



SITE INVESTIGATION REPORT

**DEARBORN REFINING SITE
DEARBORN, MICHIGAN**

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**AUGUST 2008
REF. NO. 048041 (3)**

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TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1
1.1 GENERAL	1
1.2 SITE DESCRIPTION	2
1.3 SITE HISTORY	2
1.3.1 HISTORIC SITE ACTIVITIES PRIOR TO 1947	2
1.3.2 HISTORIC SITE ACTIVITIES SUBSEQUENT TO 1947	3
1.4 PREVIOUS INVESTIGATIONS	4
1.4.1 U.S. EPA COMPLIANCE INSPECTION	4
1.4.2 U.S. EPA ROUGE RIVER OIL SPILL ASSESSMENT	5
1.4.3 MDEQ SOIL AND GROUNDWATER INVESTIGATION	5
1.4.4 LEGAL ACTIONS PERTAINING TO THE SITE	6
1.4.5 U.S. EPA SITE ASSESSMENT AND REMOVAL ACTION	9
1.5 REGIONAL SETTING	9
1.5.1 REGIONAL LAND USE	9
1.5.2 REGIONAL WATER SUPPLY	10
1.5.3 REGIONAL DEMOGRAPHICS	10
1.6 REGIONAL GEOLOGY	10
1.6.1 OVERBURDEN	10
1.6.2 BEDROCK	11
1.7 REGIONAL HYDROGEOLOGY	12
1.8 REGIONAL HYDROLOGY	13
1.9 SITE SETTING	13
1.9.1 LOCAL TOPOGRAPHY	13
1.9.2 LOCAL GEOLOGY	13
1.9.3 LOCAL HYDROGEOLOGY	14
1.9.4 SITE HYDROGEOLOGY	15
1.10 REPORT ORGANIZATION	16
2.0 SITE INVESTIGATION ACTIVITIES	17
2.1 SUBTASK 4.1 - EXTERIOR AST REMOVAL	17
2.2 SUBTASK 4.2 - SOIL INVESTIGATION AND DELINEATION	17
2.2.1 PROPERTY BOUNDARY	18
2.2.2 SURFACE SOIL SAMPLE COLLECTION AND ANALYSIS ACTIVITIES	19
2.2.3 STAINED SURFACE SOIL LOCATIONS	21
2.2.4 SOIL SCREENING CRITERIA	21
2.2.5 SOIL BORING INVESTIGATION ACTIVITIES	22
2.3 SUBTASK 4.3 - GROUNDWATER MONITORING ACTIVITIES	23
2.3.1 GROUNDWATER MONITORING WELL INSTALLATION ACTIVITIES	23
2.3.2 GROUNDWATER MONITORING	24
2.3.3 GROUNDWATER SCREENING CRITERIA	24

TABLE OF CONTENTS

	<u>Page</u>
3.0 SITE INVESTIGATION RESULTS.....	26
3.1 SUBTASK 4.2 - SOIL INVESTIGATION AND DELINEATION RESULTS	26
3.1.1 SURFACE SOIL SAMPLE RESULTS.....	26
3.1.2 STAINED SURFACE SOIL RESULTS	26
3.1.3 SOIL BORING RESULTS.....	27
3.1.4 SUMMARY OF SOIL RESULTS	28
3.2 SUBTASK 4.3 - GROUNDWATER MONITORING RESULTS.....	29
3.2.1 FIRST QUARTER GROUNDWATER MONITORING RESULTS.....	29
3.2.2 SECOND QUARTER GROUNDWATER MONITORING RESULTS.....	29
3.2.3 FREE-PHASE NAPL	30
3.2.4 SUMMARY OF GROUNDWATER RESULTS	30
4.0 REMOVAL ACTION OBJECTIVES	31
4.1 GENERAL REMOVAL ACTION OBJECTIVES	31
4.1.1 PROTECTION OF PUBLIC HEALTH.....	31
4.1.2 PROTECTION OF THE ENVIRONMENT	31
4.1.3 SCOPING DECISIONS.....	31
4.2 RA OBJECTIVES.....	32
5.0 EVALUATION OF REMOVAL ACTION ALTERNATIVES.....	33
5.1 ALTERNATIVE 1 - NO ACTION	34
5.1.1 NO ACTION ASSESSMENT	34
5.2 ALTERNATIVE 2 - INSTITUTIONAL CONTROLS.....	34
5.2.1 INSTITUTIONAL CONTROLS ASSESSMENT	35
5.3 ALTERNATIVE 3 – COVER SYSTEMS.....	35
5.3.1 REVIEW OF POTENTIAL COVER SYSTEMS	35
5.3.1.1 ALTERNATIVE 3.1: SOIL COVER ALTERNATIVE.....	36
5.3.1.2 ALTERNATIVE 3.2: GRAVEL COVER ALTERNATIVE	36
5.3.2 STORMWATER MANAGEMENT SYSTEM CONSIDERATIONS.....	37
5.3.3 ALTERNATIVE 3 – COVER SYSTEM RECOMMENDATION	37
5.4 ALTERNATIVE 4 – COVER SYSTEM/HOT SPOT REMOVAL	38
5.5 COMPARATIVE ANALYSIS OF ALTERNATIVES.....	38
6.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE PRELIMINARY (30%) DESIGN	40
7.0 REFERENCES.....	42

LIST OF FIGURES
(Following Text)

FIGURE 1.1	SITE LOCATION
FIGURE 1.2	AERIAL SITE PLAN
FIGURE 1.3	SITE PLAN
FIGURE 1.4	REGIONAL SURFICIAL GEOLOGY
FIGURE 1.5	REGIONAL BEDROCK GEOLOGY AND BEDROCK SURFACE ELEVATIONS FOR WAYNE COUNTY
FIGURE 1.6	SITE TOPOGRAPHY
FIGURE 1.7	CROSS-SECTION LOCATIONS
FIGURE 1.8	CROSS-SECTION A-A'
FIGURE 1.9	CROSS-SECTION B-B'
FIGURE 1.10	TOP OF CLAY CONTOURS
FIGURE 2.1	CERTIFIED SURVEY
FIGURE 2.2	INVESTIGATIVE AREA SURFACE SOIL SAMPLE LOCATIONS
FIGURE 2.3	STAINED AREA SURFACE SOIL SAMPLE LOCATIONS
FIGURE 2.4	GROUNDWATER MONITORING WELL AND SOIL BOREHOLE LOCATIONS
FIGURE 3.1	SURFACE (0 TO 2.5 FEET BGS) SAMPLE EXCEEDANCES
FIGURE 3.2	SUBSURFACE (>2.5 FEET BGS) SOIL SAMPLE EXCEEDANCES
FIGURE 3.3	EXTENT OF BENZO(A)PYRENE SURFACE SOIL IMPACTS ABOVE INDUSTRIAL CRITERIA (0 TO 2.5 FEET BGS)
FIGURE 3.4	EXTENT OF TOTAL PCBs SURFACE SOIL IMPACTS ABOVE INDUSTRIAL CRITERIA (0 TO 2.5 FEET BGS)

LIST OF FIGURES
(Following Text)

FIGURE 3.5	EXTENT OF ARSENIC SURFACE SOIL IMPACTS ABOVE INDUSTRIAL CRITERIA (0 TO 2.5 FEET BGS)
FIGURE 3.6	EXTENT OF LEAD SURFACE SOIL IMPACTS ABOVE INDUSTRIAL CRITERIA (0 TO 2.5 FEET BGS)
FIGURE 3.7	EXTENT OF MANGANESE SURFACE SOIL IMPACTS ABOVE INDUSTRIAL CRITERIA (0 TO 2.5 FEET BGS)
FIGURE 3.8	EXTENT OF SURFACE SOIL IMPACTS (0 TO 2.5 FEET BGS)
FIGURE 3.9	FIRST AND SECOND QUARTER GROUNDWATER MONITORING EVENTS
FIGURE 3.10	GROUNDWATER SAMPLE RESULTS
FIGURE 5.1	ALTERNATIVE 1: NO ACTION
FIGURE 5.2	ALTERNATIVE 2: INSTITUTIONAL CONTROLS
FIGURE 5.3	ALTERNATIVE 3: COVER SYSTEMS
FIGURE 5.4	TYPICAL SOIL COVER DESIGN
FIGURE 5.5	TYPICAL ROAD GRAVEL MIX COVER DESIGN
FIGURE 5.6	ALTERNATIVE 4: COVER SYSTEM/HOT SPOT REMOVAL

LIST OF TABLES
(Following Text)

TABLE 3.1	SURFACE SOIL ANALYTICAL DATA - INVESTIGATIVE AREAS
TABLE 3.2	STAINED SURFACE SOIL ANALYTICAL DATA - STAINED AREAS
TABLE 3.3	SUBSURFACE ANALYTICAL DATA
TABLE 3.4	GROUNDWATER ANALYTICAL DATA
TABLE 5.1	DETAILED COST ESTIMATE ALTERNATIVE 1: NO ACTION
TABLE 5.2	DETAILED COST ESTIMATE ALTERNATIVE 2: INSTITUTIONAL CONTROLS
TABLE 5.3	DETAILED COST ESTIMATE ALTERNATIVE 3.1: COVER SYSTEMS -SOIL
TABLE 5.4	DETAILED COST ESTIMATE ALTERNATIVE 3.2: COVER SYSTEMS - GRAVEL MIX
TABLE 5.5	DETAILED COST ESTIMATE ALTERNATIVE 4: SOIL COVER/HOT SPOT REMOVAL

LIST OF DRAWINGS
(30%) Preliminary Design

DRAWING C-01	EXISTING CONDITIONS
DRAWING C-02	CAPPING PLAN
DRAWING C-03	CROSS-SECTIONS
DRAWING C-04	DETAILS

LIST OF APPENDICES

APPENDIX A	SOIL BORING AND STRATIGRAPHIC LOGS
APPENDIX B	LABORATORY REPORTS AND ANALYTICAL DATA VALIDATION MEMORANDA
APPENDIX C	REMOVAL ACTION (30%) PRELIMINARY DESIGN

LIST OF ACRONYMS

AISLs	Acute Inhalation Toxicity Screening Levels
ALTECH	ALTECH Services LLC
AMSL	Above mean sea level
AOC	Administrative Order on Consent
API	American Petroleum Institute
ASTs	aboveground storage tanks
BEA	Baseline Environmental Assessment
bgs	below ground surface
cm/sec	centimeters per second
CRA	Conestoga-Rovers & Associates, Inc.
Csat	Soil Saturation Concentration Screening Levels
cy	cubic yards
DCC	Michigan Act 451, Part 201 Industrial and Commercial I Direct Contact Criteria
DWC	Michigan Act 451, Part 201 Industrial and Commercial II, III, and IV Drinking Water Criteria
DWPC	Michigan Act 451, Part 201 Industrial and Commercial II, III, and IV Drinking Water Protection Criteria
DWSD	Detroit Water and Sewerage Department
EDR	Environmental Data Resources, Inc.
FPT	Ferrous Processing and Trading Company
GCC	Groundwater Contact Criteria
GCL	Geosynthetic Clay Layer
GCPC	Groundwater Contact Protection Criteria
GHU	Geologic and Hydrogeologic Unit
GMS	Groundwater Monitoring System
GSIC	Michigan Act 451, Part 201 Groundwater Surface Water Interface Criteria
GSIPC	Michigan Act 451, Part 201 Groundwater Surface Water Interface Protection Criteria
GVIIC	Groundwater Volatilization to Indoor Air Inhalation Criteria
GWNIAA	Groundwater Not In An Aquifer
LNAPL	light non-aqueous phase liquid

LIST OF ACRONYMS

MDEQ	Michigan Department of Environmental Quality
MDNR	Michigan Department of Natural Resources
mg/kg	milligrams per kilogram
MPC	Marine Pollution Control Corporation
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operation and Maintenance
PCBs	polychlorinated biphenyls
PID	photoionization detector
PNA's	polynuclear aromatics
ppm	parts per million
PSIC	Particulate Soil Inhalation Criteria
PVC	Polyvinyl chloride
RA	Removal Action
RA Work Plan	U.S. EPA-approved RA Work Plan; dated September 21, 2007
RBSLs	U.S. EPA Region V Risk-Based Screening Levels
RCRA	Resource Conservation and Recovery Act
Report	Site Investigation Report
SAP	Sampling and Analysis Plan
Site	Former Dearborn Refining Site in Dearborn, Michigan
START	Superfund Technical Assessment and Response Team
SVIIC	Soil Volatilization to Indoor Air Inhalation Criteria
SVOCs	Semi-volatile organic compounds
SWMM	Stormwater Management Model
TAL	Target Analyte List
TCL	Target Compound List
TestAmerica	TestAmerica Laboratories Inc.
TSCA	Toxic Substances Control Act
U.S. EPA	United States Environmental Protection Agency
USCS	Unified Soil Classification System
VOCs	volatile organic compounds
VSIC	Infinite Source Volatile Soil Inhalation Criteria
Weston	Weston Solutions, Inc.

1.0 INTRODUCTION

1.1 GENERAL

This Site Investigation Report (Report) was prepared by Conestoga-Rovers & Associates Inc. (CRA) on behalf of the Respondents to the Final Administrative Order on Consent (AOC), issued by the United States Environmental Protection Agency (U.S. EPA) for the former Dearborn Refining Site located at 3901 Wyoming Avenue in Dearborn, Michigan (Site). The AOC became effective on August 27, 2007. The Site location is presented on Figure 1.1.

This Report presents the results of the Site investigation, an evaluation of potential Removal Action (RA) components for the Site pursuant to paragraph 88(f) of the AOC, and compliance with Michigan Act 451, Part 201 relevant Industrial and Commercial Criteria. This Report also presents the recommended RA alternative at the Preliminary (30%) Design Level. Selection of the recommended RA alternative was based on the protection of human health, welfare, and the environment; technical and cost effectiveness; and consistency with the future industrial use of the Site.

The selected RA will be implemented in a manner consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (42 U.S.C. S9605, codified at 40 CFR Part 300) and associated provisions to ensure that the work performed pursuant to the AOC is protective of human health, welfare, and the environment.

The tasks associated with the RA were presented in the U.S. EPA-approved RA Work Plan, dated September 21, 2007 (RA Work Plan) and are listed below:

- Task 1 – Site Preparation;
- Task 2 – Hazardous and Non-Hazardous Waste Disposal;
- Task 3 – Preliminary Site Closeout Activities;
- Task 4 – Site Investigation;
- Task 5 – Soil RA Design;
- Task 6 – Soil RA Implementation;
- Task 7 – Construction Certification Report; and
- Task 8 - Final Site Closeout Activities.

This Site Investigation (Task 4) was conducted in accordance with the RA Work Plan.

1.2 SITE DESCRIPTION

The Site is located at 3901 Wyoming Avenue in Dearborn in Wayne County, Michigan. The Site is approximately 6.65 acres and located in a heavily industrialized area. The Site is bordered by to the north by Liberty Truck Services (a truck repair site); to the south by Ferrous Processing and Trading Company (FPT) (a metal recycling site); to the west by railroad tracks; and to the east by Wyoming Avenue and beyond by General Truck Repair, Cummins Bridgeway (an equipment service and rental site), and Speed Wash Truck and Car Wash. The Site Plan is presented on Figure 1.2 (aerial) and Figure 1.3.

1.3 SITE HISTORY

The Site was previously operated by various entities as a waste oil refining and oil processing Site from approximately 1947 until 2006. The Site formerly received used oil, waste oil, and oil-impacted wastewater and blended them with virgin oil for market resale. Wastewater recovered from these processes was discharged to the Detroit Water and Sewerage Department (DWSD) sanitary sewer under permit number 914-005.

1.3.1 HISTORIC SITE ACTIVITIES PRIOR TO 1947

Previous reports have indicated that prior to 1947, the Site was used for clay mining and as a landfill. CRA subcontracted Environmental Data Resources, Inc. (EDR) to conduct an environmental database search of the surrounding area. CRA reviewed the results of the environmental database search as well as historic files including aerial photographs, Sanborn fire insurance maps, topographic maps, and city directories to obtain additional information regarding the historic use (pre-1947) of the Site.

The 1937 aerial photograph showed a potential area of disturbed soil in the central and eastern portion of the Site, as well as an access road running through the Site connecting Wyoming Avenue to the adjacent property to the north (formerly the Clippert Brick Plant, a clay brick manufacturing site). Subsequent aerial photographs reviewed from 1949, 1957, 1961, and 1972 showed an area of disturbed soil at the Clippert Brick Plant north of the Site. The Site property was shown in approximately its current configuration. Aerial photographs reviewed from 1985, 1993, and 2000 showed that the adjacent property to the north had been redeveloped, and the area of disturbed soil was no longer present.

Sanborn fire insurance maps reviewed from 1924, 1930, 1950, and 1963 did not include the Site property, but these fire insurance maps did identify a clay pit located on the southern portion of the Clippert Brick Plant property, north of the Site.

Topographic maps reviewed from 1905, 1952, 1968, 1973, and 1983 did not identify any historic excavation or landfilling activities at the Site.

The first entry for the Site address of 3901 Wyoming Avenue present in the city directory was for 1948, and the property was identified as Dearborn Refining Company/Phillips Waste Oil Pickup and Road Oiling Service. There were no adjacent properties identified in the city directories prior to 1948.

One adjacent property, Cummins Bridgeway, was identified in the environmental database search as a small quantity generator of Resource Conservation and Recovery Act (RCRA) hazardous waste and as having two underground storage tanks that were previously removed in the 1990s. None of the other adjacent properties were identified in the environmental database search.

1.3.2 HISTORIC SITE ACTIVITIES SUBSEQUENT TO 1947

In 1982, Dearborn Refining Company retained Soil Engineers, Inc. to perform a hydrogeological study at the Site. Findings of this study indicated that groundwater quality was degraded while passing through the Site due to the presence of contaminants including lead, oil and grease, total organic hydrocarbons, and chlorides. In 1984, Dearborn Refining Company obtained a hazardous waste storage permit for five aboveground storage tanks (ASTs) at the Site that were used to store oil with high concentrations of halogens or halogenated solvents. These five ASTs were used until 2006, at which time the ASTs were emptied and cleaned by powerwashing.

Dearborn Refining Company was acquired on February 4, 1985 by Mr. Aram Moloian, who operated the Site until 2006.

Based on information reviewed, three violations were previously issued to the Site by local and State agencies prior to the involvement of U.S. EPA at the Site (U.S. EPA issued and settled an administrative complaint against Dearborn in the late 1980s-early 1990s as a result of the RCRA violations), including:

- in 1986, the Michigan Department of Natural Resources (MDNR) identified violations at the Site including failure to have a current and accurate hazardous waste contingency plan;
- in 1990, MDNR identified additional violations at the Site, including failure to have adequate secondary containment for waste oil; and
- in 1996, DWSD issued multiple notices of violation to the Site for the release of phenols and fats, oil, and grease in excess of their permitted discharge limitations.

In April 2000, a vacant 2.5-acre parcel comprising the southern portion of the Site property was sold to FPT to be used as a storage site for scrap metal recycling operations. A Michigan Act 451, Part 201 Category "N" Baseline Environmental Assessment (BEA) was completed by Billings Industrial Group, Inc. on behalf of FPT and submitted to the Michigan Department of Environmental Quality (MDEQ).

1.4 PREVIOUS INVESTIGATIONS

1.4.1 U.S. EPA COMPLIANCE INSPECTION

U.S. EPA conducted a RCRA Multimedia Compliance Inspection at the Site in 1999 and 2000 to determine compliance with RCRA, the Clean Water Act, the Clean Air Act, and the Toxic Substances Control Act (TSCA). This inspection resulted in the following conclusions:

- at least two ASTs and at least four drums contained elevated concentrations of polychlorinated biphenyls (PCBs) (up to 210 milligrams per kilogram (mg/kg));
- at least seven ASTs, two sumps, and one drum contained concentrations of halogens ranging from 3,300 mg/kg to 9,800 mg/kg;
- there was oil and sludge on building floors and walls;
- there were ASTs lacking structural integrity;
- access to the Site was unrestricted due to the lack of perimeter fencing; and
- poor housekeeping practices observed were indicative of an uncontrolled conditions at the Site.

Subsequent to the RCRA Multimedia Compliance Inspection, U.S. EPA conducted a subsurface investigation in 2000 that included the advancement of 10 soil borings (identified as soil borings B-1 through B-10, as presented on Figure 1.5 of the RA Work

Plan, September 21, 2007) and the installation of one observation well (identified as observation well OW-1) at the Site that resulted in the following observations:

- surface and subsurface soils were stained and/or saturated with oil;
- surface and subsurface soils contained lead at concentrations that exceeded U.S. EPA Region V Risk-Based Screening Levels (RBSLs) for an industrial scenario, Michigan Act 451, Part 201 industrial and commercial II direct contact criteria (DCC), and the criteria for hazardous waste as set forth in 40 CFR Part 261;
- surface and subsurface soils contained PCBs at concentrations that exceeded RBSLs and Industrial and Commercial II DCC;
- surface and subsurface soils contained arsenic at concentrations that exceeded RBSLs;
- surface and subsurface soils contained oil and grease at concentrations up to 39,000 mg/kg; and
- the presence of an oily sheen on the groundwater at some portions of the Site.

1.4.2 U.S. EPA ROUGE RIVER OIL SPILL ASSESSMENT

In 2002, U.S. EPA and the United States Coast Guard conducted an investigation at the Site in response to the Rouge River Oil Spill that occurred in April 2002. This investigation included the collection of fourteen oil samples that were submitted for fingerprint analysis, the excavation of four test trenches to verify the connection of Site sumps to the municipal sewer system, and the performance of dye and smoke tests to evaluate the migration pathway from the Site to the Rouge River. Based on the total quantity of oil and waste stored at the Site, and the potential migration pathway from the Site to the Rouge River, the assessment concluded that the Site could not be eliminated as a potentially responsible party to the Rouge River Oil Spill.

1.4.3 MDEQ SOIL AND GROUNDWATER INVESTIGATION

From January 13, 2003 to January 14, 2003, the MDEQ Geotechnical and Hydrogeologic Unit (GHU) conducted a subsurface investigation at the Site at the request of the MDEQ Office of Criminal Investigation. The subsurface investigation included the advancement of eleven soil borings (identified as micro-wells MCW-1 through MCW-11 as presented on Figure 1.5 of the RA Work Plan) and the installation of four temporary

monitoring wells (identified as monitoring wells SB-1 through SB-4) at the Site that resulted in the following observations:

- surface soils contained arsenic and lead at select locations at concentrations that exceeded RBSLs and DCC;
- surface soils contained PCBs at select locations at concentrations that exceeded RBSLs;
- surface soils contained twelve volatile organic compounds (VOCs) (1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, benzene, ethylbenzene, naphthalene, n-propylbenzene, sec-butylbenzene, tetrachloroethene, toluene, trichloroethene, vinyl chloride, and xylenes), three polynuclear aromatics (PNAs) (fluoranthene, fluorene, and phenanthrene), and nine metals (arsenic, barium, cadmium, copper, lead, mercury, selenium, silver, and zinc) at concentrations that exceeded Michigan Act 451, Part 201 Industrial and Commercial II, III, and IV Drinking Water Protection Criteria (DWPC) and/or Groundwater Surface Water Interface Protection Criteria (GSIPC);
- groundwater contained six VOCs (1,2,4-trimethylbenzene, acetone, benzene, naphthalene, vinyl chloride, and xylenes), two PNAs (fluorene and phenanthrene), eight metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, and zinc), and PCBs at concentrations that exceeded Michigan Act 451, Part 201 criteria for residential and industrial drinking water protection and/or Groundwater Surface Water Interface Criteria (GSIC); and
- light non-aqueous phase liquid (LNAPL) was observed in one temporary monitoring well (approximately 1 foot at SB-2) and at MCW-8 (encountered at a depth of 6 feet (ft) below ground surface (bgs), thickness not specified) that was identified through fingerprint analysis as containing a fraction of motor oil and/or hydraulic oil and a fraction of kerosene.

The field work conducted by the MDEQ GHU provided additional information to support the understanding that portions of the Site were previously used for clay mining and as a landfill.

1.4.4 LEGAL ACTIONS PERTAINING TO THE SITE

On September 29, 2000, U.S. EPA issued an Order to Dearborn Refining Company under Section 7003(a) of RCRA, which required Dearborn Refining Company to comply with the following requirements:

- empty and decommission ASTs that were in poor condition, including, but not limited to, ASTs T-1, T-2, T-5, T-12, T-17, T-59, T-60, T-62, T-70, T-75, T-76, T-80, T-81, and T-82 (as presented on Figure 1.5 of the RA Work Plan, September 21, 2007);
- install four groundwater monitoring wells and monitor the groundwater on a quarterly basis for one year and on an annual basis thereafter for VOCs, PCBs, arsenic, lead, chromium, cadmium, barium, and listed halogenated spent solvents;
- repair and, as necessary, install a fence around the perimeter of the Site; and
- remove soils with concentrations of lead, arsenic, and PCBs above 1,000 mg/kg, 2.7 mg/kg, and 1 mg/kg, respectively.

A review of available records indicates that Dearborn Refining Company did not comply with the September 29, 2000 Order.

On August 15, 2003, an Initial Decision was issued by Administrative Law Judge Barbara Gunning (Docket No. RCRA-05-2001-0019) which assessed "*a civil penalty of \$1,250,000 for violations of RCRA and its implementing regulations for the management of used oil and hazardous waste...*". Judge Gunning issued a Compliance Order that required Dearborn Refining Company to meet the following requirements:

- submit a Closure Plan to MDEQ to close ASTs T-5, T-12, T-17, T-59, T-62, and T-70, and to address all soils contaminated with hazardous waste;
- install adequate secondary containment around all ASTs that stored used oil;
- properly label used oil and hazardous waste ASTs and containers;
- cease using and empty ASTs and containers that were in disrepair;
- update and maintain alarm systems, fire protection equipment, and spill protection equipment;
- implement and submit to U.S. EPA an acceptable contingency plan and used oil analysis plan;
- complete and submit to U.S. EPA a total halogen determination for the contents of all ASTs that contain used oil; and
- submit a Closure Plan to MDEQ for all ASTs determined to contain total halogens at concentrations greater than 1,000 parts per million (ppm).

On November 4, 2003, the City of Dearborn acquired the Site (for a purchase price of \$36,760) through Wayne County's tax-reversion process due to Dearborn Refining Company's failure to pay taxes during the 2000 fiscal year. The City of Dearborn gave Dearborn Refining Company an opportunity to reacquire the Site after having repaid the

monies owed. Dearborn Refining Company elected to pursue the reacquisition of the Site, but the transaction was never finalized. Mr. Moloian's attempt to reacquire the Site under a company name other than Dearborn Refining was denied by the City of Dearborn.

On September 10, 2004, the Initial Decision was confirmed by the Environmental Appeals Board "in its entirety", and Docket No. RCRA-05-2001-0019 was confirmed as a Final Order.

In 2005, U.S. EPA conducted a RCRA Compliance Inspection at the Site to determine Dearborn Refining Company's compliance with the Final Order. U.S. EPA determined that Dearborn Refining Company had not complied with any of the requirements of the Final Order. In addition, U.S. EPA observed the following Site conditions:

- breaks in perimeter fencing and an unlocked gate;
- oil spilling from process piping onto the ground;
- oil sheens present on standing water;
- lack of berms and retaining walls in an oil transfer area;
- a leaking AST that contained acid;
- additional leaking ASTs, and ASTs that were in poor and corroded conditions, with undetermined contents;
- an open trench on the west side of the Site filled with oily water; and
- a leaking drum labeled "Ferric Chloride".

Also in 2005, coinciding with U.S. EPA's RCRA enforcement, a plea agreement between the People of the State of Michigan and the Mr. Moloian was signed, which ordered Dearborn Refining Company to cease the receipt of used oil at the Site and to remove and dispose of all waste oil and hazardous materials in accordance with all State and Federal regulations. This action was to be completed by November 2005.

On August 12, 2005, U.S. EPA sent Dearborn Refining Company a letter of warning for its failure to properly label an AST containing PCB-contaminated oils, for illegally storing PCB-contaminated oil, for its failure to properly dispose of PCB-contaminated oil, and for its failure to notify U.S. EPA of its PCB waste activities.

A Stipulation and Order to Vacate Premises was issued by the City of Dearborn on February 3, 2006. The Site was vacated by Dearborn Refining Company on February 13, 2006 and the City of Dearborn assumed control of the Site.

