cd)pyrene	ND(330)	ND(330)	1700	ND(330)	ND(330)	1300J	ND(400)	ND(330)J
Phenanthrene	ND(330)	ND(330)	6300	ND(330)	ND(330)	2100	ND(400)	ND(330)J
Pyrene	ND(330)	ND(330)	9800	ND(330)	ND(330)	3900	ND(400)	ND(330)J
Dibenzofuran	ND(330)	ND(330)	420	ND(330)	ND(330)	ND(330)	ND(400)	ND(330)J
Dimethylphthalate	ND(330)	ND(330)	500	ND(330)	ND(330)	ND(330)	440	ND(330)J

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
J = Estimated value.
( ) - Method detection limit.
There were no detections of cyanide or PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TABL6-29.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-30
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
Cert Site, Bay City, Michigan

Sample I.D.:	CS-SB-26	CS-SB-27	CS-SB-28	CS-SB-29	WDP-SB-01	WDP-SB-01	WDP-SB-02	WDP-SB-02
Sample Depth (ft):	(1-4)	(4-6)	(0.5-1)	(0.5-1)	(2-4)	(4-6)	(4-6)	(19-21)
Parameter								
INORGANIC (mg/kg)								
Arsenic	NA	NA	NA	NA	NA	NA	NA	3J
Barium	NA	NA	NA	NA	NA	NA	NA	32J
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	9.4J
Copper	NA	NA	NA	NA	NA	NA	NA	13J
Lead	NA	NA	NA	NA	NA	NA	NA	3J
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	20J
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	NA	NA	NA	NA	ND(100)	NA	ND(100)	NA
MethyleneChloride	NA	NA	NA	NA	ND(10)	NA	ND(10)	NA
Toulene	NA	ND(10)	NA	NA	ND(10)	NA	ND(10)	NA
Semi-Volatile Compounds (SVOCs)								
Acenapthene	ND(200)	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Acenaphthylene	ND(200)	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Anthracene	400	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Benzo(a)anthracene	1000	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Benzo(b)fluoranthene	700	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Benzo(k)fluoranthene	700	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Benzo(a)pyrene	800	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Benzo(g,h,i)anthracene	300	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Chrysene	900	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Dibenzo(a,h)anthracene	200	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Fluoranthene	1900	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Fluorene	200	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Ideno(1,2,3-cd)pyrene	400	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Naphthalene	500	NA	NA	NA	NA	4300	NA	ND(330)
Phenanthrene	1400	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Pyrene	1900	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Dibenzofuran	NA	NA	NA	NA	NA	ND(900)J	NA	ND(330)
Dimethylphthalate	NA	NA	NA	NA	NA	ND(900)J	NA	ND(330)
2-Methylnaphthalene	NA	NA	NA	NA	NA	ND(900)J	NA	ND(330)
4-Nitrophenol	NA	NA	NA	NA	NA	ND(4000)	NA	ND(1700)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
J - Estimated value.
( ) - Method detection limit.
There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-30.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-30 (Continued)
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
Cert Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	WDP-SB-03 (9-11)	WDP-SB-03 (29-31)	WDP-SB-04 (14-16)	WDP-SB-06 (2-4)	WDP-SB-06 (2-6)	WDP-SB-07 (4.5-6.5)	WDP-SB-07 (6-8)	WDP-SB-07 (22-24)
Parameter								
INORGANIC (mg/kg)								
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	ND(100)	ND(100)	ND(100)	ND(100)	NA	ND(100)	NA	100
MethyleneChloride	ND(10)	ND(10)	10	20	NA	ND(10)	NA	ND(10)
Toulene	ND(10)	ND(10)	ND(10)	10J	NA	10J	NA	10
Semi-Volatile Compounds (SVOCs)								
Acenapthene	ND(330)	NA	ND(330)	NA	ND(330)	NA	360	NA
Acenaphthylene	ND(330)	NA	ND(330)	NA	ND(330)	NA	ND(330)	NA
Anthracene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1000	NA
Benzo(a)anthracene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1500	NA
Benzo(b)fluoranthene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1500	NA
Benzo(k)fluoranthene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1300	NA
Benzo(a)pyrene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1500	NA
Benzo(g,h,i)anthracene	ND(330)	NA	ND(330)	NA	ND(330)	NA	ND(330)	NA
Chrysene	ND(330)	NA	ND(330)	NA	ND(330)	NA	1500	NA
Dibenzo(a,h)anthracene	ND(330)	NA	ND(330)	NA	ND(330)	NA	ND(330)	NA
Fluoranthene	ND(330)	NA	ND(330)	NA	400	NA	3400	NA
Fluorene	ND(330)	NA	ND(330)	NA	ND(330)	NA	750	NA
Ideno(1,2,3-cd)pyrene	ND(330)	NA	ND(330)	NA	ND(330)	NA	650	NA
Naphthalene	ND(330)	NA	ND(330)	NA	ND(330)	NA	500	NA
Phenanthrene	ND(330)	NA	ND(330)	NA	520	NA	3900	NA
Pyrene	ND(330)	NA	ND(330)	NA	480	NA	3000	NA
Dibenzofuran	ND(330)	NA	ND(330)	NA	ND(330)	NA	570	NA
Dimethylphthalate	ND(330)	NA	ND(330)	NA	ND(330)	NA	ND(330)	NA
2-Methylnaphthalene	ND(330)	NA	ND(330)	NA	340	NA	820	NA
4-Nitrophenol	ND(1700)	NA	ND(1700)	NA	ND(1700)	NA	ND(1700)	NA

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
J - Estimated value.
( ) - Method detection limit.
There were no detections of PCBs above method detection limits.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-30 (Continued)
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
Cert Site, Bay City, Michigan

Sample I.D.:	WDP-SB-08	WDP-SB-09	WDP-SB-09	WDP-SB-09	WDP-SB-10	WDP-SB-11	WDP-SB-12	WDP-SB-13
Sample Depth (ft):	(6-8)	(2.5-4.5)	(9-11)	(14-16)	(20-22)	(20-22)	(14-16)	(4-6)
Parameter								
INORGANIC (mg/kg)								
Arsenic	NA	NA	4.1J	NA	2.2J	NA	NA	11J
Barium	NA	NA	33J	NA	19J	NA	NA	150J
Cadmium	NA	NA	0.09J	NA	ND(0.07)J	NA	NA	0.54J
Chromium	NA	NA	9J	NA	7J	NA	NA	6.7J
Copper	NA	NA	10J	NA	10J	NA	NA	51J
Lead	NA	NA	1J	NA	14J	NA	NA	320J
Mercury	NA	NA	ND(0.1)J	NA	ND(0.1)J	NA	NA	0.1J
Selenium	NA	NA	ND(0.6)J	NA	ND(0.7)	NA	NA	ND(0.6)J
Silver	NA	NA	ND(0.6)	NA	ND(0.7)	NA	NA	2.1
Zinc	NA	NA	15J	NA	17J	NA	NA	230J
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	100	NA	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)	ND(100)
MethyleneChloride	ND(10)	NA	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	10
Toulene	ND(10)	NA	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	20
Semi-Volatile Compounds (SVOCs)								
Acenapthene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Acenaphthylene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Anthracene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Benzo(a)anthracene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Benzo(b)fluoranthene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Benzo(k)fluoranthene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Benzo(a)pyrene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Benzo(g,h,i)anthracene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Chrysene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Dibenzo(a,h)anthracene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Fluoranthene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	4100
Fluorene	ND(330)	ND(330)J	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Ideno(1,2,3-cd)pyrene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Naphthalene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	ND(1900)
Phenanthrene	530	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	3100
Pyrene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	3000
Dibenzofuran	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	NA
Dimethylphthalate	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	NA
2-Methylnaphthalene	ND(330)	ND(330)	NA	NA	ND(330)	ND(330)	ND(330)	NA
4-Nitrophenol	ND(1700)	ND(1700)	NA	NA	ND(1700)	ND(1700)	ND(1700)	NA

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
J - Estimated value.
( ) - Method detection limit.
There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-30.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-30 (Continued)
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
Cert Site, Bay City, Michigan

Sample I.D.:	WDP-SB-13	WDP-SB-14	WDP-SB-15	WDP-SB-15	WDP-SB-16	WDP-SB-17	WDP-SB-17	WDP-SB-18
Sample Depth (ft):	(6-8)	(19-21)	(2-4)	(4-6)	(6.5-8.5)	(2.5-4.5)	(8.5-10.5)	(0.5-2.5)
Parameter								
INORGANIC (mg/kg)								
Arsenic	3J	NA	6J	3J	34J	8J	4J	3J
Barium	28J	NA	11J	17J	380J	48J	7J	42J
Cadmium	0.16J	NA	0.60J	0.42J	0.48J	0.21J	ND(0.07)J	0.32J
Chromium	ND(3.0)J	NA	ND(3.0)J	ND(3.3)J	12J	6.0J	ND(2.6)J	5.7J
Copper	4J	NA	6J	12J	1,400J	28J	1J	11J
Lead	15J	NA	23J	12J	480J	32J	ND(1)J	23J
Mercury	ND(0.2)J	NA	ND(0.2)J	ND(0.2)J	ND(0.2)J	ND(0.1)J	ND(0.1)J	ND(0.1)J
Selenium	ND(0.7)J	NA	ND(0.8)J	ND(0.8)J	0.9J	ND(0.6)J	ND(0.6)J	ND(0.6)J
Silver	ND(0.7)	NA	ND(0.8)	ND(0.8)	ND(0.9)	ND(0.6)	ND(0.7)	ND(0.6)
Zinc	21J	NA	310J	140J	520J	46J	8J	160J
ORGANIC (ug/kg)								
Volatile Organic Compounds (VOCs)								
Acetone	ND(100)	ND(100)	NA	NA	NA	NA	NA	NA
MethyleneChloride	20	ND(10)	NA	NA	NA	NA	NA	NA
Toulene	20	ND(10)	NA	NA	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)								
Acenapthene	ND(330)	ND(330)	NA	ND(330)	ND(330)	ND(330)	ND(330)	ND(960)
Acenaphthylene	ND(330)	ND(330)	NA	ND(330)	ND(330)	ND(330)	ND(330)	3900
Anthracene	ND(330)	ND(330)	NA	ND(330)	740	370	ND(330)	8000
Benzo(a)anthracene	ND(330)	ND(330)	NA	ND(330)	1900	790	ND(330)	15000
Benzo(b)fluoranthene	ND(330)	ND(330)	NA	ND(330)	2400	860	ND(330)	10000
Benzo(k)fluoranthene	ND(330)	ND(330)	NA	ND(330)	950	860	ND(330)	12000
Benzo(a)pyrene	ND(330)	ND(330)	NA	ND(330)	1800	930	ND(330)	14000
Benzo(g,h,i)anthracene	ND(330)	ND(330)	NA	ND(330)	410	570	ND(330)	7200
Chrysene	ND(330)	ND(330)	NA	ND(330)	1700	880	ND(330)	13000
Dibenzo(a,h)anthracene	ND(330)	ND(330)	NA	ND(330)	ND(330)	ND(330)	ND(330)	ND(960)
Fluoranthene	ND(330)	ND(330)	NA	ND(330)	2500	1500	ND(330)	25000
Fluorene	ND(330)	ND(330)	NA	ND(330)	ND(330)	ND(330)	ND(330)	1700
Ideno(1,2,3-cd)pyrene	ND(330)	ND(330)	NA	ND(330)	470	500	ND(330)	8300
Naphthalene	ND(330)	ND(330)	NA	ND(330)	ND(330)	ND(330)	ND(330)	ND(960)
Phenanthrene	ND(330)	ND(330)	NA	ND(330)	1600	730	ND(330)	14000
Pyrene	ND(330)	ND(330)	NA	ND(330)	2500	1400	ND(330)	23000
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
J - Estimated value.
( ) - Method detection limit.
There were no detections of PCBs above method detection limits.

This document was prepared by Roy F. Weston, Inc.; expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-30 (Continued)
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
Cert Site, Bay City, Michigan

Sample I.D.:	WDP-SB-18	WDP-SB-19	WDP-SB-19	WDP-SB-20	WDP-SB-20	WDP-SB-28
Sample Depth (ft):	(4.5-6.5)	(2.5-4.5)	(8.5-10.5)	(2.5-4.5)	(6.5-8.5)	(4-6)
Parameter						
INORGANIC (mg/kg)						
Arsenic	14J	5J	4J	9J	3J	1J
Barium	110J	82J	18J	94J	7J	12J
Cadmium	1.4J	0.23J	ND(0.7)J	0.75J	ND(0.07)J	0.21J
Chromium	2.4J	5.7J	ND(2.6)J	7.1J	ND(2.6)J	ND(2.5)J
Copper	29J	28J	4J	120J	4J	6J
Lead	240J	180J	8J	720J	3J	9J
Mercury	2.9J	ND(0.2)J	ND(0.1)J	0.3J	ND(0.1)J	ND(0.1)J
Selenium	ND(0.6)J	ND(0.8)J	ND(0.7)J	ND(0.6)J	ND(0.7)J	ND(0.6)J
Silver	ND(0.6)	ND(0.8)	ND(0.7)	ND(0.6)	ND(0.7)	ND(0.6)
Zinc	200J	110J	11J	270J	11J	88J
ORGANIC (ug/kg)						
Volatile Organic Compounds (VOCs)						
Acetone	NA	NA	NA	NA	NA	ND(100)
MethyleneChloride	NA	NA	NA	NA	NA	10
Toulene	NA	NA	NA	NA	NA	ND(10)
Semi-Volatile Compounds (SVOCs)						
Acenapthene	ND(55000)R	ND(330)	ND(330)	ND(1100)	ND(330)	ND(330)
Acenaphthylene	130000J	340	ND(330)	2700	ND(330)	ND(330)
Anthracene	260000J	480	ND(330)	6800	ND(330)	ND(330)
Benzo(a)anthracene	380000J	1600	ND(330)	15000	ND(330)	ND(330)
Benzo(b)fluoranthene	330000J	2400	ND(330)	9000	ND(330)	ND(330)
Benzo(k)fluoranthene	230000J	1300	ND(330)	12000	ND(330)	ND(330)
Benzo(a)pyrene	410000J	1800	ND(330)	13000	ND(330)	ND(330)
Benzo(g,h,i)anthracene	260000J	420	ND(330)	7800	ND(330)	ND(330)
Chrysene	430000J	1700	ND(330)	12000	ND(330)	ND(330)
Dibenzo(a,h)anthracene	ND(55000)R	ND(330)	ND(330)	ND(1100)	ND(330)	ND(330)
Fluoranthene	760000J	2300	ND(330)	22000	ND(330)	ND(330)
Fluorene	150000J	ND(330)	ND(330)	1800	ND(330)	ND(330)
Ideno(1,2,3-cd)pyrene	210000J	530	ND(330)	8500	ND(330)	ND(330)
Naphthalene	ND(55000)R	ND(330)	ND(330)	ND(1100)	ND(330)	ND(330)
Phenanthrene	800000J	1500	ND(330)	15000	ND(330)	ND(330)
Pyrene	860000	2700	ND(330)	22000	ND(330)	ND(330)
Dibenzofuran	NA	NA	NA	NA	NA	NA
Dimethylphthalate	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA
4-Nitrophenol	NA	NA	NA	NA	NA	NA

Notes:

ND - Not detected at method detection limit.
NA - Not analyzed.
J - Estimated value.
( ) - Method detection limit.
There were no detections of PCBs above method detection limits.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-31
Summary of Detected Parameters in Soil Samples
Cnudde (Parcel 11)
Cert Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-SB-18 (0.5-1)	CS-SB-18 (4-6)	WDP-SB-22 (8.5-10.5)	WDP-SB-22 (10.5-12.5)
Parameter				
INORGANIC (mg/kg)				
Arsenic	210	NA	NA	5J
Barium	100	NA	NA	26J
Cadmium	0.80	NA	NA	0.07J
Chromium	19	NA	NA	10J
Copper	120	NA	NA	13J
Lead	210	NA	NA	2J
Mercury	1.7	NA	NA	ND(0.1)
Selenium	11	NA	NA	ND(0.6)
Silver	ND(1)	NA	NA	ND(0.6)
Zinc	540	NA	NA	22J
ORGANIC (ug/kg)				
Semi-Volatile Compounds (SVOCs)				
Acenapthene	800	NA	ND(330)	ND(330)
Acenaphthylene	ND(500)	NA	ND(330)	ND(330)
Anthracene	2000	NA	ND(330)	ND(330)
Benzo(a)anthracene	3300	NA	ND(330)	ND(330)
Benzo(b)fluoranthene	4100	NA	ND(330)	ND(330)
Benzo(k)fluoranthene	900	NA	ND(330)	ND(330)
Benzo(a)pyrene	2800	NA	ND(330)	ND(330)
Benzo(g,h,i)anthracene	1700	NA	ND(330)	ND(330)
Bis (2-ethylhexyl) phthalate	900	NA	NA	NA
Chrysene	2600	NA	ND(330)	ND(330)
Dibenzo(a,h)anthracene	600	NA	ND(330)	ND(330)
Fluoranthene	6300	NA	ND(330)	ND(330)
Fluorene	1100	NA	ND(330)	ND(330)
Ideno(1,2,3-cd)pyrene	1500	NA	ND(330)	ND(330)
Naphthalene	700	NA	ND(330)	ND(330)
Phenanthrene	7300	NA	ND(330)	ND(330)
Pyrene	8000	NA	ND(330)	ND(330)
Dimethylphthalate	ND(500)	NA	NA	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

J - Estimated value.

( ) - Method detection limit.

There were no detections of PCBs or VOCs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-31.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-32
Summary of Detected Parameters in Soil Samples
Kunkel (Parcel 12)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-SB-12 (6-16)	WDP-SB-23 (4.5-6.5)	WDP-SB-23 (6.5-8.5)	WDP-SB-24 (2.5-4.5)	WDP-SB-24 (4.6-6.5)	WDP-SB-25 (8.5-10.5)	WDP-SB-25 (10.5-12.5)
Parameter							
INORGANIC (mg/kg)							
Arsenic	8.2	9J	22J	8J	2J	3J	3J
Barium	77	55J	170J	96J	26J	34J	40J
Cadmium	1.5	0.31J	1.0J	0.52J	0.11J	0.12J	0.08J
Chromium	14	7.0J	11J	8.7J	5.3J	9.9J	9.5J
Copper	20	19J	430J	29J	9J	14J	13J
Lead	110	79J	3,200J	87J	4J	8J	3J
Mercury	0.3	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J
Zinc	160	74J	820J	180J	19J	22J	22J
ORGANIC (ug/kg)							
Volatile Organic Compounds (VOCs)							
Methylene Chloride	30J	NA	NA	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)							
Benzo(a)anthracene	300	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	300	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	300	NA	NA	NA	NA	NA	NA
Chrysene	300	NA	NA	NA	NA	NA	NA
Fluoranthene	600	NA	NA	NA	NA	NA	NA
Phenanthrene	300	NA	NA	NA	NA	NA	NA
Pyrene	400	NA	NA	NA	NA	NA	NA

Notes:

ND - Not detected at method detection limit.

NA - Not analyzed.

J - Estimated value.

( ) - Method detection limit.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OM/PROJECTS/04500055.100/TAB6-32.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-33
Summary of Detected Parameters in Soil Samples
City of Bay City - Former Sears Automotive (Parcel 13)
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	CS-SB-10 (10-12)	CS-SB-11 (0-6)	CS-MW-01 (2-6)
Parameter			
ORGANIC (ug/kg)			
Semi-Volatile Compounds (SVOCs)			
Benzo(a)anthracene	ND(200)	700	ND(200)
Benzo(b)fluoranthene	ND(200)	1000	ND(200)
Benzo(k)fluoranthene	ND(200)	300	ND(200)
Benzo(a)pyrene	ND(200)	800	ND(200)
Benzo(g,h,i)anthracene	ND(200)	600	ND(200)
Chrysene	ND(200)	600	ND(200)
Fluoranthene	ND(200)	1500	ND(200)
Ideno(1,2,3-cd)pyrene	ND(200)	600	ND(200)
Phenanthrene	ND(200)	600	ND(200)
Pyrene	ND(200)	1100	ND(200)

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

There were no detections of PCBs above method detection limits.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-33.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of U.S. EPA.

- City of Bay City - Substation (Parcel 15) - Table 6-34
- Labadie (Parcels 18, 19 and 20) - Table 6-35
- City of Bay City - Water Street Substation (Parcel 21) - Table 6-36
- Consumers Power - Vacant Lot (Parcel 26) - Table 6-37
- Residential Parcels (Parcel 29) - Table 6-38

A summary of the analytical results from the drum samples and the radiation samples collected from the Weld-Rite parcel (Parcel 26) is presented in Table 6-39.

A summary of the detected parameters from the groundwater samples is presented in Tables 6-40.

A summary of the analytical results of the waste characterization soils sampling on the Midland parcel (Parcel 10) is presented in Table 6-41.

A summary of the analytical results of the disposal parameters core sampling on the Midland parcel (Parcel 10) is presented in Table 6-42.

A summary of the detected parameters in the Saginaw river sediment samples is presented in Tables 6-43 through 6-44.

A summary of the detected parameters in the test pit samples is presented in Tables 6-45 and 6-46.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-34
Summary of Detected Parameters in Soil Samples
City of Bay City - Substation (Parcel 15)
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	CS-HA-13 (0.5-1)	CS-HA-17 (0.5-1)	CS-HA-17 (2.5-3)
Parameter			
ORGANIC (ug/kg)			
Polychlorinated Biphenyl (PCB)			
Aroclor-1242	ND (40)	ND (100)	150
Aroclor-1248	ND (40)	200	ND (100)
Aroclor-1260	ND (40)	200	ND (100)

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-34.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of U.S. EPA.

TABLE 6-35
Summary of Detected Parameters in Soil Samples
Labadie (Parcels 18, 19 and 20)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-HA-14 (0.5-1)	CS-HA-14 (2.5-3)	CS2-SB-07 (0-1)	CS2-SB-08 (0-1)	CS2-SB-09 (0-1)	CS2-SB-10 (0-1)	CS2-SB-10 (1-2)	CS2-SB-10 (2-4)
Parameter								
ORGANIC (ug/kg)								
Polychlorinated Biphenyl (PCB)								
Aroclor-1242	ND(40000)	ND(20000)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)
Aroclor-1248	300000	47000	3300	2700	ND(330)	1000000	1700	800
Aroclor-1260	ND(40000)	ND(20000)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)

Notes:
ND - Not detected at method detection limit.
( ) - Method detection limit.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-35.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of the U.S. EPA.

TABLE 6-35 (Continued)
Summary of Detected Parameters in Soil Samples
Labadie (Parcels 18, 19 and 20)
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	CS2-SB-10 (4-6)	CS2-SB-11 (0-1)	CS2-SB-12 (0-1)	CS2-SB-12 (1-2)	CS2-SB-12 (2-4)	CS2-SB-12 (4-6)	CS2-SB-13 (0-1)	CS2-SB-13 (1-2)
Parameter								
ORGANIC (ug/kg)								
Polychlorinated Biphenyl (PCB)								
Aroclor-1242	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)
Aroclor-1248	600	600	980000	960000	1600	3000	9200	16000
Aroclor-1260	ND(330)	ND(330)	22000	28000	ND(330)	ND(330)	1300	800

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

Work Assignment No.: 55-5AED

OMI/PROJECTS/04500055.100/TAB6-35.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of the U.S. EPA.

TABLE 6-35 (Continued)
Summary of Detected Parameters in Soil Samples
Labadie (Parcels 18, 19 and 20)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS2-SB-14 (0-1)	CS2-SB-14 (1-2)	CS2-SB-14 (2-4)	CS2-SB-14 (4-6)	CS2-SB-14 (6-8)	CS2-SB-14 (8-10)	CS2-SB-16 (0-1)
Parameter							
ORGANIC (ug/kg)							
Polychlorinated Biphenyl (PCB)							
Aroclor-1242	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)
Aroclor-1248	2200000	33000 J	9400	14000	2200	ND(330)	ND(330)
Aroclor-1260	60000	ND(330)	ND(330)	ND(500)	ND(330)	ND(330)	ND(330)

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

Work Assignment No.: 55-5AED

OMI/PROJECTS/04500055.100/TAB6-35.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of the U.S. EPA.

TABLE 6-36
Summary of Detected Parameters in Soil Samples
City of Bay City - Water Street Substation (Parcel 21)
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	CS-HA-01 (0.5-1)	CS-HA-01 (2.5-3)	CS-HA-04 (0.5-1)	CS-HA-04 (2.5-3)	CS-HA-05 (0.5-1)	CS-HA-05 (2.5-3)
Parameter						
ORGANIC (ug/kg)						
Polychlorinated Biphenyl (PCB)						
Aroclor-1248	1600	4300	6000000	20000	9000000	3000
Aroclor-1260	500	1000	ND (4000000)	ND (20000)	ND (2000000)	ND (2000)

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

Work Assignment No.: 55-5AED

Document Control No.: 4500-55-ANKR

OMI/PROJECTS/04500055.100/TAB6-36.WK4

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without express, written permission of the U.S. EPA.

TABLE 6-37
Summary of Detected Parameters in Soil Samples
Consumers Power - Vacant Lot (Parcel 26)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	CS-SB-08 (4-6)	CS-SB-09 (2-4)	CS2-SB-05 (0-1)	CS2-SB-06 (0-1)	CS2-SB-06 (1-2)	CS2-SB-06 (2-4)	CS2-SB-06 (4-6)	CS2-SB-15 (0-1)	CS2-SB-17 (0-1)
Parameter									
INORGANIC (mg/kg)									
Arsenic	NA	6.8	NA	NA	NA	NA	NA	NA	NA
Barium	NA	46	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	0.78	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	6.3	NA	NA	NA	NA	NA	NA	NA
Copper	NA	25	NA	NA	NA	NA	NA	NA	NA
Lead	NA	100	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	ND (0.1)	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	ND (0.5)	NA	NA	NA	NA	NA	NA	NA
Silver	NA	0.9	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	43	NA	NA	NA	NA	NA	NA	NA
Cyanide (total)	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORGANIC (ug/kg)									
Polychlorinated Biphenyl (PCB)									
Aroclor-1248	NA	NA	1300	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)
Aroclor-1260	NA	NA	600	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
There were no detections of VOCs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-37.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of the U.S. EF

TABLE 6-38
Summary of Detected Parameters in Soil Samples
Residential Parcels (Parcel 29)
CERT Site, Bay City, Michigan

Sample I.D.: **Sample Depth (ft):**	WDP-SB-26 (6.5-8.5)	WDP-SB-26 (8.5-10.5)	WDP-SB-27 (10.5-12.5)	WDP-SB-38 (8-10)
Parameter				
INORGANIC (mg/kg)				
Arsenic	NA	2J	4J	3J
Barium	NA	34J	39J	37J
Cadmium	NA	0.11J	0.18J	0.11J
Chromium	NA	6.6J	10J	10J
Copper	NA	20J	13J	13J
Lead	NA	16J	3J	4J
Zinc	NA	29J	23J	23J
ORGANIC (ug/kg)				
Semi-Volatile Compounds (SVOCs)				
Naphthalene	720	NA	ND(330)	ND(330)

Notes:
ND- Not detected at method detection limit.
( ) - Method detection limit.
NA - Not Analyzed.
J - Estimated value.
There were no detections of PCBs or VOCs above method detection limits.

Work Assingment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-38.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-39
Summary of Detected Parameters in Product Sample and Radiation in Brick Samples
Weld-Rite (Parcel 6)
CERT Site, Bay City, Michigan

Sample I.D.:	WR-1 (Product)	WRO-E1 (Brick)	WRO-E1-(Dup) (Brick)	WRO-E2 (Brick)	WRO-E3 (Brick)
Parameter					
INORGANIC (mg/kg)					
TCLP Metals					
Arsenic	0.005	NA	NA	NA	NA
Barium	0.3	NA	NA	NA	NA
Cadmium	0.0007	NA	NA	NA	NA
Lead	0.061	NA	NA	NA	NA
Mercury	0.0009	NA	NA	NA	NA
Silver	0.002	NA	NA	NA	NA
pH	8.1	NA	NA	NA	NA
ORGANIC (ug/kg)					
Volatile Organic Compounds (VOCs)					
Ethylbenzene	8000	NA	NA	NA	NA
Styrene	13000	NA	NA	NA	NA
Toluene	8000	NA	NA	NA	NA
Xylene (total)	50000	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)					
Acenaphthene	4300000	NA	NA	NA	NA
Acenaphthylene	3400000	NA	NA	NA	NA
Anthracene	7500000	NA	NA	NA	NA
Benzo(a)anthracene	6900000	NA	NA	NA	NA
Benzo(a)pyrene	6000000	NA	NA	NA	NA
Benzo(b)fluoranthene	6000000	NA	NA	NA	NA
Benzo(g,h,i)perylene	3800000	NA	NA	NA	NA
Benzo(k)fluoranthene	3600000	NA	NA	NA	NA
Chrysene	5900000	NA	NA	NA	NA
Fluoranthene	24000000	NA	NA	NA	NA
Fluorene	12000000	NA	NA	NA	NA
Ideno(1,2,3-cd)pyrene	3300000	NA	NA	NA	NA
Naphthalene	43000000	NA	NA	NA	NA
Phenanthrene	28000000	NA	NA	NA	NA
Pyrene	12000000	NA	NA	NA	NA
Radiation Parameters(pCi/g)					
K-40	NA	17.5	18.3	14.6	12.7
CS-137	NA	0.02	0.01	0.02	-0.01
BI-214	NA	0.94	0.85	0.82	0.49
PB-214	NA	0.9	0.98	0.79	0.55
AC-228	NA	0.97	1.1	0.78	0.56

Notes:
NA - Not analyzed.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-39.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S.EPA.

TABLE 6-40
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.:	IB-MW-01	IB-MW-02	IB-MW-03	IB-MW-04	IB-MW-05	IB-MW-06
Sample Depth (ft):	12/92	12/92	12/92	12/92	12/92	12/92
Parcel Number:	Parcel 7	Parcel 7	Parcel 7	Parcel 7	Parcel 7	Parcel 7
Parameter						
INORGANIC (mg/L)						
Arsenic	0.008	0.013	0.008	0.015	0.008	0.03
Barium	0.2	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	0.2
Cadmium	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	0.006	ND(0.0002)
Chromium	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Copper	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)
Lead	0.026	0.013	ND(0.003)	ND(0.003)	0.017	0.018
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Selenium	ND(0.001)	0.004J	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Silver	0.003	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	0.03	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide	ND(0.01)	0.01	ND(0.01)	0.01	ND(0.01)	ND(0.01)
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,1,1-Trichloroethane	0.6	ND(0.5)	0.8	ND(0.5)	ND(0.5)	ND(0.5)
Chloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
1,2-Dichloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Ethylbenzene	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
Benzene	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Xylene (meta/para)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Xylene (ortho)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Toluene	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
Acetone	NA	NA	NA	NA	NA	NA
Carbon Disulfide	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	ND(5)	ND(5)	10	ND(5)	ND(5)
Naphthalene	ND(5)	ND(5)	ND(5)	11	ND(5)	ND(5)
Phenanthrene	ND(5)	ND(5)	ND(5)	13	ND(5)	ND(5)
Pyrene	ND(5)	ND(5)	ND(5)	10	ND(5)	ND(5)
Anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(b)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(k)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)pyrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Chrysene	ND(5)	ND(5)	ND(5)	5	ND(5)	ND(5)
Bis(2-chloroisopropyl)ether	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Acenaphthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Fluorene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Phenol	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.:	IB-MW-07	IB-MW-08	IB-MW-09	IB-MW-10	IB-MW-11	IB-MW-12
Sample Depth (ft):	12/92	12/92	12/92	12/92	12/92	12/92
Parcel Number:	Parcel 7	Parcel 7	Parcel 7	Parcel 7	Parcel 7	Parcel 7
Parameter						
INORGANIC (mg/L)						
Arsenic	0.005	0.008	0.003	0.005	0.011	0.005
Barium	ND(0.2)	0.2	ND(0.2)	ND(0.2)	0.2	ND(0.2)
Cadmium	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Copper	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)
Lead	0.01	0.01	ND(0.003)	0.017	0.01	ND(0.003)
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Selenium	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	0.003	ND(0.001)
Silver	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide	0.48	0.02	ND(0.005)	ND(0.01)	0.03	ND(0.01)
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)
1,1,1-Trichloroethane	4	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Chloroethane	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.8	ND(0.5)
1,2-Dichloroethane	0.9	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
Ethylbenzene	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
Benzene	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Xylene (meta/para)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Xylene (ortho)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.4)
Toluene	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)	ND(0.3)
Acetone	NA	NA	NA	NA	NA	NA
Carbon Disulfide	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	ND(1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(1)	ND(0.1)
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	62	ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Phenanthrene	ND(5)	36	ND(5)	21	ND(5)	ND(5)
Pyrene	ND(5)	62	ND(5)	ND(5)	ND(5)	ND(5)
Anthracene	ND(5)	8	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)anthracene	ND(5)	31	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(b)fluoranthene	ND(5)	18	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(k)fluoranthene	ND(5)	26	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)pyrene	ND(5)	72	ND(5)	ND(5)	ND(5)	ND(5)
Chrysene	ND(5)	37	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-chloroisopropyl)ether	11	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Acenaphthene	ND(5)	ND(5)	ND(5)	ND(5)	6	ND(5)
Fluorene	ND(5)	ND(5)	ND(5)	6	ND(5)	ND(5)
Phenol	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	IB-MW-13 12/92 Parcel 7	IB-MW-14 12/92 Parcel 7	CS-MW-01 6/93 Parcel 13	CS-MW-02 6/93 Parcel 10	CS-MW-02 9/95 Parcel 10	CS-MW-03 6/93 Parcel 10
Parameter						
INORGANIC (mg/L)						
Arsenic	0.005	0.011	0.017	0.033	ND(0.005)	0.029
Barium	ND(0.2)	0.4	ND(0.2)	ND(0.2)	ND(0.1)	ND(0.2)
Cadmium	ND(0.0002)	0.4	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.05)	0.42	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Copper	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.03)	ND(0.07)	ND(0.03)
Lead	ND(0.003)	0.44	0.018	0.028	0.006	0.021
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	0.0005	ND(0.0002)	ND(0.0002)
Selenium	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)
Silver	ND(0.0005)	0.46	ND(0.0005)	ND(0.0005)	ND(0.0005)J	ND(0.0005)
Zinc	ND(0.02)	0.03	ND(0.02)	ND(0.02)	ND(0.02)	0.09
Cyanide	ND(0.01)	0.55	ND(0.005)	ND(0.005)	0.01	ND(0.005)
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(2)	ND(2)	1	1	ND(1)	ND(1)
1,1,1-Trichloroethane	ND(0.5)	3.7	ND(1)	ND(1)	ND(1)	ND(1)
Chloroethane	6.1	16	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dichloroethane	ND(0.5)	ND(0.5)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	ND(0.3)	0.7	ND(1)	ND(1)	ND(1)	ND(1)
Benzene	ND(0.4)	8.3	ND(1)	ND(1)	ND(1)	ND(1)
Xylene (meta/para)	ND(0.4)	1	ND(1)	ND(1)	ND(1)	ND(1)
Xylene (ortho)	ND(0.4)	0.7	ND(1)	ND(1)	ND(1)	ND(1)
Toluene	ND(0.3)	ND(0.3)	ND(4)	21	ND(4)	ND(1)
Acetone	NA	NA	ND(50)	ND(50)	ND(2)	ND(16)
Carbon Disulfide	NA	NA	ND(50)	ND(50)	ND(4)	ND(50)
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	ND(0.1)	ND(0.1)	2	ND(1)	ND(1)	ND(1)
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Naphthalene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Phenanthrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Pyrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(b)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(k)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)pyrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Chrysene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-chloroisopropyl)ether	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Acenaphthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Fluorene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)
Phenol	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express. written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	CS-MW-03 9/95 Parcel 10	WDP-MW-01 10/94 Parcel 10	WDP-MW-01 9/95 Parcel 10	WDP-MW-02 10/94 Parcel 10	WDP-MW-02 9/95 Parcel 10	WDP-MW-03 10/94 Parcel 10
Parameter						
INORGANIC (mg/L)						
Arsenic	0.011	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Barium	0.2	0.5	0.3	0.5	1.4	1.1
Cadmium	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0006)	ND(0.0002)	ND(0.0006)
Chromium	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Copper	ND(0.03)	ND(0.025)	0.034	0.028	ND(0.025)	ND(0.025)
Lead	0.008	0.007	ND(0.003)	0.005	0.015	0.008
Mercury	ND(0.0002)	0.0003	ND(0.0002)	0.003	ND(0.0002)	0.0002
Selenium	ND(0.005)	ND(0.005)J	ND(0.005)	0.006J	ND(0.005)	ND(0.005)
Silver	ND(0.0005)	0.0005J	0.0008J	0.015J	0.024J	0.016J
Zinc	ND(0.02)	ND(0.02)	0.03	ND(0.02)	ND(0.2)	ND(0.02)
Cyanide	ND(0.01)	0.02	0.05	0.26	0.09	0.15
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(2)	ND(2)	NA	ND(2)	NA	ND(2)
1,1,1-Trichloroethane	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Chloroethane	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
1,2-Dichloroethane	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Ethylbenzene	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Benzene	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Xylene (meta/para)	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Xylene (ortho)	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Toluene	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Acetone	ND(4)	ND(4)	NA	ND(5)R	NA	ND(5)R
Carbon Disulfide	ND(1)	ND(1)	NA	ND(1)	NA	ND(1)
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	ND(1)	ND(0.1)	NA	ND(0.1)	NA	ND(0.1)
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Naphthalene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Phenanthrene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Pyrene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Anthracene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Benzo(a)anthracene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Benzo(b)fluoranthene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Benzo(k)fluoranthene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Benzo(a)pyrene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Chrysene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Bis(2-chloroisopropyl)ether	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Acenaphthene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Fluorene	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)
Phenol	ND(5)	ND(5)	NA	ND(5)	NA	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	WDP-MW-03 9/95 Parcel 10	WDP-MW-04 10/94 Parcel 10	WDP-MW-04 9/95 Parcel 10	WDP-MW-05 10/94 Parcel 12	WDP-MW-05 9/95 Parcel 12	WDP-MW-06 10/94 Parcel 10
Parameter						
INORGANIC (mg/L)						
Arsenic	ND(0.005)	ND(0.001)	0.011	ND(0.001)	ND(0.005)	ND(0.001)
Barium	ND(1)	0.2	ND(0.1)	0.5	0.6	0.2
Cadmium	0.0002	0.0007	0.0005	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)
Copper	ND(0.025)	ND(0.025)	0.06	ND(0.025)	0.14	ND(0.025)
Lead	0.004	ND(0.003)	ND(0.003)	ND(0.003)	ND(0.003)	0.012
Mercury	ND(0.0002)	0.0003	ND(0.0002)	ND(0.0002)	ND(0.0002)	0.0002
Selenium	ND(0.005)	ND(0.005)J	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)J
Silver	0.011J	ND(0.0005)J	ND(0.0005)J	ND(0.0005)J	ND(0.0005)J	ND(0.0005)J
Zinc	ND(0.2)	ND(0.02)	0.02	ND(0.02)J	0.05	ND(0.02)
Cyanide	ND(0.01)	NA	ND(0.01)	NA	ND(0.01)	NA
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	NA	ND(2)	NA	NA	NA	ND(2)
1,1,1-Trichloroethane	NA	ND(1)	NA	NA	NA	ND(1)
Chloroethane	NA	ND(1)	NA	NA	NA	ND(1)
1,2-Dichloroethane	NA	ND(1)	NA	NA	NA	ND(1)
Ethylbenzene	NA	ND(1)	NA	NA	NA	ND(1)
Benzene	NA	ND(1)	NA	NA	NA	ND(1)
Xylene (meta/para)	NA	ND(1)	NA	NA	NA	ND(1)
Xylene (ortho)	NA	ND(1)	NA	NA	NA	ND(1)
Toluene	NA	ND(1)	NA	NA	NA	ND(1)
Acetone	NA	ND(5)R	NA	NA	NA	ND(5)R
Carbon Disulfide	NA	ND(1)	NA	NA	NA	ND(1)
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	NA	NA	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	NA	ND(5)	NA	NA	NA	ND(5)
Naphthalene	NA	ND(5)	NA	NA	NA	ND(5)
Phenanthrene	NA	ND(5)	NA	NA	NA	ND(5)
Pyrene	NA	ND(5)	NA	NA	NA	ND(5)
Anthracene	NA	ND(5)	NA	NA	NA	ND(5)
Benzo(a)anthracene	NA	ND(5)	NA	NA	NA	ND(5)
Benzo(b)fluoranthene	NA	ND(5)	NA	NA	NA	ND(5)
Benzo(k)fluoranthene	NA	ND(5)	NA	NA	NA	ND(5)
Benzo(a)pyrene	NA	ND(5)	NA	NA	NA	ND(5)
Chrysene	NA	ND(5)	NA	NA	NA	ND(5)
Bis(2-chloroisopropyl)ether	NA	ND(5)	NA	NA	NA	ND(5)
Acenaphthene	NA	ND(5)	NA	NA	NA	ND(5)
Fluorene	NA	ND(5)	NA	NA	NA	ND(5)
Phenol	NA	ND(5)	NA	NA	NA	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	WDP-MW-06 9/95 Parcel 10	WDP-MW-08 10/94 Parcel 10	WDP-MW-09 12/94 Parcel 9	WDP-MW-09 2/95 Parcel 9	WDP-MW-10 12/94 Parcel 9	WDP-MW-10 2/95 Parcel 9
Parameter						
INORGANIC (mg/L)						
Arsenic	0.011	ND(0.001)	0.028J	0.013	0.009J	0.005
Barium	ND(0.1)	0.2	ND(0.2)	0.2	ND(0.2)J	ND(0.2)
Cadmium	ND(0.0002)	0.0002	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.5)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)J	ND(0.05)
Copper	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)J	ND(0.025)
Lead	0.003	ND(0.003)	0.013	0.013	ND(0.003)J	ND(0.003)
Mercury	ND(0.0002)	0.0002	ND(0.0002)	ND(0.0002)	0.0003	ND(0.0002)
Selenium	ND(0.005)	ND(0.005)J	ND(0.005)J	ND(0.005)	ND(0.005)J	ND(0.005)
Silver	ND(0.0005)J	0.0012J	0.0023J	0.0023	0.0012J	ND(0.005)
Zinc	ND(0.2)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)J	ND(0.02)
Cyanide	1.7	NA	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.01)
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	NA	ND(2)	ND(2)	NA	ND(2)	NA
1,1,1-Trichloroethane	NA	ND(1)	ND(1)	NA	ND(1)	NA
Chloroethane	NA	ND(1)	ND(1)	NA	ND(1)	NA
1,2-Dichloroethane	NA	ND(1)	ND(1)	NA	ND(1)	NA
Ethylbenzene	NA	ND(1)	ND(1)	NA	ND(1)	NA
Benzene	NA	ND(1)	ND(1)	NA	ND(1)	NA
Xylene (meta/para)	NA	ND(1)	ND(1)	NA	ND(1)	NA
Xylene (ortho)	NA	ND(1)	ND(1)	NA	ND(1)	NA
Toluene	NA	ND(1)	ND(1)	NA	ND(1)	NA
Acetone	NA	ND(5)R	52J	NA	ND(5)R	NA
Carbon Disulfide	NA	ND(1)	4	NA	ND(1)	NA
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	NA	ND(0.1)	ND(0.2)	NA	ND(0.4)	NA
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Naphthalene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Phenanthrene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Pyrene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Anthracene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Benzo(a)anthracene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Benzo(b)fluoranthene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Benzo(k)fluoranthene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Benzo(a)pyrene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Chrysene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Bis(2-chloroisopropyl)ether	NA	ND(5)	ND(5)	NA	ND(5)	NA
Acenaphthene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Fluorene	NA	ND(5)	ND(5)	NA	ND(5)	NA
Phenol	NA	ND(5)	53	NA	ND(5)	NA

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	WDP-MW-11 12/94 Parcel 9	WDP-MW-11 2/95 Parcel 9	WDP-MW-12 10/94 Parcel 10	CS2-MW-1S 12/95 Parcel 7	CS2-MW-1D 12/95 Parcel 7	CS2-MW-2S 12/95 Parcel 7
Parameter						
INORGANIC (mg/L)						
Arsenic	0.008J	0.01	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.005)
Barium	0.2J	ND(0.2)	0.5	0.2	0.2	0.2
Cadmium	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.05)J	ND(0.05)	ND(0.05)	ND(0.1)	ND(0.1)	ND(0.1)
Copper	ND(0.025)J	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Lead	ND(0.003)J	0.013	0.004	ND(0.003)	ND(0.003)	ND(0.003)
Mercury	0.0005	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Selenium	ND(0.005)J	ND(0.005)	ND(0.005)J	ND(0.005)	ND(0.005)	ND(0.005)
Silver	0.0016J	0.0023	ND(0.0005)J	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	ND(0.02)J	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide	ND(0.01)	ND(0.01)	ND(0.01)	NA	NA	NA
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(2)	NA	ND(2)	ND(1)	ND(1)	ND(1)
1,1,1-Trichloroethane	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
Chloroethane	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dichloroethane	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
Benzene	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
Xylene (meta/para)	ND(1)	NA	ND(1)	ND(3)	ND(3)	ND(3)
Xylene (ortho)	ND(1)	NA	ND(1)	ND(3)	ND(3)	ND(3)
Toluene	ND(1)	NA	ND(1)	ND(1)	ND(1)	ND(1)
Acetone	ND(5)R	NA	14J	ND(50)	ND(50)	ND(50)
Carbon Disulfide	ND(1)	NA	ND(1)	ND(50)	ND(50)	ND(50)
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	ND(0.2)	NA	ND(0.2)	NA	NA	NA
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	NA	5	15	ND(5)	ND(5)
Naphthalene	ND(5)	NA	ND(5)	9	ND(5)	ND(5)
Phenanthrene	ND(5)	NA	ND(5)	26	ND(5)	ND(5)
Pyrene	ND(5)	NA	ND(5)	12	ND(5)	ND(5)
Anthracene	ND(5)	NA	ND(5)	6	ND(5)	ND(5)
Benzo(a)anthracene	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(b)fluoranthene	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(k)fluoranthene	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Benzo(a)pyrene	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Chrysene	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Bis(2-chloroisopropyl)ether	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)
Acenaphthene	ND(5)	NA	ND(5)	7	ND(5)	ND(5)
Fluorene	ND(5)	NA	ND(5)	13	ND(5)	ND(5)
Phenol	ND(5)	NA	ND(5)	ND(5)	ND(5)	ND(5)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-40 (Continued)
Summary of Detected Parameters in Groundwater Samples
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft): Parcel Number:	CS2-MW-2D 12/95 Parcel 7	CS2-MW-3S 12/95 Parcel 7	CS2-MW-3D 12/95 Parcel 7	CS2-MW-4S 12/95 Parcel 7	CS2-MW-4D 12/95 Parcel 7	CS2-MW-5S 12/95 Parcel 7
Parameter						
INORGANIC (mg/L)						
Arsenic	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Barium	0.3	0.9	0.5	0.9	0.2	ND(0.1)
Cadmium	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Chromium	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)	ND(0.1)
Copper	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Lead	ND(0.003)	ND(0.003)	ND(0.003)	ND(0.003)	ND(0.003)	ND(0.003)
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Selenium	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Silver	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	ND(0.02)	0.05	0.03	ND(0.02)	ND(0.02)	ND(0.02)
Cyanide	NA	NA	NA	ND(0.01)	ND(0.01)	NA
ORGANIC (ug/L)						
Volatile Organic Compounds (VOCs)						
Methylene Chloride	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,1,1-Trichloroethane	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Chloroethane	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
1,2-Dichloroethane	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Ethylbenzene	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Benzene	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Xylene (meta/para)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Xylene (ortho)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)	ND(3)
Toluene	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)
Acetone	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Carbon Disulfide	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)
Polychlorinated Biphenyl (PCBs)						
Aroclor-1248	NA	NA	NA	NA	NA	NA
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Naphthalene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Phenanthrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Pyrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Benzo(a)anthracene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Benzo(b)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Benzo(k)fluoranthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Benzo(a)pyrene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Chrysene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Bis(2-chloroisopropyl)ether	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Acenaphthene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Fluorene	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)
Phenol	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(8)

Notes:
ND - Not detected at method detection limit.
NA - Not analyzed.
( ) - Method detection limit.
J - Estimated value.
R - Unusable data.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-40.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-41
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	WDP-SB-01 (4-6)	WDP-SB-02 (19-21)	WDP-SB-03 (9-11)	WDP-SB-04 (14-16)	WDP-SB-06 (2-6)	WDP-SB-07 (6-8)
Parameters						
EP TOXICITY LEACHATE (mg/l)						
Barium	0.6J	0.8J	0.8J	0.6J	0.9J	0.7J
Lead	0.005	ND(0.003)	0.086	0.073	0.009	ND(0.003)
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	0.0003	ND(0.0002)
Silver	ND(0.0005)	0.0010	0.0041	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	5.4	0.22J	ND(0.02)	0.67J	ND(0.02)	0.46J
TCLP LEACHATE (mg/L)						
Barium	0.6	0.9	1.1	0.6	0.8	0.3
Cadmium	0.0005	ND(0.0002)	0.0003	0.0007	0.0003	ND(0.0002)
Copper	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)	ND(0.025)
Lead	0.007	0.006	0.047	0.13	0.033	0.13
Silver	ND(0.0005)	0.0013	0.0020	0.0021	ND(0.0005)	0.0012
Zinc	ND(0.02)	0.29	0.60	0.94	0.26	ND(0.02)
pH	7.8	6.9	7.2	7.5	7.7	7.4
Reactive Cyanide (mg/kg)	66	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)

Notes:
ND - Not detected at method detection limit.
( ) - Method detection limit.
J - Estimated value.
There were no detections of ignitability, reactive sulfide or PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-41.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-41 (continued)
Summary of Detected Parameters in Soil Samples
Midland (Parcel 10)
CERT Site, Bay City, Michigan

Sample I.D.: Sample Depth (ft):	WDP-SB-08 (6-8)	WDP-SB-09 (2.5-4.5/20-22)	WDP-SB-10 (20-22)	WDP-SB-11 (20-22)	WDP-SB-12 (14-16)
Parameters					
EP TOXICITY LEACHATE (mg/l)					
Barium	0.9J	0.6J	0.8J	1.0J	0.6J
Lead	0.010	0.007	ND(0.003)	0.011	ND(0.003)
Mercury	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Silver	ND(0.0005)	0.0008	ND(0.0005)	ND(0.0005)	ND(0.0005)
Zinc	ND(0.02)J	ND(0.02)J	0.27J	ND(0.02)J	0.22J
TCLP LEACHATE (mg/L)					
Barium	0.8	0.6	1.0	1.1	0.4
Cadmium	0.0007	0.0002	ND(0.0002)	0.0003	ND(0.0002)
Copper	ND(0.025)	0.37	ND(0.025)	ND(0.025)	ND(0.025)
Lead	0.018	0.004	0.012	0.008	0.010
Silver	0.0020	ND(0.0005)	0.0015	0.0024	0.0022
Zinc	0.34	ND(0.02)	0.32	0.21	ND(0.02)
pH	7.3	8.1	7.2	7.8	7.4
Reactive Cyanide (mg/kg)	ND(50)	ND(50)	ND(50)	ND(50)	ND(50)

Notes:
ND - Not detected at method detection limit.
( ) - Method detection limit.
J - Estimated value.
There were no detections of ignitability, reactive sulfide or PCBs above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-41.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-42
Analytical Results of Disposal Parameters Sampling
Midland (Parcel 10)
CERT Site, Bay City, Michigan

Sample I.D.	WDP-LC-1A	WDP-LC-1B	WDP-LC-2A	WDP-LC-2B	WDP-LC-3A	WDP-LC-3B	WDP-LC-4A	WDP-LC-4B
Parameter								
INORGANIC (mg/kg)								
Arsenic	9.1	12	8.1	6.1	6.9	5.7	4.2	15
Barium	95	52	17	42	44	39	40	38
Cadmium	0.14J	0.14J	0.08J	0.14J	0.09J	0.16J	0.24J	0.16J
Chromium	5	8	4	8	36	7	11	7
Copper	21	7	7	7	5	6	21	5
Lead	230	4	200	4	8	3	28	3
Mercury	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J	ND(0.1)J	0.4J	ND(0.1)J
Selenium	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.9	ND(0.5)
Silver	ND(0.5)J	ND(0.5)J	0.7J	ND(0.5)J	ND(0.5)J	ND(0.5)J	ND(0.5)J	ND(0.5)J
Zinc	220J	27J	20J	31J	23J	28J	69J	28J
ORGANIC (ug/kg)								
Semi-Volatile Compounds (SVOCs)								
Anthracene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	370	ND(330)
Benzo(a)anthracene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	790	ND(330)
Benzo(a)pyrene	340	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	690	ND(330)
Benzo(b)fluoranthene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	600	ND(330)
Benzo(k)fluoranthene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	750	ND(330)
Chrysene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	790	ND(330)
Fluoranthene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	1400	ND(330)
Naphthalene	ND(330)	ND(330)	470	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)
Phenenthrene	ND(330)	ND(330)	630	ND(330)	ND(330)	ND(330)	1100	ND(330)
Pyrene	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	ND(330)	1500	ND(330)
Pesticides(mg/kg)								
4,4'DDD	ND(0.03)	ND(0.004)	0.05	ND(0.004)	ND(0.003)	ND(0.004)	ND(0.003)	ND(0.004)
4,4'DDE	ND(0.03)	ND(0.004)	0.05	ND(0.004)	ND(0.003)	ND(0.004)	ND(0.003)	ND(0.004)
4,4'DDT	ND(0.06)	ND(0.008)	0.07	ND(0.01)	ND(0.006)	ND(0.008)	ND(0.01)	ND(0.007)
TPH(mg/kg)	60	30	270	30	200	30	480	20
Other Parameters								
TVSS(mg/kg)	50000J	60000J	50000J	ND(40,000)J	ND(40,000)J	50000J	50000J	60000J
Bulk Density(g/cc)	1.48	1.15	1.62	1.15	1.35	1.11	1.98	1.03
Chemical Oxygen Demand(mg/kg)	34000	77000	85000	84000	72000	80000	55000	100000
Total Kjeldahl Nitrogen(mg/kg)	770	2000	1400	1800	800	ND(80)	ND(70)	ND(80)
Phosphorus(percent)	0.04	0.04	0.05	0.04	0.04	0.04	0.02	0.05
Total Organic Carbon(percent)	1.10	2.70	0.80	2.70	1.20	2.70	1.30	3.9
Grain Size Distribution(percent)								
Gravel	5.80	0.00	8.10	0.00	8.00	0.00	31.70	0.00
Sand	61.30	13.30	68.10	24.80	55.20	23.40	48.60	23.20
Silt	28.60	73.90	19.20	65.10	30.60	61.20	14.00	66.80
Clay	4.30	12.80	4.60	10.10	6.20	15.40	5.70	10.00

Notes:
ND - Not detected above method detection limit.
( ) - Method detection limit
J - Estimated value
There were no detections of cyanide above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-42.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of the U.S. EPA.

TABLE 6-43
Analytical Results of Disposal Parameters Sampling
Saginaw River Sediment
CERT Site, Bay City, Michigan

Sample I.D.	WDP-RC-1A	WDP-RC-1B	WDP-RC-2A	WDP-RC-2B	WDP-RC-3A	WDP-RC-3B
Parameter						
INORGANIC (mg/kg)						
Arsenic	5.2	4.4	2.8	8.3	9.3	5.5
Barium	39	46	30	5.9	35	49
Cadmium	0.21J	0.14J	0.1J	0.11J	0.07J	0.1J
Chromium	7	6	5	8	7	8
Copper	5	7	25	8	8	8
Lead	13	4	120	ND(1)	4	11
Selenium	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.8	ND(0.5)
Zinc	28J	20J	48J	27J	28J	25J
ORGANIC (ug/kg)						
Semi-Volatile Compounds (SVOCs)						
Fluoranthene	ND(330)	ND(330)	ND(820)	ND(330)	400	ND(330)
Phenenthrene	ND(330)	ND(330)	1300	ND(330)	ND(330)	ND(330)
Pyrene	ND(330)	ND(330)	1200	ND(330)	600	ND(330)
Pesticides(mg/kg)						
4,4'DDD	0.08	ND(0.004)	ND(0.03)	ND(0.004)	ND(0.03)	ND(0.04)
TPH(mg/kg)	170	40	34000	40	2200	170
Other Parameters						
TVSS(mg/kg)	60000J	40000J	60000J	50000J	50000J	50000J
Bulk Density(g/cc)	1.101	1.173	1.824	1.086	1.279	1.345
Chemical Oxygen Demand(mg/kg)	64000	36000	130000	51000	61000	46000
Total Kjeldahl Nitrogen(mg/kg)	1900	1800	750	2000	1300	1300
Phosphorus(percent)	0.05	0.05	0.05	0.05	0.03	0.06
Total Organic Carbon(percent)	1.8	1.8	3.5	1.9	1.6	2.5
Grain Size Distribution(percent)						
Gravel	16.30	0.00	49.30	0.00	8.60	10.00
Sand	58.60	8.60	30.90	22.10	28.40	53.30
Silt	20.00	69.80	16.90	54.30	50.80	29.70
Clay	5.1	21.6	2.9	23.6	12.2	7

Notes:
ND - Not detected above method detection limit.
( ) - Method detection limit
J - Estimated Value
There were no detection of cyanide above method detection limits.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-43.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of the U.S. EPA.

TABLE 6-43 (Continued)
Analytical Results of Disposal Parameters Sampling
Saginaw River Sediment
CERT Site, Bay City, Michigan

Sample I.D.	WDP-RC-4A	WDP-RC-5A	WDP-RC-5B	WDP-RC-6A	WDP-RC-6B
Parameter					
INORGANIC (mg/kg)					
Arsenic	1	1.4	6.1	4.3	6.8
Barium	15	17	18	28	46
Cadmium	0.06J	0.09J	0.14J	0.15J	0.91J
Chromium	3	3	3	5	9
Copper	10	9	ND(1)	4	7
Lead	4	8	2	4	4
Selenium	1.2	0.6	ND(0.5)	ND(0.5)	ND(0.5)
Zinc	17	26	18	27	30
ORGANIC (ug/kg)					
Semi-Volatile Compounds (SVOCs)					
Fluoranthene	ND(790)	ND(330)	ND(330)	ND(330)	ND(330)
Phenenthrene	ND(790)	ND(330)	ND(330)	ND(330)	ND(330)
Pyrene	ND(790)	520J	ND(330)	ND(330)	ND(330)
Pesticides(mg/kg)					
4,4'DDD	ND(0.03)	ND(0.004)	ND(0.03)	ND(0.04)	ND(0.03)
TPH(mg/kg)	1300	4900	30	120	30
Other Parameters					
TVSS(mg/kg)	ND(40,000)	ND(40,000)	ND(40,000)	50000	40000
Bulk Density(g/cc)	1.805	1.858	1.403	1.474	1.129
Chemical Oxygen Demand(mg/kg)	36000	63000	44000	42000	72000
Total Kjeldahl Nitrogen(mg/kg)	330	220	750	970	2100
Phosphorus(percent)	0.02	0.03	0.04	0.05	0.05
Total Organic Carbon(percent)	1.4	1.7	1.3	1.4	2.4
Grain Size Distribution(percent)					
Gravel	59.40	39.40	0.10	1.90	0.00
Sand	35.00	56.80	61.30	59.00	25.70
Silt	5.00	3.80	33.20	31.40	58.40
Clay	0.6	0	5.4	7.7	15.9

Notes:
ND - Not detected above method detection limit.
( ) - Method detection limit
J - Estimated Value
There were no detection of cyanide above method detection limits.

Page 2 of 2

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-43.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of the U.S. EPA.

TABLE 6-44
Analytical Results of Waste Characterization of River Sediments
Saginaw River Sediment
CERT Site, Bat City, Michigan

Sample I.D.:	WDP-RS-01	WDP-RS-02	WDP-RS-03	WDP-RS-04	WDP-RS-05	WDP-RS-06	WDP-RS-07	WDP-RS-08
Parameters								
INORGANIC (mg/kg)								
Total Cyanide	0.5	ND(0.3)	0.7	0.3	0.3	0.4	0.3	0.4
ORGANIC (ug/kg)								
Semi-Volatile Compounds (SVOCs)								
Dimethylphthalate	1000	ND(1000)	ND(2000)	ND(1000)	ND(2000)	ND(900)	ND(1000)	ND(1000)
Polychlorinated Biphenyl (PCBs)								
Aroclor 1248	50	ND(40)	ND(50)	ND(40)	ND(60)	40	90	ND(30)
Aroclor 1254	ND(40)	ND(40)	ND(50)	ND(40)	ND(60)	ND(30)	40	ND(30)
EP TOXICITY LEACHATE (mg/L)								
Barium	0.7	1.0	0.6	0.7	1.1	0.4	0.5	0.6
Cadmium	ND(0.002)	0.002	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
Copper	0.11	0.06	0.030	ND(0.025)	0.06	ND(0.025)	0.052	ND(0.025)
Zinc	0.20	0.58	0.40	0.33	0.13	0.20	0.21	0.27
TCLP LEACHATE (mg/L)								
Barium	0.9	1.1	0.9	1.0	1.3	0.9	0.7	0.7
Cadmium	ND(0.002)	ND(0.002)	0.002	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)	ND(0.002)
Copper	ND(0.025)	0.04	0.04	0.04	0.04	0.05	0.06	ND(0.025)
Silver	0.0006J	0.0008J	0.0006J	0.0012J	0.0008J	0.0012J	0.0012J	0.0031J
Zinc	0.46	0.30	1.3	0.61	0.23	0.43	0.34	0.26
pH	7.3	7.4	7.5	7.4	7.6	7.6	8.0	8.2

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

J - Estimated value

There were no detections of ignitability, reactive sulfide, reactive cyanide or VOCs above method detection limits.

Work Assignment No.: 55-5AED

OMI/PROJECTS/04500055.100/TAB6-44.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-45
Summary of Detected Parameters in Test Pit Samples
Saginaw Rock (Parcel 9)
CERT Site, Bay City, Michigan

Sample I.D.:	TEST PIT #4	TEST PIT #6	TEST PIT #14
Parameters			
INORGANIC (mg/kg)			
Arsenic	ND(0.1)	0.4	0.4
Barium	140J	210J	260J
Copper	5	7	9
Mercury	ND(0.1)	ND(0.1)	0.1
Silver	0.6	0.7	0.9
Zinc	ND(1)	3	2
Cyanide	2.2	1.5	2.0

Notes:

ND - Not detected at method detection limit.