1.4.5 U.S. EPA SITE ASSESSMENT AND REMOVAL ACTION

From February 15, 2006 to February, 17, 2006, U.S. EPA and Weston Solutions, Inc.'s (Weston's) Superfund Technical Assessment and Response Team (START) conducted a Site Assessment to investigate the potential presence of threats to human health, welfare, and the environment posed by Site conditions. At the time, the Site was unmanned and unsecured. The Site Assessment concluded that used oil and hazardous wastes were being stored at the Site that may pose a significant threat to human health, welfare, and the environment as defined in the NCP.

A Time-Critical RA was initiated by U.S. EPA on July 10, 2006. Contractors retained by U.S. EPA to complete the Time-Critical RA included Weston's START and Marine Pollution Control Corporation (MPC). RA activities continued until November 2006. These activities included the removal and off-Site disposal of all non-hazardous waste oil that was identified at the Site and the cleaning of all emptied ASTs, drums, and bulk vessels.

Based on information documented in a U.S. EPA presentation regarding the Site, the following items were removed from the Site as part of the 2006 Time-Critical RA:

- approximately 820,000 gallons of bulk waste oil stored in 190 ASTs;
- fourteen totes containing waste oil and/or oil-impacted wastewater; and
- approximately 721 drums containing waste oil and/or oil-impacted wastewater.

1.5 REGIONAL SETTING

1.5.1 REGIONAL LAND USE

The Site is located in the southeast corner of the City of Dearborn and is directly adjacent to the City of Detroit. The Site property boundaries extend to Liberty Truck Services to the north, FPT to the south, Wyoming Avenue to the east, and Conrail railway to the west.

The industrial properties bordering the north, east, and west portions of the Site are located within the City of Dearborn. These City of Dearborn industrial properties are

zoned for light, medium, and/or intensive industrial use (City of Dearborn designations IA, IB, and IC).

1.5.2 REGIONAL WATER SUPPLY

Potable water for the City of Dearborn is treated surface water from the Detroit River, which is located approximately 2.5 miles east of the Site. Personnel at the DWSD, Systems Control Division report that potable water for the area surrounding the Site is supplied from the Belle Isle intake in the Detroit River. Water from the intake is treated at the Spring Wells Treatment Plant in Dearborn.

According to personnel at the City of Dearborn Water Department, the treatment process for the Detroit River water involves use of chlorine to eliminate bacteria, carbon to eliminate odors, alum (flocculent) to eliminate turbidity, and sand media as a final filter.

According to personnel at the Dearborn Environmental Health Department and the Wayne County Health Department, Community and Industrial Hygiene Division, there are no known public potable water wells in the City of Dearborn.

1.5.3 REGIONAL DEMOGRAPHICS

The Site is situated in the southeast corner of the City of Dearborn, Township 2 South, Range 11E, Wayne County, Michigan. The City of Dearborn is approximately 24.5 square miles, and has a population of approximately 97,775 (www.cityofdearborn.org). Its largest employers are related to the automotive industry and include Ford Motor Company, Visteon, Lear Corporation, and AAA Michigan.

1.6 REGIONAL GEOLOGY

1.6.1 OVERBURDEN

The surficial geology of the region is dominated by unconsolidated glacial sediments deposited approximately 14,500 years ago (Farrand, 1982) during the Wisconsin stage glaciation (the last of four major glacial advances across Michigan). As the Pleistocene-age glaciers retreated, various depositional and/or erosional environments formed the basic landscape observed today. The most prominent features in the region

(Wayne County) consist of a series of moraines, lakes, and rivers. Additional information on these regional geomorphic features and depositional environments are described below.

The glacial moraine deposits are located in and limited to the northwest corner of Wayne County. The regional surficial geology is presented on Figure 1.4. The moraine deposits generally consist of interbedded sands, gravels, silts, and clays that accumulated at the edge of the ice sheets during the glacial retreat. The glacial deposit is characterized as brown to gray poorly sorted mixtures of sand, gravel, silt, and clay. The moraine deposits form elevation highs for the area (950 ft above mean sea level (AMSL)) and are generally approximately 100 to 150 ft thick. The glacial moraine deposits taper into glacial and glacial-lacustrine deposits of sand, sandy clay, and silty clay. The glacial lacustrine (lake bed) deposits occupy the majority of the county.

The former lake bed areas are relatively flat with a gentle slope to the southeast toward the Detroit River. The lake bed deposits generally consist of silts and clays that accumulated in the flat or low-lying areas formerly inundated by the Glacial Great Lakes. The lacustrine silt and clay unit is characterized as bluish to light olive-gray, mottled, with trace amounts of well-rounded pebbles. These lacustrine deposits appear to thicken in an easterly direction toward the Detroit River.

Based on information contained in the "Soil Survey of Wayne County, Michigan," the surficial soil horizons in the vicinity of the Site consist of urban land and soils from the Hoytville-Nappanee association (United States Department of Agriculture Soil Conservation Service, 1977). In general, these soils are characterized by a surficial 7- to 9-inch horizon of gray clay loam and silty loam that formed in level to gently sloping areas (i.e., former lake-plains). The soils are very poorly drained and somewhat poorly drained, respectively, and have a fine textured silt and clay subsoil.

Figure 1.4 presents information on the Regional Surficial Geology, the Regional Glacial Drift Thickness, and the General Soil Associations for the Wayne County area.

1.6.2 BEDROCK

Below the unconsolidated glacial drift, several bedrock formations of the Michigan Basin are encountered (the Michigan Basin is an accumulation of concentric bowl-shaped deposits of sedimentary rock that gently dip toward the center of the basin, which is located near the center of Michigan's lower peninsula). The southeastern edge of this basin in the Wayne County area consists of a Devonian-aged carbonate-evaporite

sequence. It is composed of shales, limestones, dolomites, gypsums, anhydrites, and halites.

The specific bedrock formations found in the region from youngest to oldest include the Antrim Shale, Traverse Group, the Dundee Formation, and the Detroit River Group. These bedrock units and others in the Michigan Basin thin in an outward direction and range from 3,000 to 6,000 ft in thickness in the Wayne County area. The dip in the formations is generally towards the northwest. However, the bedrock surface in the area slopes gently downward in an easterly to southeasterly direction toward the Detroit River. The bedrock surface elevation in the vicinity of the Site is expected to be between 450 and 500 ft AMSL.

Figure 1.5 presents the Regional Bedrock Geology, and Bedrock Surface elevations for the Wayne County area.

1.7 REGIONAL HYDROGEOLOGY

Both the glacial overburden and the bedrock in Wayne County have water bearing geologic units. The glacial overburden in the area consists mainly of low permeability moraine and lake bed deposits that are poor sources of groundwater.

The moraines in the northwestern portion of Wayne County are made up of poorly stratified and poorly sorted sand, gravel, silt, and clay material. The heterogeneous mixture limits the space available for groundwater storage and therefore these types of deposits do not yield or transmit large quantities of water. As a result, groundwater typically encountered in glacial overburden in this area is generally of limited extent and usability.

The former lake bed deposits are predominately silt and clay material which exhibit very slow percolation rates and very low recharge rates. As a result, these clay-rich deposits typically produce little or no water and can not produce a sustainable yield. However, as presented on Figure 1.4, the surficial geology map shows some sand deposits in the former lake bed areas. These deposits are generally thin, laterally discontinuous deposits that are underlain by low permeability clay deposits. When groundwater is encountered within the unconsolidated deposits, the water table is typically very high due to the shallow depth in which clay deposits are encountered. These scenarios generally result in perched water conditions that vary based on seasonal precipitation. Groundwater recharge and movement in these areas are often controlled by surface water runoff and permeable backfill material within utility corridors.

1.8 REGIONAL HYDROLOGY

The Rouge River drainage basin encompasses approximately 467 square miles within Oakland, Washtenaw, and Wayne Counties, as presented on Figure 1.4. The majority of the basin is drained by the three main tributaries of the Rouge River: the Upper Rouge River, the Middle Rouge River, and the Lower Rouge River. After their confluence near the City of Dearborn, the Rouge River flows in an easterly to southeasterly direction until it discharges into the Detroit River, which is located approximately 2 miles east of the Site. The Detroit River flows in a southerly direction and discharges into Lake Erie, which is located approximately 14 miles south of the study area. The Rouge River and its Tributaries are used for commerce and recreational purposes.

1.9 SITE SETTING

1.9.1 LOCAL TOPOGRAPHY

The topography of the Site is presented on Figure 1.6. The ground surface at and around the Site is generally flat. The ground surface elevations at the Site range from approximately 584 to 590 ft AMSL. In general, the ground elevation around the perimeter of the Site ranges from 588 to 590 ft AMSL. The Site relief is 2 ft from the northern Investigative Area D to the southern Investigative Area M. There are minor depressions at the Site as shown in Investigative Area B and at the intersection of Investigative Areas F, G, J and K at 584 ft AMSL and 585 ft AMSL, respectively.

Clay had been mined in central portions of the Site prior to 1947. This historic clay mining resulted in an excavation near the center of the Site to a depth of approximately 20 ft bgs that was backfilled with a variety of soil types (sand, silt, and gravel) and some debris (concrete and wood). Soil boring and stratigraphic logs from the Site investigation activities are presented in Appendix A.

1.9.2 LOCAL GEOLOGY

The subsurface geology at the Site is based on Site investigation activities and a review of boring logs generated from soil borings completed at the Site by U.S. EPA in 2000 and by MDEQ in 2003. However, the borings for the investigations generally provided information on the geologic (and hydrogeologic) conditions encountered within the

uppermost 30 ft of overburden material. As discussed in Section 1.6.1, the glacial depositional environment across the county was generally consistent and resulted in thick, clay-rich lake bed deposits over the bedrock.

Based on the Site investigation boring logs (Appendix A), the geology across the Site can be grouped into two general units; a surficial fill unit, and an underlying silty clay unit. Each unit is described below.

Surficial Fill

The composition of the surficial fill material varied from a homogeneous black to brown fine- to medium-grained, well sorted sand (engineering backfill) to poorly sorted heterogeneous mixtures of slag, cinders, coke, crushed concrete, brick, metal fragments, sand, sand and gravel, and/or silty clay. The thickness of the fill material varied from a few feet to over 20 ft bgs.

Silty Clay

The silty clay unit is typically brown or gray (or a combination of the two), with minor amounts of sand and gravel. Its consistency varies from soft to hard with some fractures noted in the stiff clay. The silty clay unit is present across the entire Site and was found as shallow as 2.8 ft bgs at soil boring SB-D1 and extends to depths of 20.5 ft bgs at SB-F4 (due to the mining of clay historically).

1.9.3 LOCAL HYDROGEOLOGY

As described above, the surficial soils and glacial overburden at the Site is mainly comprised of low permeability lake bed clay deposits that are poor sources of groundwater. The lacustrine deposits are predominately silt and clay materials, which exhibit very slow percolation rates and very low recharge rates. In the Site investigation boring logs (Appendix A), no significant water bearing horizons were observed in the clay-rich deposits. Several moist sandy clay or silty sand horizons were identified but were generally thin, isolated, laterally-discontinuous deposits that are underlain and overlain by low permeability clay deposits. These clay deposits act as a low permeability confining layer that retards vertical migration into the underlying unconsolidated and consolidated deposits at the Site.

When groundwater has been encountered at the Site, it is in areas associated with surficial deposits where the water is trapped within permeable fill material perched

upon the clay deposits. The depth to water is typically very shallow and varies with seasonal precipitation. Groundwater recharge and movement in these fill areas are often controlled by surface water runoff and permeable backfill material within utility corridors.

Two cross-sections (A-A' and B-B') were developed for the Site, as presented on Figure 1.7. Approximate north-south and west-east stratigraphic cross-sections are presented on Figures 1.8 and 1.9, respectively. The cross-sections were developed utilizing the soil borings from the Site investigation activities as well as the U.S. EPA subsurface investigation activities in 2000 (soil borings B-1 through B-10). The cross-sections present the general stratigraphy of the Site and the possible location of previous clay mining. A top of clay contour map was developed and is presented on Figure 1.10. The top of clay is approximately 566 ft AMSL indicating an average depth to clay of approximately 20 ft bgs. The highest point is located at soil boring SB-6 at 568 ft AMSL. The lowest point is located at SB-J2 at 566 ft AMSL. This would indicate a small 2-foot gradient from the north end to the south end of the Site. Cross-section B-B' and the top of clay contour (from Conrail to Wyoming Avenue) shows a distinct bowl effect that could have been the result of historical clay mining activities.

1.9.4 SITE HYDROGEOLOGY

Site investigation activities have determined that shallow, discontinuous perched groundwater is present at the Site contained within the previously-excavated clay mine area. Groundwater was encountered at shallow depths at three of the groundwater monitoring well locations. Sufficient groundwater was not encountered at monitoring wells MW2-08 and MW5-08 to collect a sample, demonstrating that the perched water bearing zone is discontinuous.

Since Site shallow groundwater is discontinuous and perched in areas which have been backfilled subsequent to clay mining, groundwater under these conditions may be considered Groundwater Not In An Aquifer (GWNIAA) pursuant to Michigan Act 451, Part 201.

1.10 REPORT ORGANIZATION

This Report is organized in the following manner:

Section 2.0 - Site Investigation Activities

This section presents the activities performed for the Site Investigation.

Section 3.0 - Site Investigation Results

This section presents the results of the Site investigation activities summarized in Section 2.0.

Section 4.0 - Removal Action Objectives

This section presents an overview of RA objectives.

Section 5.0 - Evaluation of Removal Action Alternatives

This section presents a review, evaluation, and assessment of RA alternatives.

Section 6.0 - Recommended Removal Action Alternative Preliminary 30% Design

This section presents the recommended RA alternative and preliminary 30% design.

Section 7.0 - References

This section presents references used in the preparation of the Report.

2.0 SITE INVESTIGATION ACTIVITIES

Site investigation (Task 4) activities included all activities necessary to investigate the nature and extent of contamination in Site soils and to monitor groundwater, as identified of the RA Work Plan with the following amendment.

A request was submitted to the U.S. EPA in March 2008 to relocate both soil sampling locations and groundwater monitoring well locations based on the corrected property boundary and presence of ASTs. In a response letter dated March 13, 2008, U.S. EPA disapproved the relocation of surface soil locations encumbered by ASTs and approved relocation of soil sampling locations and monitoring wells based on the correct property boundary or utilities. In a letter dated March 31, 2008, U.S. EPA requested that soil sampling locations encumbered by the presence of ASTs be sampled after the ASTs be removed.

Subtasks associated with Task 4 are as follows:

- Subtask 4.1 - Exterior AST Removal;
- Subtask 4.2 - Soil Investigation and Delineation;
- Subtask 4.3 - Groundwater Monitoring; and
- Subtask 4.4 - Site Investigation Report.

This section summarizes the Site Investigation activities performed at the Site from February 26, 2008 through to July 18, 2008.

2.1 SUBTASK 4.1 - EXTERIOR AST REMOVAL

A detailed description of the waste materials and ASTs removed from the Site is included in the report entitled "Final Construction Certification Report: Waste Removal Action" which will be submitted under separate cover.

2.2 SUBTASK 4.2 - SOIL INVESTIGATION AND DELINEATION

The objectives of the soil investigation and delineation activities at the Site were as follows:

- assess all potentially relevant exposure pathways in accordance with Michigan Act 451, Part 201 Generic Industrial Criteria; and
- provide data to evaluate the need for soil removal, if any, and appropriate institutional controls.

The following sections describe the soil investigation and delineation activities performed at the Site in accordance with the RA Work Plan and subsequent U.S. EPA approved amendments. The results of the soil investigation and delineation activities are presented in Section 3.2.

All sampling and surveying activities were performed by CRA. Drilling and monitoring well installation activities were performed by ALTECH Services LLC (ALTECH) of Michigan under the direct supervision of CRA. Sample chemical analyses were performed by TestAmerica Laboratories, Inc. (TestAmerica) of North Canton, Ohio.

The U.S. EPA field representative (Weston) was notified prior to conducting all sampling activities, as required by the RA Work Plan, and was on Site for the majority of Site activities.

2.2.1 PROPERTY BOUNDARY

The boundaries of the Investigative Areas were determined such that each Investigative Area comprised approximately one 0.25-acre exposure unit, consistent with the MDEQ guidance document entitled "Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria", dated August 2002.

During the initial Site Investigation phase, a survey of Site surface soil sample locations identified property boundary irregularities (between the fence and the actual property boundary on the west side of the property). As such, a Land Title Search for 3901 Wyoming Avenue, Dearborn, Michigan was performed by NCO Financial Systems, Inc., Financial Investigative Services division. This search included deeds, leases, easements, activity and use limitations, and legal descriptions of the Site. The Land Title Search identified that the legal description of the property in the City of Dearborn tax assessment was accurate. As such, CRA performed a legal survey of the Site on April 16, 2008 to accurately delineate the Site boundary. The survey was certified by a professional surveyor in the State of Michigan as presented on Figure 2.1. It should be noted that the Site is 6.65 acres in size, which differs from the 6.5 acres stated in the AOC.

As a result, surface soil samples and groundwater monitoring wells in Investigative Areas A, E, I, M, and N identified on Figure 2.2 of the RA Work Plan were redefined. Groundwater monitoring wells MW5-07 and MW4-07 were re-located to the inside of the fence of Investigative Areas I and M, respectively. Investigative Areas A, E, and I were reduced to 6 discrete samples from 9, Investigative Area M was reduced to 3 from 6 sample locations, and Sample N7 was relocated. All relocations were approved by the U.S. EPA.

2.2.2 SURFACE SOIL SAMPLE COLLECTION AND ANALYSIS ACTIVITIES

The RA Work Plan required that the soil investigation at the Site include the collection of 9 discrete surface soil samples within each of the 16 Investigative Areas (identified as Investigative Areas A through P) using manual sample collection methods (e.g., hand augers, trowel, or shovel). However, the number of surface soil samples to be collected was modified due to a correction in the actual property boundary, as discussed in Section 2.2.1.

All Investigative Area surface soil samples were collected in the interval from 0 to 6 inches bgs. In the event that the surficial material was visually identified as clean fill (e.g., gravel/stone placed at the Site during RA activities conducted by U.S. EPA in 2006), the surface soil sample was collected in the 0- to 6-inch interval immediately below the clean fill. Investigative Area surface soil samples were utilized to assess the potential for releases from surface activities at the Site. ASTs were removed prior to sample collection in encumbered areas, with the exception of T-49 as required. Where concrete was present at the proposed sample location, the concrete was either removed or cored and the sample was collected.

The Investigative Area surface soil samples were collected throughout the Site with spacing of approximately 50 ft between sample locations, as presented on Figure 2.2. Each discrete surface soil sample was uniquely identified by the letter corresponding to the Investigative Area in which the sample was collected and a number from 1 through 6 (Investigative Areas A, E, and I) or 9 (e.g., A1, A2, A3, etc.). All soil samples were examined for soil type, stratigraphy, banding, moisture, color, and visual and/or olfactory evidence of impact and were screened using a photoionization detector (PID). All soil samples were submitted to TestAmerica for analysis.

Upon receipt of the soil samples, TestAmerica prepared three composite samples from each of the Investigative Areas containing nine sample locations and two composite samples in the Investigative Areas containing six samples. Only one composite sample was prepared from Investigative Area M, as this area contained three sample locations. The discrete soil samples in each investigative area were evaluated as subgroup composite samples. The first subgroup consisted of the soil samples numbered 1 through 3, the second subgroup consisted of the soil samples numbered 4 through 6 (if applicable), and the third subgroup consisted of the soil samples numbered 7 through 9 (if applicable). One composite sample was prepared by TestAmerica from each subgroup. After each subgroup sample was composited, the sample receiving procedure of TestAmerica-Standard Operating Procedure for Sample Receiving was used. Equal aliquots were weighed from each container, mixed thoroughly and transferred to a new container. The amount aliquoted is recorded on the cooler receipt form as part of the chain of custody (COC) procedures. This procedure resulted in a total of three composite samples each for Investigative Areas B, C, D, F, G, H, J, K, L, and N and two composite samples each for Investigative Areas A, E, I, O, and P.

Both the sampling and mixing equipment were decontaminated between each composite sample, or a new single-use disposable spoon and bowl was used. Each composite soil sample was analyzed for Target Compound List (TCL) semi-volatile organic compounds (SVOCs), Target Analyte List (TAL) metals (including chromium (VI)), and TCL PCBs. All composite soil samples were submitted on-hold for analysis for fine and coarse lead fractions. If the total lead concentration in a given composite soil sample was reported to be greater than 75 mg/kg, the analysis for fine and coarse lead fractions was conducted, in accordance with Michigan Act 451, Part 201 guidance.

In addition, the discrete soil sample that exhibited the highest PID measurement from each subgroup was submitted for analysis for TCL VOCs, for a total of three discrete soil samples being analyzed for VOCs from each Investigative Area. In the event that PID measurements of 0 ppm were reported for all three discrete soil samples within a given subgroup, the discrete soil sample submitted for analysis was determined based on visual and/or olfactory evidence of impact. If there were no elevated PID levels and no visual/olfactory evidence of impact, the sample was collected based upon professional judgment. If free-phase LNAPL was visually suspected during the soil investigation, one sample was collected and field-screened using the OilScreenSoil (Sudan IV) shake test.

The Site investigation results of the Investigative Area surface soil sample collection and analysis activities are summarized in Section 3.1.1.

2.2.3 STAINED SURFACE SOIL LOCATIONS

In addition to the Investigative Area sampling, the areas of the Site with surficial staining were visually identified and mapped. Biased sampling of the stained surface soil areas was performed utilizing a five-point composite to characterize the chemical constituents of the stained soil. The samples from each stained area were collected using the same protocols as described in Section 2.2.2 and analyzed for TCL VOCs, TCLS SVOCs, TAL metals (including chromium VI) and TCL PCBs. The locations of the five point composite sample locations and the stained areas are presented on Figure 2.3.

The Site investigation results for the stained surface soil locations are presented in Section 3.1.2.

2.2.4 SOIL SCREENING CRITERIA

Pursuant to the RA Work Plan, all soil analytical results were screened against the following potentially relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria:

- Groundwater Contact Protection Criteria (GCPC); Identify soil concentrations that are not expected to contaminated groundwater at levels greater than the GCPC.
- Soil Volatilization to Indoor Air Inhalation Criteria (SVIIC); address the migration of contaminants vapors from soil into workplace buildings. These criteria identify soil concentrations that protect workers from exposure to indoor air concentrations that may cause adverse health effects.
- Infinite Source Volatile Soil Inhalation Criteria (VSIC); identify soil concentrations not expected to yield ambient air concentrations that would cause adverse human health effects via inhalation.
- Particulate Soil Inhalation Criteria (PSIC); identify concentrations of chemicals in soil that are not expected to yield ambient air concentrations of contaminated particulates that would cause adverse human health effects via inhalation.
- Direct Contact Criteria (DCC); identify soil concentrations that are protective against adverse health effects due to long-term ingestion of and dermal exposure to contaminated soil. The criteria do *not* address risks posed by inhalation and physical hazards; and
- Soil Saturation Concentration (Csat) Screening Levels; identify theoretical threshold soil concentrations above which free phase liquid contaminant may exist.

For the parameters at concentrations that exceed the potentially relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria listed above, an additional investigation was conducted within the respective Investigative Areas and Stained Areas to evaluate the vertical extent of impacts as described in the following subsection.

2.2.5 SOIL BORING INVESTIGATION ACTIVITIES

One soil boring was advanced in each Investigative Area and Stained Areas in which exceedances of the potentially relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria were reported.

The location of the soil boring advanced in both the Investigative and Stained Areas was determined based on the location of the subgroup composite sample that reported the greatest evidence of impact. All soil borings were advanced using a Geoprobe® direct-push drill rig with a MacroCore® sample and advanced until a continuous clay layer is encountered. Based on previous investigations at the Site, clay was anticipated to be encountered at depths ranging from 3 to 5 ft bgs at the perimeter, and at depths ranging from 15 to 20 ft bgs at the center. When a clay layer was encountered at each location, the soil boring was advanced up to 5 ft into the clay layer to confirm the continuity of the clay and its effectiveness as a barrier to downward migration of potentially impacted groundwater.

At each soil boring location, soil type, stratigraphy, banding, moisture, color, and visual and/or olfactory evidence of impact were logged. In addition, all soil samples were screened using a PID and the stratigraphy of each soil boring was described and classified according to the modified Unified Soil Classification System (USCS). One soil sample was collected in the interval from 1 to 2 ft bgs and submitted for analysis for TCL VOCs, TCL SVOCs, TAL metals (including chromium VI), and TCL PCBs. In the event that either visual and/or olfactory evidence of impact or PID measurements of greater than 25 ppm above background were encountered, one additional soil sample was collected from the depth interval in which the evidence of greatest impact was observed and submitted for analysis the parameters specified above. Based on the above protocol, there were nine additional samples collected greater than 2.5 ft bgs. All soil samples collected for TCL VOCs analysis were collected using a TerraCore sampling kit. A sample from all locations was submitted on-hold for analysis for fine and coarse lead fractions. If the total lead concentration in a given soil sample was reported to be greater than 75 mg/kg, the analysis for fine and coarse lead fractions was conducted, in accordance with Michigan Act 451, Part 201 guidance.

The Site investigation results of the additional soil borehole investigation activities are summarized in Section 3.1.3. The locations of the soil borings are presented on Figure 2.4.

2.3 SUBTASK 4.3 - GROUNDWATER MONITORING ACTIVITIES

2.3.1 GROUNDWATER MONITORING WELL INSTALLATION ACTIVITIES

There were five groundwater-monitoring wells installed around the perimeter of the Site, in accordance with the RA Work Plan. The wells were designated as MW1-08, MW2-08, MW3-08, MW4-08, and MW5-08. The groundwater monitoring well logs are presented in Appendix A. The location of the monitoring wells is presented on Figure 2.4.

Pursuant to the RA Work Plan, there were two additional attempts to locate monitoring wells MW2-08 and MW5-08 at each location since the original attempt resulted in a dry monitoring well. The monitoring wells depth were MW1-08 (23.5 ft), MW2-08 (4 ft), MW3-08 (16.5 ft), MW4-08 (13 ft), and MW5-08 (8 ft). These depths are generally representative of the top of clay contour beneath the fill.

Installation of the monitoring wells were completed utilizing the Geoprobe® direct push method and 1-inch diameter, polyvinyl chloride (PVC) well casings with 010-slot PVC well screens. Well screens were installed at each monitoring well location, such that the well screen was extended approximately 2 ft above the water table and 6 to 12 inches into the underlying continuous clay layer. No. 2 sand was used to create a sand pack throughout the portion of the soil boring annulus that extends from the bottom of the soil boring to a depth of 2 ft above the top of the well screen. The remainder of the soil boring annulus was filled with cement-bentonite grout. All monitoring wells were completed as stick-up monitoring wells with locking, stainless steel protective casings. The location, surface elevation, and top-of-casing elevation of each of the five monitoring wells were surveyed (using NAD 83 and NAVD 88 as reference datum) by a surveyor licensed in the State of Michigan.

2.3.2 GROUNDWATER MONITORING

The RA Work Plan specified four rounds of quarterly monitoring. This Report presents the results of the first two rounds obtained in March 2008 and June 2008. The results of the second two rounds will be submitted under separate cover when completed.

The monitoring wells were developed and sampled using low-flow sampling techniques as described in the Sampling and Analysis Plan (SAP) presented in Appendix F of the RA Work Plan, with the exception of monitoring well MW 3-08. During the second event, MW3-08 was sampled using a peristaltic pump instead of a bladder pump due to the presence of free product. This was discussed with the U.S. EPA field representative (Weston) and approved.

Groundwater samples were analyzed for TCL VOCs, TCL SVOCs, TAL metals, and TCL PCBs. Groundwater samples collected were placed directly into pre-cleaned laboratory-supplied sample jars and submitted to TestAmerica under COC protocols. Groundwater elevations were also measured during each event.

2.3.3 GROUNDWATER SCREENING CRITERIA

All groundwater analytical results were screened against the following potentially relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria:

- Groundwater Contact Criteria (GCC); identify groundwater concentrations that are protective against adverse health effects that may result from dermal exposure to chemicals in groundwater, such as could be experienced by workers in subsurface excavations.
- Groundwater Volatilization to Indoor Air Inhalation Criteria (GVIIC); identify groundwater concentrations that protect workers from the inhalation of contaminant concentrations in workplace indoor air that may cause adverse health effects.
- Water Solubility; identify theoretical threshold water concentrations above which free phase liquid contaminant may exist.
- Flammability and Explosivity Screening Levels; identifies concentrations in groundwater that are protective against physical hazards of flammability and explosivity; and

- Acute Inhalation Screening Levels (AISLs); identify groundwater concentrations protective against unacceptable air concentrations within enclosed spaces that would cause acute inhalation toxicity.