( ) - Method detection limit.

J - Estimated Value.

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-45.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

TABLE 6-46
Summary of Detected Parameters in Test Pit Sample
Midland (Parcel 10)
CERT Site, Bay City, Michigan

Sample I.D.:	SURFACE #17
Parameter	
ORGANIC (mg/kg)	
Semi-Volatile Compounds (SVOCs)	
Fluoranthene	330

Work Assignment No.: 55-5AED
OMI/PROJECTS/04500055.100/TAB6-46.WK4

Document Control No.: 4500-55-ANKR

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

SECTION 7

REMEDIAL ACTION PLANS

WESTON under contract to Doshi & Associates, Inc. (Doshi), Troy, Michigan prepared RAPs for the Saginaw Rock (Parcel 9), and Midland (Parcel 10) parcels. The purpose of these RAPs was to develop remedial action objectives, evaluate applicable potential remedial technologies, and identify the most technically and economically applicable and appropriate alternative for eliminating or reducing risks to human health and the environment posed by impacted soil and/or groundwater. In developing these RAPs, WESTON utilized MDEQ cleanup criteria that was in effect on 15 August 1994 (the date U.S. EPA acquired the parcels).

The RAP for Saginaw Rock (Parcel 9) was submitted in May 1995 (Appendix T) and the RAP for Midland (Parcel 10) was submitted in August 1995 (Appendix U). Both RAPs recommended a MDNR Type C closure for the parcels including Aggregate Capping with Deed Restrictions.

WESTON was retained by the DOJ in 1996 to revise the previously prepared RAPs for the Saginaw Rock (Parcel 9) and Midland (Parcel 10) parcels to incorporate additional updated information for the sites.

The revised RAP for Saginaw Rock (Parcel 9) was submitted to the DOJ in May 1996 (Appendix V) and the revised RAP for Midland (Parcel 10) was submitted in June 1996 (Appendix W) to DOJ. Both RAPs recommended a MDNR, Type C closure for the parcels including Aggregate Capping with Deed Restrictions. Additionally, the RAP for the Midland (Parcel 10) parcel recommended an initial round of confirmation groundwater sampling with the potential for a five-year, quarterly sampling program.

This document was prepared by Roy F. Weston, Inc., expressly for U.S. EPA. It shall not be released or disclosed in whole or in part without the express, written permission of U.S. EPA.

APPENDIX D

EDR Report

The EDR Radius Map
with GeoCheck®

Fmr. Ind. Brownhoist Site
206 South Water Street
Bay City, MI 48708

Inquiry Number: 734792.1s

February 14, 2002

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-BJR

TABLE OF CONTENTS

SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	5
Orphan Summary	46
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-6
Physical Setting Source Map Findings	A-7
Physical Setting Source Records Searched	A-9

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Disclaimer
Copyright and Trademark Notice

This report contains information obtained from a variety of public and other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL EDR BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES.

Entire contents copyright 2001 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and the edr logos are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

206 SOUTH WATER STREET
BAY CITY, MI 48708

COORDINATES

Latitude (North):	43.591000 - 43' 35' 27.6"
Longitude (West):	83.893000 - 83' 53' 34.8"
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	266457.2
UTM Y (Meters):	4830299.0

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2443083-E8 BAY CITY, MI
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 5 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
FORMER INDUSTRIAL BROWNHOIST PROPERTY 206 S. WATER ST. BAY CITY, MI	BEA	N/A

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CORRACTS..... Corrective Action Report
RCRIS-TSD..... Resource Conservation and Recovery Information System
RCRIS-LQG..... Resource Conservation and Recovery Information System

STATE ASTM STANDARD

SWF/LF..... Solid Waste Facilities Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees

EXECUTIVE SUMMARY

ROD..... Records Of Decision
Delisted NPL..... National Priority List Deletions
FINDS..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST..... Aboveground Tanks

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS 1 degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the target property includes a tolerance of +/- 10 feet. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

FEDERAL ASTM STANDARD

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 10/22/2001 has revealed that there is 1 NPL site within approximately 1.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir		Map ID	Page
BAY CITY MIDDLEGROUNDS	*800 EVERGREEN DRIVE*	*1 - 2*	*SSW*	*69*	*43*

Proposed NPL: Proposed NPL sites . The source of this database is the U.S. EPA.

A review of the Proposed NPL list, as provided by EDR, and dated 10/22/2001 has revealed that there is 1 Proposed NPL site within approximately 1.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir		Map ID	Page
BAY CITY MIDDLEGROUNDS	*800 EVERGREEN DRIVE*	*1 - 2*	*SSW*	*69*	*43*

EXECUTIVE SUMMARY

STATE ASTM STANDARD

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Environmental Quality's' Contaminated Sites List on Diskette With Address.

A review of the SHWS list, as provided by EDR, has revealed that there are 11 SHWS sites within approximately 1.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
SAGINAW BAY INDUSTRIES	242 N. WATER STREET	0 - 1/8 NE	A4	6
INDUSTRIAL BROWNHOIST	112 N WATER STREET	1/8 - 1/4 SSE	C6	6
LABADIE OLDSMOBILE	***244 SAGINAW***	***1/8 - 1/4 ENE***	***B15***	***11***
MIDLAND CONTRACTING	612 S. WATER	1/4 - 1/2 SSW	L45	27
PAINTERS SUPPLY BAY CITY	406 E MIDLAND	1/2 - 1 NNW	66	42
ULTRA-CARBON	1310 MADISON AVE	1/2 - 1 NNE	O67	42
HIRSCHFIELD H SONS CO	***1414 N MADISON AVE***	***1/2 - 1 NNE***	***O68***	***42***
MORTON STREET, 209	209 MORTON STREET	1 - 2 SW	70	44
MARCAN COMPANY	800 WOODSIDE	1 - 2 NE	71	44
KUHLMAN ELECTRIC	1601 GARFIELD	1 - 2 S	72	44
MARQUETTE AVE, 480	480 MARQUETTE AVE	1 - 2 N	73	45

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environmental Quality's Leaking Underground Storage Tank (LUST) Database.

A review of the LUST list, as provided by EDR, and dated 06/01/2001 has revealed that there are 31 LUST sites within approximately 0.75 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BAY CITY INDUSTRIAL COMPLEX	112 N WATER ST	1/8 - 1/4 SSE	C8	7
G.L. LTD	***244 SAGINAW ST***	***1/8 - 1/4 ENE***	***B14***	***10***
W GERBER OTTO	***205 S WATER***	***1/8 - 1/4 SSE***	***C16***	***12***
OLD TOWN GARAGE & TIRE INC	***200 WASHINGTON AVE***	***1/8 - 1/4 E***	***E22***	***15***
FORMER GAS STATION	250 WASHINGTON	1/8 - 1/4 ENE	23	16
NORCO REALTY CO	***110 S WASHINGTON***	***1/8 - 1/4 SE***	***F24***	***17***
SAGINAW ROCK PRODUCT CO	***300 S WATER***	***1/8 - 1/4 S***	***G25***	***17***
MCCOY HEATING & COOLING	***303 S WATER***	***1/8 - 1/4 S***	***G26***	***17***
MICHIGAN AIRGAS, INC	***311 COLUMBUS AVE***	***1/8 - 1/4 ESE***	***F27***	***18***
BOSCO FOOD SERVICE INC	***407 11TH ST***	***1/4 - 1/2 E***	***28***	***18***
CLARK STORE #1464	***322 GARFIELD***	***1/4 - 1/2 SSE***	***29***	***18***
BAY COUNTY HISTORICAL SOCIETY	***321 N WASHINGTON AVE***	***1/4 - 1/2 NE***	***30***	***19***
FIRESTONE STORE #2541/006483	***416 WASHINGTON AVE***	***1/4 - 1/2 NE***	***35***	***21***
DUNLOP PONTIAC, INC	***517 WASHINGTON AVE***	***1/4 - 1/2 NE***	***I37***	***23***
FORMER AUTO SALES & SERVICE	600 SAGINAW ST	1/4 - 1/2 NNE	J39	24
TRIPLE CLEAN INC	601 GARFIELD ST	1/4 - 1/2 SSE	M48	28
SAMARITAN HEALTH CENTER	***713 NINTH ST***	***1/4 - 1/2 ENE***	***51***	***29***
GREGORY CONSTRUCTION CO	***1009 S HENRY ST***	***1/2 - 1 W***	***52***	***30***
BAY CITY DPW	***800 S WATER ST***	***1/2 - 1 SSW***	***53***	***31***
HENRY REALTY	***823 GARFIELD***	***1/2 - 1 SSE***	***54***	***32***
CREDIT UNION PLUS	1001 COLUMBUS	1/2 - 1 E	55	33
BAY CITY ELECTRIC LIGHT AND PO	***900 S WATER ST***	***1/2 - 1 SSW***	***56***	***33***

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
OLD GOODYEAR TIRE FACILITY	*520 CENTER AVE*	*1/2 - 1 NE*	*57*	*33*
HOWARD H. HERZBERGER	*1101 COLUMBUS*	*1/2 - 1 E*	*58*	*34*
BAY VALLEY OIL CO	*1309/1311 S HENRY ST*	*1/2 - 1 WSW*	*59*	*35*
KONKLES MOBIL SERVICE	*715 CENTER AVE*	*1/2 - 1 NE*	*N60*	*36*
BAY CITY MAIN	*1000 WASHINGTON*	*1/2 - 1 NNE*	*61*	*37*
AMOCO OIL CO MORGANS AUTO REPA	*800 CENTER AVE*	*1/2 - 1 NE*	*N62*	*38*
BAY COUNTY BUILDING	*911 N MADISON*	*1/2 - 1 NE*	*63*	*40*
VACANT LAND (FORMER MONARCH GA	*1000 ADAMS ST*	*1/2 - 1 NNE*	*64*	*40*
THE BRAKE SHOP	*103 THIRD ST*	*1/2 - 1 N*	*65*	*41*

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environmental Quality's Michigan UST database.

A review of the UST list, as provided by EDR, and dated 07/01/2001 has revealed that there are 18 UST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BAY AGGREGATES INC	301 N WATERS	0 - 1/8 S	2	5
G.L. LTD	*244 SAGINAW ST*	*1/8 - 1/4 ENE*	*B14*	*10*
W GERBER OTTO	*205 S WATER*	*1/8 - 1/4 SSE*	*C16*	*12*
OLD TOWN GARAGE & TIRE INC	*200 WASHINGTON AVE*	*1/8 - 1/4 E*	*E22*	*15*
NORCO REALTY CO	*110 S WASHINGTON*	*1/8 - 1/4 SE*	*F24*	*17*
SAGINAW ROCK PRODUCT CO	*300 S WATER*	*1/8 - 1/4 S*	*G25*	*17*
MCCOY HEATING & COOLING	*303 S WATER*	*1/8 - 1/4 S*	*G26*	*17*
MICHIGAN AIRGAS, INC	*311 COLUMBUS AVE*	*1/8 - 1/4 ESE*	*F27*	*18*
BOSCO FOOD SERVICE INC	*407 11TH ST*	*1/4 - 1/2 E*	*28*	*18*
CLARK STORE #1464	*322 GARFIELD*	*1/4 - 1/2 SSE*	*29*	*18*
BAY COUNTY HISTORICAL SOCIETY	*321 N WASHINGTON AVE*	*1/4 - 1/2 NE*	*30*	*19*
SEARS, ROEBUCK & CO	401 SAGINAW ST	1/4 - 1/2 NE	H31	19
FIRESTONE STORE #2541/006483	*416 WASHINGTON AVE*	*1/4 - 1/2 NE*	*35*	*21*
DUNLOP PONTIAC, INC	*517 WASHINGTON AVE*	*1/4 - 1/2 NE*	*I37*	*23*
BAY COUNTY CONFERENCE CENTER	621 N WATER	1/4 - 1/2 NNE	38	24
TRIPLE CLEAN INC	601 GARFIELD ST	1/4 - 1/2 SSE	M47	28
A.W. EURICH PLUMBING & HEATING	610 ADAMS ST	1/4 - 1/2 NE	50	29
SAMARITAN HEALTH CENTER	*713 NINTH ST*	*1/4 - 1/2 ENE*	*51*	*29*

BEA: Baseline Environmental Assessment.

A review of the BEA list, as provided by EDR, and dated 09/28/2001 has revealed that there are 5 BEA sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
INDUSTRIAL BROWNHOIST	112 N. WATER ST.	1/8 - 1/4 SSE	C10	8
Not reported	205 SOUTH WATER STREET	1/8 - 1/4 SSE	C17	13
210 COLUMBUS AVE./110 S. WASHI	210 COLUMBUS AVE.	1/8 - 1/4 SE	D20	14
600 SAGINAW ST.	600 SAGINAW ST.	1/4 - 1/2 NNE	J40	24
Not reported	613 SAGINAW ST.	1/4 - 1/2 NNE	J42	26

EXECUTIVE SUMMARY

PROPRIETARY DATABASES

Former Manufactured Gas (Coal Gas) Sites:

The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative

A review of the Coal Gas list, as provided by EDR, has revealed that there are 2 Coal Gas sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
BAY CITY GAS CO.	135 SAGINAW	1/8 - 1/4 ESE	D11	8
BAY CITY GAS CO.	401-423 N. WATER ST.	1/4 - 1/2 S	34	21

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
DORE INDUSTRIAL DEVELOPMENT INCORPORATION	FINDS, SWF/LF, RCRIS-LQG, RCRIS-TSD, UST, CORRACTS, CERC-NFRAP
SAGINAW RIVER AND SAGINAW BAY	SHWS
BAY CO. ROAD COM. - EAST DISTRIC	SHWS
UNION OIL TERMINAL	SHWS
DELTA LANDFILL	SHWS
CROTTY STREET CHANNEL	SHWS
SAGINAW AND 10TH STREETS	SHWS
THIRTEENTH AND SAGINAW STS.	SHWS
WATER ST, N 2905	SHWS
FIRST AND WATER STREETS	SHWS
PORTSMOUTH TWP DUMP	SHWS
STRAITS JP4 LOADING RACK	SHWS
SURATH SCRAP YARD	SHWS
DOW CHEM BAY REFINERY + TERMINAL	SHWS
CONSUMER POWER MNF GAS PLANT	SHWS
RIDGE ROAD, OLD PEERLESS PROP.	SHWS
BANGOR TWP SAN LDFL	SHWS, CERC-NFRAP
C AND O RAILROAD BAY CITY	SHWS
FISHER BROTHERS	SHWS
WATER STREET EAST BTWN 6TH + 7TH	SHWS
SAGINAW RIVER DRUM	CERCLIS
C & 0 RAILROAD BAY CITY	CERC-NFRAP
PORTSMOUTH TWP	SWF/LF
SPEEDWAY #3626	LUST
CITY OF BAY CITY	LUST
LAKEHEAD PIPE LINE COMPANY, INC	UST
MARATHON	UST
DORES STORE	UST
MIDOT BRIDGE M-25 OVER SAGINAW RIVER	RCRIS-SQG, FINDS
CLEVELAND TANKERS JUPITER SITE	RCRIS-SQG, FINDS
AMOCO OIL CO BAY VALLEY FOOD	RCRIS-SQG, FINDS
AMOCO OIL CO 5007	RCRIS-SQG, FINDS
SAGINAW RIVER ORPHAN DRUM	RCRIS-SQG, FINDS
CONSUMERS ENERGY - HORAK PARKING LOT	RCRIS-SQG, FINDS
240 / 248 WASHINGTON AVE.	BEA
241 & 252 AUSABLE STATE RD.	BEA
EASTERN PORTION OF 241 & 252	BEA
BLOCK 71 / 72 LOWER SAGINAW PLAT	BEA
BANKRUPTCY COURT, ADJACENT TO	BEA

OVERVIEW MAP - 734792.1s - AKT Peerless Environmental Svc

Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Coal Gasification Sites

National Priority List Sites

Landfill Sites

0 1/2 1 2 Miles

Power transmission lines

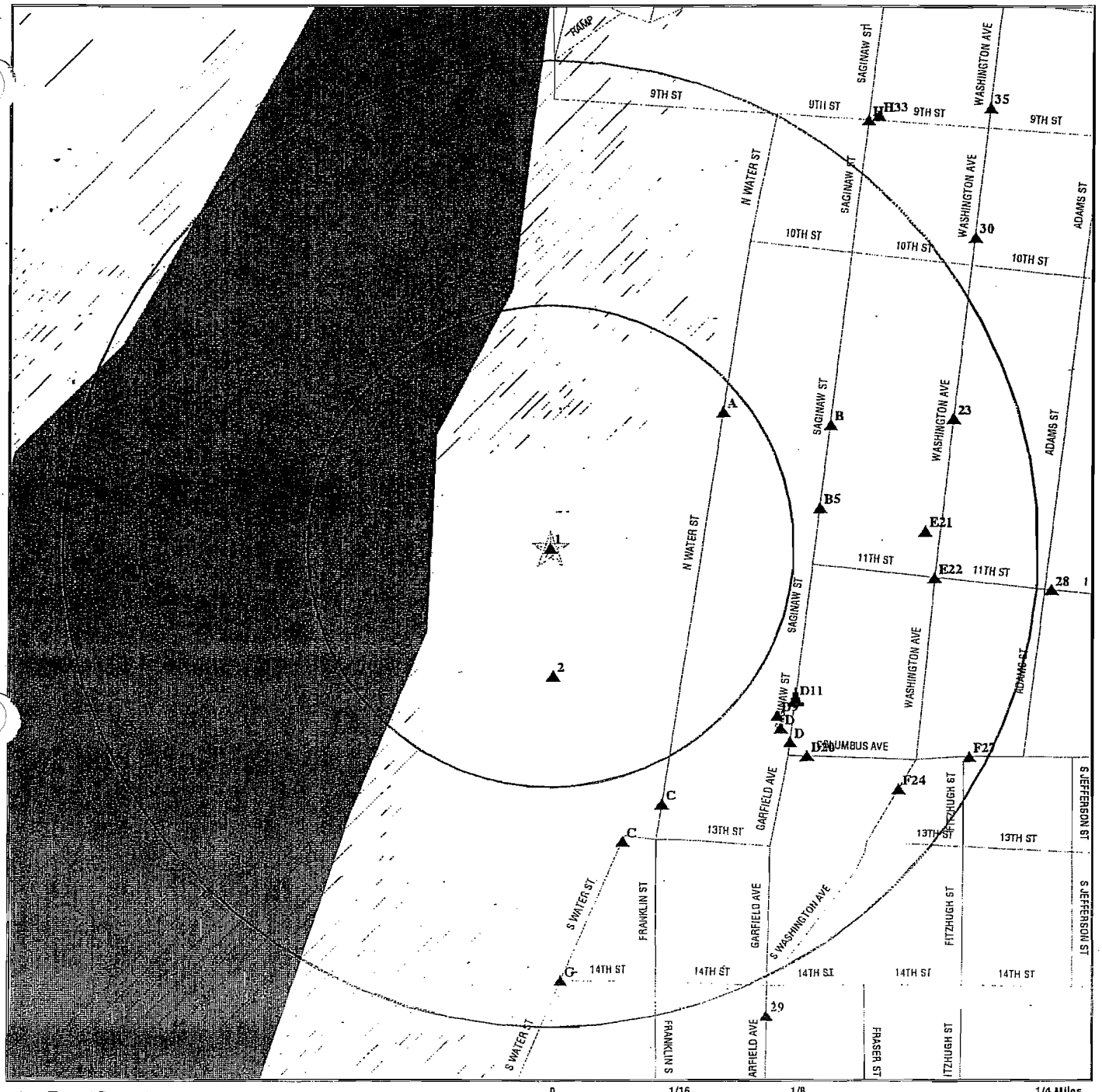
Oil & Gas pipelines

100-year flood zone

500-year flood zone

TARGET PROPERTY:	Fmr. Ind. Brownhoist Site	CUSTOMER:	AKT Peerless Environmental Svc
ADDRESS:	206 South Water Street	CONTACT:	Bev Dempsey
CITY/STATE/ZIP:	Bay City MI 48708	INQUIRY #:	734792.1s
LAT/LONG:	43.5910 / 83.8930	DATE:	February 14, 2002 1:12 pm

DETAIL MAP - 734792.1s - AKT Peerless Environmental Svc



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

TARGET PROPERTY:	Fmr. Ind. Brownhoist Site	CUSTOMER:	AKT Peerless Environmental Svc
ADDRESS:	206 South Water Street	CONTACT:	Bev Dempsey
CITY/STATE/ZIP:	Bay City MI 48708	INQUIRY #:	734792.1s
LAT/LONG:	43.5910 / 83.8930	DATE:	February 14, 2002 1:13 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.250	0	0	0	0	1	1
Proposed NPL		1.250	0	0	0	0	1	1
CERCLIS		0.750	0	0	0	0	NR	0
CERC-NFRAP		0.500	0	1	0	NR	NR	1
CORRACTS		1.250	0	0	0	0	0	0
RCRIS-TSD		0.750	0	0	0	0	NR	0
RCRIS Lg. Quan. Gen.		0.500	0	0	0	NR	NR	0
RCRIS Sm. Quan. Gen.		0.500	1	8	8	NR	NR	17
ERNS		0.250	0	1	NR	NR	NR	1
STATE ASTM STANDARD								
State Haz. Waste		1.250	1	2	1	3	4	11
State Landfill		0.750	0	0	0	0	NR	0
LUST		0.750	0	9	8	14	NR	31
UST		0.500	1	7	10	NR	NR	18
BEA	X	0.500	0	3	2	NR	NR	5
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.000	0	1	1	0	NR	2
AQUIFLOW - see EDR Physical Setting Source Addendum								

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
1 Target Property	**FORMER INDUSTRIAL BROWNHOIST PROPERTY 206 S. WATER ST. BAY CITY, MI**	**BEA**	**S104911166 N/A**

BEA:

Petition Disclosure:	0
BEA Number:	381
District:	Saginaw Bay
Date Received:	04/03/2001
Submitter Name:	Port Fisher LLC
Petition Determination:	No Request
Category:	Same Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	persona
Division Assigned:	Environmental Response Division

2 South < 1/8 354 Higher	**BAY AGGREGATES INC 301 N WATERS BAY CITY, MI 48706**	**UST**	**U003425998 N/A**

UST:

Facility ID:	0014779		
Tank ID:	1		
Owner:	BAY AGGREGATES INC	Owner Phone:	(517) 892-6191
Owner Address:	301 NORTH WATER BAY CITY, MI		
Product:	Diesel		
Capacity:	6,000		
Tank Status:	Removed from Ground		

A3 NE < 1/8 598 Higher	**GODDEYNE MFG CO 242 N WATER BAY CITY, MI 48708**	**RCRIS-SQG FINDS**	**1000188703 MID005371000**

Site 1 of 2 in cluster A

RCRIS:

Owner:	CARD L LETHERER B (312) 555-1212
Contact:	LYNN CARD (517) 892-1561
Record Date:	10/03/1980
Classification:	Small Quantity Generator
Used Oil Recyc:	No
Violation Status:	No violations found

FINDS:

Other Pertinent Environmental Activity Identified at Site:

Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)
Toxic Chemical Release Inventory System (TRIS)

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
A4 NE < 1/8 598 Higher	**SAGINAW BAY INDUSTRIES 242 N. WATER STREET BAY CITY, MI 48708**	**SHWS**	**S105143871 N/A**

Site 2 of 2 in cluster A

SHWS:

Facility ID:	09000181
Facility Status:	Active
Source:	Plating & Polishing
Pollutant(s):	Pb Cu Zn, Cd CN, PCBs
SAM Score:	41
SAM Score Date:	1994-08-19 00:00
Township:	14N
Range:	05E
Section:	28
Quarter:	N
Quarter/Quarter:	N

B5 East 1/8-1/4 739 Higher	**LABADIE OLDS CADILLAC INC 245 SAGINAW ST BAY CITY, MI 48706**	**RCRIS-SQG FINDS**	**1000145519 MID982610651**

Site 1 of 3 in cluster B

RCRIS:

Owner:	LABADIE GARY (312) 555-1212
Contact:	THOMAS SHARP (517) 893-9593
Record Date:	07/05/1988
Classification:	Small Quantity Generator
Used Oil Recyc:	No

Violation Status: No violations found

FINDS:

Other Pertinent Environmental Activity Identified at Site:
- Facility Registry System (FRS)
- Resource Conservation and Recovery Act Information system (RCRAINFO)

C6 SSE 1/8-1/4 771 Higher	INDUSTRIAL BROWNHOIST 112 N WATER STREET BAY CITY, MI 48706	SHWS	S105143863 N/A

Site 1 of 6 in cluster C

SHWS:

Facility ID:	09000045
Facility Status:	Active
Source:	Hoist Manufacturing
Pollutant(s):	Benzene Chlorobenzen, Metals PERC Xylenes, null
SAM Score:	28
SAM Score Date:	1991-09-19 00:00
Township:	14N
Range:	05E
Section:	28
Quarter:	N
Quarter/Quarter:	n

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
C7 SSE 1/8-1/4 771 Higher	**AMERICAN HOIST DERRICK CO 112 N WATER BAY CITY, MI 48708**	**RCRIS-SQG FINDS**	**1000359485 MID086744208**

Site 2 of 6 in cluster C

RCRIS:

Owner: NAME NOT REPORTED
(312) 555-1212

Contact: CHUCK HAYWARD
(517) 894-2961

Record Date: 08/11/1980
Classification: Small Quantity Generator
Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	10/19/1988
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	12/08/1988
Actual Date Achieved Compliance:	09/28/1992
Enforcement Action:	Written Informal
Enforcement Action Date:	11/14/1988
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported
Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	02/14/1990
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	04/02/1990
Actual Date Achieved Compliance:	09/28/1992
Enforcement Action:	Written Informal
Enforcement Action Date:	03/15/1990
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported

There are 2 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	09/28/1992
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	09/28/1992

FINDS:

Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

C8 SSE 1/8-1/4 771 Higher	**BAY CITY INDUSTRIAL COMPLEX 112 N WATER ST BAY CITY, MI 48708**	**LUST**	**1001713386 N/A**

Site 3 of 6 in cluster C

LUST:

Facility ID: 0-037246
Release Number: CR-210-93
Release Date: 01-11-1993

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
D12 SE 1/8-1/4 801 Higher	**PROMATEC INC 109 SAGINAW ST B BAY CITY, MI 48708**	**RCRIS-SQG FINDS**	**1000296603 MID985567544**

Site 3 of 7 in cluster D

RCRIS:

Owner: NOT AVAILABLE
(312) 555-1212

Contact: JANET HAFF
(312) 353-7923

Record Date: 03/15/1989
Classification: Conditionally Exempt Small Quantity Generator
Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	10/19/1988
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	11/30/1988
Actual Date Achieved Compliance:	09/28/1992
Enforcement Action:	Written Informal
Enforcement Action Date:	11/14/1988
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported
Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	03/25/1991
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	04/30/1991
Actual Date Achieved Compliance:	09/28/1992
Enforcement Action:	Written Informal
Enforcement Action Date:	04/17/1991
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported

There are 2 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Other Evaluation	Generator-All Requirements	09/28/1992
Compliance Schedule Evaluation (CSE)	Generator-All Requirements	09/28/1992

FINDS:

Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

D13 SE 1/8-1/4 801 Higher	**STANDARD UNIVERSAL 109 SAGINAW ST A BAY CITY, MI 48707**	**RCRIS-SQG FINDS**	**1000310452 MID985567882**

Site 4 of 7 in cluster D

OLD TOWN GARAGE & TIRE INC (Continued) **1000691458**

Owner: HAROLD H & JACQUELINE DAY Owner Phone: ( ) -
Owner Address: 530 RODEO RD
SEDONA, AZ
Product: Gasoline
Capacity: 500
Tank Status: Removed from Ground

Facility ID: 0037042
Tank ID: 6
Owner: HAROLD H & JACQUELINE DAY Owner Phone: ( ) -
Owner Address: 530 RODEO RD
SEDONA, AZ
Product: Gasoline
Capacity: 500
Tank Status: Removed from Ground

Facility ID: 0037042
Tank ID: 7
Owner: HAROLD H & JACQUELINE DAY Owner Phone: ( ) -
Owner Address: 530 RODEO RD
SEDONA, AZ
Product: Not reported
Capacity: 500
Tank Status: Removed from Ground

Facility ID: 0037042
Tank ID: 8
Owner: HAROLD H & JACQUELINE DAY Owner Phone: ( ) -
Owner Address: 530 RODEO RD
SEDONA, AZ
Product: Gasoline
Capacity: 500
Tank Status: Removed from Ground

Facility ID: 0037042
Tank ID: 9
Owner: HAROLD H & JACQUELINE DAY Owner Phone: ( ) -
Owner Address: 530 RODEO RD
SEDONA, AZ
Product: Gasoline
Capacity: 500
Tank Status: Removed from Ground

---

23 ENE 1/8-1/4 1148 Higher

FORMER GAS STATION
250 WASHINGTON
BAY CITY, MI 48708

LUST **S102353176**
N/A

LUST:
Facility ID: 5-001905
Release Number: C-629-96
Release Date: 08-08-1996
Facility Status: OPEN

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
F24 SE 1/8-1/4 1157 Higher	**NORCO REALTY CO 110 S WASHINGTON BAY CITY, MI 48706**	**LUST UST**	**U002300662 N/A**

Site 1 of 2 in cluster F

LUST:
Facility ID: 0-038507
Release Number: C-971-97
Release Date: 08-12-1997
Facility Status: CLOSED

UST:
Facility ID: 0038507
Tank ID: 1
Owner: NORCO REALTY CO
Owner Phone: (517) 753-2414
Owner Address: 2800 E HOLLAND AVE
SAGINAW, MI
Product: Used Oil
Capacity: 250
Tank Status: Removed from Ground

G25 South 1/8-1/4 1193 Higher	**SAGINAW ROCK PRODUCT CO 300 S WATER BAY CITY, MI 48706**	**LUST UST**	**U002300674 N/A**

Site 1 of 2 in cluster G

LUST:
Facility ID: 0-016564
Release Number: CR-66-93
Release Date: 01-07-1993
Facility Status: CLOSED

UST:
Facility ID: 0016564
Tank ID: 1
Owner: SAGINAW ROCK PRODUCT
Owner Phone: (517) 754-5861
Owner Address: 1701 N FIRST ST
SAGINAW, MI
Product: Diesel
Capacity: 6,000
Tank Status: Removed from Ground

G26 South 1/8-1/4 1200 Higher	**MCCOY HEATING & COOLING 303 S WATER BAY CITY, MI 48708**	**LUST UST**	**U001777365 N/A**

Site 2 of 2 in cluster G

LUST:
Facility ID: 0-037629
Release Number: C-896-99
Release Date: 08-30-1999
Facility Status: CLOSED

UST:
Facility ID: 0037629
Tank ID: 1
Owner: MCCOY HEATING & COOLING
Owner Phone: (517) 895-8569
Owner Address: 303 S WATER ST
BAY CITY, MI

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
	MCCOY HEATING & COOLING (Continued)		**U001777365**
	Product: Gasohol Capacity: 500 Tank Status: Removed from Ground		
F27 ESE 1/8-1/4 1274 Higher	**MICHIGAN AIRGAS, INC 311 COLUMBUS AVE BAY CITY, MI 48708**	**LUST UST**	**U000250009 N/A**
	Site 2 of 2 in cluster F		
	LUST: Facility ID: 0-017575 Release Number: C-2319-91 Release Date: 10-24-1991 Facility Status: CLOSED		
	UST: Facility ID: 0017575 Tank ID: 1 Owner: AIRGAS MICHIGAN Owner Address: 311 COLUMBUS AVE BAY CITY, MI Product: Gasoline Capacity: 3,000 Tank Status: Removed from Ground	Owner Phone: (517) 894-4101	
28 East 1/4-1/2 1360 Higher	**BOSCO FOOD SERVICE INC 407 11TH ST BAY CITY, MI 48708**	**LUST UST**	**U000250055 N/A**
	LUST: Facility ID: 0-021424 Release Number: C-1037-99 Release Date: 10-07-1999 Facility Status: CLOSED		
	UST: Facility ID: 0021424 Tank ID: 1 Owner: BOSCO FOOD SERV INC Owner Address: 407 11TH ST BAY CITY, MI Product: Diesel Capacity: 2,000 Tank Status: Removed from Ground	Owner Phone: (517) 892-1052	
29 SSE 1/4-1/2 1416 Higher	**CLARK STORE #1464 322 GARFIELD BAY CITY, MI 48706**	**LUST UST**	**U000250156 N/A**
	LUST: Facility ID: 0-012223 Release Number: C-491-85 Release Date: 10-21-1988 Facility Status: OPEN		

CLARK STORE #1464 (Continued) **U000250156**

Facility ID: 0-012223
Release Number: C-615-95
Release Date: 05-31-1995
Facility Status: OPEN

UST:
Facility ID: 0012223
Tank ID: 1
Owner: CLARK REFINING & MARKETING INC — Owner Phone: (630) 942-5300
Owner Address: 800 ROOSEVELT RD
GLEN ELLYN, IL
Product: Gasoline
Capacity: 10,000
Tank Status: Currently in Use

Facility ID: 0012223
Tank ID: 2
Owner: CLARK REFINING & MARKETING INC — Owner Phone: (630) 942-5300
Owner Address: 800 ROOSEVELT RD
GLEN ELLYN, IL
Product: Gasoline
Capacity: 10,000
Tank Status: Currently in Use

---

30 NE 1/4-1/2 1427 Higher

BAY COUNTY HISTORICAL SOCIETY
321 N WASHINGTON AVE
BAY CITY, MI 48708

LUST **U003082236**
UST **N/A**

LUST:
Facility ID: 0-012710
Release Number: C-414-95
Release Date: 04-13-1995
Facility Status: CLOSED

UST:
Facility ID: 0012710
Tank ID: 1
Owner: BAY COUNTY HISTORICAL SOCIETY — Owner Phone: (517) 893-5733
Owner Address: 321 WASHINGTON AVE
BAY CITY, MI
Product: Gasoline
Capacity: 275
Tank Status: Removed from Ground

H31 NE 1/4-1/2 1444 Higher

SEARS, ROEBUCK & CO
401 SAGINAW ST
BAY CITY, MI 48708

UST **U000250051**
N/A

Site 1 of 3 in cluster H

UST:
Facility ID: 0021452
Tank ID: 1
Owner: SEARS, ROEBUCK & CO — Owner Phone: (517) 892-2553
Owner Address: 401 SAGINAW ST
BAY CITY, MI

SEARS, ROEBUCK & CO (Continued) **U000250051**

Product: Not reported
Capacity: 500
Tank Status: Removed from Ground

Facility ID: 0021452
Tank ID: 2
Owner: SEARS, ROEBUCK & CO Owner Phone: (517) 892-2553
Owner Address: 401 SAGINAW ST
BAY CITY, MI
Product: Used Oil
Capacity: 1,500
Tank Status: Removed from Ground

Facility ID: 0021452
Tank ID: 3
Owner: SEARS, ROEBUCK & CO Owner Phone: (517) 892-2553
Owner Address: 401 SAGINAW ST
BAY CITY, MI
Product: Not reported
Capacity: 1,500
Tank Status: Removed from Ground

Facility ID: 0021452
Tank ID: 4
Owner: SEARS, ROEBUCK & CO Owner Phone: (517) 892-2553
Owner Address: 401 SAGINAW ST
BAY CITY, MI
Product: Not reported
Capacity: 1,500
Tank Status: Removed from Ground

H32 **HORAK CO THE** **RCRIS-SQG** **1000369197**
NE **401 SAGINAW ST** **FINDS** **MID020836441**
1/4-1/2 **BAY CITY, MI 48708**
1444
Higher **Site 2 of 3 in cluster H**

RCRIS:
Owner: FRITZ HORAK
(312) 555-1212
Contact: STEVE ROUSSE
(517) 892-6505

Record Date: 07/09/1999
Classification: Small Quantity Generator
Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated: Not reported
Area of Violation: Generator-All Requirements
Date Violation Determined: 07/14/1999
Priority of Violation: Low
Schedule Date to Achieve Compliance: 08/01/1999
Actual Date Achieved Compliance: 08/19/1999

Enforcement Action: Written Informal
Enforcement Action Date: 07/14/1999
Proposed Monetary Penalty: Not reported
Final Monetary Penalty: Not reported

HORAK CO THE (Continued) **1000369197**

There are 1 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	08/19/1999

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AIRS Facility System (AIRS/AFS)
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

H33
NE
1/4-1/2
1470
Higher

US EPA BAY CITY CERT SITE
9TH AND 18TH W SAGINAW AND WAT
BAY CITY, MI 48708

RCRIS-SQG **1000865503**
FINDS **MI0000058446**

Site 3 of 3 in cluster H

RCRIS:
Owner: U S EPA
(513) 569-7951

Contact: ANDREW AVEL
(513) 569-7951

Record Date: 02/18/1994
Classification: Not reported
Used Oil Recyc: No

Violation Status: No violations found

NY MANIFEST
Additional detail is available in NY MANIFEST. Please contact your EDR Account Executive for more information.

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Resource Conservation and Recovery Act Information system (RCRAINFO)

34
South
1/4-1/2
1566
Higher

BAY CITY GAS CO.
401-423 N. WATER ST.
BAY CITY, MI 48708

Coal Gas **G000001353**
N/A

COAL GAS SITE DESCRIPTION:
1912 Site is located on the west side of the northern extension of N. Wat er Street, south of McKinley Ave. and east of the Saginaw River. Site is north of 9th Street. Gasometers are located on the eastern side of N. Water between 9t h St. and 10th St. 1942, site owned by Consumers Power Co.

©Copyright 1993 Real Property Scan, Inc.

35
NE
1/4-1/2
1685
Higher

FIRESTONE STORE #2541/006483
416 WASHINGTON AVE
BAY CITY, MI 48706

LUST **U000250060**
UST **N/A**

FIRESTONE STORE #2541/006483 (Continued) **U000250060**

LUST:
Facility ID: 0-007419
Release Number: C-494-85
Release Date: 11-30-1988
Facility Status: CLOSED

UST:
Facility ID: 0007419
Tank ID: 1
Owner: FIRESTONE TIRE & RUBBER CO Owner Phone: (216) 379-7000
Owner Address: 1200 FIRESTONE PKWY
AKRON, OH
Product: Used Oil
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0007419
Tank ID: 2
Owner: FIRESTONE TIRE & RUBBER CO Owner Phone: (216) 379-7000
Owner Address: 1200 FIRESTONE PKWY
AKRON, OH
Product: Used Oil
Capacity: 1,000
Tank Status: Removed from Ground

I36 NE 1/4-1/2 1965 Higher | **DUNLOP PONTIAC INC**
517 W WASHINGTON
BAY CITY, MI 48706 | **RCRIS-SQG 1000290539**
FINDS MID016733776

Site 1 of 2 in cluster I

RCRIS:
Owner: BEATTLE ROBERT
(312) 555-1212

Contact: ROBT BEATTIE
(517) 895-8583

Record Date: 05/12/1986
Classification: Small Quantity Generator
Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated: Not reported
Area of Violation: Generator-All Requirements
Date Violation Determined: 10/15/1993
Priority of Violation: Low
Schedule Date to Achieve Compliance: 11/12/1993
Actual Date Achieved Compliance: 02/10/1994

Enforcement Action: Written Informal
Enforcement Action Date: 10/15/1993
Proposed Monetary Penalty: Not reported
Final Monetary Penalty: Not reported

There are 1 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	02/10/1994

DUNLOP PONTIAC INC (Continued) **1000290539**

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

I37 NE 1/4-1/2 1967 Higher | **DUNLOP PONTIAC, INC**
517 WASHINGTON AVE
BAY CITY, MI 48707 | **LUST** **U000250083**
UST **N/A**

Site 2 of 2 in cluster I

LUST:
Facility ID: 0-017828
Release Number: C-2489-91
Release Date: 11-22-1991
Facility Status: CLOSED

UST:
Facility ID: 0017828
Tank ID: 1
Owner: DUNLOP PONTIAC, INC — Owner Phone: (517) 895-8583
Owner Address: 517 WASHINGTON AVE
BAY CITY, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0017828
Tank ID: 2
Owner: DUNLOP PONTIAC, INC — Owner Phone: (517) 895-8583
Owner Address: 517 WASHINGTON AVE
BAY CITY, MI
Product: Used Oil
Capacity: 1,000
Tank Status: Closed in Ground

Facility ID: 0017828
Tank ID: 3
Owner: DUNLOP PONTIAC, INC — Owner Phone: (517) 895-8583
Owner Address: 517 WASHINGTON AVE
BAY CITY, MI
Product: HYDRAULIC FLUID
Capacity: 25
Tank Status: Currently in Use

Facility ID: 0017828
Tank ID: 4
Owner: DUNLOP PONTIAC, INC — Owner Phone: (517) 895-8583
Owner Address: 517 WASHINGTON AVE
BAY CITY, MI
Product: HYDRAULIC FLUID
Capacity: 25
Tank Status: Currently in Use

Facility ID: 0017828
Tank ID: 5
Owner: DUNLOP PONTIAC, INC — Owner Phone: (517) 895-8583
Owner Address: 517 WASHINGTON AVE
BAY CITY, MI

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	DUNLOP PONTIAC, INC (Continued)		**U000250083**

Product: HYDRAULIC FLUID
Capacity: 40
Tank Status: Removed from Ground

---

38 NNE 1/4-1/2 2069 Higher	**BAY COUNTY CONFERENCE CENTER** **621 N WATER** **BAY CITY, MI 48708**	**UST**	**U002300691** **N/A**

UST:

Facility ID: 0038769
Tank ID: 1
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8200
Owner Address: 301 WASHINGTON AVE
BAY CITY, MI
Product: UNK
Capacity: 750
Tank Status: Removed from Ground

Facility ID: 0038769
Tank ID: 2
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8200
Owner Address: 301 WASHINGTON AVE
BAY CITY, MI
Product: UNK
Capacity: 750
Tank Status: Removed from Ground

J39 NNE 1/4-1/2 2091 Higher	**FORMER AUTO SALES & SERVICE** **600 SAGINAW ST** **BAY CITY, MI 48706**	**LUST**	**S104872702** **N/A**

Site 1 of 4 in cluster J

LUST:

Facility ID: 5-002644
Release Number: C-617-00
Release Date: 05-18-2000
Facility Status: OPEN

J40 NNE 1/4-1/2 2091 Higher	**600 SAGINAW ST.** **600 SAGINAW ST.** **BAY CITY, MI**	**BEA**	**S104910952** **N/A**

Site 2 of 4 in cluster J

600 SAGINAW ST. (Continued) **S104910952**

BEA:

Petition Disclosure:	0
BEA Number:	320
District:	Saginaw Bay
Date Received:	06/23/2000
Submitter Name:	Brennan Construction Company
Petition Determination:	No Request
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	temppm
Division Assigned:	Storage Tank Division

J41 NNE 1/4-1/2 2132 Higher

CITY AUTO PARTS CO OF BAY CITY
611 SAGINAW ST
BAY CITY, MI 48708

RCRIS-SQG 1000439517
FINDS MID016733164

Site 3 of 4 in cluster J

RCRIS:

Owner: ROGERS ALBERT K
(312) 555-1212

Contact: DAVID PRUDEN
(517) 892-3581

Record Date: 06/12/1987
Classification: Small Quantity Generator
Used Oil Recyc: No

Violation Status: Violations exist

Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	04/13/1989
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	05/22/1989
Actual Date Achieved Compliance:	04/27/1990
Enforcement Action:	Written Informal
Enforcement Action Date:	05/16/1989
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported
Regulation Violated:	Not reported
Area of Violation:	Generator-All Requirements
Date Violation Determined:	03/21/1990
Priority of Violation:	Low
Schedule Date to Achieve Compliance:	05/01/1990
Actual Date Achieved Compliance:	04/27/1990
Enforcement Action:	Written Informal
Enforcement Action Date:	04/17/1990
Proposed Monetary Penalty:	Not reported
Final Monetary Penalty:	Not reported

There are 2 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Schedule Evaluation (CSE)	Generator-All Requirements	04/27/1990
Compliance Evaluation Inspection (CEI)	Generator-All Requirements	04/27/1990

CITY AUTO PARTS CO OF BAY CITY (Continued) **1000439517**

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

J42
NNE
1/4-1/2
2140
Higher

613 SAGINAW ST.
BAY CITY, MI

Site 4 of 4 in cluster J

BEA **S105094699**
N/A

BEA:

Petition Disclosure:	0
BEA Number:	418
District:	Saginaw Bay
Date Received:	08/23/2001
Submitter Name:	Great Lakes Center Foundation
Petition Determination:	No Request
Category:	No Hazardous Substance(s)
Determination 20107A:	No Request
Reviewer:	persona
Division Assigned:	Environmental Response Division

43
NE
1/4-1/2
2222
Higher

SHERWIN WILLIAMS CO
601 WASHINGTON AVE
BAY CITY, MI 48706

RCRIS-SQG **1000371236**
FINDS **MID020837191**

RCRIS:

Owner:	SHERWIN WILLIAMS CO (216) 566-2000
Contact:	D ALEXANDER (216) 566-3096
Record Date:	08/18/1980
Classification:	Not reported
Used Oil Recyc:	No

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

K44
North
1/4-1/2
2292
Higher

RESEARCH VESSEL HYDRA
24 SIXTH ST B
BAY CITY, MI 48708

Site 1 of 2 in cluster K

RCRIS-SQG 1000531239
FINDS MI1680090320

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	RESEARCH VESSEL HYDRA (Continued)		**1000531239**

RCRIS:
Owner: US EPA
(312) 353-1373
Contact: DAVID ROCKWELL
(312) 353-1373
Record Date: 04/22/1991
Classification: Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

L45 SSW 1/4-1/2 2348 Higher	**MIDLAND CONTRACTING** **612 S. WATER** **BAY CITY, MI 48708**	**SHWS**	**S105143873** **N/A**

Site 1 of 2 in cluster L

SHWS:
Facility ID: 09000218
Facility Status: Active
Source: null
Pollutant(s): Benzene, Pb, PCBs
SAM Score: 38
SAM Score Date: 1994-08-19 00:00
Township: 14N
Range: 05E
Section: 21
Quarter: S
Quarter/Quarter: N

L46 SSW 1/4-1/2 2348 Higher	**MIDLAND CONTRACTING** **613 S WATER ST** **BAY CITY, MI 48708**	**RCRIS-SQG** **FINDS**	**1000277005** **MID981803299**

Site 2 of 2 in cluster L

RCRIS:
Owner: MIDLAND CONTRACTING
(312) 555-1212
Contact: TERRY BURGER
(517) 893-6261
Record Date: 02/12/1987
Classification: Small Quantity Generator

TRIPLE CLEAN INC (Continued) **S104872698**

LUST:
Facility ID: 0-017298
Release Number: C-453-00
Release Date: 05-17-2000
Facility Status: OPEN

K49
North
1/4-1/2
2389
Higher

R V LAKE GUARDIAN **RCRIS-SQG** **1000531284**
24 SIXTH ST **FINDS** **MI6680090317**
BAY CITY, MI 48708

Site 2 of 2 in cluster K

RCRIS:
Owner: U S EPA
Contact: DAVID ROCKWELL
(312) 353-1373
Record Date: 04/03/1991
Classification: Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

50
NE
1/4-1/2
2422
Higher

A.W. EURICH PLUMBING & HEATING C **UST** **U000250093**
610 ADAMS ST **N/A**
BAY CITY, MI 48708

UST:
Facility ID: 0013200
Tank ID: 1
Owner: SAGINAW BAY UNDERWRITERS Owner Phone: (517) 894-2716
Owner Address: 610 ADAMS ST
BAY CITY, MI
Product: Gasoline
Capacity: 500
Tank Status: Removed from Ground

51
ENE
1/4-1/2
2568
Higher

SAMARITAN HEALTH CENTER **LUST** **U003082586**
713 NINTH ST **UST** **N/A**
BAY CITY, MI 48708

LUST:
Facility ID: 0-018846
Release Number: C-0580-91
Release Date: 04-16-1991
Facility Status: CLOSED

UST:
Facility ID: 0018846

SAMARITAN HEALTH CENTER (Continued) **U003082586**

Tank ID: 1
Owner: BAY MEDICAL CTR Owner Phone: (517) 894-3760
Owner Address: 1900 COLUMBUS AVE
BAY CITY, MI
Product: #2 HEATING FUEL
Capacity: 10,000
Tank Status: Currently in Use

Facility ID: 0018846
Tank ID: 2
Owner: BAY MEDICAL CTR Owner Phone: (517) 894-3760
Owner Address: 1900 COLUMBUS AVE
BAY CITY, MI
Product: Diesel
Capacity: 500
Tank Status: Removed from Ground

---

52 West 1/2-1 2669 Higher | **GREGORY CONSTRUCTION CO**
1009 S HENRY ST
BAY CITY, MI 48706 | **LUST U003082222**
UST N/A

LUST:
Facility ID: 0-012443
Release Number: C-307-00
Release Date: 03-21-2000
Facility Status: OPEN

UST:
Facility ID: 0012443
Tank ID: 1
Owner: GREGORY CONST CO Owner Phone: (517) 892-4553
Owner Address: 1009 S HENRY ST
BAY CITY, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0012443
Tank ID: 2
Owner: GREGORY CONST CO Owner Phone: (517) 892-4553
Owner Address: 1009 S HENRY ST
BAY CITY, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0012443
Tank ID: 3
Owner: GREGORY CONST CO Owner Phone: (517) 892-4553
Owner Address: 1009 S HENRY ST
BAY CITY, MI
Product: Gasoline
Capacity: 1,500
Tank Status: Removed from Ground

Facility ID: 0012443
Tank ID: 4

GREGORY CONSTRUCTION CO (Continued) **U003082222**

Owner: GREGORY CONST CO — Owner Phone: (517) 892-4553
Owner Address: 1009 S HENRY ST
BAY CITY, MI
Product: Gasoline
Capacity: 1,500
Tank Status: Removed from Ground

Facility ID: 0012443
Tank ID: 5
Owner: GREGORY CONST CO — Owner Phone: (517) 892-4553
Owner Address: 1009 S HENRY ST
BAY CITY, MI
Product: Diesel
Capacity: 1,500
Tank Status: Removed from Ground

---

53 SSW 1/2-1 2921 Higher

BAY CITY DPW
800 S WATER ST
BAY CITY, MI 48708

LUST U003082220
UST N/A

LUST:
Facility ID: 0-012417
Release Number: C-0983-89
Release Date: 11-30-1989
Facility Status: OPEN

Facility ID: 0-012417
Release Number: C-894-97
Release Date: 09-24-1997
Facility Status: OPEN

UST:
Facility ID: 0012417
Tank ID: 1
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8319
Owner Address: 301 WASHINGTON
BAY CITY, MI
Product: Gasoline
Capacity: 10,000
Tank Status: Removed from Ground

Facility ID: 0012417
Tank ID: 2
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8319
Owner Address: 301 WASHINGTON
BAY CITY, MI
Product: Gasoline
Capacity: 10,000
Tank Status: Removed from Ground

Facility ID: 0012417
Tank ID: 3
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8319
Owner Address: 301 WASHINGTON
BAY CITY, MI
Product: Diesel
Capacity: 12,000

BAY CITY DPW (Continued) **U003082220**

Tank Status: Removed from Ground

Facility ID: 0012417
Tank ID: 4
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8319
Owner Address: 301 WASHINGTON
BAY CITY, MI
Product: Diesel
Capacity: 10,000
Tank Status: Currently in Use

Facility ID: 0012417
Tank ID: 5
Owner: CITY OF BAY CITY — Owner Phone: (517) 894-8319
Owner Address: 301 WASHINGTON
BAY CITY, MI
Product: Gasoline
Capacity: 10,000
Tank Status: Currently in Use

54
SSE
1/2-1
2973
Higher

HENRY REALTY
823 GARFIELD
BAY CITY, MI 48706

LUST **U000250131**
UST **N/A**

LUST:
Facility ID: 0-002764
Release Number: C-142-00
Release Date: 02-09-2000
Facility Status: OPEN

UST:
Facility ID: 0002764
Tank ID: 1
Owner: HENRY REALTY — Owner Phone: (212) 682-1170
Owner Address: 256 FIFTH AVE
NEW YORK, NY
Product: Not reported
Capacity: UNK
Tank Status: Removed from Ground

Facility ID: 0002764
Tank ID: 2
Owner: HENRY REALTY — Owner Phone: (212) 682-1170
Owner Address: 256 FIFTH AVE
NEW YORK, NY
Product: Not reported
Capacity: UNK
Tank Status: Removed from Ground

Facility ID: 0002764
Tank ID: 3
Owner: HENRY REALTY — Owner Phone: (212) 682-1170
Owner Address: 256 FIFTH AVE
NEW YORK, NY
Product: Not reported
Capacity: UNK
Tank Status: Removed from Ground

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
55 East 1/2-1 3057 Higher	**CREDIT UNION PLUS 1001 COLUMBUS BAY CITY, MI 48708**	**LUST**	**S104235404 N/A**

LUST:
Facility ID: 0-040193
Release Number: C-888-99
Release Date: 08-23-1999
Facility Status: OPEN

---

56 SSW 1/2-1 3195 Higher	**BAY CITY ELECTRIC LIGHT AND POWER 900 S WATER ST BAY CITY, MI 48708**	**PADS RCRIS-SQG FINDS LUST**	**1000526674 MID044512465 -**

RCRIS:
Owner: BAY CITY CITY OF
(517) 894-8246

Contact: LARRY SCHULZ
(517) 894-8356

Record Date: 01/26/1998
Classification: Small Quantity Generator
Used Oil Recyc: No

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
AIRS Facility System (AIRS/AFS)
Facility Registry System (FRS)
National Compliance Database (NCDB)
PCB Handler Activity Data System (PADS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

LUST:
Facility ID: 5-001492
Release Number: C-490-85
Release Date: 12-06-1988
Facility Status: OPEN

---

57 NE 1/2-1 3222 Higher	**OLD GOODYEAR TIRE FACILITY 520 CENTER AVE BAY CITY, MI 48708**	**LUST UST**	**U002300686 N/A**

LUST:
Facility ID: 0-038699
Release Number: C-740-95
Release Date: 06-19-1995
Facility Status: CLOSED

UST:
Facility ID: 0038699
Tank ID: 1
Owner: FIRST OF AMERICA
Owner Phone: (517) 893-5533
Owner Address: 300 CENTER AVE

BAY VALLEY OIL CO (Continued) **U003103067**

Tank ID: 2
Owner: BAY VALLEY OIL CO — Owner Phone: (517) 667-0741
Owner Address: 700 MARQUETTE
BAY CITY, MI
Product: Not reported
Capacity: 25,000
Tank Status: Removed from Ground

Facility ID: 0017937
Tank ID: 3
Owner: BAY VALLEY OIL CO — Owner Phone: (517) 667-0741
Owner Address: 700 MARQUETTE
BAY CITY, MI
Product: Not reported
Capacity: 20,000
Tank Status: Removed from Ground

Facility ID: 0017937
Tank ID: 4
Owner: BAY VALLEY OIL CO — Owner Phone: (517) 667-0741
Owner Address: 700 MARQUETTE
BAY CITY, MI
Product: Not reported
Capacity: 20,000
Tank Status: Removed from Ground

Facility ID: 0017937
Tank ID: 5
Owner: BAY VALLEY OIL CO — Owner Phone: (517) 667-0741
Owner Address: 700 MARQUETTE
BAY CITY, MI
Product: Not reported
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0017937
Tank ID: 6
Owner: BAY VALLEY OIL CO — Owner Phone: (517) 667-0741
Owner Address: 700 MARQUETTE
BAY CITY, MI
Product: UNK
Capacity: 500
Tank Status: Removed from Ground

N60 NE 1/2-1 3564 Higher

KONKLES MOBIL SERVICE — LUST U000250107
715 CENTER AVE — UST N/A
BAY CITY, MI 48708

Site 1 of 2 in cluster N

LUST:
Facility ID: 0-019470
Release Number: C-1363-99
Release Date: 12-21-1999
Facility Status: OPEN

UST:
Facility ID: 0019470
Tank ID: 1

KONKLES MOBIL SERVICE (Continued) **U000250107**

Owner: KONKLES MOBIL SERV Owner Phone: (517) 894-0044
Owner Address: 715 CENTER AVE
BAY CITY, MI
Product: Gasoline
Capacity: 4,000
Tank Status: Removed from Ground

Facility ID: 0019470
Tank ID: 2
Owner: KONKLES MOBIL SERV Owner Phone: (517) 894-0044
Owner Address: 715 CENTER AVE
BAY CITY, MI
Product: Gasoline
Capacity: 4,000
Tank Status: Removed from Ground

Facility ID: 0019470
Tank ID: 3
Owner: KONKLES MOBIL SERV Owner Phone: (517) 894-0044
Owner Address: 715 CENTER AVE
BAY CITY, MI
Product: Gasoline
Capacity: 4,000
Tank Status: Removed from Ground

Facility ID: 0019470
Tank ID: 4
Owner: KONKLES MOBIL SERV Owner Phone: (517) 894-0044
Owner Address: 715 CENTER AVE
BAY CITY, MI
Product: Gasoline
Capacity: 4,000
Tank Status: Removed from Ground

Facility ID: 0019470
Tank ID: 5
Owner: KONKLES MOBIL SERV Owner Phone: (517) 894-0044
Owner Address: 715 CENTER AVE
BAY CITY, MI
Product: Used Oil
Capacity: 500
Tank Status: Removed from Ground

---

61 NNE 1/2-1 3658 Higher | **BAY CITY MAIN**
1000 WASHINGTON
BAY CITY, MI 48707 | **LUST** **U003330610**
UST **N/A**

LUST:
Facility ID: 0-014426
Release Number: C-0332-90
Release Date: 04-16-1990
Facility Status: CLOSED

Facility ID: 0-014426
Release Number: C-410-97
Release Date: 06-12-1997
Facility Status: CLOSED

BAY CITY MAIN (Continued) **U003330610**

UST:

Facility ID:	0014426		
Tank ID:	1		
Owner:	US POSTAL SERV	Owner Phone:	(616) 776-6133
Owner Address:	678 FRONT AVE NW GRAND RAPIDS, MI		
Product:	Gasoline		
Capacity:	6,000		
Tank Status:	Removed from Ground		

Facility ID:	0014426		
Tank ID:	2		
Owner:	US POSTAL SERV	Owner Phone:	(616) 776-6133
Owner Address:	678 FRONT AVE NW GRAND RAPIDS, MI		
Product:	Gasoline		
Capacity:	10,000		
Tank Status:	Removed from Ground		

N62 NE 1/2-1 3723 Higher — **AMOCO OIL CO MORGANS AUTO REPAIR**, **800 CENTER AVE**, **BAY CITY, MI 48708** — **RCRIS-SQG, FINDS, LUST, UST** — **1000529194** / **MID985616275**

Site 2 of 2 in cluster N

RCRIS:

Owner:	MD VENTURES INC (517) 895-8199
Contact:	DIANA DALTON (517) 895-8199
Record Date:	06/07/1991
Classification:	Small Quantity Generator
Used Oil Recyc:	No
Violation Status:	No violations found

FINDS:

Other Pertinent Environmental Activity Identified at Site:
- Facility Registry System (FRS)
- Resource Conservation and Recovery Act Information system (RCRAINFO)

LUST:

Facility ID:	0-010698
Release Number:	C-590-96
Release Date:	08-26-1996
Facility Status:	CLOSED

Facility ID:	0-010698
Release Number:	C-258-01
Release Date:	04-25-2001
Facility Status:	OPEN

UST:

Facility ID:	0010698		
Tank ID:	1		
Owner:	MD VENTURES INC	Owner Phone:	(517) 892-0567
Owner Address:	800 CENTER AVE BAY CITY, MI		

AMOCO OIL CO MORGANS AUTO REPAIR (Continued) **1000529194**

Facility ID: 0010698
Tank ID: 5
Owner: MD VENTURES INC — Owner Phone: (517) 892-0567
Owner Address: 800 CENTER AVE
BAY CITY, MI
Product: Used Oil
Capacity: 550
Tank Status: Removed from Ground

---

63 NE 1/2-1 3724 Higher

BAY COUNTY BUILDING — **LUST** **U003330753**
911 N MADISON — **UST** **N/A**
BAY CITY, MI 48708

LUST:
Facility ID: 0-039446
Release Number: C-631-97
Release Date: 07-30-1997
Facility Status: CLOSED

UST:
Facility ID: 0039446
Tank ID: 1
Owner: BAY COUNTY BLDG & GROUNDS — Owner Phone: (517) 895-4097
Owner Address: 1212 WASHINGTON AVE
BAY CITY, MI
Product: Gasoline
Capacity: 1,500
Tank Status: Removed from Ground

---

64 NNE 1/2-1 3754 Higher

VACANT LAND (FORMER MONARCH GAS) — **LUST** **U002300658**
1000 ADAMS ST — **UST** **N/A**
BAY CITY, MI 48708

LUST:
Facility ID: 0-038258
Release Number: C-954-94
Release Date: 08-30-1994
Facility Status: CLOSED

UST:
Facility ID: 0038258
Tank ID: 1
Owner: BAY METRO TRANSIT AUTHORITY — Owner Phone: (517) 894-2900
Owner Address: 1510 N JOHNSON ST
BAY CITY, MI
Product: Gasoline
Capacity: 15,000
Tank Status: Removed from Ground

Facility ID: 0038258
Tank ID: 2
Owner: BAY METRO TRANSIT AUTHORITY — Owner Phone: (517) 894-2900
Owner Address: 1510 N JOHNSON ST
BAY CITY, MI

VACANT LAND (FORMER MONARCH GAS) (Continued) **U002300658**

Product: Gasoline
Capacity: 15,000
Tank Status: Removed from Ground

Facility ID: 0038258
Tank ID: 3
Owner: BAY METRO TRANSIT AUTHORITY Owner Phone: (517) 894-2900
Owner Address: 1510 N JOHNSON ST
BAY CITY, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0038258
Tank ID: 4
Owner: BAY METRO TRANSIT AUTHORITY Owner Phone: (517) 894-2900
Owner Address: 1510 N JOHNSON ST
BAY CITY, MI
Product: Gasoline
Capacity: 2,000
Tank Status: Removed from Ground

---

65 North 1/2-1 3836 Higher | **THE BRAKE SHOP**
103 THIRD ST
BAY CITY, MI 48708 | **LUST UST** | **U003082973 N/A**

LUST:
Facility ID: 0-037910
Release Number: C-1112-95
Release Date: 10-11-1995
Facility Status: CLOSED