The Site investigation results for the groundwater monitoring wells are summarized in Section 3.3.

3.0 SITE INVESTIGATION RESULTS

This section presents the results of the Site Investigation for the following subtasks associated with Task 4:

- Subtask 4.2 – Soil Investigation and Delineation; and
- Subtask 4.3 – Groundwater Monitoring.

The results of these Site investigation activities for these subtasks are summarized below. Laboratory analytical reports for all samples collected and analytical memorandum are presented in Appendix B.

3.1 SUBTASK 4.2 - SOIL INVESTIGATION AND DELINEATION RESULTS

3.1.1 SURFACE SOIL SAMPLE RESULTS

Surface soil sampling and collection activities commenced on February 28, 2008. Several discrete soil sample locations were found to be encumbered by ASTs, buildings, concrete pads, debris piles, vehicles, and equipment. Surface soil sampling activities were completed on July 9, 2008. The surface soil-sampling results were screened against the pertinent Michigan Act 451, Part 201 Industrial Criteria. The Investigative Area surface soil sampling analytical results and exceedances are presented in Table 3.1. A summary of exceedances is presented on Figure 3.1.

In general, surface soil samples were collected from between 0-2.5 ft bgs. Forty-three locations had one or more exceedances of Michigan Act 451, Part 201 Industrial PSIC and/or DCC.

3.1.2 STAINED SURFACE SOIL RESULTS

There were six distinct stained surface soil areas identified at the Site. Most of the surface staining was typically identified surrounding the ASTs and tank farms. The largest surface soil stained area encompasses six Investigative Areas including F, G, J, K, N, and O. The smallest of the stained areas is located north of the blending room in Investigative Area H. The locations of the stained surface soil areas are presented on Figure 2.3.

Biased sampling of the stained surface soil areas was performed utilizing a five-point composite. In total, there were thirty discrete surface soil samples taken in the stained areas that were composited into six samples for analysis. Section 2.2.3 discusses the surface soil sampling activities. All the stained surface soil-sampling results were screened for the pertinent Michigan Act 451, Part 201 Industrial Criteria.

The analytical results and exceedances of the pertinent Michigan Act 451, Part 201 Industrial Criteria for the stained area surface soil samples are presented in Table 3.2. A summary of exceedances is presented on Figure 3.1.

3.1.3 SOIL BORING RESULTS

There were 16 borings installed in the Investigative Areas and an additional 6 borings were installed in the areas of surface soil staining for a total of 22 boreholes. The soil subsurface investigation activities are discussed in detail in Section 2.2.5.

All the soil subsurface analytical results were screened against the potentially relevant Michigan Act 451, Part 201 Industrial Criteria. The analytical results and exceedances are presented in Table 3.3. A summary of exceedances are summarized on Figures 3.1 and 3.2. Figure 3.1 presents exceedances of the pertinent Michigan Act 451, Part 201 Industrial Criteria between 0-2.5 ft bgs. Figure 3.2 presents exceedances of the Michigan Act 451, Part 201 Industrial Criteria at depths greater than 2.5 ft bgs.

In general, the depth of the soil borings ranged from 1 foot to 25 ft bgs. The majority of the soil boring samples were collected at shallow depths less than 2.5 ft bgs as required by the RA Work Plan (1-2 ft bgs). There were nine samples collected at depth based on field evidence of impact including SB-2 (12-14 ft bgs), SB-6 (12-14 ft bgs), SB-7 (5-6 ft bgs), SB-F4 (4.5-5.5 ft bgs), SB-H1 (12-14 ft bgs), SB-I1 (4-5 ft bgs), SB-K1 (11-12 ft bgs), SB-M3 (4-5 ft bgs), and SB-O4 (2-5 ft bgs).

Samples of potentially LNAPL-containing soil were collected and field screened using the OilScreenSoil (Sudan IV) shake test kit. Samples were collected and field screened at six soil boring locations (SB-4 (1-2 ft bgs), SB-5 (1-2 ft bgs), SB-7 (12-14 ft bgs), SB-10 (12-14 ft bgs), SB-F4 (4.5-5.5 ft bgs), and SB-M3 (4-5 ft bgs)). The Sudan IV field tests did not confirm the presence of free-phase LNAPL in any of the six samples.

The RA Work Plan specified that one to two soil borings would be advanced to investigate subsurface conditions in each stained area. Based on the above results and

the results of the subsurface delineation at the Site with the advancement of the 16 soil borings in each of the Investigative Areas, a second soil boring was not required.

As discussed in Section 1.9.3, there is a distinct "bowl effect" indicated by the top of clay contours presented on Figure 1.10. This bowl effect spans approximately the length of the Site from MW1-08 through to MW3-08. At its widest, the width spans approximately 300 ft from SB-E6 through to SB-G6. There is a smaller clay bowl that surrounds MW1-08. The top of clay slopes back into the Site from MW3-08 (567.95 ft AMSL) to MW1-08 (563.09 ft AMSL).

3.1.4 SUMMARY OF SOIL RESULTS

A. Surface Soil Results (0 to 2.5 ft bgs)

The following constituents were identified at concentrations in excess of the pertinent Michigan Act 451, Part 201 Industrial Criteria from 0 to 2.5 ft bgs:

1. benzo(a)pyrene;
2. total PCBs;
3. arsenic;
4. manganese; and
5. lead.

Extent of impact above Michigan Act 451, Part 201 Industrial Criteria were developed from 0 to 2.5 ft bgs for benzo(a)pyrene, total PCBs, arsenic, lead, and manganese on Figures 3.3, 3.4, 3.5, 3.6, and 3.7, respectively.

Figure 3.8 presents a composite (0 to 2.5 ft bgs) of Figures 3.3 to 3.7. Shallow soil exceedances of the Michigan Act 451, Part 201 Industrial Criteria were identified on approximately 75% of the Site.

A summary of the surface soil exceedances are presented in Table 3.1 and Figure 3.1.

B. Subsurface Soil Results (>2.5 ft bgs)

The subsurface soil results indicate that both lead coarse and fine fraction exceeds the Michigan Act 451, Part 201 Industrial Criteria for direct contact at depths greater than 2.5 ft bgs in sample locations SB-B7 (5-6 ft bgs), SB-6 (12-14 ft bgs), SB-F4 (4.5-5.5 ft bgs), SB-M3 (4-5 ft bgs), and SB-04 (2-5 ft bgs). A summary of the subsurface exceedances are presented on Table 3.3 and Figure 3.2.

3.2 SUBTASK 4.3 - GROUNDWATER MONITORING RESULTS

There were two rounds of groundwater monitoring events in March 2008 and June 2008. These are discussed in the following sections.

3.2.1 FIRST QUARTER GROUNDWATER MONITORING RESULTS

The first round of groundwater monitoring was performed in March during the first quarter of 2008. Monitoring wells MW2-08 and MW5-08 were not sampled due to insufficient well yield.

There were no exceedances of the relevant Michigan Act 451, Part 201 Industrial Criteria. Groundwater elevations were measured for monitoring wells MW1-08 (585.05 ft AMSL), MW3-08 (583.91 ft AMSL), and MW4-08 (585.14 ft AMSL), as presented on Figure 3.9. There was insufficient groundwater elevation data to develop groundwater contours but groundwater flow is assumed to be to the southwest.

The groundwater analytical results are presented in Table 3.4 and on Figure 3.10.

3.2.2 SECOND QUARTER GROUNDWATER MONITORING RESULTS

The second round of groundwater monitoring was performed in June during the second quarter of 2008. Monitoring wells MW2-08 and MW5-08 were not sampled due to insufficient well yield.

There were no exceedances of potentially relevant Michigan Act 451, Part 201 Industrial Criteria. Groundwater elevations were measured for monitoring wells MW1-08 (584.97 ft AMSL), MW3-08 (583.44 ft AMSL), and MW4-08 (584.12 ft AMSL) as presented on Figure 3.9. There was insufficient groundwater elevation data to develop groundwater contours but groundwater is assumed to be to the southwest.

The second quarter monitoring well sample analytical results are presented in Table 3.4 and on Figure 3.10. Two more groundwater monitoring events will take place in September 2008 and December 2008. The results from these monitoring events will be presented under separate cover.

3.2.3 FREE-PHASE NAPL

There was visual evidence of free-phase LNAPL encountered during the groundwater monitoring at MW3-08 (0.81 ft) and a slight sheen at MW4-08 during the second quarter groundwater monitoring event. LNAPL was not observed in these wells during the first quarter groundwater monitoring event. In addition, evidence of NAPL was not found during the soil sampling and Sudan IV field screening.

3.2.4 SUMMARY OF GROUNDWATER RESULTS

Perched groundwater was only identified at MW1-08, MW3-08, and MW4-08. MW2-08 and MW5-08 were essentially dry. The perched water exists in the abandoned clay excavation which has been backfilled with fill. Groundwater is not used for municipal supply (surface water is provided from the Detroit River) and the Site condition would indicate that this groundwater is not an actual aquifer. Groundwater results did not exceed the pertinent Michigan Act 451, Part 201 Industrial Criteria for any pathway evaluated.

Potential free-phase LNAPL was encountered at MW3-08 (0.81 ft) and a slight sheen at MW4-08. Based on the information collected to date, groundwater does not appear to be a media requiring further evaluation or remediation.

4.0 REMOVAL ACTION OBJECTIVES

The selection of the recommended RA alternative will be evaluated with consideration for protection of human health, welfare, and the environment; technical and cost effectiveness; compliance with relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria; and continued industrial use of the Site.

4.1 GENERAL REMOVAL ACTION OBJECTIVES

4.1.1 PROTECTION OF PUBLIC HEALTH

The primary objective of the RA alternatives is to protect public health by preventing human exposures under current and reasonably expected future land use. Protection of public health includes consideration of potential exposures and hazards during implementation and maintenance of the RA.

The primary potential exposures to be addressed by the RA include:

- direct contact with impacted soil or groundwater;
- ingestion of impacted soil or groundwater; and
- inhalation of vapors or dust from impacted soil and groundwater.

4.1.2 PROTECTION OF THE ENVIRONMENT

The general objectives established for the protection of public health are considered to be appropriate for the protection of the environment at the Site.

4.1.3 SCOPING DECISIONS

Continued use of the Site for industrial purposes was considered for evaluating RA alternatives, as required by paragraph 96 of the AOC. Therefore, allowing continued industrial use of the land and a groundwater use limitation after implementation of the RA is the general objective for the RA.

4.2 RA OBJECTIVES

The specific RA objectives for the Site are summarized as follows:

- 1) eliminate the potential for significant human exposures to Site constituents via ingestion of and dermal contact with soil or groundwater, or inhalation of unacceptable levels of dust or vapor from these media during long-term use of the Site in the future;
- 2) minimize the potential for routine/construction worker and public exposure at the Site during implementation of the RA;
- 3) allow continued use of the Site for industrial purposes;
- 4) reduce long-term operation, maintenance, and monitoring requirements;
- 5) initiate and complete RA activities within a reasonable period of time; and
- 6) be cost effective.

5.0 EVALUATION OF REMOVAL ACTION ALTERNATIVES

This section compiles potential RA components for the Site, pursuant to paragraph 88(f) of the AOC, into RA alternatives and then evaluates the alternatives in accordance with the RA objectives presented in Section 4.0. Specifically, each RA alternative was evaluated with consideration for protection of human health, welfare, and the environment; technical and cost effectiveness; compliance with relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria; and the continued future industrial use of the Site. Based on Site conditions, future uses, soil and groundwater investigations, the relevant exposure pathways considered for the evaluation were DCC and PSIC for soil media. Groundwater does not exceed any potentially relevant criteria.

As required by paragraph 89(b) of the AOC, the Respondents met with the City of Dearborn on August 5, 2008 to consult regarding the RA alternatives being considered and the evaluation process.

Each RA alternative for the Site may include a combination of the following RA components consistent with paragraph 88(f) of the AOC:

- Hot spot soil removal;
- Contaminated soil removal;
- Physical containment;
- Free product containment or removal;
- Groundwater monitoring;
- O&M; and
- Deed restrictions.

The RA alternatives presented in this section were identified as potentially viable RA alternatives for the Site and that some variations to the assembled alternatives may also be viable in attaining RA objectives (e.g., detailed design). Based on Site conditions, the RA alternatives that were not further evaluated for the Site included contaminated soil removal and free product containment or removal.

A detailed description of the alternatives is provided in the following sections.

5.1 ALTERNATIVE 1 - NO ACTION

Alternative 1 is the No Action Alternative which serves as the baseline for comparison to other alternatives. This alternative does not include any active RA other than groundwater monitoring for the remaining two monitoring events. The groundwater monitoring would include monitoring wells MW1-08, MW3-08, and MW4-08, as presented on Figure 5.1. Groundwater monitoring would include the collection and analysis of groundwater samples and the measurement of groundwater elevations. For the purposes of the RA, the proposed Site specific parameter list for the groundwater samples would consist of TCL VOCs, TCL SVOCs, metals, and PCBs.

A detailed cost breakdown for Alternative 1 is presented in Table 5.1

5.1.1 NO ACTION ASSESSMENT

The No Action Alternative will not change the existing conditions at the Site. Soil with concentrations exceeding Michigan Act 451, Part 201 Industrial Criteria will remain at the Site.

5.2 ALTERNATIVE 2 - INSTITUTIONAL CONTROLS

Institutional controls (e.g., security fence, work area restrictions, deed restrictions, etc.) will be considered as a component of all RA alternatives other than the No Action baseline alternative. Institutional controls may involve the placement of a restriction within the deed to the property. Deed restrictions can be made enforceable and permanent through various legal mechanisms. The use of a deed restriction does not imply that other RA components are unnecessary.

Alternative 2 includes the same groundwater monitoring described for Alternative 1, and the implementation of institutional controls. The components of Alternative 2 are presented on Figure 5.2. The institutional controls would consist of deed restrictions as well as maintaining the existing physical controls to eliminate the future potential for on-Site exposures (e.g., uncontrolled groundwater use limitation). Institutional controls would be utilized to effectively mitigate the potential for exposure to impacted media, and therefore, reduce risks associated with such exposures.

Institutional controls may involve the placement of a restriction within the deed (or other actions such as zoning changes) to the property ensuring that the property owner

does not conduct specific unacceptable activities (e.g., excavation, residential use, etc.). Deed restrictions also may involve placing a notation on the property deed, which makes the current and any prospective property owner aware of the property's history and restricted land use of the property. Deed restrictions can be made enforceable and permanent through various legal mechanisms.

Additional institutional controls would include physical controls such as maintaining a security perimeter fence.

A detailed cost breakdown for Alternative 2 is presented in Table 5.2.

5.2.1 INSTITUTIONAL CONTROLS ASSESSMENT

Institutional controls will minimize potential future contact with impacted soil at the Site.

5.3 ALTERNATIVE 3 - COVER SYSTEMS

Alternative 3 involves the use of cover systems to provide physical barriers to contain or otherwise restrict the mobility and migration of Site-related constituents. The construction of a cover system also includes a preliminary cost estimate for the demolition and decommissioning of existing building structures on-Site to the extent necessary.

5.3.1 REVIEW OF POTENTIAL COVER SYSTEMS

The purpose of the cover system is to prevent direct contact and the generation of contaminated dust at the Site. In addition, cover systems provide long-term protection against erosion and subsequent transport of contaminants.

In general, the cover system technology provides very good isolation of the contaminated soil but may extend the length of time that other possible remedy components, such as monitoring, are required because they do not significantly reduce the mass of contaminants within the zone of impact.

Materials evaluated for the construction of a cover system include:

- 1) Soil Cover; and
- 2) Gravel Cover.

Prior to the construction of the cover system, demolition activities would be performed to the extent necessary. Demolition would consider the lab and blending room, office, water treatment building, boiler rooms, pump house, boiler house, and press room to the extent necessary to install the cover. Any slabs will be left in place underneath the cover system. A brief description and Site-specific screening of each cover system technology is presented below. The cover system is presented on Figure 5.3.

5.3.1.1 ALTERNATIVE 3.1: SOIL COVER ALTERNATIVE

This technology would require the installation/preparation of a grading layer to provide minimum slopes; placement of geotextile fabric; and placement, compaction, and grading of compacted fill. The finished surface would be covered with topsoil and would be seeded to provide a vegetative cover. Vegetation would help manage or control surface water runoff by slowing down runoff and capturing some water within the vegetative layer as well as mitigating any erosive processes.

The soil cover option would require importation of clean soil materials. A typical soil cover design is shown on Figure 5.4. A detailed cost breakdown for Alternative 3.1 is presented in Table 5.3.

5.3.1.2 ALTERNATIVE 3.2: GRAVEL COVER ALTERNATIVE

This technology would involve the installation/preparation of a grading layer to provide minimum slopes; placement of geotextile fabric; placement, compaction, and grading of common fill; and placement compaction and grading of a gravel surface. A typical gravel mix cover cross-section is presented on Figure 5.5.

A detailed cost breakdown for Alternative 3.2 is presented in Table 5.4. Long term O&M costs are associated with the cover systems are minimal with respect to overall capital costs. These costs were not included as they will not influence the selection of the alternative and be performed by owner.

5.3.2 STORMWATER MANAGEMENT SYSTEM CONSIDERATIONS

Stormwater management was evaluated for the cover system. Stormwater Management System components will consist of drainage swales and detention ponds, if required. Under the current grading plans, drainage will be directed into a drainage ditch at the center of the Site and then to the stormwater detention pond.

The stormwater detention pond has been included in the 30% design using a Stormwater Management Model (SWMM). Swale dimensions can be varied within the SWMM such that the most efficient dimensions and locations are achieved.

The final cover system design will greatly affect the stormwater design. The better the cover is at reducing infiltration, the larger the runoff component of precipitation. This will require larger swales and ponds to handle the stormwater.

5.3.3 ALTERNATIVE 3 - COVER SYSTEM RECOMMENDATION

Consistent with the review presented in the previous section, the soil cover alternative is recommended over the gravel cover design (Alternative 3.1).

The recommended general cover system cross-section, is as follows (bottom to top):

- grading layer (depth varies, as necessary);
- geotextile fabric;
- clean common fill layer (9 inches);
- topsoil (3 inches); and
- vegetative cover.

This Cover System cross-section is recommended because it is considered to be protective of human health, welfare, and the environment, technically feasible and cost effective, and addresses the Michigan Act 451, Part 201 DCC and PSIC exposure pathways.

5.4 ALTERNATIVE 4 - COVER SYSTEM/HOT SPOT REMOVAL

Alternative 4 consists of Alternative 3 and "Hot Spot" soil removal with off-Site disposal at a U.S. EPA approved landfill. Figure 5.6 presents Alternative 4.

The soil exceedances of the relevant Michigan Act 451, Part 201 Industrial Criteria generally exist across 75% of the surface area of the Site to a depth of approximately 2.5 ft bgs. In addition, soil exceedances of Michigan Act 451, Part 201 Industrial Criteria occurred in the majority of samples collected below 2.5 ft bgs to depths of 16 ft bgs. In general, the Site soil is marginally above the Michigan Act 451, Part 201 Industrial Criteria and in all cases is less than an order of magnitude above. The purpose of a Time Critical RA is generally to address the higher levels (i.e., greater than 100 times the cleanup criteria) of constituents. There are no constituents at 100 times the potentially relevant Michigan Act 451, Part 201 Industrial Criteria. Alternative 4 could address the removal of the material that exceeds Michigan Act 451, Part 201 Industrial Criteria:

$$\begin{aligned}\text{Volume} &= \text{Acreage} \times \text{Depth} \times \% \text{ of stained surface} \\ &= 6.65 \text{ acres} \times 15 \text{ ft} \times 75\% \\ &= 120,700 \text{ cy}\end{aligned}$$

$$\begin{aligned}\text{Tonnage} &= 120,700 \text{ cy} \times 1.5 \text{ tons/cy} \\ &= 181,100 \text{ tons}\end{aligned}$$

Alternate 4 addresses 50% of this soil material (i.e., 90,500 tons) for comparative purposes (versus Alternative 3). The cover system would still have to be constructed as part of Alternative 4. A detailed Alternative 4 cost breakdown for the soil cover/Hot Spot removal is presented in Table 5.5.

If 100% of the soil were removed from the Site (i.e., 181,000 tons) the capital expense would be \$15,740,000; however, a cover system would not be required.

5.5 COMPARATIVE ANALYSIS OF ALTERNATIVES

A comparative analysis of the four alternatives was performed for the selection of the recommended RA Alternative. Each alternative was evaluated for protection of human health, welfare, and the environment; technical and cost effectiveness; consistent with the future industrial use of the Site, and compliance with Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria. The comparative analysis of the alternatives are summarized below:

	<i>Human Health</i>	<i>Human Welfare</i>	<i>Protection of the Environment</i>	<i>Technical Effectiveness</i>	<i>Cost Effectiveness</i>	<i>Industrial Use</i>	<i>Michigan Act 451, Part 201 Compliant</i>
Alternative 1 No Action	No	No	No	No	Yes	No	No
Alternative 2 Institutional Controls	No	No	No	No	Yes	No	No
Alternative 3 Cover Systems	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Alternative 4 Soil Hot Spot Removal/ Cover Systems	Yes	Yes	Yes	Yes	No	Yes	Yes

Alternatives 1 and 2 were not found to be protective of human health, welfare, and the environment and not compliant with Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria. Alternatives 3 and 4 are fully protective and are compliant with Michigan Act 451, Part 201. Alternative 3 is selected as the recommended alternative because Alternative 4 is not cost effective.

6.0 **RECOMMENDED REMOVAL ACTION ALTERNATIVE PRELIMINARY (30%) DESIGN**

Section 5.0 presented a review of potential RA components for the Site pursuant to paragraph 88(f) of the AOC. Selection of the recommended RA alternative was evaluated for protection of human health, welfare, and the environment; technical and cost effectiveness; compliance with relevant Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria, and continued future industrial use of the Site.

This section presents the recommended RA that will be carried out in a manner consistent with the NCP (42 U.S.C. S9605, codified at 40 CFR Part 300) and associated provisions to ensure that the work performed pursuant to the AOC is protective of human health, welfare, and the environment.

A recommendation for implementation of an RA alternative for the Site included a review of the Site investigation results in combination with the following RA components (paragraph 88(f) of the AOC):

- Hot spot removal;
- Contaminated soil removal;
- Physical containment;
- Groundwater monitoring (2 remaining events);
- O&M; and
- Deed restrictions.

The recommended RA is Alternative 3.1, Soil Cover System. This provides for the City of Dearborn to continue to maintain existing zoning to be reflective of future industrial use of the Site and ensure future O&M is conducted and implement deed restrictions (per the AOC).

The implementation of Alternative 3 is technically feasible and utilizes current construction practices and methods. Alternative 3 is also compliant with Michigan Act 451, Part 201 Generic Industrial Cleanup Criteria by eliminating the DCC and PSIC exposure pathways. Construction techniques can be easily implemented with equipment readily available. The preliminary 30% design includes a soil cap cross-section and allowing for a stormwater pond.

A detailed cost breakdown for the soil cover system is presented in Table 5.3. The future beneficial use of the property includes all above ground operations with little limitations. Future industrial building construction activities would include slab on grade construction with little limitations and potential footing construction with appropriate deed restrictions.

This preliminary 30% design level is presented in Appendix C.

7.0 REFERENCES

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TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								A3	lab composite A1,A2,A3	A6	lab composite A4,A5,A6	B1	lab composite B1,B2,B3	B5	lab composite B4,B5,B6	B7	B7
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	S-48041-061808-MC-003 A3	S-48041-061808-MC-003	S-48041-061208-AF-001 A6	S-48041-061208-AF-001	S-48041-062008-MC-004 B1	S-48041-062008-MC-004	S-48041-062008-MC-003 B5	S-48041-062008-MC-003	S-48041-062008-MC-001 B7	S-48041-062008-MC-002 B7	
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	
Sample Type	Units	a	b	c	d	e	f	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	
Metals																		
Aluminum	mg/kg	6900	1000000	NLV	NLV	ID	370000	NA	--	5600	--	6050	--	5600	--	2100	--	
Antimony	mg/kg	NA	49000	NLV	NLV	5900	670	NA	--	1.0 J	--	1.2 J	--	0.66 J	--	0.21 J	--	
Arsenic	mg/kg	5.8	2000	NLV	NLV	910	37	NA	--	13.3	--	5.6 J	--	7.9	--	2.0	--	
Barium	mg/kg	75	1000000	NLV	NLV	150000	130000	NA	--	225	--	269 J	--	201 J	--	598 J	--	
Beryllium	mg/kg	NA	1000000	NLV	NLV	590	1600	NA	--	0.32	--	0.33	--	0.33	--	ND(0.18)	--	
Cadmium	mg/kg	1.2	230000	NLV	NLV	2200	2100	NA	--	11.8	--	2.2	--	2.0	--	0.73	--	
Calcium	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	35200	--	23900	--	50500 J	--	15000 J	--	
Chromium Total	mg/kg	18	1000000	NLV	NLV	150000	1000000	NA	--	57.1 J	--	45.5 J	--	31.2	--	13.1	--	
Chromium VI (Hexavalent)	mg/kg	NA	140000	NLV	NLV	240	9200	NA	--	6.6	--	2.6 J	--	1.8	--	1.9	--	
Cobalt	mg/kg	6.8	48000	NLV	NLV	5900	9000	NA	--	5.9	--	3.8	--	5.0	--	1.3	--	
Copper	mg/kg	32	1000000	NLV	NLV	59000	73000	NA	--	93.4 J	--	68.2	--	80.2 J	--	16.6 J	--	
Iron	mg/kg	12000	1000000	NLV	NLV	ID	580000	NA	--	30100	--	24300	--	16700	--	5400	--	
Lead - Coarse Fraction	mg/kg	NA	ID	NLV	NLV	NA	900	NA	--	328	--	556	--	1090 f	--	82.6	--	
Lead - Fine Fraction	mg/kg	21	ID	NLV	NLV	44000	900	NA	--	445	--	708	--	676	--	129	--	
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	NA	ID	NLV	NLV	NA	NA	NA	--	357	--	636	--	1020	--	90.9	--	
Magnesium	mg/kg	NA	1000000	NLV	NLV	2900000	1000000	NA	--	8150 J	--	5220 J	--	8400 J	--	5050 J	--	
Manganese	mg/kg	440	180000	NLV	NLV	1500	90000	NA	--	819	--	557	--	632 J	--	118 J	--	
Mercury	mg/kg	0.13	47	89	62	8800	580	NA	--	0.20 J	--	0.18	--	0.24	--	0.11	--	
Nickel	mg/kg	20	1000000	NLV	NLV	16000	150000	NA	--	80.2	--	26.5	--	18.6	--	6.2	--	
Potassium	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	913	--	644	--	1090	--	216 J	--	
Selenium	mg/kg	0.41	78000	NLV	NLV	59000	9600	NA	--	3.1	--	1.4	--	0.71	--	0.16 J	--	
Silver	mg/kg	1	200000	NLV	NLV	2900	9000	NA	--	0.26	--	0.34	--	0.21	--	0.048 J	--	
Sodium	mg/kg	NA	1000000	NLV	NLV	ID	1000000	NA	--	210	--	247	--	141	--	ND(90.2)	--	
Thallium	mg/kg	NA	15000	NLV	NLV	ID	130	NA	--	0.22	--	0.18	--	0.37	--	0.032 J	--	
Vanadium	mg/kg	NA	1000000	NLV	NLV	ID	5500	NA	--	29.9 J	--	17.8 J	--	17.9	--	6.8	--	
Zinc	mg/kg	47	1000000	NLV	NLV	ID	630000	NA	--	378	--	347 J	--	320	--	120	--	
PCBs																		
Aroclor-1016 (PCB-1016)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	ND(1.9)	--	ND(0.4)	--	ND(0.37)	--	
Aroclor-1221 (PCB-1221)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	ND(1.9)	--	ND(0.4)	--	ND(0.37)	--	
Aroclor-1232 (PCB-1232)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	ND(1.9)	--	ND(0.4)	--	ND(0.37)	--	
Aroclor-1242 (PCB-1242)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	ND(1.9)	--	ND(0.4)	--	ND(0.37)	--	
Aroclor-1248 (PCB-1248)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	ND(1.9)	--	ND(0.4)	--	ND(0.37)	--	
Aroclor-1254 (PCB-1254)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2)	--	13	--	ND(0.4)	--	2.5	--	
Aroclor-1260 (PCB-1260)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	17	--	ND(1.9)	--	3.2	--	ND(0.37)	--	
Total PCBs	mg/kg	NA	NILL	16000	810	6500	16	NA	--	17 f	--	13	--	3.2	--	2.5	--	
Semi-Volatile Organic Compounds																		
2,2'-oxybis(1-Chloropropane)	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,4,5-Trichlorophenol	ug/kg	NA	9100000	NLV	NLV	1000000000	73000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,4,6-Trichlorophenol	ug/kg	NA	200000	NLV	NLV	1300000000	3300000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,4-Dichlorophenol	ug/kg	NA	960000	NLV	NLV	2300000000	1800000	1800000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,4-Dimethylphenol	ug/kg	NA	10000000	NLV	NLV	2100000000	36000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(1800)	--	ND(13000)	--	ND(1200)	--	ND(8500)	--	
2,4-Dinitrotoluene	ug/kg	NA	170000	NLV	NLV	20000000	220000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2-Chloronaphthalene	ug/kg	NA	2300000	ID	ID	ID	180000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2-Chlorophenol	ug/kg	NA	1900000	ID	ID	ID	4500000	19000000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2-Methylnaphthalene	ug/kg	NA	5500000	ID	ID	ID	26000000	NA	--	160 J	--	ND(22000)	--	200 J	--	7200 J	--	
2-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2400)	--	ND(17000)	--	ND(1600)	--	ND(11000)	--	
2-Nitrophenol	ug/kg	NA	1600000	NLV	NLV	ID	2000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
3,3'-Dichlorobenzidine	ug/kg	NA	4600	NLV	NLV	8200000	30000	NA	--	ND(19000)	--	ND(140000)	--	ND(13000)	--	ND(90000)	--	
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2400)	--	ND(17000)	--	ND(1600)	--	ND(11000)	--	
4,6-Dinitro-2-methylphenol	ug/kg	NA	190000	NLV	NLV	ID	260000	NA	--	ND(1800)	--	ND(13000)	--	ND(1200)	--	ND(8500)	--	
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	NA	--	ND(3200)	--	ND(2100)	--	ND(15000)	--	
4-Chloro-3-methylphenol	ug/kg	NA	3000000	NLV	NLV	ID	15000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(1800)	--	ND(13000)	--	ND(1200)	--	ND(8500)	--	
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
4-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	--	ND(3200)	--	1900 J	--	ND(2100)	--	ND(15000)	--	
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(2400)	--	ND(17000)	--	ND(1600)	--	ND(11000)	--	
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(4000)	--	ND(28000)	--	ND(2600)	--	ND(19000)	--	
Acenaphthene	ug/kg	NA	970000	350000000	97000000	6200000000	130000000	NA	--	110 J	--	ND(22000)	--	670 J	--	470 J	--	
Acenaphthylene	ug/kg	NA	440000	3000000	2700000	1000000000	5200000	NA	--	360 J	--	ND(22000)	--	560 J	--	ND(15000)	--	
Acetophenone	ug/kg	NA	1100000	1100000	52000000	14000000000	1100000	1100000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
Anthracene	ug/kg	NA	41000	1000000000	1600000000	29000000000	730000000	NA	--	730 J	--	ND(22000)	--	1800 J	--	740 J	--	
Atrazine	ug/kg	NA	110000	NLV	NLV	ID	330000	NA	--	ND(490)	--	ND(3400)	--	ND(320)	--	ND(2300)	--	
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	
Benzo(a)anthracene	ug/kg	NA	NILL															

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								A3	lab composite A1,A2,A3	A6	lab composite A4,A5,A6	B1	lab composite B1,B2,B3	B5	lab composite B4,B5,B6	B7	B7
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	S-48041-061808-MC-003 A3	S-48041-061808-MC-003	S-48041-061208-AF-001 A6	S-48041-061208-AF-001	S-48041-062008-MC-004 B1	S-48041-062008-MC-004	S-48041-062008-MC-003 B5	S-48041-062008-MC-003	S-48041-062008-MC-003	S-48041-062008-MC-001 B7	S-48041-062008-MC-002 B7
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type	Units	a	b	c	d	e	f	g	Final	Final	Final	Final	Final	Final	Final	Final	Final	Duplicate
Benzo(a)pyrene	ug/kg	NA	NLL	NLV	NLV	1900000	8000	NA	--	2500 J	--	1300 J	--	5500	--	400 J	--	--
Benzo(b)fluoranthene	ug/kg	NA	NLL	ID	ID	80000	80000	NA	--	ND(3200)	--	1700 J	--	7000	--	550 J	--	--
Benzo(g,h,i)perylene	ug/kg	NA	NLL	NLV	NLV	350000000	7000000	NA	--	1800 J	--	970 J	--	4000	--	440 J	--	--
Benzo(k)fluoranthene	ug/kg	NA	NLL	NLV	NLV	ID	800000	NA	--	ND(3200)	--	760 J	--	2300	--	ND(15000)	--	--
Biphenyl	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	2300 J	--	--
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
bis(2-Chloroethyl)ether	ug/kg	NA	110000	44000	13000	12000000	58000	2200000	--	ND(970)	--	ND(6800)	--	ND(640)	--	ND(4500)	--	--
bis(2-Ethylhexyl)phthalate	ug/kg	NA	NLL	NLV	NLV	890000000	10000000	10000000	--	ND(3200)	--	ND(22000)	--	190 J	--	ND(15000)	--	--
Butyl benzylphthalate	ug/kg	NA	310000	NLV	NLV	21000000000	310000	310000	--	1100 J	--	110000	--	ND(2100)	--	4400 J	--	--
Caprolactam	ug/kg	NA	1000000000	NLV	NLV	2900000000	310000000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Carbazole	ug/kg	NA	820000	NLV	NLV	ID	2400000	NA	--	310 J	--	ND(22000)	--	730 J	--	ND(15000)	--	--
Chrysene	ug/kg	NA	NLL	ID	ID	ID	8000000	NA	--	2500 J	--	1200 J	--	5200	--	660 J	--	--
Dibenz(a,h)anthracene	ug/kg	NA	NLL	NLV	NLV	ID	8000	NA	--	ND(3200)	--	ND(22000)	--	860 J	--	ND(15000)	--	--
Dibenzofuran	ug/kg	NA	ID	ID	ID	ID	ID	NA	--	ND(3200)	--	ND(22000)	--	310 J	--	ND(15000)	--	--
Diethyl phthalate	ug/kg	NA	740000	NLV	NLV	1500000000	740000	740000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Dimethyl phthalate	ug/kg	NA	790000	NLV	NLV	1500000000	790000	790000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Di-n-butylphthalate	ug/kg	NA	760000	NLV	NLV	1500000000	760000	760000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Di-n-octyl phthalate	ug/kg	NA	140000000	NLV	NLV	ID	20000000	140000000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Fluoranthene	ug/kg	NA	730000	1000000000	890000000	4100000000	130000000	NA	--	4100	--	1400 J	--	11000	--	1000 J	--	--
Fluorene	ug/kg	NA	890000	1000000000	1500000000	4100000000	870000000	NA	--	ND(3200)	--	ND(22000)	--	640 J	--	ND(15000)	--	--
Hexachlorobenzene	ug/kg	NA	8200	220000	56000	8500000	37000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Hexachlorobutadiene	ug/kg	NA	350000	350000	460000	180000000	350000	350000	--	ND(490)	--	ND(3400)	--	ND(320)	--	ND(2300)	--	--
Hexachlorocyclopentadiene	ug/kg	NA	720000	56000	60000	5900000	720000	720000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Hexachloroethane	ug/kg	NA	110000	79000	660000	100000000	730000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NLL	NLV	NLV	ID	80000	NA	--	1600 J	--	850 J	--	3300	--	ND(15000)	--	--
Isophorone	ug/kg	NA	2400000	NLV	NLV	8200000000	2400000	2400000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Naphthalene	ug/kg	NA	2100000	470000	350000	88000000	52000000	NA	--	100 J	--	700 J	--	440 J	--	ND(15000)	--	--
Nitrobenzene	ug/kg	NA	220000	170000	64000	21000000	340000	490000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
N-Nitrosodi-n-propylamine	ug/kg	NA	7200	NLV	NLV	2000000	5400	1500000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
N-Nitrosodiphenylamine	ug/kg	NA	700000	NLV	NLV	ID	7800000	NA	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Pentachlorophenol	ug/kg	NA	4300	NLV	NLV	130000000	320000	NA	--	ND(1800)	--	ND(13000)	--	ND(1200)	--	ND(8500)	--	--
Phenanthrene	ug/kg	NA	1100000	5100000	190000	2900000	5200000	NA	--	2300 J	--	990 J	--	7100	--	3200 J	--	--
Phenol	ug/kg	NA	12000000	NLV	NLV	18000000000	12000000	12000000	--	ND(3200)	--	ND(22000)	--	770 J	--	ND(15000)	--	--
Pyrene	ug/kg	NA	480000	1000000000	780000000	2900000000	84000000	NA	--	3800	--	1300 J	--	9900	--	1800 J	--	--
Pyridine	ug/kg	NA	37000	2000	9800	100000000	37000	37000	--	ND(3200)	--	ND(22000)	--	ND(2100)	--	ND(15000)	--	--
Volatile Organic Compounds																		
1,1,1-Trichloroethane	ug/kg	NA	460000	460000	4500000	29000000000	460000	460000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
1,1,2,2-Tetrachloroethane	ug/kg	NA	94000	23000	34000	68000000	240000	870000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
1,1,2-Trichloroethane	ug/kg	NA	420000	24000	57000	250000000	840000	920000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
1,1-Dichloroethane	ug/kg	NA	890000	430000	2500000	15000000000	890000	890000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	13 J
1,1-Dichloroethene	ug/kg	NA	220000	330	3700	78000000	570000	570000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
1,2,4-Trichlorobenzene	ug/kg	NA	1100000	1100000	34000000	11000000000	1100000	1100000	ND(340)	--	300	--	ND(270)	--	ND(870)	--	32 J	43 J
1,2,4-Trimethylbenzene	ug/kg	NA	110000	110000	25000000	36000000000	110000	110000	120 J	--	ND(85)	--	260	--	16000	--	130	92 J
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	1200	1200	15000	5900000	1200	1200	ND(340)	--	ND(210)	--	ND(270)	--	ND(870)	--	ND(250)	ND(250)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	NA	500	3600	5800	18000000	430	890000	ND(340)	--	ND(210)	--	ND(270)	--	ND(870)	--	ND(250)	ND(250)
1,2-Dichlorobenzene	ug/kg	NA	210000	210000	46000000	44000000000	210000											

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								A3	lab composite A1,A2,A3	A6	lab composite A4,A5,A6	B1	lab composite B1,B2,B3	B5	lab composite B4,B5,B6	B7	B7
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	S-48041-061808-MC-003 A3	S-48041-061808-MC-003	S-48041-061208-AF-001 A6	S-48041-061208-AF-001	S-48041-061208-AF-001	S-48041-062008-MC-004 B1	S-48041-062008-MC-004	S-48041-062008-MC-003 B5	S-48041-062008-MC-003	S-48041-062008-MC-001 B7	S-48041-062008-MC-002 B7
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/20/2008
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type								Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Duplicate
	Units	a	b	c	d	e	f	g										
Isopropylbenzene	ug/kg	NA	390000	390000	200000	2600000000	390000	390000	ND(340)	--	ND(210)	--	21 J	--	530 J	--	12 J	9.6 J
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	290 J	--	ND(1000)	--	380 J	--	ND(4200)	--	220 J	200 J
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	93 J	--	ND(1000)	--	36 J	--	410 J	--	33 J	56 J
Methyl Tert Butyl Ether	ug/kg	NA	5900000	5900000	3000000	88000000000	5900000	5900000	ND(340)	--	ND(210)	--	ND(270)	--	ND(870)	--	ND(250)	ND(250)
Methylene chloride	ug/kg	NA	2300000	240000	700000	8300000000	2300000	2300000	ND(340)	--	ND(210)	--	ND(270)	--	ND(870)	--	ND(250)	ND(250)
Styrene	ug/kg	NA	270000	520000	3300000	6900000000	520000	520000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
Tetrachloroethene	ug/kg	NA	88000	60000	600000	6800000000	88000	88000	19 J	--	ND(42)	--	ND(55)	--	ND(170)	--	18 J	17 J
Toluene	ug/kg	NA	250000	250000	3300000	12000000000	250000	250000	340 J	--	24 J	--	78 J	--	51 J	--	53 J	120
trans-1,2-Dichloroethene	ug/kg	NA	1400000	43000	330000	2100000000	1400000	1400000	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(67)	--	ND(42)	--	ND(55)	--	ND(170)	--	ND(50)	ND(49)
Trichloroethene	ug/kg	NA	440000	37000	260000	2300000000	500000	500000	25 J	--	44	--	17 J	--	ND(170)	--	58	95
Trichlorofluoromethane (CFC-11)	ug/kg	NA	560000	560000	11000000	1700000000000	560000	560000	ND(130)	--	ND(85)	--	ND(110)	--	ND(350)	--	ND(100)	ND(99)
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	550000	550000	21000000	2300000000000	550000	550000	ND(340)	--	ND(210)	--	ND(270)	--	ND(870)	--	ND(250)	ND(250)
Vinyl chloride	ug/kg	NA	20000	2800	29000	8900000000	34000	490000	ND(54)	--	ND(34)	--	ND(44)	--	ND(140)	--	ND(40)	ND(39)
Xylene (total)	ug/kg	NA	150000	150000	5400000	130000000000	150000	150000	300 J	--	39 J	--	110 J	--	5500	--	120 J	200

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	lab composite B7,B8,B9		lab composite B7,B8,B9		C3	lab composite C1,C2,C3		C6	C6	lab composite C4,C5,C6		lab composite C4,C5,C6		C8	lab composite C7,C8,C9		D1	lab composite D1,D2,D3						
Sample ID	S-48041-062008-MC-001		S-48041-062008-MC-002		S-48041-062008-MC-009 C3		S-48041-062008-MC-009 C1 C2 C3		S-48041-061808-MC-004 C6		S-48041-061808-MC-005 C6		S-48041-061808-MC-004		S-48041-061808-MC-005		S-048041-022908-DD-017C8		S-048041-022908-DD-017		S-48041-062008-MC-010 D1		S-48041-062008-MC-010	
Sample Date	6/20/2008		6/20/2008		6/20/2008		6/20/2008		6/18/2008		6/18/2008		6/18/2008		6/18/2008		2/29/2008		2/29/2008		6/20/2008		6/20/2008	
Sample Depth	0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS		0.67-1.2 ft BGS		0-1.6 ft BGS		0-0.5 ft BGS		0-0.5 ft BGS	
Sample Type	Final		Duplicate		Final		Final		Final		Duplicate		Final		Duplicate		Final		Final		Final		Final	
Units																								
Metals																								
Aluminum	mg/kg	5990		3820	--		10900	--		--		7230		5130	--		7020	--		7320				
Antimony	mg/kg	0.59 J		0.24 J	--		0.51 J	--		--		3.2 J		1.5 J	--		10.2	--		0.32 J				
Arsenic	mg/kg	5.7		6.2	--		4.0	--		--		23.3 J		6.6 J	--		7.6	--		4.8				
Barium	mg/kg	153 J		86.7 J	--		90.1	--		--		241		276	--		693	--		142 J				
Beryllium	mg/kg	0.16 J		0.13 J	--		ND(0.18)	--		--		0.56		0.27	--		0.56	--		0.13 J				
Cadmium	mg/kg	1.8		0.81	--		0.81	--		--		2.8		2.3	--		6.1	--		0.75				
Calcium	mg/kg	50600 J		24100 J	--		32300	--		--		53200		52600	--		38800	--		52300 J				
Chromium Total	mg/kg	39.1		18.6	--		39.2 J	--		--		95.9 J		55.2 J	--		35.0	--		265				
Chromium VI (Hexavalent)	mg/kg	1.2		1.2	--		1.4	--		--		1.7		1.7	--		ND(0.95)	--		0.87 J				
Cobalt	mg/kg	4.0		2.9	--		4.9	--		--		8.1		4.1	--		3.7	--		4.0				
Copper	mg/kg	42.8 J		20.1 J	--		30.0	--		--		156 J		59.9 J	--		91.9	--		24.1 J				
Iron	mg/kg	13100		9510	--		13800	--		--		48300		21500	--		24400	--		33200				
Lead - Coarse Fraction	mg/kg	465		486	--		169	--		--		654		576	--		5430 f	--		353				
Lead - Fine Fraction	mg/kg	465		465	--		165	--		--		725		883	--		8170 f	--		425				
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	465		481	--		168	--		--		668		648	--		5880	--		374				
Magnesium	mg/kg	13500 J		8130 J	--		12200	--		--		16300 J		16800 J	--		8820	--		18500 J				
Manganese	mg/kg	919 J		510 J	--		508	--		--		1840 e		729	--		1200	--		5220 J e				
Mercury	mg/kg	0.19		0.17	--		0.081	--		--		0.33 J		0.27 J	--		0.14	--		0.047				
Nickel	mg/kg	23.3		13.6	--		40.3	--		--		40.2		19.7	--		23.1	--		17.1				
Potassium	mg/kg	672		409 J	--		782	--		--		817		722	--		842	--		880				
Selenium	mg/kg	0.60		0.36	--		0.46	--		--		0.63		0.82	--		0.75	--		0.44				
Silver	mg/kg	0.16		0.070 J	--		0.11	--		--		0.32		0.24	--		0.29	--		0.12				
Sodium	mg/kg	154		120	--		106	--		--		760		756	--		596	--		118				
Thallium	mg/kg	0.13		0.073 J	--		0.082 J	--		--		0.13		0.13	--		ND(0.095)	--		0.13				
Vanadium	mg/kg	16.5		10.6	--		16.8	--		--		18.7 J		13.0 J	--		15.5	--		70.9				
Zinc	mg/kg	262		125	--		140	--		--		444		375	--		297	--		111				
PCBs																								
Aroclor-1016 (PCB-1016)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		ND(2)	--		ND(19)				
Aroclor-1221 (PCB-1221)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		ND(2)	--		ND(19)				
Aroclor-1232 (PCB-1232)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		ND(2)	--		ND(19)				
Aroclor-1242 (PCB-1242)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		4.2	--		ND(19)				
Aroclor-1248 (PCB-1248)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		ND(2)	--		ND(19)				
Aroclor-1254 (PCB-1254)	mg/kg	ND(2)		ND(3.9)	--		ND(1.9)	--		--		ND(3.6)		ND(3.7)	--		ND(2)	--		ND(19)				
Aroclor-1260 (PCB-1260)	mg/kg	19		32	--		17	--		--		47		55	--		12	--		150				
Total PCBs	mg/kg	19 f		32 f	--		17 f	--		--		47 f		55 f	--		16.2 f	--		150 f				
Semi-Volatile Organic Compounds																								
2,2'-oxybis(1-Chloropropane)	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,4,5-Trichlorophenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,4,6-Trichlorophenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,4-Dichlorophenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,4-Dimethylphenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,4-Dinitrophenol	ug/kg	ND(4500)		ND(4500)	--		ND(680)	--		--		ND(4100)		ND(4200)	--		ND(8900)	--		ND(670)				
2,4-Dinitrotoluene	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2,6-Dinitrotoluene	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2-Chloronaphthalene	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2-Chlorophenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2-Methylnaphthalene	ug/kg	ND(7900)		ND(7800)	--		34 J	--		--		810 J		950 J	--		ND(16000)	--		ND(1200)				
2-Methylphenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
2-Nitroaniline	ug/kg	ND(6000)		ND(5900)	--		ND(910)	--		--		ND(5500)		ND(5600)	--		ND(12000)	--		ND(900)				
2-Nitrophenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
3,3'-Dichlorobenzidine	ug/kg	ND(48000)		ND(47000)	--		ND(7300)	--		--		ND(44000)		ND(44000)	--		ND(95000)	--		ND(7200)				
3-Nitroaniline	ug/kg	ND(6000)		ND(5900)	--		ND(910)	--		--		ND(5500)		ND(5600)	--		ND(12000)	--		ND(900)				
4,6-Dinitro-2-methylphenol	ug/kg	ND(4500)		ND(4500)	--		ND(680)	--		--		ND(4100)		ND(4200)	--		ND(8900)	--		ND(670)				
4-Bromophenyl phenyl ether	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
4-Chloro-3-methylphenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
4-Chloroaniline	ug/kg	ND(4500)		ND(4500)	--		ND(680)	--		--		ND(4100)		ND(8900)	--		ND(4200)	--		ND(670)				
4-Chlorophenyl phenyl ether	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
4-Methylphenol	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
4-Nitroaniline	ug/kg	ND(6000)		ND(5900)	--		ND(910)	--		--		ND(5500)		ND(5600)	--		ND(12000)	--		ND(900)				
4-Nitrophenol	ug/kg	ND(9800)		ND(9800)	--		ND(1500)	--		--		ND(9100)		ND(9200)	--		ND(20000)	--		ND(1500)				
Acenaphthene	ug/kg	ND(7900)		ND(7800)	--		79 J	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
Acenaphthylene	ug/kg	ND(7900)		ND(7800)	--		34 J	--		--		260 J		ND(7300)	--		ND(16000)	--		77 J				
Acetophenone	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
Anthracene	ug/kg	ND(7900)		ND(7800)	--		160 J	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		74 J				
Atrazine	ug/kg	ND(1200)		ND(1200)	--		ND(180)	--		--		ND(1100)		ND(1100)	--		ND(2400)	--		ND(180)				
Benzaldehyde	ug/kg	ND(7900)		ND(7800)	--		ND(1200)	--		--		ND(7300)		ND(7300)	--		ND(16000)	--		ND(1200)				
Benzo(a)anthracene	ug/kg	590 J		590 J	--		1900	--		--		1500 J		1900 J	--		ND(16000)	--		900 J				

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		lab composite B7,B8,B9	lab composite B7,B8,B9	C3	lab composite C1,C2,C3	C6	C6	lab composite C4,C5,C6	lab composite C4,C5,C6	C8	lab composite C7,C8,C9	D1	lab composite D1,D2,D3
Sample ID		S-48041-062008-MC-001	S-48041-062008-MC-002	S-48041-062008-MC-009 C3	S-48041-062008-MC-009 C1 C2 C3	S-48041-061808-MC-004 C6	S-48041-061808-MC-005 C6	S-48041-061808-MC-004	S-48041-061808-MC-005	S-048041-022908-DD-017C8	S-048041-022908-DD-017	S-48041-062008-MC-010 D1	S-48041-062008-MC-010
Sample Date		6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/18/2008	6/18/2008	6/18/2008	6/18/2008	2/29/2008	2/29/2008	6/20/2008	6/20/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0.67-1.2 ft BGS	0-1.6 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Duplicate	Final	Duplicate	Final	Duplicate	Final	Duplicate	Final	Duplicate	Final	Final
Units													
Benzo(a)pyrene	ug/kg	720 J	740 J	--	3400	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	1500
Benzo(b)fluoranthene	ug/kg	1200 J	1200 J	--	4200	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	1800
Benzo(g,h,i)perylene	ug/kg	810 J	700 J	--	2500	--	--	1200 J	1100 J	--	ND(16000)	--	950 J
Benzo(k)fluoranthene	ug/kg	290 J	390 J	--	1500	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	810 J
Biphenyl	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
bis(2-Chloroethoxy)methane	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
bis(2-Chloroethyl)ether	ug/kg	ND(2400)	ND(2400)	--	ND(360)	--	--	ND(2200)	ND(2200)	--	ND(4800)	--	ND(360)
bis(2-Ethylhexyl)phthalate	ug/kg	ND(7900)	540 J	--	ND(1200)	--	--	950 J	ND(7300)	--	1500 J	--	ND(1200)
Butyl benzylphthalate	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	3500 J	2200 J	--	ND(16000)	--	ND(1200)
Caprolactam	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Carbazole	ug/kg	ND(7900)	ND(7800)	--	88 J	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Chrysene	ug/kg	650 J	670 J	--	2400	--	--	1400 J	1700 J	--	730 J	--	870 J
Dibenz(a,h)anthracene	ug/kg	ND(7900)	ND(7800)	--	630 J	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	190 J
Dibenzofuran	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Diethyl phthalate	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Dimethyl phthalate	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Di-n-butylphthalate	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	1100 J	--	ND(1200)
Di-n-octyl phthalate	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Fluoranthene	ug/kg	830 J	800 J	--	2200	--	--	3000 J	3900 J	--	1800 J	--	940 J
Fluorene	ug/kg	ND(7900)	ND(7800)	--	46 J	--	--	940 J	1100 J	--	ND(16000)	--	ND(1200)
Hexachlorobenzene	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Hexachlorobutadiene	ug/kg	ND(1200)	ND(1200)	--	ND(180)	--	--	ND(1100)	ND(1100)	--	ND(2400)	--	ND(180)
Hexachlorocyclopentadiene	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Hexachloroethane	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Indeno(1,2,3-cd)pyrene	ug/kg	540 J	670 J	--	2100	--	--	940 J	920 J	--	ND(16000)	--	810 J
Isophorone	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Naphthalene	ug/kg	ND(7900)	ND(7800)	--	33 J	--	--	320 J	310 J	--	ND(16000)	--	ND(1200)
Nitrobenzene	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
N-Nitrosodi-n-propylamine	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
N-Nitrosodiphenylamine	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Pentachlorophenol	ug/kg	ND(4500)	ND(4500)	--	ND(680)	--	--	ND(4100)	ND(4200)	--	ND(8900)	--	ND(670)
Phenanthrene	ug/kg	ND(7900)	290 J	--	590 J	--	--	2600 J	3000 J	--	1200 J	--	210 J
Phenol	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	ND(16000)	--	ND(1200)
Pyrene	ug/kg	900 J	810 J	--	2100	--	--	2500 J	3200 J	--	1600 J	--	870 J
Pyridine	ug/kg	ND(7900)	ND(7800)	--	ND(1200)	--	--	ND(7300)	ND(7300)	--	--	--	ND(1200)
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,1,2,2-Tetrachloroethane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,1,2-Trichloroethane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,1-Dichloroethane	ug/kg	--	--	ND(51)	--	11 J	ND(190)	--	--	ND(43)	--	ND(46)	--
1,1-Dichloroethene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,2,4-Trichlorobenzene	ug/kg	--	--	ND(260)	--	190 J	150 J	--	--	88 J	--	700	--
1,2,4-Trimethylbenzene	ug/kg	--	--	55 J	--	740 J	760 J	--	--	330	--	35 J	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
1,2-Dichlorobenzene	ug/kg	--	--	ND(100)	--	ND(100)	ND(390)	--	--	61 J	--	29 J	--
1,2-Dichloroethane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,2-Dichloropropane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
1,3,5-Trimethylbenzene	ug/kg	--	--	ND(100)	--	120 J	130 J	--	--	150	--	ND(92)	--
1,3-Dichlorobenzene	ug/kg	--	--	ND(100)	--	34 J	ND(390)	--	--	ND(86)	--	62 J	--
1,4-Dichlorobenzene	ug/kg	--	--	ND(100)	--	18 J	ND(390)	--	--	ND(86)	--	250	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	--	--	ND(770)	--	ND(750)	ND(2900)	--	--	ND(650)	--	ND(690)	--
2-Hexanone	ug/kg	--	--	ND(2600)	--	ND(2500)	ND(9600)	--	--	ND(2200)	--	ND(2300)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	--	--	34 J	--	91 J	120 J	--	--	190 J	--	21 J	--
Acetone	ug/kg	--	--	ND(770)	--	ND(750)UJ	ND(2900)	--	--	ND(650)	--	ND(690)	--
Benzene	ug/kg	--	--	9.9 J	--	48 J	59 J	--	--	23 J	--	10 J	--
Bromodichloromethane	ug/kg	--	--	ND(100)	--	ND(100)	ND(390)	--	--	ND(86)	--	ND(92)	--
Bromoform	ug/kg	--	--	ND(100)	--	ND(100)	ND(390)	--	--	ND(86)	--	ND(92)	--
Bromomethane (Methyl Bromide)	ug/kg	--	--	ND(210)	--	ND(200)	ND(770)	--	--	ND(170)	--	ND(180)	--
Carbon disulfide	ug/kg	--	--	ND(260)	--	39 J	ND(960)	--	--	ND(220)	--	ND(230)	--
Carbon tetrachloride	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Chlorobenzene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	40 J	--
Chloroethane	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
Chloroform (Trichloromethane)	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Chloromethane (Methyl Chloride)	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
cis-1,2-Dichloroethene	ug/kg	--	--	ND(51)	--	34 J	ND(190)	--	--	ND(43)	--	ND(46)	--
cis-1,3-Dichloropropene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Cyclohexane	ug/kg	--	--	85 J	--	88 J	260 J	--	--	62 J	--	66 J	--
Dibromochloromethane	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	--	--	ND(100)	--	ND(100)	ND(390)	--	--	ND(86)	--	ND(92)	--
Ethylbenzene	ug/kg	--	--	17 J	--	78 J	79 J	--	--	110	--	13 J	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		lab composite B7,B8,B9	lab composite B7,B8,B9	C3	lab composite C1,C2,C3	C6	C6	lab composite C4,C5,C6	lab composite C4,C5,C6	C8	lab composite C7,C8,C9	D1	lab composite D1,D2,D3
Sample ID		S-48041-062008-MC-001	S-48041-062008-MC-002	S-48041-062008-MC-009 C3	S-48041-062008-MC-009 C1 C2 C3	S-48041-061808-MC-004 C6	S-48041-061808-MC-005 C6	S-48041-061808-MC-004	S-48041-061808-MC-005	S-048041-022908-DD-017C8	S-048041-022908-DD-017	S-48041-062008-MC-010 D1	S-48041-062008-MC-010
Sample Date		6/20/2008	6/20/2008	6/20/2008	6/20/2008	6/18/2008	6/18/2008	6/18/2008	6/18/2008	2/29/2008	2/29/2008	6/20/2008	6/20/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0.67-1.2 ft BGS	0-1.6 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Duplicate	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final
	Units												
Isopropylbenzene	ug/kg	--	--	ND(260)	--	100 J	100 J	--	--	61 J	--	ND(230)	--
Methyl acetate	ug/kg	--	--	390 J	--	120 J	ND(4600)	--	--	130 J	--	160 J	--
Methyl cyclohexane	ug/kg	--	--	78 J	--	64 J	43 J	--	--	140 J	--	30 J	--
Methyl Tert Butyl Ether	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
Methylene chloride	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
Styrene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Tetrachloroethene	ug/kg	--	--	ND(51)	--	11 J	ND(190)	--	--	34 J	--	ND(46)	--
Toluene	ug/kg	--	--	110	--	94 J	100 J	--	--	270	--	46 J	--
trans-1,2-Dichloroethene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
trans-1,3-Dichloropropene	ug/kg	--	--	ND(51)	--	ND(50)	ND(190)	--	--	ND(43)	--	ND(46)	--
Trichloroethene	ug/kg	--	--	ND(51)	--	26 J	ND(190)	--	--	560	--	30 J	--
Trichlorofluoromethane (CFC-11)	ug/kg	--	--	ND(100)	--	ND(100)	ND(390)	--	--	ND(86)	--	ND(92)	--
Trifluorotrichloroethane (Freon 113)	ug/kg	--	--	ND(260)	--	ND(250)	ND(960)	--	--	ND(220)	--	ND(230)	--
Vinyl chloride	ug/kg	--	--	ND(41)	--	ND(40)	ND(150)	--	--	ND(35)	--	ND(37)	--
Xylene (total)	ug/kg	--	--	130 J	--	310 J	330 J	--	--	410	--	65 J	--