UST:
Facility ID: 0037910
Tank ID: 1
Owner: MILITELLO PER FORMANCE INC Owner Phone: (517) 686-2081
Owner Address: 2340 E CHIP
KAWKAWLIN, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0037910
Tank ID: 2
Owner: MILITELLO PER FORMANCE INC Owner Phone: (517) 686-2081
Owner Address: 2340 E CHIP
KAWKAWLIN, MI
Product: Gasoline
Capacity: 1,000
Tank Status: Removed from Ground

Facility ID: 0037910
Tank ID: 3
Owner: MILITELLO PER FORMANCE INC Owner Phone: (517) 686-2081
Owner Address: 2340 E CHIP
KAWKAWLIN, MI
Product: Gasoline

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	THE BRAKE SHOP (Continued)		**U003082973**
	Capacity: 1,000 Tank Status: Removed from Ground		
66 **NNW** **1/2-1** **4701** **Higher**	**PAINTERS SUPPLY BAY CITY** **406 E MIDLAND** **BAY CITY, MI 48706**	**SHWS**	**S105143862** **N/A**
	SHWS: Facility ID: 09000044 Facility Status: No Action Taken Source: Paint Products Pollutant(s): Paint Waste, null, null SAM Score: 19 SAM Score Date: 1991-10-19 00:00 Township: 14N Range: 05E Section: 20 Quarter: N Quarter/Quarter: S		
O67 **NNE** **1/2-1** **5008** **Higher**	**ULTRA-CARBON** **1310 MADISON AVE** **BAY CITY, MI 48708** **Site 1 of 2 in cluster O**	**SHWS**	**S105143881** **N/A**
	SHWS: Facility ID: 09000267 Facility Status: No Action Taken Source: Misc Manufacturing Industries Pollutant(s): PCB, null, null SAM Score: 28 SAM Score Date: 1998-04-10 00:00 Township: 14N Range: 05E Section: 21 Quarter: N Quarter/Quarter: n		
O68 **NNE** **1/2-1** **5203** **Higher**	**HIRSCHFIELD H SONS CO** **1414 N MADISON AVE** **BAY CITY, MI 48706** **Site 2 of 2 in cluster O**	**RCRIS-SQG** **SHWS** **FINDS**	**1000451824** **MID006957138**

HIRSCHFIELD H SONS CO (Continued) **1000451824**

RCRIS:
Owner: HIRSCHFIELD ROBERT
Contact: TIMOTHY NEAL
(517) 895-5571
Record Date: 08/15/1990
Classification: Small Quantity Generator
Used Oil Recyc: No
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Facility Registry System (FRS)
Permit Compliance System (PCS)
Resource Conservation and Recovery Act Information system (RCRAINFO)

SHWS:
Facility ID: 09000016
Facility Status: Active
Source: Scrap & Waste Materials
Pollutant(s): PCBs Oils, null, null
SAM Score: 25
SAM Score Date: 1990-09-27 00:00
Township: 14N
Range: 05E
Section: 21
Quarter: N
Quarter/Quarter: N

---

69 SSW > 1 5489 Higher

BAY CITY MIDDLEGROUNDS
800 EVERGREEN DRIVE
BAY CITY, MI 48706

PADS 1000107052
CERCLIS MID981092935
FINDS
NPL
Proposed NPL

CERCLIS Classification Data:
Site Incident Category: Not reported
Federal Facility: Not a Federal Facility
Non NPL Status: Not reported
Ownership Status: Other
NPL Status: Proposed for NPL
Contact: JOHN FAGIOLO
Contact Tel: (312) 886-0800
Contact Title: Not reported
Contact: LAWRENCE SCHMITT
Contact Tel: (312) 353-6565
Contact Title: Not reported

CERCLIS Assessment History:

Assessment:	DISCOVERY	Completed:	07/24/1985
Assessment:	PRELIMINARY ASSESSMENT	Completed:	07/24/1985
Assessment:	SITE INSPECTION	Completed:	09/09/1986
Assessment:	EXPANDED SITE INSPECTION	Completed:	10/02/1992
Assessment:	HRS PACKAGE	Completed:	02/13/1995
Assessment:	PROPOSAL TO NPL	Completed:	02/13/1995

CERCLIS Site Status:
Not reported

CERCLIS Alias Name(s):
BAY CITY MIDDLEGROUNDS

NPL PROPOSED:
EPA ID: MID981092935
Region: 05

BAY CITY MIDDLEGROUNDS (Continued) **1000107052**

Federal: General
Proposed Date: 02/13/1995

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Comperhensive Environmental Response, Compensation and Liability Information System (CERCLIS)
PCB Handler Activity Data System (PADS)

---

70 SW > 1 5541 Higher | **MORTON STREET, 209** | **SHWS** | **S105143874**
209 MORTON STREET | **N/A**
BAY CITY, MI 48706

SHWS:
Facility ID: 09000227
Facility Status: Active
Source: Metal Stamping
Pollutant(s): Tetrachloroethene, Trichloroehene, null
SAM Score: 26
SAM Score Date: 1996-01-11 00:00
Township: 14N
Range: 05E
Section: 32
Quarter: N
Quarter/Quarter: N

---

71 NE > 1 5625 Higher | **MARCAN COMPANY** | **SHWS** | **S103094821**
800 WOODSIDE | **N/A**
BAY CITY, MI 48706

SHWS:
Facility ID: 09000038
Facility Status: Closed.
Source: Unknown
Pollutant(s): Lead Arsenic, null, null
SAM Score: null
SAM Score Date: 1991-09-11 00:00
Township: 14N
Range: 05E
Section: 22
Quarter: N
Quarter/Quarter: S

---

72 South > 1 5702 Higher | **KUHLMAN ELECTRIC** | **SHWS** | **S105143872**
1601 GARFIELD | **N/A**
BAY CITY, MI 48706

SHWS:
Facility ID: 09000184
Facility Status: Active
Source: Transformers
Pollutant(s): PCB DDT, DDE, null
SAM Score: 45

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number
	KUHLMAN ELECTRIC (Continued)		**S105143872**
	SAM Score Date: 1994-08-23 00:00 Township: 14N Range: 05E Section: 33 Quarter: N Quarter/Quarter: S		
73 North > 1 6343 Higher	**MARQUETTE AVE, 480 480 MARQUETTE AVE BAY CITY, MI 48706**	**SHWS**	**S105143880 N/A**

SHWS:

Facility ID:	09000264
Facility Status:	No Action Taken
Source:	Unknown
Pollutant(s):	PNAs, null, null
SAM Score:	31
SAM Score Date:	1997-09-11 00:00
Township:	14N
Range:	05E
Section:	21
Quarter:	N
Quarter/Quarter:	N

Date of Government Version: 11/21/01
Date Made Active at EDR: 02/04/02
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/26/01
Elapsed ASTM days: 40
Date of Last EDR Contact: 12/16/01

CORRACTS: Corrective Action Report
Source: ERA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 11/14/01
Date Made Active at EDR: 01/14/02
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 11/14/01
Elapsed ASTM days: 61
Date of Last EDR Contact: 11/14/01

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 06/21/00
Date Made Active at EDR: 07/31/00
Database Release Frequency: Varies
Date of Data Arrival at EDR: 07/10/00
Elapsed ASTM days: 21
Date of Last EDR Contact: 01/14/02

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 08/08/00
Date Made Active at EDR: 09/06/00
Database Release Frequency: Varies
Date of Data Arrival at EDR: 08/11/00
Elapsed ASTM days: 26
Date of Last EDR Contact: 02/01/02

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/99
Database Release Frequency: Biennially
Date of Last EDR Contact: 12/17/01
Date of Next Scheduled EDR Contact: 03/18/02

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies
Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

ROD: Records Of Decision
Source: NTIS
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/30/00
Database Release Frequency: Annually
Date of Last EDR Contact: 01/07/02
Date of Next Scheduled EDR Contact: 04/08/02

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 11/13/01
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/04/02
Date of Next Scheduled EDR Contact: 05/06/02

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 10/29/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/07/02
Date of Next Scheduled EDR Contact: 04/08/02

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4526
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 05/31/01
Database Release Frequency: Annually
Date of Last EDR Contact: 01/21/02
Date of Next Scheduled EDR Contact: 04/22/02

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/25/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/07/02
Date of Next Scheduled EDR Contact: 04/08/02

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 12/14/01
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/02/02
Date of Next Scheduled EDR Contact: 04/01/02

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 11/19/01
Date of Next Scheduled EDR Contact: 02/18/02

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3936
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 09/30/01
Database Release Frequency: Annually
Date of Last EDR Contact: 11/13/01
Date of Next Scheduled EDR Contact: 02/12/02

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 12/11/01
Date of Next Scheduled EDR Contact: 03/11/02

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/99
Database Release Frequency: Annually
Date of Last EDR Contact: 12/26/01
Date of Next Scheduled EDR Contact: 03/25/02

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98
Database Release Frequency: Every 4 Years
Date of Last EDR Contact: 01/22/02
Date of Next Scheduled EDR Contact: 04/22/02

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 10/25/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/26/01
Date of Next Scheduled EDR Contact: 03/25/02

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 10/25/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/26/01
Date of Next Scheduled EDR Contact: 03/25/02

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STATE OF MICHIGAN ASTM STANDARD RECORDS

SHWS: Contaminated Sites
Source: Department of Environmental Quality
Telephone: 517-373-9541
State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 11/26/01
Date Made Active at EDR: 12/21/01
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 11/27/01
Elapsed ASTM days: 24
Date of Last EDR Contact: 11/27/01

SWF/LF: Solid Waste Facilities Database
Source: Department of Environmental Quality
Telephone: 517-335-4035
Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 07/31/01
Date Made Active at EDR: 09/05/01
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 08/13/01
Elapsed ASTM days: 23
Date of Last EDR Contact: 01/29/02

LUST: Leaking Underground Storage Tank Sites
Source: Department of Environmental Quality
Telephone: 517-373-8168
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 06/01/01
Date Made Active at EDR: 07/16/01
Database Release Frequency: Annually
Date of Data Arrival at EDR: 06/18/01
Elapsed ASTM days: 28
Date of Last EDR Contact: 12/21/01

UST: Underground Storage Tank Facility List
Source: Department of Environmental Quality
Telephone: 517-373-8168
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 07/01/01
Date Made Active at EDR: 09/07/01
Database Release Frequency: Annually
Date of Data Arrival at EDR: 08/16/01
Elapsed ASTM days: 22
Date of Last EDR Contact: 12/21/01

BEA: BASELINE ENVIRONMENTAL ASSESSMENT DATABASE
Source: DEPT. OF ENVIRONMENTAL QUALITY
Telephone: 517-373-9541

Date of Government Version: 09/28/01
Date Made Active at EDR: 10/18/01
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 09/28/01
Elapsed ASTM days: 20
Date of Last EDR Contact: 12/18/01

STATE OF MICHIGAN ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Tanks
Source: Department of Environmental Quality
Telephone: 517-373-8168
Registered Aboveground Storage Tanks.

GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

FMR. IND. BROWNHOIST SITE
206 SOUTH WATER STREET
BAY CITY, MI 48708

TARGET PROPERTY COORDINATES

Latitude (North):	43.591000 - 43' 35' 27.6"
Longitude (West):	83.892998 - 83' 53' 34.8"
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	266457.2
UTM Y (Meters):	4830299.0

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

USGS TOPOGRAPHIC MAP ASSOCIATED WITH THIS SITE

Target Property: 2443083-E8 BAY CITY, MI
Source: USGS 7.5 min quad index

GENERAL TOPOGRAPHIC GRADIENT AT TARGET PROPERTY

Target Property: General WNW

Source: General Topographic Gradient has been determined from the USGS 1 Degree Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
BAY, MI	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 26017C0175D / CWPP

Additional Panels in search area: 26017C0180D / CWPP
26017C0205D / CWPP

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
BAY CITY	Not Available

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Site-Specific Hydrogeological Data:*
Search Radius: 2.0 miles
Status: Not found

AQUIFLOW®

Search Radius: 2.000 Miles.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era: Paleozoic
System: Pennsylvanian
Series: Atokan and Morrowan Series
Code: PP1 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

* ©1998 Site-specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Component Name: TAPPAN

Soil Surface Texture: loam

Hydrologic Group: Class B/D - Drained/undrained hydrology class of soils that can be drained and are classified.

Soil Drainage Class: Poorly. Soils may have a saturated zone, a layer of low hydraulic conductivity, or seepage. Depth to water table is less than 1 foot.

Hydric Status: Soil meets the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel: HIGH

Depth to Bedrock Min: > 60 inches

Depth to Bedrock Max: > 60 inches

Soil Layer Information

	Boundary			Classification			
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**	**Permeability Rate (in/hr)**	**Soil Reaction (pH)**
1	0 inches	13 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.60	Max: 8.40 Min: 7.40
2	13 inches	31 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 2.00 Min: 0.20	Max: 8.40 Min: 7.90
3	31 inches	60 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.20 Min: 0.06	Max: 8.40 Min: 7.90

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: sandy loam
silt loam
loamy fine sand

Surficial Soil Types: sandy loam
silt loam
loamy fine sand

Shallow Soil Types: No Other Soil Types

Deeper Soil Types: silty clay loam

very fine sandy loam
sandy loam

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	MI0000470	1/4 - 1/2 Mile NE

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 734792.1s

- Major Roads
- Contour Lines
- Water Wells
- Public Water Supply Wells
- Groundwater Flow Direction
- Indeterminate Groundwater Flow at Location
- Groundwater Flow Varies at Location
- Cluster of Multiple Icons
- Earthquake epicenter, Richter 5 or greater
- Closest Hydrogeological Data
- Oil, gas or related wells

TARGET PROPERTY:	Fmr. Ind. Brownhoist Site	CUSTOMER:	AKT Peerless Environmental Svc
ADDRESS:	206 South Water Street	CONTACT:	Bev Dempsey
CITY/STATE/ZIP:	Bay City MI 48708	INQUIRY #:	734792.1s
LAT/LONG:	43.5910 / 83.8930	DATE:	February 14, 2002 1:13 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation	Database	EDR ID Number
1 **NE** **1/4 - 1/2 Mile** **Higher**	**FRDS PWS**	**MI0000470**

PWS ID:	MI0000470	PWS Status:	Not Reported
Date Initiated:	Not Reported	Date Deactivated:	Not Reported
PWS Name:	BAY CITY BAY CITY WATER PLANT 2691 N. EUCLID ROAD BAY CITY, MI 48706		

Treatment Objective: DISINFECTION
Treatment Process: GASEOUS CHLORINATION, POST
Source: Surface water

Addressee / Facility: Not Reported

Facility Latitude:	Not Reported	Facility Longitude:	Not Reported
City Served:	Not Reported		
Treatment Class:	Mixed (treated and untreated)	Population:	38500

PWS currently has or had major violation(s) or enforcement: Yes

Violations information not reported.

ENFORCEMENT INFORMATION:

System Name:	BAY CITY		
Violation Type:	Monitoring, Repeat Minor (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1995-12-01 - 1995-12-31	Analytical Value:	00000000.00
Violation ID:	9610001	Enforcement ID:	9610001
Enforcement Date:	1996-01-12	Enf. Action:	State Violation/Reminder Notice
System Name:	BAY CITY		
Violation Type:	Monitoring, Repeat Minor (TCR)		
Contaminant:	COLIFORM (TCR)		
Compliance Period:	1995-12-01 - 1995-12-31	Analytical Value:	00000000.00
Violation ID:	9610001	Enforcement ID:	9610002
Enforcement Date:	1996-01-12	Enf. Action:	State Public Notif Requested

APPENDIX E

AKT PEERLESS LABORATORY ANALYTICAL RESULTS

Fibertec
Environmental
Services

March 11, 2002

Fibertec Project # 68226
Project Identification: Fisher Brothers/ 3550F

Mr. Scott Klipa
AKT Peerless Environmental
22725 Orchard Lake Rd
Farmington Hills, MI 48336

Dear Mr. Klipa:

Thank you for selecting Fibertec Environmental Services as your analytical laboratory. The samples you submitted have been analyzed as requested and the results compiled in the enclosed report. Please note samples will be disposed of 30 days after reporting date.

If you have any questions regarding these results or if we may be of further assistance to you, please contact me at (517) 699-0345.

Sincerely,

Daryl P. Strandbergh
Laboratory Director

DPS/kc

Enclosures

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**001**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-1 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**1**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 12%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**001**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-1 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**1**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 12%**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TOLUENE	270	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
TOTAL XYLENES	420	ug/Kg	150	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**001**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-1 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**1**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 12%**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
ISOPROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
N-PROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
2-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
4-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
TERT-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,4-TRIMETHYLBENZENE	110	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
SEC-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,4-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
N-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DIBROMO-3-CHLOROPROPANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
HEXACHLOROBUTADIENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,3-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,4-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**001**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-1 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**1**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 12%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PHENANTHRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CADMIUM	350	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	9,300	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	1,600,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**002**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-2 (4-5')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**2**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 12%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
BENZENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
TOLUENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20788	3/5/2002	3/8/2002	TK
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20788	3/5/2002	3/8/2002	TK
1,2,4-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20788	3/5/2002	3/8/2002	TK
NAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PHENANTHRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**003**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-3 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**3**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 26%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
BENZENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
TOLUENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20788	3/5/2002	3/8/2002	TK
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20788	3/5/2002	3/8/2002	TK
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20788	3/5/2002	3/8/2002	TK
1,2,4-TRIMETHYLBENZENE	ND	ug/Kg	100.	5035/8260	20788	3/5/2002	3/8/2002	TK
NAPHTHALENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
FLUORENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
PHENANTHRENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
FLUORANTHENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
PYRENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(a)ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
CHRYSENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(b)FLUORANTHENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(k)FLUORANTHENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(a)PYRENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
INDENO(1,2,3-cd)PYRENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(ghi)PERYLENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**004**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-4 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**4**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**004**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-4 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**4**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BENZENE	150	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TOLUENE	1,900	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
ETHYLBENZENE	500	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
TOTAL XYLENES	6,200	ug/Kg	150	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**004**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-4 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**4**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
ISOPROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
BROMOBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
N-PROPYLBENZENE	290	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
2-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
4-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3,5-TRIMETHYLBENZENE	1,400	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
TERT-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,4-TRIMETHYLBENZENE	3,100	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
SEC-BUTYLBENZENE	69	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,3-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,4-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/7/2002	WR
N-BUTYLBENZENE	260	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2-DIBROMO-3-CHLOROPROPANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
HEXACHLOROBUTADIENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,3-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR
1,2,4-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/7/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**004**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-4 (1-2')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**4**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	380	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
2-METHYLNAPHTHALENE	720	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PHENANTHRENE	490	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	1,000	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	900	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	640	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	770	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	710	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	580	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	700	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	530	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	510	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CADMIUM	230	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	13,000	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	84,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**005**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-5 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**5**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**005**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-5 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**5**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**005**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-5 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**5**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
ISOPROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
N-PROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TERT-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
SEC-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,4-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
N-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DIBROMO-3-CHLOROPROPANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
HEXACHLOROBUTADIENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE GLYCOL	ND	ug/Kg	10,000	8015	20877	3/7/2002	3/7/2002	CRB

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	AKT PEERLESS	SAMPLE MATRIX:	SOIL
FIBERTEC PROJECT NO:	68226	FIBERTEC SAMPLE NUMBER:	005

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	FISHER BROTHERS	CLIENT SAMPLE DESCRIPTION:	B-5 (3-4')
PROJECT NUMBER:	3550F	CLIENT SAMPLE NUMBER:	5
SAMPLE DATE:	3/5/2002	CHAIN OF CUSTODY NUMBER:	26711

COMMENTS: ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 16%
*RAISED RL DUE TO SAMPLE MATRIX

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORENE	350	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PHENANTHRENE	5,500	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	1,300	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	8,100	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	6,100	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	3,200	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	3,400	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	2,900	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	1,800	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	2,900	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	1,600	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	1,500	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CADMIUM	1,100	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	19,000	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	350,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**006**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-6 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**6**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 19%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**006**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-6 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**6**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 19%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TOLUENE	120	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TETRACHLOROETHENE	620	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TOTAL XYLENES	230	ug/Kg	150	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**006**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-6 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**6**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 19%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	1,100	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
2-METHYLNAPHTHALENE	510	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHENE	1,000	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
FLUORENE	960	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
PHENANTHRENE	13,000	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
ANTHRACENE	3,400	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
FLUORANTHENE	14,000	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
PYRENE	12,000	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(a)ANTHRACENE	6,000	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
CHRYSENE	5,300	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(b)FLUORANTHENE	4,500	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
BENZO(k)FLUORANTHENE	3,900	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(a)PYRENE	5,300	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
INDENO(1,2,3-cd)PYRENE	3,400	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
BENZO(ghi)PERYLENE	3,300	ug/Kg	1,700*	8270	20874	3/7/2002	3/8/2002	LN
CADMIUM	3,100	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	27,000	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	790,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**007**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-7 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**7**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 20%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**007**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-7 (3-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**7**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 20%**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**008**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-8 (2-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**8**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 14%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**008**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-8 (2-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**8**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 14%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**008**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-8 (2-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**8**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 14%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
ISOPROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
N-PROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TERT-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
SEC-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,4-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
N-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DIBROMO-3-CHLOROPROPANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
HEXACHLOROBUTADIENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**008**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-8 (2-4')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**8**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 14%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORENE	420	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
PHENANTHRENE	4,900	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	1,300	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	8,900	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	7,900	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	3,700	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	4,200	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	3,500	ug/Kg	330	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	3,000	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	4,300	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	2,700	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	2,700	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
CADMIUM	490	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	24,000	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	780,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**009**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-9 (2-3')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**9**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 13%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: **ND** = NOT DETECTED AT OR ABOVE REPORTING LIMIT; **RL** = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
DICHLORODIFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL CHLORIDE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACROLEIN	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROFLUOROMETHANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
ACETONE	ND	ug/Kg	750	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ACRYLONITRILE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
IODOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
METHYLENE CHLORIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
VINYL ACETATE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CARBON DISULFIDE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
MTBE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-BUTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,2-DICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROFORM	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	AKT PEERLESS	SAMPLE MATRIX:	SOIL
FIBERTEC PROJECT NO:	68226	FIBERTEC SAMPLE NUMBER:	009

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	FISHER BROTHERS	CLIENT SAMPLE DESCRIPTION:	B-9 (2-3')
PROJECT NUMBER:	3550F	CLIENT SAMPLE NUMBER:	9
SAMPLE DATE:	3/5/2002	CHAIN OF CUSTODY NUMBER:	26711

COMMENTS: ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 13%
*RAISED RL DUE TO SAMPLE MATRIX

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
CARBON TETRACHLORIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TRICHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMODICHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROETHYL VINYL ETHER	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
CIS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-METHYL-2-PENTANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
TRANS-1,3-DICHLOROPROPENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2-TRICHLOROETHANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROPROPANE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
2-HEXANONE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
DIBROMOCHLOROMETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLENE DIBROMIDE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
TETRACHLOROETHENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,1,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
CHLOROBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
ETHYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOFORM	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
STYRENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,1,2,2-TETRACHLOROETHANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TOTAL XYLENES	ND	ug/Kg	150	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROPROPANE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	**AKT PEERLESS**	SAMPLE MATRIX:	**SOIL**
FIBERTEC PROJECT NO:	**68226**	FIBERTEC SAMPLE NUMBER:	**009**

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	**FISHER BROTHERS**	CLIENT SAMPLE DESCRIPTION:	**B-9 (2-3')**
PROJECT NUMBER:	**3550F**	CLIENT SAMPLE NUMBER:	**9**
SAMPLE DATE:	**3/5/2002**	CHAIN OF CUSTODY NUMBER:	**26711**

COMMENTS: **ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 13%**
***RAISED RL DUE TO SAMPLE MATRIX**

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
ISOPROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
BROMOBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
N-PROPYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
2-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
4-CHLOROTOLUENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3,5-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
TERT-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRIMETHYLBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
SEC-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,3-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,4-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DICHLOROBENZENE	ND	ug/Kg	100	5035/8260	20869	3/5/2002	3/8/2002	WR
N-BUTYLBENZENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2-DIBROMO-3-CHLOROPROPANE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
HEXACHLOROBUTADIENE	ND	ug/Kg	50	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,3-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR
1,2,4-TRICHLOROBENZENE	ND	ug/Kg	250	5035/8260	20869	3/5/2002	3/8/2002	WR

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

Fibertec
Environmental
Services

ANALYTICAL LABORATORY RESULTS

CLIENT IDENTIFICATION:	AKT PEERLESS	SAMPLE MATRIX:	SOIL
FIBERTEC PROJECT NO:	68226	FIBERTEC SAMPLE NUMBER:	009

CLIENT SAMPLE INFORMATION

PROJECT IDENTIFICATION:	FISHER BROTHERS	CLIENT SAMPLE DESCRIPTION:	B-9 (2-3')
PROJECT NUMBER:	3550F	CLIENT SAMPLE NUMBER:	9
SAMPLE DATE:	3/5/2002	CHAIN OF CUSTODY NUMBER:	26711

COMMENTS: ALL RESULTS REPORTED ON DRY WEIGHT BASIS. PERCENT MOISTURE = 13%
*RAISED RL DUE TO SAMPLE MATRIX

DEFINITIONS: ND = NOT DETECTED AT OR ABOVE REPORTING LIMIT; RL = REPORTING LIMIT
N/A = NOT APPLICABLE

ANALYTE	RESULT	UNITS	RL	METHOD	BATCH	EXTRACTION DATE	ANALYSIS DATE	TECH. INIT.
NAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
2-METHYLNAPHTHALENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHYLENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
ACENAPHTHENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
FLUORENE	ND	ug/Kg	330	8270	20874	3/7/2002	3/8/2002	LN
PHENANTHRENE	2,700	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
FLUORANTHENE	4,600	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
PYRENE	4,100	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)ANTHRACENE	2,400	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
CHRYSENE	2,700	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(b)FLUORANTHENE	2,200	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(k)FLUORANTHENE	1,700	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(a)PYRENE	2,500	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
DIBENZO(a,h)ANTHRACENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
INDENO(1,2,3-cd)PYRENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
BENZO(ghi)PERYLENE	ND	ug/Kg	1,700*	8270	20874	3/7/2002	3/7/2002	LN
CADMIUM	310	ug/Kg	50	6020	20878	3/7/2002	3/8/2002	JLH
CHROMIUM	9,300	ug/Kg	500	6020	20878	3/7/2002	3/8/2002	JLH
LEAD	130,000	ug/Kg	1,000	6020	20878	3/7/2002	3/8/2002	JLH

2280 Aurelius Road Holt, Michigan 48842 Telephone: (517) 699-0345 Facsimile: (517) 699-0388
29300 Wall Street Wixom, Michigan 48393 Telephone: (248) 348-5598 Facsimile: (248) 348-4896

APPENDIX F

AKT PEERLESS SOIL BORING LOGS

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS. PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-1

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	10.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	GEOPROBE	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							STONEMIX: Gravel	
02						SW	SAND: Fine to Medium-Grained, Black, Trace Fine Gravel, Dry	
04						CL	CLAY: Medium-Grained, Brown, Sandy, Trace Concrete Debris, Dry	
06						CL	CLAY: Soft to Medium-Stiff, Black, Moist	
08						CL	CLAY: Soft to Medium-Stiff, Gray, Trace Wood Debris, Dry	
10							10.0' BORING TERMINATED	

▽ = TOP OF GROUNDWATER

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS: PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-2

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	8.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	GEOPROBE	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium-Grained, Dark Brown to Black Trace Concrete Debris, Dry	
04						CL	CLAY: Medium-Stiff, Brown, Trace Gravel, Dry	
06								
08							8.0' BORING TERMINATED	
10								
12								

▽ = TOP OF GROUNDWATER

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS. PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-3

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	7.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	GEOPROBE	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							GRAVEL	
02							DEBRIS: Wood, Moist	
04						SW	SAND: Fine to Medium-Grained, Black, Moist, Trace Gravel, Moist	
06							DEBRIS: Wood, Moist	
08							7.0' BORING TERMINATED	
10								

▽ = TOP OF GROUNDWATER

AKTPEERLESS environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS. PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-4

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	6.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	HAND-AUGER	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium Grained, Black, Trace Gravel Moist	
04						CL	CLAY: Dark Brown, Trace Gravel, Dry Moist	
06							6.0' BORING TERMINATED	
08								
10								

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS. PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-5

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	5.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	HAND-AUGER	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium Grained, Dark Brown to Black, Trace Gravel Debris	
04						CL	CLAY: Medium Grained, Brown, Trace Gravel, Dry	
06							5.0' BORING TERMINATED	
08								
10								

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROS. PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-6

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	5.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	HAND-AUGER	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium Grained, Some Gravel, Misc. Debris, Black, Moist	
04								
							5.0' BORING TERMINATED	
06								
08								
10								
2								

AKT PEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROTHERS PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-7

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	5.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	HAND-AUGER	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium Grained, Black, Some Gravel	
04								
06							5.0' BORING TERMINATED	
08								
10								

▽ = TOP OF GROUNDWATER

AKTPEERLESS
environmental services
24073 Research Drive, Farmington Hills, MI 48335
Phone: (248)615-1333 Fax: (248)615-1334

BORING LOG

FISHER BROTHERS PROPERTY
301 NORTH WATER STREET
BAY CITY, MICHIGAN
PROJECT NUMBER: 3522F

B-8

DRAWN BY: JB
DATE: 03-14-02

DRILLING COMPANY:	FIBERTEC	SURFACE ELEVATION:	
TECHNICIAN:	JH	BORING DEPTH:	5.0'
DATE DRILLED:	03-05-02	DEPTH TO GW:	
DRILLING METHOD:	HAND-AUGER	SCREEN INTERVAL:	
		SCREEN MATERIAL:	

DEPTH FEET	SAMPLE NUMBER	BLOWS/FT.	PID (ppm) VALUES	PID (ppm) PROFILE (10, 25, 50, 75, 100, 250, 500, 750, 1000)	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	TEMPORARY WELL DIAGRAM
							CONCRETE	
02						SW	SAND: Fine to Medium Grained, Black, Trace Gravel, Trace Brick Debris	
04						CL	CLAY: Medium-Stiff, Dark Brown, Trace Gravel, Dry	
06							5.0' BORING TERMINATED	
08								
10								
12								

▽ = TOP OF GROUNDWATER

APPENDIX G

MATERIAL DATA SAFETY SHEETS

MATERIAL SAFETY DATA SHEET

ENAMEL REDUCERS

Section I - Manufacturer

Manufacturer:
DuPont Co.
Automotive
Wilmington, Delaware 19898
Telephone:
Product information (800)441-7515
Medical emergency (800) 441-3637
Transportation emergency (800) 424-9300 (CHEMTREC)
Product: Enamel Reducers (Y3812S,Y3832S, Y3864S, Y8508S, Y8522S, 1700S, 3812S,3864S, 7065S, 7075S, 7085S, 7095S, 8022S, 8034S, 8093S, 8096S, 8100S, 8485S, 8508S, 8522S, 8575S, 8585S, 8595S).
OSHA Hazard Class: Flammable liquid
DOT Shipping Name: See DOT addendum.
Hazardous Materials Information: See Section X.

Section II - Hazardous Ingredients
(See Section X)

Ingredients	*CAS No.*	*Vapor Pressure (20°C. mm Hg)*	*Exposure Limits*
Acetic acid ester	90438-79-2	Unknown	None-A,O
Acetone	67-64-1	184.0	500 ppm-A 8 hr TWA 1000 ppm-O 8 hr TWA 750 ppm-A 15 min (STEL) 500 ppm-D 8&12 hr
Aromatic hydrocarbon A	64742-95-6	10.0 @ 25°C	None-A,O
Aromatic hydrocarbon B	64742-94-5	10.0	None-A,O
Butyl acetate	123-86-4	8.0	150 ppm-A,O 200 ppm-A 15 min (STEL)
Cumene	98-82-8	3.7	50 ppm-A,O Skin
Cyclohexane	110-82-7	100.0 @ 60°C	300 ppm-A,O 150 ppm-D 12 hr TWA
Diethylene glycol monobutyl ether	112-34-5	0.1	5 ppm-D None-A,O
Diisobutyl ketone	108-83-8	1.7	25 ppm-A 50 ppm-O
Ethyl acetate	141-78-6	76.0	400 ppm-A,O
Ethylbenzene	100-41-4	7.0	100 ppm-A,O 125 ppm-A 15 min (STEL) 25 ppm-D 8&12 hr
Ethylene glycol monobutyl ether acetate	112-07-2	0.3	20 ppm-D Skin None-A,O
Ethyl 3-ethoxy propionate	763-69-9	Unknown	None-A,O
Heptane	142-82-5	40.0	400 ppm-A 500 ppm-O 500 ppm-A 15 min(STEL)
Heavy mineral spirits	64742-96-7	None	100 ppm-D None-A,O
Hexyl acetate isomers	88230-35-7	0.7	50 ppm-A Hexyl Acet None-O
Isopropyl alcohol	67-63-0	33.0	400 ppm-A,O 500 ppm-A 15 min(STEL) 400 ppm-D 8 & 12 hr
Lead naphthenate	61790-14-5	None	150 µg/m3-A Pb 50 µg/m3-O Pb
Medium mineral spirits	64742-88-7	10.0	100 ppm-D None-A,O
Methyl amyl ketone	110-43-0	2.2	50 ppm-A 100 ppm-O
Methyl ethyl ketone	78-93-3	71.0	200 ppm-A,O 300 ppm-A 15 min(STEL) 200 ppm-D 8&12 hr TWA 300 ppm-D 15 min TWA
Mixed dibasic esters	Not Available	0.2	10 mg/m3-D None-A,O
n-Butyl alcohol	71-36-3	5.5	50 ppm-A C Skin 100 ppm-O 25 ppm-D 50 ppm-D 15 min. TWA
Naphthalene	91-20-3	1.0 @ 52.6°C	10 ppm-A,O
Petroleum naphtha	64742-89-8	50.0 @ 25°C	300 ppm-A,O 400 ppm-O 15min(STEL) 100 ppm-D
Propylene glycol monomethyl ether acetate	108-65-6	3.7	None-A,O 10 ppm-D
Toluene	108-88-3	36.7	50 ppm-A Skin 200 ppm-O 300 ppm-O Ceiling 500 ppm-O 10 min MAX 50 ppm-D 8&12 hr TWA
VM&P Naphtha	64742-89-8	15.0 @ 37.8°C	300 ppm-A,O 400 ppm-O 15min(STEL) 100 ppm-D
Xylene	1330-20-7	7.0 @ 25°C	100 ppm-A,O 150 ppm-A 15 min(STEL) 100 ppm-D 8&12 hr 150 ppm-D 15 min TWA
1,2,4-Trimethyl Benzene	95-63-6	7.0 @ 44.4°C	25 ppm-A,O
2,2,4 Trimethyl- 1,3 pentanediol monoisobutyrate	25265-77-4	40.0	None-A,O

A = ACGIH TLV; O = OSHA; D = DuPont internal limit; S = Supplier Furnished limit; STEL = Short Term Exposure Limit; C= Ceiling.

Section III - Physical Data

Evaporation rate: Less than ether
Vapor Density: Heavier than air
Solubility in water: Miscible
Percent volatile by volume: 99.6%- 100%
Percent volatile by weight: 99.4%- 100%
Boiling range: 54°C- 245°C/ 129.2°F- 473.0°F
Gallon weight: 6.41- 7.50 lbs./gallon

Section IV - Fire and Explosion Data

Flash point (closed cup): See Section X for exact values.
Flammable limits: 0.6% - 13.1%
Extinguishing media: Universal aqueous film-forming foam, carbon dioxide, dry chemical.
Special fire fighting procedures: Full protective equipment, including self-contained breathing apparatus, is recommended. Water from fog nozzles may be used to cool closed containers to prevent pressure build up.
Unusual fire & explosion hazards: When heated above the flash point, emits flammable vapors which, when mixed with air, can burn or be explosive. Fine mists or sprays may be flammable at temperatures below the flash point.

Section V - Health Hazard Data

General Effects:
Ingestion: Gastrointestinal distress. In the unlikely event of ingestion, call a physician immediately and have the names of ingredients available. **DO NOT INDUCE VOMITING.**
Inhalation: May cause nose and throat irritation. Repeated and prolonged overexposure to solvents may lead to permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are signs that solvent levels are too high. If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists, or occurs later, consult a physician.
Skin or eye contact: May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. In case of eye contact, immediately flush with plenty of water for at least 15 minutes; call a physician. In case of skin contact, wash with soap and water. If irritation occurs, contact a physician.

Specific Effects:
Aromatic Hydrocarbon-A & B Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Butyl Acetate** May cause abnormal liver function. Tests for embryotoxic activity in animals has been inconclusive. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Diethylene Glycol Monobutyl Ether** Contact may cause skin irritation with discomfort or rash. Recurrent overexposure may result in liver and kidney injury. High doses in laboratory animals have shown non specific effects such as irritation, weight loss, moderate blood changes. Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive. **Diisobutyl Ketone** Extremely high oral and inhalation doses in laboratory animals have shown weight changes in various organs such as the liver, kidney, brain, heart and adrenal gland. In addition liver and kidney injury were observed at the extremely high inhalation level. In another inhalation study there was a slight depression in the white blood cell count. Repeated exposure may cause allergic skin rash, itching, swelling. **Ethyl Acetate** Prolonged and repeated high exposures of laboratory animals resulted in secondary anemia with an increase in white blood cells; fatty degeneration , cloudy swelling and an excess of blood in various organs.
Ethylbenzene Recurrent overexposure may result in liver and kidney injury. Studies in laboratory animals have shown reproductive, embryotoxic and developmental effects. Has shown mutagenic activity in laboratory cell culture tests. Tests in some laboratory animals demonstrate carcinogenic activity. Individuals with preexisting diseases of the central nervous system, lungs, liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Ethylene Glycol Monobutyl Ether Acetate** Can be absorbed through the skin in harmful amounts. May destroy red blood cells. May cause abnormal kidney function. **Heavy Mineral Spirits & Medium Mineral Spirits** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Isopropyl Alcohol** Ingestion studies on laboratory animals showed that very high oral doses caused increased liver and kidney weights. **Lead Napthenate** Over exposure to lead may cause adverse effects to the blood forming, nervous, urinary, reproductive systems including embryotoxic effects. Symptoms may include loss of appetite, anemia, disturbance of sleep and fatigue. See OSHA lead standard 29CFR1910.1025. For exposures longer than 8 hours the OSHA exposure limit is reduced by this formula: limit(in ug/m3)= 400/hours worked in the day. Can be absorbed through the skin in harmful amounts. **WARNING:** This chemical is known to the State of California to cause cancer and birth defects or other reproductive harm **Methyl Amyl Ketone** Ingestion studies on laboratory animals showed that very high oral doses caused increased liver and kidney weights. **Methyl Ethyl Ketone** High concentrations have caused embryotoxic effects in laboratory animals. Methyl ethyl ketone has been demonstrated to potentiate (i.e., shorten the time of onset) the peripheral neuropathy caused by either n-hexane or methyl n-butyl ketone. MEK by itself has not been demonstrated to cause peripheral neuropathy. Liquid splashes in the eye may result in chemical burns. **Mixed Dibasic Esters** High airborne levels in rats have shown mild injury to the olfactory region of the nose. **n-Butyl Alcohol** Liquid splashes in the eye may result in chemical burns. May cause abnormal blood forming function with anemia. Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. **Naphthalene** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the liver or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Petroleum Naphtha & VM&P Naphtha** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Propylene Glycol Monomethyl Ether Acetate** May cause moderate eye burning. Recurrent overexposure may result in liver and kidney injury. **Toluene** Recurrent overexposure may result in liver and kidney injury. High airborne levels have produced irregular heart beats in animals and occasional palpitations in humans. Rats exposed to very high airborne levels have exhibited high frequency hearing deficits. The significance of this to man is unknown. Chromosomal changes in the circulating blood of exposed workers have been reported. The significance of these reports is unclear because of exposure to other substances. Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures. **WARNING:** This chemical is known to the State of California to cause birth defects or other reproductive harm. **Xylene** Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Individuals with pre-existing disease of the central nervous system, kidneys, liver, cardiovascular system, lungs, or bone marrow may have increased susceptibility to the toxicity of excessive exposures. Canada classifies Xylene as a developmental toxin as high exposures to xylenes in some animal studies have been reported to cause health effects on the developing fetus/embryo. These effects were often at levels toxic to the adult animal. The significance of these effects to humans is not known.

Section VI - Reactivity Data

Stability: Stable
Incompatibility (materials to avoid): None reasonably foreseeable.
Hazardous decomposition products: CO, CO_2, smoke.
Hazardous polymerization: Will not occur.

Section VII - Spill or Leak Procedures

Steps to be taken in case material is released or spilled: Ventilate area. Remove sources of ignition. Prevent skin and eye contact and breathing of vapor. Wear a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH approved TC-23C), eye protection, gloves and protective clothing. Confine and remove with inert absorbent.

Waste disposal method: Do not allow material to contaminate ground water systems. Incinerate absorbed material in accordance with federal, state, and local requirements. Do not incinerate in closed containers.

Section VIII - Special Protection Information

Respiratory: Do not breathe vapors or mists. Wear a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH approved TC-23C) and particulate filter (NIOSH TC-84A) during application and until all vapors and spray mists are exhausted. In confined spaces, or in situations where continuous spray

operations are typical, or if proper air purifying respirator fit is not possible, wear a positive pressure, supplied-air respirator (NIOSH TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.
Ventilation: Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits.
Protective clothing: Neoprene gloves and coveralls are recommended.
Eye protection: Desirable in all industrial situations. Include splash guards or side shields.

Section IX - Special Precautions

Precautions to be taken in handling and storing: Observe label precautions. Keep away from heat, sparks and flame. Close container after each use. Ground containers when pouring. Wash thoroughly after handling and before eating or smoking. Do not store above 120°F.
Other precautions: Do not sand, flame cut, braze or weld dry coating without a NIOSH approved respirator or appropriate ventilation.

Section X - Other Information

Section 313 Supplier Notification: The chemicals listed below with percentages are subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986 and of 40 CFR 372.

PRODUCT CODE **INGREDIENTS (See Section II)**

Y-3812S acetone, cyclohexane (0-1%*), ethylbenzene (0-2%*), isopropyl alcohol, petroleum naphtha, toluene (8-12%*), xylene (6-7%*)
GAL WT: 6.23 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.23 VOC LE: 6.2 VOC AP: 5.6 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

Y-3832S acetone, aromatic hydrocarbon-b, cyclohexane (0-1%*), medium mineral spirits, n-butyl alcohol (7%*), naphthalene (0-1%*), petroleum naphtha, toluene (10-13%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.41 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.41 VOC LE: 6.4 VOC AP: 5.8 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

Y-3864S aromatic hydrocarbon-b, cyclohexane (0-1%*), medium mineral spirits, naphthalene (0-1%*), petroleum naphtha, toluene (9-13%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.28 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.28 VOC LE: 6.3 VOC AP: 6.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

Y-8508S acetone, ethylbenzene (0-3%*), isopropyl alcohol, lead napthenate (%*), toluene (10-13%*), vm&p naphtha, xylene (3-8%*)
GAL WT: 6.42 WT PCT SOLIDS: 0.60 VOL PCT SOLIDS: 0.36
SOLVENT DENSITY: 6.40 VOC LE: 6.4 VOC AP: 5.7 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

Y-8522S aromatic hydrocarbon-a, cumene (0-1%*), ethylbenzene (6-17%*), medium mineral spirits, xylene (49-60%*), 1,2,4-trimethyl benzene (1-5%*)
GAL WT: 6.99 WT PCT SOLIDS: 0.01 VOL PCT SOLIDS: 0.02
SOLVENT DENSITY: 6.99 VOC LE: 7.0 VOC AP: 7.0 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC

1700S acetone, aromatic hydrocarbon-a, butyl acetate, ethylbenzene (0-1%*), mixed dibasic esters, toluene (7-9%*), vm&p naphtha, xylene (0-3%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.80 WT PCT SOLIDS: 0.05 VOL PCT SOLIDS: 0.04
SOLVENT DENSITY: 6.80 VOC LE: 6.8 VOC AP: 5.8 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

32030S acetone
GAL WT: 6.55 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.55 VOC LE: 0.0 VOC AP: 0.0 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3812S acetone, cyclohexane (0-1%*), ethylbenzene (0-2%*), isopropyl alcohol, petroleum naphtha, toluene (8-12%*), xylene (6-7%*)
GAL WT: 6.23 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.23 VOC LE: 6.2 VOC AP: 5.6 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3832S acetone, aromatic hydrocarbon-b, cyclohexane (0-1%*), medium mineral spirits, n-butyl alcohol (7%*), naphthalene (0-1%*), petroleum naphtha, toluene (10-13%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.41 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.41 VOC LE: 6.4 VOC AP: 5.8 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3864S aromatic hydrocarbon-b, cyclohexane (0-1%*), medium mineral spirits, naphthalene (0-1%*), petroleum naphtha, toluene (9-13%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.28 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.28 VOC LE: 6.3 VOC AP: 6.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

7065S acetone, ethyl acetate, methyl ethyl ketone (2%*),
GAL WT: 7.23 WT PCT SOLIDS: 0.34 VOL PCT SOLIDS: 0.27
SOLVENT DENSITY: 7.22 VOC LE: 7.4 VOC AP: 5.6 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

7075S butyl acetate, ethyl acetate, methyl amyl ketone, methyl ethyl ketone (30%*),
GAL WT: 7.10 WT PCT SOLIDS: 0.02 VOL PCT SOLIDS: 0.02
SOLVENT DENSITY: 7.10 VOC LE: 7.1 VOC AP: 7.1 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

7085S butyl acetate, ethylene glycol monobutyl ether acetate (10%*), methyl amyl ketone, methyl ethyl ketone (20%*)
GAL WT: 7.19 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.19 VOC LE: 7.2 VOC AP: 7.2 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

7095S butyl acetate, diisobutyl ketone, ethylene glycol monobutyl ether acetate (22%*), methyl amyl ketone, methyl ethyl ketone (7%*)
GAL WT: 7.14 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.14 VOC LE: 7.1 VOC AP: 7.1 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

7099S diisobutyl ketone, ethylene glycol monobutyl ether acetate (35%*), propylene glycol monomethyl ether acetate
GAL WT: 7.11 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.11 VOC LE: 7.1 VOC AP: 7.1 H: 2 F: 2
R: 0 FLASH PT: BETWEEN 100 - 140 F (CC) OSHA STORAGE: II

8022S acetone, aromatic hydrocarbon-b, butyl acetate, cyclohexane (0-1%*), diethylene glycol monobutyl ether (3%*), diisobutyl ketone, ethylbenzene (0-1%*), ethylene glycol monobutyl ether acetate (2%*), naphthalene (0-1%*), petroleum naphtha, propylene glycol monomethyl ether acetate, toluene (6-9%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 6.57 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.57 VOC LE: 6.6 VOC AP: 6.0 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8034S acetone, aromatic hydrocarbon-b, cyclohexane (0-1%*), ethyl acetate, ethylene glycol monobutyl ether acetate (2%*), naphthalene (0-1%*), petroleum naphtha, toluene (8-12%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 6.44 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.44 VOC LE: 6.4 VOC AP: 5.2 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8093S acetone, ethylbenzene (0-1%*), ethylene glycol monobutyl ether acetate (12%*), medium mineral spirits, mixed dibasic esters, propylene glycol monomethyl ether acetate, toluene (10-12%*), vm&p naphtha, xylene (0-4%*)
GAL WT: 6.74 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.74 VOC LE: 6.8 VOC AP: 6.1 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8096S acetone, aromatic hydrocarbon-b, diethylene glycol monobutyl ether (2%*), ethylbenzene (0-1%*), ethylene glycol monobutyl ether acetate (7%*), medium mineral spirits, mixed dibasic esters, propylene glycol monomethyl ether acetate, toluene (9-11%*), vm&p naphtha, xylene (0-3%*), 1,2,4-trimethyl benzene (0-1%*), 2,2,4-trimethyl-1,3-pentanediolmonoisobutyrate
GAL WT: 6.80 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.80 VOC LE: 6.8 VOC AP: 6.2 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8100S aromatic hydrocarbon-a, ethylene glycol monobutyl ether acetate (12%*), heavy mineral spirits, medium mineral spirits, mixed dibasic esters, propylene glycol monomethyl ether acetate, toluene (6%*), 1,2,4-trimethyl benzene (0-3%*)
GAL WT: 7.31 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.31 VOC LE: 7.3 VOC AP: 7.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC

8485S ethyl acetate, ethylene glycol monobutyl ether acetate (10%*)
GAL WT: 7.50 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.50 VOC LE: 7.5 VOC AP: 7.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

8508S ethylbenzene (0-2%*), lead napthenate (%*), toluene (46-49%*), vm&p naphtha, xylene (1-5%*),
GAL WT: 6.69 WT PCT SOLIDS: 0.57 VOL PCT SOLIDS: 0.36
SOLVENT DENSITY: 6.68 VOC LE: 6.7 VOC AP: 6.7 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

8522S acetone, aromatic hydrocarbon-b, ethylbenzene (0-1%*), medium mineral spirits, propylene glycol monomethyl ether acetate, toluene (11-13%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 6.57 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.57 VOC LE: 6.6 VOC AP: 5.0 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8575S heptane, hexyl acetate isomers, isopropyl alcohol, methyl ethyl ketone (50%*),
GAL WT: 6.27 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.27 VOC LE: 6.3 VOC AP: 6.3 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8585S ethyl 3-ethoxy propionate, heptane, hexyl acetate isomers, methyl ethyl ketone (36%*), n-butyl alcohol (3%*)
GAL WT: 6.39 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.39 VOC LE: 6.4 VOC AP: 6.4 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

8595S acetic acid ester, heptane, hexyl acetate isomers, methyl ethyl ketone (27%*), n-butyl alcohol (7%*)
GAL WT: 6.43 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.43 VOC LE: 6.4 VOC AP: 6.4 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

Notice: The data in this material safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process.

Product Manager - Refinish Sales

Prepared by D. G. Detweiler

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 10/27/98

Control No. 115159

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** RHEOCRETE® CNI

Chemical Family: Calcium Nitrite solution.

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Calcium Nitrite	13780-06-8	None	None	None	< 40%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	ca 108	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	ca. 0	Specific Gravity:	ca. 1.25
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	< 11.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Brownish liquid		Odor: Mild sweet.	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire. In dry form, this material is an oxidizer and may provide oxygen to combustible materials. Resultant fires should be extinguished with Carbon dioxide foam.

Special Fire & Unusual Hazards None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability Stable. Not sensitive to mechanical impact.

Incompatibility: Acids, Ammonium salts, Activated carbon, Reducing agents, and Cyanides.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon and Nitrogen. Avoid direct contact with other materials that may cause pH to fall below 8.0 resulting in the possible formation of Nitrogen oxide gas.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; prevent from entering waterways, vacuum up liquid or use absorbent media; remove to storage for disposal

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product in liquid form is not defined as hazardous by EPA. In dry form it becomes an oxidizer and is defined as a reactive waste coded D003.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 2 (Serious)

PRIMARY ROUTE OF ENTRY: Eyes, Dermal, Ingestion

Effects Of Overexposure

Inhalation: At room temperature, exposures to vapors are unlikely due to physical properties. Mists may cause irritation to the mucous membrane.

Eyes: May cause moderate transient irritation, reddening, swelling and blurred vision. Prolonged contact may cause serious irritation and possible corneal damage.

Skin Contact: Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.

Skin Absorption: Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury. Large quantities may cause nausea, vomiting, cyanosis, or coma which could be fatal.

LC(50) Oral CASRN 13780-06-8 283 mg/kg Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. **FIRST AID:**

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9. **SPECIAL PROTECTION INFORMATION:**

Ventilation. Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. **ADDITIONAL INFORMATION:**

Average Shelf Life:	Refer to Product Data sheet.
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard Immediate Physical hazard: None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List.	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

RHEOCRETE® CNI was tested using UN test O.2, "Test for Oxidizing Liquids", following the procedure described in the Transport of Dangerous Goods Manual of Tests and Criteria, 2nd revised edition, United Nations, New York and Geneva, 1995. The results indicated that RHEOCRETE® CNI is **NOT** an oxidizing liquid.

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

DULUX® ALKYD ENAMELS

Section I - Manufacturer

Manufacturer:
DuPont Co.
Automotive
Wilmington, Delaware 19898
Telephone:
Product information (800)441-7515
Medical emergency (800) 441-3637
Transportation emergency (800) 424-9300 (CHEMTREC)
Product: Dulux® Alkyd Enamel Tints and Factory Package Colors.
OSHA Hazard Class: Flammable liquid
DOT Shipping Name: See DOT addendum.
Hazardous Materials Information: See Section X.

Section II - Hazardous Ingredients
(See Section X)

Ingredients	*CAS No.*	*Vapor Pressure (20°C. mm Hg)*	*Exposure Limits*
Acetone	67-64-1	184.0	500 ppm-A 8 hr TWA 750 ppm-A (15 min STEL) 1000 ppm-O 8 hr TWA 500 ppm-D 8&12 hr
Acrylic polymer	96591-17-2	None	None-A,O
Alkyd resin A	66070-61-9	None	None-A,O
Alkyd resin B	68083-25-0	None	None-A,O
Alkyd resin C	68213-52-5	None	None-A,O
Alkyd resin D	66070-61-9	None	None-A,O
Alkyd resin E	68083-25-0	None	None-A,O
Alkyd resin F	66070-62-0	None	None-A,O
Alkyd resin G	66070-93-7	None	None-A,O
Alkyd resin H	67763-06-8	None	None-A,O
Alkyd resin I	Not Available	None	None-A,O
Alkyd resin J	Not Available	None	None-A,O
Aluminum	7429-90-5	None	10 mg/m³-A 15 mg/m³-O 5 mg/m³-O Resp
Aromatic hydrocarbon-A	64742-95-6	10 @ 25°C	None-A,O
Aromatic hydrocarbon-B	64742-94-5	10.0	None-A,O
Aromatic naphtha	68477-31-6	1.0	None-A,O
Butyl acetate	123-86-4	8.0	150 ppm-A,O 200 ppm-A 15 min(STEL)
Carbon black	1333-86-4	None	3.5 mg/m³-A 3.5 mg/m³-O 0.5 mg/m³-D
Cumene	98-82-8	3.7	50 ppm-A,O Skin
Dioxazine carbozole pigment	4378-61-4	None	10 mg/m³-A 15 mg/m³-O 5 mg/m³-O Resp
Ethylbenzene	100-41-4	7.0	100 ppm-A,O 125 ppm-A 15 min(STEL) 25 ppm-D 8&12 hr
Ferric hexacyanoferrate	14038-43-8	None	10 mg/m 15 mg/m 5 mg/m³-O Re
Iron Oxide	1309-37-1	None	5 mg/m 10 mg/m
Lead chromate	18454-12-1	None	50 µg/m³-A,O 12 µg/m³-A 1.0 mg/m³-O Cr Ceili
Lead chromate molybdate	12656-85-8	None	50 µg/m³-A,O 12 µg/m3-A 1.0 mg/m³-O Cr Ceili
Lead naphthenate	61790-14-5	None	150 µg/m³-A 50 µg/m³-O
Medium mineral spirits	64742-88-7	Unknown	None-A 100 ppm
Methyl ethyl ketone	78-93-3	71.0	200 ppm-A, 300 ppm-A 15 min(STE 200 ppm-D 8&12 hr TW 300 ppm-D 15 min TW
n-Butyl alcohol	71-36-3	5.5	50 ppm-A Ceiling Sk 100 ppm- 25 ppm- 50 ppm-D 15 min. TW
Naphthalene	91-20-3	1.0 @ 52.6°C	10 ppm-A,
Perylene pigment	128-69-8	None	10 mg/m³- None-
Phthalocyanine blue pigment	147-14-8	None	1 mg/m³-A,O CU, 8
Phthalocyanine green pigment	1328-53-6	None	10 mg/m³- 15 mg/m³- 5 mg/m³-O Res
Quinacridone pigment	1047-16-1	None	10 mg/m³- 15 mg/m³- 5 mg/m³-O Res
Tetrachloroisoindolinone yellow pigment	5590-18-1	None	10 mg/m³- None-
Titanium dioxide	13463-67-7	None	10 mg/m³- 15 mg/m³- 10 mg/m³-
Toluene	108-88-3	36.7	50 ppm-A Ski 200 ppm- 300 ppm-O Ceilin 500 ppm-O 10 min MA 50 ppm-D 8&12 hr TW
Toluidine pigment	None	None	10 mg/m³- None-
VM&P Naphtha	64742-89-8	15.0 @ 37.8°C	300 ppm-A, 400 ppm-O 15 min(STEL 100 ppm-
Xylene	1330-20-7	7.0 @ 25°C	100 ppm-A, 150 ppm-A,O 15 min(STEL 100 ppm-D 8&12 h 150 ppm-D 15 min TW
1,2,4-Trimethyl benzene	95-63-6	7.0 @ 44.4°C	25 ppm-A,

A = ACGIH TLV; O = OSHA; D = DuPont internal limit; S = Supplier Furnished limit; STEL = Short Term Exposure Limit; C = Ceiling.

Section III - Physical Data

Evaporation rate: Less than ether
Vapor Density: Heavier than air
Solubility in water: Miscible
Percent volatile by volume: 61.7% - 73.4%
Percent volatile by weight: 43.4%- 63.2%
Boiling range: 54.0°C- 220°C/ 129.2°F- 428.0°F
Gallon weight: 7.53- 9.73 lb/gallon

Section IV - Fire and Explosion Data

Flash point (closed cup): See Section X for exact values.
Flammable limits: 0.9 - 13.0%
Extinguishing media: Universal aqueous film-forming foam, carbon dioxide, dry chemical.
Special fire fighting procedures: Full protective equipment, including self-contained breathing apparatus, is recommended. Water from fog nozzles may be used to cool closed containers to prevent pressure build up.
Unusual fire & explosion hazards: When heated above the flash point, emits flammable vapors which, when mixed with air, can burn or be explosive. Fine mists or sprays may be flammable at temperatures below the flash point.

Section V - Health Hazard Data

General Effects:
Ingestion: Gastrointestinal distress. In the unlikely event of ingestion, call a physician immediately and have the names of ingredients available. **DO NOT INDUCE VOMITING.**
Inhalation: May cause nose and throat irritation. Repeated and prolonged overexposure to solvents may lead to permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are signs that solvent levels are too high. If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists, or occurs later, consult a physician. Additional effects when this material contains, or is mixed with an isocyanate activator/hardener: Exposure to isocyanates may cause respiratory sensitization. This effect may be permanent. This effect may be delayed for several hours after exposure. Repeated overexposure to isocyanates may cause a decrease in lung function [illegible]h may be permanent. Individuals with or breathing problems or [illegible] reaction to isocyanates must not be exposed to vapors or [illegible]y mist of this product
Skin or eye contact: May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. In case of eye contact, immediately flush with plenty of water for at least 15 minutes; call a physician. In case of skin contact, wash with soap and water. If irritation occurs, contact a physician.

Specific Effects:
Aromatic Hydrocarbon-A & B & Aromatic Naphtha Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Butyl Acetate** May cause abnormal liver function. Tests for embryotoxic activity in animals has been inconclusive. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Carbon Black** Is an IARC, NTP or OSHA carcinogen. **Ethylbenzene** Recurrent overexposure may result in liver and kidney injury. Studies in laboratory animals have shown reproductive, embryotoxic and developmental effects. Has shown mutagenic activity in laboratory cell culture tests. Tests in some laboratory animals demonstrate carcinogenic activity. Individuals with preexisting diseases of the central nervous system, lungs, liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Lead Chromate, Lead Chromate Molybdate, & Lead Napthenate** Over exposure to lead may cause adverse effects to the blood forming, nervous, urinary, reproductive systems including embryotoxic effects. Symptoms may include loss of appetite, anemia, disturbance of sleep and fatigue. See OSHA lead standard 29CFR1910.1025. For exposures longer than 8 hours the OSHA exposure limit is reduced by this formula: limit(in ug/m3)= 400/ hours worked in the day. Can be absorbed through the skin in harmful amounts. **WARNING:** This chemical is known to the State of California to cause cancer and birth defects or other reproductive har[illegible] **Medium Mineral Spirits** Laboratory studies with rats have sh[illegible]st petroleum distillates can cause kidney damage and ki[illegible] liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Methyl Ethyl Ketone** High concentrations have caused embryotoxic effects in laboratory animals. Methyl ethyl ketone has been demonstrated to potentiate (i.e., shorten the time of onset) the peripheral neuropathy caused by either n-hexane or methyl n-butyl ketone. MEK by itself has not been demonstrated to cause peripheral neuropathy. Liquid splashes in the eye may result in chemical burns. **n-Butyl Alcohol** Liquid splashes in the eye may result in chemical burns. May cause abnormal blood forming function with anemia. Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. **Naphthalene** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the liver or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Titanium Dioxide** In A Lifetime Inhalation Test, Lung Cancers Were Found In Some Rats Exposed To 250 Mg/M3 Respirable Titanium Dust. Analysis of the titanium dioxide concentrations in the rat's lungs showed that the lung clearance mechanism was overwhelmed and that the results at the massive 250 mg/m3 level are not relevant to the workplace. **Toluene** Recurrent overexposure may result in liver and kidney injury. High airborne levels have produced irregular heart beats in animals and occasional palpitations in humans. Rats exposed to very high airborne levels have exhibited high frequency hearing deficits. The significance of this to man is unknown. Chromosomal changes in the circulating blood of exposed workers have been reported. The significance of these reports is unclear because of exposure to other substances. Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures. **WARNING:** This chemical is known to the State of California to cause birth defects or other reproductive harm. **VM&P Naphtha** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Xylene** Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Individuals with pre-existing disease of the central nervous system, kidneys, liver, cardiovascular system, lungs, or bone marrow may have increased susceptibility to the toxicity of excessive exposures. Canada classifies Xylene as a developmental toxin as high exposures to xylenes in some animal studies have been reported to cause health effects on the developing fetus/embryo. These effects were often at levels toxic to the adult animal. The significance of these effects to humans is not known.

Section VI - Reactivity Data

Stability: Stable
Incompatibility (materials to avoid): None reasonably foreseeable.
Hazardous decomposition products: CO, CO_2, smoke, oxides of heavy metals in Section II.
Hazardous polymerization: Will not occur.