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		D4	lab composite D6,D5,D4	D9	lab composite D7,D8,D9	E2	E2	lab composite E1,E2,E3	lab composite E1,E2,E3	E6	lab composite E4,E5,E6	F1	lab composite F1,F2,F3	F4	lab composite F4,F5,F6
Sample ID		S-048041-030308-DD-019D4	S-048041-030308-DD-019D	S-48041-061808-MC-006 D9	S-48041-061808-MC-006	S-48041-061208-AF-002 E2	S-48041-061208-AF-003 E2	S-48041-061208-AF-002	S-48041-061208-AF-003	S-48041-061208-AF-004 E6	S-48041-061208-AF-004	S-48041-062008-MC-005 F1	S-48041-062008-MC-005	S-48041-061208-AF-005 F4	S-48041-061208-AF-005
Sample Date		3/3/2008	3/3/2008	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/12/2008	6/12/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final	Final	Final
Units															
Metals															
Aluminum	mg/kg	--	7260	--	13500	--	--	12000	8490	--	10900	--	4740	--	9420
Antimony	mg/kg	--	1.0 J	--	0.24 J	--	--	0.63 J	1.1 J	--	1.1 J	--	0.17 J	--	0.95 J
Arsenic	mg/kg	--	7.8	--	2.6	--	--	6.8 J	4.6 J	--	7.3 J	--	1.6	--	5.7 J
Barium	mg/kg	--	188 J	--	194	--	--	196 J	182 J	--	326 J	--	58.0 J	--	229 J
Beryllium	mg/kg	--	0.96 J	--	3.1	--	--	2.6	1.3	--	0.84	--	0.72	--	0.27
Cadmium	mg/kg	--	1.0 J	--	0.52	--	--	3.4	2.7	--	4.7	--	0.48	--	3.2
Calcium	mg/kg	--	33000	--	53600	--	--	56600	55300	--	55500	--	52300 J	--	58400
Chromium Total	mg/kg	--	47.8 J	--	22.3 J	--	--	54.0 J	60.6 J	--	112 J	--	11.4	--	218 J
Chromium VI (Hexavalent)	mg/kg	--	1.5	--	1.3	--	--	2.4 J	3.1 J	--	1.6 J	--	0.98	--	2.4 J
Cobalt	mg/kg	--	3.8 J	--	2.3	--	--	3.0	4.0	--	5.7	--	2.0	--	4.4
Copper	mg/kg	--	41.3 J	--	22.8 J	--	--	68.1	80.9	--	154	--	11.2 J	--	63.0
Iron	mg/kg	--	28100	--	8210	--	--	18900	22100	--	28300	--	6010	--	44900
Lead - Coarse Fraction	mg/kg	--	226	--	112	--	--	707	648	--	1060 f	--	129	--	742
Lead - Fine Fraction	mg/kg	--	549	--	308	--	--	999 f	1010 f	--	1060 f	--	351	--	783
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--	324	--	164	--	--	873	798	--	1060	--	171	--	754
Magnesium	mg/kg	--	8340	--	43300 J	--	--	19100 J	12000 J	--	35400 J	--	19700 J	--	19700 J
Manganese	mg/kg	--	1130	--	1280	--	--	1490	977	--	1540 e	--	565 J	--	7510 e
Mercury	mg/kg	--	0.092	--	0.049 J	--	--	0.18	0.26	--	0.18	--	0.031 J	--	0.10
Nickel	mg/kg	--	16.4 J	--	12.4	--	--	23.4	29.0	--	33.3	--	7.4	--	22.3
Potassium	mg/kg	--	750 J	--	1500	--	--	1130	944	--	1440	--	411 J	--	955
Selenium	mg/kg	--	1.3 J	--	1.5	--	--	2.0	1.3	--	1.5	--	0.51	--	1.0
Silver	mg/kg	--	0.15	--	0.081 J	--	--	0.13	0.17	--	0.37	--	0.040 J	--	0.22
Sodium	mg/kg	--	228 J	--	673	--	--	565	410	--	346	--	253	--	379
Thallium	mg/kg	--	0.15	--	0.058 J	--	--	0.17	0.19	--	0.34	--	0.11	--	0.27
Vanadium	mg/kg	--	23.3 J	--	18.4 J	--	--	17.6 J	19.5 J	--	50.6 J	--	7.6	--	91.7 J
Zinc	mg/kg	--	124	--	134	--	--	358 J	402 J	--	592 J	--	60.1	--	432 J
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg	--	ND(8.3)	--	ND(1.8)	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	ND(0.19)	--	ND(3.9)
Aroclor-1221 (PCB-1221)	mg/kg	--	ND(8.3)	--	ND(8.3)	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	ND(0.19)	--	ND(3.9)
Aroclor-1232 (PCB-1232)	mg/kg	--	ND(8.3)	--	ND(1.8)	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	ND(0.19)	--	ND(3.9)
Aroclor-1242 (PCB-1242)	mg/kg	--	ND(8.3)	--	ND(8.3)	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	ND(0.19)	--	ND(3.9)
Aroclor-1248 (PCB-1248)	mg/kg	--	ND(8.3)	--	ND(1.8)	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	ND(0.19)	--	ND(3.9)
Aroclor-1254 (PCB-1254)	mg/kg	--	ND(8.3)	--	ND(1.8)	--	--	14 J	8.5 J	--	7	--	ND(0.19)	--	ND(3.9)
Aroclor-1260 (PCB-1260)	mg/kg	--	65	--	19	--	--	ND(1.9)	ND(1.9)	--	ND(1.9)	--	0.25	--	20
Total PCBs	mg/kg	--	65 f	--	19 f	--	--	14	8.5	--	7	--	0.25	--	20 f
Semi-Volatile Organic Compounds															
2,2'-oxybis(1-Chloropropane)	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,4,5-Trichlorophenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,4,6-Trichlorophenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,4-Dichlorophenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,4-Dimethylphenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,4-Dinitrophenol	ug/kg	--	ND(3800)	--	ND(810)	--	--	ND(3500)	ND(3400)	--	ND(3600)	--	ND(1700)	--	ND(3600)
2,4-Dinitrotoluene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2,6-Dinitrotoluene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2-Chloronaphthalene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2-Chlorophenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2-Methylnaphthalene	ug/kg	--	210 J	--	ND(1400)	--	--	240 J	160 J	--	ND(6000)	--	ND(3000)	--	190 J
2-Methylphenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
2-Nitroaniline	ug/kg	--	ND(5000)	--	ND(1100)	--	--	ND(4600)	ND(4600)	--	ND(4600)	--	ND(2300)	--	ND(4800)
2-Nitrophenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(3000)	--	ND(6000)	--	ND(6300)	--	ND(6300)
3,3'-Dichlorobenzidine	ug/kg	--	ND(40000)	--	ND(8600)	--	--	ND(37000)	ND(37000)	--	ND(37000)	--	ND(18000)	--	ND(38000)
3-Nitroaniline	ug/kg	--	ND(5000)	--	ND(1100)	--	--	ND(4600)	ND(4600)	--	ND(4600)	--	ND(2300)	--	ND(4800)
4,6-Dinitro-2-methylphenol	ug/kg	--	ND(3800)	--	ND(810)	--	--	ND(3500)	ND(3500)	--	ND(3400)	--	ND(1700)	--	ND(3600)
4-Bromophenyl phenyl ether	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
4-Chloro-3-methylphenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
4-Chloroaniline	ug/kg	--	ND(3800)	--	ND(810)	--	--	ND(3500)	ND(3500)	--	ND(3400)	--	ND(1700)	--	ND(3600)
4-Chlorophenyl phenyl ether	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
4-Methylphenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
4-Nitroaniline	ug/kg	--	ND(5000)	--	ND(1100)	--	--	ND(4600)	ND(4600)	--	ND(4600)	--	ND(2300)	--	ND(4800)
4-Nitrophenol	ug/kg	--	ND(8300)	--	ND(1800)	--	--	ND(7700)	ND(7900)	--	ND(3800)	--	ND(7900)	--	ND(9600)
Acenaphthene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Acenaphthylene	ug/kg	--	180 J	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Acetophenone	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Anthracene	ug/kg	--	650 J	--	ND(1400)	--	--	220 J	190 J	--	170 J	--	ND(3000)	--	190 J
Atrazine	ug/kg	--	ND(1000)	--	ND(220)	--	--	ND(930)	ND(930)	--	ND(910)	--	ND(450)	--	ND(960)
Benzaldehyde	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Benzo(a)anthracene	ug/kg	--	3000 J	--	ND(1400)	--	--	820 J	710 J	--	570 J	--	290 J	--	970 J

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		D4	lab composite D6,D5,D4	D9	lab composite D7,D8,D9	E2	E2	lab composite E1,E2,E3	lab composite E1,E2,E3	E6	lab composite E4,E5,E6	F1	lab composite F1,F2,F3	F4	lab composite F4,F5,F6
Sample ID		S-048041-030308-DD-019D4	S-048041-030308-DD-019D	S-48041-061808-MC-006 D9	S-48041-061808-MC-006	S-48041-061208-AF-002 E2	S-48041-061208-AF-003 E2	S-48041-061208-AF-002	S-48041-061208-AF-003	S-48041-061208-AF-004 E6	S-48041-061208-AF-004	S-48041-062008-MC-005 F1	S-48041-062008-MC-005	S-48041-061208-AF-005 F4	S-48041-061208-AF-005
Sample Date		3/3/2008	3/3/2008	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/12/2008	6/12/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final	Final	Final
	Units														
Benzo(a)pyrene	ug/kg	--	3100 J	--	270 J	--	--	980 J	710 J	--	740 J	--	370 J	--	960 J
Benzo(b)fluoranthene	ug/kg	--	3600 J	--	370 J	--	--	1400 J	1100 J	--	1200 J	--	480 J	--	1400 J
Benzo(g,h,i)perylene	ug/kg	--	2100 J	--	280 J	--	--	1100 J	890 J	--	1300 J	--	340 J	--	1200 J
Benzo(k)fluoranthene	ug/kg	--	2000 J	--	140 J	--	--	440 J	390 J	--	440 J	--	230 J	--	590 J
Biphenyl	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
bis(2-Chloroethoxy)methane	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
bis(2-Chloroethyl)ether	ug/kg	--	ND(2000)	--	ND(430)	--	--	ND(1900)	ND(1900)	--	ND(1800)	--	ND(910)	--	ND(1900)
bis(2-Ethylhexyl)phthalate	ug/kg	--	ND(6700)	--	240 J	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	360 J	--	780 J
Butyl benzylphthalate	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Caprolactam	ug/kg	--	ND(6700)	--	ND(1400)	--	--	1600 J	1400 J	--	970 J	--	ND(3000)	--	1200 J
Carbazole	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Chrysene	ug/kg	--	2800 J	--	280 J	--	--	790 J	610 J	--	610 J	--	300 J	--	890 J
Dibenz(a,h)anthracene	ug/kg	--	610 J	--	ND(1400)	--	--	210 J	ND(6100)	--	190 J	--	ND(3000)	--	200 J
Dibenzofuran	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Diethyl phthalate	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Dimethyl phthalate	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Di-n-butylphthalate	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Di-n-octyl phthalate	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Fluoranthene	ug/kg	--	5600 J	--	220 J	--	--	1200 J	1000 J	--	900 J	--	550 J	--	1100 J
Fluorene	ug/kg	--	220 J	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Hexachlorobenzene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Hexachlorobutadiene	ug/kg	--	ND(1000)	--	ND(220)	--	--	ND(930)	ND(930)	--	ND(910)	--	ND(450)	--	ND(960)
Hexachlorocyclopentadiene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Hexachloroethane	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Indeno(1,2,3-cd)pyrene	ug/kg	--	1900 J	--	190 J	--	--	760 J	660 J	--	790 J	--	270 J	--	970 J
Isophorone	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Naphthalene	ug/kg	--	180 J	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	160 J
Nitrobenzene	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
N-Nitrosodi-n-propylamine	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
N-Nitrosodiphenylamine	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Pentachlorophenol	ug/kg	--	ND(3800)	--	ND(810)	--	--	ND(3500)	ND(3500)	--	ND(3400)	--	ND(1700)	--	ND(3600)
Phenanthrene	ug/kg	--	2200 J	--	72 J	--	--	570 J	430 J	--	190 J	--	190 J	--	500 J
Phenol	ug/kg	--	ND(6700)	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Pyrene	ug/kg	--	4400 J	--	270 J	--	--	1100 J	880 J	--	830 J	--	390 J	--	1100 J
Pyridine	ug/kg	--	--	--	ND(1400)	--	--	ND(6100)	ND(6100)	--	ND(6000)	--	ND(3000)	--	ND(6300)
Volatile Organic Compounds															
1,1,1-Trichloroethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,1,2,2-Tetrachloroethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,1,2-Trichloroethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,1-Dichloroethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,1-Dichloroethene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,2,4-Trichlorobenzene	ug/kg	ND(210)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	28 J	--
1,2,4-Trimethylbenzene	ug/kg	54 J	--	ND(86)	--	ND(100)	ND(97)	--	--	33 J	--	ND(95)	--	79 J	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
1,2-Dichlorobenzene	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
1,2-Dichloroethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,2-Dichloropropane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
1,3,5-Trimethylbenzene	ug/kg	49 J	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
1,3-Dichlorobenzene	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
1,4-Dichlorobenzene	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	9.1 J	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	ND(790)	--	ND(640)	--	ND(780)	ND(730)	--	--	72 J	--	ND(710)	--	96 J	--
2-Hexanone	ug/kg	ND(2600)	--	ND(2100)	--	ND(2600)	ND(2400)	--	--	ND(2200)	--	ND(2400)	--	ND(2300)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	190 J	--	ND(2100)	--	ND(2600)	ND(2400)	--	--	ND(2200)	--	ND(2400)	--	67 J	--
Acetone	ug/kg	ND(790)	--	ND(640)UJ	--	ND(780)	ND(730)	--	--	ND(660)UJ	--	ND(710)	--	ND(680)	--
Benzene	ug/kg	14 J	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(47)	--	ND(45)	--	ND(45)	--
Bromodichloromethane	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
Bromoform	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
Bromomethane (Methyl Bromide)	ug/kg	ND(210)	--	ND(170)	--	ND(210)	ND(190)	--	--	ND(180)	--	ND(190)	--	ND(180)	--
Carbon disulfide	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
Carbon tetrachloride	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Chlorobenzene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Chloroethane	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
Chloroform (Trichloromethane)	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Chloromethane (Methyl Chloride)	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
cis-1,2-Dichloroethene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	22 J	--
cis-1,3-Dichloropropene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Cyclohexane	ug/kg	61 J	--	ND(1000)	--	ND(1200)	ND(1200)	--	--	ND(1100)	--	ND(1100)	--	69 J	--
Dibromochloromethane	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
Ethylbenzene	ug/kg	35 J	--	ND(43)	--	ND(52)	ND(49)	--	--	13 J	--	ND(47)	--	24 J	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		D4	lab composite D6,D5,D4	D9	lab composite D7,D8,D9	E2	E2	lab composite E1,E2,E3	lab composite E1,E2,E3	E6	lab composite E4,E5,E6	F1	lab composite F1,F2,F3	F4	lab composite F4,F5,F6
Sample ID		S-048041-030308-DD-019D4	S-048041-030308-DD-019D	S-48041-061808-MC-006 D9	S-48041-061808-MC-006	S-48041-061208-AF-002 E2	S-48041-061208-AF-003 E2	S-48041-061208-AF-002	S-48041-061208-AF-003	S-48041-061208-AF-004 E6	S-48041-061208-AF-004	S-48041-062008-MC-005 F1	S-48041-062008-MC-005	S-48041-061208-AF-005 F4	S-48041-061208-AF-005
Sample Date		3/3/2008	3/3/2008	6/18/2008	6/18/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/12/2008	6/12/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final	Final	Final
	Units														
Isopropylbenzene	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	33 J	--
Methyl acetate	ug/kg	ND(1300)	--	160 J	--	110 J	ND(1200)	--	--	130 J	--	ND(1100)	--	250 J	--
Methyl cyclohexane	ug/kg	96 J	--	ND(1000)	--	ND(1200)	ND(1200)	--	--	49 J	--	ND(1100)	--	150 J	--
Methyl Tert Butyl Ether	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
Methylene chloride	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
Styrene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Tetrachloroethene	ug/kg	27 J	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	29 J	--
Toluene	ug/kg	240	--	ND(86)	--	ND(100)	ND(97)	--	--	27 J	--	ND(95)	--	71 J	--
trans-1,2-Dichloroethene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
trans-1,3-Dichloropropene	ug/kg	ND(52)	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	ND(47)	--	ND(45)	--
Trichloroethene	ug/kg	39 J	--	ND(43)	--	ND(52)	ND(49)	--	--	ND(44)	--	22 J	--	65	--
Trichlorofluoromethane (CFC-11)	ug/kg	ND(100)	--	ND(86)	--	ND(100)	ND(97)	--	--	ND(89)	--	ND(95)	--	ND(90)	--
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(260)	--	ND(210)	--	ND(260)	ND(240)	--	--	ND(220)	--	ND(240)	--	ND(230)	--
Vinyl chloride	ug/kg	ND(42)	--	ND(34)	--	ND(42)	ND(39)	--	--	ND(35)	--	ND(38)	--	ND(36)	--
Xylene (total)	ug/kg	140 J	--	26 J	--	ND(160)	ND(150)	--	--	54 J	--	ND(140)	--	170	--

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	F9	lab composite F7,F8,F9	G3	lab composite G1,G2,G3	G6	lab composite G6,G5,G4	G8	lab composite G7,G8,G9	H1	lab composite H1,H2,H3	H5	lab composite H4,H5,H6	H8	lab composite H7,H8,H9
Sample ID	S-48041-062008-MC-006 F9	S-48041-062008-MC-006	S-048041-022808-DD-001G3	S-048041-022808-DD-001	S-048041-022808-DD-002G6	S-048041-022808-DD-002	S-48041-062008-MC-007 G8	S-48041-062008-MC-007	S-048041-022808-DD-003H1	S-048041-022808-DD-003	S-048041-022808-DD-004H5	S-048041-022808-DD-004	S-048041-022808-DD-005H8	S-048041-022808-DD-005
Sample Date	6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008
Sample Depth	0-0.5 ft BGS	0-0.5 ft BGS	1-1.5 ft BGS	0-1.5 ft BGS	0.83-1.3 ft BGS	0-1.3 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	1.2-1.7 ft BGS	0-1.7 ft BGS	0.5-0.58 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Units														
Metals														
Aluminum	mg/kg	--	9790	--	8150	--	9810	--	6330	--	11200	--	7990	9490
Antimony	mg/kg	--	1.7 J	--	0.46 J	--	0.46 J	--	1.8 J	--	0.14 J	--	0.96 J	0.37 J
Arsenic	mg/kg	--	6.0	--	5.7	--	7.0	--	3.7	--	1.3	--	7.5	3.9
Barium	mg/kg	--	284 J	--	170 J	--	219 J	--	124 J	--	142 J	--	271 J	182 J
Beryllium	mg/kg	--	1.1	--	1.5	--	1.6	--	0.41	--	3.3	--	1.2	2.1
Cadmium	mg/kg	--	4.0	--	1.2	--	1.4	--	2.1	--	0.21	--	3.1	0.92
Calcium	mg/kg	--	56100 J	--	58300	--	59300	--	33400 J	--	94300	--	51900	97600
Chromium Total	mg/kg	--	104	--	58.0 J	--	39.2 J	--	72.0	--	103 J	--	91.8 J	79.1 J
Chromium VI (Hexavalent)	mg/kg	--	0.53 J	--	ND(0.93)	--	0.57 J	--	1.9	--	ND(0.90)	--	0.47 J	0.34 J
Cobalt	mg/kg	--	8.3	--	4.0	--	5.5	--	0.85	--	5.5	--	5.5	2.6
Copper	mg/kg	--	168 J	--	35.9	--	64.9	--	96.2 J	--	9.9	--	95.5	29.5
Iron	mg/kg	--	19200	--	13200	--	15300	--	18200	--	7560	--	24700	20700
Lead - Coarse Fraction	mg/kg	--	484	--	185	--	284	--	273	--	292	--	494	156
Lead - Fine Fraction	mg/kg	--	633	--	313	--	470	--	290	--	558	--	657	446
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--	512	--	219	--	303	--	276	--	364	--	534	266
Magnesium	mg/kg	--	14100 J	--	15400	--	12600	--	8190 J	--	26900	--	11400	23300
Manganese	mg/kg	--	965 J	--	1630 e	--	779	--	661 J	--	2170 e	--	2120 e	3990 e
Mercury	mg/kg	--	0.27	--	0.20	--	0.28	--	0.058	--	0.20	--	0.15	
Nickel	mg/kg	--	102	--	17.4	--	24.4	--	32.1	--	3.7	--	26.3	10.7
Potassium	mg/kg	--	1010	--	716	--	1270	--	703	--	738	--	1110	754
Selenium	mg/kg	--	1.1	--	1.1	--	1.2	--	0.52	--	1.6	--	1.3	1.3
Silver	mg/kg	--	0.58	--	0.10	--	0.25	--	0.22	--	0.058 J	--	0.30	0.093 J
Sodium	mg/kg	--	475	--	335	--	222	--	267	--	518	--	438	371
Thallium	mg/kg	--	0.21	--	0.19	--	0.22	--	ND(0.48)	--	0.040 J	--	0.16	0.093 J
Vanadium	mg/kg	--	23.7	--	21.3 J	--	19.9 J	--	18.3	--	21.7 J	--	30.4 J	42.9 J
Zinc	mg/kg	--	1720	--	159	--	243	--	671	--	33.8	--	3050	144
PCBs														
Aroclor-1016 (PCB-1016)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1221 (PCB-1221)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1232 (PCB-1232)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1242 (PCB-1242)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1248 (PCB-1248)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1254 (PCB-1254)	mg/kg	--	ND(4.3)	--	ND(1.9)	--	ND(2.2)	--	ND(3.9)	--	ND(3.7)	--	ND(3.9)	ND(2)
Aroclor-1260 (PCB-1260)	mg/kg	--	14	--	12	--	17	--	8	--	31	--	18	12
Total PCBs	mg/kg	--	14	--	12	--	17 f	--	8	--	31 f	--	18 f	12
Semi-Volatile Organic Compounds														
2,2'-oxybis(1-Chloropropane)	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,4,5-Trichlorophenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,4,6-Trichlorophenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,4-Dichlorophenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,4-Dimethylphenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,4-Dinitrophenol	ug/kg	--	ND(9700)	--	ND(4300)	--	ND(1800)	--	ND(3400)	--	ND(20000)	--	ND(4500)	ND(8000)
2,4-Dinitrotoluene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2,6-Dinitrotoluene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2-Chloronaphthalene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2-Chlorophenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2-Methylnaphthalene	ug/kg	--	ND(17000)	--	220 J	--	120 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	560 J
2-Methylphenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
2-Nitroaniline	ug/kg	--	ND(13000)	--	ND(5800)	--	ND(2600)	--	ND(2400)	--	ND(4500)	--	ND(27000)	ND(6100)
2-Nitrophenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
3,3'-Dichlorobenzidine	ug/kg	--	ND(100000)	--	ND(46000)	--	ND(21000)	--	ND(19000)	--	ND(36000)	--	ND(210000)	ND(48000)
3-Nitroaniline	ug/kg	--	ND(13000)	--	ND(5800)	--	ND(2600)	--	ND(2400)	--	ND(4500)	--	ND(27000)	ND(6100)
4,6-Dinitro-2-methylphenol	ug/kg	--	ND(9700)	--	ND(4300)	--	ND(2000)	--	ND(1800)	--	ND(3400)	--	ND(20000)	ND(4500)
4-Bromophenyl phenyl ether	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
4-Chloro-3-methylphenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
4-Chloroaniline	ug/kg	--	ND(9700)	--	ND(4300)	--	ND(2000)	--	ND(1800)	--	ND(3400)	--	ND(20000)	ND(4500)
4-Chlorophenyl phenyl ether	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
4-Methylphenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
4-Nitroaniline	ug/kg	--	ND(13000)	--	ND(5800)	--	ND(2600)	--	ND(2400)	--	ND(4500)	--	ND(27000)	ND(6100)
4-Nitrophenol	ug/kg	--	ND(21000)	--	ND(9500)	--	ND(4300)	--	ND(3900)	--	ND(7500)	--	ND(44000)	ND(10000)
Acenaphthene	ug/kg	--	ND(17000)	--	ND(7600)	--	180 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	270 J
Acenaphthylene	ug/kg	--	ND(17000)	--	ND(7600)	--	200 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
Acetophenone	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
Anthracene	ug/kg	--	ND(17000)	--	390 J	--	490 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
Atrazine	ug/kg	--	ND(2600)	--	ND(1200)	--	ND(520)	--	ND(900)	--	ND(5300)	--	ND(1200)	ND(1200)
Benzaldehyde	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	ND(8000)
Benzo(a)anthracene	ug/kg	--	ND(17000)	--	960 J	--	1400 J	--	260 J	--	230 J	--	ND(35000)	210 J

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		F9	lab composite F7,F8,F9	G3	lab composite G1,G2,G3	G6	lab composite G6,G5,G4	G8	lab composite G7,G8,G9	H1	lab composite H1,H2,H3	H5	lab composite H4,H5,H6	H8	lab composite H7,H8,H9
Sample ID		S-48041-062008-MC-006 F9	S-48041-062008-MC-006	S-048041-022808-DD-001G3	S-048041-022808-DD-001	S-48041-022808-DD-002G6	S-048041-022808-DD-002	S-48041-062008-MC-007 G8	S-48041-062008-MC-007	S-048041-022808-DD-003H1	S-048041-022808-DD-003	S-048041-022808-DD-004H5	S-048041-022808-DD-004	S-048041-022808-DD-005H8	S-048041-022808-DD-005
Sample Date		6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	1-1.5 ft BGS	0-1.5 ft BGS	0.83-1.3 ft BGS	0-1.3 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	1.2-1.7 ft BGS	0-1.7 ft BGS	0.5-0.58 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units														
Benzo(a)pyrene	ug/kg	--	ND(17000)	--	940 J	--	1600 J	--	290 J	--	260 J	--	1100 J	--	290 J
Benzo(b)fluoranthene	ug/kg	--	770 J	--	1400 J	--	2000 J	--	460 J	--	540 J	--	2100 J	--	500 J
Benzo(g,h,i)perylene	ug/kg	--	600 J	--	810 J	--	1600 J	--	240 J	--	330 J	--	1200 J	--	300 J
Benzo(k)fluoranthene	ug/kg	--	ND(17000)	--	520 J	--	920 J	--	200 J	--	ND(6000)	--	ND(35000)	--	ND(8000)
Biphenyl	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
bis(2-Chloroethoxy)methane	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
bis(2-Chloroethyl)ether	ug/kg	--	ND(5200)	--	ND(2300)	--	ND(1000)	--	ND(950)	--	ND(1800)	--	ND(11000)	--	ND(2400)
bis(2-Ethylhexyl)phthalate	ug/kg	--	7400 J	--	900 J	--	320 J	--	1700 J	--	ND(6000)	--	17000 J	--	960 J
Butyl benzylphthalate	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	3500 J	--	ND(8000)
Caprolactam	ug/kg	--	ND(17000)	--	ND(7600)	--	580 J	--	1100 J	--	ND(6000)	--	ND(35000)	--	ND(8000)
Carbazole	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Chrysene	ug/kg	--	ND(17000)	--	1200 J	--	1600 J	--	320 J	--	450 J	--	1700 J	--	230 J
Dibenz(a,h)anthracene	ug/kg	--	ND(17000)	--	ND(7600)	--	340 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Dibenzofuran	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Diethyl phthalate	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Dimethyl phthalate	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Di-n-butylphthalate	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Di-n-octyl phthalate	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Fluoranthene	ug/kg	--	640 J	--	1900 J	--	2600 J	--	580 J	--	450 J	--	2100 J	--	560 J
Fluorene	ug/kg	--	ND(17000)	--	430 J	--	200 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	390 J
Hexachlorobenzene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Hexachlorobutadiene	ug/kg	--	ND(2600)	--	ND(1200)	--	ND(520)	--	ND(480)	--	ND(900)	--	ND(5300)	--	ND(1200)
Hexachlorocyclopentadiene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Hexachloroethane	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Indeno(1,2,3-cd)pyrene	ug/kg	--	ND(17000)	--	660 J	--	1200 J	--	200 J	--	220 J	--	1100 J	--	230 J
Isophorone	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Naphthalene	ug/kg	--	ND(17000)	--	ND(7600)	--	140 J	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	210 J
Nitrobenzene	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
N-Nitrosodi-n-propylamine	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
N-Nitrosodiphenylamine	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Pentachlorophenol	ug/kg	--	ND(9700)	--	ND(4300)	--	ND(2000)	--	ND(1800)	--	ND(3400)	--	ND(20000)	--	ND(4500)
Phenanthrene	ug/kg	--	ND(17000)	--	1100 J	--	1700 J	--	220 J	--	240 J	--	1600 J	--	1000 J
Phenol	ug/kg	--	ND(17000)	--	ND(7600)	--	ND(3500)	--	ND(3100)	--	ND(6000)	--	ND(35000)	--	ND(8000)
Pyrene	ug/kg	--	920 J	--	1500 J	--	2400 J	--	560 J	--	510 J	--	2700 J	--	560 J
Pyridine	ug/kg	--	ND(17000)	--	--	--	--	--	ND(3100)	--	--	--	--	--	--
Volatile Organic Compounds															
1,1,1-Trichloroethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,1,2,2-Tetrachloroethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,1,2-Trichloroethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,1-Dichloroethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,1-Dichloroethene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,2,4-Trichlorobenzene	ug/kg	ND(340)	--	100 J	--	970 J	--	ND(300)	--	110 J	--	1700	--	ND(210)	--
1,2,4-Trimethylbenzene	ug/kg	430	--	140	--	77 J	--	44 J	--	91	--	2300	--	530	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)	--
1,2-Dichlorobenzene	ug/kg	ND(140)	--	ND(100)	--	110 J	--	ND(120)	--	ND(84)	--	15000	--	44 J	--
1,2-Dichloroethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,2-Dichloropropane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
1,3,5-Trimethylbenzene	ug/kg	200	--	82 J	--	ND(93)	--	ND(120)	--	72 J	--	980	--	ND(83)	--
1,3-Dichlorobenzene	ug/kg	ND(140)	--	ND(100)	--	250 J	--	ND(120)	--	ND(84)	--	ND(560)	--	ND(83)	--
1,4-Dichlorobenzene	ug/kg	ND(140)	--	ND(100)	--	470 J	--	ND(120)	--	ND(84)	--	530 J	--	ND(83)	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	170 J	--	ND(790)	--	ND(700)	--	120 J	--	59 J	--	ND(4200)	--	ND(620)	--
2-Hexanone	ug/kg	ND(3400)	--	ND(2600)	--	ND(2300)	--	ND(3000)	--	ND(2100)	--	ND(14000)	--	ND(2100)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	65 J	--	ND(2600)	--	ND(2300)	--	ND(3000)	--	ND(2100)	--	570 J	--	ND(2100)	--
Acetone	ug/kg	ND(1000)	--	ND(790)	--	ND(700)	--	ND(910)UJ	--	ND(630)	--	ND(4200)	--	ND(620)	--
Benzene	ug/kg	16 J	--	23 J	--	13 J	--	ND(61)	--	7.2 J	--	ND(280)	--	ND(41)	--
Bromodichloromethane	ug/kg	ND(140)	--	ND(100)	--	ND(93)	--	ND(120)	--	ND(84)	--	ND(560)	--	ND(83)	--
Bromoform	ug/kg	ND(140)	--	ND(100)	--	ND(93)	--	ND(120)	--	ND(84)	--	ND(560)	--	ND(83)	--
Bromomethane (Methyl Bromide)	ug/kg	ND(270)	--	ND(210)	--	ND(190)	--	ND(240)	--	ND(170)	--	ND(1100)	--	ND(170)	--
Carbon disulfide	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)	--
Carbon tetrachloride	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
Chlorobenzene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
Chloroethane	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)	--
Chloroform (Trichloromethane)	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
Chloromethane (Methyl Chloride)	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)	--
cis-1,2-Dichloroethene	ug/kg	ND(69)	--	ND(52)	--	34 J	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
cis-1,3-Dichloropropene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
Cyclohexane	ug/kg	65 J	--	100 J	--	ND(1100)	--	12 J	--	56 J	--	ND(6700)	--	52 J	--
Dibromochloromethane	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(140)	--	ND(100)	--	ND(93)	--	ND(120)	--	ND(84)	--	ND(560)	--	ND(83)	--
Ethylbenzene	ug/kg	52 J	--	57	--	30 J	--	10 J	--	24 J	--	120 J	--	360	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	F9	lab composite F7,F8,F9	G3	lab composite G1,G2,G3	G6	lab composite G6,G5,G4	G8	lab composite G7,G8,G9	H1	lab composite H1,H2,H3	H5	lab composite H4,H5,H6	H8	lab composite H7,H8,H9
Sample ID	S-48041-062008-MC-006 F9	S-48041-062008-MC-006	S-048041-022808-DD-001G3	S-048041-022808-DD-001	S-048041-022808-DD-002G6	S-048041-022808-DD-002	S-48041-062008-MC-007 G8	S-48041-062008-MC-007	S-048041-022808-DD-003H1	S-048041-022808-DD-003	S-048041-022808-DD-004H5	S-048041-022808-DD-004	S-048041-022808-DD-005H8	S-048041-022808-DD-005
Sample Date	6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/20/2008	6/20/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008
Sample Depth	0-0.5 ft BGS	0-0.5 ft BGS	1-1.5 ft BGS	0-1.5 ft BGS	0.83-1.3 ft BGS	0-1.3 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	1.2-1.7 ft BGS	0-1.7 ft BGS	0.5-0.58 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units													
Isopropylbenzene	ug/kg	20 J	--	67 J	--	64 J	--	ND(300)	--	ND(210)	--	420 J	--	64 J
Methyl acetate	ug/kg	530 J	--	280 J	--	450 J	--	560 J	--	180 J	--	ND(6700)	--	96 J
Methyl cyclohexane	ug/kg	93 J	--	240 J	--	83 J	--	33 J	--	120 J	--	ND(6700)	--	110 J
Methyl Tert Butyl Ether	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)
Methylene chloride	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)
Styrene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	42 J	--	ND(42)	--	ND(280)	--	ND(41)
Tetrachloroethene	ug/kg	19 J	--	28 J	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)
Toluene	ug/kg	110 J	--	170	--	28 J	--	40 J	--	56 J	--	220 J	--	41 J
trans-1,2-Dichloroethene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)
trans-1,3-Dichloropropene	ug/kg	ND(69)	--	ND(52)	--	ND(47)	--	ND(61)	--	ND(42)	--	ND(280)	--	ND(41)
Trichloroethene	ug/kg	ND(69)	--	65	--	210 J	--	ND(61)	--	55	--	ND(280)	--	38 J
Trichlorofluoromethane (CFC-11)	ug/kg	ND(140)	--	ND(100)	--	ND(93)	--	83 J	--	ND(84)	--	ND(560)	--	ND(83)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(340)	--	ND(260)	--	ND(230)	--	ND(300)	--	ND(210)	--	ND(1400)	--	ND(210)
Vinyl chloride	ug/kg	ND(55)	--	ND(42)	--	ND(37)	--	ND(48)	--	ND(34)	--	ND(220)	--	ND(33)
Xylene (total)	ug/kg	320	--	250	--	94 J	--	66 J	--	120 J	--	960	--	210

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		I1	lab composite I1, I3, I5	I2	lab composite I2, I4, I6	I2	lab composite I1,I2,I3	I4	lab composite I4,I5,I6	I9	lab composite I7,I8,I9	K1	lab composite K1, K2, K3	K4	lab composite K4, K5, K6
Sample ID		S-048041-070908-DD-014 I1	S-048041-070908-DD-014	S-048041-070908-DD-015 I2	S-048041-070908-DD-015	S-048041-030408-DD-020I2	S-048041-030408-DD-020	S-048041-030408-DD-021I4	S-048041-030408-DD-021	S-048041-030408-DD-022I9	S-048041-030408-DD-022	S-048041-071008-DD-018 K1	S-048041-071008-DD-018	S-048041-070908-DD-016 K4	S-048041-070908-DD-016
Sample Date		7/9/2008	7/9/2008	7/9/2008	7/9/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	7/10/2008	7/10/2008	7/9/2008	7/9/2008
Sample Depth		1.5-2 ft BGS	0-2 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0.17-0.67 ft BGS	0-1.7 ft BGS	0.25-0.75 ft BGS	0-0.75 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0.21-0.71 ft BGS	0-1.5 ft BGS	0.67-1.17 ft BGS	0-1.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Units															
Metals															
Aluminum	mg/kg	--	14300 J	--	7330 J	--	7920	--	5350	--	5930	--	8390	--	10700 J
Antimony	mg/kg	--	0.58	--	0.77	--	1.3 J	--	0.74 J	--	0.54 J	--	0.43 J	--	0.42
Arsenic	mg/kg	--	6.8	--	10.4	--	9.8	--	6.0	--	3.3	--	9.2 J	--	4.3
Barium	mg/kg	--	262	--	335	--	289	--	204	--	176	--	150	--	212
Beryllium	mg/kg	--	3.2	--	0.89	--	0.40	--	0.37	--	1.0	--	0.51	--	1.7
Cadmium	mg/kg	--	1.5 J	--	9.3 J	--	1.9 J	--	1.6 J	--	6.4 J	--	1.5	--	3.3 J
Calcium	mg/kg	--	150000	--	42400	--	72300	--	51600	--	42900	--	56800	--	54800
Chromium Total	mg/kg	--	36.4 J	--	19.5 J	--	37.3 J	--	54.3 J	--	50.5 J	--	33.1	--	54.6 J
Chromium VI (Hexavalent)	mg/kg	--	3.1	--	ND(0.92)	--	0.28 J	--	0.50 J	--	0.32 J	--	1.2	--	ND(0.90)
Cobalt	mg/kg	--	3.5 J	--	5.7 J	--	4.9	--	3.2	--	2.1	--	4.8	--	6.6 J
Copper	mg/kg	--	43.7	--	77.3	--	192	--	78.3	--	59.5	--	47.5	--	125
Iron	mg/kg	--	16100 J	--	23000 J	--	19700	--	18800	--	18500	--	15900	--	14800 J
Lead - Coarse Fraction	mg/kg	--	165 J	--	401 J	--	3740 f	--	417	--	4630 f	--	275 J	--	362 J
Lead - Fine Fraction	mg/kg	--	253 J	--	381 J	--	946 f	--	472	--	4860 f	--	438 J	--	478 J
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--	206	--	396	--	2920	--	434	--	4680	--	322	--	396
Magnesium	mg/kg	--	28700 J	--	5070 J	--	11600 J	--	7990 J	--	9580 J	--	8570	--	18900 J
Manganese	mg/kg	--	1600 J e	--	408 J	--	842	--	1690 e	--	1570 e	--	660	--	1440 J
Mercury	mg/kg	--	0.098	--	0.15	--	0.27	--	0.32	--	0.091	--	0.14	--	0.14
Nickel	mg/kg	--	15.3 J	--	17.2 J	--	26.7 J	--	12.8 J	--	11.9 J	--	16.6	--	18.4 J
Potassium	mg/kg	--	1910	--	780	--	2170	--	495	--	571	--	1230	--	2190
Selenium	mg/kg	--	2.0	--	1.2	--	1.2	--	0.70	--	0.69	--	1.2	--	1.2
Silver	mg/kg	--	0.16	--	1.5	--	1.0	--	0.20	--	1.3	--	0.15	--	0.23
Sodium	mg/kg	--	692	--	582	--	320	--	252	--	282	--	489	--	1100
Thallium	mg/kg	--	0.29	--	0.20	--	0.42	--	0.14	--	0.055 J	--	0.36	--	0.11
Vanadium	mg/kg	--	18.0	--	20.0	--	21.0	--	29.9	--	21.2	--	24.7	--	20.4
Zinc	mg/kg	--	234	--	4180	--	393	--	298	--	303	--	175	--	352
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	ND(3.8)	--	ND(0.74)
Aroclor-1221 (PCB-1221)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	ND(3.8)	--	ND(0.74)
Aroclor-1232 (PCB-1232)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	ND(3.8)	--	ND(0.74)
Aroclor-1242 (PCB-1242)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	ND(3.8)	--	ND(0.74)
Aroclor-1248 (PCB-1248)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	39	--	1.6
Aroclor-1254 (PCB-1254)	mg/kg	--	5	--	4.9	--	16	--	3.4	--	ND(3.9)	--	ND(3.8)	--	ND(0.74)
Aroclor-1260 (PCB-1260)	mg/kg	--	ND(0.75)	--	ND(0.76)	--	ND(2.1)	--	ND(0.4)	--	ND(3.9)	--	12	--	4.4
Total PCBs	mg/kg	--	5	--	4.9	--	16	--	3.4	--	0	--	51 f	--	6
Semi-Volatile Organic Compounds															
2,2'-oxybis(1-Chloropropane)	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,4,5-Trichlorophenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,4,6-Trichlorophenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,4-Dichlorophenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,4-Dimethylphenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,4-Dinitrophenol	ug/kg	--	ND(8500)	--	ND(11000)	--	ND(9500)	--	ND(9100)	--	ND(31000)	--	ND(8700)	--	ND(11000)
2,4-Dinitrotoluene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2,6-Dinitrotoluene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2-Chloronaphthalene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2-Chlorophenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2-Methylnaphthalene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	6400 J	--	8500 J
2-Methylphenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
2-Nitroaniline	ug/kg	--	ND(11000)	--	ND(14000)	--	ND(13000)	--	ND(12000)	--	ND(41000)	--	ND(12000)	--	ND(14000)
2-Nitrophenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
3,3'-Dichlorobenzidine	ug/kg	--	ND(91000)	--	ND(120000)	--	ND(100000)	--	ND(97000)	--	ND(330000)	--	ND(92000)	--	ND(110000)
3-Nitroaniline	ug/kg	--	ND(11000)	--	ND(14000)	--	ND(13000)	--	ND(12000)	--	ND(41000)	--	ND(12000)	--	ND(14000)
4,6-Dinitro-2-methylphenol	ug/kg	--	ND(8500)	--	ND(11000)	--	ND(9500)	--	ND(9100)	--	ND(31000)	--	ND(8700)	--	ND(11000)
4-Bromophenyl phenyl ether	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
4-Chloro-3-methylphenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
4-Chloroaniline	ug/kg	--	ND(8500)	--	ND(11000)	--	ND(9500)	--	ND(9100)	--	ND(31000)	--	ND(8700)	--	ND(11000)
4-Chlorophenyl phenyl ether	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
4-Methylphenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
4-Nitroaniline	ug/kg	--	ND(11000)	--	ND(14000)	--	ND(13000)	--	ND(12000)	--	ND(41000)	--	ND(12000)	--	ND(14000)
4-Nitrophenol	ug/kg	--	ND(19000)	--	ND(24000)	--	ND(21000)	--	ND(20000)	--	ND(68000)	--	ND(19000)	--	ND(23000)
Acenaphthene	ug/kg	--	ND(15000)	--	500 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	670 J
Acenaphthylene	ug/kg	--	860 J	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Acetophenone	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Anthracene	ug/kg	--	500 J	--	1800 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	600 J
Atrazine	ug/kg	--	ND(2300)	--	ND(2900)	--	ND(2500)	--	ND(2400)	--	ND(8200)	--	ND(2800)	--	ND(2300)
Benzaldehyde	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Benzo(a)anthracene	ug/kg	--	3100 J	--	2600 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		I1	lab composite I1, I3, I5	I2	lab composite I2, I4, I6	I2	lab composite I1,I2,I3	I4	lab composite I4,I5,I6	I9	lab composite I7,I8,I9	K1	lab composite K1, K2, K3	K4	lab composite K4, K5, K6
Sample ID		S-048041-070908-DD-014 I1	S-048041-070908-DD-014	S-048041-070908-DD-015 I2	S-048041-070908-DD-015	S-048041-070908-DD-020I2	S-048041-030408-DD-020	S-048041-030408-DD-021I4	S-048041-030408-DD-021	S-048041-030408-DD-022I9	S-048041-030408-DD-022	S-048041-071008-DD-018 K1	S-048041-071008-DD-018	S-048041-070908-DD-016 K4	S-048041-070908-DD-016
Sample Date		7/9/2008	7/9/2008	7/9/2008	7/9/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	7/10/2008	7/10/2008	7/9/2008	7/9/2008
Sample Depth		1.5-2 ft BGS	0-2 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0.17-0.67 ft BGS	0-1.7 ft BGS	0.25-0.75 ft BGS	0-0.75 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0.21-0.71 ft BGS	0-1.5 ft BGS	0.67-1.17 ft BGS	0-1.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Units															
Benzo(a)pyrene	ug/kg	--	3300 J	--	2100 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Benzo(b)fluoranthene	ug/kg	--	4500 J	--	2900 J	--	ND(17000)	--	570 J	--	ND(54000)	--	ND(15000)	--	530 J
Benzo(g,h,i)perylene	ug/kg	--	2100 J	--	1300 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Benzo(k)fluoranthene	ug/kg	--	1800 J	--	1300 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Biphenyl	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
bis(2-Chloroethoxy)methane	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
bis(2-Chloroethyl)ether	ug/kg	--	ND(4500)	--	ND(5800)	--	ND(5100)	--	ND(4800)	--	ND(16000)	--	ND(4600)	--	ND(5600)
bis(2-Ethylhexyl)phthalate	ug/kg	--	ND(15000)	--	ND(19000)	--	1100 J	--	4900 J	--	6400 J	--	ND(15000)	--	ND(19000)
Butyl benzylphthalate	ug/kg	--	ND(15000)	--	1400 J	--	ND(17000)	--	ND(16000)	--	4300 J	--	ND(15000)	--	ND(19000)
Caprolactam	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Carbazole	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Chrysene	ug/kg	--	3000 J	--	3300 J	--	660 J	--	ND(16000)	--	ND(54000)	--	1200 J	--	ND(19000)
Dibenz(a,h)anthracene	ug/kg	--	610 J	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Dibenzofuran	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Diethyl phthalate	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Dimethyl phthalate	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Di-n-butylphthalate	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Di-n-octyl phthalate	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Fluoranthene	ug/kg	--	3200 J	--	6300 J	--	1100 J	--	1100 J	--	ND(54000)	--	1900 J	--	930 J
Fluorene	ug/kg	--	ND(15000)	--	740 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	6300 J	--	1700 J
Hexachlorobenzene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Hexachlorobutadiene	ug/kg	--	ND(2300)	--	ND(2900)	--	ND(2500)	--	ND(8200)	--	ND(2300)	--	ND(2800)	--	ND(2800)
Hexachlorocyclopentadiene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Hexachloroethane	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Indeno(1,2,3-cd)pyrene	ug/kg	--	2100 J	--	1100 J	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Isophorone	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Naphthalene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	1800 J	--	2700 J
Nitrobenzene	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
N-Nitrosodi-n-propylamine	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
N-Nitrosodiphenylamine	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Pentachlorophenol	ug/kg	--	ND(8500)	--	ND(11000)	--	ND(9500)	--	ND(9100)	--	ND(31000)	--	ND(8700)	--	ND(11000)
Phenanthrene	ug/kg	--	670 J	--	4800 J	--	760 J	--	ND(16000)	--	ND(54000)	--	6600 J	--	3600 J
Phenol	ug/kg	--	ND(15000)	--	ND(19000)	--	ND(17000)	--	ND(16000)	--	ND(54000)	--	ND(15000)	--	ND(19000)
Pyrene	ug/kg	--	2800 J	--	5300 J	--	960 J	--	820 J	--	1400 J	--	1800 J	--	1500 J
Pyridine	ug/kg	--	ND(15000)	--	ND(19000)	--	--	--	--	--	--	--	ND(15000)	--	ND(19000)
Volatile Organic Compounds															
1,1,1-Trichloroethane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,1,2,2-Tetrachloroethane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,1,2-Trichloroethane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,1-Dichloroethane	ug/kg	ND(100)	--	13 J	--	ND(50)	--	ND(61)	--	ND(47)	--	57	--	42 J	--
1,1-Dichloroethene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,2,4-Trichlorobenzene	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
1,2,4-Trimethylbenzene	ug/kg	ND(200)	--	ND(96)	--	72 J	--	170	--	1000	--	2700	--	490 J	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
1,2-Dichlorobenzene	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	170	--	28 J	--	65 J	--	29 J	--
1,2-Dichloroethane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,2-Dichloropropane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
1,3,5-Trimethylbenzene	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	320	--	850	--	91 J	--
1,3-Dichlorobenzene	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)	--
1,4-Dichlorobenzene	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	120 J	--	84 J	--	ND(750)	--	ND(920)	--	ND(700)	--	ND(700)	--	ND(740)	--
2-Hexanone	ug/kg	ND(5000)	--	ND(2400)	--	ND(2500)	--	ND(3100)	--	ND(2300)	--	ND(2300)	--	ND(2500)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(5000)	--	ND(2400)	--	ND(2500)	--	ND(3100)	--	ND(2300)	--	ND(2300)	--	ND(2500)	--
Acetone	ug/kg	ND(1500)UJ	--	ND(720)	--	ND(750)	--	ND(920)	--	ND(700)	--	ND(700)	--	ND(740)UJ	--
Benzene	ug/kg	ND(100)	--	24 J	--	60	--	70	--	73	--	30 J	--	12 J	--
Bromodichloromethane	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)	--
Bromoform	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)	--
Bromomethane (Methyl Bromide)	ug/kg	ND(400)	--	ND(190)	--	ND(250)	--	ND(190)	--	ND(190)	--	ND(190)	--	ND(200)	--
Carbon disulfide	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
Carbon tetrachloride	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
Chlorobenzene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
Chloroethane	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
Chloroform (Trichloromethane)	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
Chloromethane (Methyl Chloride)	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)	--
cis-1,2-Dichloroethene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	49	--	43 J	--
cis-1,3-Dichloropropene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
Cyclohexane	ug/kg	ND(2400)	--	ND(1200)	--	150 J	--	250 J	--	170 J	--	84 J	--	ND(1200)	--
Dibromochloromethane	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)	--
Ethylbenzene	ug/kg	ND(100)	--	12 J	--	49 J	--	89	--	180	--	470	--	110 J	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	I1	lab composite I1, I3, I5	I2	lab composite I2, I4, I6	J2	lab composite J1, J2, J3	J4	lab composite J4, J5, J6	J9	lab composite J7, J8, J9	K1	lab composite K1, K2, K3	K4	lab composite K4, K5, K6
Sample ID	S-048041-070908-DD-014 I1	S-048041-070908-DD-014	S-048041-070908-DD-015 I2	S-048041-070908-DD-015	S-048041-030408-DD-020 J2	S-048041-030408-DD-020	S-048041-030408-DD-021 J4	S-048041-030408-DD-021	S-048041-030408-DD-022 J9	S-048041-030408-DD-022	S-048041-071008-DD-018 K1	S-048041-071008-DD-018	S-048041-070908-DD-016 K4	S-048041-070908-DD-016
Sample Date	7/9/2008	7/9/2008	7/9/2008	7/9/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	3/4/2008	7/10/2008	7/10/2008	7/9/2008	7/9/2008
Sample Depth	1.5-2 ft BGS	0-2 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0.17-0.67 ft BGS	0-1.7 ft BGS	0.25-0.75 ft BGS	0-0.75 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0.21-0.71 ft BGS	0-1.5 ft BGS	0.67-1.17 ft BGS	0-1.5 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units													
Isopropylbenzene	ug/kg	ND(500)	--	ND(240)	--	300	--	620	--	150 J	--	200 J	--	26 J
Methyl acetate	ug/kg	9400 J	--	280 J	--	660 J	--	160 J	--	160 J	--	220 J	--	ND(1200)
Methyl cyclohexane	ug/kg	ND(2400)	--	67 J	--	540 J	--	1000 J	--	320 J	--	92 J	--	ND(1200)
Methyl Tert Butyl Ether	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)
Methylene chloride	ug/kg	ND(500)	--	ND(240)	--	170 J	--	170 J	--	ND(230)	--	ND(230)	--	ND(250)
Styrene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	78	--	ND(49)
Tetrachloroethene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)
Toluene	ug/kg	ND(200)	--	32 J	--	24 J	--	110 J	--	130	--	950	--	130 J
trans-1,2-Dichloroethene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)
trans-1,3-Dichloropropene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	ND(47)	--	ND(49)
Trichloroethene	ug/kg	ND(100)	--	ND(48)	--	ND(50)	--	ND(61)	--	ND(47)	--	81	--	36 J
Trichlorofluoromethane (CFC-11)	ug/kg	ND(200)	--	ND(96)	--	ND(100)	--	ND(120)	--	ND(94)	--	ND(94)	--	ND(98)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(500)	--	ND(240)	--	ND(250)	--	ND(310)	--	ND(230)	--	ND(230)	--	ND(250)
Vinyl chloride	ug/kg	ND(80)	--	ND(39)	--	ND(40)	--	ND(49)	--	ND(38)	--	180	--	ND(39)
Xylene (total)	ug/kg	ND(300)	--	57 J	--	240	--	340	--	820	--	1700	--	480 J