Section VII - Spill or Leak Procedures

Steps to be taken in case material is released or spilled: Ventilate area. Remove sources of ignition. Prevent skin and eye contact and breathing of vapor. Wear respirator, eye protection, gloves and protective clothing. Confine and remove with inert absorbent.

<u>If the material contains, or is mixed with an isocyanate activator/ hardener:</u> Wear a positive-pressure, supplied-air respirator (NIOSH approved TC-19C). Pour liquid decontamination solution over the spill and allow to sit at least 10 minutes. Typical decontamination solutions for isocyanate containing materials are:

20% Surfactant (Tergitol TMN 10) and 80% Water OR

0-10% Ammonia, 2-5% Detergent and Water (balance)

Pressure can be generated. <u>Do not</u> seal container. After 48 hours, material may be sealed and disposed of properly.

<u>If material does not contain or is not mixed with an isocyanate activator/hardener:</u> Wear a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH approved TC-23C).

Waste disposal method: Do not allow material to contaminate

ground water systems. Incinerate absorbed material in accordance with federal, state, and local requirements. Do not incinerate in closed containers.

Section VIII - Special Protection Information

Respiratory: Do not breathe vapors or mists. When these products are used with paints requiring isocyanate activators /hardeners, wear a positive-pressure, supplied-air respirator (NIOSH approved TC-19C) while mixing activator/hardener with paint, during application and until all vapors and spray mist are exhausted. If product is used without isocyanate activators/hardeners, a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH TC-23C) and particulate filter (NIOSH TC-84A) may be used. Follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area. Refer to the hardener/ activator label instructions and MSDS for further information. Individuals with history of lung or breathing problems or prior reaction to isocyanates should not use or be exposed to this product if mixed with isocyanate activators/hardeners.
Ventilation: Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits.
Protective clothing: Neoprene gloves and coveralls are recommended.
Eye protection: Desirable in all industrial situations. Include splash guards or side shields.

Section IX - Special Precautions

Precautions to be taken in handling and storing: Observe label precautions. Keep away from heat, sparks and flame. Close container after each use. Ground containers when pouring. Wash thoroughly after handling and before eating or smoking. Do not store above 120°F.
Other precautions: Do not sand, flame cut, braze or weld dry coating without a NIOSH approved respirator or appropriate ventilation.

Section X - Other Information

Section 313 Supplier Notification: The chemicals listed below with percentages are subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986 and of 40 CFR 372.

PRODUCT CODE **INGREDIENTS** (See Section II)

1D alkyd resin-b, alkyd resin-c, alkyd resin-g, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (7%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (1-9%*)
GAL WT: 8.58 WT PCT SOLIDS: 50.09 VOL PCT SOLIDS: 37.98
SOLVENT DENSITY: 6.90 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
13D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, carbon black, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (3-4%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.72 WT PCT SOLIDS: 42.21 VOL PCT SOLIDS: 34.82
SOLVENT DENSITY: 6.84 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
14D alkyd resin-a, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), dioxazine carbozole pigment, ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (5%*), xylene (4-6%*), 1,2,4-trimethyl benzene (1-9%*)
GAL WT: 8.00 WT PCT SOLIDS: 44.26 VOL PCT SOLIDS: 35.27
SOLVENT DENSITY: 6.89 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
15D alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-2%*), medium mineral spirits, naphthalene (0-1%*), phthalocyanine blue pigment, toluene (7-8%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (3-16%*)
GAL WT: 7.88 WT PCT SOLIDS: 40.57 VOL PCT SOLIDS: 33.74
SOLVENT DENSITY: 7.07 VOC LE: 4.7 VOC AP: 4.7 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
16D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate molybdate (24%*), medium mineral spirits, toluene (1-2%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 9.40 WT PCT SOLIDS: 54.29 VOL PCT SOLIDS: 36.13
SOLVENT DENSITY: 6.73 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
18D alkyd resin-g, alkyd resin-h, aromatic naphtha, butyl acetate, ethylbenzene (0-1%*), medium mineral spirits, tetrachloroisonsolinone yellow pigment, toluene (0-1%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 7.53 WT PCT SOLIDS: 40.24 VOL PCT SOLIDS: 30.76
SOLVENT DENSITY: 6.50 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
19D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), toluidine pigment, vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.91 WT PCT SOLIDS: 46.52 VOL PCT SOLIDS: 38.25
SOLVENT DENSITY: 6.85 VOC LE: 4.2 VOC AP: 4.2 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
2D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, carbon black, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (10-11%*), vm&p naphtha, xylene (2-3%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.85 WT PCT SOLIDS: 42.89 VOL PCT SOLIDS: 35.61
SOLVENT DENSITY: 6.96 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
21D alkyd resin-b, alkyd resin-c, alkyd resin-j, aluminum (2%*), aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (7%*), vm&p naphtha, xylene (2-3%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.93 WT PCT SOLIDS: 44.84 VOL PCT SOLIDS: 37.45
SOLVENT DENSITY: 6.99 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
23D alkyd resin-b, alkyd resin-c, alkyd resin-g, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (5%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 8.94 WT PCT SOLIDS: 52.02 VOL PCT SOLIDS: 37.47
SOLVENT DENSITY: 6.86 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
24D alkyd resin-f, alkyd resin-g, medium mineral spirits, titanium dioxide, toluene (1-2%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 8.52 WT PCT SOLIDS: 52.47 VOL PCT SOLIDS: 36.66
SOLVENT DENSITY: 6.39 VOC LE: 4.0 VOC AP: 4.0 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
25D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), dioxazine carbozole pigment, ethylbenzene (0-2%*), medium mineral spirits, naphthalene (0-1%*), toluene (4-5%*), vm&p naphtha, xylene (4-6%*), 1,2,4-trimethyl benzene (1-9%*)
GAL WT: 7.77 WT PCT SOLIDS: 42.64 VOL PCT SOLIDS: 34.96
SOLVENT DENSITY: 6.85 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
26D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, quinacridone pigment, vm&p naphtha, xylene (3-5%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 7.50 WT PCT SOLIDS: 36.75 VOL PCT SOLIDS: 28.93
SOLVENT DENSITY: 6.67 VOC LE: 4.7 VOC AP: 4.7 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
3D alkyd resin-a, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), ferric hexacyanoferrate (10%*), medium mineral spirits, toluene (9%*), xylene (4-5%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 8.00 WT PCT SOLIDS: 43.51 VOL PCT SOLIDS: 34.09
SOLVENT DENSITY: 6.86 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
32D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-2%*), medium mineral spirits, naphthalene (0-1%*), quinacridone pigment, vm&p naphtha, xylene (3-6%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.64 WT PCT SOLIDS: 40.13 VOL PCT SOLIDS: 32.63
SOLVENT DENSITY: 6.79 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
34D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), toluidine pigment, vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.82 WT PCT SOLIDS: 44.58 VOL PCT SOLIDS: 36.20
SOLVENT DENSITY: 6.79 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3

R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
35D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), quinacridone pigment, toluene (8-9%*), vm&p naphtha, xylene (2-[illegible]%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 7.73 WT PCT SOLIDS: 41.75 VOL PCT SOLIDS: 34.31
SOLVENT DENSITY: 6.85 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
36D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate molybdate (25%*), medium mineral spirits, toluene (3-4%*), vm&p naphtha, xylene (3-5%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 9.73 WT PCT SOLIDS: 56.60 VOL PCT SOLIDS: 38.12
SOLVENT DENSITY: 6.82 VOC LE: 4.2 VOC AP: 4.2 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
37D alkyd resin-b, alkyd resin-c, alkyd resin-j, aluminum (2%*), aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (6-7%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.80 WT PCT SOLIDS: 43.30 VOL PCT SOLIDS: 36.05
SOLVENT DENSITY: 6.92 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
38D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), iron oxide, medium mineral spirits, naphthalene (0-1%*), toluene (7%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 8.39 WT PCT SOLIDS: 48.88 VOL PCT SOLIDS: 37.95
SOLVENT DENSITY: 6.91 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
40D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead chromate (19%*), medium mineral spirits, naphthalene (0-1%*), toluene (7-8%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 9.11 WT PCT SOLIDS: 52.24 VOL PCT SOLIDS: 36.57
SOLVENT DENSITY: 6.86 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
41D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead chromate [illegible]%*), medium mineral spirits, naphthalene (0-1%*), toluene (1%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 9.17 WT PCT SOLIDS: 53.05 VOL PCT SOLIDS: 37.86
SOLVENT DENSITY: 6.93 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
42D alkyd resin-a, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), dioxazine carbozole pigment, ethylbenzene (0-2%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), vm&p naphtha, xylene (3-6%*), 1,2,4-trimethyl benzene (2-9%*)
GAL WT: 7.54 WT PCT SOLIDS: 36.80 VOL PCT SOLIDS: 29.13
SOLVENT DENSITY: 6.72 VOC LE: 4.8 VOC AP: 4.8 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
43D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), iron oxide, medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), vm&p naphtha, xylene (1-4%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 8.10 WT PCT SOLIDS: 45.47 VOL PCT SOLIDS: 34.30
SOLVENT DENSITY: 6.72 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
47D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (1-3%*), medium mineral spirits, naphthalene (0-1%*), perylene pigment, vm&p naphtha, xylene (7-10%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.80 WT PCT SOLIDS: 42.24 VOL PCT SOLIDS: 34.34
SOLVENT DENSITY: 6.86 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
5D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), iron oxide, medium mineral spirits, naphthalene (0-1%*), toluene (4%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 8.60 WT PCT SOLIDS: 48.95 VOL PCT SOLIDS: 35.42
SOLVENT DENSITY: 6.80 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
51D acrylic polymer, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, butyl acetate, [illegible]ene (0-1%*), ethylbenzene (0-1%*), iron oxide, medium mineral [illegible]its, methyl ethyl ketone (5%*), naphthalene (0-1%*), toluene (1-2%*), xylene (3-5%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.96 WT PCT SOLIDS: 43.16 VOL PCT SOLIDS: 35.56
SOLVENT DENSITY: 7.02 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
54D acetone, alkyd resin-g, alkyd resin-h, alkyd resin-i, butyl acetate, ethylbenzene (0-1%*), iron oxide, medium mineral spirits, toluene (4-5%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 7.64 WT PCT SOLIDS: 36.83 VOL PCT SOLIDS: 26.57
SOLVENT DENSITY: 6.57 VOC LE: 4.6 VOC AP: 4.0 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
56D alkyd resin-b, alkyd resin-c, alkyd resin-j, aluminum (2%*), aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), toluene (6-7%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (2-11%*)
GAL WT: 7.85 WT PCT SOLIDS: 43.88 VOL PCT SOLIDS: 36.38
SOLVENT DENSITY: 6.92 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
58D alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene(0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), phthalocyanine blue pigment, vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (2-12%*)
GAL WT: 7.74 WT PCT SOLIDS: 41.16 VOL PCT SOLIDS: 33.85
SOLVENT DENSITY: 6.88 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
59D alkyd resin-b, alkyd resin-c, alkyd resin-d, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), medium mineral spirits, naphthalene (0-1%*), phthalocyanine blue pigment, toluene (0-1%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.73 WT PCT SOLIDS: 42.17 VOL PCT SOLIDS: 34.63
SOLVENT DENSITY: 6.84 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
6D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, n-butyl alcohol (1%*), naphthalene (0-1%*), phthalocyanine green pigment, toluene (10%*), xylene (2-3%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 7.81 WT PCT SOLIDS: 41.37 VOL PCT SOLIDS: 33.14
SOLVENT DENSITY: 6.85 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
69D alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-j, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), medium mineral spirits, naphthalene (0-1%*), tetrachloroisonsolinone yellow pigment, toluene (6-7%*), vm&p naphtha, xylene (3-5%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 7.67 WT PCT SOLIDS: 40.63 VOL PCT SOLIDS: 32.39
SOLVENT DENSITY: 6.74 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-97902 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate molybdate (9%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), quinacridone pigment, vm&p naphtha, xylene (3-5%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 8.24 WT PCT SOLIDS: 45.21 VOL PCT SOLIDS: 32.45
SOLVENT DENSITY: 6.68 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-005 alkyd resin-f, alkyd resin-j, carbon black, ethylbenzene (0-1%*), lead napthenate (2%*), medium mineral spirits, toluene (2-3%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 7.50 WT PCT SOLIDS: 45.73 VOL PCT SOLIDS: 36.22
SOLVENT DENSITY: 6.38 VOC LE: 4.1 VOC AP: 4.1 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-082 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate (14%*), lead chromate molybdate (6%*), lead napthenate (%*), medium mineral spirits, toluene (0-1%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 9.07 WT PCT SOLIDS: 51.47 VOL PCT SOLIDS: 34.17
SOLVENT DENSITY: 6.69 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-421 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate (18%*), lead chromate molybdate (1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (0-1%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 8.97 WT PCT SOLIDS: 50.71 VOL PCT SOLIDS: 33.95
SOLVENT DENSITY: 6.69 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-508 alkyd resin-c, alkyd resin-e, alkyd resin-g, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 8.74 WT PCT SOLIDS: 50.30 VOL PCT SOLIDS: 35.59
SOLVENT DENSITY: 6.74 VOC LE: 4.3 VOC AP: 4.3 H: 2 F: 3

R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
93- 1863 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate molybdate (9%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), vm&p naphtha, xylene (2-3%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 8.13 WT PCT SOLIDS: 44.65 VOL PCT SOLIDS: 32.53
SOLVENT DENSITY: 6.67 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93- 3430 alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), phthalocyanine blue pigment, titanium dioxide, toluene (3-4%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.97 WT PCT SOLIDS: 42.35 VOL PCT SOLIDS: 32.59
SOLVENT DENSITY: 6.82 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93- 5127 alkyd resin-c, alkyd resin-e, alkyd resin-g, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (0-1%*), vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 8.53 WT PCT SOLIDS: 48.43 VOL PCT SOLIDS: 33.52
SOLVENT DENSITY: 6.62 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93- 6578 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate (18%*), lead chromate molybdate (1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (0-1%*), vm&p naphtha, xylene (1-2%*), 1,2,4-trimethyl benzene (1-6%*)
GAL WT: 8.97 WT PCT SOLIDS: 50.76 VOL PCT SOLIDS: 33.95
SOLVENT DENSITY: 6.69 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-21667 alkyd resin-c, alkyd resin-e, alkyd resin-g, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (0-1%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 8.58 WT PCT SOLIDS: 49.24 VOL PCT SOLIDS: 35.02
SOLVENT DENSITY: 6.70 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-24160 alkyd resin-a, alkyd resin-b, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), ferric hexacyanoferrate (2%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), phthalocyanine blue pigment, titanium dioxide, toluene (2-3%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 7.91 WT PCT SOLIDS: 41.86 VOL PCT SOLIDS: 32.24
SOLVENT DENSITY: 6.79 VOC LE: 4.6 VOC AP: 4.6 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-54701 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate (18%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (1-7%*)
GAL WT: 8.88 WT PCT SOLIDS: 50.00 VOL PCT SOLIDS: 33.79
SOLVENT DENSITY: 6.71 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
93-71890 alkyd resin-a, alkyd resin-b, alkyd resin-c, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate (15%*), lead chromate molybdate (%*), lead napthenate (%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, vm&p naphtha, xylene (1-3%*), 1,2,4-trimethyl benzene (2-10%*)
GAL WT: 8.91 WT PCT SOLIDS: 49.73 VOL PCT SOLIDS: 34.10
SOLVENT DENSITY: 6.80 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
93-77968 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), lead napthenate (1%*), medium mineral spirits, naphthalene (0-1%*), toluene (0-1%*), toluidine pigment, vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (1-9%*)
GAL WT: 7.72 WT PCT SOLIDS: 42.05 VOL PCT SOLIDS: 33.25
SOLVENT DENSITY: 6.70 VOC LE: 4.5 VOC AP: 4.5 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
93-95616 alkyd resin-a, alkyd resin-c, alkyd resin-e, aromatic hydrocarbon-a, aromatic hydrocarbon-b, cumene (0-1%*), ethylbenzene (0-1%*), lead chromate molybdate (2%*), lead napthenate (1%*), medium mineral spirits, naphthalene (0-1%*), titanium dioxide, toluene (0-1%*), toluidine pigment, vm&p naphtha, xylene (0-2%*), 1,2,4-trimethyl benzene (1-8%*)
GAL WT: 7.87 WT PCT SOLIDS: 43.46 VOL PCT SOLIDS: 33.47
SOLVENT DENSITY: 6.69 VOC LE: 4.4 VOC AP: 4.4 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

Notice: The data in this material safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process.

Product Manager - Refinish Sales

Prepared by D. G. Detweiler

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 11/30/97

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** MICRO-AIR

Chemical Family: Surfactant mixture. Aqueous solution.

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Surfactant Mixture	61790-12-3; 68439-57-6; 25322-68-3	None	None	None	< 15%
Potassium Hydroxide	1310-58-3	None	None	None	< 1.0%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	105	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	Nil	Solubility in Water:	100%
Freezing Point (oC):	-2	Specific Gravity:	1.01
Vapor Pressure mmHg @20 (oC):	N/Av	pH	ca. 11.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Fatty acid	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen.

Hazardous Polymerization. Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Contain spill by diking; on hard surface, vacuum up liquid or use absorbent media; on loose surface shovel up contaminated layer; remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 2 (Moderate)

PRIMARY ROUTE OF ENTRY: Dermal

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause severe irritation with corneal injury.
Skin Contact:	Prolonged or repeated skin may cause irritation.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Do **NOT** induce vomiting; give large quantities of water and at least one ounce of vinegar mixed with water; get immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquids into lungs. Do **NOT** give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do **NOT** wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life:	18 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard: Immediate Physical hazard: None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 04/10/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200) Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** POZZOLITH® NC534 (Formerly: CONSET® NC)

   Chemical Family: Cement dispersing agent.

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Calcium Nitrate	10124-37-5	None	None	None	< 40%
Sodium Thiocyanate	540-72-7	None	None	None	< 5%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	Nil	Solubility in Water:	100%
Freezing Point (oC):	-12	Specific Gravity:	1.34
Vapor Pressure mmHg @ 20 (oC):	N/Av	pH.	ca. 6.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av	Odor: Odorless	
Appearance: Dark brown liquid			

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

   Flash Point: Non-flammable Method: Not Applicable

   Auto-Ignition Temperature: Not Applicable

   Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

   Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

   Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	Moderate irritation and possible transient corneal injury.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested incidental to industrial handling are not expected to cause injury.

LC(50) Oral	CASRN 540-72-7	1380	mg/kg	Rat.
	10124-37-5	283	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. **FIRST AID:**

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9. **SPECIAL PROTECTION INFORMATION:**

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910 134 for recommended respiratory protection

10. **ADDITIONAL INFORMATION:**

Average Shelf Life:	12 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard Immediate Physical hazard: None
Title III Section 313	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 01/04/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** DELVO STABILIZER

   Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Naphthalene sulfonate salt	6419-19-8	None	None	None	< 5 %

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	105	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	-3	Specific Gravity:	1.07
Vapor Pressure mmHg @20 (oC):	N/Av	pH	ca. 3.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Slightly pungent	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

   Flash Point: Non-flammable Method: Not Applicable

   Auto-Ignition Temperature: Not Applicable

   Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

   Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

   Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong caustic compounds, oxidizing agents.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, and Phosphines.

Hazardous Polymerization. Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Eyes, Dermal, Ingestion

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties
Eyes:	May cause slight transient irritation
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury.

LD(50) Oral CASRN 6419-19-8 2910 mg/kg Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Do **NOT** induce vomiting; give large quantities of water followed by milk of magnesia; get immediate medical attention. If vomiting occurs spontaneously, keep head below hips to prevent aspiration of liquids into lungs. Do **NOT** give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do **NOT** wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life:	12 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard: Immediate Physical hazard: None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

MASTER BUILDERS TECHNOLOGIES, LTD.
1800 CLARK BOULEVARD
BRAMPTON, ONTARIO L6T 4M7
905-792-2012

24 HOUR CONTACT
CHEMTREC
800-424-9300
D.C. AREA 483-7616

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** POLYHEED® 997

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Sodium nitrate	7631-99-4	None	None	None	10-20%
Sodium thiocyanate	540-72-7	None	None	None	3-10%
Triethanolamine	102-71-6	None	None	None	< 5%

*1 Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (°C):	100	Water/Oil Distribution Coefficient:	N/Av
Percent VOC (w/w):	0	Solubility in Water:	100%
Freezing Point (°C):	0	Specific Gravity:	1.27
Vapor Pressure mmHg @20 (°C):	N/Av	pH:	ca. 8.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Musty	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

4 **FIRE AND EXPLOSION HAZARD DATA:** (cont'd)

Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: None known.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation: At room temperature, exposures to vapors are unlikely due to physical properties.

Eyes: Moderate irritation and possible transient corneal injury.

Skin Contact: Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.

Skin Absorption: Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity

Ingestion: Amounts ingested, incidental to industrial handling, are not expected to cause injury.

LC (50)	**Oral**	CASRN	100-71-6	8	gm/kg	Rat.
			540-72-7	764	mg/kg	Rat.
			7631-99-4	3236	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do **NOT** give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do **NOT** wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Nitrile gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV or TWA limits. Use NIOSH/OSHA approved respirators equipped required cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910 134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life: 18 Months

Special Instructions: Keep from freezing

REGULATORY INFORMATION:

Title III Section 302: No reportable chemicals.

Title III Section 311/312: Health hazard: Immediate
Physical hazard: None

Title III Section 313: CASRN 7631-99-4 < 20 %

State: California No reportable chemicals.

WHMIS Classification: Class D, Div. 2, Sub B

Canadian Domestic Substance List: All chemicals are listed

10. ADDITIONAL INFORMATION: (cont'd)

TRANSPORTATION

Shipping Name: NOT REGULATED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NO REPORTABLE CHEMICALS

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

This information is furnished without warranty, representation, or license of any kind, except that this information is accurate to the best of Master Builder's knowledge, or is obtained from sources believed by Master Builders to be accurate. No warranty is expressed or implied regarding the accuracy of this information or the results to be obtained from its use thereof. Master Builders assumes no responsibility for injuries proximately caused by use of the Material if reasonable safety procedures are not followed as stipulated in this Data Sheet. Additionally, Master Builders assumes no responsibility for injuries proximately caused by abnormal use of the Material even if reasonable safety procedures are followed. Buyer assumes the risk in its use of the Material.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 01/04/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** RHEOBUILD 1000

   Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Salt of Naphthalenesulfonate	37293-74-6	None	None	None	< 50%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	Nil	Solubility in Water:	100%
Freezing Point (oC):	0	Specific Gravity:	1.20
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	ca. 8.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Musty	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

   Flash Point: Non-flammable Method: Not Applicable

   Auto-Ignition Temperature: Not Applicable

   Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

   Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

   Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur.

Hazardous Polymerization Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking, vacuum up liquid or use absorbent media, remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	Moderate irritation and possible transient corneal injury.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury.

LC(50) Oral CASRN 37293-74-6 3800 mg/kg Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. **FIRST AID.**

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9. **SPECIAL PROTECTION INFORMATION:**

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. **ADDITIONAL INFORMATION:**

Average Shelf Life:	Refer to Product Data Sheet.
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals
Title III Section 311/312:	Health hazard. Immediate Physical hazard None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED
Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

MASTER BUILDERS
TECHNOLOGIES, LTD.
1800 CLARK BOULEVARD
BRAMPTON, ONTARIO L6T 4M7
905-792-2012

24 HOUR CONTACT
CHEMTREC
800-424-9300
D.C. AREA 483-7616

Prepared by: Department of Environment, Health & Safety
Revision Date: 06/26/2000

Control No. 01959

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** POZZOLITH® 320N

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Triethanolamine	102-71-6	None	None	None	< 20%

(*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (°C):	100	Water/Oil Distribution Coefficient:	N/Av
Percent VOC (w/w):	0	Solubility in Water:	100%
Freezing Point (°C):	0	Specific Gravity:	1.19
Vapor Pressure mmHg @20 (°C):	N/Av	pH:	ca. 8.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Musty	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon and Nitrogen.

Hazardous Polymerization: Will not occur.

6 **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause slight transient irritation.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested, incidental to industrial handling, are not expected to cause injury.
LD (50) Oral	CASRN 101-71-6 5160 mg/kg Rat.
Chronic:	Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.
	Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection wherever airborne concentrations exceed TLV or TWA limits. Use NIOSH/OSHA approved respirators equipped with required cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life:	18 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard: None Physical hazard: None
Title III Section 313:	None above demin'mis.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

Shipping Name: NOT REGULATED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NO REPORTABLE CHEMICALS

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

This information is furnished without warranty, representation, or license of any kind, except that this information is accurate to the best of Master Builder's knowledge, or is obtained from sources believed by Master Builders to be accurate. No warranty is expressed or implied regarding the accuracy of this information or the results to be obtained from its use thereof. Master Builders assumes no responsibility for injuries proximately caused by use of the Material if reasonable safety procedures are not followed as stipulated in this Data Sheet. Additionally, Master Builders assumes no responsibility for injuries proximately caused by abnormal use of the Material even if reasonable safety procedures are followed. Buyer assumes the risk in its use of the Material.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 04/18/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** RHEOBUILD® 3000 FC (Formerly: ADMIXTURE PS-1140)

   Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Copolymer mixture:	Proprietary	None	None	None	< 50%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	-6	Specific Gravity:	1.08
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	ca. 6.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Amber liquid		Odor: Very slight	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

   Flash Point: Non-flammable Method: Not Applicable

   Auto-Ignition Temperature: Not Applicable

   Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

   Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

   Special Fire & Unusual Hazards: None known

5. **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: None known.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause slight to moderate transient irritation.
Skin Contact:	Prolonged contact may cause slight irritation.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested incidental to industrial handling are not expected to cause injury.
LC(50) Oral	Proprietary 2000 mg/kg Rabbit.
Chronic:	Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910,1200.
	Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do **NOT** give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do **NOT** wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life:	12 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard: Immediate Physical hazard: None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof Consult Master Builders, Inc. for further information.

Lansing Board of Water & Light

MATERIAL SAFETY DATA SHEET

COAL ASH

General Information

Company's Name:	Lansing Board of Water & Light
Address:	PO Box 13007
Street:	123 W. Ottawa
City:	Lansing State: Michigan Zip: 48901
Company's Emergency Phone #:	517-371-6400
Company's Information Phone #:	517-371-6380
Date MSDS Prepared:	August 19, 1996
MSDS Preparer's Name:	Environmental Services Department

0

1. Material Identification
2. Ingredients and Hazards

Chemical/Material Name - COAL ASH

Synonyms: Fly ash, Bottom ash, Slag

Ingredient	CAS Number	Percent	OSHA PEL	ACGIH TLV
Amorphous Silicon Dioxide (Silica)	7631-86-9	1-55 %	6 mg/m³	10 mg/m³
Silica, Crystalline - Quartz	14808-60-7	0-7 %	See Table Z3	0.1 mg/m³
Aluminum Oxide	1344-28-1	15-40 %	15 mg/m³ total dust	10 mg/m³ total dust
Iron Oxide	13093-37-1	1-50 %	10 mg/m³ iron	5 mg/m³ iron
Titanium Dioxide	13463-67-7	0-5 %	15 mg/m³ total dust	10 mg/m³ total dust
Calcium Oxide	1305-78-8	0-30 %	5 mg/m³	2 mg/m³
Magnesium Oxide	1309-47-4	0-6 %	15 mg/m³ particulate	10 mg/m³ total dust
Sodium Oxide	1313-59-3	0-2 %	not established	not established
Potassium Oxide	12030-59-5	0-5 %	not established	not established
Sulfur Trioxide (SARA III)	7446-11-9	0-15%	not established	not established
Phosphorous Pentoxide (SARA III)	1314-56-3	0-1%	not established	not established
Arsenic (SARA III)	7440-38-2	0-1%	0.5 mg/m³ arsenic	0.1 mg/m³

3. Physical Data

Appearance And Odor:	Fly ash, minute glass spheres, light tan/gray to almost black color.
Boiling Point:	Not applicable
Melting Point:	> 1370 Celsius
Vapor Pressure (MM Hg/70 F):	Not applicable
Vapor Density (Air =1):	Not applicable
Specific Gravity:	2.0-3.2
Decomposition Temperature:	Not applicable
Evaporation Rate:	Not applicable
Solubility In Water:	Minimal
Percent Volatiles By Volume:	Not applicable
pH:	Not applicable

4. Fire & Explosion Hazard Data

Flash Point:	Not applicable
Flash Point Method:	Not applicable
Lower Explosive Limit:	Not applicable
Upper Explosive Limit:	Not applicable
Extinguishing Media:	Use media suitable for surrounding fire.
Special Fire Fighting Procedures:	Wear NIOSH/MSHA approved SCBA and full protective equipment
Unusual Fire And Explosion Hazards:	Non-flammable & non-explosive

5. Reactivity Data

Stability:	Yes
Conditions to Avoid:	None
Materials To Avoid:	None
Hazardous Decomposition Products:	None
Hazardous Polymerization Occur:	No
Conditions To Avoid (Polymerization):	Not applicable

6. Health Hazard Information

Route Of Entry - Inhalation	Yes
Route Of Entry - Skin	Yes
Route Of Entry - Ingestion	No
Health Hazard - Acute & Chronic	Primarily composed of inert dust (irritant to the mucus membrane), with low amounts of calcium oxide (irritant to the mucus membrane & wet skin) and crystalline silica (pneumoconiosis - producing dust)

When fly ash is handled in confined areas without adequate ventilation PEL may be exceeded for arsenic which is an OSHA designated carcinogen

Signs/Symptoms Of Overexposure

Acute: Exposure may result in irritation to eyes, skin or respiratory tract.

Chronic: Persistent exposure to airborne dust may decrease pulmonary function.

Medical Condition Aggravated By Exposure

None identified

Emergency/First Aid Procedure

Eye:: Immediately flush thoroughly with water for at least 15 minutes. Seek medical attention if irritation persists.
Skin: Immediately wash with soap and water. Seek medical attention if irritation persists.
Inhalation: Immediate remove affected person to fresh air. Seek medical attention immediately if unusual coughing, tightness in chest or shortness of breath occurs after exposure. Rinse mouth out with water.

7. Spill, Leak, and Disposal Procedures

If Material is Released or Spill:

Wet ash with water to reduce airborne dust.

Neutralizing Agent:

Not applicable

Waste Disposal Method:

Material may be disposed as a low hazard industrial waste in an appropriate solid waste landfill. Dispose of in accordance with federal, state, & local regulations.

Precautions-Handling/Storing:

Do not allow ash or dust to get in eyes, remain on skin, be inhaled, get in mouth or be swallowed.

Other Precautions:

Do not create unnecessary airborne dust when handling. Industrial hygiene surveys of worker exposure in specific ash handling operations are needed to determine the need for engineering controls of airborne dust levels.

8. Special Protection and Control Measures

Respiratory Protection: If airborne dust exposure approaches TLV or PEL, use NIOSH approved respirators.
Ventilation: Provide adequate ventilation.
Protective Gloves: Impervious gloves.
Eye Protection: Chemical workers goggles.
Work Hygienic Practices: Contact lenses should not be worn when working with ash.

MICHIGAN LIMESTONE OPERATIONS, LTD.

1035 CALCITE ROAD
ROGERS CITY, MICHIGAN 49779
(517) - 734 - 2131

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION

PRODUCT NAME: LIMESTONE
COMMON NAMES: CALCIUM CARBONATE, CALCITE
CAS. NO.: 1317-65-3

II. INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS

COMPOSITION	TYPICAL % WEIGHT	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
CALCIUM CARBONATE	99 +	15 MILLIGRAMS PER CUBIC METER OF AIR (TOTAL DUST) 5 MG/M3 FOR RESPIRABLE DUST	10 MILLIGRAMS PER CUBIC METER OF AIR (TOTAL DUST) 3 MG/M3 FOR RESPIRABLE DUST
SILICA (QUARTZ)	< 1.0		
RESPIRABLE FRACTION		10 MG/M3 % SiO2 + 2	0.1 MG SILICA / M3

III. PHYSICAL DATA

MELTING POINT:	DECOMPOSES AT APPROXIMATELY 1500 F AND LIBERATES CARBON DIOXIDE.
VAPOR PRESSURE:	NOT APPLICABLE
BOILING POINT:	NOT APPLICABLE
EVAPORATION RATE:	NOT APPLICABLE
SPECIFIC GRAVITY:	2.4 - 2.6 (TYPICAL)
APPEARANCE AND ODOR:	TAN/GRAY-BROWN IN COLOR AND ODORLESS.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NOT APPLICABLE
EXTINGUISHING MEDIA: WATER
UNUSUAL FIRE & EXPLOSIVE MEDIA: NONE

V. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED:
SWEEP OR VACUUM MATERIAL FROM SPILLAGE INTO A WASTE CONTAINER FOR DISPOSAL.
WASTE DISPOSAL METHOD:
THIS MATERIAL CAN BE DISPOSED OF IN A LANDFILL OR BY OTHER PROCEDURES WHICH ARE ACCEPTABLE UNDER FEDERAL, STATE AND LOCAL REGULATIONS.

ORIGINAL ISSUE DATE: 03/03/99 REVISED DATE: _____

VI. HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

LIMESTONE IS THE TECHNICAL OR AGRICULTURAL GRADE OF CALCIUM CARBONATE. THE MATERIAL IS ESSENTIALLY NON-TOXIC. EXTREMELY HIGH CONCENTRATIONS OF CALCIUM CARBONATE DUST ARE USUALLY SELF-LIMITING DUE TO THE NUISANCE CONDITIONS THEY MAY CREATE SUCH AS COUGHING, SNEEZING AND NASAL IRRITATION. LIMESTONE DUST MAY, HOWEVER, CONTAIN RESPIRABLE SILICA PARTICLES. SILICA IS CAPABLE OF CAUSING SILICOSIS IF INHALED IN HIGH ENOUGH CONCENTRATIONS OVER AN EXTENDED PERIOD OF TIME. EXPOSURE TO EXCESSIVE CONCENTRATIONS MAY AGGRAVATE PRE-EXISTING RESPIRATORY CONDITIONS. EXCESSIVE CONCENTRATIONS MAY CAUSE TRANSIENT EYE IRRITATION.

ROUTES OF EXPOSURE:
INHALATION: YES
INGESTION: YES
SKIN: NO

CARCINOGENICITY:
NTP: NO
OSHA: NO
IARC: NO

EMERGENCY AND FIRST AID PROCEDURES

FOR SKIN OR EYE IRRITATION, FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS, REFER TO MEDICAL AID. REMOVE FROM EXPOSURE IN CASES OF OVERWHELMING DUST GENERATION.

VII. REACTIVITY DATA

AVOID CONTACT WITH ACID. STABLE.
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY:
APPROPRIATE NIOSH APPROVED DUST RESPIRATORS DEPENDING UPON THE TYPE AND MAGNITUDE OF EXPOSURE.

SKIN:
GOOD PERSONAL HYGIENE, CLEAN WORK CLOTHS AND MOISTURIZING CREAMS.

EYE:
SAFETY GLASSES

VENTILATION:
MECHANICAL VENTILATION TO REDUCE DUST CONCENTRATIONS.

OTHER PROTECTIVE EQUIPMENT:
NONE.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
EXCESSIVE PARTICULATE IN WORKPLACE AIR TO BE AVOIDED.

THIS INFORMATION IS TAKEN FROM SOURCES OR BASED UPON DATA BELIEVED TO BE RELIABLE; HOWEVER MICHIGAN LIMESTONE OPERATIONS, LTD MAKES NO WARRANTY AS TO THE ABSOLUTE CORRECTNESS OR SUFFICIENCY OF ANY OF THE FOREGOING OR THAT ADDITIONAL OR OTHER MEASURES MAY NOT BE REQUIRED UNDER PARTICULAR CONDITIONS.

MICHIGAN LIMESTONE OPERATIONS, LTD.

ROUTE #1 P.O. BOX 400
CEDARVILLE, MI 49719
(906) - 484 - 2201

MATERIAL SAFETY DATA SHEET

I. IDENTIFICATION

PRODUCT NAME: DOLOMITE
COMMON NAMES: CARBONATE OF CALCIUM AND MAGNESIUM
CAS. NO : 16389-88-1

II. INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS

COMPOSITION	TYPICAL % WEIGHT	EXPOSURE LIMITS	
		OSHA PEL	ACGIH TLV
MIXTURE OF MAGNESIUM AND CALCIUM CARBONATES	99 +	15 MILLIGRAMS PER CUBIC METER OF AIR (TOTAL DUST) 5 MG/M3 FOR RESPIRABLE DUST	10 MILLIGRAMS PER CUBIC METER OF AIR (TOTAL DUST) 3 MG/M3 FOR RESPIRABLE DUST
SILICA (QUARTZ)	= 1.0		
RESPIRABLE FRACTION		10 MG/M3 / % SiO2 + 2	0.1 MG SILICA / M3

III. PHYSICAL DATA

MELTING POINT:	DECOMPOSES AT APPROXIMATELY 1500 F AND LIBERATES CARBON DIOXIDE.
VAPOR PRESSURE:	NOT APPLICABLE
BOILING POINT:	NOT APPLICABLE
EVAPORATION RATE:	NOT APPLICABLE
SPECIFIC GRAVITY:	2.6 - 2.8 (TYPICAL)
APPEARANCE AND ODOR:	GRAY AND WHITE. CHARACTERIZED BY LOW POROSITY AND USUALLY TRANSLUCENT, RESEMBLING GLASS IN LUSTER.

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT:	NOT APPLICABLE
EXTINGUISHING MEDIA:	WATER
UNUSUAL FIRE & EXPLOSIVE MEDIA:	NONE

V. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED:
SWEEP OR VACUUM MATERIAL FROM SPILLAGE INTO A WASTE CONTAINER FOR DISPOSAL.

WASTE DISPOSAL METHOD:
THIS MATERIAL CAN BE DISPOSED OF IN A LANDFILL OR BY OTHER PROCEDURES WHICH ARE ACCEPTABLE UNDER FEDERAL, STATE AND LOCAL REGULATIONS.

ORIGINAL ISSUE DATE: 03/03/98 REVISED DATE: _____

HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

DOLOMITE IS ESSENTIALLY A NON-TOXIC MATERIAL. EXTREMELY HIGH CONCENTRATIONS OF DOLOMITE DUST ARE SELF-LIMITING DUE TO THE NUISANCE CONDITIONS THEY MAY CREATE, SUCH AS COUGHING, SNEEZING AND NASAL IRRITATION. DOLOMITE MAY CONTAIN SMALL AMOUNTS OF RESPIRABLE SILICA PARTICLES. SILICA IS CAPABLE OF CAUSING SILICOSIS IF INHALED IN HIGH ENOUGH CONCENTRATIONS OVER AN EXTENDED PERIOD OF TIME. EXPOSURE TO EXCESSIVE CONCENTRATIONS MAY AGGRAVATE PRE-EXISTING RESPIRATORY CONDITIONS. EXCESSIVE CONCENTRATIONS MAY CAUSE TRANSIENT EYE IRRITATION.

ROUTES OF EXPOSURE:

INHALATION: YES
INGESTION: YES
SKIN: NO

CARCINOGENICITY:

NTP: NO
OSHA: NO
IARC: NO

EMERGENCY AND FIRST AID PROCEDURES

FOR SKIN OR EYE IRRITATION, FLUSH WITH WATER FOR 15 MINUTES. IF IRRITATION PERSISTS, REFER TO MEDICAL AID. REMOVE FROM EXPOSURE IN CASES OF OVERWHELMING DUST GENERATION.

VII. REACTIVITY DATA

AVOID CONTACT WITH ACID. STABLE.
HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY

APPROPRIATE NIOSH APPROVED DUST RESPIRATORS DEPENDING UPON THE TYPE AND MAGNITUDE OF EXPOSURE.

SKIN:

GOOD PERSONAL HYGIENE, CLEAN WORK CLOTHS AND MOISTURIZING CREAMS.

EYE:

SAFETY GLASSES

VENTILATION:

MECHANICAL VENTILATION TO REDUCE DUST CONCENTRATIONS.

OTHER PROTECTIVE EQUIPMENT:

NONE.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

EXCESSIVE PARTICULATE IN WORKPLACE AIR TO BE AVOIDED.

THIS INFORMATION IS TAKEN FROM SOURCES OR BASED UPON DATA BELIEVED TO BE RELIABLE; HOWEVER MICHIGAN MESTONE OPERATIONS, LTD. MAKES NO WARRANTY AS TO THE ABSOLUTE CORRECTNESS OR SUFFICIENCY OF ANY OF THE FOREGOING OR THAT ADDITIONAL OR OTHER MEASURES MAY NOT BE REQUIRED UNDER PARTICULAR CONDITIONS.

Master Builders MBT FAXLine
888-MBT-4FAX
(888-628-4329)

Master Builders Technologies

From: **Master Builders, Inc.**
Phone No: **800-MBT-9990 (800-628-9990)**
Fax No: **216-831-6910**
Web Site **www.masterbuilders.com**

The following documents include information you requested through the MBT FAXline. If you have questions regarding the information please feel free to call the above toll free customer service line. Thank you for your interest in Master Builders quality products and services.

INNOVATIVE SOLUTIONS FOR A STRONGER TOMORROW

Date: March 15, 2000 - 07:52AM
Total Pages: 5 (Including this cover)
To:
Fax #: 5178929593

You have requested the following documents:

Pozzolith NC 534 MSDS

NEW! **Installation Bulletins are now available on Construction Products.**

OUR VISION IS TO BE THE MOST RESPONSIVE, KNOWLEDGEABLE, PROVIDER OF ADVANCED CONSTRUCTION MATERIALS AND SYSTEMS

Building Tomorrow Together® SKW-MBT

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 04/10/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** POZZOLITH® NC534 (Formerly: CONSET® NC)

   Chemical Family: Cement dispersing agent.

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Calcium Nitrate	10124-37-5	None	None	None	< 40%
Sodium Thiocyanate	540-72-7	None	None	None	< 5%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	Nil	Solubility in Water:	100%
Freezing Point (oC):	-12	Specific Gravity:	1.34
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	ca. 6.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Odorless	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

   Flash Point Non-flammable Method: Not Applicable

   Auto-Ignition Temperature: Not Applicable

   Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

   Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

   Special Fire & Unusual Hazards: None known.

5 **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability. Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking, vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	Moderate irritation and possible transient corneal injury.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested incidental to industrial handling are not expected to cause injury.

LC(50) Oral	CASRN	540-72-7	1380	mg/kg	Rat.
		10124-37-5	283	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8. FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9. SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910 134 for recommended respiratory protection.

10. ADDITIONAL INFORMATION:

Average Shelf Life:	12 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311/312:	Health hazard: Immediate Physical hazard: None
Title III Section 313:	No reportable chemicals.
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. ADDITIONAL INFORMATION: (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

Master Builders Technologies

POZZOLITH® 220-N

Concrete admixture

DESCRIPTION:

POZZOLITH® 220-N is a ready-to-use, liquid admixture for making more uniform and predictable quality concrete. It meets ASTM C 494 requirements for Type A water-reducing, Type B retarding and Type D retarding and water-reducing admixtures, specifically:

- Increased strength—compressive and flexural
- Relative durability to damage from freezing and thawing—well above industry standards
- Reduced water content required for a given workability
- Normal-setting characteristics

ADVANTAGES:

Concrete with POZZOLITH 220-N admixture has a setting time comparable to plain concrete while providing the following special qualities:

- Improved workability
- Reduced segregation
- Improved finishing characteristics for flatwork and cast surfaces
- Effective as a singular admixture or as a component in a Master Builders Admixture System

WHERE TO USE:

POZZOLITH 220-N admixture is recommended for use in all concrete where normal-setting characteristics are desired.

As a result of the advantages listed above, this admixture improves pumped concrete, shotcrete (wet mix), and conventionally placed concretes. It improves plain, reinforced, precast, prestressed, lightweight or standard weight concrete.

POZZOLITH 220-N admixture can be used with portland cements approved under AASHTO, ASTM and CRD specifications. The use of POZZOLITH 220-N and a Master Builders air-entraining admixture is recommended whenever concrete is required to withstand freeze/thaw cycles. When used in conjunction with another admixture, each admixture must be dispensed separately into the mix. By itself, POZZOLITH 220-N admixture does not entrain air.

POZZOLITH 220-N admixture will not initiate or promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally added calcium chloride or chloride-based ingredients. The admixture, due to chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00015% (1.5 ppm) chloride ions by weight of the cement when used at the rate of 1 fl. oz. per 100 lbs. (65 ml per 100 kg) of cement.

POZZOLITH 220-N admixture can be used in white or colored concrete and in architectural concrete.

QUANTITY TO USE:

POZZOLITH 220-N admixture is recommended for use at a rate of 2 to 5 fl ozs per 100 lbs (130 to 325 mL per 100 kg) of cement for most concrete mixes using average concrete ingredients. Because of variations in job conditions and concrete materials, dosage rates other than the recommended amounts may be required. In such cases, contact your local Master Builders representative.

PACKAGING:

POZZOLITH 220-N admixture is supplied in 55 U.S. gallon (208 liter) drums and by bulk delivery.

TEMPERATURE PRECAUTION:

If POZZOLITH 220-N admixture has frozen, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

For additional information on POZZOLITH 220-N admixture or on its use in developing a concrete mix with special performance characteristics, contact your local Master Builders representative.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 11/30/97

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200) Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

1 **PRODUCT NAME:** POZZOLITH 220N

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

		EXPOSURE LIMITS*			
	CASNO	TLV	STEL	PEL	CONTENT
Triethanolamine	102-71-6	None	None	None	< 20%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	0	Specific Gravity:	1.19
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	ca. 8.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Musty	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards None known.

5 **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable Not sensitive to mechanical impact.

Incompatibility Strong mineral acids

Hazardous Decomposition Products: (After water has evaporated) Oxides of Carbon and Nitrogen.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause slight transient irritation.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury.

LD(50) Oral	CASRN	101-71-6	5160	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200 .

Materials are not known mutagenic, teratogenic, or reproductive health hazards

8 FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse.

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9 SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLV's is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection

10 ADDITIONAL INFORMATION:

Average Shelf Life	18 Months
Special Instructions:	Keep from freezing

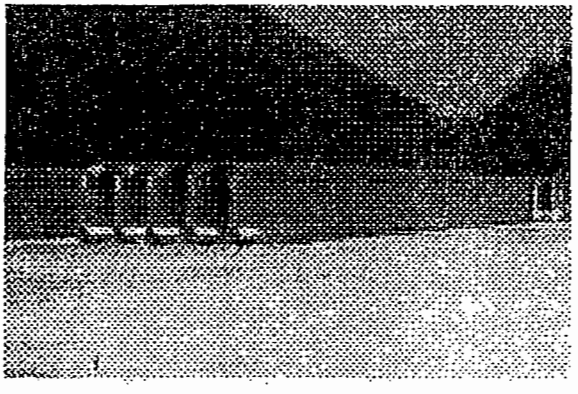
REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals
Title III Section 311/312:	Health hazard: None Physical hazard: None
Title III Section 313	No reportable chemicals.
State: California	No reportable chemicals
WHMIS Classification	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

Master Builders Technologies

RHEOBUILD® 3000FC

High-range water-reducing admixture



DESCRIPTION:

RHEOBUILD® 3000FC ready-to-use high-range water-reducing admixture is a new generation of admixture based on GLENIUM™ Technology. **RHEOBUILD 3000FC** admixture can be used to produce rheoplastic concrete. Rheoplastic concrete flows easily, maintaining workability for long periods of time without any affect on setting time. **RHEOBUILD 3000FC** admixture meets ASTM C494 requirements for Type A, water-reducing, and Type F, high-range water-reducing admixture.

RECOMMENDED FOR:

- Use in concrete where faster setting characteristics, enhanced surface appearance and accelerated strength development is desired
- Use in all concrete where control of workability and setting time is critical
- Use in concrete where high-range water reduction (12 to 40%) is necessary
- Use in concrete where high early and ultimate strengths and increased durability is required

FEATURES/BENEFITS:

- Reduced water content for a given slump
- Provides linear water reduction throughout the recommended dosage range
- Produces a cohesive and non-segregating concrete mixture
- Faster setting times and strength development
- Increased compressive strength and flexural strength performance at all ages
- Results in lower production cost due to faster placement, enhanced finishing, and reduced curing costs

PERFORMANCE DATA:

MIX DATA
658 lb of Type III cement per cubic yard (390 kg/m³); slump, 6 in. (150 mm); Air content, 5 to 6%; Concrete temperature, 65 °F (18 °C); Curing temperature, 65 °F (18 °C).

Compressive Strength Performance

	8 h		12 h	
	psi	MPa	psi	MPa
Conventional Superplasticizer	390	2.7	3090	21.2
RHEOBUILD 3000FC	1230	8.5	4100	28.2

MIX DATA
658 lb of Type I cement per cubic yard (390 kg/m³); Slump, 8 to 9 in. (200 to 225 mm), Non-air-entrained concrete; Concrete temperature, 70 °F (21 °C); Dosage rate of admixtures adjusted to obtain 30% water reduction.

Setting Time Performance

Mix	Initial set h:min	Difference h:min
Plain	3:58	---
Conventional Superplasticizer	7:15	+3:17
RHEOBUILD 3000FC Admixture	4:42	+0:44

NOTE: The data shown is based controlled laboratory tests. Reasonable variations from the results shown here may be experienced as a result of differences in concrete making materials and jobsite conditions.

QUANTITY TO USE:

RHEOBUILD 3000FC high-range water-reducing admixture has a recommended dosage range of 4 to 8 fl oz per 100 lb (260 to 390 mL per 100 kg) of cement for most concrete mixes. The dosage range is applicable to most concrete mixes using average concrete ingredients. However, variations in job conditions and concrete materials, such as silica fume, may require dosage rates outside the recommended range. In such cases, contact your local Master Builders representative.

RATE OF HARDENING:

RHEOBUILD 3000FC admixture is formulated to produce normal to accelerated setting characteristics throughout its recommended dosage range while providing enhanced workability retention.

Setting time of concrete is influenced by the chemical and physical composition of the basic ingredients of the concrete, temperature of the concrete, and climatic conditions. Trial mixes should be made with actual production materials to determine the dosage required for a specified setting time and a given strength requirement.

DIRECTIONS FOR USE:

Unlike conventional superplasticizers, **RHEOBUILD 3000FC** admixture can be added with the initial mix water or delayed until the final water is added to the mix.

NOTE: For directions on the proper evaluation of the **RHEOBUILD 3000FC** admixture in specific applications, contact your local Master Builders representitive.

PACKAGING:

RHEOBUILD 3000FC admixture is supplied in 55 U.S. gal (208 L) drums, 275 U.S. gal (1,040 L) totes and by bulk delivery.

TEMPERATURE PRECAUTION:

If **RHEOBUILD 3000FC** admixture freezes, thaw at 45 °F (7 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

NON-CHLORIDE, NON-CORROSIVE:

RHEOBUILD 3000FC admixture will neither initiate nor promote corrosion of reinforcing steel embedded in concrete, pre-stressed concrete or concrete placed on galvanized steel floor and roof systems. Neither calcium chloride nor any chloride-based ingredients are used in the manufacture of **RHEOBUILD 3000FC** admixture. In all concrete applications, **RHEOBUILD 3000FC** admixture conforms to the most stringent or minimum chloride ion limits currently suggested by construction industry standards and practices.

For additional information on **RHEOBUILD 3000FC** admixture or its use in developing a concrete mixture with special performance characteristics, contact your local Master Builders representative.

RELATED BULLETINS:

Material Safety Data Sheet --- **RHEOBUILD 3000FC ADMIXTURE**

Master Builders, Inc.

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5554
(800) MBT-9990
Fax (216) 831-6910

Canada
3637 Weston Road
Toronto, Ontario M9L 1W1
(800) 387-5362
Fax (416) 741-7925

Mexico
Blvd. M. Avila Camacho 80, 3er Piso
53390 Naucalpan, México
011-525-557-5544
Fax 011-525-395-7903

® Registered Trademark of MBT Holding AG
© 1998, Master Builders, Inc.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 09/18/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

1. **PRODUCT NAME:** RHEOBUILD® 3000 FC (Formerly: ADMIXTURE PS-1140)

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Copolymer mixture.	Proprietary	None	None	None	< 50%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	-5	Specific Gravity:	1.08
Vapor Pressure mmHg (@20 (oC):	N/Av	pH:	ca. 6.5
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av	Odor: Very slight	
Appearance: Amber liquid			
N/Av = Not Available	N/Ap = Not Applicable		ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards: None known.

5 **REACTIVITY DATA:** HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: None known.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur

Hazardous Polymerization: Will not occur

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility

7 **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause slight to moderate transient irritation
Skin Contact:	Prolonged contact may cause slight irritation.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested incidental to industrial handling are not expected to cause injury
LC(50) Oral	Proprietary 2000 mg/kg Rabbit
Chronic:	Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.
	Materials are not known mutagenic, teratogenic, or reproductive health hazards

curacy
ation.

Master Builders Technologies

RHEOBUILD® 1000

For the production of rheoplastic concrete

DESCRIPTION:

RHEOBUILD® 1000 high-range, water-reducing admixture, is one of a complete line of RHEOBUILD admixtures formulated to produce rheoplastic concrete. Rheoplastic concrete flows easily, maintaining high plasticity for time periods unmatched by any other superplasticized concrete. Yet it has the low water/cement ratio of no-slump concrete, providing excellent engineering (hardened) properties. The slump-retention characteristics of rheoplastic concrete permit the addition of RHEOBUILD 1000 admixture at the batch plant.

This ready-to-use, liquid admixture meets ASTM C 494 requirements for Type A and Type F admixtures.

ADVANTAGES IN THE PLASTIC STATE:

RHEOBUILD 1000 admixture aids in the production of concrete with these special qualities:

- Plasticity range of 8 to 11" (200 to 280 mm)
- Extended slump retention
- Controlled time of set
- Cohesive and non-segregating
- Minimal bleed water

ADVANTAGES IN THE HARDENED STATE:

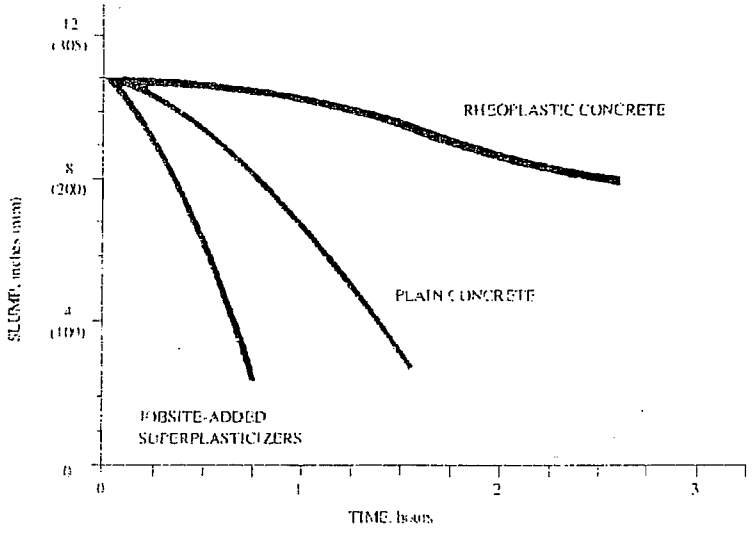
Through improved cement hydration efficiency, less dependence on consolidation energy and potential mix proportion adjustments, concrete treated with RHEOBUILD 1000 admixture provides the following engineering properties:

- Higher earlier strengths than can be achieved with conventional superplasticizers
- Increased ultimate compressive strength
- Higher modulus of elasticity
- Improved bond strength to steel
- Low permeability
- High durability
- Reduced shrinkage and creep
- Highly reliable in-place structural integrity

BENEFITS:

The economic benefits are both immediate and long-term, and extend to the total construction team. Use of rheoplastic concrete saves job time and cost through higher productivity rates or reduced labor. The higher early strength achieved with rheoplastic concrete allows for accelerated construction methods, resulting in completion dates ahead of schedule. Also, rheoplastic concrete permits engineering specification changes that allow for greater limits on the free-fall of concrete, lift heights and concrete temperatures, and potential economic mix adjustments.

SLUMP RETENTION VS. TIME



59 / 2 / 1

WHERE TO USE:

RHEOBUILD 1000 admixture is recommended for use in concrete where high plasticity, normal-setting characteristics and accelerated strengths are desired.

As a result of the preceding advantages and benefits, this admixture will improve performance in prestressed, precast and ready-mixed concrete applications.

RHEOBUILD 1000 admixture can be used with portland cements approved under ASTM, AASHTO or CRD specifications. The use of RHEOBUILD 1000 and a Master Builders air-entraining admixture is recommended whenever concrete is required to withstand freeze/thaw cycles. It is strongly recommended that concrete be properly cured.

RHEOBUILD 1000 admixture can be used effectively as a singular admixture or as a component in a Master Builders admixture system. When used in conjunction with another admixture, each admixture must be dispensed separately into the mix.

DIRECTIONS FOR USE:

Because slump retention is increased using RHEOBUILD 1000 admixture, it may be batched at the ready-mix plant as opposed to jobsite addition often required when using other high-range water-reducers.

NOTE: For directions on the proper evaluation and use of RHEOBUILD 1000 admixture in specific applications, contact your local Master Builders representative.

WORKABILITY:

Concrete containing RHEOBUILD 1000 admixture has the ability to maintain a rheoplastic state [8 to 11" (200 to 280 mm)] for up to two hours, if such workability is required. The precise duration of workability depends not only on temperature, but also on the type of cement, mix proportions, the nature of the aggregates, the method of transport, and the dosage rate of RHEOBUILD 1000 admixture.

For additional information on RHEOBUILD 1000 admixture or on its use in developing a concrete mixture with special performance characteristics, contact your local Master Builders representative.

QUANTITY TO USE:

RHEOBUILD 1000 admixture is recommended for use at a rate of 10 to 25 fl oz per 100 lb (0.65 to 1.6 liters per 100 kg) of cementitious materials, depending upon the application, and the amount of strength acceleration needed or slump increase desired.

This dosage range applies for most concrete mixes using average concrete ingredients. However, variations in job conditions and concrete materials, such as silica fume, may make usage rates outside the recommended dosage range desirable. In such cases, contact your local Master Builders representative.

RATE OF HARDENING:

RHEOBUILD 1000 admixture is formulated to produce normal-setting characteristics throughout its recommended dosage range.

Setting time of concrete is influenced by the chemical and physical composition of the basic ingredients of the concrete, temperature of the concrete and climatic conditions. Trial mixes should be made with job materials to determine the dosage required for a specified setting time and a given strength requirement.

PACKAGING:

RHEOBUILD 1000 admixture is supplied in 55 U.S. gallon (208 liter) drums and bulk delivery.

TEMPERATURE PRECAUTION:

If RHEOBUILD 1000 admixture has frozen, thaw at 45 °F (7 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

NON-CHLORIDE, NON-CORROSIVE:

RHEOBUILD 1000 admixture will not initiate or promote corrosion of reinforcing steel embedded in concrete, prestressed concrete or concrete placed on galvanized steel floor and roof systems. Neither calcium chloride nor any chloride-based ingredients are used in the manufacture of RHEOBUILD 1000. In all concrete applications, RHEOBUILD 1000 admixture conforms to the most stringent or minimum chloride ion limits currently suggested by construction industry standards and practices.

Master Builders, Inc.

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5554
(800) MBT-9990
Fax (216) 831-6910

Canada
3637 Weston Road
Toronto, Ontario M9L 1W1
(800) 387-5862
Fax (416) 741-7925

Mexico
Blvd. M. Avila Camacho 80, 3er Piso
53390 Naucalpan, México
011-525-557-5544
Fax 011-525-395-7903

® Registered Trademark of MBT Holding AG
©1998, Master Builders, Inc.

rhb1000.p65 #112474
Printed in U.S.A. 698

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 01/04/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

1 **PRODUCT NAME:** RHEOBUILD 1000

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Salt of Naphthalenesulfonate	37293-74-6	None	None	None	< 50%

*: Refer to Section 7 for available LD/LC(50) Health Hazard Data

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	Nil	Solubility in Water:	100%
Freezing Point (oC):	0	Specific Gravity:	1.20
Vapor Pressure mmHg (@20 (oC):	N/Av	pH:	ca. 8.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av	Odor: Musty	
Appearance: Dark brown liquid			

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong mineral acids.

Hazardous Decomposition Products: (After water has evaporated) Oxides of Carbon, Nitrogen and Sulfur

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media, remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility

7 **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	Moderate irritation and possible transient corneal injury.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity

Ingestion. Amounts ingested incidental to industrial handling are not expected to cause injury.

LC(50) Oral	CASRN 37293-74-6 3800 mg/kg Rat.
Chronic:	Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200
	Materials are not known mutagenic, teratogenic, or reproductive health hazards

8 **FIRST AID:**

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration. preferably mouth-to-mouth. Seek medical attention.

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention Wash contaminated clothing before reuse

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9 **SPECIAL PROTECTION INFORMATION:**

Ventilation Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLVs is especially important Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection

10 **ADDITIONAL INFORMATION:**

Average Shelf Life	Refer to Product Data Sheet.
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302:	No reportable chemicals.
Title III Section 311 312:	Health hazard: Immediate Physical hazard: None
Title III Section 313	No reportable chemicals
State: California	No reportable chemicals.
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED
Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL Not Listed	ND = Not Determined	

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

Master Builders Technologies

DELVO® STABILIZER

Hydration control admixture

DESCRIPTION:

DELVO® Stabilizer is a ready-to-use, liquid admixture for making more uniform and predictable high-performance concrete. DELVO Stabilizer retards setting time by controlling the hydration of portland cement and facilitating placing and finishing operations. It can be used to stabilize returned plastic concrete and concrete washwater to reduce waste and increase profits.

DELVO Stabilizer meets ASTM C 494 requirements for Type B, Retarding, and Type D, Water-Reducing and Retarding, admixtures, specifically:

- Increased strength - compressive and flexural
- Relative durability to damage from freezing and thawing - well above industry standards
- Reduced water content required for a given workability
- Retarded-setting time characteristics

ADVANTAGES:

The set-retarding characteristics of DELVO Stabilizer aid in the production of concrete with the following special qualities:

- Improved workability
- Reduced segregation
- Superior finishing characteristics for flatwork and cast surfaces
- Moderate to extended retardation - depending on the dosage rate used
- Provides flexibility in the scheduling of placing and finishing operations
- Offsets the effects of slump loss during extended delays between mixing and placing
- Helps eliminate cold joints
- Allows for dead-load deflection to take place (before concrete sets) in extended pours for bridge decks, cantilevers, nonshored structural elements, etc.
- Effective as a singular admixture or as a component in a Master Builders Admixture System
- Reduces waste associated with concrete washwater and returned concrete

WHERE TO USE:

DELVO Stabilizer is recommended for use in all types of concrete where moderate to extended retardation of set time and improved performance are desired.