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		K9	lab composite K9,K8,K7	L3	lab composite L1,L2,L3	L6	lab composite L6,L5,L4	L9	lab composite L7,L8,L9	lab composite M1,M2,M3	M-3	N3	lab composite N1,N2,N3	N6	lab composite N4,N5,N6
Sample ID		S-048041-022908-DD-016K9	S-048041-022908-DD-016	S-048041-022808-DD-006L3	S-048041-022808-DD-006	S-048041-022808-DD-007L6	S-048041-022808-DD-007	S-048041-022808-DD-008L9	S-048041-022808-DD-008	S-48041-061208-AF-006	S-48041-061208-AF-006 M3	S-48041-062008-MC-008 N3	S-48041-062008-MC-008	S-48041-061808-MC-001 N6	S-48041-061808-MC-001
Sample Date		2/29/2008	2/29/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/18/2008	6/18/2008
Sample Depth		0.33-0.83 ft BGS	0-0.83 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Units															
Metals															
Aluminum	mg/kg	--	5720	--	5670	--	11900	--	8310	9080	--	--	15600	--	5800
Antimony	mg/kg	--	0.46	--	1.0 J	--	0.25 J	--	0.40 J	0.57 J	--	--	0.79 J	--	0.66 J
Arsenic	mg/kg	--	3.9	--	4.3	--	2.6	--	4.1	4.4 J	--	--	7.9	--	5.4
Barium	mg/kg	--	115	--	126 J	--	168 J	--	170 J	144 J	--	--	285 J	--	145
Beryllium	mg/kg	--	0.38	--	0.80	--	3.4	--	1.5	0.57	--	--	3.1	--	0.34
Cadmium	mg/kg	--	2.1	--	0.90	--	0.71	--	1.8	3.3	--	--	1.8	--	1.9
Calcium	mg/kg	--	64200	--	68400	--	134000	--	168000	48900	--	--	54200 J	--	53800
Chromium Total	mg/kg	--	61.2	--	229 J	--	61.1 J	--	162 J	52.7 J	--	--	46.9	--	49.6 J
Chromium VI (Hexavalent)	mg/kg	--	ND(0.96)	--	0.48 J	--	ND(0.92)	--	0.29 J	1.5 J	--	--	1.1	--	2.9
Cobalt	mg/kg	--	4.2	--	3.5	--	2.0	--	2.4	4.1	--	--	4.3	--	4.4
Copper	mg/kg	--	43.4	--	48.8	--	23.8	--	38.1	80.5	--	--	86.0 J	--	66.1 J
Iron	mg/kg	--	17400	--	41800	--	14400	--	22000	19600	--	--	26900	--	22400
Lead - Coarse Fraction	mg/kg	--	567	--	235	--	3240 f	--	299	795	--	--	501	--	331
Lead - Fine Fraction	mg/kg	--	488	--	289	--	4620 f	--	467	1260 f	--	--	775	--	421
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--	535	--	257	--	3830	--	354	968	--	--	568	--	353
Magnesium	mg/kg	--	12200	--	16300	--	24900	--	41200	11800 J	--	--	24800 J	--	11300 J
Manganese	mg/kg	--	1440	--	6210 e	--	2680 e	--	13300 e	749	--	--	1270 J	--	1110
Mercury	mg/kg	--	0.24	--	0.25	--	0.11	--	0.19	0.049	--	--	0.28	--	0.28 J
Nickel	mg/kg	--	17.0	--	14.7	--	10.7	--	11.8	20.4	--	--	25.9	--	26.7
Potassium	mg/kg	--	727	--	516	--	1000	--	737	1370	--	--	1620	--	669
Selenium	mg/kg	--	0.51	--	0.74	--	1.3	--	1.2	0.76	--	--	2.2	--	0.62
Silver	mg/kg	--	0.12	--	0.11	--	0.059 J	--	0.12	1.0	--	--	0.29	--	0.22
Sodium	mg/kg	--	343	--	117	--	478	--	545	596	--	--	713	--	240
Thallium	mg/kg	--	ND(0.096)	--	0.095 J	--	0.078 J	--	0.098	0.25	--	--	0.23	--	0.17
Vanadium	mg/kg	--	23.1	--	76.6 J	--	29.9 J	--	56.5 J	24.0 J	--	--	21.3	--	24.0 J
Zinc	mg/kg	--	245	--	114	--	118	--	166	668 J	--	--	597	--	519
PCBs															
Aroclor-1016 (PCB-1016)	mg/kg	--	ND(0.79)	--	ND(0.8)	--	ND(0.76)	--	ND(0.72)	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1221 (PCB-1221)	mg/kg	--	ND(0.79)	--	ND(0.8)	--	ND(0.76)	--	ND(0.72)	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1232 (PCB-1232)	mg/kg	--	ND(0.79)	--	ND(0.8)	--	ND(0.76)	--	ND(0.72)	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1242 (PCB-1242)	mg/kg	--	0.34 J	--	ND(0.8)	--	ND(0.76)	--	ND(0.72)	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1248 (PCB-1248)	mg/kg	--	ND(0.79)	--	ND(0.8)	--	ND(0.76)	--	ND(0.72)	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1254 (PCB-1254)	mg/kg	--	ND(0.79)	--	ND(0.8)	--	ND(0.76)	--	9.2	ND(0.8)	--	--	ND(0.2)	--	ND(0.2)
Aroclor-1260 (PCB-1260)	mg/kg	--	8.3	--	7	--	7.2	--	ND(0.72)	4.2	--	--	1.7	--	2
Total PCBs	mg/kg	--	8.64 J	--	7	--	7.2	--	9.2	4.2	--	--	1.7	--	2
Semi-Volatile Organic Compounds															
2,2'-oxybis(1-Chloropropane)	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,4,5-Trichlorophenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,4,6-Trichlorophenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,4-Dichlorophenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,4-Dimethylphenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,4-Dinitrophenol	ug/kg	--	ND(9000)	--	ND(180)	--	ND(1700)	--	ND(4100)	ND(3600)	--	--	ND(4500)	--	ND(3600)
2,4-Dinitrotoluene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2,6-Dinitrotoluene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2-Chloronaphthalene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2-Chlorophenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2-Methylnaphthalene	ug/kg	--	ND(16000)	--	30 J	--	ND(3000)	--	ND(7200)	280 J	--	--	ND(7900)	--	ND(6400)
2-Methylphenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
2-Nitroaniline	ug/kg	--	ND(12000)	--	ND(240)	--	ND(2300)	--	ND(5500)	ND(4900)	--	--	ND(6000)	--	ND(4900)
2-Nitrophenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
3,3'-Dichlorobenzidine	ug/kg	--	ND(96000)	--	ND(1900)	--	ND(18000)	--	ND(44000)	ND(39000)	--	--	ND(48000)	--	ND(39000)
3-Nitroaniline	ug/kg	--	ND(12000)	--	ND(240)	--	ND(2300)	--	ND(5500)	ND(4900)	--	--	ND(6000)	--	ND(4900)
4,6-Dinitro-2-methylphenol	ug/kg	--	ND(9000)	--	ND(180)	--	ND(1700)	--	ND(4100)	ND(3600)	--	--	ND(4500)	--	ND(3600)
4-Bromophenyl phenyl ether	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
4-Chloro-3-methylphenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
4-Chloroaniline	ug/kg	--	ND(9000)	--	ND(180)	--	ND(1700)	--	ND(4100)	ND(3600)	--	--	ND(4500)	--	ND(3600)
4-Chlorophenyl phenyl ether	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
4-Methylphenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
4-Nitroaniline	ug/kg	--	ND(12000)	--	ND(240)	--	ND(2300)	--	ND(5500)	ND(4900)	--	--	ND(6000)	--	ND(4900)
4-Nitrophenol	ug/kg	--	ND(20000)	--	ND(400)	--	ND(3800)	--	ND(9000)	ND(8000)	--	--	ND(9900)	--	ND(8000)
Acenaphthene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	300 J
Acenaphthylene	ug/kg	--	ND(16000)	--	11 J	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	220 J
Acetophenone	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Anthracene	ug/kg	--	ND(16000)	--	21 J	--	ND(3000)	--	220 J	ND(6400)	--	--	ND(7900)	--	1100 J
Atrazine	ug/kg	--	ND(2400)	--	ND(49)	--	ND(460)	--	ND(1100)	ND(970)	--	--	ND(1200)	--	ND(970)
Benzaldehyde	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Benzo(a)anthracene	ug/kg	--	690 J	--	73 J	--	230 J	--	420 J	410 J	--	--	320 J	--	3000 J

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		K9	lab composite K9,K8,K7	L3	lab composite L1,L2,L3	L6	lab composite L6,L5,L4	L9	lab composite L7,L8,L9	lab composite M1,M2,M3	M-3	N3	lab composite N1,N2,N3	N6	lab composite N4,N5,N6
Sample ID		S-048041-022908-DD-016K9	S-048041-022908-DD-016	S-048041-022808-DD-006L3	S-048041-022808-DD-006	S-048041-022808-DD-007L6	S-048041-022808-DD-007	S-048041-022808-DD-008L9	S-048041-022808-DD-008	S-48041-061208-AF-006	S-48041-061208-AF-006 M3	S-48041-062008-MC-008 N3	S-48041-062008-MC-008	S-48041-061808-MC-001 N6	S-48041-061808-MC-001
Sample Date		2/29/2008	2/29/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/18/2008	6/18/2008
Sample Depth		0.33-0.83 ft BGS	0-0.83 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units														
Benzo(a)pyrene	ug/kg	--	560 J	--	100 J	--	290 J	--	500 J	680 J	--	--	ND(7900)	--	2300 J
Benzo(b)fluoranthene	ug/kg	--	870 J	--	150 J	--	400 J	--	840 J	1100 J	--	--	650 J	--	ND(6400)
Benzo(g,h,i)perylene	ug/kg	--	440 J	--	140 J	--	330 J	--	580 J	950 J	--	--	400 J	--	1600 J
Benzo(k)fluoranthene	ug/kg	--	ND(16000)	--	57 J	--	160 J	--	270 J	310 J	--	--	ND(7900)	--	ND(6400)
Biphenyl	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
bis(2-Chloroethoxy)methane	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
bis(2-Chloroethyl)ether	ug/kg	--	ND(4800)	--	ND(920)	--	ND(97)	--	ND(2200)	ND(1900)	--	--	ND(2400)	--	ND(1900)
bis(2-Ethylhexyl)phthalate	ug/kg	--	1100 J	--	47 J	--	240 J	--	530 J	ND(6400)	--	--	2500 J	--	ND(6400)
Butyl benzylphthalate	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Caprolactam	ug/kg	--	ND(16000)	--	250 J	--	550 J	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Carbazole	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Chrysene	ug/kg	--	730 J	--	89 J	--	290 J	--	740 J	620 J	--	--	490 J	--	2400 J
Dibenz(a,h)anthracene	ug/kg	--	ND(16000)	--	24 J	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Dibenzofuran	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Diethyl phthalate	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Dimethyl phthalate	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Di-n-butylphthalate	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Di-n-octyl phthalate	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Fluoranthene	ug/kg	--	1500 J	--	130 J	--	410 J	--	990 J	630 J	--	--	660 J	--	6400
Fluorene	ug/kg	--	480 J	--	9.1 J	--	ND(3000)	--	190 J	ND(6400)	--	--	ND(7900)	--	570 J
Hexachlorobenzene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Hexachlorobutadiene	ug/kg	--	ND(2400)	--	ND(49)	--	ND(1100)	--	ND(970)	ND(1200)	--	--	ND(970)	--	ND(1200)
Hexachlorocyclopentadiene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Hexachloroethane	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Indeno(1,2,3-cd)pyrene	ug/kg	--	ND(16000)	--	100 J	--	220 J	--	440 J	590 J	--	--	310 J	--	1500 J
Isophorone	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Naphthalene	ug/kg	--	ND(16000)	--	23 J	--	ND(3000)	--	ND(7200)	250 J	--	--	ND(7900)	--	ND(6400)
Nitrobenzene	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
N-Nitrosodi-n-propylamine	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
N-Nitrosodiphenylamine	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Pentachlorophenol	ug/kg	--	ND(9000)	--	ND(180)	--	ND(1700)	--	ND(4100)	ND(3600)	--	--	ND(4500)	--	ND(3600)
Phenanthrene	ug/kg	--	1300 J	--	62 J	--	790 J	--	430 J	260 J	--	--	4200 J	--	4200 J
Phenol	ug/kg	--	ND(16000)	--	ND(320)	--	ND(3000)	--	ND(7200)	ND(6400)	--	--	ND(7900)	--	ND(6400)
Pyrene	ug/kg	--	1300 J	--	120 J	--	400 J	--	890 J	580 J	--	--	780 J	--	4800 J
Pyridine	ug/kg	--	--	--	--	--	--	--	--	ND(6400)	--	--	ND(7900)	--	ND(6400)
Volatile Organic Compounds															
1,1,1-Trichloroethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,1,2,2-Tetrachloroethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,1,2-Trichloroethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,1-Dichloroethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,1-Dichloroethene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,2,4-Trichlorobenzene	ug/kg	60 J	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
1,2,4-Trimethylbenzene	ug/kg	190	--	220 J	--	50 J	--	40 J	--	--	ND(98)	ND(140)	--	ND(120)	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
1,2-Dichlorobenzene	ug/kg	23 J	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
1,2-Dichloroethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,2-Dichloropropane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
1,3,5-Trimethylbenzene	ug/kg	150	--	ND(120)	--	ND(96)	--	42 J	--	--	ND(98)	ND(140)	--	ND(120)	--
1,3-Dichlorobenzene	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
1,4-Dichlorobenzene	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	ND(700)	--	ND(940)	--	ND(720)	--	ND(690)	--	--	ND(730)	170 J	--	ND(870)	--
2-Hexanone	ug/kg	ND(2300)	--	ND(3100)	--	ND(2400)	--	ND(2300)	--	--	ND(2400)	ND(3400)	--	ND(2900)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(2300)	--	ND(3100)	--	ND(2400)	--	ND(2300)	--	--	ND(2400)	ND(3400)	--	ND(2900)	--
Acetone	ug/kg	ND(700)	--	ND(940)	--	ND(720)	--	ND(690)	--	--	ND(730)UJ	ND(1000)UJ	--	ND(870)UJ	--
Benzene	ug/kg	31 J	--	12 J	--	ND(48)	--	ND(46)	--	--	12 J	--	--	20 J	--
Bromodichloromethane	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
Bromoform	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
Bromomethane (Methyl Bromide)	ug/kg	ND(190)	--	ND(250)	--	ND(190)	--	ND(180)	--	--	ND(200)	ND(270)	--	ND(230)	--
Carbon disulfide	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
Carbon tetrachloride	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
Chlorobenzene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
Chloroethane	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
Chloroform (Trichloromethane)	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
Chloromethane (Methyl Chloride)	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)	--
cis-1,2-Dichloroethene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
cis-1,3-Dichloropropene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
Cyclohexane	ug/kg	ND(1100)	--	ND(1500)	--	ND(1200)	--	ND(1100)	--	--	ND(1200)	ND(1600)	--	ND(1400)	--
Dibromochloromethane	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)	--
Ethylbenzene	ug/kg	54	--	78 J	--	ND(48)	--	ND(46)	--	--	13 J	12 J	--	69 J	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	K9	lab composite K9,K8,K7	L3	lab composite L1,L2,L3	L6	lab composite L6,L5,L4	L9	lab composite L7,L8,L9	lab composite M1,M2,M3	M-3	N3	lab composite N1,N2,N3	N6	lab composite N4,N5,N6
Sample ID	S-048041-022908-DD-016K9	S-048041-022908-DD-016	S-048041-022808-DD-006L3	S-048041-022808-DD-006	S-048041-022808-DD-007L6	S-048041-022808-DD-007	S-048041-022808-DD-008L9	S-048041-022808-DD-008	S-48041-061208-AF-006	S-48041-061208-AF-006 M3	S-48041-062008-MC-008 N3	S-48041-062008-MC-008	S-48041-061808-MC-001 N6	S-48041-061808-MC-001
Sample Date	2/29/2008	2/29/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	2/28/2008	6/12/2008	6/12/2008	6/20/2008	6/20/2008	6/18/2008	6/18/2008
Sample Depth	0.33-0.83 ft BGS	0-0.83 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-1.1 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final	Final
Units														
Isopropylbenzene	ug/kg	64 J	--	87 J	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)
Methyl acetate	ug/kg	370 J	--	140 J	--	280 J	--	450 J	--	--	150 J	470 J	--	240 J
Methyl cyclohexane	ug/kg	100 J	--	100 J	--	73 J	--	66 J	--	--	55 J	50 J	--	19 J
Methyl Tert Butyl Ether	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)
Methylene chloride	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)
Styrene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)
Tetrachloroethene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)
Toluene	ug/kg	72 J	--	45 J	--	13 J	--	ND(92)	--	--	21 J	49 J	--	200 J
trans-1,2-Dichloroethene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)
trans-1,3-Dichloropropene	ug/kg	ND(47)	--	ND(62)	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)
Trichloroethene	ug/kg	25 J	--	28 J	--	ND(48)	--	ND(46)	--	--	ND(49)	ND(68)	--	ND(58)
Trichlorofluoromethane (CFC-11)	ug/kg	ND(93)	--	ND(120)	--	ND(96)	--	ND(92)	--	--	ND(98)	ND(140)	--	ND(120)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(230)	--	ND(310)	--	ND(240)	--	ND(230)	--	--	ND(240)	ND(340)	--	ND(290)
Vinyl chloride	ug/kg	ND(37)	--	ND(50)	--	ND(38)	--	ND(37)	--	--	ND(39)	ND(54)	--	ND(46)
Xylene (total)	ug/kg	230	--	200 J	--	68 J	--	53 J	--	--	43 J	62 J	--	110 J

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	N8		lab composite N7,N8,N9		O1		lab composite O1, O2, O3		O4		O4		lab composite O4,O5,O6		lab composite O4,O5,O6		P1		lab composite P1,P2,P3		P6		lab composite P4,P5,P6	
Sample ID	S-48041-061808-MC-002 N8		S-48041-061808-MC-002		S-048041-070908-DD-017 01		S-048041-070908-DD-017		S-048041-022908-DD-01404		S-048041-022908-DD-015010		S-048041-022908-DD-014		S-048041-022908-DD-015		S-048041-022808-DD-009P1		S-048041-022808-DD-009		S-048041-022908-DD-011P6		S-048041-022908-DD-011	
Sample Date	6/18/2008		6/18/2008		7/9/2008		7/9/2008		2/29/2008		2/29/2008		2/29/2008		2/28/2008		2/28/2008		2/29/2008		2/29/2008		2/29/2008	
Sample Depth	0-0.5 ft BGS		0-0.5 ft BGS		1-1.5 ft BGS		0-1.5 ft BGS		0.17-0.67 ft BGS		0.17-0.67 ft BGS		0-0.67 ft BGS		0-0.67 ft BGS		1.1-1.6 ft BGS		0.25-1.6 ft BGS		0.5-1 ft BGS		0.42-1 ft BGS	
Sample Type	Final		Final		Final		Final		Final		Duplicate		Final		Duplicate		Final		Final		Final		Final	
Units																								
Metals																								
Aluminum	mg/kg	--		5630	--		5820 J	--		--		--	17000		13600	--		--	8350	--		--	4490	
Antimony	mg/kg	--		2.0 J	--		0.92	--		--		--	1.0 J		0.57 J	--		--	0.40 J	--		--	0.31	
Arsenic	mg/kg	--		12.7	--		6.6	--		--		--	4.2 J		3.3 J	--		--	4.5	--		--	8.9	
Barium	mg/kg	--		317	--		156	--		--		--	322		269	--		--	140 J	--		--	139	
Beryllium	mg/kg	--		0.47	--		0.14 J	--		--		--	2.8		2.1	--		--	1.7 J	--		--	0.52	
Cadmium	mg/kg	--		3.7	--		1.3 J	--		--		--	4.0		2.8	--		--	0.84	--		--	0.76	
Calcium	mg/kg	--		45800	--		24700	--		--		--	123000		88100	--		--	56000	--		--	39400	
Chromium Total	mg/kg	--		87.5 J	--		31.8 J	--		--		--	65.6		61.8	--		--	76.1 J	--		--	24.4	
Chromium VI (Hexavalent)	mg/kg	--		5.2	--		2.7	--		--		--	0.89 J		0.65 J	--		--	ND(0.96)	--		--	1.1	
Cobalt	mg/kg	--		5.4	--		4.5 J	--		--		--	4.6		4.0	--		--	3.6	--		--	2.6	
Copper	mg/kg	--		267 J	--		58.2	--		--		--	74.0		71.8	--		--	49.4	--		--	27.3	
Iron	mg/kg	--		35200	--		21900 J	--		--		--	14400		11900	--		--	16700	--		--	9060	
Lead - Coarse Fraction	mg/kg	--		799	--		741 J	--		--		--	279		292	--		--	216	--		--	281	
Lead - Fine Fraction	mg/kg	--		1160 f	--		637 J	--		--		--	9920 J f		572 J	--		--	302	--		--	370	
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--		892	--		707	--		--		--	4460 J		400 J	--		--	247	--		--	314	
Magnesium	mg/kg	--		6870 J	--		6050 J	--		--		--	25700		11700	--		--	15200	--		--	9200	
Manganese	mg/kg	--		622	--		341 J	--		--		--	2070 e		2520 e	--		--	2090 e	--		--	712	
Mercury	mg/kg	--		1.1 J	--		0.33	--		--		--	0.31		0.22	--		--	0.19	--		--	0.068	
Nickel	mg/kg	--		50.9	--		18.9 J	--		--		--	30.8		25.6	--		--	20.8	--		--	10.2	
Potassium	mg/kg	--		558	--		1050	--		--		--	1630		1280	--		--	756	--		--	569	
Selenium	mg/kg	--		1.1	--		0.66	--		--		--	2.5		1.7	--		--	1.3	--		--	0.80	
Silver	mg/kg	--		0.45	--		0.11	--		--		--	0.21		0.14	--		--	0.097	--		--	0.082 J	
Sodium	mg/kg	--		429	--		259	--		--		--	410		305	--		--	225	--		--	229	
Thallium	mg/kg	--		0.13	--		0.16	--		--		--	ND(0.11)		ND(0.097)	--		--	0.10	--		--	ND(0.11)	
Vanadium	mg/kg	--		17.7 J	--		16.6	--		--		--	18.7		22.8	--		--	30.2 J	--		--	15.4	
Zinc	mg/kg	--		708	--		119	--		--		--	385		267	--		--	149	--		--	86.4	
PCBs																								
Aroclor-1016 (PCB-1016)	mg/kg	--		ND(3.7)	--		ND(0.39)	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1221 (PCB-1221)	mg/kg	--		ND(3.7)	--		ND(0.39)	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1232 (PCB-1232)	mg/kg	--		ND(3.7)	--		ND(0.39)	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1242 (PCB-1242)	mg/kg	--		ND(3.7)	--		ND(0.39)	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1248 (PCB-1248)	mg/kg	--		ND(3.7)	--		1.5	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1254 (PCB-1254)	mg/kg	--		27	--		ND(0.39)	--		--		--	ND(0.42)		ND(0.4)	--		--	ND(0.79)	--		--	ND(0.76)	
Aroclor-1260 (PCB-1260)	mg/kg	--		ND(3.7)	--		2.1	--		--		--	2.9		3	--		--	6.6	--		--	6.7	
Total PCBs	mg/kg	--		27 f	--		3.6	--		--		--	2.9		3	--		--	6.6	--		--	6.7	
Semi-Volatile Organic Compounds																								
2,2'-oxybis(1-Chloropropane)	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,4,5-Trichlorophenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,4,6-Trichlorophenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,4-Dichlorophenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,4-Dimethylphenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,4-Dinitrophenol	ug/kg	--		ND(3400)	--		ND(8800)	--		--		--	ND(9500)		ND(3600)	--		--	ND(1800)	--		--	ND(1700)	
2,4-Dinitrotoluene	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2,6-Dinitrotoluene	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2-Chloronaphthalene	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2-Chlorophenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2-Methylnaphthalene	ug/kg	--		ND(5900)	--		7600 J	--		--		--	ND(17000)		ND(6400)	--		--	82 J	--		--	170 J	
2-Methylphenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
2-Nitroaniline	ug/kg	--		ND(4500)	--		ND(12000)	--		--		--	ND(13000)		ND(4800)	--		--	ND(2400)	--		--	ND(2300)	
2-Nitrophenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
3,3'-Dichlorobenzidine	ug/kg	--		ND(36000)	--		ND(94000)	--		--		--	ND(100000)		ND(39000)	--		--	ND(19000)	--		--	ND(19000)	
3-Nitroaniline	ug/kg	--		ND(4500)	--		ND(12000)	--		--		--	ND(13000)		ND(4800)	--		--	ND(2400)	--		--	ND(2300)	
4,6-Dinitro-2-methylphenol	ug/kg	--		ND(3400)	--		ND(8800)	--		--		--	ND(9500)		ND(3600)	--		--	ND(1800)	--		--	ND(1700)	
4-Bromophenyl phenyl ether	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
4-Chloro-3-methylphenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
4-Chloroaniline	ug/kg	--		ND(3400)	--		ND(8800)	--		--		--	ND(9500)		ND(3600)	--		--	ND(1800)	--		--	ND(1700)	
4-Chlorophenyl phenyl ether	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
4-Methylphenol	ug/kg	--		ND(5900)	--		ND(16000)	--		--		--	ND(17000)		ND(6400)	--		--	ND(3200)	--		--	ND(3100)	
4-Nitroaniline	ug/kg	--		ND(4500)	--		ND(12000)	--		--		--	ND(13000)		ND(4800)	--		--	ND(2400)	--		--	ND(2300)	
4-Nitrophenol	ug/kg	--		ND(7400)	--		ND(19000)	--		--		--	ND(2100											