This admixture improves pumped concrete, shotcrete (wet mix) and conventionally-placed concretes. It improves plain, reinforced, precast, prestressed, lightweight and normal weight concrete.

Primary Applications*

There are three primary applications of DELVO Stabilizer.

1. **Stabilization of concrete washwater**
2. **Stabilization of returned plastic concrete**
3. **Stabilization of freshly batched concrete for long hauls**

DELVO Stabilizer can be used with portland cements approved under AASHTO and CRD specifications. The use of DELVO Stabilizer and a Master Builders air-entraining admixture is recommended when concrete will be required to withstand freeze-thaw cycles. When used in conjunction with another admixture, each admixture must be dispensed separately into the mix.

DELVO Stabilizer will not initiate or promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally-added calcium chloride or chloride-based ingredients. The admixture will contribute less than 0.00014% (1.4 ppm) chloride ions by weight of cement when used at a dosage rate of 1 fl oz per 100 lb (65 mL/100 kg) of cement.

DELVO Stabilizer can be used in white or colored concrete and in architectural concrete.

** For more complete information, please refer to corresponding Data Sheets for the three primary applications of DELVO Stabilizer. These Data Sheets are available from your local Master Builders Representative.*

QUANTITY TO USE:

DELVO Stabilizer is recommended for use at the rate of 4 ± 1 fl oz per 100 lb (260 ± 65 mL/100 kg) of cement for most concrete mixes using average concrete ingredients. Because of variations in job conditions and concrete materials, dosage rates other than the recommended amounts may be required. In such cases, contact your local Master Builders Representative.

RATE OF HARDENING:

The temperature of a concrete mix and the ambient temperature (forms, earth, air, etc.) affect the hardening rate of concrete. At higher temperatures, concrete hardens more rapidly which may cause problems with placing and finishing.

One of the functions of DELVO Stabilizer is to retard the set of concrete. Within the normal dosage range, it will generally extend the working and setting times of concrete containing normal portland cement, fly ash, slag and silica fume approximately 1 hour to 5 hours compared to a plain concrete mix. This depends on job materials and temperatures, and trial mixes should be made under approximate job conditions to determine the dosage required.

COMPRESSIVE STRENGTH:

Concrete produced with DELVO Stabilizer admixture will develop higher early (within 24 hours) and higher ultimate strengths than plain concrete when used within the recommended dosage range and under normal, comparable curing conditions.

When DELVO Stabilizer is used in heat-cured concrete, the length of the preheating period should be increased until the initial set of the concrete is achieved. The actual heat-curing period is then reduced accordingly to maintain existing production cycles without sacrificing early or ultimate strengths.

PACKAGING:

DELVO Stabilizer is supplied in 55 U.S. gallon (208 liter) drums and by bulk delivery.

TEMPERATURE PRECAUTION:

If DELVO Stabilizer freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

For more information on DELVO Stabilizer, contact your local Master Builders Representative.

Master Builders, Inc.

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5534
(800) MBT-9990
Fax (216) 831-6910

Canada
3637 Weston Road
Toronto, Ontario M9L 1W1
(800) 387-3862
Fax (416) 741-7925

Mexico
Blvd. M. Avila Camacho 80, 3er Piso
53390 Naucalpan, México
011-525-557-5544
Fax 011-525-395-7903

Visit us on the Web for the most current product information and news: www.masterbuilders.com

®Registered Trademark MBT Holding AG
©1998, Master Builders, Inc.

Printed in U.S.A. 898
File: delvstab #115140

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 01/04/98

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

1 **PRODUCT NAME:** DELVO STABILIZER

Chemical Family: Cement Dispersing Agent

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Naphthalene sulfonate salt	6479-19-3	None	None	None	< 5 %

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data.

3 **PHYSICAL DATA:**

Boiling Point (oC):	105	Water/Oil Distribution Coefficient	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	-3	Specific Gravity	1.07
Vapor Pressure mmHg (@20) (oC):	N/Av	pH:	ca. 3.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold (ppm)	N/Av		

Appearance: Dark brown liquid
Odor: Slightly pungent

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No. 0 (Minimal)

Flash Point: Non-flammable Method Not Applicable

Auto-Ignition Temperature Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards None known.

5 **REACTIVITY DATA:** HMIS Hazard Rating No 0 (Minimal)

Stability: Stable Not sensitive to mechanical impact.

Incompatibility: Strong caustic compounds, oxidizing agents.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, and Phosphines.

Hazardous Polymerization: Will not occur

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility

7 **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Eyes, Dermal, Ingestion

Effects Of Overexposure

Inhalation	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause slight transient irritation.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.

Ingestion: Amounts ingested incidental to industrial handling are not expected to cause injury.

LD(50) Oral	CASRN 6419-19-8	2910	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards

Master Builders Technologies

MB AE® 90

Admixture for entraining air in concrete

DESCRIPTION:

MB AE 90 admixture is an air-entraining admixture which meets the requirements of ASTM C 260, AASHTO M 154 and CRD-C 13.

ADVANTAGES OF AIR ENTRAINMENT:

The entrainment of air in concrete results in the following improvements in concrete quality:

- Increased resistance to damage from freezing and thawing
- Increased resistance to scaling from deicing salts
- Reduced permeability—increased watertightness
- Reduced segregation and bleeding
- Improved plasticity and workability
- Improved properties of concrete block, and pipe.

Concrete durability research has established that the best protection for concrete from the adverse effects of freeze/thaw cycles and deicing salts results from: (a) proper air content in the hardened concrete; (b) a suitable air-void system in terms of bubble size and spacing; and (c) adequate concrete strength, assuming the use of sound aggregates and proper mixing, placing, handling and curing techniques.

Control of air content should be based upon determinations made on concrete at the time of placement, following adjustment of the batch to proper consistency (slump). The dosage rate of an air-entraining admixture depends on the air content to be obtained along with many other factors. The amount normally required is reduced by the introduction of a water-reducing, set-controlling admixture.

When unusually low or high amounts of an air-entraining admixture are required to achieve normal ranges of air content or if the required amount of air-entraining admixture necessary to achieve required levels of air content is observed to change significantly under given conditions, the reason should be investigated. In such cases, it is especially important to determine: (a) that a proper amount of air is contained in the fresh concrete at the point of placement; and (b) that a suitable air-void system is being obtained in the hardened concrete.

FEATURES:

Ready to Use—Solution is the proper concentration for rapid, accurate dispensing.

Compatible for Use—MB AE 90 admixture is compatible with concrete containing other admixtures; water-reducers, high-range water-reducers, accelerators, retarders, and water repellents.

The use of MB AE 90 air-entraining admixture with Master Builders water-reducing, set-controlling admixtures forms a desirable combination for producing high-quality normal or lightweight concrete. Heavyweight concrete normally does not contain entrained air.

NOTE: When two or more admixtures are used, each must be added to the mix separately (through dispensers or manually) and must not be mixed with each other prior to adding to the concrete mix.

For optimum, consistent performance, the air-entraining admixture should be dispensed on damp, fine aggregate. When using lightweight fine aggregate, field evaluations should be conducted to determine the best location to dispense the air-entraining admixture—on the damp, fine aggregate or with the initial batch water.

USAGE INFORMATION:

MB AE 90 admixture is a ready-to-use solution. Do not dilute or mix it with any other admixture.

Add MB AE 90 admixture to the concrete mix using a dispenser designed for air-entraining admixtures; or add manually using a suitable measuring device that ensures accuracy within plus or minus 3% of the required amount.

There is no standard dosage rate for MB AE 90 admixture. The exact quantity of air-entraining admixture needed for a given air content of concrete is not predictable because of differences in concrete-making materials. Typical factors which might influence the amount of entrained air are: temperature, cement, sand gradation, sand-aggregate ratio, slump, means of conveying and placing, use of extra fine materials such as fly ash, etc.

The amount of MB AE 90 admixture used will depend upon the amount of entrained air required under actual job conditions. In a trial mix, use 1/4 to 4 fl oz/ 100 lbs (16 to 260 mL/100 kg) of cement.
In mixes containing water-reducing, set-controlling admixtures, the amount of MB AE 90 needed may be somewhat less than the amount required in plain concrete. In mixes requiring a higher or lower dosage to obtain the desired air content, consult your local Master Builders representative.

Measure the air content of the trial mix and either increase or decrease the quantity of MB AE 90 admixture to obtain the desired air content of the first batch and make further adjustments if needed.

Frequent checks during the course of the work should be made since many factors may require adjustments in the MB AE 90 dosage rate. Adjustments to the dosage should be based on the amount of entrained air in the mix at the point of placement.

MATERIAL SAFETY DATA SHEET

MASTER BUILDERS, INC.
23700 CHAGRIN BLVD.
CLEVELAND, OHIO 44122
216-831-5500

24-HOUR CHEMTREC
800-424-9300
D.C. AREA 483-7616

MASTER BUILDERS TECHNOLOGIES, LTD.
3637 WESTON ROAD
TORONTO, ONTARIO M9L 1W1
416-741-3830

Prepared by: Department of Safety & Environment
Revision Date: 11/30/97

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200). Where a proprietary ingredient is shown, the identity may be made available as provided in this standard.

All components of this product are included in the EPA Toxic Substances Control Act (TSCA) Chemical Substance Inventory

1. **PRODUCT NAME:** MP AE 90

Chemical Family: Anionic Surfactant

2. **HAZARDOUS INGREDIENTS:**

	CASNO	EXPOSURE LIMITS* TLV	STEL	PEL	CONTENT
Resin soap	None	None	None	None	< 10%

*) Refer to Section 7 for available LD/LC(50) Health Hazard Data

3. **PHYSICAL DATA:**

Boiling Point (oC):	100	Water/Oil Distribution Coefficient:	N/Av
Percent Volatile:	0	Solubility in Water:	100%
Freezing Point (oC):	0	Specific Gravity	1.014
Vapor Pressure mmHg @20 (oC):	N/Av	pH:	ca. 11.0
Vapor Density:	> Air	Evaporation Rate:	N/Av
Odor Threshold: (ppm)	N/Av		
Appearance: Dark brown liquid		Odor: Odorless	

N/Av = Not Available N/Ap = Not Applicable ca. = Approximate

4. **FIRE AND EXPLOSION HAZARD DATA:** HMIS Hazard Rating No 0 (Minimal)

Flash Point: Non-flammable Method: Not Applicable

Auto-Ignition Temperature: Not Applicable

Limits Of Flammability: LEL: Not Applicable UEL: Not Applicable

Extinguishing Media: This material does not give a flash point by conventional test methods. Use extinguishing agent suitable for type of surrounding fire.

Special Fire & Unusual Hazards: None known.

5. **REACTIVITY DATA:** HMIS Hazard Rating No 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: Strong acids, aluminum, galvanized metals.

Hazardous Decomposition Products: Hydrogen in contact with aluminum or zinc (After water has evaporated.) Oxides of Carbon and Nitrogen.

Hazardous Polymerization: Will not occur.

6. **ENVIRONMENTAL & DISPOSAL INFORMATION:**

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media, remove to storage for disposal and rinse residual stain with water

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility

7. **HEALTH HAZARD DATA:** HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	May cause severe irritation, possible burns and corneal damage.
Skin Contact:	May cause moderate to severe irritation.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.

Ingestion: May cause gastrointestinal irritation and nausea.

Chronic:	Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.
	Materials are not known mutagenic, teratogenic, or reproductive health hazards

10. **ADDITIONAL INFORMATION:** (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC): NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name: NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate PP = Severe WS = Water Sheen
NL = Not Listed ND = Not Determined

The information herein is given in good faith. No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information

Master Builders Technologies

POLYHEED® 997

Superior pumping/finishing admixture

DESCRIPTION:

POLYHEED® 997 multi-component, non-chloride, mid-range water-reducing admixture is formulated to produce:

1. True mid-range water reduction (5-18%) and excellent performance across a wide concrete slump range, especially the difficult slump range of 5-8 inches (125-200 mm);
2. Normal concrete setting time throughout the recommended dosage range;
3. Superior workability, pumpability and finishability qualities even in concrete mixes containing low amounts of cementitious materials;
4. Strength performance comparable to chloride-bearing, water-reducing admixtures at all ages;
5. Improved performance with a wide range of cements, fly ashes, silica fumes, granulated slags, and aggregates (including coarse and manufactured sands).

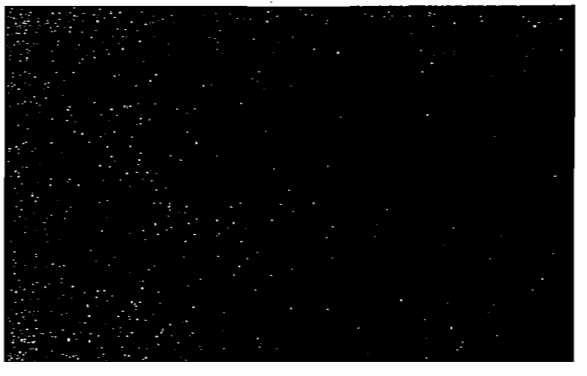
POLYHEED 997 admixture meets ASTM C 494 requirements for Type A, water-reducing admixtures, and Type F, water-reducing high-range admixtures, specifically:

- Reduced water content for a given slump
- Normal setting time characteristics
- Increased compressive and flexural strength performance at all ages
- Improved concrete durability to damage from freezing and thawing

ADVANTAGES:

POLYHEED 997 admixture facilitates the production of quality concrete through these special benefits:

- Superior workability and pumpability in various concrete applications
- Reduced segregation
- Superior finishing characteristics for residential/commercial flatwork and formed surfaces
- Consistent performance in low to high slump concrete mixtures, in particular, the mid-range slump of 5-8 inches (125-200 mm)
- Effective as a singular admixture or as a component in a Master Builders admixture system



PERFORMANCE CHARACTERISTICS:

MIX DATA

500 lb of Type I cement per cubic yard (295 kg/m³). Slump, 6-7 inches (150-180 mm), 5-6% Air, Concrete temperature 70 °F (21 °C), Ambient temperature, 70 °F (21 °C).

Setting Time Performance[1]

Mix	Initial Set h:min	Difference h: min
Plain	6:01	--
POLYHEED 997 admixture		
5 fl oz/cwt (325 mL/100 kg)	6:22	+0:21
10 fl oz/cwt (650 mL/100 kg)	6:57	+0:56
15 fl oz/cwt (950 mL/100 kg)	7:31	+1:30

Compressive Strength Performance

Mix	7 Day psi	7 Day MPa	7 Day %	28 Day psi	28 Day MPa	28 Day %
Plain	2960	16.3	100	3320	22.9	100
POLYHEED 997 admixture						
5 fl oz/cwt (325 mL/100 kg)	3060	21.1	129	3930	27.1	118
10 fl oz/cwt (650 mL/100 kg)	3740	25.8	158	4610	31.8	136
15 fl oz/cwt (980 mL/100 kg)	4620	31.9	196	5460	37.7	165

[1]*NOTE: The data shown is based on controlled laboratory tests. Reasonable variations from the results shown here may be experienced as a result of differences in concrete making materials and jobsite conditions.*

Building Tomorrow Together®

SKW-MBT CONSTRUCTION CHEMICALS

Master Builders Technologies

WHERE TO USE:

POLYHEED 997 mid-range water-reducing admixture is recommended for use in all concrete where normal setting characteristics, and superior workability, pumpability and finishability qualities are desired.

POLYHEED 997 admixture is particularly useful in placing concrete in the mid-range slump of 6-8 inches (150-200 mm). Field data have consistently shown improved workability, pumpability and finishability versus conventional water-reducing admixtures.

This admixture improves conventionally placed concrete mixes containing a wide range of cements, granulated slags, Class C and F fly ashes, silica fumes, and aggregates. It improves reinforced, precast, prestressed, lightweight or normal weight concrete, and pumped concrete.

POLYHEED 997 admixture can be used with air-entraining admixtures approved under ASTM, AASHTO and CRD specifications when air-entrained concrete is specified or desired. Master Builders air-entraining admixtures are recommended for use with **POLYHEED 997** admixture when air-entrained concrete is specified or desired.

POLYHEED 997 admixture may be used in all colored and architectural concrete.

When used in conjunction with other admixtures, each admixture must be dispensed separately into the mix.

QUANTITY TO USE:

POLYHEED 997 mid-range water-reducing admixture has a recommended dosage range of 3-15 fl oz per 100 lb (195-975 mL per 100 kg) of cement for most concrete mixes.

As the dosage rate of **POLYHEED 997** admixture increases to 15 fl oz per 100 lb (975 mL per 100 kg) of cement, normal concrete setting time characteristics are maintained, and early and ultimate compressive strengths increase.

Master Builders does not recommend the use of dosage rates outside the recommended range without trial testing. Consult your local Master Builders sales representative for assistance in determining the dosage rate for optimum performance.

PACKAGING:

POLYHEED 997 is supplied in 55 U.S. gallon (208 liter) drums and by bulk delivery.

TEMPERATURE PRECAUTION:

If **POLYHEED 997** admixture freezes, thaw at 35 °F (2 °C) or above and completely reconstitute by mild mechanical agitation. **Do not use pressurized air for agitation.**

NON-CHLORIDE, NON CORROSIVE:

POLYHEED 997 admixture will not initiate or promote corrosion of reinforcing steel in concrete. This admixture does not contain intentionally added calcium chloride or chloride-based ingredients. The admixture, due to chlorides originating from all the ingredients used in its manufacture, contributes less than 0.00012% (1.2 ppm chloride ions) by weight of the cement when used at a dosage rate of 1 fl oz per 100 lb (65 mL per 100 kg) of cement.

For additional information on **POLYHEED 997** admixture or on its use in developing a concrete mixture with special performance characteristics, contact your local Master Builders representative.

Master Builders, Inc.

United States
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5554
(800) MBT-9990
Fax (216) 831-6910

Canada
3637 Weston Road
Toronto, Ontario M9L 1W1
(800) 387-5862
Fax (416) 741-7925

Mexico
Blvd. M. Avila Camacho 80, 3er Piso
53390 Naucalpan, México
011-525-557-5544
Fax 011-525-395-7903

®Registered Trademark of MBT Holding AG
©1998, Master Builders, Inc.

polhd997.p65 #112493
Printed in U.S.A. 1298

4 FIRE AND EXPLOSION HAZARD DATA: (cont'd)

Special Fire & Unusual Hazards: None known.

5 REACTIVITY DATA: HMIS Hazard Rating No. 0 (Minimal)

Stability: Stable. Not sensitive to mechanical impact.

Incompatibility: None known.

Hazardous Decomposition Products: (After water has evaporated.) Oxides of Carbon, Nitrogen and Sulfur

Hazardous Polymerization: Will not occur.

6. ENVIRONMENTAL & DISPOSAL INFORMATION:

Action to Take for Spills/Leaks: Wear appropriate protective equipment. Take action to eliminate source of leak; contain spill by diking; vacuum up liquid or use absorbent media; remove to storage for disposal and rinse residual stain with water.

Waste Disposal Method: Dispose in accordance with local, provincial, state and federal regulations. This product is biodegradable and, with prior appropriate approval, can be disposed of in a sanitary treatment system or licensed land application facility.

7 HEALTH HAZARD DATA: HMIS Hazard Rating No. 1 (Slight)

PRIMARY ROUTE OF ENTRY: Dermal, Eyes

Effects Of Overexposure

Inhalation:	At room temperature, exposures to vapors are unlikely due to physical properties.
Eyes:	Moderate irritation and possible transient corneal injury.
Skin Contact:	Prolonged or repeated skin contact tends to remove skin oils possibly leading to irritation and dermatitis.
Skin Absorption:	Not expected to be absorbed through the skin in sufficient quantities to increase overall toxicity.
Ingestion:	Amounts ingested incidental to industrial handling are not expected to cause injury.

LC(50) - Oral	CASRN	100-71-6	8	gm/kg	Rat.
		540-72-7	764	mg/kg	Rat.
		7631-99-4	3236	mg/kg	Rat.

Chronic: Product does not contain carcinogenic materials as defined by OSHA Hazardous Communications Act 1910.1200.

Materials are not known mutagenic, teratogenic, or reproductive health hazards.

8 FIRST AID:

Inhalation: Remove victim from exposure. If difficulty with breathing, administer oxygen. If breathing has stopped administer artificial respiration, preferably mouth-to-mouth. Seek medical attention

Eyes: Flush eyes with water, lifting upper and lower lids occasionally for 15 minutes. Seek medical attention.

Skin: Remove contaminated clothing. Wash thoroughly with soap and water. If irritation persists seek medical attention. Wash contaminated clothing before reuse

Ingestion: Drink two glasses of water, then induce vomiting by taking IPECAC syrup, salt water or by placing finger at back of throat. Do NOT give anything by mouth to an unconscious person.

9 SPECIAL PROTECTION INFORMATION:

Ventilation: Ventilation is generally not required.

Personal Protection Equipment: Do NOT wear contact lenses when working with this material. Use chemical goggles/safety glasses with side shields and Rubber/Latex gloves. Selection of specific items such as boots and apron will depend on operation. Wear respirator protection whenever airborne concentrations exceed TLV ceilings or TWA, use NIOSH/OSHA approved respirators equipped with an organic vapor cartridge for listed hazard.

Confined spaces, rooms, or tanks are areas where concern for TLVs is especially important. Reference OSHA Regulation CFR 29 1910.134 for recommended respiratory protection.

10 ADDITIONAL INFORMATION:

Average Shelf Life	18 Months
Special Instructions:	Keep from freezing

REGULATORY INFORMATION:

Title III Section 302	No reportable chemicals
Title III Section 311/312:	Health hazard: Immediate Physical hazard: None
Title III Section 313	No reportable chemicals
State: California	No reportable chemicals
WHMIS Classification:	Class D, Div. 2, Sub B
Canadian Domestic Substance List:	All chemicals are listed.

POLYHEED 997

III. ADDITIONAL INFORMATION: (cont'd)

TRANSPORTATION

National Motor Freight Classification (NMFC) NOT DETERMINED

Description: NOT DETERMINED

Emergency Response Guide Page No.: NOT REGULATED

DOT Reportable Quantity: NOT REGULATED

Shipping Name NOT REGULATED - USE NMFC DESCRIPTION

Marine Pollutant: NL

P = Moderate	PP = Severe	WS = Water Sheen
NL = Not Listed	ND = Not Determined	

The information herein is given in good faith No warranty, expressed or implied, is given regarding the accuracy of these data or the results obtained from the use thereof. Consult Master Builders, Inc. for further information.

MATERIAL SAFETY DATA SHEET

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

PRODUCT NAME: LIQUIDOW (R) 30-42% CALCIUM CHLORIDE SOLUTION

Effective Date: 10/16/85 Date Printed: 11/27/85 Product Code: 45297

1. INGREDIENTS:

Calcium chloride	CAS# 010043-52-4	30-42%
Potassium chloride	CAS# 007447-40-7	1-3%
Sodium chloride	CAS# 007647-14-5	1-2%
Water	CAS# 007732-18-5	BAL.

Substances listed in the Ingredients Section are those identified as being present at a concentration of 1% or greater, or 0.1% if the substance is on the list of potential carcinogens cited in OSHA Hazard Communication Standard. Where proprietary ingredient shows, the identity of this substance may be made available as provided in 29 CFR 1910.1200(I).

2. PHYSICAL DATA:

BOILING POINT: 230-251F, 110-122C
VAP PRESS: 7-15 mmHg @ 25C, 77F
VAP DENSITY: Same as water.
SOL. IN WATER: Completely miscible
SP. GRAVITY: 1.29-1.44 25/25C, 77F
APPEARANCE: Clear to straw liquid solution.
ODOR: None.

3. FIRE AND EXPLOSION HAZARD DATA:

FLASH POINT: Not applicable
METHOD USED: Not applicable

FLAMMABLE LIMITS
LFL: Not applicable
UFL: Not applicable

EXTINGUISHING MEDIA: Non-combustible.

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

3. FIRE AND EXPLOSION HAZARD DATA: (CONTINUED)

FIRE & EXPLOSION HAZARDS: None.

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

4. REACTIVITY DATA:

STABILITY: (CONDITIONS TO AVOID)

INCOMPATIBILITY: (SPECIFIC MATERIALS TO AVOID) Metals will slowly corrode in aqueous solution. Aluminum (and its alloys) and yellow brass will be attacked by calcium chloride.

HAZARDOUS DECOMPOSITION PRODUCTS: Not applicable.

HAZARDOUS POLYMERIZATION: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

ACTION TO TAKE FOR SPILLS/LEAKS: Flush area with plenty of water. Walking surfaces may remain wet longer due to moisture being held by spilled material.

DISPOSAL METHOD: Wash away with large excess of water. Keep out of drinking water sources. Comply with local, state, and federal regulations.

6. HEALTH HAZARD DATA:

EYE: May cause moderate to severe eye irritation with corneal injury, which may be slow to heal.

SKIN CONTACT: Short single exposure not likely to cause significant skin irritation. Prolonged or repeated exposure may cause skin irritation, even a burn. May cause more severe response if confined to skin or skin is abraded (scratched or cut).

(Continued on Page 3)

(R) Indicates a trademark of The Dow Chemical Company

6. HEALTH HAZARD DATA: (CONTINUED)

SKIN ABSORPTION: A single prolonged exposure is not likely to result in the material being absorbed through skin in harmful amounts. The LD50 for skin absorption in rabbits is >5000 mg/kg for $CaCl_2$.

INGESTION: Single dose oral toxicity is believed to be low. The oral LD50 for $CaCl_2$ in rats is 1-2 mg/kg. Ingestion may cause gastrointestinal irritation or ulceration.

INHALATION: Vapors are unlikely due to physical properties. Mists may cause irritation to upper respiratory tract.

SYSTEMIC & OTHER EFFECTS: Results of in vitro mutagenicity tests have been negative for $CaCl_2$.

7. FIRST AID:

EYES: Irrigate with flowing water immediately and continuously for 15 minutes. Consult medical personnel.

SKIN: Wash off in flowing water or shower.

INGESTION: If swallowed, induce vomiting immediately by giving two glasses of water and sticking finger down throat. Call a physician. (Never give anything by mouth or attempt to induce vomiting in an unconscious person.)

INHALATION: Remove to fresh air if effects occur. Consult a physician.

NOTE TO PHYSICIAN: If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

(Continued on Page 4)

(R) Indicates a trademark of The Dow Chemical Company

8. HANDLING PRECAUTIONS:

EXPOSURE GUIDELINE(S): Dow IHG is 10 mg/m3 for calcium chloride, sodium chloride, and potassium chloride.

VENTILATION: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

RESPIRATORY PROTECTION: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, use an approved air-purifying respirator.

SKIN PROTECTION: For brief contact, no precautions other than clean body-covering clothing should be needed. Use protective clothing impervious to this material. Selection of specific items such as gloves, boots, apron, or full-body suit will depend on operation. If skin comes in contact with contaminated clothing, remove the clothing immediately, wash skin area with soap and water, and launder clothing before reuse.

EYE PROTECTION: Use chemical goggles. Eye wash fountain should be located in immediate work area.

9. ADDITIONAL INFORMATION:

SPECIAL PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Avoid eye and prolonged skin contact. Always use cool water (temperature less than 80F, 27C) when diluting calcium chloride solution. Heat developed by solutions is very high during mixing. Leather clothing and shoes will be damaged by calcium chloride.

MSDS STATUS: Revised sections 6 - 8.

(R) Indicates a trademark of The Dow Chemical Company
The Information Herein Is Given In Good Faith, But No Warranty, Express Or Implied, Is Made. Consult The Dow Chemical Company For Further Information.

Essroc
Italcementi Group

3251 Bath Pike
Nazareth, Pa. 18064

ENTERED 1-20-98

MATERIAL SAFETY DATA SHEET

Section 1 - IDENTIFICATION

Product Name: Masonry Cement

CAS Reg. No.: 65997-15-1

Chemical Name and Synonyms: Masonry Cement. Masonry Cement is also known as Masonry Cement Silicate or Mortar Masonry Silicate.

Trade Names: Brixment N,S or M. Saylor's Light, Dark or Super Velvet Masonry's. Mohawk N,S or M masonry, BLX

MSDS Information: This Material Safety Data Sheet was produced in September 1997 and replaces any prior versions.

Chemical Family: Calcium compounds. Calcium silicate compounds and other calcium compounds containing iron and aluminum make up the majority of this product. Major products include:

$3CaO \cdot SiO_2$	Tricalcium silicate
CaC03	Calcium Carbonate
MgC03	Magnesium Carbonate
$2CaO \cdot SiO_2$	Dicalcium silicate
$3CaO \cdot Al_2O_3$	Tricalcium Aluminate
$4CaO \cdot Al_2O_3 \cdot Fe_2O_3$	Tetracalcium aluminoferrate
$CaSO_4 \cdot 2H_20$	Calcium sulfate dihydrate or Gypsum
C	Carbon

Formula: This product consists of finely ground cement clinker mixed with a small amount of calcium sulfate dihydrate (gypsum) and limestone.

Informational Phone Numbers: (800) 437-7762 Customer Service-Nazareth, Pa.
(800) 336-0366 Customer Service-Speed, IN.

Emergency Contact Information: (800) 424-9300 Chemtrec

MSDS Prepared By: Essroc MSDS Development Committee
(610) 837-6725
October 1997

Effects resulting from skin contact: Discomfort or pain cannot be relied upon to alert a person to hazardous skin exposure. Consequently, the only effective means of avoiding skin injury or illness involves minimizing skin contact, particularly contact with wet cement. Exposed persons may not feel discomfort until hours after the exposure has ended and significant injury has occurred.

Exposure to dry masonry cement may cause drying of the skin with consequent mild irritation or more significant effects attributable to aggravation or other conditions. Dry masonry cement contacting wet skin or exposure to moist or wet masonry cement may cause more severe skin effects including thickening, cracking, or fissuring of the skin. Prolonged exposure can cause severe skin damage in the form of (caustic) chemical burns.

Some individuals may exhibit an allergic response upon exposure to masonry cement, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with masonry cement products.

Effects resulting from inhalation: Masonry cement may contain trace amounts of free crystalline silica. Prolonged exposure to airborne free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (also see "Carcinogenic potential" below.) It may also aggravate other lung conditions. Exposure to masonry cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects resulting from ingestion: Although ingestion of small quantities of masonry cement are not known to be harmful, ill effects are possible especially if larger quantities are consumed. Masonry cement should not be eaten.

Carcinogenic potential: Masonry cement is not listed as a carcinogen by the National Toxicology Program (NTP), International Agency for Research (IARC) or the Occupational Safety and Health Administration (OSHA). It may, however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a potential trace level contaminant in masonry cement, is now classified by IARC as a known human carcinogen (Group 1). NTP has characterized respirable silica a "reasonably anticipated to be a carcinogen".

Medical conditions which may be aggravated by inhalation or dermal exposure:
Pre-existing upper respiratory and lung diseases.
Unusual (hyper) sensitivity to hexavalent chromium (chromium^{+6}) salts.

Section 4 - FIRST AID

Eyes: Immediate flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes including under lids, to remove all particles. Call physician immediately.

Skin: Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of airborne dust: Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of masonry cement requires immediate medical attention.)

Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Respiratory protection: Avoid actions that cause dust to become airborne. Use local or general ventilation to control exposures below applicable exposure limits.

Use NIOSH/MSHA-approved (under 30 CFR 11) or NIOSH-approved (under 42 CFR 84) respirators in poorly ventilated areas, if an applicable exposure limit is exceeded, or when dust causes discomfort or irritation. (Advisory: Respirators and filters purchased after July 10, 1998, must be certified under 42 CFR 84.)

Ventilation: Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye protection: When engaged in activities where cement dust or wet cement or concrete could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with masonry cement or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Gray or white with powder
Odor	No distinct odor
Physical state	Solid (powder)
pH (in water)(ASTM D 1293-95)	12 to 13
Solubility in water	Slightly soluble (0.1 to 1.0%)
Vapor pressure	Not applicable
Vapor density	Not applicable
Boiling point	Not applicable (i.e., >1000 deg. C)
Melting point	Not applicable
Specific gravity (H_2O = 1.0)	2.80
Evaporation Rate	Not applicable
Freezing Point	Not Applicable
Coefficient of oil to water distribution	Not Applicable

Section 10 - STABILITY AND REACTIVITY

Stability: Stable.

Conditions to avoid: Unintentional contact with water.

Incompatibility: Wet masonry cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

Hazardous decomposition: Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

Hazardous polymerization: Will not occur.

Section 15 - OTHER REGULATORY INFORMATION

Status under USDOL-OSHA Hazard Communication Rule, 29 CFR 1910.1200: Portland cement is considered a "hazardous chemical" under this regulation, and should be part of any hazard communication program.

Status under CERCLA/Superfund, 40 CFR 117 and 302: Not Listed.

Hazard Category under SARA TITLE III, Sections 311- 312: Portland cement qualifies as a "hazard substance" with delayed health effects.

Status under SARA Title III, Section 313: This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 in concentrations above deminimis levels.

Toxic Substance Control Act (TSCA): Some substances in masonry cement are on TSCA's inventory list.

Status under the Federal Hazardous Substances Act: Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under Canadian Environmental Protection Act: Not listed.

Status under WHMIS: Portland cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class E - Corrosive material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

SECTION 16 - OTHER INFORMATION

Prepared by: **Essroc MSDS Development Committee**

Abbreviations:

ACGIH	American Conference of Government Industrial Hygienists
ASTM	American Society of Testing Materials
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
DOT	Department of Transportation
IARC	International Agency for Research
m^3	Cubic meter
mg	Milligram
mm	Millimeter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RQ	Reportable Quantities
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time Weighted Average
URT	Upper Respiratory Tract
WHMIS	Workplace Hazardous Material Information System

Essroc
Italcementi Group

3251 Bath Pike
Nazareth, Pa. 18064

ENTERED 1-20-98

MATERIAL SAFETY DATA SHEET

Section 1 - IDENTIFICATION

Product Name: Portland Cement

CAS Reg. No.: 65997-15-1

Chemical Name and Synonyms: Portland Cement. Portland Cement is also known as hydraulic cement and cement.

MSDS Information: This Material Safety Data Sheet was produced in September 1997 and replaces any prior versions.

Chemical Family: Calcium compounds. Calcium silicate compounds and other calcium compounds containing iron and aluminum make up the majority of this product. Major products include:

$3CaO \cdot SiO_2$	Tricalcium silicate
$2CaO \cdot SiO_2$	Dicalcium silicate
$3CaO \cdot Al_2O_3$	Tricalcium Aluminate
$4CaO \cdot Al_2O_3 \cdot Fe_2O_3$	Tetracalcium aluminoferrate
$CaS0_2 \cdot 2H_20$	Calcium sulfate dihydrate or Gypsum

Formula: This product consists of finely ground portland cement clinker mixed with a small amount of calcium sulfate dihydrate (gypsum).

Informational Phone Numbers: (800) 437-7762 Customer Service-Nazareth, Pa.
(800) 336-0366 Customer Service-Speed, IN.

Emergency Contact Information: (800) 424-9300 Chemtrec

MSDS Prepared By: Essroc MSDS Development Committee
(610) 837-6725
October 1997

Section 2 - COMPONENTS

Hazardous Ingredients:

Portland cement (CAS# 65997-15-1) - approximately 90 to 95% by weight

ACGIH TLV-TWA (1995-1996) = 10 mg total dust/m^3

OSHA PEL (8-hour TWA) = 50 million particles/ft^3

LD50 = Not Established

LC50 = TWA 50 mppcf

Some individuals may exhibit an allergic response upon exposure to portland cement, possibly due to trace amounts of chromium. The response may appear in a variety of forms ranging from a mild rash to severe skin ulcers. Persons already sensitized may react to their first contact with the product. Other persons may first experience this effect after years of contact with portland cement products.

Effects resulting from inhalation: Portland cement may contain trace amounts of free crystalline silica. Prolonged exposure to airborne free crystalline silica may cause delayed lung injury including silicosis, a disabling and potentially fatal lung disease, and/or other diseases. (also see "Carcinogenic potential" below.) It may also aggravate other lung conditions. Exposure to portland cement may cause irritation to the moist mucous membranes of the nose, throat, and upper respiratory system. It may also leave unpleasant deposits in the nose.

Effects resulting from ingestion: Although ingestion of small quantities of portland cement are not known to be harmful, ill effects are possible especially if larger quantities are consumed. Portland cement should not be eaten.

Carcinogenic potential: Portland cement is not listed as a carcinogen by the National Toxicology Program (NTP), International Agency for Research (IARC) or the Occupational Safety and Health Administration (OSHA). It may, however, contain trace amounts of substances listed as carcinogens by these organizations.

Crystalline silica, a potential trace level contaminant in portland cement, is now classified by IARC as a known human carcinogen (Group 1). NTP has characterized respirable silica a "reasonably anticipated to be a carcinogen".

Medical conditions which may be aggravated by inhalation or dermal exposure:

Pre-existing upper respiratory and lung diseases.

Unusual (hyper) sensitivity to hexavalent chromium (chromium^{+6}) salts.

Section 4 - FIRST AID

Eyes: Immediate flush eyes thoroughly with water. Continue flushing eye for at least 15 minutes including under lids, to remove all particles. Call physician immediately.

Skin: Wash skin with cool water and pH-neutral soap or a mild detergent intended for use on skin. Seek medical treatment in all cases of prolonged exposure to wet cement, cement mixtures, liquids from fresh cement products, or prolonged wet skin exposure to dry cement.

Inhalation of airborne dust: Remove to fresh air. Seek medical help if coughing and other symptoms do not subside. ("Inhalation" of gross amounts of portland cement requires immediate medical attention.)

Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

Ventilation: Use local exhaust or general dilution ventilation to control exposure within applicable limits.

Eye protection: When engaged in activities where cement dust or wet cement or concrete could contact the eye, wear safety glasses with side shields or goggles. In extremely dusty environments and unpredictable environments, wear unvented or indirectly vented goggles to avoid eye irritation or injury. Contact lenses should not be worn when working with portland cement or fresh cement products.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Gray or white with powder
Odor	No distinct odor
Physical state	Solid (powder)
pH (in water)(ASTM D 1293-95)	12 to 13
Solubility in water	Slightly soluble (0.1 to 1.0%)
Vapor pressure	Not applicable
Vapor density	Not applicable
Boiling point	Not applicable (i.e., >1000 deg. C)
Melting point	Not applicable
Specific gravity (H_2O = 1.0)	3.15
Evaporation Rate	Not applicable
Freezing Point	Not Applicable
Coefficient of oil to water distribution	Not Applicable

Section 10 - STABILITY AND REACTIVITY

Stability: Stable.

Conditions to avoid: Unintentional contact with water.

Incompatibility: Wet portland cement is alkaline. As such it is incompatible with acids, ammonium salts and aluminum metal.

Hazardous decomposition: Will not spontaneously occur. Adding water results in hydration and produces (caustic) calcium hydroxide.

Hazardous polymerization: Will not occur.

Hazard Category under SARA TITLE III, Sections 311-312: Portland cement qualifies as a "hazard substance" with delayed health effects.

Status under SARA Title III, Section 313: This product contains NONE of the substances subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372 in concentrations above deminimis levels.

Toxic Substance Control Act (TSCA): Some substances in portland cement are on TSCA's inventory list.

Status under the Federal Hazardous Substances Act: Portland cement is a "hazardous substance" subject to statutes promulgated under the subject act.

Status under Canadian Environmental Protection Act: Not listed.

Status under WHMIS: Portland cement is considered to be a hazardous material under the Hazardous Products Act as defined by the Controlled Products Regulations (Class E - Corrosive material) and is therefore subject to the labeling and MSDS requirements of the Workplace Hazardous Materials Information System (WHMIS).

SECTION 16 - OTHER INFORMATION

Prepared by: **Essroc MSDS Development Committee**

Abbreviations:

ACGIH	American Conference of Government Industrial Hygienists
ASTM	American Society of Testing Materials
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations
DOT	Department of Transportation
IARC	International Agency for Research
m^3	Cubic meter
mg	Milligram
mm	Millimeter
MSDS	Material Safety Data Sheet
MSHA	Mine Safety and Health Administration
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicity Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
RQ	Reportable Quantities
SARA	Superfund Amendments and Reauthorization Act
TLV	Threshold Limit Value
TWA	Time Weighted Average
URT	Upper Respiratory Tract
WHMIS	Workplace Hazardous Material Information System

BAY AGGREGATE, INC
PORTLAND CEMENT CONCRETE
MATERIAL SAFETY DATA SHEET

VENDEE AND THIRD PERSONS ASSUME THE RISK OF INJURY PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT FOLLOWED AS PROVIDED FOR IN THE DATA SHEET, AND VENDOR SHALL NOT BE LIABLE FOR SUCH INJURY. FURTHERMORE, VENDOR SHALL NOT BE LIABLE FOR INJURY TO VENDEE OR THIRD PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED.

ALL PERSONS USING THIS PRODUCT, ALL PERSONS WORKING IN AN AREA WHERE THIS PRODUCT IS USED, AND ALL PERSONS HANDLING THIS PRODUCT SHOULD BE FAMILIAR WITH THE CONTENTS OF THIS DATA SHEET. POSTING THIS DOCUMENT FOR EMPLOYEE NOTIFICATION IS RECOMMENDED BY THE VENDOR.

I. PRODUCT IDENTITY:

Manufacturer's Name:	Bay Aggregate, Inc.
Address:	301 North Water Street P.O. Box 1067 Bay City, Michigan 48706
Phone:	517-892-6191
Product Name:	Portland Cement Concrete

II. EMERGENCY AND FIRST AID PROCEDURES:

SKIN CONTACT--Wash skin with large amounts of soap and clean water. For minor irritation, apply a lanolin-containing cream to skin after washing. Contact a physician if persistent or severe irritation or discomfort occurs.

EYE CONTACT--Contact a physician immediately. Flush eyes with large amounts of clean water for at least 15 minutes.

INGESTION--Due to the nature of this material, it is unlikely that it will be ingested. If this does occur, remove individual from area. Two or three lasses of milk or water should be provided to dilute the stomach contents, if the individual is conscious. Do not induce vomiting. Contact a physician or Poison Control Center.

III. HAZARDOUS INGREDIENTS:

Concrete is a mixture of inert gravel, sand, Portland cement, and water. It may also contain chemical admixtures and/or flyash. The chemical admixtures are present in quantities comprising less than 1% of the material.

The hazardous ingredients in plastic (wet) concrete cannot become airborne. However, when the water is added to the dry ingredients, it reacts with the calcium oxide in the Portland cement to form calcium hydroxide-a corrosive chemical which will irritate the eyes and skin upon contact. Concrete dust from dried Portland cement concrete may also contain hazardous ingredients in sufficient concentrations to cause skin, eye, or respiratory disease.

Chemical Common Name	OSHA PEL	NIOSH REL	%	CAS NO.
Portland Cement	5.0 mg/M3 respirable dust; 15.0 mg/M3 total dust	5.0 mg/M3 respirable dust; 10.0 mg/M3 total dust	20-30	65997-15-1
calcium oxide	5 mg/M3 total dust	2 mg/M3 total dust	2-4	1305-62-0
sand, quartz, 'line silica	approximately 0.1 mg/M3 respirable dust	0.05 mg/M3 respirable dust	10-20	14808-60-7
gravel	none	none	40-50	1317-67-3

The product is delivered as ready mixed cement mud, so there is no dust hazard present from the wet product and the OSHA PELs and NIOSH RELs generally would not be applicable at time of delivery.

BAY AGGREGATE, INC
PORTLAND CEMENT CONCRETE
MATERIAL SAFETY DATA SHEET

IV. PHYSICAL CHARACTERISTICS:

Appearance:	grey, plastic, granular mud
Melting point:	not applicable
Boiling point:	not applicable
Specific gravity:	(water = 1) Normal range 1.5-2.9
Vapor pressure:	not applicable
Vapor density:	not applicable
Stability:	stable
Incompatible materials:	none
Hazardous polymerization:	none
Special precautions:	will harden in 2-8 hours
Neutralizing chemicals:	not applicable

V. FIRE AND EXPLOSION HAZARD INFORMATION:

Flash point:	not applicable
Flammable limits:	not applicable
Extinguishing media:	not applicable
Special fire fighting procedures:	not applicable
Unusual fire/explosion hazards:	not applicable

VI. SPECIAL PROTECTION AND HEALTH HAZARD INFORMATION:

Routes of Entry and Health Effects:

SKIN/EYE CONTACT: Wet ready mix concrete mud has an alkalinity level of pH12 to pH13, and so may cause irritation and alkali burns. Prolonged or repeated contact may cause allergic dermatitis in sensitive individuals. Skin contact may cause local irritation of the affected area. Pre-existing conditions may be aggravated by exposure.

INGESTION: Unlikely. May cause irritation.

INHALATION: Wet ready mix concrete mud does not pose an inhalation hazard.
HOWEVER, SAWING, GRINDING, CUTTING, DRILLING, OR OTHERWISE DISTURBING DRIED CONCRETE MAY CONTRIBUTE TO ELEVATED LEVELS OF AIRBORNE RESPIRABLE SILICA DUST, WHICH MAY CAUSE SILICOSIS. ALWAYS USE APPROPRIATE RESPIRATORY PROTECTION IN DUSTY ENVIRONMENTS.

SILICOSIS:

SILICOSIS IS A PROGRESSIVE LUNG DISEASE CAUSED BY BREATHING RESPIRABLE PARTICLES OF SILICA DUST OVER A PERIOD OF TIME. INDIVIDUAL VARY IN THEIR SUSCEPTIBILITY. CHRONIC SILICOSIS MAY DEVELOP AFTER 10 OR MORE YEARS OF EXPOSURE TO CRYSTALLINE SILICA AT RELATIVELY LOW LEVELS. ACCELERATED SILICOSIS MAY RESULT FROM EXPOSURE TO HIGH CONCENTRATIONS OVER 5-10 YEARS. ACUTE SILICOSIS OCCURS WHERE EXPOSURE CONCENTRATIONS ARE THE HIGHEST AND CAN CAUSE SYMPTOMS TO DEVELOP WITHIN A FEW WEEKS TO 5 YEARS. DRY COUGH MAY BE AN EARLY MANIFESTATION OF SILICOSIS. AS THE DISEASE PROGRESSES, THE COUGH MAY BECOME MORE PROLONGED AND BE ASSOCIATED WITH SPUTUM PRODUCTION. THE MOST FREQUENTLY OBSERVED SYMPTOMS ARE UNPRODUCTIVE COUGH, DYSPNEA (LABORED OR DIFFICULT BREATHING), CHEST PAINS, AND CHANGES IN BREATH SOUNDS.

VII. PERSONAL PROTECTION AND HAZARD CONTROL INFORMATION:

GOOD WORK PRACTICES--minimize skin contact. Use goggles or face shield when splashing is possible. Use gloves and other skin coverings to prevent contact. Clothing saturated with plastic (wet) concrete should be removed promptly to prevent continued contact with skin.

VENTILATION--not required with plastic (wet) concrete.

RESPIRATORY PROTECTION--not required with plastic (wet) concrete.

PERSONAL PROTECTIVE EQUIPMENT--EYES: wear safety goggles or face shield. SKIN: wear waterproof gloves and normal work clothing covering arms, legs, and feet.

PRECAUTIONS FOR SAFE HANDLING AND USE:

PLASTIC (WET) CONCRETE SHOULD BE KEPT OUT OF REACH OF CHILDREN.

PLASTIC WET CONCRETE:

--Small Spills: Material will harden in 2-8 hours and can generally be removed after hardening. If removing while still wet, water may be used to dilute. Use personal protective equipment described above.

--Large spills: Notify safety personnel. Clean-up personnel need to use eye and body protection as described above.

DRIED PORTLAND CEMENT CONCRETE:

--Respirable dust may be generated when hardened concrete is subjected to mechanical forces, such as in demolition work and surface treatment (sanding, grooving, chiseling, cutting, grinding, etc.).

--To the extent practical, use wet methods to minimize airborne dust levels when sawing or using other concrete renovation methods.

--Wear an appropriate and approved respirator when the work generates visible airborne dust. Providing exhaust ventilation to remov the dust to an unoccupied area when sawing or using other renovation methods may also contribute to reduced dust levels.

--Persons not wearing appropriate respiratory protective equipment should be excluded from dusty areas until the demolition work has been completed and the dust has cleared.

--When clearing renovation or demolition refuse, avoid re-entraining dust. Use wet methods or a vacuum with a high efficiency filter to remove the dust.

IX. **HAZARD CLASSIFICATION:**

The International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), and the National Institute for Occupational Safety and Health (NIOSH) classify crystalline silica as a probable human carcinogen.

MSDS PREPARATION:

MARCH 19, 1997

Material Safety Data Sheet

SPARTAN OIL CORPORATION
P.O. Box 18218 Lansing, Michigan 48901
Phone (517) 485-2285 Fax (517) 485-0605
Toll Free 1-800-968-OILS

Request Date: 7/21/95
Customer Number: 5719

CUSTOMER:
BAY AGGREGATE
301 N. WATER STREET

BAY CITY MI 48706

THIS IS NOT AN INVOICE

Enclosed are
MATERIAL SAFETY DATA SHEETS (MSDS)
for products that you recently purchased

Item No.	MSDS No.	Description	Auto Print
6101.DR	6101	PERMANENT ANTIFREEZE 55GA	Yes

We are required by the OSHA Hazard Communication Standard (the "Right-to-Know Law," CFR 1910.1200, 11/25/83) to provide an MSDS to certain customers for some products. In general, you will receive an MSDS the first time you purchase a product, or if the product or safety information changes.

If you use these products in manufacuring, you may be required to make this information available to your employees. If you resell these products, you may be required to pass this information to your customer. We suggest you CONSULT THE OSHA REGULATION or legal counsel.

MSDS for all products we sell are available on request.

MATERIAL SAFETY DATA SHEET

BODIE-HOOVER PETROLEUM CORP.
P.O. Box 698
Lemont, IL 60439
(708) 257-7781

Date prepared: 8/8/94
Replaces: 2/27/91

Emergency Telephone Number: 800-424-9300 (Chemtrec)

I. Product Identification

Name: ZENITH PERMANENT ANTIFREEZE

Product Code: AF2021-03

HMIS

Health	2*
Flammability	1
Reactivity	0
PPE	B

II. Composition and Hazard Information

Component	CAS Registry	%
Ethylene Glycol	107 - 21- 1	95
Hazardous component < 1%	—	2
Non -hazardous component	—	3

Exposure Limits	PEL	ACGIH	
Ethylene Glycol (CAS 107211)	50 ppm	50 ppm	Ceiling

III. Physical Data

Boiling Point:	>190 C	Solubility in H2O	100%
Vapor Pressure	< 0.1 mm Hg @ 20 C	Melting Point	N. A.
Spec Gravity (H2O = 1)	1.12 - 1.13	Evaporation Rate	
Vapor Density (air=1)	2.1	(BuAc= 1)	< 1
Appearance and odor	Thin, blue-green liquid; mild, sweet odor		

IV. Health Hazard Data

Eye Contact Liquid, vapor or mist may cause slight irritation. Serious corneal injury not expected.

Skin Contact No evidence of harmful effects.

Inhalation Exposure to spray or mists may cause mucus membrane irritation. High vapor concentrations may cause nausea, vomiting, headache, dizziness and irregular eye movements

Ingestion * May cause abdominal discomfort or pain, nausea, vomiting, dizziness, drowsiness, lumbar pain, oliguria, uremia, convulsions and coma. Cardiac failure and pulmonary edema may develop. Ingesting large amounts may cause severe kidney damage, liver damage and may be fatal.

Emergency and First Aid Procedures

Eye Contact	Immediately flush eyes with water for several minutes. Seek medical attention
Skin Contact	Remove and wash contaminated clothing. Wash skin with soap and water. If irritation persist seek medical attention
Inhalation	Remove to fresh air. Obtain medical attention if symptoms persist.
Ingestion	If patient is conscious, give two glasses of water and induce vomiting. Obtain medical attention immediately. If patient is unconscious obtain medical attention immediately. Do not induce vomiting or give anything by mouth to an unconscious person.

V. Fire and Explosion Hazard Data

Flash Point	120 C (COC)	**Flammable limits in air**		
			LEL	3.2
			UEL	15.3
Extinguishing media	Alcohol type, or all-purpose type foam. Dry chemical or CO2 for small fires.			
Special fire fighting procedures	Use self contained breathing apparatus and protective clothing, do not direct a solid stream of water or foam into a burning pool of liquid.			

VI. Reactivity Hazard Data

Stability	Stable
Conditions to avoid	Open sparks or flame, strong oxidizing agents
Incompatibility	Explosive decomposition may occur if combined with strong acids or strong bases, and/or strong oxidizing agents.
Decomposition products	Carbon dioxide and/or carbon monoxide
Hazardous polymerization	Will not occur

VII. Environmental Procedures

Steps to be taken if material is spilled or released

Wear appropriate personal protective equipment. Dike to contain spill. Collect for disposal. All clean up and disposal should be carried out in compliance to local, state and federal regulations.

Waste Disposal Method

Incineration is the preferred disposal route. Check with local, state and federal authorities before taking a specific action.

VIII. Handling and Storage

Use with adequate ventilation. Wash thoroughly after handling. Do not store in open or unlabeled containers. Keep out of reach of children and animals. Do not store near heat or flames. Store away from incompatible materials.

IX. Special Protection

Ventilation	Maintain sufficient mechanical and/or local exhaust necessary to keep exposure below the TLV.
Respiratory	Use NIOSH approved face mask with organic vapor cartridge (not for use in fire-fighting) and dust or mist pre-filter.
Gloves	Use chemical resistant (butyl rubber or PVC coated rubber) gloves
Eyes	Chemical splash goggles or full face shield
Other	Use chemical resistant apron to prevent clothing from contamination. Eyewash stations should be available. Launder contaminated clothing prior to re-wearing.

X. Transportation and Regulatory Information

DOT Hazard Class	Not Regulated
Shipping Class	Not Regulated
I. D. Number	Not Regulated
CERCLA	Requires notification of the National Response Center of release of quantities of hazardous substances equal to or greater than the reportable quantities in 40 CFR 302.4 Component present in this product at a level which could require reporting: Ethylene Glycol, CAS: 107-21-1
SARA Title III	Product contains a toxic chemical subject to the reporting requirements of section 313 of Title III of the *Superfund Amendments and Reauthorization Act of 1986* and *40 CFR part 372*
RCRA Hazardous Waste number	Not Applicable

The information in this document is believed to be correct as of the date issued. HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. The information supplied is for your consideration, investigation and verification. It is the users obligation to determine the conditions of safe use of this product.

========== CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ==========

TRADE NAME: #2 DIESEL FUEL
CAS NUMBER: 68476-34-6
SYNONYM(S): PROCESS STREAM; NO. 2 DIESEL FUEL; FUEL OIL; MIDDLE DISTILLATE; AB0/AA9-1; AG7; AG8
MSDS NUMBER: 1354
PRODUCT CODE: NA
HIERARCHY: NA
MANUFACTURER/SUPPLIER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375
TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE:
BP America (In Ohio): 800-362-8059
BP America (Outside Ohio): 800-321-8642
CHEMTREC ASSISTANCE: 800-424-9300
TELEPHONE NUMBERS - GENERAL ASSISTANCE: (Normal Office Hours): (8:00-4:30 M-F, EST):
Technical: 216-441-8106
MSDS Contact: 216-586-8023

========== COMPOSITION/INFORMATION ON INGREDIENTS ==========

COMPONENT:A distillate having a minimum viscosity of 32.6 SUS at 100 degrees F to a maximum of 40.1 SUS at 100 degrees F
CAS NO.: 68476-34-6
% BY WT.: 99.9 - 100
EXPOSURE LIMITS: None Established

========== HAZARDS IDENTIFICATION ==========

EMERGENCY OVERVIEW:

Clear Liquid With Hydrocarbon Odor. May Be Dyed For Identification.
Danger!
Harmful or Fatal If Swallowed.
Aspiration Hazard If Swallowed--Can Enter Lungs and Cause Damage.
May Be Irritating To the Eyes and Respiratory Tract.
Causes.Skin Irritation.
Vapors May Be Harmful.
Possible Cancer Hazard - Contains Material Which May Cause Cancer Based On Animal Data.
Combustible Liquid & Vapor.

POTENTIAL HEALTH EFFECTS:

SKIN:

Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. May cause allergic reactions in some individuals. Absorption from prolonged or massive skin contact may cause poisoning. High pressure skin injections are Serious Medical Emergencies. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section).

EYE:

Exposure to vapors, fumes or mists may cause irritation.

INHALATION:

May cause respiratory tract irritation. Exposure may cause central nervous system symptoms similar to those listed under "Ingestion" (see Ingestion section). Degenerative changes in the liver, kidneys and bone marrow may occur with prolonged, high concentrations. Repeated or prolonged exposures may cause behavioral changes.

INGESTION:

Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea. May cause harmful central nervous system effects. Effects may include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SPECIAL TOXIC EFFECTS:

Based on animal studies, repeated overexposure may produce skin tumors upon repeated and prolonged skin contact in the absence of good personal hygiene. However, long-term dermal application studies with similar materials, i.e. middle distillates, in animals have shown that skin tumors are produced only when marked and prolonged skin irritation takes place during the study. Therefore, this product should not present a significant hazard of skin tumor formation when the "Skin Protection" recommendations are followed.

IARC has determined that diesel engine exhaust is probably carcinogenic to humans. (IARC Class- 2A). Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Warning: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and

inadequate oxygen levels. IARC has determined that occupational exposures in petroleum refining are probably carcinogenic to humans.

See Section FIRST AID MEASURES - for Medical Conditions Aggravated by Exposure.

========== FIRST AID MEASURES ==========

SKIN:

Remove contaminated clothing immediately. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. High pressure skin injections are serious medical emergencies. Thermal burns require immediate medical attention. Get immediate medical attention.

EYE:

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists. Thermal burns require immediate medical attention.

INHALATION:

Remove affected person from source of exposure. If not breathing, ensure clear airway and institute cardiopulmonary resuscitation (CPR). If breathing is difficult, administer oxygen if available. After administration of oxygen, continue to monitor closely. Get medical attention.

INGESTION:

Do not induce vomiting because of danger of aspirating liquid into lungs. Get immediate medical attention. If spontaneous vomiting occurs, monitor for breathing difficulty.

NOTES TO PHYSICIAN:

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an endotracheal tube, to prevent aspiration. Individuals intoxicated by Diesel Fuel No. 2 should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will

be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

========== FIREFIGHTING MEASURES ==========

FLASH POINT: 51.7 C (125.06 F)
AUTOIGNITION TEMPERATURE: ND
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: > 0.7
FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: < 5

HAZARDOUS COMBUSTION PRODUCTS:

Combustion may produce CO, CO2 and reactive hydrocarbons.

BASIC FIRE FIGHTING PROCEDURES:

Use water spray, dry chemical, foam or carbon dioxide to extinguish fire. Use water spray to cool fire-exposed containers, structures and to protect personnel. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers or other drainage systems. Exposed firefighters must wear MSHA/NIOSH approved positive pressure self-contained breathing apparatus with full face mask and full protective clothing.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Irritating and/or toxic substances may be emitted upon thermal decomposition. Dangerous when exposed to heat or flame. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire.

========== ACCIDENTAL RELEASE MEASURES ==========

your facility or operation has an "Oil or Hazardous Substance Contingency Plan", activate its procedures. Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material. For technical advice and assistance related to chemicals, contact CHEMTREC (800/424-9300) and your local fire department. Notify the National Response Center, if required. Also notify appropriate state and local regulatory agencies, the LEPC and the SERC. Contact the local Coast Guard if the release is into a waterway.

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. (Also see Personal Protection Information section.)
Shut off ignition sources; no flares, smoking or flames in hazard

area. Stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Large Spills: Dike far ahead of liquid spill for later disposal.

When reporting a spill to the National Response Center or the Coast Guard, you may need to supply the Coast Guard Chemical Hazard Response Information System (CHRIS) code:

Group Number: 33
CHRIS Code: OTD

Additional spill related information may be found in the U.S. Coast Guard Chemical Hazard Response Information System (CHRIS) Manual.

During an accidental release, personal protection equipment may be required (see Section EXPOSURE CONTROLS/PERSONAL PROTECTION). Additional regulatory requirements may apply (see Section REGULATORY INFORMATION).

========== HANDLING AND STORAGE ==========

HANDLING:

Use non-sparking tools. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion.

Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose containers unless adequate precautions are taken against these hazards.

STORAGE:

Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles.

========== EXPOSURE CONTROLS / PERSONAL PROTECTION ==========

ENGINEERING CONTROLS:

Ventilation may be used to control or reduce airborne concentrations.

PERSONAL PROTECTION EQUIPMENT (PPE):

EYE PROTECTION:

Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses when working with this substance. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION:

Wear impervious gloves and protective clothing to prevent skin contact.

RESPIRATORY PROTECTION:

NIOSH/MSHA approved breathing equipment may be required for non-routine and emergency use.

See Section COMPOSITION/INFORMATION ON INGREDIENTS For Exposure Guidelines.

PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT: 160 C (320 F)
SP. GRAVITY (Water=1): 0.84 - 0.88 @ 15.56 C (60.008 F)
MELTING POINT: NA
% VOLATILE: Negligible
VAPOR PRESSURE: 0.4 MM HG @ 20 C (68 F)
EVAPORATION RATE: Slower
VAPOR DENSITY (Air=1): 4.7
VISCOSITY: 1.2 - 4.6 CST @ 37.8 C (100.04 F)
% SOLUBILITY IN WATER: Negligible
POUR POINT: -12.22 C (10.004 F)
pH: NEUTRAL
MOLECULAR WEIGHT: NA
MOLECULAR FORMULA: Mixture
ODOR/APPEARANCE:
Clear Liquid With Hydrocarbon Odor. May Be Dyed For Identification.

STABILITY AND REACTIVITY

STABILITY/INCOMPATIBILITY:

Stable. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:

Thermal decomposition or combustion may produce CO, CO2 and reactive hydrocarbons.

TOXICOLOGICAL INFORMATION

OTHER:

An extensive profile which characterizes adverse health effects information for this material has been prepared by the Agency for Toxic Substances Disease Registry (ATSDR). Individuals interested in a summary of the toxicology of this material should reference this document. This profile can be obtained from the National Technical Information Services (NTIS).

========== DISPOSAL CONSIDERATIONS ==========

WASTE DISPOSAL (Resource Conservation & Recovery Act - RCRA):

This material, when discarded or disposed of, is a characteristic hazardous waste according to Federal regulations (40 CFR 261). This material exhibits the characteristic of ignitability and is assigned the EPA Hazardous Waste Number of D001. The discarding or disposal of this material must be done at a properly permitted facility in accordance with the regulations of 40 CFR 262, 263, 264, and 268. Additionally, the discarding or disposal of this material may be further regulated by state, regional, or local regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate, or otherwise inappropriate. The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

There may be specific current regulations at the local, regional, or state level that pertain to this information. Chemical additions, processing, or otherwise altering this material may make the waste

========== TRANSPORT INFORMATION ==========

U.S. DEPARTMENT OF TRANSPORTATION (D.O.T.):

Proper Shipping Name (49 CFR 172.101): Fuel Oil (No. 2)
Hazard Class (49 CFR 172.101): 3
UN/NA Code (49 CFR 172.101): NA 1993
Packing Group (49 CFR 179.101): PG III
Bill Of Lading Desc. (49 CFR 172.101): Fuel Oil (No. 2), 3, NA 1993, PG III
Labels Required (49 CFR 172.101): Not Regulated
Placards Required (49 CFR 172.101): Combustible

INTERNATIONAL AND DOMESTIC AIR TRANSPORTATION:

IATA Proper Shipping Name: Diesel Fuel
Hazard Class: 3
Subsidiary Risk: NA
UN/NA: UN 1202
Packaging Specification: 309, 310
** [illegible] **

Labels Required: Flammable Liquid, Orientation Arrows

INTERNATIONAL WATER TRANSPORTATION:

IMO Proper Shipping Name: Diesel Fuel
Hazard Class: 3.3
UN Code: UN 1202
IMDG Page Number: 3375
Labels Required: Flammable Liquid
Placards Required: Flammable

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (T.D.G.):

Shipping Name: Fuel Oil, No. 2
Product NA: UN 1202
Residual Class: 3
Division: NA
Packaging Group: PGIII
Labels Required: Flammable Liquid
Placards Required: Flammable

========== REGULATORY INFORMATION ==========

NOTICE:

A[illegible] or release, or substantial threat of release, of this m[illegible] to navigable water (virtually any surface water) sufficient to [illegible] a visible sheen upon the water must be reported immediately to [illegible]tional Response Center (800/424-8802), as required by U.S. [illegible]aw. Failure to report may result in substantial civil and [illegible]es. Also contact the Coast Guard and appropriate [illegible] regulatory agencies.

U[illegible] SUBSTANCE CONTROL ACT (TSCA):

A[illegible]nponents of this product are listed on the TSCA inventory.

U[illegible] SUPERFUND AMENDMENTS & REAUTHORIZATION ACT (SARA) TITLE III
IN[illegible]ATION:
L[illegible] the hazard catagories for SARA Section 311/312 (40
C[illegible]
Imm[illegible]rd: X
D[illegible]: X
F[illegible] X
P[illegible] -
** [illegible] 08

Re tivity Hazard: -

CA ENVIRONMENTAL PROTECTION ACT (CEPA):

All of this product are listed on the Canadian DSL or N

C. AN RKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)
C OR :
Th ollowing HMIS categories apply to this product:
C : - Other Toxic Effects: X
F ustible: X Bio Hazardous: -
O - Corrosive: -
A X Dangerously Reactive: -

==================== OTHER INFORMATION ==============================

N HMIS RATINGS:
0 Health: 0
2 Flammability: 2
0 Reactivity: 0
ds: - Personal Protective Equipment:H

R TE: 27-sep-1996
R ET DATED: 17-feb-1995
C : BP OIL HSEQ DEPARTMENT
R ARY: The following section(s) have been revised since
th of this MSDS:
NTIFICATION
ASURES
ONTROLS / PERSONAL PROTECTION
D REACTIVITY
CAL INFORMATION
NSIDERATIONS
INFORMATION
INFORMATION
MATION

N ormation presented herein is based on data
c ccurate as of the date of preparation of this
M ata Sheet. However, no warranty or representation,
e d, is made as to the accuracy or completeness of
th and safety information, nor is any authorization
g practice any patented invention without a
li n, no responsibility can be assumed by vendor
fo r injury resulting from abnormal use, from any
fa o recommended practices, or from any hazards
**

inherer [illegible] ure of the product.

ND: No D[illegible] Not Applicable *See specific note or section

========== CHEMICAL PRODUCT AND COMPANY IDENTIFICATION ==========

TRADE NAME: LOW SULFUR NO. 2 DIESEL
CAS NUMBER: 68476-34-6
SYNONYM(S): PROCESS STREAM; NO. 2 DIESEL FUEL; FUEL OIL; MIDDLE DISTILLATE; AB0/AA9-1; AG7; AG8
MSDS NUMBER: 1354
PRODUCT CODE: NA
HIERARCHY: 040.020
MANUFACTURER/SUPPLIER: BP Oil Company
ADDRESS: 200 Public Square, Cleveland, OH 44114-2375
TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE:
BP America (In Ohio): 800-362-8059
BP America (Outside Ohio): 800-321-8642
CHEMTREC ASSISTANCE: 800-424-9300
TELEPHONE NUMBERS - GENERAL ASSISTANCE: (Normal Office Hours): (8:00-4:30 M-F, EST):
Technical: 216-441-8106
MSDS Contact: 216-586-8023

========== COMPOSITION/INFORMATION ON INGREDIENTS ==========

COMPONENT:A distillate having a minimum viscosity of 32.6 SUS at 100 degrees F to a maximum of 40.1 SUS at 100 degrees F
CAS NO.: 68476-34-6
% BY WT.: 99.9 - 100
EXPOSURE LIMITS: None Established

========== HAZARDS IDENTIFICATION ==========

EMERGENCY OVERVIEW:

Clear Liquid With Hydrocarbon Odor. May Be Dyed For Identification.
Danger!
Harmful or Fatal If Swallowed.
Aspiration Hazard If Swallowed--Can Enter Lungs and Cause Damage.
May Be Irritating To the Eyes and Respiratory Tract.
Causes Skin Irritation.
Vapors May Be Harmful.
Possible Cancer Hazard - Contains Material Which May Cause Cancer Based On Animal Data.
Combustible Liquid & Vapor.

POTENTIAL HEALTH EFFECTS:

SKIN:

Repeated or prolonged contact may result in defatting, redness, itching, inflammation, cracking and possible secondary infection. May cause allergic reactions in some individuals. Absorption from prolonged or massive skin contact may cause poisoning. High pressure skin injections are Serious Medical Emergencies. Injury may not appear serious at first; within a few hours, tissue will become swollen, discolored and extremely painful (see Notes to Physician section).

EYE:

Exposure to vapors, fumes or mists may cause irritation.

INHALATION:

May cause respiratory tract irritation. Exposure may cause central nervous system symptoms similar to those listed under "Ingestion" (see Ingestion section). Degenerative changes in the liver, kidneys and bone marrow may occur with prolonged, high concentrations. Repeated or prolonged exposures may cause behavioral changes.

INGESTION:

Aspiration into lungs may cause pneumonitis. May cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting and diarrhea. May cause harmful central nervous system effects. Effects may include excitation, euphoria, headache, dizziness, drowsiness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death.

SPECIAL TOXIC EFFECTS:

Based on animal studies, repeated overexposure may produce skin tumors upon repeated and prolonged skin contact in the absence of good personal hygiene. However, long-term dermal application studies of similar materials, i.e. middle distillates, in animals have shown that skin tumors are produced only when marked and prolonged skin irritation takes place during the study. Therefore, this product should not present a significant hazard of skin tumor formation when the "Skin Protection" recommendations are followed.

IARC has determined that diesel engine exhaust is probably carcinogenic to humans. (IARC Class- 2A). Lifetime exposure to whole diesel exhaust has been shown to cause cancer in laboratory animals. NIOSH recommends that whole diesel exhaust be regarded as a potential occupational carcinogen.

Warning: The use of any hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of combustion products and

inadequate oxygen levels. IARC has determined that occupational exposures in petroleum refining are probably carcinogenic to humans.

See Section FIRST AID MEASURES - for Medical Conditions Aggravated Exposure.

========== FIRST AID MEASURES ==========

SKIN:

Remove contaminated clothing immediately. Wash area of contact thoroughly with soap and water. Get medical attention if irritation persists. High pressure skin injections are serious medical emergencies. Thermal burns require immediate medical attention. Get immediate medical attention.

EYE:

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists. Thermal burns require immediate medical attention.

INHALATION:

Remove affected person from source of exposure. If not breathing, ensure clear airway and institute cardiopulmonary resuscitation (CPR). If breathing is difficult, administer oxygen if available. After administration of oxygen, continue to monitor closely. Get medical attention.

INGESTION:

Do not induce vomiting because of danger of aspirating liquid into lungs. Get immediate medical attention. If spontaneous vomiting occurs, monitor for breathing difficulty.

NOTES TO PHYSICIAN:

In case of ingestion, gastric lavage with activated charcoal can be used promptly to prevent absorption. Consideration should be given to the use of an endotracheal tube, to prevent aspiration. Individuals intoxicated by Diesel Fuel No. 2 should be hospitalized immediately, with acute and continuing attention to neurologic and cardiopulmonary function. Positive pressure ventilation may be necessary. After the initial episode, individuals should be followed for changes in blood variables and the delayed appearance of pulmonary edema and chemical pneumonitis. Such patients should be followed for several days or weeks for delayed effects, including bone marrow toxicity, hepatic and renal impairment. Individuals with chronic pulmonary disease will

be more seriously impaired, and recovery from inhalation exposure may be complicated. In case of skin injection, prompt debridement of the wound is necessary to minimize necrosis and tissue loss.

========== FIREFIGHTING MEASURES ==========

FLASH POINT: 51.7 C (125.06 F)
AUTOIGNITION TEMPERATURE: ND
FLAMMABILITY LIMITS IN AIR (% BY VOL.) LOWER: > 0.7
FLAMMABILITY LIMITS IN AIR (% BY VOL.) UPPER: < 5

HAZARDOUS COMBUSTION PRODUCTS:

Combustion may produce CO, CO2 and reactive hydrocarbons.

BASIC FIRE FIGHTING PROCEDURES:

Use water spray, dry chemical, foam or carbon dioxide to extinguish fire. Use water spray to cool fire-exposed containers, structures and to protect personnel. If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop leak. Use water to flush spills away from sources of ignition. Do not flush down public sewers or other drainage systems. Exposed firefighters must wear MSHA/NIOSH approved positive pressure self-contained breathing apparatus with full face mask and full protective clothing.

UNUSUAL FIRE & EXPLOSION HAZARDS:

Irritating and/or toxic substances may be emitted upon thermal decomposition. Dangerous when exposed to heat or flame. Runoff to sewer may cause fire or explosion hazard. Containers may explode in heat of fire.

========== ACCIDENTAL RELEASE MEASURES ==========

your facility or operation has an "Oil or Hazardous Substance Contingency Plan", activate its procedures. Take immediate steps to stop and contain the spill. Caution should be exercised regarding personnel safety and exposure to the spilled material. For technical advice and assistance related to chemicals, contact CHEMTREC (800/424-9300) and your local fire department. Notify the National Response Center, if required. Also notify appropriate state and local regulatory agencies, the LEPC and the SERC. Contact the local Coast Guard if the release is into a waterway.

Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind; keep out of low areas. (Also see Personal Protection Information section.)
Shut off ignition sources; no flares, smoking or flames in hazard

area. Stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Large Spills: Dike far ahead of liquid spill for later disposal.

When reporting a spill to the National Response Center or the Coast Guard, you may need to supply the Coast Guard Chemical Hazard Response Information System (CHRIS) code:

Group Number: 33
CHRIS Code: OTD

Additional spill related information may be found in the U.S. Coast Guard Chemical Hazard Response Information System (CHRIS) Manual.

During an accidental release, personal protection equipment may be required (see Section EXPOSURE CONTROLS/PERSONAL PROTECTION). Additional regulatory requirements may apply (see Section REGULATORY INFORMATION).

========== HANDLING AND STORAGE ==========

HANDLING:

Use non-sparking tools. Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion.

Empty containers may contain toxic, flammable/combustible or explosive residue or vapors. Do not cut, grind, drill, weld, reuse or dispose containers unless adequate precautions are taken against these hazards.

STORAGE:

Store in tightly closed containers in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles.

========== EXPOSURE CONTROLS / PERSONAL PROTECTION ==========

ENGINEERING CONTROLS:

Ventilation may be used to control or reduce airborne concentrations.

PERSONAL PROTECTION EQUIPMENT (PPE):

EYE PROTECTION:

Wear safety glasses or chemical goggles to prevent eye contact. Do not wear contact lenses when working with this substance. Have eye washing facilities readily available where eye contact can occur.

SKIN PROTECTION:

Wear impervious gloves and protective clothing to prevent skin contact.

RESPIRATORY PROTECTION:

NIOSH/MSHA approved breathing equipment may be required for non-routine and emergency use.

See Section COMPOSITION/INFORMATION ON INGREDIENTS For Exposure Guidelines.

========== PHYSICAL AND CHEMICAL PROPERTIES ==========

BOILING POINT: 160 C (320 F)
SP. GRAVITY (Water=1): 0.84 - 0.88 @ 15.56 C (60.008 F)
MELTING POINT: NA
% VOLATILE: Negligible
VAPOR PRESSURE: 0.4 MM HG @ 20 C (68 F)
EVAPORATION RATE: Slower
VAPOR DENSITY (Air=1): 4.7
VISCOSITY: 1.2 - 4.6 CST @ 37.8 C (100.04 F)
% SOLUBILITY IN WATER: Negligible
POUR POINT: -12.22 C (10.004 F)
pH: NEUTRAL
MOLECULAR WEIGHT: NA
MOLECULAR FORMULA: Mixture
ODOR/APPEARANCE:
Clear Liquid With Hydrocarbon Odor. May Be Dyed For Identification.

========== STABILITY AND REACTIVITY ==========

STABILITY/INCOMPATIBILITY:

Stable. Avoid contact with strong oxidizers.

HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS:

Thermal decomposition or combustion may produce CO, CO2 and reactive hydrocarbons.

========== TOXICOLOGICAL INFORMATION ==========

OTHER:

An extensive profile which characterizes adverse health effects information for this material has been prepared by the Agency for Toxic Substances Disease Registry (ATSDR). Individuals interested in summary of the toxicology of this material should reference this cument. This profile can be obtained from the National Technical formation Services (NTIS).

========== DISPOSAL CONSIDERATIONS ==========

WASTE DISPOSAL (Resource Conservation & Recovery Act - RCRA):

This material, when discarded or disposed of, is a characteristic hazardous waste according to Federal regulations (40 CFR 261). This material exhibits the characteristic of ignitability and is assigned the EPA Hazardous Waste Number of D001. The discarding or disposal of this material must be done at a properly permitted facility in accordance with the regulations of 40 CFR 262, 263, 264, and 268. Additionally, the discarding or disposal of this material may be further regulated by state, regional, or local regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate, or otherwise inappropriate. The transportation, storage, treatment and disposal of this waste material must be conducted in compliance with all applicable Federal, state, and local regulations.

There may be specific current regulations at the local, regional, or state level that pertain to this information. Chemical additions, processing, or otherwise altering this material may make the waste

========== TRANSPORT INFORMATION ==========

U.S. DEPARTMENT OF TRANSPORTATION (D.O.T.):

Proper Shipping Name (49 CFR 172.101): Fuel Oil (No. 2)
azard Class (49 CFR 172.101): 3
/NA Code (49 CFR 172.101): NA 1993
cking Group (49 CFR 179.101): PG III
Bill Of Lading Desc. (49 CFR 172.101): Fuel Oil (No. 2), 3, NA 1993, PG III
Labels Required (49 CFR 172.101): Not Regulated
Placards Required (49 CFR 172.101): Combustible

INTERNATIONAL AND DOMESTIC AIR TRANSPORTATION:

IATA Proper Shipping Name: Diesel Fuel
Hazard Class: 3
Subsidiary Risk: NA
UN Code: UN 1202
Package Specification: 309, 310

Labels Required: Flammable Liquid, Orientation Arrows

INTERNATIONAL WATER TRANSPORTATION:

IMDG Proper Shipping Name: Diesel Fuel
Hazard Class: 3.3
UN Code: UN 1202
IMDG Page Number: 3375
Labels Required: Flammable Liquid
Placards Required: Flammable

CANADIAN TRANSPORTATION OF DANGEROUS GOODS (T.D.G.):

Shipping Name: Fuel Oil, No. 2
PIN (UN/NA): UN 1202
Regulated Class: 3
Division: NA
Packaging Group: PGIII
Labels Required: Flammable Liquid
Placards Required: Flammable

========== REGULATORY INFORMATION ==========

NOTIFICATION:

Any spill or release, or substantial threat of release, of this material to navigable water (virtually any surface water) sufficient to cause a visible sheen upon the water must be reported immediately to the National Response Center (800/424-8802), as required by U.S. Federal Law. Failure to report may result in substantial civil and criminal penalties. Also contact the Coast Guard and appropriate state and local regulatory agencies.

US EPA TOXIC SUBSTANCE CONTROL ACT (TSCA):

All components of this product are listed on the TSCA inventory.

US EPA SUPERFUND AMENDMENTS & REAUTHORIZATION ACT (SARA) TITLE III INFORMATION:
Listed below are the hazard catagories for SARA Section 311/312 (40 CFR 370):
Immediate Hazard: X
Delayed Hazard: X
Fire Hazard: X
Pressure Hazard: -

Reactivity Hazard: -

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):

All components of this product are listed on the Canadian DSL or NDSL inventories.

CANADIAN WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CATEGORIES:
The following WHMIS categories apply to this product:

Compressed Gas:	-	Other Toxic Effects:	X
Flammable/Combustible:	X	Bio Hazardous:	-
Oxidizer:	-	Corrosive:	-
Acutely Toxic:	X	Dangerously Reactive:	-

========== OTHER INFORMATION ==========

NFPA RATINGS:		HMIS RATINGS:	
Health:	0	Health:	0
Flammability:	2	Flammability:	2
Reactivity:	0	Reactivity:	0

Special Hazards: - Personal Protective Equipment:H

REVISION DATE: 27-sep-1996
REPLACES SHEET DATED: 17-feb-1995
COMPLETED BY: BP OIL HSEQ DEPARTMENT
REVISION SUMMARY: The following section(s) have been revised since the previous issue of this MSDS:

- HAZARDS IDENTIFICATION
- FIRST AID MEASURES
- EXPOSURE CONTROLS / PERSONAL PROTECTION
- STABILITY AND REACTIVITY
- TOXICOLOGICAL INFORMATION
- DISPOSAL CONSIDERATIONS
- TRANSPORT INFORMATION
- REGULATORY INFORMATION
- OTHER INFORMATION

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. However, no warranty or representation, express or implied, is made as to the accuracy or completeness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, no responsibility can be assumed by vendor for any damage or injury resulting from abnormal use, from any failure to adhere to recommended practices, or from any hazards

inherent in the nature of the product.

ND: No Data NA: Not Applicable *See specific note or section

MATERIAL SAFETY DATA SHEET

MSDS Number: 71630E - 12

24 Hour Emergency Assistance: CHEMTEL (877) 276-7283
General Assistance Number: (877) 276-7285

SECTION 1 PRODUCT IDENTIFICATION

MATERIAL IDENTITY: Rotella® T 15W-40 with Advanced Soot Control

PRODUCT CODES: 50012
COMPANY ADDRESS: Equilon Enterprises, LLC, P. O. Box 4453, Houston, TX. 77210-4453

SECTION 2 PRODUCT/INGREDIENTS

INGREDIENTS	CAS#	CONCENTRATION
Motor Oil 15W-40 with Advanced Soot Control	Mixture	100 %volume
Hydrotreated Heavy Paraffinic Distillate	64742-54-7	85 - 95 %volume
Zinc Compounds	Mixture	3 - 6 %volume
Polymer additives	Proprietary	1 - 3 %volume

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Appearance & Odor: Dark amber liquid. Slight hydrocarbon odor.
Health Hazards: No known immediate health hazards.
Physical Hazards: No known physical hazards.
NFPA Rating (Health, Fire, Reactivity): 0, 1, 0
Hazard Rating: Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4

Inhalation:
Inhalation of vapors (generated at high temperatures only) or oil mist may cause mild irritation of the nose, throat, and respiratory tract.

Eye Irritation:
Lubricating oils are generally considered no more than minimally irritating to the eyes.

Skin Contact:
Lubricating oils are generally considered no more than minimally irritating to the skin. Prolonged and repeated contact may result in defatting and drying of the skin that may cause various skin disorders such as dermatitis, folliculitis or oil acne.

Ingestion:
Lubricating oils are generally no more than slightly toxic if swallowed.

Other Health Effects:
The International Agency for Research on Cancer (IARC) has determined there is sufficient evidence for the carcinogenicity in experimental animals of used gasoline motor oils. Handling procedures and safety precautions in the MSDS should be followed to minimize exposure to the used product.

Material may release hydrogen sulfide (H_2S), a highly toxic and extremely flammable gas, when heated to 120 Degrees F or higher. H_2S can cause irritation of the eyes and respiratory tract, headache, dizziness, nausea, vomitting, diarrhea, and pulmonary edema. At concentrations above 300 ppm, respiratory paralysis, causing unconsciousness and death, can occur. The odor ("rotten egg") threshold is 0.02 ppm. Do not depend on sense of smell for warning; H_2S rapidly deadens the sense of smell.

Signs and Symptoms:
Irritation as noted above.

Aggravated Medical Conditions:
Pre-existing eye, skin and respiratory disorders may be aggravated by exposure to this product.

For additional health information, refer to section 11.

SECTION 4 FIRST AID MEASURES

Inhalation:
Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Skin:
Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.

Eye:
Flush with water. If irritation occurs, get medical attention.

Ingestion:
Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention.

Note to Physician:
In general, emesis induction is unnecessary in high viscosity, low volatility products such as oils and greases.

SECTION 5 FIRE FIGHTING MEASURES

Flash Point [Method]: >400 °F/>204.44 °C [Pensky-Martens Closed Cup]

Extinguishing Media:
Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO_2) to extinguish flames. Do not use a direct stream of water. Product will float and can be reignited on surface of water.

Fire Fighting Instructions:
Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots), including a positive pressure, NIOSH approved, self-contained breathing apparatus.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures:
May burn although not readily ignitable.

Wear appropriate personal protective equipment when cleaning up spills. Refer to Section 8.

Spill Management:
FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

Place in container for proper disposal.

Reporting:
CERCLA: Product is covered by EPA's Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) petroleum exclusion. Releases to air, land, or water are not reportable under CERCLA (Superfund).

CWA: This product is an oil as defined under Section 311 of EPA's Clean Water Act (CWA). Spills into or leading to surface waters that cause a sheen must be reported to the National Response Center, 1-800-424-8802.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures:
Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toliet. Launder contaminated clothing before reuse. Properly dispose of contaminated leather articles such as shoes or belts that cannot be decontaminated. Avoid heat, open flames, including pilot lights, and strong oxidizing agents. Use explosion-proof ventilation to prevent vapor accumulation. Ground all handling equipment to prevent sparking.

Material may release hydrogen sulfide (H_2S), a highly toxic and extremely flammable gas, when heated to 120 Degrees F or higher. H_2S may collect in the headspace of the container.

Storage:
Store in a cool, dry place with adequate ventilation. Keep away from open flames and high temperatures.

Container Warnings:
Keep containers closed when not in use. Containers, even those that have been emptied, can contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Chemical	Limit	TWA	STEL	Ceiling	Notation
Oil mist, mineral	ACGIH TLV	5 mg/m3	10 mg/m3		
Oil mist, mineral	OSHA PEL	5 mg/m3			

Decomposition Product	Limit	TWA	STEL	Ceiling	Notation
Hydrogen sulfide	ACGIH - TLV	10 ppmm	15 ppmm		
Hydrogen sulfide	OSHA - PEL_IS	10 ppmm	15 ppmm		

Decomposition Product	Method	Condition
Hydrogen sulfide	Elevated Temperatures	at temperatures >120 Deg F

Exposure Controls

Adequate ventilation to control airborne concentrations below the exposure guidelines/limits.

Personal Protection

Personal protective equipment (PPE) selections vary based on potential exposure conditions such as handling practices, concentration and ventilation. Information on the selection of eye, skin and respiratory protection for use with this material is provided below.

Eye Protection:
Safety glasses with side shields

Skin Protection:
Use protective clothing which is chemical resistant to this material. Selection of protective clothing depends on potential exposure conditions and may include gloves, boots, suits and other items. The selection(s) should take into account such factors as job task, type of exposure and durability requirements.

Published literature, test data and/or glove and clothing manufacturers indicate the best protection is provided by:

Neoprene, or Nitrile Rubber

Respiratory Protection:
If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, an approved respirator must be worn. Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Types of respirator(s) to be considered in the selection process include:

For Mist: Air Purifying, R or P style NIOSH approved respirator. For Vapors: Air Purifying, R or P style prefilter & organic cartridge, NIOSH approved respirator. Self-contained breathing apparatus.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor: Dark amber liquid. Slight hydrocarbon odor.
Substance Chemical Family: Petroleum Hydrocarbon

Flash Point	> 400 °F [Pensky-Martens Closed Cup]	**Pour Point**	-15 °F
Specific Gravity	0.8844	**Stability**	Stable
Vapor Pressure	< 0.1 mmHg	**Viscosity**	100 cSt @ 104 °F

SECTION 10 REACTIVITY AND STABILITY

Stability:
Material is stable under normal conditions.

Conditions to Avoid:
Avoid heat and open flames.

Materials to Avoid:
Avoid contact with strong oxidizing agents.

Hazardous Decomposition Products:
Thermal decomposition products are highly dependent on combustion conditions. A complex mixture of airborne solids, liquids and gases will evolve when this material undergoes pyrolysis or combustion. Acids, Acrolein, Aldehydes, Carbon Monoxide, Carbon Dioxide, Hydrogen Sulfide, Ketones, Nitrogen Oxides, Phosphorus Oxides, Sulfur Oxides and other unidentified organic compounds may be formed upon combustion.

SECTION 11 TOXICOLOGICAL INFORMATION

Acute Toxicity

TEST	Result	OSHA Classification	Material Tested
Dermal LD50	>5.0 g/kg(Rabbit)	Non-Toxic	Based on components(s)
Eye Irritation Draize	0 [Rabbit, 24 HOUR(S)]	Non-Irritating	Based on components(s)
Oral LD50	>5.0 g/kg(Rat)	Non-Toxic	Based on components(s)
Skin Irritation Draize	0.00 [Rabbit, 24 HOUR(S)]	Non-Irritating	Based on components(s)

Carcinogenicity Classification

Chemical Name	NTP	IARC	ACGIH	OSHA
Motor Oil 15W-40 with Advanced Soot Control	No	Not Reviewed by IARC	Not Reviewed	No

SECTION 12 ECOLOGICAL INFORMATION

Environmental Impact Summary:
There is no ecological data available for this product. However, this product is an oil. It is persistent and does not readily biodegrade. However, it does not bioaccumulate.

SECTION 13 DISPOSAL CONSIDERATIONS

RCRA Information:

Under RCRA, it is the responsibility of the user of the material to determine, at the time of the disposal, whether the material meets RCRA criteria for hazardous waste. This is because material uses, transformations, mixtures, processes, etc. may affect the classification. Refer to the latest EPA, state and local regulations regarding proper disposal.

SECTION 14 TRANSPORT INFORMATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

SECTION 15 REGULATORY INFORMATION

Federal Regulatory Status

OSHA Classification:
Product is hazardous according to the OSHA Hazard Communication Standard, 29 CFR 19.10.1200, because it carries the occupational exposure limit for mineral oil mist.

Ozone Depleting Substances (40 CFR 82 Clean Air Act):
This material does not contain nor was it directly manufactured with any Class I or Class II ozone depleting substances.

Superfund Amendment & Reauthorization Act (SARA) Title III:

There are no components in this product on the SARA 302 list.

SARA Hazard Categories (311/312):

Immediate Health	Delayed Health	Fire	Pressure	Reactivity
NO	NO	NO	NO	NO

SARA Toxic Release Inventory (TRI) (313):
Zinc compounds

Toxic Substances Control Act (TSCA) Status:
All component(s) of this material is(are) listed on the EPA/TSCA Inventory of Chemical Substances.

Other Chemical Inventories:
Austrailian AICS, Canadian DSL, Chinese Inventory, European EINECS, Japan ENCS, Korean Inventory, Phillipines PICCS

State Regulation

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

New Jersey Right-To-Know Chemical List:

Zinc compounds	3 - 6 %volume	

Pennsylvania Right-To-Know Chemical List:

Zinc compounds	3 - 6 %volume	Environmental Hazard

SECTION 16 OTHER INFORMATION

HMIS Rating (Health, Fire, Reactivity): 1, 1, 0

Revision#: 12
Revision Date: 01/05/2000
Revisions since last change (discussion): This Material Safety Data Sheet has changed because Equiva Services LLC. has implemented new software to generate the sheet. There will be slight differences in the hazard and precautionary language as we incorporate the guidance contained in the ANSI MSDS standard (ANSI Z400.1-1998). There are no significant changes to the health, safety or precautionary messages. We encourage you to take the opportunity to reread the sheet and review the information contained.

PRODUCT CODES: 50012

SECTION 17 LABEL INFORMATION

READ AND UNDERSTAND MATERIAL SAFETY DATA SHEET BEFORE HANDLING OR DISPOSING OF PRODUCT. THIS LABEL COMPLIES WITH THE REQUIREMENTS OF THE OSHA HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) FOR USE IN THE WORKPLACE. THIS LABEL IS NOT INTENDED TO BE USED WITH PACKAGING INTENDED FOR SALE TO CONSUMERS AND MAY NOT CONFORM WITH THE REQUIREMENTS OF THE CONSUMER PRODUCT SAFETY ACT OR OTHER RELATED REGULATORY REQUIREMENTS.

Rotella® T 15W-40 with Advanced Soot Control

ATTENTION!

PROLONGED OR REPEATED SKIN CONTACT MAY CAUSE OIL ACNE OR DERMATITIS. USED GASOLINE ENGINE OIL HAS BEEN SHOWN TO CAUSE CANCER IN LABORATORY ANIMALS.

Avoid prolonged or repeated contact with eyes, skin and clothing. Wash thoroughly after handling.

FIRST AID

Inhalation: Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.
Skin Contact: Remove contaminated clothing and shoes and wipe excess from skin. Flush skin with water, then wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.
Eye Contact: Flush with water. If irritation occurs, get medical attention.
Ingestion: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical attention.

FIRE

In case of fire, Use water fog, 'alcohol foam', dry chemical or carbon dioxide (CO_2) to extinguish flames. Do not use a direct stream of water. Product will float and can be reignited on surface of water.

Spill or Leak

Dike and contain spill.
FOR LARGE SPILLS: Remove with vacuum truck or pump to storage/salvage vessels.

FOR SMALL SPILLS: Soak up residue with an absorbent such as clay, sand or other suitable material. Place in non-leaking container and seal tightly for proper disposal.

CONTAINS: Hydrotreated Heavy Paraffinic Distillate, 64742-54-7; Zinc Compounds, Mixture; Polymer additives, Proprietary

NFPA Rating (Health, Fire, Reactivity): 0, 1, 0

TRANSPORTATION

US Department of Transportation Classification
This material is not subject to DOT regulations under 49 CFR Parts 171-180.

Oil: This product is an oil under 49CFR (DOT) Part 130. If shipped by rail or highway in a tank with a capacity of 3500 gallons or more, it is subject to these requirements. Mixtures or solutions containing 10% or more of this product may also be subject to this rule.

CAUTION: Misuse of empty containers can be hazardous. Empty containers can be hazardous if used to store toxic, flammable, or reactive materials. Cutting or welding of empty containers might cause fire, explosion or toxic fumes from residues. Do not pressurize or expose to open flames or heat. Keep container closed and drum bungs in place.

Name and Address
Equilon Enterprises, LLC
P. O. Box 4453
Houston, TX 77210-4453

TRANSPORTATION EMERGENCY CHEMTEL (877) 276-7283

HEALTH EMERGENCY CHEMTEL (877) 276-7283

ADMINISTRATIVE INFORMATION
COMPANY ADDRESS: Equilon Enterprises, LLC, P. O. Box 4453, Houston, TX. 77210-4453 **Company Product Stewardship & Regulatory Compliance Contact:** Timothy W Childs
MSDS FAX-BACK Phone Number: (877) 276-7285

THE INFORMATION CONTAINED IN THIS DATA SHEET IS BASED ON THE DATA AVAILABLE TO US AT THIS TIME, AND IS BELIEVED TO BE ACCURATE BASED UPON THAT DATA. IT IS PROVIDED INDEPENDENTLY OF ANY SALE OF THE PRODUCT, FOR PURPOSE OF HAZARD COMMUNICATION. IT IS NOT INTENDED TO CONSTITUTE PRODUCT PERFORMANCE INFORMATION, AND NO EXPRESS OR IMPLIED WARRANTY OF ANY KIND IS MADE WITH RESPECT TO THE PRODUCT, UNDERLYING DATA OR THE INFORMATION CONTAINED HEREIN. YOU ARE URGED TO OBTAIN DATA SHEETS FOR ALL PRODUCTS YOU BUY, PROCESS, USE OR DISTRIBUTE, AND ARE ENCOURAGED TO ADVISE THOSE WHO MAY COME IN CONTACT WITH SUCH PRODUCTS OF THE INFORMATION CONTAINED HEREIN.

TO DETERMINE THE APPLICABILITY OR EFFECT OF ANY LAW OR REGULATION WITH RESPECT TO THE PRODUCT, YOU SHOULD CONSULT WITH YOUR LEGAL ADVISOR OR THE APPROPRIATE GOVERNMENT AGENCY. WE WILL NOT PROVIDE ADVICE ON SUCH MATTERS, OR BE RESPONSIBLE FOR ANY INJURY FROM THE USE OF THE PRODUCT DESCRIBED HEREIN. THE UNDERLYING DATA, AND THE INFORMATION PROVIDED HEREIN AS A RESULT OF THAT DATA, IS THE PROPERTY OF EQUIVA SERVICES, LLC AND IS NOT TO BE THE SUBJECT OF SALE OR EXCHANGE WITHOUT THE EXPRESS WRITTEN CONSENT OF EQUIVA SERVICES, LLC.

Shell

MATERIAL SAFETY DATA SHEET

EQUILON MSDS: 864040E-08 01/04/99

SPIRAX(R) HEAVY DUTY GEAR OIL 85W-140 (MIL-2105E)

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE
EQUIVA SERVICES: 877-276-7283
CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
877-276-7285

NAME AND ADDRESS

EQUILON ENTERPRISES LLC
PRODUCT STEWARDSHIP
P.O. BOX 674414
HOUSTON, TX 77267-4414

SECTION I NAME

PRODUCT: SPIRAX(R) HEAVY DUTY GEAR OIL 85W-140 (MIL-2105E)
CHEM NAME: MIXTURE (SEE SECTION II-A)
CHEM FAMILY: PETROLEUM HYDROCARBON; GEAR OIL
SHELL CODE: 59212

HEALTH HAZARD: 1 FIRE HAZARD: 1 REACTIVITY: 0

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NO.	PERCENT
P	SPIRAX HEAVY DUTY GEAR OIL 85W-140 (MIL-2105E)	MIXTURE	100
1	HIGHLY REFINED PETROLEUM OILS	MIXTURE*	90-95
2	ADDITIVES	MIXTURE	<10

* MAY CONTAIN: 64742-18-3, 64742-52-5, 64742-57-0
NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE	NOT AVAILABLE	NOT AVAILABLE
1	>5.0 G/KG (RAT)*	>5.0 G/KG (RABBIT)*	NOT AVAILABLE

* BASED ON API STUDIES.

SECTION III HEALTH INFORMATION

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

EYE CONTACT: BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT: BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT CAN RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS. FOLLICULITIS OR OIL ACNE.

INHALATION: INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MINOR IRRITATION OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT.

INGESTION: BASED ON COMPONENT INFORMATION THIS PRODUCT IS NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS: IRRITATION AS NOTED ABOVE.

AGGRAVATED MEDICAL CONDITIONS:
PREEXISTING SKIN AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS:
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

FOR A SPANISH TRANSLATION OF THIS MSDS, CALL 1-800-240-MSDS.

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

COMP NO.	OSHA PEL/TWA	PEL/CEILING	TLV/TWA	ACGIH TLV/STEL	OTHER
P	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	NONE

*OIL MIST, MINERAL

SECTION V EMERGENCY AND FIRST AID PROCEDURES

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

SKIN CONTACT: REMOVE CONTAMINATED CLOTHING AND WIPE EXCESS OFF. WASH WITH SOAP AND WATER OR A WATERLESS HAND CLEANER FOLLOWED BY SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION: REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION: DO NOT INDUCE VOMITING. IN GENERAL NO TREATMENT IS NECESSARY UNLESS LARGE QUANTITIES OF PRODUCT ARE INGESTED. HOWEVER, GET MEDICAL ADVICE.

NOTE TO PHYSICIAN: IN GENERAL, EMESIS INDUCTION IS UNNECESSARY IN HIGH VISCOSITY, LOW VOLATILITY PRODUCTS, I.E., MOST OILS AND GREASES.

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT (DEG F): NOT AVAILABLE

SPECFIC GRAVITY (H2O = 1): 0.9007

VAPOR PRESSURE (MM HG): <0.1

MELTING POINT (DEG F): -9 (POUR POINT)

SOLUBILITY IN WATER: NEGLIGIBLE

VAPOR DENSITY (AIR = 1): NOT AVAILABLE

VISCOSITY: 344.3 (CS @ 104 DEG F)

EVAPORATION RATE (NORMAL BUTYL ACETATE = 1):NOT AVAILABLE

APPEARANCE AND ODOR:BROWN LIQUID. SLIGHT HYDROCARBON ODOR.
PHYS/CHEM PROPERTIES: SEE ABOVE FOR DETAILS

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD: 420.8 DEG F (COC)
FLAMMABLE LIMITS/PERCENT VOLUME IN AIR: LOWER: N/AV HIGHER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS:

MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
NONE IDENTIFIED

SECTION IX REACTIVITY

STABLITY: STABLE HAZARDOUS POLYMERIZATION WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS:
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. HYDROGEN SULFIDE, CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION:
IF EXPOSURE MAY OR DOES EXCEED OCCUPATIONAL EXPOSURE LIMITS (SECTION IV) USE A NIOSH-APPROVED RESPIRATOR TO PREVENT OVEREXPOSURE. IN ACCORD WITH 29 CFR 1910.134 USE EITHER AN ATMOSPHERE-SUPPLYING RESPIRATOR OR AN AIR-PURIFYING RESPIRATOR FOR ORGANIC VAPORS AND PARTICULATES.

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE GLOVES.

ADDITIONAL PROTECTIVE MEASURES:
NONE IDENTIFIED

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES:
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED. STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
NOT HAZARDOUS BY D.O.T. REGULATIONS

DOT PROPER SHIPPING NAME: NOT APPLICABLE

OTHER REQUIREMENTS: NOT APPLICABLE

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PROD UCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE AP PLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YO U SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	CAS NO	PERCENT	STATE CODE
SOL. REF., HYDROTREATED, ACID	64742-18-3	0-15	MA

TREATED HEAVY NAPHTHENIC
DIST.

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI SPECIAL NOTES

MSDS REVISED IN SECTION II-A TO SHOW REVISED COMPOSITION, SECTION II-B WITH REVISED TOX DATA AND EDS SECTION I. THE OSHA HAZARD EVALUATION AND REGULATORY STATUS OF THE PRODUCT HAS NOT CHANGED. A SPANISH TRANSLATION OF THIS MSDS MAY BE OBTAINED BY CALLING 1-800-240-MSDS.

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

WE ARE PROVIDING OUR MOST RECENT MATERIAL SAFETY DATA SHEET AND / OR ENVIRONMENTAL DATA SHEET. IF YOU WISH TO RECEIVE UPDATES TO THIS INFORMATION, PLEASE CALL OUR GENERAL MSDS ASSISTANCE LINE (877-276-7285) TO ENSURE THAT YOU ARE ADDED TO OUR REGULAR MSDS DISTRIBUTION SYSTEM

Shell

ENVIRONMENTAL DATA SHEET

EQUILON EDS: 864040E

SPIRAX(R) HEAVY DUTY GEAR OIL 85W-140 (MIL-2105E)

TELEPHONE NUMBER:

24 HOUR EMERGENCY ASSISTANCE
EQUIVA SERVICES: 877-276-7283
CHEMTREC: 800-424-9300

GENERAL MSDS ASSISTANCE
877-276-7285

NAME AND ADDRESS

EQUILON ENTERPRISES
PRODUCT STEWARDSHIP
P.O. BOX 674414
HOUSTON, TX 77267-4414

PRODUCT CODE: 59212

SECTION I PRODUCT COMPOSITION

NO.	COMPOSITION	CAS	PERCENT
P	SPIRAX HEAVY DUTY GEAR OIL 85W-140 (MIL-2105E)	MIXTURE	100
1	HIGHLY REFINED PETROLEUM OILS	MIXTURE*	90-95
2	ADDITIVES	MIXTURE	<10

* MAY CONTAIN: 64742-18-3, 64742-52-5, 64742-57-0

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (*1)	EHS TPQ (*2)	SEC-313 (*3)	313 CATEGORY (*4)	311/312 CATEGORY (*5)

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT IS NOT REGULATED BY SARA, TITLE III.

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = CATEGORY (FOR AGGREGATE REPORTING REQUIREMENTS UNDER SARA 311, 312)
HEALTH: H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD
H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL: P-3 = FIRE HAZARD
P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS COVERED BY EPA'S COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) PETROLEUM EXCLUSION. THEREFORE, RELEASES TO AIR, LAND, OR WATER ARE NOT REPORTABLE UNDER CERCLA ("SUPERFUND"). HOWEVER, UNDER SECTION 311 OF EPA'S CLEAN WATER ACT (CWA), THIS PRODUCT IS CONSIDERED AN OIL. AS SUCH, SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.
THIS PRODUCT IS AN OIL UNDER 49 CFR (DOT) PART 130. IF SHIPPED BY RAIL OR HIGHWAY IN A TANK WITH A CAPACITY OF 3,500 GALLONS OR MORE, IT IS SUBJECT TO THE REQUIREMENTS OF PART 130. MIXTURE SOLUTIONS IN WHICH THIS PRODUCT IS PRESENT AT 10% OR MORE MAY ALSO BE SUBJECT TO THIS RULE.

SECTION IV RCRA INFORMATION

IF THIS PRODUCT BECOMES A WASTE, IT WOULD NOT BE A HAZARDOUS WASTE BY RCRA CRITERIA (40 CFR 261). PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN

COMPLIANCE WITH LOCAL REGULATIONS.

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

KAREN G. HAYNES

EQUIVA SERVICES LLC
P.O. BOX 674414
HOUSTON, TX 77267-4414

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(877) 276-7285

FOR EMERGENCY ASSISTANCE PLEASE CALL
EQUIVA SERVICES LLC: (877) 276-7283
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97368 (4-85)

MSDS NUMBER ▶ 80,070-13T PAGE

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
3	1	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

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

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

SECTION I

	NAME
PRODUCT ▶	SHELLZONE(R) ALL SEASON ANTI-FREEZE ANTI-BOIL PROTECTION
CHEMICAL NAME ▶	ETHYLENE GLYCOL
CHEMICAL FAMILY ▶	GLYCOL
SHELL CODE ▶	32350 94010

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SHELLZONE(R) ALL SEASON ANTI-FREEZE ANTI-BOIL PROTECTION	MIXTURE	100
1	ETHYLENE GLYCOL	107-21-1	84-94
2	DIETHYLENE GLYCOL	111-46-6	0-10
3	WATER	7732-18-5	2-4
4	INORGANIC/ORGANIC SALTS		2-4

NFPA HAZARD RATING: HEALTH 1 FIRE 1 REACTIVITY 0

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
1	4.0 G/KG (RAT)	NONE	NONE
2	14.8 G/KG (RAT)	11.9 G/KG (RAT)	NONE

SECTION III HEALTH INFORMATION

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

EYE CONTACT
BASED ON PRESENCE OF COMPONENT 1, PRODUCT IS MODERATELY TO SEVERELY IRRITATING TO THE EYES. VAPORS CAN ALSO CAUSE SEVERE EYE IRRITATION.

SKIN CONTACT
BASED ON PRESENCE OF COMPONENTS 1 AND 2, PRODUCT IS MILDLY IRRITATING TO THE SKIN AND SLIGHTLY TOXIC ON PROLONGED OR REPEATED CONTACT.

INHALATION
VAPORS ARE MILDLY TO MARKEDLY IRRITATING TO THE LUNGS DEPENDING ON THE EXPOSURE LEVEL.

INGESTION
PRODUCT MAY BE HARMFUL OR FATAL IF SWALLOWED; MAY PRODUCE CENTRAL NERVOUS SYSTEM (CNS) DEPRESSION AND KIDNEY DAMAGE WHICH MAY BE FATAL. INGESTION OF COMPONENT 2 MAY ALSO PRODUCE LIVER DAMAGE.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. EARLY TO MODERATE CNS DEPRESSION MAY BE EVIDENCED BY GIDDINESS, HEADACHE, DIZZINESS AND NAUSEA; IN EXTREME CASES, UNCONSCIOUSNESS AND DEATH MAY OCCUR. KIDNEY DAMAGE MAY BE EVIDENCED BY CHANGES IN URINE OUTPUT, URINE APPEARANCE OR EDEMA (SWELLING FROM FLUID RETENTION). LIVER DAMAGE MAY BE EVIDENCED BY LOSS OF APPETITE, JAUNDICE (YELLOWISH SKIN COLOR) AND SOMETIMES PAIN IN THE UPPER ABDOMEN ON THE RIGHT SIDE.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING SKIN, EYE, AND RESPIRATORY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT. IMPAIRED KIDNEY AND LIVER FUNCTIONS FROM PREEXISTING DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS
INTENTIONAL ABUSE, MISUSE OR OTHER MASSIVE EXPOSURE MAY CAUSE MULTIPLE ORGAN DAMAGE AND/OR DEATH.

SEE SECTION VI FOR ADDITIONAL INFORMATION.

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
1		50 PPM	39.4 PPM*		

* CEILING (AEROSOL)

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

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

SKIN CONTACT
FLUSH SKIN WITH WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION
DO NOT GIVE LIQUIDS IF VICTIM IS UNCONSCIOUS OR VERY DROWSY. OTHERWISE, GIVE NO MORE THAN 2 GLASSES OF WATER AND INDUCE VOMITING BY GIVING 30CC (2 TABLESPOONS) SYRUP OF IPECAC.* IF IPECAC IS UNAVAILABLE, GIVE 2 GLASSES OF WATER AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF VICTIM'S THROAT. KEEP VICTIM'S HEAD BELOW HIPS WHILE VOMITING. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN
IF VICTIM IS A CHILD, GIVE NO MORE THAN 1 GLASS OF WATER AND 15CC (1 TABLESPOON) SYRUP OF IPECAC. IF SYMPTOMS SUCH AS LOSS OF GAG REFLEX, CONVULSIONS OR UNCONSCIOUSNESS OCCUR BEFORE EMESIS, GASTRIC LAVAGE SHOULD BE CONSIDERED FOLLOWING INTUBATION WITH A CUFFED ENDOTRACHEAL TUBE.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

THERE CASE REPORTS OF ETHYLENE GLYCOL SENSITIZATION (ALLERGY) HAVE BEEN PUBLISHED BUT ALLERGY TO ETHYLENE GLYCOL IS NOT A COMMON PHENOMENON.

IN ONE STUDY, WHEN ETHYLENE GLYCOL WAS ADMINISTERED IN THE DIET AT DAILY DOSES UP TO 1.0 G/KG TO PREGNANT RATS, NO MATERNAL TOXICITY, NO EMBRYOTOXICITY NOR TERATOGENICITY WERE OBSERVED. IN A MORE RECENT STUDY, WHEN ETHYLENE GLYCOL WAS ADMINISTERED BY GAVAGE AT DAILY DOSES OF 1.25 G/KG AND ABOVE TO PREGNANT RATS, OR AT 750 MG/KG AND ABOVE TO PREGNANT MICE, THERE WAS AN INCREASE IN THE NUMBER OF MALFORMED FETUSES AT ALL DOSE LEVELS. EXCEPT AT THE LOWEST DOSE LEVEL IN MICE, THERE WAS ALSO EVIDENCE OF MATERNAL TOXICITY AT ALL DOSE LEVELS.

IN ONE STUDY, DIETHYLENE GLYCOL ADMINISTERED ORALLY AT HIGH DOSES TO PREGNANT RATS AND MICE CAUSED TOXICITY TO THE EMBRYOFETUS INCLUDING DECREASED FETAL BODY WEIGHTS AND INCREASED VARIATIONS, BUT NO BIRTH DEFECTS WERE OBSERVED. THERE WAS ALSO MATERNAL TOXICITY INCLUDING SOME LETHALITY.

IN ANOTHER STUDY, DIETHYLENE GLYCOL ADMINISTERED TO HAMSTERS BY I.P. INJECTION AT DOSES OF 2.5 - 4.48 G/KG ON THE 8TH DAY OF GESTATION RESULTED IN NEURAL TUBE ABNORMALITIES IN ALL DOSE GROUPS BUT NOT IN THE CONTROLS. THERE WAS EVIDENCE OF MATERNAL TOXICITY IN TREATED ANIMALS. UNDER THE CONDITIONS OF THIS STUDY, DEG CAUSED DEVELOPMENTAL EFFECTS IN HAMSTERS. THE SIGNIFICANCE OF THIS INFORMATION TO MAN IS UNKNOWN.

SECTION VII PHYSICAL DATA

BOILING POINT: 330-340 (DEG F)

SPECIFIC GRAVITY: 1.1373 (H2O=1)

VAPOR PRESSURE: N/AV (MM HG)

MELTING POINT: N/AV (DEG F)

SOLUBILITY: COMPLETE (IN WATER)

VAPOR DENSITY: >1 (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): <0.01

POUR POINT = -40 DEG. F

APPEARANCE AND ODOR:
COLORLESS TO GREEN, SLIGHTLY VISCOUS LIQUID. MILD ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
246 DEG. F SETAFLASH

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AP UPPER: N/AP

EXTINGUISHING MEDIA
USE WATER FOG, "ALCOHOL" FOAM, DRY CHEMICAL OR CO2.

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE PRESSURE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
KEEP AWAY FROM STRONG OXIDIZING AGENTS.

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

SECTION X EMPLOYEE PROTECTION

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

PROTECTIVE CLOTHING
AVOID CONTACT WITH EYES. WEAR CHEMICAL GOGGLES IF THERE IS LIKELIHOOD OF CONTACT WITH EYES. AVOID PROLONGED OR REPEATED CONTACT WITH SKIN. WEAR CHEMICAL RESISTANT GLOVES AND OTHER CLOTHING AS REQUIRED TO MINIMIZE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE, NEOPRENE, PVC OR NATURAL RUBBER GLOVES.

ADDITIONAL PROTECTIVE MEASURES
USE VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS. EYE WASH FOUNTAINS AND SAFETY SHOWERS SHOULD BE AVAILABLE FOR EMERGENCY USE.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACUUM TRUCKS OR PUMP TO STORAGE/SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND OR OTHER SUITABLE MATERIAL; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM FLAMES AND HIGH TEMPERATURES.

WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
CLASS 9 (OTHER REGULATED SUBSTANCES), III

D.O.T. PROPER SHIPPING NAME:
OTHER REGULATED SUBSTANCES, LIQUID, N.O.S. (CONTAINS ETHYLENE GLYCOL)

OTHER REQUIREMENTS:
NA3082, GUIDE 171. REGULATED ONLY IN PACKAGES THAT CONTAIN 5000 LBS. OR GREATER OF ETHYLENE GLYCOL.

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
ETHYLENE GLYCOL (CAS NO: 107-21-1)	84-94	CA, CT, FL, IL, LA, MA, ME, MN, NJ, PA, RI
DIETHYLENE GLYCOL (CAS NO: 111-46-6)	0-10	CA, MN, PA, RI

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOX. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI SPECIAL NOTES

THIS MSDS REVISION HAS CHANGES IN SECTIONS IV, XIII AND EDS SECTION III. A SPANISH TRANSLATION OF THIS MSDS MAY BE OBTAINED BY CALLING 1-800-240-MSDS.

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

DATE PREPARED: DECEMBER 29, 1995

J. C. WILLETT

BE SAFE

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

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

ENVIRONMENTAL DATA SHEET

Shell

EDS NUMBER ▶ 80,070-4 PAGE

97449 (9-87)

PRODUCT ▶ SHELLZONE(R) ALL SEASON ANTI-FREEZE ANTI-BOIL PROTECTION

PRODUCT CODE ▶ 32350 94010

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	SHELLZONE(R) ALL SEASON ANTI-FREEZE ANTI-BOIL PROTECTION	MIXTURE	100
1	ETHYLENE GLYCOL	107-21-1	84-94
2	DIETHYLENE GLYCOL	111-46-6	0-10
3	WATER	7732-18-5	2-4
4	INORGANIC/ORGANIC SALTS		2-4

NFPA HAZARD RATING: HEALTH 1 FIRE 1 REACTIVITY 0

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)
P					H-1, H-2
1			YES		

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

EPA - COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT. UNDER EPA-CERCLA ("SUPERFUND") RELEASES TO AIR, LAND OR WATER WHICH EXCEED THE REPORTABLE QUANTITY MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

THE REPORTABLE QUANTITY (RQ) FOR A RELEASE OF THIS PRODUCT IS 5,319 LBS., WHICH IS BASED ON THE PRESENCE OF COMPONENT #1.

SECTION IV RCRA INFORMATION

PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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

DATE PREPARED: DECEMBER 29, 1995

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9481
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97368 (4-85)

MSDS NUMBER ▶ 864,020-7 T

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶ LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4
1	1	0	

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

BE SAFE
READ OUR PRODUCT SAFETY INFORMATION ... AND PASS IT ON
[PRODUCT LIABILITY LAW; REQUIRES IT]

SECTION I

	NAME
PRODUCT ▶	SPIRAX(R) HEAVY DUTY GEAR OIL 80W-90 (MIL-L-2105; MIL-L-2105D)
CHEMICAL NAME ▶	MIXTURE (SEE SECTION II-A)
CHEMICAL FAMILY ▶	PETROLEUM HYDROCARBON; GEAR OIL
SHELL CODE ▶	59210

SECTION II-A — PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SPIRAX HEAVY DUTY GEAR OIL 80W-90	MIXTURE	100
1	SOLVENT REFINED, HYDROTREATED RESIDUAL OIL	64742-57-0	0-65
2	SOLVENT DEWAXED RESIDUAL OIL	64742-62-7	0-65
3	SOLVENT DEWAXED HEAVY PARAFFINIC DISTILLATE	64742-65-0	0-35
4	SOLVENT REFINED, HYDROTREATED MIDDLE DISTILLATE	64742-46-7	0-20
5	SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE	64842-53-6	0-20
6	SOLVENT REFINED, HYDROTREATED, ACID TREATED HEAVY NAPHTHENIC DISTILLATE	64742-18-3	0-15
7	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	0-15
8	ADDITIVE PACKAGE	MIXTURE	<10

NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B — ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
3	>5 G/KG, RAT*	>5 G/KG, RABBIT*	
5	>5 G/KG, RAT*	>5 G/KG, RABBIT*	
6	>5 G/KG, RAT*	>5 G/KG, RABBIT*	
7	>5 G/KG, RAT*	>5 G/KG, RABBIT*	

* BASED ON API STUDIES

SECTION III — HEALTH INFORMATION

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

EYE CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT CAN RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS. FOLLICULITIS OR OIL ACNE.

INHALATION
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MINOR IRRITATION OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT.

INGESTION
BASED ON COMPONENT INFORMATION THIS PRODUCT IS NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE.

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

OTHER HEALTH EFFECTS
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

SECTION IV OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	OTHER
P	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	NONE

*OIL MIST, MINERAL

SECTION V EMERGENCY AND FIRST AID PROCEDURES

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

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING AND WIPE EXCESS OFF. WASH WITH SOAP AND WATER OR A WATERLESS HAND CLEANER FOLLOWED BY SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IN GENERAL NO TREATMENT IS NECESSARY UNLESS LARGE QUANTITIES OF PRODUCT ARE INGESTED. HOWEVER, GET MEDICAL ADVICE.

NOTE TO PHYSICIAN
IN GENERAL, EMESIS INDUCTION IS UNNECESSARY IN HIGH VISCOSITY, LOW VOLATILITY PRODUCTS, I.E., MOST OILS AND GREASES.

SECTION VI SUPPLEMENTAL HEALTH INFORMATION

AMOCO HAS REPORTED TO THE U.S. EPA PURSUANT TO SECTION 8(E) OF TSCA THAT A SAMPLE OF HYDROTREATED MIDDLE DISTILLATE (CAS REGISTRY NUMBER 64742-46-7) APPLIED REPEATEDLY TO THE SKIN OF EXPERIMENTAL ANIMALS OVER THEIR LIFETIME PRODUCED A WEAK TUMORIGENIC RESPONSE IN THE SKIN. THE FULL REFINING/PROCESS HISTORY OF THIS SAMPLE WAS NOT PROVIDED IN AMOCOS SUBMISSION.

SECTION VII PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)

SPECIFIC GRAVITY: 0.8990 (H2O=1)

VAPOR PRESSURE: <0.1 (MM HG)

MELTING POINT: -16 (POUR POINT) (DEG F)

SOLUBILITY: NEGLIGIBLE (IN WATER)

VAPOR DENSITY: NOT AVAILABLE (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

VISCOSITY: 13-15 (CS @ 212 DEG F)

APPEARANCE AND ODOR:
BROWN LIQUID. SLIGHT HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
329 DEG F (COC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

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

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROVIDED BY NITRILE GLOVES.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACCUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED. STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
NOT HAZARDOUS BY D.O.T. REGULATIONS

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
SOL. REF., HYDROTREATED, ACID TREATED HEAVY NAPHTHENIC DIST. (CAS NO: 64742-18-3)	0-15	MA
SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (CAS NO: 64742-53-6)	0-20	MA

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI SPECIAL NOTES

MSDS REVISED IN SECTIONS I, II-A, II-B, VII, XV, AND EDS SECTIONS I, III AND IV.

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

DATE PREPARED: DECEMBER 22, 1995

J. C. WILLETT

BE SAFE

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

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

ENVIRONMENTAL DATA SHEET

Shell

EDS NUMBER ▶ 864,020-5 PAGE

97449 (9-87)

PRODUCT ▶ SPIRAX(R) HEAVY DUTY GEAR OIL 80W-90 (MIL-L-2105; MIL-L-2105D)

PRODUCT CODE ▶ 59210

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	SHELL SPIRAX HEAVY DUTY GEAR OIL 80W-90	MIXTURE	100
1	SOLVENT REFINED, HYDROTREATED RESIDUAL OIL	64742-57-0	0-65
2	SOLVENT DEWAXED RESIDUAL OIL	64742-62-7	0-65
3	SOLVENT DEWAXED HEAVY PARAFFINIC DISTILLATE	64742-65-0	0-35
4	SOLVENT REFINED, HYDROTREATRED MIDDLE DISTILLATE	64742-46-7	0-20
5	SEVERELY HYDROTREATED LIGHT NAPHTHENIC DISTILLATE	64842-53-6	0-20
6	SOLVENT REFINED, HYDROTREATED, ACID TREATED HEAVY NAPHTHENIC DISTILLATE	64742-18-3	0-15
7	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	0-15
8	ADDITIVE PACKAGE	MIXTURE	<10

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT IS NOT REGULATED BY SARA, TITLE III

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS COVERED BY EPA'S COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) PETROLEUM EXCLUSION. THEREFORE, RELEASES TO AIR, LAND, OR WATER ARE NOT REPORTABLE UNDER CERCLA ("SUPERFUND"). HOWEVER, UNDER SECTION 311 OF EPA'S CLEAN WATER ACT (CWA), THIS PRODUCT IS CONSIDERED AN OIL. AS SUCH, SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

THIS PRODUCT IS AN OIL UNDER 49 CFR (DOT) PART 130. IF SHIPPED BY RAIL OR HIGHWAY IN A TANK WITH A CAPACITY OF 3,500 GALLONS OR MORE, IT IS SUBJECT TO THE REQUIREMENTS OF PART 130. MIXTURE SOLUTIONS IN WHICH THIS PRODUCT IS PRESENT AT 10% OR MORE MAY ALSO BE SUBJECT TO THIS RULE.

SECTION IV RCRA INFORMATION

IF THIS PRODUCT BECOMES A WASTE, IT WOULD NOT BE A HAZARDOUS WASTE BY RCRA CRITERIA (40 CFR 261). PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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

DATE PREPARED: DECEMBER 22, 1995

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX. 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97368 (4-85)

MSDS NUMBER ▶ 60,483-1 PAGE

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
1	1	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

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

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

SECTION I

	NAME
PRODUCT ▶	DONAX(R) TC 30
CHEMICAL NAME ▶	MIXTURE (SEE SECTION II-A)
CHEMICAL FAMILY ▶	PETROLEUM HYDROCARBON; TRANSMISSION FLUID
SHELL CODE ▶	53083

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	DONAX TC 30		
1	HYDROTREATED HEAVY PARAFFINIC DISTILLATE	64742-54-7	70-80
2	HYDROTREATED RESIDUAL OIL	64742-57-0	10-20
3	ADDITIVES CONTAINING	MIXTURE	5-10
3A	ZINC COMPOUND		2-3

NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE		
1	>5.0 G/KG, RAT*	>5.0 G/KG, RABBIT*	

* BASED ON API STUDIES

SECTION III HEALTH INFORMATION

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

EYE CONTACT
BASED ON COMPONENT INFORMATION PRODUCT MAY BE IRRITATING TO THE EYES.

SKIN CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT CAN RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE.

INHALATION
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MINOR IRRITATION OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT.

INGESTION
BASED ON COMPONENT INFORMATION THIS PRODUCT IS NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE.