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		N8	lab composite N7,N8,N9	O1	lab composite O1, O2, O3	O4	O4	lab composite O4,O5,O6	lab composite O4,O5,O6	P1	lab composite P1,P2,P3	P6	lab composite P4,P5,P6
Sample ID		S-48041-061808-MC-002 N8	S-48041-061808-MC-002	S-048041-070908-DD-017 01	S-048041-070908-DD-017	S-048041-022908-DD-01404	S-048041-022908-DD-015010	S-048041-022908-DD-014	S-048041-022908-DD-015	S-048041-022808-DD-009P1	S-048041-022808-DD-009	S-048041-022908-DD-011P6	S-048041-022908-DD-011
Sample Date		6/18/2008	6/18/2008	7/9/2008	7/9/2008	2/29/2008	2/29/2008	2/29/2008	2/29/2008	2/28/2008	2/28/2008	2/29/2008	2/29/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	1-1.5 ft BGS	0-1.5 ft BGS	0.17-0.67 ft BGS	0.17-0.67 ft BGS	0-0.67 ft BGS	0-0.67 ft BGS	1.1-1.6 ft BGS	0.25-1.6 ft BGS	0.5-1 ft BGS	0.42-1 ft BGS
Sample Type		Final	Final	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final
Units													
Benzo(a)pyrene	ug/kg	--	ND(5900)	--	490 J	--	--	440 J	260 J	--	520 J	--	380 J
Benzo(b)fluoranthene	ug/kg	--	ND(5900)	--	700 J	--	--	ND(17000)	420 J	--	810 J	--	470 J
Benzo(g,h,i)perylene	ug/kg	--	1100 J	--	ND(16000)	--	--	620 J	550 J	--	520 J	--	370 J
Benzo(k)fluoranthene	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	280 J	--	230 J
Biphenyl	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
bis(2-Chloroethoxy)methane	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
bis(2-Chloroethyl)ether	ug/kg	--	ND(1800)	--	ND(4700)	--	--	ND(5100)	ND(1900)	--	ND(960)	--	ND(930)
bis(2-Ethylhexyl)phthalate	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	650 J	--	ND(3200)	--	ND(3100)
Butyl benzylphthalate	ug/kg	--	9400	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Caprolactam	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Carbazole	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Chrysene	ug/kg	--	1200 J	--	900 J	--	--	ND(17000)	200 J	--	610 J	--	450 J
Dibenz(a,h)anthracene	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	120 J	--	ND(3100)
Dibenzofuran	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Diethyl phthalate	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Dimethyl phthalate	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Di-n-butylphthalate	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Di-n-octyl phthalate	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Fluoranthene	ug/kg	--	2400 J	--	1600 J	--	--	660 J	390 J	--	1000 J	--	870 J
Fluorene	ug/kg	--	ND(5900)	--	4600 J	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Hexachlorobenzene	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Hexachlorobutadiene	ug/kg	--	ND(900)	--	ND(2400)	--	--	ND(2500)	ND(970)	--	ND(480)	--	ND(460)
Hexachlorocyclopentadiene	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Hexachloroethane	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Indeno(1,2,3-cd)pyrene	ug/kg	--	890 J	--	ND(16000)	--	--	ND(17000)	320 J	--	390 J	--	270 J
Isophorone	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Naphthalene	ug/kg	--	ND(5900)	--	740 J	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	79 J
Nitrobenzene	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
N-Nitrosodi-n-propylamine	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
N-Nitrosodiphenylamine	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Pentachlorophenol	ug/kg	--	ND(3400)	--	ND(8800)	--	--	ND(9500)	ND(3600)	--	ND(1800)	--	ND(1700)
Phenanthrene	ug/kg	--	1300 J	--	4500 J	--	--	580 J	180 J	--	430 J	--	440 J
Phenol	ug/kg	--	ND(5900)	--	ND(16000)	--	--	ND(17000)	ND(6400)	--	ND(3200)	--	ND(3100)
Pyrene	ug/kg	--	2000 J	--	1700 J	--	--	650 J	340 J	--	790 J	--	770 J
Pyridine	ug/kg	--	ND(5900)	--	ND(16000)	--	--	--	--	--	--	--	--
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,1,2,2-Tetrachloroethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,1,2-Trichloroethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,1-Dichloroethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,1-Dichloroethene	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,2,4-Trichlorobenzene	ug/kg	ND(330)	--	140 J	--	ND(340)	ND(270)	--	--	ND(240)	--	99 J	--
1,2,4-Trimethylbenzene	ug/kg	74 J	--	6000	--	75 J	63 J	--	--	130	--	120 J	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
1,2-Dichlorobenzene	ug/kg	ND(130)	--	500	--	ND(130)	ND(110)	--	--	ND(95)	--	30 J	--
1,2-Dichloroethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,2-Dichloropropane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
1,3,5-Trimethylbenzene	ug/kg	ND(130)	--	2700	--	68 J	54 J	--	--	67 J	--	ND(130)	--
1,3-Dichlorobenzene	ug/kg	ND(130)	--	51 J	--	ND(130)	ND(110)	--	--	ND(95)	--	ND(130)	--
1,4-Dichlorobenzene	ug/kg	ND(130)	--	170 J	--	ND(130)	ND(110)	--	--	ND(95)	--	14 J	--
2-Butanone (Methyl Ethyl Ketone)	ug/kg	ND(990)	--	ND(1400)	--	ND(1000)	ND(800)	--	--	ND(720)	--	ND(950)	--
2-Hexanone	ug/kg	ND(3300)	--	ND(4800)	--	ND(3400)	ND(2700)	--	--	ND(2400)	--	ND(3200)	--
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(3300)	--	ND(4800)	--	ND(3400)	ND(2700)	--	--	ND(2400)	--	ND(3200)	--
Acetone	ug/kg	ND(990)UJ	--	ND(1400)	--	ND(1000)	ND(800)	--	--	ND(720)	--	ND(950)	--
Benzene	ug/kg	20 J	--	370	--	ND(67)	ND(53)	--	--	11 J	--	ND(63)	--
Bromodichloromethane	ug/kg	ND(130)	--	ND(190)	--	ND(130)	ND(110)	--	--	ND(95)	--	ND(130)	--
Bromoform	ug/kg	ND(130)	--	ND(190)	--	ND(130)	ND(110)	--	--	ND(95)	--	ND(130)	--
Bromomethane (Methyl Bromide)	ug/kg	ND(260)	--	ND(380)	--	ND(210)	ND(190)	--	--	ND(190)	--	ND(250)	--
Carbon disulfide	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Carbon tetrachloride	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Chlorobenzene	ug/kg	ND(66)	--	260	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Chloroethane	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Chloroform (Trichloromethane)	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Chloromethane (Methyl Chloride)	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
cis-1,2-Dichloroethene	ug/kg	ND(66)	--	42 J	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
cis-1,3-Dichloropropene	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Cyclohexane	ug/kg	110 J	--	1600 J	--	ND(1600)	ND(1300)	--	--	61 J	--	83 J	--
Dibromochloromethane	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(130)	--	ND(190)	--	ND(130)	ND(110)	--	--	ND(95)	--	ND(130)	--
Ethylbenzene	ug/kg	19 J	--	470	--	12 J	25 J	--	--	25 J	--	23 J	--

TABLE 3.1
SURFACE SOIL ANALYTICAL DATA GRID SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		N8	lab composite N7,N8,N9	O1	lab composite O1, O2, O3	O4	O4	lab composite O4,O5,O6	lab composite O4,O5,O6	P1	lab composite P1,P2,P3	P6	lab composite P4,P5,P6
Sample ID		S-48041-061808-MC-002 N8	S-48041-061808-MC-002	S-048041-070908-DD-017 01	S-048041-070908-DD-017	S-048041-022908-DD-01404	S-048041-022908-DD-015010	S-048041-022908-DD-014	S-048041-022908-DD-015	S-048041-022808-DD-009P1	S-048041-022808-DD-009	S-048041-022908-DD-011P6	S-048041-022908-DD-011
Sample Date		6/18/2008	6/18/2008	7/9/2008	7/9/2008	2/29/2008	2/29/2008	2/29/2008	2/29/2008	2/28/2008	2/28/2008	2/29/2008	2/29/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	1-1.5 ft BGS	0-1.5 ft BGS	0.17-0.67 ft BGS	0.17-0.67 ft BGS	0-0.67 ft BGS	0-0.67 ft BGS	1.1-1.6 ft BGS	0.25-1.6 ft BGS	0.5-1 ft BGS	0.42-1 ft BGS
Sample Type		Final	Final	Final	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final	Final
	Units												
Isopropylbenzene	ug/kg	12 J	--	4200	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Methyl acetate	ug/kg	170 J	--	ND(2300)	--	190 J	420 J	--	--	270 J	--	100 J	--
Methyl cyclohexane	ug/kg	110 J	--	6500 J	--	110 J	83 J	--	--	110 J	--	170 J	--
Methyl Tert Butyl Ether	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Methylene chloride	ug/kg	ND(330)	--	1400	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Styrene	ug/kg	ND(66)	--	ND(96)	--	ND(67)	110 J	--	--	ND(48)	--	ND(63)	--
Tetrachloroethene	ug/kg	130 J	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	97	--
Toluene	ug/kg	140 J	--	300	--	37 J	46 J	--	--	110	--	36 J	--
trans-1,2-Dichloroethene	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
trans-1,3-Dichloropropene	ug/kg	ND(66)	--	ND(96)	--	ND(67)	ND(53)	--	--	ND(48)	--	ND(63)	--
Trichloroethene	ug/kg	ND(66)	--	260	--	ND(67)	ND(53)	--	--	65	--	540	--
Trichlorofluoromethane (CFC-11)	ug/kg	ND(130)	--	ND(190)	--	ND(130)	ND(110)	--	--	ND(95)	--	ND(130)	--
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(330)	--	ND(480)	--	ND(340)	ND(270)	--	--	ND(240)	--	ND(320)	--
Vinyl chloride	ug/kg	ND(53)	--	ND(76)	--	ND(54)	ND(43)	--	--	ND(38)	--	ND(51)	--
Xylene (total)	ug/kg	170 J	--	4500	--	100 J	280 J	--	--	240	--	180 J	--

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.2

SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ^(b)								001A2	lab composite A1,A2,A3,A4,A5	002B2	lab composite B1,B2,B3,B4,B5	003C3	lab composite C1,C2,C3,C4,C5
Sample ID	Statewide Default	Groundwater Contact	Soil Volatilization to Indoor Air	Infinite Source Volatile Soil Inhalation	Particulate Soil Inhalation	Direct Contact Industrial and Commercial II	Soil Saturation Concentration	S-048041-051408-MC-001 A2	S-048041-051408-MC-001	S-048041-051408-MC-002 B2	S-048041-051408-MC-002	S-048041-051508-MC-003 C3	S-048041-051508-MC-003	
Sample Date								5/14/2008	5/14/2008	5/14/2008	5/14/2008	5/15/2008	5/15/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation				0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	
Sample Type	Units	a	b	c	d	e	f	g	Final	Final	Final	Final	Final	
Metals														
Aluminum	mg/kg	6900	1000000	NLV	NLV	ID	370000	NA	--	9390	--	12300	--	8220
Antimony	mg/kg	NA	49000	NLV	NLV	5900	670	NA	--	0.93 J	--	0.78 J	--	0.85 J
Arsenic	mg/kg	5.8	2000	NLV	NLV	910	37	NA	--	6.0	--	6.2	--	10.5
Barium	mg/kg	75	1000000	NLV	NLV	150000	130000	NA	--	181	--	244	--	280
Beryllium	mg/kg	NA	1000000	NLV	NLV	590	1600	NA	--	0.57	--	0.83	--	0.46
Cadmium	mg/kg	1.2	230000	NLV	NLV	2200	2100	NA	--	1.9	--	1.8	--	5.5
Calcium	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	73400	--	74600	--	58600
Chromium Total	mg/kg	18	1000000	NLV	NLV	150000	1000000	NA	--	57.7 J	--	39.6 J	--	130 J
Chromium VI (Hexavalent)	mg/kg	NA	140000	NLV	NLV	240	9200	NA	--	ND(0.94)	--	ND(0.91)	--	4.8 J
Cobalt	mg/kg	6.8	48000	NLV	NLV	5900	9000	NA	--	5.4 J	--	6.1 J	--	5.0 J
Copper	mg/kg	32	1000000	NLV	NLV	59000	73000	NA	--	76.4	--	78.5	--	118
Iron	mg/kg	12000	1000000	NLV	NLV	ID	580000	NA	--	21600	--	17600	--	36000
Lead - Coarse Fraction	mg/kg	NA	ID	NLV	NLV	NA	900	NA	--	449	--	394	--	1500 f
Lead - Fine Fraction	mg/kg	21	ID	NLV	NLV	44000	900	NA	--	491	--	521	--	1130 f
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	NA	ID	NLV	NLV	NA	NA	NA	--	455	--	413	--	1430
Magnesium	mg/kg	NA	1000000	NLV	NLV	2900000	1000000	NA	--	18000 J	--	15200 J	--	12700 J
Manganese	mg/kg	440	180000	NLV	NLV	1500	90000	NA	--	2090 J e	--	1080 J	--	1620 J e
Mercury	mg/kg	0.13	47	89	62	8800	580	NA	--	0.18	--	0.20	--	0.22
Nickel	mg/kg	20	1000000	NLV	NLV	16000	150000	NA	--	26.0 J	--	24.7 J	--	26.4 J
Potassium	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	1210	--	1680	--	1110
Selenium	mg/kg	0.41	78000	NLV	NLV	59000	9600	NA	--	0.78	--	0.99	--	1.2
Silver	mg/kg	1	200000	NLV	NLV	2900	9000	NA	--	0.16	--	0.17	--	0.34
Sodium	mg/kg	NA	1000000	NLV	NLV	ID	1000000	NA	--	289	--	333	--	215
Thallium	mg/kg	NA	15000	NLV	NLV	ID	130	NA	--	0.21	--	0.19	--	0.34
Vanadium	mg/kg	NA	1000000	NLV	NLV	ID	5500	NA	--	39.1 J	--	19.7 J	--	31.1 J
Zinc	mg/kg	47	1000000	NLV	NLV	ID	630000	NA	--	422	--	326	--	724
PCBs														
Aroclor-1016 (PCB-1016)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1221 (PCB-1221)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1232 (PCB-1232)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1242 (PCB-1242)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1248 (PCB-1248)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1254 (PCB-1254)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(3.9)	--	ND(3.8)	--	ND(0.44)
Aroclor-1260 (PCB-1260)	mg/kg	NA	NA	NA	NA	NA	NA	NA	--	33	--	19	--	2.2
Total PCBs	mg/kg	NA	NLL	16000	810	6500	16	NA	--	33 f	--	19 f	--	2.2
Semi-Volatile Organic Compounds														
2,2'-oxybis(1-Chloropropane)	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,4,5-Trichlorophenol	ug/kg	NA	9100000	NLV	NLV	10000000000	73000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,4,6-Trichlorophenol	ug/kg	NA	200000	NLV	NLV	1300000000	3300000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,4-Dichlorophenol	ug/kg	NA	960000	NLV	NLV	2300000000	1800000	1800000	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,4-Dimethylphenol	ug/kg	NA	10000000	NLV	NLV	2100000000	36000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(18000)	--	ND(17000)	--	ND(30000)
2,4-Dinitrotoluene	ug/kg	NA	170000	NLV	NLV	20000000	220000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2-Chloronaphthalene	ug/kg	NA	2300000	ID	ID	ID	180000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2-Chlorophenol	ug/kg	NA	1900000	ID	ID	ID	4500000	19000000	--	ND(31000)	--	ND(30000)	--	ND(53000)
2-Methylnaphthalene	ug/kg	NA	5500000	ID	ID	ID	26000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(23000)	--	ND(23000)	--	ND(40000)
2-Nitrophenol	ug/kg	NA	1600000	NLV	NLV	ID	2000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
3,3'-Dichlorobenzidine	ug/kg	NA	4600	NLV	NLV	8200000	30000	NA	--	ND(190000)	--	ND(180000)	--	ND(320000)
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(23000)	--	ND(23000)	--	ND(40000)
4,6-Dinitro-2-methylphenol	ug/kg	NA	190000	NLV	NLV	ID	260000	NA	--	ND(18000)	--	ND(17000)	--	ND(30000)
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
4-Chloro-3-methylphenol	ug/kg	NA	3000000	NLV	NLV	ID	15000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(18000)	--	ND(17000)	--	ND(30000)
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
4-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(23000)	--	ND(23000)	--	ND(40000)
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(39000)	--	ND(38000)	--	ND(67000)
Acenaphthene	ug/kg	NA	970000	350000000	97000000	6200000000	130000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
Acenaphthylene	ug/kg	NA	440000	3000000	2700000	1000000000	5200000	NA	--	ND(31000)	--	ND(30000)	--	1900 J
Acetophenone	ug/kg	NA	1100000	1100000	52000000	14000000000	1100000	1100000	--	ND(31000)	--	ND(30000)	--	ND(53000)
Anthracene	ug/kg	NA	41000	1000000000	1600000000	29000000000	730000000	NA	--	ND(31000)	--	ND(30000)	--	1400 J
Atrazine	ug/kg	NA	110000	NLV	NLV	ID	330000	NA	--	ND(47000)	--	ND(45000)	--	ND(81000)
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)
Benzo(a)anthracene	ug/kg	NA	NLL	NLV	NLV	ID	80000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)

TABLE 3.2

SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ^(b)								001A2	lab composite A1,A2,A3,A4,A5		002B2	lab composite B1,B2,B3,B4,B5		003C3	lab composite C1,C2,C3,C4,C5	
Sample ID	Statewide Default	Groundwater Contact	Soil Volatilization to Indoor Air	Infinite Source Volatile Soil	Particulate Soil Inhalation	Direct Contact Industrial and Commercial II	Soil Saturation Concentration	S-048041-051408-MC-001 A2	S-048041-051408-MC-001	S-048041-051408-MC-002 B2	S-048041-051408-MC-002	S-048041-051508-MC-003 C3	S-048041-051508-MC-003				
Sample Date								5/14/2008	5/14/2008	5/14/2008	5/14/2008	5/15/2008	5/15/2008				
Sample Depth	Background	Protection	Inhalation	Inhalation			Screening	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS				
Sample Type								Final	Final	Final	Final	Final	Final				
	Units	a	b	c	d	e	f	g									
Benzo(a)pyrene	ug/kg	NA	NLL	NLV	NLV	1900000	8000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Benzo(b)fluoranthene	ug/kg	NA	NLL	ID	ID	ID	8000	NA	--	2000 J	--	ND(30000)	--	ND(53000)			
Benzo(g,h,i)perylene	ug/kg	NA	NLL	NLV	NLV	350000000	7000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Benzo(k)fluoranthene	ug/kg	NA	NLL	NLV	NLV	ID	800000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Biphenyl	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
bis(2-Chloroethyl)ether	ug/kg	NA	110000	44000	13000	12000000	58000	2200000	--	ND(9400)	--	ND(9100)	--	ND(16000)			
bis(2-Ethylhexyl)phthalate	ug/kg	NA	NLL	NLV	NLV	890000000	10000000	10000000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Butyl benzylphthalate	ug/kg	NA	310000	NLV	NLV	21000000000	310000	310000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Caprolactam	ug/kg	NA	1000000000	NLV	NLV	2900000000	310000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Carbazole	ug/kg	NA	820000	NLV	NLV	ID	2400000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Chrysene	ug/kg	NA	NLL	ID	ID	ID	8000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Dibenz(a,h)anthracene	ug/kg	NA	NLL	NLV	NLV	ID	8000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Dibenzofuran	ug/kg	NA	ID	ID	ID	ID	ID	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Diethyl phthalate	ug/kg	NA	740000	NLV	NLV	1500000000	740000	740000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Dimethyl phthalate	ug/kg	NA	790000	NLV	NLV	1500000000	790000	790000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Di-n-butylphthalate	ug/kg	NA	760000	NLV	NLV	1500000000	760000	760000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Di-n-octyl phthalate	ug/kg	NA	140000000	NLV	NLV	ID	20000000	140000000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Fluoranthene	ug/kg	NA	730000	1000000000	8900000000	4100000000	1300000000	NA	--	960 J	--	2600 J	--	5400 J			
Fluorene	ug/kg	NA	890000	1000000000	1500000000	4100000000	870000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Hexachlorobenzene	ug/kg	NA	8200	220000	56000	8500000	37000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Hexachlorobutadiene	ug/kg	NA	350000	350000	460000	1800000000	350000	350000	--	ND(4700)	--	ND(4500)	--	ND(8100)			
Hexachlorocyclopentadiene	ug/kg	NA	720000	56000	60000	5900000	720000	720000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Hexachloroethane	ug/kg	NA	110000	79000	660000	1000000000	730000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NLL	NLV	NLV	ID	80000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Isophorone	ug/kg	NA	2400000	NLV	NLV	8200000000	2400000	2400000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Naphthalene	ug/kg	NA	2100000	470000	350000	880000000	52000000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Nitrobenzene	ug/kg	NA	220000	170000	64000	21000000	340000	490000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
N-Nitrosodi-n-propylamine	ug/kg	NA	7200	NLV	NLV	2000000	5400	1500000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
N-Nitrosodiphenylamine	ug/kg	NA	700000	NLV	NLV	ID	7800000	NA	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Pentachlorophenol	ug/kg	NA	4300	NLV	NLV	130000000	320000	NA	--	ND(18000)	--	ND(17000)	--	ND(30000)			
Phenanthrene	ug/kg	NA	1100000	5100000	190000	2900000	5200000	NA	--	ND(31000)	--	1000 J	--	5400 J			
Phenol	ug/kg	NA	12000000	NLV	NLV	18000000000	12000000	12000000	--	ND(31000)	--	ND(30000)	--	ND(53000)			
Pyrene	ug/kg	NA	480000	1000000000	7800000000	29000000000	84000000	NA	--	1200 J	--	2300 J	--	8100 J			
Volatile Organic Compounds																	
1,1,1-Trichloroethane	ug/kg	NA	460000	460000	4500000	290000000000	460000	460000	ND(61)	--	ND(48)	--	ND(54)	--			
1,1,2,2-Tetrachloroethane	ug/kg	NA	94000	23000	34000	680000000	240000	870000	ND(61)	--	ND(48)	--	ND(54)	--			
1,1,2-Trichloroethane	ug/kg	NA	420000	24000	57000	250000000	840000	920000	ND(61)	--	ND(48)	--	ND(54)	--			
1,1-Dichloroethane	ug/kg	NA	890000	430000	2500000	15000000000	890000	890000	ND(61)	--	ND(48)	--	ND(54)	--			
1,1-Dichloroethene	ug/kg	NA	220000	330	3700	780000000	570000	570000	ND(61)	--	ND(48)	--	ND(54)	--			
1,2,4-Trichlorobenzene	ug/kg	NA	1100000	1100000	34000000	11000000000	1100000	1100000	22 J	--	25 J	--	ND(270)	--			
1,2,4-Trimethylbenzene	ug/kg	NA	110000	110000	25000000	360000000000	110000	110000	48 J	--	39 J	--	ND(110)	--			
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	1200	1200	15000	5900000	1200	1200	ND(300)	--	ND(240)	--	ND(270)	--			
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	NA	500	3600	5800	18000000	430	890000	ND(300)	--	ND(240)	--	ND(270)	--			
1,2-Dichlorobenzene	ug/kg	NA	210000	210000	46000000	44000000000	210000	210000	37 J	--	ND(96)	--	ND(110)	--			
1,2-Dichloroethane	ug/kg	NA	380000	11000	21000	150000000	420000	1200000	ND(61)	--	ND(48)	--	ND(54)	--			
1,2-Dichloropropane	ug/kg	NA	320000	7400	30000	120000000	550000	550000	ND(61)	--	ND(48)	--	ND(54)	--			
1,3,5-Trimethylbenzene	ug/kg	NA	94000	94000	19000000	360000000000	94000	94000	ND(120)	--	ND(96)	--	ND(110)	--			
1,3-Dichlorobenzene	ug/kg	NA	51000	ID	ID	ID	170000	170000	ND(120)	--	ND(96)	--	ND(110)	--			
1,4-Dichlorobenzene	ug/kg	NA	140000	100000	260000	570000000	1900000	NA	ND(120)	--	ND(96)	--	ND(110)	--			
2-Butanone (Methyl Ethyl Ketone)	ug/kg	NA	27000000	27000000	35000000	290000000000	27000000	27000000	82 J	--	ND(720)	--	73 J	--			
2-Hexanone	ug/kg	NA	25000000	18000000	13000000	12000000000	25000000	25000000	ND(3000)	--	ND(2400)	--	ND(2700)	--			
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	NA	27000000	27000000	530000000	600000000000	27000000	27000000	27 J	--	23 J	--	ND(2700)	--			
Acetone	ug/kg	NA	110000000	110000000	160000000	1700000000000	73000000	110000000	ND(910)	--	ND(720)	--	ND(810)	--			
Benzene	ug/kg	NA	220000	8400	45000	470000000	400000	400000	ND(61)	--	ND(48)	--	34 J	--			
Bromodichloromethane	ug/kg	NA	280000	6400	31000	110000000	490000	1500000	ND(120)	--	ND(96)	--	ND(110)	--			
Bromoform	ug/kg	NA	870000	770000	3100000	3600000000	870000	870000	ND(120)	--	ND(96)	--	ND(110)	--			
Bromomethane (Methyl Bromide)	ug/kg	NA	1400000	1600	13000	150000000	1000000	2200000	ND(240)	--	ND(190)	--	ND(220)	--			
Carbon disulfide	ug/kg	NA	280000	140000	1600000	21000000000	280000	280000	ND(300)	--	ND(240)	--	ND(270)	--			
Carbon tetrachloride	ug/kg	NA	92000	990	12000	170000000	390000	390000	ND(61)	--	ND(48)	--	ND(54)	--			
Chlorobenzene	ug/kg	NA	260000	220000	920000	2100000000	260000	260000	ND(61)	--	ND(48)	--	ND(54)	--			
Chloroethane	ug/kg	NA	950000	950000	36000000	2900000000000	950000	950000	ND(300)	--	ND(240)	--	ND(270)	--			
Chloroform (Trichloromethane)	ug/kg	NA	1500000	38000	150000	1600000000	1500000	1500000	ND(61)	--	ND(48)	--	ND(54)	--			
Chloromethane (Methyl Chloride)	ug/kg	NA	1100000	10000	120000	2600000000	1100000	1100000	ND(300)	--	ND(240)	--	ND(270)	--			
cis-1,2-Dichloroethene	ug/kg	NA	640000	41000	210000	1000000000	640000	640000	ND(61)	--	ND(48)	--	21 J	--			
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(61)	--	ND(48)	--	ND(54)	--			
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(1500)	--	63 J	--	74 J	--			
Dibromochloromethane	ug/kg	NA	360000	21000	80000	160000000	500000	610000	ND(61)	--	ND(48)	--	ND(54)	--			
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	1000000	1700000	63000000	15000000000000	1000000	1000000	ND(120)	--	ND(96)	--	ND(110)	--			
Ethylbenzene	ug/kg	NA	140000	140000	2400000	13000000000	140000	140000	23 J	--	19 J	--	15 J	--			
Isopropylbenzene	ug/kg	NA	390000	390000	2000000	2600000000	390000	390000	ND(300)	--	7.9 J	--	ND(270)	--			

TABLE 3.2
SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								001A2	lab composite A1,A2,A3,A4,A5	002B2	lab composite B1,B2,B3,B4,B5	003C3	lab composite C1,C2,C3,C4,C5
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	S-048041-051408-MC-001 A2	S-048041-051408-MC-001	S-048041-051408-MC-002 B2	S-048041-051408-MC-002	S-048041-051508-MC-003 C3	S-048041-051508-MC-003	
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	5/14/2008	5/14/2008	5/14/2008	5/14/2008	5/15/2008	5/15/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	
Sample Type								Final	Final	Final	Final	Final	Final	
	Units	a	b	c	d	e	f	g						
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	130 J	--	86 J	--	100 J	
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	29 J	--	18 J	--	22 J	
Methyl Tert Butyl Ether	ug/kg	NA	5900000	5900000	30000000	88000000000	5900000	5900000	ND(300)	--	ND(240)	--	ND(270)	
Methylene chloride	ug/kg	NA	2300000	240000	700000	83000000000	2300000	2300000	ND(300)	--	ND(240)	--	ND(270)	
Styrene	ug/kg	NA	270000	520000	3300000	69000000000	520000	520000	ND(61)	--	ND(48)	--	ND(54)	
Tetrachloroethene	ug/kg	NA	88000	60000	600000	68000000000	88000	88000	ND(61)	--	ND(48)	--	ND(54)	
Toluene	ug/kg	NA	250000	250000	3300000	12000000000	250000	250000	89 J	--	52 J	--	72 J	
trans-1,2-Dichloroethene	ug/kg	NA	1400000	43000	330000	2100000000	1400000	1400000	ND(61)	--	ND(48)	--	ND(54)	
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(61)	--	ND(48)	--	ND(54)	
Trichloroethene	ug/kg	NA	440000	37000	260000	23000000000	500000	500000	ND(61)	--	ND(48)	--	44 J	
Trichlorofluoromethane (CFC-11)	ug/kg	NA	560000	560000	110000000	1700000000000	560000	560000	2100	--	440 J	--	ND(110)	
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	550000	550000	210000000	2300000000000	550000	550000	ND(300)	--	ND(240)	--	ND(270)	
Vinyl chloride	ug/kg	NA	20000	2800	29000	8900000000	34000	490000	ND(48)	--	ND(38)	--	ND(43)	
Xylene (total)	ug/kg	NA	150000	150000	54000000	130000000000	150000	150000	66 J	--	46 J	--	65 J	

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.
G - Laboratory qualiiier: Elevated reporting limit. The reporting limit is elevated due to matrix interference.

TABLE 3.2
SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	004D4	lab composite D1,D2,D3,D4,D5	005E1	lab composite E1,E2,E3,E4,E5	006F2	lab composite F1,F2,F3,F4,F5	007G4	lab composite G1,G2,G3,G4,G5	
Sample ID	S-048041-051508-MC-004 D4	S-048041-051508-MC-004	S-048041-051508-MC-005 E1	S-048041-051508-MC-005	S-048041-051508-MC-006 F2	S-048041-051508-MC-006	S-048041-051508-MC-007 G4	S-048041-051508-MC-007	
Sample Date	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	
Sample Depth	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	
	Units								
Metals									
Aluminum	mg/kg	--	11500	--	3690	--	7150	--	12900
Antimony	mg/kg	--	1.0 J	--	0.45 J	--	1.8 J	--	0.83 J
Arsenic	mg/kg	--	9.4	--	5.2	--	9.4	--	5.2
Barium	mg/kg	--	284	--	116	--	260	--	315
Beryllium	mg/kg	--	0.73	--	0.088 J	--	0.36	--	2.4
Cadmium	mg/kg	--	5.5	--	2.1	--	3.9	--	6.8
Calcium	mg/kg	--	39200	--	43500	--	46200	--	107000
Chromium Total	mg/kg	--	81.4 J	--	20.6 J	--	125 J	--	51.1 J
Chromium VI (Hexavalent)	mg/kg	--	ND(0.97)	--	11.1 J	--	1.2 J	--	ND(0.89)
Cobalt	mg/kg	--	6.9 J	--	2.9 J	--	10.2 J	--	3.6 J
Copper	mg/kg	