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

OTHER HEALTH EFFECTS
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
*	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	

*OIL MIST, MINERAL

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

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

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

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

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

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

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)

SPECIFIC GRAVITY: 0.901 (H2O=1)

VAPOR PRESSURE: <0.1 (MM HG)

MELTING POINT: -5 (POUR POINT) (DEG F)

SOLUBILITY: NEGLIGIBLE (IN WATER)

VAPOR DENSITY: NOT AVAILABLE (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

VISCOSITY: 100 (CS @ 104 DEG F)

APPEARANCE AND ODOR:
RED LIQUID. SLIGHT HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
435 DEG F (PMCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FOUND UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

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

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROIVDED BY NITRILE GLOVES.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK

IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACCUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
NOT HAZARDOUS BY D.O.T. REGULATIONS

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

PROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 1990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH ANY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
ZINC COMPOUND (CAS NO: NONE)	2-3	MA, NJ

CA = CALIFORNIA HAZ. SUBST. LIST; CA65C, CA65R, CA65C/R = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT OF 1986 OR PROPOSITION 65 LIST; CT = CONNECTICUT TOXIC. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ. SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST

SECTION XVI SPECIAL NOTES

THIS MSDS HAS BEEN REVISED IN SECTIONS II-A, II-B, III, V, VII, XV, AND EDS SECTIONS I AND IV.

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

DATE PREPARED: FEBRUARY 22, 1995

J. C. WILLETT

BE SAFE

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

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

ENVIRONMENTAL DATA SHEET

Shell

EDS NUMBER ▶ 60,483-1 PAGE

97449 (9-87)

PRODUCT ▶ DONAX(R) TC 30

PRODUCT CODE ▶ 53083

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	DONAX TC 30	MIXTURE	100
1	HYDROTREATED HEAVY PARAFFINIC DISTILLATE	64742-54-7	70-80
2	HYDROTREATED RESIDUAL OIL	64742-57-0	10-20
3	ADDITIVES CONTAINING	MIXTURE	5-10
3A	ZINC COMPOUND		2-3

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)
3A			YES	ZINC COMPOUNDS	

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS COVERED BY EPA'S COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT (CERCLA) PETROLEUM EXCLUSION. THEREFORE RELEASES TO AIR, LAND, OR WATER ARE NOT REPORTABLE UNDER CERCLA ("SUPERFUND"). HOWEVER UNDER SECTION 311 OF EPA'S CLEAN WATER ACT (CWA), THIS PRODUCT IS CONSIDERED AN OIL. AS SUCH , SPILLS INTO OR LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

THIS PRODUCT IS AN OIL UNDER 49 CFR (DOT) PART 130. IF SHIPPED BY RAIL OR HIGHWAY IN A TANK WITH A CAPACITY OF 3,500 GALLONS OR MORE, IT IS SUBJECT TO THE REQUIREMENTS OF PART 130. MIXTURE SOLUTIONS IN WHICH THIS PRODUCT IS PRESENT AT 10% OR MORE MAY ALSO BE SUBJECT TO THIS RULE.

SECTION IV RCRA INFORMATION

IF THIS PRODUCT BECOMES A WASTE, IT WOULD NOT BE A HAZARDOUS WASTE BY RCRA CRITERIA (40 CFR 261). PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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

DATE PREPARED: FEBRUARY 22, 1995

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97368 (4-85)

MSDS NUMBER ▶ 856,706

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
1	1	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

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

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

SECTION I	NAME
PRODUCT ▶	SHELL RETINAX HD GREASE 2
CHEMICAL NAME ▶	MIXTURE (SEE SECTION II-A)
CHEMICAL FAMILY ▶	PETROLEUM GREASE
SHELL CODE ▶	70408

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SHELL RETINAX HD GREASE 2	MIXTURE	100
1	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	50-60
2	SOLVENT REFINED HYDROTREATED RESIDUAL OIL	64742-57-0	20-30
3	LITHIUM HYDROXYSTEARATE	7620-77-1	10
4	CALCIUM HYDROXYSTEARATE	3159-62-4	2-3
5	ADDITIVES	MIXTURE	10

NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE		

SECTION III HEALTH INFORMATION

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

EYE CONTACT
MAY BE MILDLY IRRITATING TO THE EYES.

SKIN CONTACT
PROLONGED OR REPEATED CONTACT MAY CAUSE VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE. RELEASE DURING HIGH PRESSURE USAGE MAY RESULT IN INJECTION OF OIL INTO THE SKIN CAUSING LOCAL NECROSIS.

INHALATION
NOT EXPECTED TO BE A RELEVANT ROUTE OF EXPOSURE; HOWEVER, UNDER HIGH TEMPERATURE CONDITIONS, VAPORS IRRITATING TO THE NOSE, THROAT AND UPPER RESPIRATORY TRACT MAY BE PRODUCED.

INGESTION
NO SPECIFIC INFORMATION IDENTIFIED.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE. LOCAL NECROSIS IS EVIDENCED BY DELAYED ONSET OF PAIN AND TISSUE DAMAGE A FEW HOURS FOLLOWING INJECTION.

AGGRAVATED MEDICAL CONDITIONS
PREEXISTING SKIN DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO THIS PRODUCT.

OTHER HEALTH EFFECTS
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	

NO OSHA/PEL OR ACGIH/TLV HAS BEEN ESTABLISHED.

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

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

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING AND WIPE EXCESS OFF. WASH WITH SOAP AND WATER OR A WATERLESS HAND CLEANER FOLLOWED BY SOAP AND WATER. DO NOT REUSE CLOTHING UNTIL THOROUGHLY CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION. IF MATERIAL IS INJECTED UNDER THE SKIN, GET MEDICAL ATTENTION PROMPTLY TO PREVENT SERIOUS DAMAGE; DO NOT WAIT FOR SYMPTOMS TO DEVELOP.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IN GENERAL, NO TREATMENT IS NECESSARY UNLESS LARGE QUANTITIES OF PRODUCT ARE INGESTED. HOWEVER, GET MEDICAL ADVICE.*

NOTE TO PHYSICIAN
*NOTE TO THE PHYSICIAN: IN GENERAL, EMESIS INDUCTION IS UNNECESSARY IN HIGH VISCOSITY, LOW VOLATILITY PRODUCTS, I.E., MOST OILS AND GREASES.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)

SPECIFIC GRAVITY: NOT AVAILABLE (H2O=1)

VAPOR PRESSURE: NOT AVAILABLE (MM HG)

MELTING POINT: 329 (DROPPING POINT) (DEG F)

SOLUBILITY: NEGLIGIBLE (IN WATER)

VAPOR DENSITY: NOT AVAILABLE (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

APPEARANCE AND ODOR:
DARK GREEN, SMOOTH GREASE; SLIGHT ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
385 DEG F. PMCC (BASE OIL)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
DO NOT ENTER CONFINED FIRE SPACE WITHOUT PROPER PROTECTIVE EQUIPMENT INCLUDING A NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS SURROUNDING EQUIPMENT AND STRUCTURES WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

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

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

RESPIRATORY PROTECTION
NOT ORDINARILY REQUIRED.

PROTECTIVE CLOTHING
USE OIL RESISTANT GLOVES AND OTHER CLOTHING AS NEEDED TO MINIMIZE SKIN CONTACT. AVOID CONTACT WITH EYES. WEAR SAFETY GLASSES OR GOGGLES AS APPROPRIATE.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
SCOOP UP EXCESS GREASE. CLEAN AREA WITH APPROPRIATE CLEANER.

ECTION XII SPECIAL PRECAUTIONS

TORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH EMPERATURES.

INIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET ACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER RTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

ECTION XIII TRANSPORTATION REQUIREMENTS

EPARTMENT OF TRANSPORTATION CLASSIFICATION:
OT HAZARDOUS BY D.O.T. REGULATIONS

ECTION XIV OTHER REGULATORY CONTROLS

HE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

ROTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 990): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH NY CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

N ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE OPIED AND SENT WITH THE MSDS.

ECTION XV STATE REGULATORY INFORMATION

ASED ON INFORMATION AVAILABLE TO SHELL, THIS PRODUCT DOES NOT CONTAIN ANY CHEMICAL SUBSTANCE ISTED ON A CHEMICAL SPECIFIC STATE LIST.

ECTION XVI SPECIAL NOTES

EW PRODUCT. ORIGINAL MSDS ISSUE.

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

DATE PREPARED: JULY 13, 1992

J. C. WILLETT

BE SAFE

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

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

ENVIRONMENTAL DATA SHEET

Shell

EDS NUMBER ▶ 856,706

97449 (9-87)

PRODUCT	▶ SHELL RETINAX HD GREASE 2
PRODUCT CODE	▶ 70408

SECTION I — PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	SHELL RETINAX HD GREASE 2	MIXTURE	100
1	SEVERELY HYDROTREATED HEAVY NAPHTHENIC DISTILLATE	64742-52-5	50-60
2	SOLVENT REFINED, HYDROTREATED RESIDUAL OIL	64742-54-7	20-30
3	LITHIUM HYDROXYSTEARATE	7620-77-1	10
4	CALCIUM HYDROXYSTEARATE	3159-62-4	2-3
5	ADDITIVES	MIXTURE	10

SECTION II — SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT IS NOT REGULATED BY SARA, TITLE III

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III — ENVIRONMENTAL RELEASE INFORMATION

EPA - CLEAN WATER ACT (CWA). THIS PRODUCT IS CLASSIFIED AS AN OIL UNDER SECTION 311 OF THE CLEAN WATER ACT. SPILLS ENTERING (A) SURFACE WATERS OR (B) ANY WATERCOURSES OR SEWERS ENTERING/LEAVING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER, 800-424-8802.

SECTION IV — RCRA INFORMATION

DISPOSE OF IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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

DATE PREPARED: JULY 13, 1992

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97368 (4-85)

MSDS NUMBER ▶ 60,482-1 PAGE

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶
1	1	0	LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4

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

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

SECTION I	NAME
PRODUCT ▶	DONAX(R) TC 10W
CHEMICAL NAME ▶	MIXTURE (SEE SECTION II-A)
CHEMICAL FAMILY ▶	PETROLEUM HYDROCARBON; TRANSMISSION FLUID
SHELL CODE ▶	53082

SECTION II-A PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	DONAX TC 10W	MIXTURE	100
1	SOLVENT REFINED, HYDROTREATED HEAVY PARAFFINIC DISTILLATE	64742-54-7	90-95
2	ADDITIVES CONTAINING:	MIXTURE	5-10
2A	ZINC COMPOUND		1-2

NFPA HAZARD RATING: HEALTH 0 FIRE 1 REACTIVITY 0

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NOT AVAILABLE		
1	>5.0 G/KG, RAT*	>5.0 G/KG, RABBIT*	NOT AVAILABLE

* BASED ON API STUDIES

SECTION III HEALTH INFORMATION

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

EYE CONTACT
BASED ON COMPONENT INFORMATION PRODUCT MAY BE IRRITATING TO THE EYES.

SKIN CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT CAN RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE. CONTAINS APPROXIMATELY 1% METAL SULFONATE WHICH MAY HAVE THE POTENTIAL TO CAUSE ALLERGIC SKIN REACTIONS.

INHALATION
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MINOR IRRITATION OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT.

INGESTION
BASED ON COMPONENT INFORMATION THIS PRODUCT IS NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE.

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

OTHER HEALTH EFFECTS
THIS PRODUCT AND ITS COMPONENTS ARE NOT CLASSIFIED AS CARCINOGENS BY INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC), NATIONAL TOXICOLOGY PROGRAM (NTP) OR OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
P	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	

*OIL MIST, MINERAL

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

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

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

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

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

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

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

NONE IDENTIFIED.

SECTION VII PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)

SPECIFIC GRAVITY: 0.884 (H2O=1)

VAPOR PRESSURE: <0.1 (MM HG)

MELTING POINT: -35 (POUR POINT) (DEG F)

SOLUBILITY: (IN WATER) NEGLIGIBLE

VAPOR DENSITY: NOT AVAILABL (AIR=1)

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

VISCOSITY: 35.48 (CS @ 104 DEG F)

APPEARANCE AND ODOR:
RED LIQUID. SLIGHT HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
385 DEG F (PMCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEA (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FOUND UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

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

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROIVDED BY NITRILE GLOVES.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK

SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACCUM TRUCKS OR PUMP TO STORAGE SALVAGE ESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; SPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP TH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

CTION XII SPECIAL PRECAUTIONS

NIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET CILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER TICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

ORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH MPERATURES.

CTION XIII TRANSPORTATION REQUIREMENTS

PARTMENT OF TRANSPORTATION CLASSIFICATION:
T HAZARDOUS BY D.O.T. REGULATIONS

CTION XIV OTHER REGULATORY CONTROLS

E COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

OTECTION OF STRATOSPHERIC OZONE (PURSUANT TO SECTION 611 OF THE CLEAN AIR ACT AMENDMENTS OF 90): PER 40 CFR PART 82, THIS PRODUCT DOES NOT CONTAIN NOR WAS IT DIRECTLY MANUFACTURED WITH Y CLASS I OR CLASS II OZONE DEPLETING SUBSTANCES.

ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD WAYS BE COPIED AND SENT WITH THE MSDS.

CTION XV STATE REGULATORY INFORMATION

E FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH D SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR TAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

ATE LISTED COMPONENT	PERCENT	STATE CODE
NC COMPOUND (CAS NO: NONE)	1-2	MA, NJ

CA = CALIFORNIA HAZ. SUBST. LIST; CA65 = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT LIST; CT = CONNECTICUT TOX. SUBST. LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; LA = LOUISIANA HAZ. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI SPECIAL NOTES

THIS MSDS HAS BEEN REVISED IN SECTIONS II-A, II-B, V, VII, XV AND EDS SECTIONS I, II AND III.

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

DATE PREPARED: APRIL 14, 1995

J. C. WILLETT

BE SAFE

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

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

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

DATE PREPARED: APRIL 14, 1995

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

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

DATE PREPARED: APRIL 14, 1995

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

MATERIAL SAFETY DATA SHEET

Shell

97367 (4-85)

MSDS NUMBER ▶ 67,311-6 PAGE

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

ACUTE HEALTH *	FIRE	REACTIVITY	HAZARD RATING ▶ LEAST - 0 SLIGHT - 1 MODERATE - 2 HIGH - 3 EXTREME - 4
1	1	0	

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

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

SECTION I — NAME

PRODUCT ▶	SHELL DONAX(R) TG PLUS FLUID
CHEMICAL NAME ▶	MIXTURE (SEE SECTION II-A)
CHEMICAL FAMILY ▶	PETROLEUM HYDROCARBON; TRANSMISSION FLUID
SHELL CODE ▶	53000

SECTION II-A — PRODUCT/INGREDIENT

NO.	COMPOSITION	CAS NUMBER	PERCENT
P	SHELL DONAX TG PLUS FLUID	MIXTURE	100
1	SOLVENT REFINED, HYDROTREATED, HEAVY PARAFFINIC DISTILLATE	64742-54-7	0-80
2	SOLVENT REFINED, HYDROTREATED, LIGHT NAPHTHENIC DISTILLATE	64742-53-6	0-10
3	SOLVENT REFINED, CATALYTIC DEWAXED HEAVY PARAFFINIC OIL	64742-70-7	0-10
4	SOLVENT REFINED, HYDROTREATED MIDDLE DISTILLATE	64742-46-7	0-10
5	HYDROTREATED LIGHT PARAFFINIC DISTILLATE	64742-55-8	0-90
6	ADDITIVE	MIXTURE	10-20

SECTION II-B — ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50	ACUTE DERMAL LD50	ACUTE INHALATION LC50
P	NO DATA AVAILABLE		

BASED UPON DATA AVAILABLE TO SHELL, COMPONENT 6 IN THIS PRODUCT IS NOT HAZARDOUS UNDER OSHA HAZARD COMMUNICATION (29 CFR 1910.1200).

SECTION III — HEALTH INFORMATION

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

EYE CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MINIMALLY IRRITATING TO THE EYES.

SKIN CONTACT
BASED ON COMPONENT INFORMATION PRODUCT IS NO MORE THAN MILDLY IRRITATING TO THE SKIN. PROLONGED AND REPEATED CONTACT CAN RESULT IN VARIOUS SKIN DISORDERS SUCH AS DERMATITIS, FOLLICULITIS OR OIL ACNE.

INHALATION
INHALATION OF VAPORS (GENERATED AT HIGH TEMPERATURES ONLY) OR OIL MIST FROM THIS PRODUCT MAY CAUSE MINOR IRRITATION OF THE MUCOUS MEMBRANES OF THE UPPER RESPIRATORY TRACT.

INGESTION
BASED ON COMPONENT INFORMATION THIS PRODUCT IS NO MORE THAN SLIGHTLY TOXIC IF SWALLOWED.

SIGNS AND SYMPTOMS
IRRITATION AS NOTED ABOVE.

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

SECTION IV — OCCUPATIONAL EXPOSURE LIMITS

	OSHA		ACGIH		OTHER
NO.	PEL/TWA	PEL/CEILING	TLV/TWA	TLV/STEL	
P	5 MG/M3*	NONE	5 MG/M3*	10 MG/M3*	

*OIL MIST, MINERAL

SECTION V — EMERGENCY AND FIRST AID PROCEDURES

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

SKIN CONTACT
REMOVE CONTAMINATED CLOTHING AND WIPE EXCESS OFF. WASH WITH SOAP AND WATER OR A WATERLESS HAND CLEANER FOLLOWED BY SOAP AND WATER. IF IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION
REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GET MEDICAL ATTENTION.

INGESTION
DO NOT INDUCE VOMITING. IN GENERAL NO TREATMENT IS NECESSARY UNLESS LARGE QUANTITIES OF PRODUCT ARE INGESTED. HOWEVER, GET MEDICAL ADVICE.

NOTE TO PHYSICIAN
IN GENERAL, EMESIS INDUCTION IS UNNECESSARY IN HIGH VISCOSITY, LOW VOLATILITY PRODUCTS, I.E., MOST OILS AND GREASES.

SECTION VI — SUPPLEMENTAL HEALTH INFORMATION

AMOCO HAS REPORTED TO THE U.S. EPA PURSUANT TO SECTION 8(E) OF TSCA THAT A SAMPLE OF HYDROTREATED MIDDLE DISTILLATE (CAS REGISTRY NUMBER 64742-46-7) APPLIED REPEATEDLY TO THE SKIN OF EXPERIMENTAL ANIMALS OVER THEIR LIFETIME PRODUCED A WEAK TUMORIGENIC RESPONSE IN THE SKIN. THE FULL REFINING/PROCESS HISTORY OF THIS SAMPLE WAS NOT PROVIDED IN AMOCO'S SUBMISSION.

SECTION VII — PHYSICAL DATA

BOILING POINT: NOT AVAILABLE (DEG F)	SPECIFIC GRAVITY: 0.8772 (H2O=1)	VAPOR PRESSURE: NOT AVAILABLE (MM HG)

MELTING POINT: -59.8(POUR POINT) (DEG F)

SOLUBILITY: (IN WATER) NEGLIGIBLE

VAPOR DENSITY: (AIR=1) NOT AVAILABLE

EVAPORATION RATE (N-BUTYL ACETATE = 1): NOT AVAILABLE

VIS, CS AT 100 DEG C. (212 F)=6.8

APPEARANCE AND ODOR:
RED LIQUID. SLIGHT HYDROCARBON ODOR.

SECTION VIII FIRE AND EXPLOSION HAZARDS

FLASH POINT AND METHOD:
177 DEG C (PMCC)

FLAMMABLE LIMITS /% VOLUME IN AIR
LOWER: N/AV UPPER: N/AV

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

SPECIAL FIRE FIGHTING PROCEDURES AND PRECAUTIONS
MATERIAL WILL NOT BURN UNLESS PREHEATED. DO NOT ENTER CONFINED FIRE-SPACE WITHOUT FULL BUNKER GEAR (HELMET WITH FACE SHIELD, BUNKER COATS, GLOVES AND RUBBER BOOTS), INCLUDING A POSITIVE-PRESSURE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS. COOL FIRE EXPOSED CONTAINERS WITH WATER.

SECTION IX REACTIVITY

STABILITY: STABLE

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS AND MATERIALS TO AVOID:
AVOID HEAT, OPEN FLAMES AND OXIDIZING MATERIALS.

HAZARDOUS DECOMPOSITION PRODUCTS
THERMAL DECOMPOSITION PRODUCTS ARE HIGHLY DEPENDENT ON THE COMBUSTION CONDITIONS. A COMPLEX MIXTURE OF AIRBORNE SOLID, LIQUID, PARTICULATES AND GASES WILL EVOLVE WHEN THIS MATERIAL UNDERGOES PYROLYSIS OR COMBUSTION. CARBON MONOXIDE, OXIDES OF SULFUR, AND OTHER UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FOUND UPON COMBUSTION.

SECTION X EMPLOYEE PROTECTION

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

PROTECTIVE CLOTHING
WEAR CHEMICAL RESISTANT GLOVES AND OTHER PROTECTIVE CLOTHING AS REQUIRED TO MINIMIZE SKIN CONTACT. WEAR SAFETY GOGGLES TO AVOID EYE CONTACT. TEST DATA FROM PUBLISHED LITERATURE AND/OR GLOVE AND CLOTHING MANUFACTURERS INDICATE THE BEST PROTECTION IS PROIVDED BY NITRILE GLOVES.

SECTION XI ENVIRONMENTAL PROTECTION

SPILL OR LEAK PROCEDURES
MAY BURN ALTHOUGH NOT READILY IGNITABLE. USE CAUTIOUS JUDGMENT WHEN CLEANING UP LARGE SPILLS. *** LARGE SPILLS *** WEAR RESPIRATOR AND PROTECTIVE CLOTHING AS APPROPRIATE. SHUT OFF SOURCE OF LEAK IF SAFE TO DO SO. DIKE AND CONTAIN. REMOVE WITH VACCUM TRUCKS OR PUMP TO STORAGE SALVAGE VESSELS. SOAK UP RESIDUE WITH AN ABSORBENT SUCH AS CLAY, SAND, OR OTHER SUITABLE MATERIALS; DISPOSE OF PROPERLY. FLUSH AREA WITH WATER TO REMOVE TRACE RESIDUE. *** SMALL SPILLS *** TAKE UP WITH AN ABSORBENT MATERIAL AND DISPOSE OF PROPERLY.

SECTION XII SPECIAL PRECAUTIONS

MINIMIZE SKIN CONTACT. WASH WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. PROPERLY DISPOSE OF CONTAMINATED LEATHER ARTICLES, INCLUDING SHOES, THAT CANNOT BE DECONTAMINATED.

STORE IN A COOL, DRY PLACE WITH ADEQUATE VENTILATION. KEEP AWAY FROM OPEN FLAMES AND HIGH TEMPERATURES.

SECTION XIII TRANSPORTATION REQUIREMENTS

DEPARTMENT OF TRANSPORTATION CLASSIFICATION:
NOT HAZARDOUS BY D.O.T. REGULATIONS

SECTION XIV OTHER REGULATORY CONTROLS

THE COMPONENTS OF THIS PRODUCT ARE LISTED ON THE EPA/TSCA INVENTORY OF CHEMICAL SUBSTANCES.

IN ACCORDANCE WITH SARA TITLE III, SECTION 313, THE ATTACHED ENVIRONMENTAL DATA SHEET (EDS) SHOULD ALWAYS BE COPIED AND SENT WITH THE MSDS.

SECTION XV STATE REGULATORY INFORMATION

THE FOLLOWING CHEMICALS ARE SPECIFICALLY LISTED BY INDIVIDUAL STATES; OTHER PRODUCT SPECIFIC HEALTH AND SAFETY DATA IN OTHER SECTIONS OF THE MSDS MAY ALSO BE APPLICABLE FOR STATE REQUIREMENTS. FOR DETAILS ON YOUR REGULATORY REQUIREMENTS YOU SHOULD CONTACT THE APPROPRIATE AGENCY IN YOUR STATE.

STATE LISTED COMPONENT	PERCENT	STATE CODE
SOLVENT REFINED, HYDROTREATED LIGHT NAPHTHENIC DISTILLATE (CAS NO: 64742-53-6)	0-10	MA
SOLVENT REFINED CATALYTIC DEWAXED HEAVY PARAFFINIC OIL (CAS NO: 64742-70-7)	0-10	MA
DISTILLATES (PETROLEUM), HYDROTREATED LIGHT PARAFFINIC (CAS NO: 64742-55-8)	0-90	MA

CA = CALIFORNIA HAZ. SUBST. LIST; CA65 = CALIFORNIA SAFE DRINKING WATER AND TOXICS ENFORCEMENT ACT LIST; FL = FLORIDA SUBST. LIST; IL = ILLINOIS TOX. SUBST. LIST; MA = MASSACHUSETTS SUBST. LIST; ME = MAINE HAZ SUBST. LIST; MN = MINNESOTA HAZ. SUBST. LIST; NJ = NEW JERSEY HAZ. SUBST. LIST; PA = PENNSYLVANIA HAZ. SUBST. LIST; RI = RHODE ISLAND HAZ. SUBST. LIST.

SECTION XVI SPECIAL NOTES

PRODUCT REFORMULATED. MSDS REVISED IN SECTION II-A AND EDS SECTION I TO REFLECT NEW INGREDIENT(S). THE PERFORMANCE CHARACTERISTICS OF THE PRODUCT HAVE NOT CHANGED. THE HAZARD EVALUATION HAS NOT CHANGED.

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

DATE PREPARED: OCTOBER 06, 1992

J. C. WILLETT

BE SAFE

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

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

ENVIRONMENTAL DATA SHEET

Shell

EDS NUMBER ▶ 67,311-4 PAGE

97449 (9-87)

PRODUCT ▶ SHELL DONAX(R) TG PLUS FLUID

PRODUCT CODE ▶ 53000

SECTION I PRODUCT/COMPOSITION

NO.	COMPONENT	CAS NUMBER	PERCENT
P	SHELL DONAX TG FLUID	MIXTURE	100
1	SOLVENT REFINED, HYDROTREATED, HEAVY PARAFFINIC DISTILLATE	64742-54-7	0-80
2	SOLVENT REFINED, HYDROTREATED, LIGHT NAPHTHENIC DISTILLATE	64742-53-6	0-10
3	SOLVENT REFINED, CATALYTIC DEWAXED HEAVY PARAFFINIC OIL	64742-70-7	0-10
4	SOLVENT REFINED, HYDROTREATED MIDDLE DISTILLATE	64742-46-7	0-10
5	HYDROTREATED LIGHT PARAFFINIC DISTILLATE	64742-55-8	0-90
6	ADDITIVE	MIXTURE	10-20

SECTION II SARA TITLE III INFORMATION

NO.	EHS RQ (LBS) (*1)	EHS TPQ (LBS) (*2)	SEC 313 (*3)	313 CATEGORY (*4)	311/312 CATEGORIES (*5)

BASED ON THE DATA AVAILABLE TO SHELL THIS PRODUCT CONTAINS NO SUBSTANCES SUBJECT TO REPORTING OR PLANNING REQUIREMENTS UNDER SARA TITLE III.

FOOTNOTES

*1 = REPORTABLE QUANTITY OF EXTREMELY HAZARDOUS SUBSTANCE, SEC.302
*2 = THRESHOLD PLANNING QUANTITY, EXTREMELY HAZARDOUS SUBSTANCE, SEC 302
*3 = TOXIC CHEMICAL, SEC 313
*4 = CATEGORY AS REQUIRED BY SEC 313 (40 CFR 372.65 C), MUST BE USED ON TOXIC RELEASE INVENTORY FORM
*5 = HAZARD CATEGORY FOR SARA SEC. 311/312 REPORTING
HEALTH H-1 = IMMEDIATE (ACUTE) HEALTH HAZARD H-2 = DELAYED (CHRONIC) HEALTH HAZARD
PHYSICAL P-3 = FIRE HAZARD P-4 = SUDDEN RELEASE OF PRESSURE HAZARD
P-5 = REACTIVE HAZARD

SECTION III ENVIRONMENTAL RELEASE INFORMATION

THIS PRODUCT IS CLASSIFIED AS AN OIL UNDER SECTION 311 OF THE CLEAN WATER ACT. SPILLS ENTERING (A) SURFACE WATERS OR (B) ANY WATER COURSES OR SEWERS ENTERING/LEADING TO SURFACE WATERS THAT CAUSE A SHEEN MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER. 800-424-8802.

SECTION IV RCRA INFORMATION

PLACE IN AN APPROPRIATE DISPOSAL FACILITY IN COMPLIANCE WITH LOCAL REGULATIONS.

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

DATE PREPARED: OCTOBER 06, 1992

SHELL OIL COMPANY
CORPORATE ENVIRONMENTAL AFFAIRS
P. O. BOX 4320
HOUSTON, TX 77210

FOR ADDITIONAL INFORMATION ON THIS ENVIRONMENTAL DATA PLEASE CALL
(713) 241-2252

FOR EMERGENCY ASSISTANCE PLEASE CALL
SHELL: (713) 473-9461
CHEMTREC: (800) 424-9300

Material Safety Data Sheet

SEARLES PRESSURE WASHERS, INC.
11325 E. Monroe Road
MERRILL, MI 48637-9621
(517) 643-5317 800-332-2647

Date March 23, 1987

I. General Information

Manufacturer

Schaefer Technologies, Inc.
3000 Carrollton Road
Saginaw, MI 48604

Chemical Name & Synonyms

Chemical Family

Manufacturer's Phone Number (517) 753-1877

Trade Name & Synonyms POWERHOUSE

Formula Aqueous mixture of alkalis and surfactants

EMERGENCY CONTACT: Chemtrec 800/424-9300

II. Ingredients

Principal Hazardous Components	C.A.S. No.	Threshold Limit Value (units)
Potassium Hydroxide	1310-58-3	N.A.
Sodium Metasilicate	10213-79-3	N.A.
Sodium Tripolyphosphate	7758-29-4	N.A.
Ethoxylated Alcohol	9002-92-0	None
Sodium Xylene Sulfonate	1300-72-7	None

III. Physical Data

Boiling Point (°F) Greater than 212°F

Vapor Pressure (mm Hg) Not determined

Vapor Density (Air = 1) Not determined

Solubility in Water Complete

Appearance & Odor pink liquid, no odor

Specific Gravity (H_2O = 1) 1.12

Percent Volatile By weight (%) 82

Evaporation Rate (_____ = 1) Not determined

pH 13.2

IV. Fire & Explosion Hazard Data

Flash Point (Test Method) None

Flammable Limits Non Combustible

Extinguishing Media water, fog, CO_2, dry chemical

Special Fire Fighting Procedures None

Unusual Fire & Explosion Hazards Unknown

Auto Ignition Temperature N.A.

LEL | UEL

Att. Herb.

Bay Agra

Data Sheet

I. General Information

Manufacturer

Schaefer Technologies, Inc.
3000 Carrollton Road
Saginaw, MI 48604

Chemical Name & Synonyms

Chemical Family

Manufacturer's Phone Number (517) 753-1877

Trade Name & Synonyms POWERHOUSE

Formula Aqueous mixture of alkalis and surfactants

EMERGENCY CONTACT: Chemtrec 800/424-9300

II. Ingredients

Principal Hazardous Components	C.A.S. No.	Threshold Limit Value (units)
Potassium Hydroxide	1310-58-3	N.A.
Sodium Metasilicate	10213-79-3	N.A.
Sodium Tripolyphosphate	7758-29-4	N.A.
Ethoxylated Alcohol	9002-92-0	None
Sodium Xylene Sulfonate	1300-72-7	None

III. Physical Data

Boiling Point (°F) Greater than 212°F

Vapor Pressure (mm Hg.) Not determined

Vapor Density (Air = 1) Not determined

Solubility in Water Complete

Appearance & Odor pink liquid, no odor

Specific Gravity (H_2O = 1) 1.12

Percent Volatile By weight (%) 82

Evaporation Rate (_____ = 1) Not determined

pH 13.2

IV. Fire & Explosion Hazard Data

Flash Point (Test Method) None

Flammable Limits Non Combustible

Extinguishing Media water, fog, CO_2, dry chemical

Special Fire Fighting Procedures None

Unusual Fire & Explosion Hazards Unknown

Auto Ignition Temperature N.A.

LEL | UEL

V. Health Hazard Data

reshold Limit Value: None determined

rcinogenicity: NTP No IARC No OSHA No

mary Route(s) of Entry: Dermal, Ingestion

mptoms of Exposure: Causes severe eye injury on contact. Causes skin burns. Ingestion: Causes burns to digestive tract.

mergency First Aid: Eyes: Flush with plenty of water for at least 15 minutes, get immediate medical attention.
Skin: Remove contaminated clothing. Wash skin thoroughly with water until slipperiness is gone. If irritation persists, get medical attention.
Ingestion: DO NOT induce vomiting. Give 2-3 glasses of water or milk. Then, Citrus juice. See a physician.

VI. Reactivity Data

Stability		Unstable	Conditions To Avoid
	X	Stable	
Incompatability			Materials To Avoid: Strong acids, oxidizers. Do not use with aluminum equipment.
Hazardous Polymerization		May Occur	Conditions To Avoid
	X	Will Not Occur	

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide.

VII. Environmental Protection Procedures

Spill Response: Small spills: flush to sewer with water. Large spills: absorb with inert material for disposal.

Waste Disposal Method: Flush small amounts to sewer. This is a biodegradable detergent. - Or, dispose of in accordance with federal state or local regulations.

VIII. Special Protection Information

Eye Protection: face shield

Skin Protection: plastic or rubber gloves

Respiratory Protection (Specific Type): none required

Ventilation Recommended: normal

Other Protection: rubber apron and boots
eye wash fountain and safety shower in the work area recommended.

IX. Special Precautions

Hygienic Practices In Handling & Storage: Wash contaminated clothing before reuse.

Other Precautions: Keep from freezing.

Required under USDL Safety and Health Regulations for Shipyard Employment (29 CFR 1915)

canberra corporation

Section I

Manufacturer's Name: Canberra Corporation

Emergency Telephone Number: 419-841-6616

Address (Number, Street, City State and ZIP Code): 3610 Holland-Sylvania Rd.

Toledo, OH 43615

Chemical Name and Synonyms: Cleaning, Compound, Liquid Class 5

Trade Name and Synonyms: SUPER HUSKY Toilet Bowl Cleaner

Chemical Family: Dilute (muriatic) hydrochloric acid

Formula: 23% HCl

Section II - Hazardous Ingredients

Paints, Preservatives, and Solvents	%	TLV (Units)	Alloys and Metallic Coatings	%	TLV (Units)
Pigments		N/A	Base Metal		N/A
Catalyst		N/A	Alloys		N/A
Vehicle		N/A	Metallic Coatings		N/A
Solvents		N/A	Filler Metal Plus Coating or Core Flux		N/A
Additives		N/A	Others		N/A
Others		N/A			

Hazardous Mixtures of Other Liquids, Solids or Gases

		%	TLV (Units)
Hydrochloric acid	CAS #7647-01-00	23.0	5 pp
Bis (Tributyltin) Oxide	CAS # unknown	.01%	
N-Alkyl Dimethyl Benzyl Amm. Chloride	CAS #63891-01-5	.05%	

Section III - Physical Data

Boiling Point (°F)	N/A	Specific Gravity (H_2O=1)	1.122
Vapor Pressure (mm Hg.)	N/A	Percent Volatile by Volume (%)	N/A
Vapor Density (AIR=1)	N/A	Evaporation Rate (_____ =1)	N/A

Solubility in Water: excellent

Appearance and Odor: pink liquid - pungent odor

Section IV - Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	Lel	Uel
no flash point		N/A	N/A

Extinguishing Media: standard equipment

Special Fire Fighting Procedures: none

Unusual Fire and Explosion Hazards: none

Section V - Health Hazard Data

Threshold Limit Value

T.L.V. 20 ppm

Effects of Overexposure

produces chemical burns

Emergency First Aid Procedures Internal: Call a physician immediately. Drink a teaspoonful or more of magnesia, chalk, or small pieces of soap, softened with water, or in milk, or raw egg white. External: Eyes-wash with water for 15 mins. Get prompt medical attention. Skin-wipe off gently, immediately flood surface with water using soap freely, then cover with moist magnesia or baking soda.

Section VI - Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatability (Materials to Avoid)

ammonia - do not mix with any other chemical

Hazardous Decomposition Products

- chlorine gas

Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	X	

Section VII - Spill or Leak Procedures

Steps to be Taken in Case Material is Released or Spilled

Contain spill and collect in approved container. Ventilate area to dissipate fumes. Rinse with bicarbonate solution to neutralize acid residue. Neutralize with sodium hydroxide or other base chemical.

Waste Disposal Method

Do not reuse empty container. Rinse container and put in trash. Handle waste material in accordance with RCRA requirements.

Section VIII - Special Protection Information

Respiratory Protection (Specify Type)

Normally not needed-arrange ventilation of some type by using fan, opening, etc.

Ventilation	Local Exhaust	Special
	not required	N/A
	Mechanical (General)	Other
	not required	

Protective Gloves	Eye Protection
rubber gloves	plastic goggles

Other Protective Equipment

use regular toilet bowl applicator when cleaning urinals/bowls

Section IX - Special Precautions

Precautions to be Taken in Handling and Storing

Do not mix with ammonia

Other Precautions

Avoid contact with skin or eyes. Keep out of reach of children

SAFETY-KLEEN 105 SOLVENT VIRGIN

MATERIAL SAFETY DATA SHEET FOR USA AND CANADA

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **SAFETY-KLEEN 105 SOLVENT VIRGIN**

SYNONYMS: Parts Washer Solvent; Petroleum Distillates; Petroleum Naptha; Naptha, Solvent; Stoddard Solvent; Mineral Spirits.

PRODUCT PART NUMBERS: 6610, 1011614, 1014614.

PRODUCT USE: Cleaning and degreasing metal parts.
If this product is used in combination with other products, refer to the Material Safety Data Sheets for those products.

	24-HOUR EMERGENCY PHONE NUMBERS	
These numbers are for emergency use only. If you desire non-emergency product information, please call a phone number listed below.	**MEDICAL:** **1-800-752-7869** **Extension 2** **or** **1-312-906-6194**	**TRANSPORTATION (SPILL):** **1-800-468-1760 (USA)** **1-613-996-6666 (CANADA)** **(call collect)**

SUPPLIER: Safety-Kleen Corp.
1301 Gervais Street, Suite 300
Columbia, SC 29201
USA
1-803-933-4200

TECHNICAL INFORMATION: **1-800-669-5740, Extension 7500**

MSDS FORM NUMBER: 82341 **ISSUE:** March 24, 2000

ORIGINAL ISSUE: February 13, 1991 **SUPERSEDES:** April 4, 1997

PREPARED BY: Product MSDS Coordinator **APPROVED BY:** MSDS Task Force

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

WT%	NAME	SYNONYM	CAS NO.	OSHA PEL TWA	OSHA PEL STEL	ACGIH TLV® TWA	ACGIH TLV® STEL	LD[a]	LC[b]
100	Distillates (petroleum), hydrotreated light[e]	N.Av.	64742-47-8	500[d] ppm	N.Av.	100[d] ppm	N.Av.	>5000[c]	>5500[d] mg/m^3/4 hours

N.Av. = Not Available
[a]Oral-Rat LD (mg/kg)
[b]Inhalation-Rat LC
[c]Based on Stoddard solvent: Skin-Rabbit LD_{50} >3000 mg/kg
[d]Based on Stoddard Solvent.
[e]Based on Stoddard Solvent, NIOSH IDLH (Immediately Dangerous to Life or Health): 20000 mg/m^3 (5000 ppm)

SECTION 3: HAZARDS IDENTIFICATION

APPEARANCE
Liquid, clear, colorless or green, mild hydrocarbon odor.

WARNING!

PHYSICAL HAZARD
Combustible liquid and vapor.

HEALTH HAZARDS
May be harmful if inhaled.
May irritate eyes and skin.
May be harmful if swallowed.
Contains material which may cause central nervous system damage.

ENVIRONMENTAL HAZARDS
Toxic to aquatic life.

POTENTIAL HEALTH EFFECTS

INHALATION (BREATHING): High concentrations of vapor or mist may be harmful if inhaled. High concentrations of vapor or mist may irritate the respiratory tract (nose, throat, and lungs). High concentrations of vapor or mist may cause nausea, vomiting, headaches, dizziness, loss of coordination, numbness, and other central nervous system effects. Massive acute overexposure may cause rapid central nervous system depression, sudden collapse, coma, and/or death.

EYES: May cause irritation with watering, stinging, and/or redness.

SKIN: May cause irritation. Not likely to be absorbed through the skin in harmful amounts.

INGESTION: (SWALLOWING) Do NOT induce vomiting. Immediately get medical attention. Call 1-800-752-7869, extension 2 or 1-312-906-6194 for additional information. If spontaneous vomiting occurs, keep head below hips to avoid breathing the product into the lungs. Never give anything to an unconscious person by mouth.

NOTE TO PHYSICIANS: Treat symptomatically and supportively. Administration of gastric lavage, if warranted, should be performed by qualified medical personnel. Treatment may vary with condition of victim and specifics of incident. Call 1-800-752-7869, extension 2 or 1-312-906-6194 for additional information.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: 105°F (40°C) (minimum) Tag Closed Cup

FLAMMABLE LIMITS IN AIR: **LOWER:** 0.7 VOL% (minimum)
UPPER: 5 VOL% (maximum)

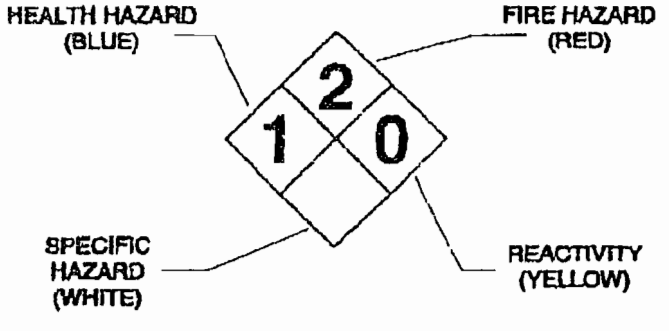
AUTOIGNITION TEMPERATURE: 410°F (210°C) (minimum)

HAZARDOUS COMBUSTION PRODUCTS: Decomposition and combustion materials may be toxic. Burning may produce carbon monoxide and unidentified organic compounds.

CONDITIONS OF FLAMMABILITY: Heat, sparks, or flame.

EXTINGUISHING MEDIA: Carbon dioxide, regular foam, dry chemical, water spray, or water fog.

NFPA 704 HAZARD IDENTIFICATION: This information is intended solely for the use by individuals trained in this system.



FIRE FIGHTING INSTRUCTIONS: Keep storage containers cool with water spray. A positive-pressure, self-contained breathing apparatus (SCBA) and full-body protective equipment are required for fire emergencies.

FIRE AND EXPLOSION HAZARDS: Vapor explosion hazard indoors, outdoors, or in sewers. Vapors may travel to ignition source and flashback. Vapors will spread along the ground and collect in low or confined areas. Run-off to sewer may create a fire hazard. Heated containers may rupture. "Empty" containers may retain residue and can be dangerous. Not sensitive to mechanical impact. Product may be sensitive to static discharge, which could result in fire or explosion.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Remove all ignition sources. Do not touch or walk through spilled product. Stop leak if you can do it without risk. Wear protective equipment and provide engineering controls as specified in **SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Ventilate area and avoid breathing vapor or mist. A vapor suppressing foam may be used to reduce vapors. Contain spill away from surface waters and sewers. Contain spill as a liquid for possible recovery or sorb with compatible sorbent material and shovel with a clean, sparkproof tool into a sealable container for disposal.

Additionally, for large spills: Water spray may reduce vapor, but may not prevent ignition in closed spaces. Dike far ahead of liquid spill for collection and later disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING: Keep away from heat, sparks, or flame. Where flammable mixtures may be present, equipment safe for such locations should be used. Use clean, sparkproof tools and explosion-proof equipment. When transferring product, metal containers, including trucks and tank cars, should be grounded and bonded. Do not breathe vapor or mist. Use in a well ventilated area. Avoid contact with eyes, skin, clothing, and shoes. Do not smoke while using this product.

SHIPPING AND STORING: Keep container tightly closed when not in use and during transport. Do not pressurize, cut, weld, braze, solder, drill, or grind containers. Keep containers away from heat, flame, sparks, static electricity, or other sources of ignition. Empty product containers may retain product residue and can be dangerous. See **SECTION 14: TRANSPORT INFORMATION** for Packing Group information.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide general ventilation needed to maintain concentration of vapor or mist below applicable exposure limits. Where adequate general ventilation is unavailable, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Where explosive mixtures may be present, equipment safe for such locations should be used.

PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION: Use NIOSH-certified, air-purifying respirators with organic vapor cartridges respiratory protective equipment when concentration of vapor or mist exceeds applicable exposure limits. Protection provided by air-purifying respirators is limited. Selection and use of respiratory protective equipment should be in accordance in the USA with OSHA General Industry Standard 29 CFR 1910.134; or in Canada with CSA Standard Z94.4.

EYE PROTECTION: Where eye contact is likely, wear chemical goggles; contact lens use is not recommended.

SKIN PROTECTION: Where skin contact is likely, wear nitrile, supported neoprene, Viton®, polyvinyl alcohol (PVA), laminate (such as North Silver Shield®, Safety 4 4h®, Ansell Edmont Barrier®), or equivalent protective gloves; use of polyvinyl chloride (PVC), natural rubber (latex), or equivalent gloves is not recommended.

To avoid prolonged or repeated contact where spills and splashes are likely, wear appropriate chemical-resistant faceshield, boots, apron, whole body suits, or other protective clothing.

PERSONAL HYGIENE: Use good personal hygiene. Wash thoroughly with soap and water after handling product and before eating, drinking, or using tobacco products. Clean affected clothing, shoes, and protective equipment before reuse. Discard affected clothing, shoes, or protective equipment if they cannot be thoroughly cleaned. Discard leather articles, such as shoes, saturated with the product.

OTHER PROTECTIVE EQUIPMENT: Where spills and splashes are likely, facilities storing or using this product should be equipped with an emergency eyewash and shower, both equipped with clean water, in the immediate work area.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE, APPEARANCE, AND ODOR:	Liquid, clear, colorless or green, mild hydrocarbon odor.
ODOR THRESHOLD:	30 ppm (based on Stoddard Solvent)
MOLECULAR WEIGHT:	Not available.
SPECIFIC GRAVITY:	0.77 to 0.80 at 60°F/60°F (15.6°C/15.6°C) (water = 1)
DENSITY:	6.4 to 6.7 LB/US gal (770 to 800 g/l)
VAPOR DENSITY:	5 (air = 1) (approximately)
VAPOR PRESSURE:	0.4 mm Hg at 68°F (20°C) (approximately) 1.0 mm Hg at 100°F (38°C) (approximately)
BOILING POINT:	310°F (155°C) (initial)
FREEZING/MELTING POINT:	-45°F (-43°C) (maximum)
pH:	Not applicable.
EVAPORATION RATE:	0.1 (butyl acetate = 1) (based on Stoddard Solvent)
SOLUBILITY IN WATER:	Insoluble.
FLASH POINT:	105°F (40°C) (minimum) Tag Closed Cup
FLAMMABLE LIMITS IN AIR:	**LOWER:** 0.7 VOL% (minimum) **UPPER:** 5 VOL% (maximum)
AUTOIGNITION TEMPERATURE:	410°F (210°C) (minimum)

SECTION 10: STABILITY AND REACTIVITY

STABILITY:	Stable under normal temperatures and pressures. Avoid heat, sparks, or flame.
INCOMPATIBILITY:	Avoid acids, alkalies, oxidizing agents, reducing agents, or reactive halogens.

REACTIVITY: Polymerization is not known to occur under normal temperatures and pressures. Not reactive with water.

HAZARDOUS DECOMPOSITION PRODUCTS: None under normal temperatures and pressures. See also **SECTION 5: HAZARDOUS COMBUSTION PRODUCTS.**

SECTION 11: TOXICOLOGICAL INFORMATION

SENSITIZATION: Based on best current information, there is no known human sensitization associated with this product.

MUTAGENICITY: Based on best current information, there is no known mutagenicity associated with this product.

CARCINOGENICITY: Based on best current information, there is no known carcinogenicity as regulated by OSHA; as categorized by ACGIH A1 or A2 substances; as categorized by IARC Group 1, Group 2A, or Group 2B agents; or as listed by NTP as either known carcinogens or substances for which there is limited evidence of carcinogenicity in humans or sufficient evidence of carcinogenicity in experimental animals.

Also see **SECTION 15: CALIFORNIA.**

REPRODUCTIVE TOXICITY: Based on best current information, there is no known reproductive toxicity associated with this product.

Also see **SECTION 15: CALIFORNIA.**

TERATOGENICITY: Based on best current information, there is no known teratogenicity associated with this product.

TOXICOLOGICALLY SYNERGISTIC PRODUCT(S): Based on best current information, there are no known toxicologically synergistic products associated with this product.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: 2900 ug/L 96 hour LC_{50} Rainbow trout, donaldson trout (Oncorhynchus mykiss) (based on Distillates (petroleum) hydrotreated light).

OCTANOL/WATER PARTITION COEFFICIENT: Not available.

VOLATILE ORGANIC COMPOUNDS:	100 WT%; 6.4 to 6.7 LB/US gal; 770 to 800 g/l As per 40 CFR Part 51.100(s).

SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSAL: Dispose in accordance with federal, state, provincial, and local regulations. Regulations may also apply to empty containers. The responsibility for proper waste disposal lies with the owner of the waste. Contact Safety-Kleen regarding recycling or proper disposal.

USEPA WASTE CODE(S): D001, D018.
Based on available data, this information applies to the product as supplied to the user. Processing, use, or contamination by the user may change the waste code(s) applicable to the disposal of this product.

SECTION 14: TRANSPORT INFORMATION

DOT:	COMBUSTIBLE LIQUID, N.O.S. (PETROLEUM NAPHTHA), NA1993, PG III
TDG:	Petroleum Distillates, N.O.S., Class 3, UN1268, PG III
EMERGENCY RESPONSE GUIDE NUMBER:	128 Reference *North American Emergency Response Guidebook*

SECTION 15: REGULATORY INFORMATION

USA REGULATIONS

SARA SECTIONS 302 AND 304: Based on the ingredient listed in **SECTION 2**, this product does not contain any "extremely hazardous substances" listed pursuant to Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Section 302 or Section 304 as identified in 40 CFR Part 355, Appendix A and B.

SARA SECTIONS 311 AND 312: This product poses the following physical and health hazards as defined in 40 CFR Part 370 and is subject to the requirements of sections 311 and 312 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA):

- Immediate (Acute) Health Hazard
- Delayed (Chronic) Health Hazard
- Fire Hazard

SARA SECTION 313: This product does not contain toxic chemicals subject to the requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40 CFR Part 372.

CERCLA: Based on the ingredient listed in **SECTION 2**, this product does not contain any "hazardous substance" listed pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) in 40 CFR Part 302, Table 302.4.

TSCA: All the components of this product are listed on the TSCA Inventory.

CALIFORNIA: This product may contain a detectable amount of benzene CAS 71-43-2. WARNING: This chemical is known to the State of California to cause cancer.

This product may contain detectable amounts of benzene CAS 71-43-2 and toluene CAS 108-88-3. WARNING: These chemicals are known to the State of California to cause birth defects or other reproductive harm.

CANADIAN REGULATIONS

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS: B3, D2B

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): All the components of this product are listed on the Canadian Domestic Substances List (DSL).

SECTION 16: OTHER INFORMATION

REVISION INFORMATION: Revised format. This MSDS has been revised in the following sections:

SECTION 3: Emergency Overview, Inhalation, Chronic
SECTION 4: Ingestion
SECTION 5: Upper Flammable Limit, Autoignition Temperature
SECTION 8: Skin Protection
SECTION 9: Molecular Weight
SECTION 12: Ecotoxicity

LABEL/OTHER INFORMATION: This product is United States Department of Agriculture (USDA) approved and Underwriter's Laboratories (UL) classified.

User assumes all risks incident to the use of this product. To the best of our knowledge the information contained herein is accurate. However, Safety-Kleen assumes no liability whatsoever for the accuracy or completeness of the information contained herein. No representations or warranties, either express or implied, or merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to information or the product to which information refers. The data contained on this sheet apply to the product as supplied to the user.

©2000 Printed in the USA.

MATERIAL SAFETY DATA SHEET

LACQUER THINNERS & CLEANING SOLVENTS

Section I - Manufacturer

Manufacturer:
DuPont Co.
Automotive
Wilmington, Delaware 19898
Telephone:
Product information (800)441-7515
Medical emergency (800) 441-3637
Transportation emergency (800) 424-9300 (CHEMTREC)
Product: Lacquer thinners and cleaning solvents (2319S, 3602S, 3608S, 3613S, 3642S, 3661S, 3671S, 3696S, 3900S, 3901S, 3909S, 3914S, 3919S, Y3919S, 3921S, 3924S, 3929S, 3939S, 3949S, 3979S)
OSHA Hazard Class: Flammable liquid
DOT Shipping Name: See DOT addendum.
Hazardous Materials Information: See Section X.

Section II - Hazardous Ingredients

(See Section X)

Ingredients	*CAS No.*	*Vapor Pressure (20°C. mm Hg)*	*Exposure Limits **
Acetic acid	64-19-7	11.6	10 ppm-A,O 15 ppm-A 15 min (STEL) 10 ppm-D 8&12 hr
Acetone	67-64-1	184.0	500 ppm-A 8 hr TWA 1000 ppm-O 8 hr TWA 750 ppm-A 15 min (STEL) 500 ppm-D 8&12 hr
Aliphatic hydrocarbon/ aliphatic ester/surfactant	Not Available	0.2 @ 25 °C	None-A,O
Aliphatic solvent mixture	Not Available	Unknown	None-A,O
Aromatic hydrocarbon A	64742-95-6	10.0 @ 25 °C	None-A,O
Aromatic hydrocarbon B	64742-94-5	10.0	None-A,O
Block polymer	25067-11-2	Unknown	None-A,O
Butyl acetate	123-86-4	8.0	150 ppm-A,O 200 ppm-A 15 min (STEL)
Cumene	98-82-8	3.7	50 ppm- A,O Skin
Cyclohexane	110-82-7	100 @ 60 °C	300 ppm-A,O 150 ppm-D 12 hr TWA
Ethylbenzene	100-41-4	7.0	100 ppm-A,O 125 ppm-A 15 min (STEL) 25 ppm-D 8&12 hr
Ethylene glycol monobutyl ether acetate	112-07-2	0.3	20 ppm-D Skin None-A,O
Formaldehyde	50-00-0	Unknown	0.3 ppm-A Ceiling 0.7ppm-O 2 ppm-O 15min(STEL) 1 ppm-D 8&12 hr 2 ppm-D 15min TWA
Isopropyl alcohol	67-63-0	33.0	400 ppm-A,O 500 ppm-A 15 min(STEL) 400 ppm-D 8&12 hr
Medium mineral spirits	64742-88-7	10.0	100 ppm-D None-A,O
Methyl alcohol	67-56-1	100.0	200 ppm-A skin 200 ppm-O 250 ppm- A Skin 15 min (STEL) 200 ppm Skin 8&12 hr TWA
Methyl ethyl ketone	78-93-3	71.0	200 ppm-A,O 300 ppm- A 15min(STEL) 200 ppm- D 8&12 hr TWA 300 ppm-D 15 min TWA
Methyl isobutyl ketone	108-10-1	15.0	50 ppm-A 100 ppm-O 75 ppm- A 15 min(STEL)
Methyl n-propyl ketone	107-87-9	27.8	200 ppm-A,O 250 ppm-A 15 min(STEL)
Mixed dibasic esters	Not Available	0.2	None-A,O 10 mg/m³-D
n-butyl alcohol	71-36-3	5.5	50 ppm-A C Skin 100 ppm-O 25 ppm-D 50 ppm-D 15 min. TWA
Naphthalene	91-20-3	1.0 @ 52.6 °C	10 ppm-A,O
Nonylphenoxypoly ethanol	9016-45-9	Unknown	None-A,O
Petroleum naphtha	64742-89-8	50.0 @ 25 °C	300 ppm-A,O 400 ppm-O 15 min(STEL) 100 ppm-D
Propylene glycol monomethyl ether acetate	108-65-6	3.7	None-A,O 10 ppm-D
Toluene	108-88-3	36.7	50 ppm-A Skin 200 ppm-O 300 ppm-O Ceiling 500 ppm-O 10 min MAX 50 ppm-D 8&12 HR TWA
VM&P naphtha	64742-89-8	15.0 @ 37.8 °C	300 ppm-A,O 400 ppm-O 15 min(STEL) 100 ppm-D
Water	7732-18-5	23.6	None-A,O
Xylene	1330-20-7	7.0 @ 25 °C	100 ppm-A,O 150 ppm-A 15 min(STEL) 100 ppm-D 8&12 hr 150 ppm-D 15 min TWA
1,2,4-Trimethyl benzene	95-63-6	7.0 @ 44.4 °C	25 ppm-A,O

A = ACGIH TLV; O = OSHA; D = DuPont internal limit; S =Supplier Furnished limit; STEL = Short Term Exposure Limit; C = Ceiling.

Section III - Physical Data

Evaporation rate: Less than ether
Vapor Density: Heavier than air
Solubility in water: Miscible
Percent volatile by volume: 93 - 100%
Percent volatile by weight: 92 - 100%
Boiling range: 54°C- 232°C/ 129°F- 450°F
Gallon weight: 6.05- 8.30 lbs./gallon

Section IV - Fire and Explosion Data

Flash point (closed cup): See Section X for exact values.
Flammable limits: 0.9% - 36.5%
Extinguishing media: Universal aqueous film-forming foam, carbon dioxide, dry chemical.
Special fire fighting procedures: Full protective equipment, including self-contained breathing apparatus, is recommended. Water from fog nozzles may be used to cool closed containers to

prevent pressure build up.
Unusual fire & explosion hazards: When heated above the flash point, emits flammable vapors which, when mixed with air, can burn or be explosive. Fine mists or sprays may be flammable at temperatures below the flash point.

Section V - Health Hazard Data

General Effects:
Ingestion: Gastrointestinal distress. In the unlikely event of ingestion, call a physician immediately and have the names of ingredients available. **DO NOT INDUCE VOMITING.**
Inhalation: May cause nose and throat irritation. Repeated and prolonged overexposure to solvents may lead to permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are signs that solvent levels are too high. If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists, or occurs later, consult a physician.
Skin or eye contact: May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. In case of eye contact, immediately flush with plenty of water for at least 15 minutes; call a physician. In case of skin contact, wash with soap and water. If irritation occurs, contact a physician.
Specific Effects:
Acetic Acid May cause irritation of the mucous membranes. Contact may cause skin burns. Causes eye corrosion and permanent injury. Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive. **Aromatic Hydrocarbon-A & B** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Butyl Acetate** May cause abnormal liver function. Tests for embryotoxic activity in animals has been inconclusive. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Ethylbenzene** Recurrent overexposure may result in liver and kidney injury. Studies in laboratory animals have shown reproductive, embryotoxic and developmental effects. Has shown mutagenic activity in laboratory cell culture tests. Tests in some laboratory animals demonstrate carcinogenic activity. Individuals with preexisting diseases of the central nervous system, lungs, liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Ethylene Glycol Monobutyl Ether Acetate** Can be absorbed through the skin in harmful amounts. May destroy red blood cells. May cause abnormal kidney function. **Formaldehyde** Repeated exposure may cause allergic skin rash, itching, swelling. Causes severe eye irritation. Formaldehyde has produced tumors in the nasal passages of laboratory animals when exposed to high concentrations for a two year period. Epidemiology studies conducted to date have not found evidence of formaldehyde related tumor induction in humans. May induce pulmonary sensitization or significant irritation of the respiratory airways. Is an IARC, NTP or OSHA carcinogen. Has shown mutagenic activity in laboratory cell culture tests. **WARNING**: This chemical is known to the State of California to cause cancer. **Isopropyl Alcohol** Ingestion studies on laboratory animals showed that very high oral doses caused increased liver and kidney weights. **Medium Mineral Spirits** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Methyl Alcohol** Excessive human exposure to methanol may lead to: fatigue, headache, anaesthetic, neurologic effects, and visual difficulties including blindness or death. Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Methyl Ethyl Ketone** High concentrations have caused embryotoxic effects in laboratory animals. Methyl ethyl ketone has been demonstrated to potentiate (i.e., shorten the time of onset) the peripheral neuropathy caused by either n-hexane or methyl n-butyl ketone. MEK by itself has not been demonstrated to cause peripheral neuropathy. Liquid splashes in the eye may result in chemical burns. **Methyl Isobutyl Ketone** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the central nervous system or lungs may have increased susceptibility to the toxicity of excessive exposures. **Mixed Dibasic Esters** High airborne levels in rats have shown mild injury to the olfactory region of the nose. **n-Butyl Alcohol** Liquid splashes in the eye may result in chemical burns. May cause abnormal blood forming function with anemia. Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. **Naphthalene** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the liver or kidneys may have increased susceptibility to the toxicity of excessive exposures.
Nonylphenoxypoly(Ethyleneoxy)Ethanol Liquid splashes in the eye may result in chemical burns. **Petroleum Naphtha** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. May cause moderate eye burning. Recurrent overexposure may result in liver and kidney injury. **Toluene** Recurrent overexposure may result in liver and kidney injury. High airborne levels have produced irregular heart beats in animals and occasional palpitations in humans. Rats exposed to very high airborne levels have exhibited high frequency hearing deficits. The significance of this to man is unknown. Chromosomal changes in the circulating blood of exposed workers have been reported. The significance of these reports is unclear because of exposure to other substances. Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures. **WARNING**: This chemical is known to the State of California to cause birth defects or other reproductive harm. **VM&P Naphtha** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Xylene** Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Individuals with pre-existing disease of the central nervous system, kidneys, liver, cardiovascular system, lungs, or bone marrow may have increased susceptibility to the toxicity of excessive exposures. Canada classifies Xylene as a developmental toxin as high exposures to xylenes in some animal studies have been reported to cause health effects on the developing fetus/embryo. These effects were often at levels toxic to the adult animal. The significance of these effects to humans is not known.

Section VI - Reactivity Data

Stability: Stable
Incompatibility (materials to avoid): None reasonably foreseeable.
Hazardous decomposition products: CO, CO_2, smoke.
Hazardous polymerization: Will not occur.

Section VII - Spill or Leak Procedures

Steps to be taken in case material is released or spilled: Ventilate area. Remove sources of ignition. Prevent skin and eye contact and breathing of vapor. Wear a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH approved TC-23C), eye protection, gloves and protective clothing. Confine and remove with inert absorbent.

Waste disposal method: Do not allow material to contaminate ground water systems. Incinerate absorbed material in accordance with federal, state, and local requirements. Do not incinerate in closed containers.

Section VIII - Special Protection Information

Respiratory: Do not breathe vapors or mists. Wear a properly fitted air-purifying respirator with organic vapor cartridges (NIOSH approved TC-23C) and particulate filter (NIOSH TC-84A) during application and until all vapors and spray mists are exhausted. In confined spaces, or in situations where continuous spray operations are typical, or if proper air purifying respirator fit is not possible, wear a positive pressure, supplied-air respirator (NIOSH TC-19C). In all cases, follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.
Ventilation: Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits.
Protective clothing: Neoprene gloves and coveralls are recommended.

Eye protection: Desirable in all industrial situations. Include splash guards or side shields.

Section IX - Special Precautions

Precautions to be taken in handling and storing: Observe label precautions. Keep away from heat, sparks and flame. Close container after each use. Ground containers when pouring. Wash thoroughly after handling and before eating or smoking. Do not store above 120°F.
Other precautions: Do not sand, flame cut, braze or weld dry coating without a NIOSH approved respirator or appropriate ventilation.

Section X - Other Information

Section 313 Supplier Notification: The chemicals listed below with percentages are subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986 and of 40 CFR 372.

PRODUCT CODE **INGREDIENTS (See Section II)**
Y-3919S aromatic hydrocarbon-b, cyclohexane (0-1%*), medium mineral spirits, petroleum naphtha, toluene (3-7%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 6.17 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.17 VOC LE: 6.2 VOC AP: 6.2 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

2319S acetic acid, isopropyl alcohol, water,
GAL WT: 6.91 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.91 VOC LE: 6.6 VOC AP: 5.5 H: 1 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3602S acetone, aromatic hydrocarbon-a, ethyl 3-ethoxy propionate, isopropyl alcohol, methyl alcohol (4%*), methyl isoamyl ketone, n-butyl alcohol (17%*), petroleum naphtha, toluene (6-8%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (0-3%*)
GAL WT: 6.60 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.60 VOC LE: 6.6 VOC AP: 5.4 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3608S acetone, aromatic hydrocarbon-a, cyclohexane (0-1%*), ethyl 3-ethoxy propionate, isopropyl alcohol, methyl alcohol (4%*), petroleum naphtha, toluene (10-12%*), 1,2,4-trimethyl benzene (0-3%*)
GAL WT: 6.54 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.54 VOC LE: 6.5 VOC AP: 4.6 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3613S acetone, isopropyl alcohol, petroleum naphtha, toluene (20-21%*),
GAL WT: 6.61 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.61 VOC LE: 6.7 VOC AP: 2.9 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3642S acetone, butyl acetate, cyclohexane (0-1%*), isopropyl alcohol, methyl alcohol (3%*), petroleum naphtha, propylene glycol monomethyl ether acetate, toluene (18-20%*)
GAL WT: 6.55 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.55 VOC LE: 6.6 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3661S acetone, aromatic hydrocarbon-b, ethyl 3-ethoxy propionate, isopropyl alcohol, methyl alcohol (4%*), n-butyl alcohol (6%*), naphthalene (0-1%*), petroleum naphtha, toluene (11-13%*), vm&p naphtha, xylene (0-1%*), 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 6.57 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.57 VOC LE: 6.6 VOC AP: 5.0 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3696S acetone, aromatic hydrocarbon-a, cyclohexane (0-1%*), ethyl 3-ethoxy propionate, isopropyl alcohol, methyl alcohol (4%*), methyl isoamyl ketone, mixed dibasic esters, petroleum naphtha, toluene (5-8%*), 1,2,4-trimethyl benzene (0-3%*)
GAL WT: 6.60 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.60 VOC LE: 6.6 VOC AP: 5.4 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3671S acetone, ethylbenzene (0-2%*), isopropyl alcohol, mixed dibasic esters, n-butyl alcohol (6%*), petroleum naphtha, propylene glycol monomethyl ether acetate, toluene (11-12%*), xylene(6-7%*)
GAL WT: 6.64 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.64 VOC LE: 6.7 VOC AP: 4.8 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3900S aromatic hydrocarbon-a, cumene (0-2%*), ethylbenzene (0-2%*), isopropyl alcohol, toluene (0-3%*), vm&p naphtha, xylene (1-6%*), 1,2,4-trimethyl benzene (3-14%*)
GAL WT: 6.52 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.52 VOC LE: 6.5 VOC AP: 6.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3901S cyclohexane (0-2%*), ethylbenzene (0-1%*), petroleum naphtha, toluene (3-10%*), vm&p naphtha, xylene (0-2%*)
GAL WT: 6.05 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.05 VOC LE: 6.1 VOC AP: 6.1 H: 2 F: 3 R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3909S aliphatic solvent mixture, water,
GAL WT: 8.30 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 8.30 VOC LE: 8.1 VOC AP: 0.5 H: 2 F: 1
R: 0 FLASH PT: ABOVE 200 F (CC) OSHA STORAGE: IIIB

3914S acetone, butyl acetate, ethylbenzene (3-8%*), isopropyl alcohol, medium mineral spirits, methyl ethyl ketone (9%*), toluene (25-26%*), vm&p naphtha, xylene (22-28%*)
GAL WT: 6.90 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.90 VOC LE: 6.9 VOC AP: 6.3 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3919S medium mineral spirits, 1,2,4-trimethyl benzene (0-2%*),
GAL WT: 6.40 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.40 VOC LE: 6.4 VOC AP: 6.4 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC

3921S butyl acetate, methyl isobutyl ketone (4%*), methyl n-propyl ketone, n-butyl alcohol (5%*),
GAL WT: 6.87 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.87 VOC LE: 6.9 VOC AP: 6.9 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3924S acetone, cyclohexane (0-1%*), isopropyl alcohol, petroleum naphtha, toluene (18-21%*),
GAL WT: 6.42 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.42 VOC LE: 6.4 VOC AP: 4.5 H: 2 F: 3
R: 0 FLASH PT: BELOW 20 F (CC) OSHA STORAGE: IB

3929S aromatic hydrocarbon-a, block polymer (polyglycols), cumene (0-1%*), formaldehyde (%*), medium mineral spirits, nonylphenoxypoly(ethyleneoxy)ethanol, vm&p naphtha, water, xylene (1-2%*), 1,2,4-trimethyl benzene (1-5%*)
GAL WT: 8.09 WT PCT SOLIDS: 7.71 VOL PCT SOLIDS: 7.29
SOLVENT DENSITY: 8.05 VOC LE: 5.0 VOC AP: 1.3 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3939S medium mineral spirits, toluene (13%*), 1,2,4-trimethyl benzene (0-3%*),
GAL WT: 6.52 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 6.52 VOC LE: 6.5 VOC AP: 6.5 H: 2 F: 3
R: 0 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

3949S aliphatic hydrocarbon/aliphatic ester/surfactant, water
GAL WT: 8.25 WT PCT SOLIDS: 0.14 VOL PCT SOLIDS: 0.15
SOLVENT DENSITY: 8.25 VOC LE: 6.9 VOC AP: 0.4 H: 0 F: 1
R: 0 FLASH PT: ABOVE 200 F (CC) OSHA STORAGE: IIIB

3979S aromatic hydrocarbon-b, ethylene glycol monobutyl ether acetate (30%*), medium mineral spirits, naphthalene (0-1%*), propylene glycol monomethyl ether acetate, 1,2,4-trimethyl benzene (0-1%*)
GAL WT: 7.76 WT PCT SOLIDS: 0.00 VOL PCT SOLIDS: 0.00
SOLVENT DENSITY: 7.76 VOC LE: 7.8 VOC AP: 7.8 H: 2 F: 2
R: 0 FLASH PT: BETWEEN 100 - 140 F (CC) OSHA STORAGE: II

Notice: The data in this material safety data sheet relate only to the specific material designated herein and do not relate to use in combination with any other material or in any process.

Product Manager - Refinish Sales

Prepared by D.G. Detweiler

Airgas

Five Radnor Corporate Center
100 Matsonford Road
Radnor, Pennsylvania 19087
(215) 687-5253
Telecopy: (215) 687-1052

MATERIAL SAFETY DATA SHEET

PRODUCT NAME Argon	CAS # 7440-37-1
TRADE NAME AND SYNONYMS Argon; Argon, Compressed	DOT I.D. No: UN 1006
CHEMICAL NAME AND SYNONYMS Argon	DOT Hazard Class: Nonflammable Gas
ISSUE DATE AND REVISIONS May 1990	Formula: Ar
	Chemical Family: Rare gas

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT Argon is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg (ACGIH 1989-1990).

SYMPTOMS OF EXPOSURE

Effects of exposure to high concentrations so as to displace the oxygen in air necessary for life may include any, all, or none of the following:

- Loss of balance or dizziness
- Tightness in the frontal area of the forehead

(Continued on last page)

TOXICOLOGICAL PROPERTIES

Argon is nontoxic but the liberation of a large amount in a confined area could displace the amount of oxygen in air necessary to support life.

Argon is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health where such illness would be aggravated by exposure to argon should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ARGON. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Forms carbonic acid in the presence of water.

PHYSICAL DATA

BOILING POINT Sublimation point = -109.3°F (-78.5°C)	LIQUID DENSITY AT BOILING POINT Solid Density = 97.5 lb/ft^3 (1562 kg/m^3)
VAPOR PRESSURE @ 70°F (21.1°C) = 856 psia (5900 kPa)	GAS DENSITY AT 70°F, 1 atm .124 lb/ft^3 (1.99 kg/m^3)
SOLUBILITY IN WATER Very soluble	FREEZING POINT -69.8°F (-56.6°C) @ 75.1 psia (518 kPa)
EVAPORATION RATE N/A	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 1.65
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME LEL N/A UEL N/A
EXTINGUISHING MEDIA Nonflammable, inert gas		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES N/A		
UNUSUAL FIRE AND EXPLOSION HAZARDS N/A		

REACTIVITY DATA

STABILITY Unstable		CONDITIONS TO AVOID
Stable	X	N/A
INCOMPATIBILITY (Materials to avoid) None		
HAZARDOUS DECOMPOSITION PRODUCTS Carbon Monoxide		
HAZARDOUS POLYMERIZATION May Occur		CONDITIONS TO AVOID
Will Not Occur	X	N/A

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED See Note On Last Page
WASTE DISPOSAL METHOD See Note On Last Page

HEALTH HAZARD DATA

SYMPTOMS OF EXPOSURE: (Continued)

- Tingling in the tongue, fingertips or toes
- Weakened speech leading to the inability to utter sounds
- Rapid reduction in the ability to perform movements
- Reduced consciousness of the surroundings
- Loss of tactile sensations
- Heightened mental activity

It should be recognized that it is possible that none of the above symptoms may occur in argon asphyxia so that there are no definite warning symptoms.

SPECIAL PROTECTION INFORMATION

LOCAL EXHAUST:

To prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 18 molar percent.

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

25% CARBON DIOXIDE AND 75% ARGON GAS MIXTURE
MATERIAL SAFETY DATA SHEET

Airgas
Five Radnor Corporate Center
Suite 550, 100 Matsonford Road
Radnor, PA 19087-4578
(610) 687-5253

Emergency Contact:
CHEMTREC 1-800-424-9300

SUBSTANCE IDENTIFICATION

Substance: Gas Mixture, 25% Carbon Dioxide and 75% Argon

Trade Names/Synonyms: Shielding Gas

ARGON - CO_2

D.O.T. Proper Shipping Name: Compressed Gases, N.O.S.

C-25

D.O.T. Identification Number: UN-1956

Chemical Family: Not Applicable.

Mixture Molecular Weight: 40.9635

HEALTH HAZARD INGREDIENTS

This section covers the materials from which this product is manufactured. The fumes and gases produced during cutting with the normal use of this product are covered in "REACTIVITY SECTION". The term "Health Hazard" should be interpreted as a term required and defined in OSHA 29 CFR 1910.1200.

Ingredient	Vol(%)	1994-1995 ACGIH TLV-TWA	OSHA-PEL
Argon Cas #7440-37-1	75	Simple Asphyxiant	None Currently Established
Carbon Dioxide Cas #124-38-9	25	5,000 PPM 30,000 PPM (STEL)	5,000 PPM

TOXICITY

Gas Mixture: Asphyxiant. Relatively Nontoxic

Carbon Dioxide: IDLH 4% by volume. (equivalent to approximately 16% of this gas mixture).

Carcinogen Status: None (OSHA).

Target Effects: Mixtures of carbon dioxide can increase respiration and heart rate.

PHYSICAL DATA

Description: Gas mixture packaged under pressure generally between 1500 and 2000 psig.

Nonflammable colorless gas, with a slight smell. Forms carbonic acid upon contact with moisture.

Boiling Point: Not Applicable. (mixture tends to separate at cryogenic temperatures)

Melting point: Not applicable. (mixture tends to separate at cryogenic temperatures)

25% CARBON DIOXIDE AND 75% ARGON GAS MIXTURE
MATERIAL SAFETY DATA SHEET

PHYSICAL DATA (continued)

Solubility in Water, Vol/Vol: Slightly

Density (Gas): 1.7004 g/l @ 70°F, 1 ATM

REACTIVITY

Reactivity:
Gas mixture is stable under normal temperatures and pressures.

Products which may be incompatible with this carbon dioxide/argon mixture:

Acrylaldehyde	Exothermic polymerization.
Cesium Oxide	Ignition.
Diethyl Magnesium	Ignition.
Metal Hydrides	Reduction reaction.
Metals	Dusts of many metals suspended in a carbon dioxide enriched atmosphere may be ignitable and explosive.
Sodium Peroxide (with Al or Mg)	Vigorous reaction.

Decomposition:
When welding or cutting, temperatures above 1700 C may cause decomposition of carbon dioxide and the release of oxygen and highly toxic carbon monoxide. The arc process may form ozone and nitrogen oxides. Other decomposition products of normal operation originate from volatilization, reaction, or oxidation of the material being worked.

HEALTH EFFECTS AND FIRST AID

Inhalation:

Acute Exposure: The symptoms of asphyxia depend on the rapidity with which the oxygen deficiency develops and how long it continues. Moderate concentrations may cause headache, drowsiness, dizziness, stinging of the nose and throat, excitation, rapid breathing, increased heart rate, excess salivation, vomiting, and unconsciousness.

Chronic Exposure: No Data Available.

First Aid - Immediately remove from exposure area to fresh air. If breathing has stopped, give artificial respiration. Maintain airway and blood pressure and administer oxygen if available. Keep affected person warm and at rest. Treat symptomatically and supportively. Administration of oxygen should be performed by qualified personnel. Get medical attention immediately.

Skin contact:

Acute Exposure - No adverse effects from the gas mixture are evident from available information.

Chronic Exposure - No adverse effects are expected from chronic exposure to gas mixture.

First Aid - Where contact with the gas mixture at ambient temperature is involved, it is unlikely that emergency treatment will be required. If adverse effects occur, get medical attention.

Eye Contact:

Acute Exposure - No adverse effects have been reported from the gas mixture.

Chronic Exposure - [illegible]

First Aid - It is unlikely that contact with gas at atmospheric pressure and ambient temperature will require emergency treatment. If eyes are irritated, rinse with water for [illegible] minutes and get medical attention immediately.

25% CARBON DIOXIDE AND 75% ARGON GAS MIXTURE
MATERIAL SAFETY DATA SHEET

HEALTH EFFECTS AND FIRST AID (continued)

Additional Health Hazards:

Welding or cutting with this gas may create additional health hazards. Fumes and other gases formed can be dangerous to your health and may cause serious lung disease. See "SPECIAL PRECAUTIONS FOR WELDING AND CUTTING" section.

Notes to Physician:

Acute Exposure - Gases, fumes, and dusts from welding or cutting may cause irritation to the eyes, lungs, nose, and throat. Some toxic gases associated with welding and related processes may cause pulmonary edema, asphyxiation, and death. Acute overexposure may include signs and symptoms such as watery eyes, nose and throat irritation, headache, dizziness, difficulty breathing, frequent coughing, or chest pains.

Chronic Exposure - Protracted inhalation of air contaminants may lead to their accumulation in the lungs, a condition which may be seen as dense areas on chest X-rays. The severity of change is proportional to the length of exposure. The changes seen are not necessarily associated with symptoms or signs of reduced lung function or disease. In addition, the changes on X-rays may be caused by non-work related factors such as smoking, etc.

Medical Condition Aggravated by Overexposure: Persons with a history of cardiovascular or pulmonary impairment.

FIRE AND EXPLOSION DATA

Fire and Explosion Hazard:
Gas mixture is nonflammable.

Cylinder may rupture or explode in heat of fire. Containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperatures.

Firefighting Media:
Use media appropriate for surrounding fire.

Firefighting:
Move container from fire area if possible without risk. Cool fire-exposed containers with water from maximum distance until well after the fire is out. Withdraw immediately if rising sound from venting safety device is heard.

ACCIDENTAL RELEASE MEASURES

Accidental Leak:
This gas mixture is an asphyxiant. Stop leaking gas if you can do it without risk. Keep unnecessary people away. Isolate hazard area and deny entry. Ventilate closed spaces before entering.

CONDITIONS TO AVOID

Do not permit physical damage or overheating of containers. Contents are under pressure; containers may violently rupture and travel a considerable distance. If welding, do not strike arc on cylinder.

PROTECTIVE EQUIPMENT

Ventilation:
Provide general dilution ventilation enough to keep oxygen above 19.5% and if welding, enough ventilation to keep fumes and other gases below the TLV's in worker's breathing zone.

Respirator:
When working in a confined space, the following respirators are recommended based on information found in the Toxicity, Physical Data, and Health Effects sections.

Any supplied air respirator operated in pressure-demand or other positive pressure mode.

Any self-contained breathing apparatus

25% CARBON DIOXIDE AND 75% ARGON GAS MIXTURE
MATERIAL SAFETY DATA SHEET

PROTECTIVE EQUIPMENT (continued)

Clothing:
When welding or cutting, wear protective clothing.
Protective clothing not required when only strictly working with this gas mixture in a non-welding or non-cutting process.

Gloves:
Work gloves are required when handling a compressed gas cylinder.
Welding gloves are required when welding or cutting.

Eye Protection:
Safety glasses are required when handling high pressure gas.
When welding or cutting, wear a helmet or use a face shield with a filter lens.

SPECIAL PRECAUTIONS FOR WELDING AND CUTTING

Fumes and gases cannot be classified easily. The composition and quantity of both are dependent upon the metal (including its coating) being worked, fluxes, the process, procedure, and electrodes used. See American National Standard Z 49.1, "Safety in Welding and Cutting" issued by the American National Standards Institute (212) 642-4900.

STORAGE AND DISPOSAL

****STORAGE****

Store in accordance with 29 CFR 1910.101.

****DISPOSAL****

Vent the carbon dioxide and argon gas mixture slowly to a well-ventilated outdoor location remote from personnel, work areas, and building air intakes.

TRANSPORTATION DATA

Department of Transportation Proper Shipping Name: Compressed Gases, N.O.S.

Department of Transportation Hazard Class 49 CFR 172.101:
2.2 (Nonflammable Gas)

Department of Transportation Identification Number: UN 1956

Department of Transportation Labeling Requirements 49 CFR 172.101 and Subpart E:
Nonflammable Gas

Department of Transportation Packaging Requirements: 49 CFR 173.302

Limited Quantity Exceptions: 49 CFR 173.306

Authorized: Airgas: No distribution except as required by law
Creation date: 07/01/95 Revision date:

-Additional Information-

Airgas makes no warranties, guarantees or representations of any kind or nature with respect to the product or this data, either expressed or implied, and whether arising by law or otherwise, including but not limited to any implied warranty of personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use or reliance upon this data.

Airgas

Five Radnor Corporate Center
100 Matsonford Road
Radnor, Pennsylvania 19087
(215) 687-5253
Telecopy: (215) 687-1052

MATERIAL SAFETY DATA SHEET

PRODUCT NAME Acetylene	CAS # 74-86-2
TRADE NAME AND SYNONYMS Acetylene, Ethyne	DOT I.D. No.: UN 1001
CHEMICAL NAME AND SYNONYMS Acetylene	DOT Hazard Class: Flammable Gas
ISSUE DATE AND REVISIONS May 1990	Formula: C_2H_2
	Chemical Family: Alkyne

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT Acetylene is defined as a simple asphyxiant. Oxygen levels should be maintained at greater than 18 molar percent at normal atmospheric pressure which is equivalent to a partial pressure of 135 mm Hg (ACGIH 1989-1990 and OSHA 1989).

SYMPTOMS OF EXPOSURE

Inhalation: Low concentrations (10-20% in air) cause symptoms similar to that of being intoxicated. Higher concentrations so as to exclude an adequate supply of oxygen to the lungs cause unconsciousness.

TOXICOLOGICAL PROPERTIES

As a narcotic gas or intoxicant causes hypercapnia (an excessive amount of carbon dioxide in the blood). Repeated exposures to tolerable levels has not shown deleterious effects. The major property is the exclusion of an adequate supply of oxygen to the lungs.

Acetylene is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health where such illness would be aggravated by exposure to acetylene should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO ACETYLENE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

Inhalation: Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from uncontaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given mouth-to-mouth resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Flammable over an extremely wide range in air. Explosive reactions may occur on ignition. Reacts explosively with halogens and halogenated compounds.

PHYSICAL DATA

BOILING POINT Sublimation point = -118.8°F (-83.8°C)	LIQUID DENSITY AT BOILING POINT @ -116°F (-82°C) = 38.8 lb/ft^3 (622 kg/m^3)
VAPOR PRESSURE @ 70°F (21.1°C) = 645 psia (4450 kPa)	GAS DENSITY AT 70°F, 1 atm .0691 lb/ft^3 (1.107 kg/m^3)
SOLUBILITY IN WATER Soluble	FREEZING POINT -113°F (-80.6°C)
EVAPORATION RATE N/A	SPECIFIC GRAVITY (AIR=1) @ 68°F (20°C) = 0.906

APPEARANCE AND ODOR: Pure acetylene is a colorless gas with an ethereal odor. Commercial (carbide) acetylene has a distinctive garlic-like odor.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMPERATURE	FLAMMABLE LIMITS % BY VOLUME
Gas	565°F (296°C)	See Last Page LEL 2.2 UEL 80-85

EXTINGUISHING MEDIA: Carbon dioxide; dry chemical

ELECTRICAL CLASSIFICATION: Class 1, Group A

SPECIAL FIRE FIGHTING PROCEDURES

If possible, stop flow of escaping gas. Use water spray to cool surrounding containers. Keep personnel away since heated or burning cylinders can rupture violently.

UNUSUAL FIRE AND EXPLOSION HAZARDS

GASEOUS ACETYLENE IS SPONTANEOUSLY COMBUSTIBLE IN AIR AT PRESSURES ABOVE 30 PSIA (207 kPa). It requires a very low ignition energy so that fires which have been extinguished without (Continued on last page)

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
Unstable	X	Do not allow the free gas (outside of cylinder) to exceed 30 psia. Cylinders should not be exposed to sudden shock or sources of heat.
Stable		

INCOMPATIBILITY (Materials to avoid): Oxygen and other oxidizers including all of the halogens and halogen compounds. (Continued on last page)

HAZARDOUS DECOMPOSITION PRODUCTS: Carbon and hydrogen

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		
Will Not Occur	X	N/A

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.		
VENTILATION Hood with forced ventilation	LOCAL EXHAUST To prevent accumulation above the LEL	SPECIAL N/A
	MECHANICAL (Gen.) In accordance with electrical codes	OTHER N/A
PROTECTIVE GLOVES PVC or rubber in laboratory; as required for cutting and welding		
EYE PROTECTION Safety goggles or glasses		
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Acetylene — DOT Hazard Class: Flammable Gas

DOT Shipping Label: Flammable Gas — I.D. No.: UN 1001

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when removing gas from the cylinder. DO NOT ALLOW THE FREE GAS TO EXCEED 30 PSIA (207 kPa) @ 70°F (21.1°C). Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional recommendations, consult Compressed Gas Association's Pamphlets G-1, P-1, P-14 and Safety Bulletin SB-2.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

For additional recommendations, consult Compressed Gas Association's Pamphlets G-1, P-1, P-14, and Safety Bulletin SB-2.

SPECIAL PACKAGING RECOMMENDATIONS

Since acetylene will explode or combust if its pressure exceeds 30 psia (207 kPa) it is shipped dissolved in acetone or dimethylformamide which is dispersed in a porous mass within the cylinder. Follow your supplier's instructions for the maximum withdrawal rate for each size cylinder so that solvent is not withdrawn with the acetylene.

Most metals except silver, copper, mercury or brasses with more than 66% copper are compatible (noncorrosive) with acetylene.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Earth-ground and bond all lines and equipment associated with the acetylene system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Federal Law (49CFR).

(Continued on last page)

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

FIRE AND EXPLOSION HAZARD DATA

UEL: (Continued)

Pure acetylene can ignite by decomposition above 30 psia (207 kPa); therefore, the UEL is 100% if the ignition source is of sufficient intensity.

UNUSUAL FIRE AND EXPLOSION HAZARDS: (Continued)

stopping the flow of gas can easily reignite with possible explosive force. Acetylene has a density very similar to that of air so when leaking it does not readily dissipate.

REACTIVITY DATA

INCOMPATIBILITY (Materials to avoid): (Continued)

Forms explosive acetylide compounds with copper, mercury, silver, brasses containing more than 66% copper and brazing materials containing silver or copper.

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Five Radnor Corporate Center
100 Matsonford Road
Radnor, Pennsylvania 19087
(215) 687-5253
Telecopy: (215) 687-1052

MATERIAL SAFETY DATA SHEET

PRODUCT NAME Oxygen	CAS # 7782-44-7
TRADE NAME AND SYNONYMS Oxygen; Oxygen, Compressed	DOT I.D. No.: UN 1072
CHEMICAL NAME AND SYNONYMS Oxygen	DOT Hazard Class: Nonflammable Gas
	Formula: O_2
ISSUE DATE AND REVISIONS May 1990	Chemical Family: Oxidizer

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

None established (ACGIH 1989-1990). Oxygen is the "vital element" in the atmosphere in which we live and breathe (Continued on last page)

SYMPTOMS OF EXPOSURE

Breathing high concentrations (greater than 75 molar percent) causes symptoms of hyperoxia which includes cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells, and convulsions capable of leading to death.

For additional information on hyperoxia, see Compressed Gas Association's Pamphlet P-14.

TOXICOLOGICAL PROPERTIES

The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75 molar percent present a risk of inflammation of organic matter in the body.

Oxygen is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.

Persons in ill health where such illness would be aggravated by exposure to oxygen should not be allowed to work with or handle this product.

RECOMMENDED FIRST AID TREATMENT

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGEN-RICH ATMOSPHERES.

Conscious persons should be assisted to an uncontaminated area and breathe fresh air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing (has experienced) hyperoxia.

Unconscious persons should be moved to an uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continued treatment should be symptomatic and supportive.

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use.
Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

Oxygen vigorously accelerates combustion. Contact with all flammable materials should be avoided. Some materials which are not flammable in air will burn in pure oxygen or oxygen-enriched atmospheres.

PHYSICAL DATA

BOILING POINT -297.3°F (-182.9°C)	LIQUID DENSITY AT BOILING POINT 71.23 lb/ft^3 (1141 kg/m^3)
VAPOR PRESSURE @ 70°F (21.1°C) = Above the critical temperature of -181.1°F (-118.4°C)	GAS DENSITY AT 70°F, 1 atm .0828 lb/ft^3 (1.326 kg/m^3)
SOLUBILITY IN WATER Slightly	FREEZING POINT -361.8°F (-218.8°C)
EVAPORATION RATE N/A	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 1.11
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME LEL N/A	UEL N/A
EXTINGUISHING MEDIA Copious quantities of water for fires with oxygen as the oxidizer.		ELECTRICAL CLASSIFICATION Nonhazardous	

SPECIAL FIRE FIGHTING PROCEDURES

If possible, stop the flow of oxygen which is supporting the fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS

Vigorously accelerates combustion. If cylinders are involved in a fire, safely relocate or keep cool with water spray.

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
Unstable		
Stable	X	N/A

INCOMPATIBILITY (Materials to avoid)

All flammable materials

HAZARDOUS DECOMPOSITION PRODUCTS

None

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		
Will Not Occur	X	N/A

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.

WASTE DISPOSAL METHOD

Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)	N/A	
VENTILATION	LOCAL EXHAUST To prevent accumulation above 25 molar percent.	SPECIAL N/A
See Local Exhaust	MECHANICAL (Gen.) N/A	OTHER N/A
PROTECTIVE GLOVES	As required; any material	
EYE PROTECTION	Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT	Safety shoes, safety shower	

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Oxygen or Oxygen, Compressed
DOT Shipping Label: Oxidizer
DOT Hazard Class: Nonflammable Gas
I.D. No.: UN 1072

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3,000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder.

For additional handling recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and G-4.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits and away from full or empty stored cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 130F (54C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association's Pamphlets P-1, P-14, and G-4.

SPECIAL PACKAGING RECOMMENDATIONS

Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications use stainless steels, copper and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel®, Inconel®, or beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon® and Kel-F® are the preferred nonmetal gaskets.

Special Note: It should be recognized that the ignition temperature of metals and nonmetals in pure oxygen service decreases with increasing oxygen pressure.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants. Equipment to contain oxygen must be "cleaned for oxygen service." See Compressed Gas Association Pamphlet G-4.1.

Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the

(Continued on last page)

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT: (Continued)

(approximately 21 molar % of the atmosphere). OSHA 1989 does not list a TWA for oxygen.

SPECIAL PRECAUTIONS

OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

owner or with his (written) consent is a violation of Federal Law (49CFR).

Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

Material Safety Data Sheet

May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Standard must be consulted for specific requirements.

U.S. Department of Labor
Occupational Safety and Health Administration
(Non-Mandatory Form)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name THE WILKINSON CORPORATION	Emergency Telephone Number 1-517-843-5163
Address (Number, Street, City, State, and ZIP Code) 8290 N. Lapeer Rd.	Telephone Number for Information 1-517-843-5163
Mayville MI 48744	Date Prepared
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Calcium Magnesium Chloride $CaMgCl_2$				
Specific Gravity 1.28				
Temp in Centegrade 45°c				
Calcium as Chloride				26.87%
Magnesium as Chloride				1.13%
Sodium as Salts (not included for total percentage)				2.28%

Section III — Physical/Chemical Characteristics

Boiling Point	N.D.	Specific Gravity (H_2O = 1)	1.28
Vapor Pressure (mm Hg.)	N.D.	Melting Point	
Vapor Density (AIR = 1)	N.D.	Evaporation Rate (Butyl Acetate = 1)	N.D.

Solubility in Water
Water solution

Appearance and Odor
Clear to Tan liquid, mild odor

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) NONE	Flammable Limits	LEL	UEL

Extinguishing Media
Non-FLAMMABLE

Special Fire Fighting Procedures
NONE

Unusual Fire and Explosion Hazards
NONE

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid NONE
	Stable		

Incompatibility (Materials to Avoid)
NON KNOWN

Hazardous Decomposition or Byproducts
Fumes of chloride, if heated to decomposition

Hazardous Polymerization	May Occur		Conditions to Avoid NONE
	Will Not Occur	XX	

Section VI — Health Hazard Data

Route(s) of Entry: Inhalation? Skin? Ingestion?

Health Hazards (Acute and Chronic)
SEE EMERGENCY & FIRST AID PRECAUTIONS.

Carcinogenicity: NTP? IARC Monographs? OSHA Regulated?

Signs and Symptoms of Exposure
Skin will become irritated. Wash with water.

Medical Conditions
Generally Aggravated by Exposure

Emergency and First Aid Procedures
SKIN-Flush with water. EYES-Flush with water

INGESTION -Give two (2) glasses of water, induce vomiting.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken In Case Material Is Released or Spilled
Collect by most convenient means. Wash area with water, if not washed, spill area may remain wet for a long period of time.

Waste Disposal Method
Dispose of in accordance with Local, State and Federal regulations, according to Chloride content.

Precautions to Be Taken in Handling and Storing
Chloride fumes will corrode bare metal over time, keep in closed container.

Other Precautions
Clean spilled material immediately. Spill will remain wet for long periods due to Chloride content.

Section VIII — Control Measures

Respiratory Protection (Specify Type)
NONE

Ventilation	Local Exhaust: Use in ventilated area	Special: NONE
	Mechanical (General): Will corrode metal surfaces over time	Other: NONE

Protective Gloves	Eye Protection
Impervious	Safety glasses for fac : shield.

Other Protective Clothing or Equipment

Work/Hygienic Practices

SEP-13-00 11:25 AM MILKINSON.CORP. 517 543 6451 P.02

MATERIAL SAFETY DATA SHEET

IDENTITY (As Used on Label and List)

Bituminous Coal Fly and Bottom Ash

SECTION I

Name

Consumers Power Company

Address (Number, Street, City, State and ZIP Code)

212 West Michigan Avenue

Jackson, MI 49201

Telephone Number for Information

(517) 788-0679

Date Prepared

Revised 1/1/89

1314

56

3

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL mg/m³	ACGIH TLV mg/m³	% (opti
Aluminum Oxide, Al_2O_3	NE	NE	21-31%
Calcium Oxide, CaO	5	2	0.7-3.0
Carbon, C. 7440-44-0	NE	NE	1.0-13%
Iron Oxide, Fe_2O_3	10	5	4.5-18%
Lithium Oxide, Li_2O	NE	NE	0.01-0.
Magnesium Oxide, MgO 1309-48-4	15 (fume)	10 (fume)	0.5-1.5
Phosphorous Pentoxide, P_2O_5	NE	NE	0.1-2.5
Potassium Oxide, K_2O	NE	NE	1.0-5.0
Silica, SiO_2	$10mg/m^3/\%SiO_2+2$	0.1	39-62%
Sodium Oxide, Na_2O	NE	NE	0.1-5.0
Sulfite, SO_3 14265-45-3	NE	NE	0.2-1.5
Titanium Oxide, TiO_2	15	10 (<1% quartz)	0.5-2.5

May contain trace amounts of Arsenic (15-150 ppm)

Note: Concentrations are approximate and may vary with coal source and boiler operating conditions (NE means n established). The International Agency for Research on Cancer (IARC) has classified crystalline silica as a pr able human carcinogen.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point

NA

Specific Gravity (water = 1)

NA

Vapor Pressure (mm Hg)

NA

Melting Point

NA

Vapor Density (air = 1)

NA

Evaporation Rate (Butyl Acetate = 1)

NA

Solubility in Water

Minimal

Appearance and Odor

Hygroscopic powder, light to medium gray

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used)
NA

Flammable Limits — LEL — UEL
NA

Extinguishing Media
NA

Special Fire Fighting Procedures
NA

Unusual Fire and Explosion Hazards
NA

SECTION V - REACTIVITY DATA

Stability		Conditions To Avoid
	Unstable	
	Stable X	

Incompatibility (Materials To Avoid)
NA

Hazardous Decomposition or Byproducts
NA

Hazardous Polymerization		Conditions To Avoid
	May Occur	
	Will Not Occur X	

SECTION VI - HEALTH HAZARD DATA

Route(s) of Entry: Inhalation? Yes — Skin? Yes — Ingestion? No

Health Hazards (Acute and Chronic)
Dust particles may irritate eyes, skin and mucous membranes of the respiratory tract.

Carcinogenicity: NTP? No — IARC Monographs? Yes-Silica — OSHA Regulated? No

Signs and Symptoms of Exposure
Eye, skin irritation. Difficulty in breathing, pneumoconiosis with excessive chronic exposure.

Medical Conditions Generally Aggravated by Exposure
Existing respiratory illnesses or skin disorders

Emergency and First-Aid Procedures
Thoroughly flush eyes for at least 15 minutes. Wash skin with soap and water. Remove to fresh air.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

Steps To Be Taken In Case Material Is Released or Spilled
Scoop or shovel into container or vacuum. Handle wet when possible.

Waste Disposal Method
Approved landfills following applicable federal, state and local regulations.

Precautions To Be Taken In Handling and Storing
Follow good housekeeping procedure.

Other Precautions
Minimize inhalation and direct skin contact. Dust respirator should be used in conditions involving high ash exposure.

SECTION VIII - CONTROL MEASURES

Respiratory Protection (Specify Type)
Wear NIOSH approved dust respirator.

Ventilation

Local Exhaust NA	**Special** NA
Mechanical (General) Yes	**Other** NA

Protective Gloves
Cloth, plastic or rubber

Eye Protection
Goggles in dusty conditions

Other Protective Clothing or Equipment
Paper or cloth coveralls under heavy dust conditions

Work/Hygienic Practices
Avoid generating excessive dust when handling.

MATERIAL SAFETY DATA SHEET

ISOCYANATE ACTIVATORS, HARDENERS & ADDITIVES

Section I - Manufacturer

Manufacturer:
DuPont Co.
Automotive
Wilmington, Delaware 19898
Telephone:
Product information (800)441-7515
Medical emergency (800) 441-3637
Transportation emergency (800) 424-9300 (CHEMTREC)
Product: Isocyanate activators, hardeners & additives (77S, 192S, 193S, 195S, 582S, 782S, 785S, 792S, 793S, 795S,VG-Y-1421, 2000S,PartB, 3505S, 7005S, 7006S, 8105S, 8705S, 12305S).
OSHA Hazard Class: Flammable liquid
DOT Shipping Name: See DOT addendum.
Hazardous Materials Information: See Section X.

Section II - Hazardous Ingredients

(See Section X)

Ingredients	*CAS No.*	*Vapor Pressure (20°C. mm Hg)*	*Exposure Limits **
Aliphatic polyisocyanate resin	28182-81-2	Unknown	0.5 mg/m³-S 1.0 mg/m³-S 15 min (STEL) None-A,O
Aliphatic polymeric isocyanate	3779-63-3	Unknown	0.5 mg/m³-S 8 hr TWA 1 mg/m³-S 15 min (STEL) None-A,O
Aromatic hydrocarbon-A	64742-95-6	10.0 @ 25°C	None-A,O
Aromatic hydrocarbon-B	64742-94-5	10.0	None-A,O
Bis(1-2,2,6,6-pentamethyl-4-piperdinyl) sebacate	41556-26-7	6.0	None-A,O
Bis(2,2,6,6-Tetramethyl-4 Piperidyl) sebacate	52829-07-9	Unknown	0.1 mg/m³-S None-A,O
Butyl acetate	123-86-4	8.0	150 ppm-A,O 200 ppm-A 15 min (STEL)
Cumene	98-82-8	3.7	50 ppm-A,O Skin
Dibutyl tin dilaurate	77-58-7	0.2 @ 60°C	0.1 mg/m³-A Skin as Sn 0.1 mg/m³-O as Sn
Diethylene glycol monobutyl ether	112-34-5	0.1	5 ppm-D None-A,O
Diisobutyl ketone	108-83-8	1.7	25 ppm-A 50 ppm-O
Ethyl acetate	141-78-6	76.0	400 ppm-A,O
Ethylbenzene	100-41-4	7.0	100 ppm-A,O 125 ppm-A 15 min(STEL) 25 ppm-D 8&12 hr
Ethylene glycol monobutyl ether acetate	112-07-2	0.3	20 ppm-D Skin None-A,O
Hexyl acetate isomers	88230-35-7	0.7	50 ppm-A Hex Acet None-O
Isophorone diisocyanate homopolymer	53880-05-0	None	None-A,O
Methyl ethyl ketone	78-93-3	71.0	200 ppm-A,O 300 ppm-A 15 min(STEL) 200 ppm-D 8&12 hr TWA 300 ppm-D 15 min TWA
Naphthalene	91-20-3	1.0 @ 52.6°C	10 ppm-A,O
Oxo-actyl acetate	108419-32-5	1.0 @ 25°C	50 ppm-S None-A,O
Propylene glycol monomethyl ether acetate	108-65-6	3.7	10 ppm-D None-A,O
Toluene	108-88-3	36.7	50 ppm-A Skin 200 ppm-O 300 ppm-O Ceiling 500 ppm-O 10 min MAX 50 ppm-D 8&12 hr TWA
Trimer of hexamethylene diisocyanate	3779-63-3	None	1.0 mg/m³-S 15 min(STEL) 0.5 mg/m³-S None-A,O
Trixylenyl phosphate	25155-23-1	1.0	None-A,O
Xylene	1330-20-7	7.0 @ 25°C	100 ppm-A,O 150 ppm-A 15 min(STEL) 100 ppm-D 8&12 hr 150 ppm-D 15 min TWA
1,2,4-Trimethyl Benzene	95-63-6	7.0 @ 44.4°C	25 ppm-A,O
1,6-Hexamethylene diisocyanate	822-06-0	Unknown	5 ppb-A None-O
2(2-Hydroxy-3, 5-diteramylphenyl) benzotriazole	25973-55-1	Unknown	None-A,O

A = ACGIH TLV; O = OSHA; D = DuPont internal limit; S = Supplier Furnished limit; STEL = Short Term Exposure Limit; C = Ceiling.

Section III - Physical Data

Evaporation rate: Less than ether
Vapor Density: Heavier than air
Solubility in water: Miscible
Percent volatile by volume: 6.4%- 79.8%
Percent volatile by weight: 5.0%- 74.7%
Boiling range: 76°C- 472°C/ 169° F- 882°F
Gallon weight: 7.74- 9.43 lbs./gallon

Section IV - Fire and Explosion Data

Flash point (closed cup): See Section X for exact values.
Flammable limits: 0.8%- 13.1%
Extinguishing media: Universal aqueous film-forming foam, carbon dioxide, dry chemical.
Special fire fighting procedures: Full protective equipment, including self-contained breathing apparatus, is recommended. Water from fog nozzles may be used to cool closed containers to prevent pressure build up.
Unusual fire & explosion hazards: When heated above the flash point, emits flammable vapors which, when mixed with air, can burn or be explosive. Fine mists or sprays may be flammable at temperatures below the flash point.

Section V - Health Hazard Data

General Effects:
Ingestion: Gastrointestinal distress. In the unlikely event of ingestion, call a physician immediately and have the names of ingredients available. **DO NOT INDUCE VOMITING.**
Inhalation: May cause nose and throat irritation. Repeated and prolonged overexposure to solvents may lead to permanent brain and nervous system damage. Eye watering, headaches, nausea, dizziness and loss of coordination are signs that solvent levels are too high. Exposure to isocyanates may cause respiratory sensitiza-

tion. This effect may be permanent. This effect may be delayed for several hours after exposure. Repeated overexposure to isocyanates may cause a decrease in lung function which may be permanent. Individuals with breathing problems or prior reaction to isocyanates must not be exposed to vapors or spray mist of this product. If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists, or occurs later, consult a physician.
Skin or eye contact: May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. In case of eye contact, immediately flush with plenty of water for at least 15 minutes; call a physician. In case of skin contact, wash with soap and water. If irritation occurs, contact a physician.

Specific Effects:
Aliphatic Polyisocyanate Resin Repeated exposure may cause allergic skin rash, itching, swelling. May cause eye irritation with discomfort, tearing, or blurred vision. Repeated overexposure to isocyanates may cause lung injury, including a decrease in lung function, which may be permanent. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. **Aliphatic Polymeric Isocyanate** Repeated exposure may cause allergic skin rash, itching, swelling. Repeated overexposure to isocyanates may cause lung injury, including a decrease in lung function, which may be permanent. May cause eye irritation with discomfort, tearing, or blurred vision. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. **Aromatic Hydrocarbon-A & B** Laboratory studies with rats have shown that petroleum distillates can cause kidney damage and kidney or liver tumors. These effects were not seen in similar studies with guinea pigs, dogs, or monkeys. Several studies evaluating petroleum workers have not shown a significant increase of kidney damage or an increase in kidney or liver tumors. **Bis(1,2,2,6,6-Pentamethyl-4-Piperdinyl) Sebacate** Repeated exposure may cause allergic skin rash, itching, swelling. **Bis(2,2,6,6, Tetramethyl-4 Piperidyl) Sebacate** Causes severe eye irritation. Contact may cause skin irritation with discomfort or rash. **Butyl Acetate** May cause abnormal liver function. Tests for embryotoxic activity in animals has been inconclusive. Has been toxic to the fetus in laboratory animals at doses that are toxic to the mother. **Dibutyl Tin Dilaurate** Causes eye corrosion and permanent injury. Contact may cause skin burns. Can be absorbed through the skin in harmful amounts. **Diethylene Glycol Monobutyl Ether** Contact may cause skin irritation with discomfort or rash. Recurrent overexposure may result in liver and kidney injury. High doses in laboratory animals have shown non specific effects such as irritation, weight loss, moderate blood changes. Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive. **Diisobutyl Ketone** Extremely high oral and inhalation doses in laboratory animals have shown weight changes in various organs such as the liver, kidney, brain, heart and adrenal gland. In addition liver and kidney injury were observed at the extremely high inhalation level. In another inhalation study there was a slight depression in the white blood cell count. Repeated exposure may cause allergic skin rash, itching, swelling. **Ethyl Acetate** Prolonged and repeated high exposures of laboratory animals resulted in secondary anemia with an increase in white blood cells; fatty degeneration , cloudy swelling and an excess of blood in various organs.
Ethylbenzene Recurrent overexposure may result in liver and kidney injury. Studies in laboratory animals have shown reproductive, embryotoxic and developmental effects. Has shown mutagenic activity in laboratory cell culture tests. Tests in some laboratory animals demonstrate carcinogenic activity. Individuals with preexisting diseases of the central nervous system, lungs, liver, or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Ethylene Glycol Monobutyl Ether Acetate** Can be absorbed through the skin in harmful amounts. May destroy red blood cells. May cause abnormal kidney function. **Isophorone Diisocyanate Homopolymer** May cause temporary upper respiratory and/or lung irritation with cough, difficult breathing, or shortness of breath. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Repeated exposure may cause allergic skin rash, itching, swelling. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. May cause eye irritation with discomfort, tearing, or blurred vision. Repeated overexposure to isocyanates may cause lung injury, including a decrease in lung function, which may be permanent. **Methyl Ethyl Ketone** High concentrations have caused embryotoxic effects in laboratory animals. Methyl ethyl ketone has been demonstrated to potentiate (i.e., shorten the time of onset) the peripheral neuropathy caused by either n-hexane or methyl n-butyl ketone. MEK by itself has not been demonstrated to cause peripheral neuropathy. Liquid splashes in the eye may result in chemical burns. **Naphthalene** Recurrent overexposure may result in liver and kidney injury. Individuals with preexisting diseases of the liver or kidneys may have increased susceptibility to the toxicity of excessive exposures. **Propylene Glycol Monomethyl Ether Acetate** May cause moderate eye burning. Recurrent overexposure may result in liver and kidney injury. **Toluene** Recurrent overexposure may result in liver and kidney injury. High airborne levels have produced irregular heart beats in animals and occasional palpitations in humans. Rats exposed to very high airborne levels have exhibited high frequency hearing deficits. The significance of this to man is unknown. Chromosomal changes in the circulating blood of exposed workers have been reported. The significance of these reports is unclear because of exposure to other substances. Individuals with preexisting diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures. **WARNING:** This chemical is known to the State of California to cause birth defects or other reproductive harm. **Trimer Of Hexamethylene Diisocyanate** Repeated exposure may cause allergic skin rash, itching, swelling. May cause eye irritation with discomfort, tearing, or blurred vision. Repeated overexposure to isocyanates may cause lung injury, including a decrease in lung function, which may be permanent. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures. **Trixylenyl Phosphate** Has produced nervous system effects (such as weakness and tremors) in studies on laboratory animals. **Xylene** Recurrent overexposure may result in liver and kidney injury. Can be absorbed through the skin in harmful amounts. Individuals with pre-existing disease of the central nervous system, kidneys, liver, cardiovascular system, lungs, or bone marrow may have increased susceptibility to the toxicity of excessive exposures. Canada classifies Xylene as a developmental toxin as high exposures to xylenes in some animal studies have been reported to cause health effects on the developing fetus/embryo. These effects were often at levels toxic to the adult animal. The significance of these effects to humans is not known. **1,6-Hexamethylene Diisocyanate** May cause temporary upper respiratory and/or lung irritation with cough, difficult breathing, or shortness of breath. Overexposure may cause asthma-like reactions with shortness of breath, wheezing, cough, which may be permanent; or permanent lung sensitization. This effect may be delayed for several hours after exposure. Prolonged skin contact may cause chemical burns. Liquid splashes in the eye may result in chemical burns. Individuals with preexisting lung disease, asthma or breathing difficulties may have increased susceptibility to the toxicity of excessive exposures.

Section VI - Reactivity Data

Stability: Stable
Incompatibility (materials to avoid): Water, amines, metal salts
Hazardous decomposition products: CO, CO_2, smoke.
Hazardous polymerization: Will not occur.

Section VII - Spill or Leak Procedures

Steps to be taken in case material is released or spilled: Ventilate area. Remove sources of ignition. Do not breathe vapors. Do not get in eyes or on skin. Wear a positive-pressure, supplied-air respirator (NIOSH approved TC-19C), eye protection, gloves and protective clothing. Pour liquid decontamination solution over the spill and allow to sit at least 10 minutes. Typical decontamination solutions for isocyanate containing materials are:

20% Surfactant (Tergitol TMN 10) and 80% Water OR

0-10% Ammonia, 2-5% Detergent and Water (balance)

Confine and remove with inert absorbent. Pressure can be

generated. Do not seal container. After 48 hours, material may be sealed and disposed of properly.

Waste disposal method: Do not allow material to contaminate ground water systems. Incinerate absorbed material in accordance with federal, state, and local requirements. Do not incinerate in closed containers.

Section VIII - Special Protection Information

Respiratory: Do not breathe vapors or mists. Wear a positive-pressure, supplied air respirator (NIOSH approved TC-19C), while mixing activator with paint, during application and until all vapors and spray mists are exhausted. Follow respirator manufacturer's directions for respirator use. Do not permit anyone without protection in the painting area.
Refer to the hardener/activator label instructions for further information.
Individuals with history of lung or breathing problems or prior reaction to isocyanates should not use or be exposed to this product if mixed with isocyanate activators/hardeners.
Ventilation: Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits.
Protective clothing: Neoprene gloves and coveralls are recommended.
Eye protection: Desirable in all industrial situations. Include splash guards or side shields.

Section IX - Special Precautions

Precautions to be taken in handling and storing: Observe label precautions. Keep away from heat, sparks and flame. Close container after each use. Ground containers when pouring. Wash thoroughly after handling and before eating or smoking. Do not store above 120°
Other precautions: Do not sand, flame cut, braze or weld dry coating without a NIOSH approved respirator or appropriate ventilation.

Section X - Other Information

Section 313 Supplier Notification: The chemicals listed below with percentages are subject to the reporting requirements of Section 313 of the Emergency Planning and Right-To-Know Act of 1986 and of 40 CFR 372.

PRODUCT CODE **INGREDIENTS** (See Section II)

VGY1421 aliphatic polyisocyanate resin, aromatic hydrocarbon-a, butyl acetate, cumene (0-1%*), 1,2,4-trimethyl benzene (0-4%*), 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 8.97 WT PCT SOLIDS: 74.32 VOL PCT SOLIDS: 68.33
SOLVENT DENSITY: 7.27 VOC LE: 2.3 VOC AP: 2.3 H: 3 F: 3
R: 1 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
12305S aliphatic polyisocyanate resin, hexyl acetate isomers, propylene glycol monomethyl ether acetate, toluene (7%*), 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 8.82 WT PCT SOLIDS: 64.40 VOL PCT SOLIDS: 58.39
SOLVENT DENSITY: 7.55 VOC LE: 3.1 VOC AP: 3.1 H: 3 F: 3
R: 1 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
192S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, butyl acetate, ethyl acetate, 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 8.06 WT PCT SOLIDS: 32.68 VOL PCT SOLIDS: 27.09
SOLVENT DENSITY: 7.44 VOC LE: 5.4 VOC AP: 5.4 H: 3 F: 3
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
193S aliphatic polyisocyanate resin, butyl acetate, ethyl acetate, ethylene glycol monobutyl ether acetate (4%*), 1,6-hexamethylene diisocyanate (0.2%*)
GAL WT: 9.01 WT PCT SOLIDS: 74.98 VOL PCT SOLIDS: 69.92
SOLVENT DENSITY: 7.49 VOC LE: 2.3 VOC AP: 2.3 H: 2 F: 3
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
194S aliphatic polyisocyanate resin, butyl acetate, ethyl acetate, oxo-octyl acetate, 1,6-hexamethylene diisocyanate (0.2%*)
GAL WT: 8.97 WT PCT SOLIDS: 75.00 VOL PCT SOLIDS: 69.66
SOLVENT DENSITY: 7.39 VOC LE: 2.2 VOC AP: 2.2 H: 2 F: 3
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
195S aliphatic polymeric isocyanate, aromatic hydrocarbon-a, butyl acetate, ethyl acetate, 1,2,4-trimethyl benzene (0-2%*), 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 8.64 WT PCT SOLIDS: 60.73 VOL PCT SOLIDS: 54.39
SOLVENT DENSITY: 7.44 VOC LE: 3.4 VOC AP: 3.4 H: 3 F: 3
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
2000S-B aliphatic polyisocyanate resin, aromatic hydrocarbon-a, bis(1,2,2,6,6-pentamethyl-4-piperdinyl) sebacate, butyl acetate, toluene (7%*), trixylenyl phosphate, 1,2,4-trimethyl benzene (0-2%*), 1,6-hexamethylene diisocyanate (<0.2%*), 2(2'-hydroxy-3, diteramylphenyl)benzotriazole
GAL WT: 9.19 WT PCT SOLIDS: 84.70 VOL PCT SOLIDS: 80.67
SOLVENT DENSITY: 7.27 VOC LE: 1.4 VOC AP: 1.4 H: 3 F:
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
3505S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, aromatic hydrocarbon-b, butyl acetate, diisobutyl ketone, ethylbenzene (1-3%*), naphthalene (0-1%*), xylene (8-10%*), 1,2,4-trimethyl benzene (0-2%*)
GAL WT: 8.10 WT PCT SOLIDS: 41.95 VOL PCT SOLIDS: 34.93
SOLVENT DENSITY: 7.23 VOC LE: 4.7 VOC AP: 4.7 H: 3 F
R: 1 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
3705S butyl acetate, trimer of hexamethylene diisocyanate, 1,6-hexamethylene diisocyanate (<0.2%*),
GAL WT: 9.43 WT PCT SOLIDS: 95.01 VOL PCT SOLIDS: 93.59
SOLVENT DENSITY: 7.34 VOC LE: 0.5 VOC AP: 0.5 H: 3 F:
R: 1 FLASH PT: BETWEEN 73 - 100 F (CC) OSHA STORAGE: IC
582S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, butyl acetate, ethyl acetate,
GAL WT: 8.19 WT PCT SOLIDS: 38.13 VOL PCT SOLIDS: 32.01
SOLVENT DENSITY: 7.45 VOC LE: 5.1 VOC AP: 5.1 H: 3 F:
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
7005S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, butyl acetate, diisobutyl ketone, ethyl acetate, 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 8.71 WT PCT SOLIDS: 65.28 VOL PCT SOLIDS: 58.27
SOLVENT DENSITY: 7.25 VOC LE: 3.0 VOC AP: 3.0 H: 3 F:
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
7006S aliphatic polymeric isocyanate, hexyl acetate isomers, propylene glycol monomethyl ether acetate, 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 9.00 WT PCT SOLIDS: 73.13 VOL PCT SOLIDS: 68.19
SOLVENT DENSITY: 7.60 VOC LE: 2.4 VOC AP: 2.4 H: 3 F:
R: 1 FLASH PT: BETWEEN 100 - 140 F (CC) OSHA STORAGE: II
77S aromatic hydrocarbon-a, butyl acetate, dibutyl tin dilaurate (2%*), isophorone diisocyanate homopolymer, toluene (72%*)
GAL WT: 7.74 WT PCT SOLIDS: 25.30 VOL PCT SOLIDS: 20.16
SOLVENT DENSITY: 7.24 VOC LE: 5.8 VOC AP: 5.8 H: 3 F:
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
782S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, butyl acetate, ethyl acetate, 1,6-hexamethylene diisocyanate (<0.2%*)
GAL WT: 8.61 WT PCT SOLIDS: 58.21 VOL PCT SOLIDS: 51.60
SOLVENT DENSITY: 7.43 VOC LE: 3.6 VOC AP: 3.6 H: 3 F:
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
785S aliphatic polymeric isocyanate, methyl ethyl ketone (10%*, 1,6-hexamethylene diisocyanate (<0.2%*),
GAL WT: 9.24 WT PCT SOLIDS: 90.00 VOL PCT SOLIDS: 86.13
SOLVENT DENSITY: 6.66 VOC LE: 0.9 VOC AP: 0.9 H: 3 F
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
792S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, bis(2,2,6,6, tetramethyl-4 piperidyl) sebacate, butyl acetate, ethyl acetate, 1,2,4-trimethyl benzene (0-2%*), 2(2'-hydroxy-3,5'-diteramylphenyl)benzotriazole
GAL WT: 8.07 WT PCT SOLIDS: 33.99 VOL PCT SOLIDS: 28.45
SOLVENT DENSITY: 7.45 VOC LE: 5.3 VOC AP: 5.3 H: 3 F
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
793S aliphatic polyisocyanate resin, aromatic hydrocarbon-a, bis(2,2,6,6, tetramethyl-4 piperidyl) sebacate, butyl acetate, diethylene glycol monobutyl ether (6%*), ethyl acetate, toluene (4%*), trixylenyl phosphate, 1,2,4-trimethyl benzene (0-2%*), 1,6 hexamethylene diisocyanate (<0.2%*), 2(2'-hydroxy-3,5'-diteramylphenyl)benzotriazole
GAL WT: 9.09 WT PCT SOLIDS: 78.76 VOL PCT SOLIDS: 74.19
SOLVENT DENSITY: 7.48 VOC LE: 1.9 VOC AP: 1.9 H: 3 F
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
795S aliphatic polymeric isocyanate, butyl acetate, ethyl aceta ethylene glycol monobutyl ether acetate (6%*), 1,6-hexamethyle diisocyanate (0.2%*)
GAL WT: 8.81 WT PCT SOLIDS: 66.77 VOL PCT SOLIDS: 60.9
SOLVENT DENSITY: 7.50 VOC LE: 2.9 VOC AP: 2.9 H: 3 I
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB
8705S aliphatic polymeric isocyanate, butyl acetate, ethyl acet ethylbenzene (3-8%*), toluene (4%*), xylene (24-30%*)
GAL WT: 8.08 WT PCT SOLIDS: 39.60 VOL PCT SOLIDS: 33.1
SOLVENT DENSITY: 7.30 VOC LE: 4.9 VOC AP: 4.9 H: 3
R: 1 FLASH PT: BETWEEN 20 - 73 F (CC) OSHA STORAGE: IB

Notice: The data in this material safety data sheet relate only to specific material designated herein and do not relate to use in combination with any other material or in any process.

Product Manager - Refinish Sales

Prepared by D. G. Detweiler

APPENDIX H

ENVIRONMENTAL PROFESSIONAL EXPERIENCE

AKTPEERLESS
environmental services

SCOTT G. KLIPA, P.E.
Senior Environmental Engineer
Environmental Engineering Services

EDUCATION

Michigan Technological University, Houghton, Michigan
B.S., Civil Engineering, 1994

Wayne State University, Detroit, Michigan
Graduate Certificate, Hazardous Waste Control (December 1998)

PROFESSIONAL EXPERIENCE

Environmental Engineer, AKT Peerless Environmental Services
Environmental Engineer, FEA Management, Inc.

AREA OF EXPERTISE

Expertise includes: (1) conducting field operations such as soil and groundwater sampling, and surveying, (2) assisting in the design, installation, and operation of soil and groundwater remediation systems, (3) preparing reports to maintain compliance with Michigan Department of Environmental Quality reporting requirements, (4) obtaining approval for waste disposal, (5) assisting with soil vapor extraction test, and hydraulic conductivity and aquifer pump tests, (6) air quality sampling, permitting, and regulatory reporting (7) creating maps, diagrams, and drawings using CAD software.

SUMMARY OF SELECTED PROJECTS

(1) Supervised drilling operations. Activities included: selecting boring locations, collecting soil samples, field screening soil samples, installation of monitoring wells, and selecting samples for laboratory analysis.

(2) Assisted with Phase I environmental assessments. The assessments included reviewing regulatory records, inspecting the site for underground storage tanks (USTs), hazardous substance storage, and potential sources of PCBs.

(3) Assisted in design and implementation of a lead abatement program. Activities included: regulatory review, design of training program, assist with implementation of training program at facility.

(4) Assisted with a compliance program for community college volatile storage area. Activities included: inventory of storage area, disposal approval and preparation for

various hazardous and non-hazardous substances, implementation of proper storage and signage procedures for remaining materials.

(5) Completed Michigan air pollution reporting forms for small manufacturing facilities. Activities included: review of site activities, estimation of air emissions, completing facility-reporting forms.

(6) Operation and maintenance of remediation systems.

CERTIFICATIONS

Occupational Safety And Health Administration (OSHA) 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER)

Certified Storm Water Management-Construction Site Supervisor (A-1j)

Professional Engineer, Michigan Engineers (License No. 48096)

Engineering Society of Detroit

JOSHUA J. BENNETT

PROFESSIONAL PROFILE

Geologist
Environmental Engineering Services

EDUCATION

University of Michigan, Ann Arbor, Michigan
B.S., Professional Geology, 2000

PROFESSIONAL EXPERIENCE

Geologist, AKT Peerless Environmental Services

AREA OF EXPERTISE

Expertise includes: (1) conducting field operations such as soil, surface water, and groundwater sampling, (2) oversight of field operations such as monitoring well installation, and contaminant delineation, (3) preparing Phase II Subsurface Investigation Reports, (4) preparing Baseline Environmental Assessment Reports, (5) creating maps, diagrams, and drawings.

Mr. Bennett has three months of experience in investigative activities regarding hazardous materials, substances or contaminants; including environmental site assessment and long term monitoring and removal activities. Mr. Bennett has conducted subsurface investigations to evaluate the presence and/or extent of soil and groundwater contamination.

SUMMARY OF SELECTED PROJECTS

(1) Supervised drilling and mobile lab operations. Activities included: selecting boring locations, collecting soil samples, field screening soil samples, installing monitoring wells, and selecting samples for laboratory analysis.

(2) Conducted vertical profiling and discrete sampling of groundwater at specific depths to determine the vertical extent of contamination. Conducted delineation procedures to determine the exact location and extent of soil contamination.

(3) Conducted long term monitoring including well development and well sampling procedures.

CERTIFICATIONS

Occupational Safety And Health Administration (OSHA) 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER)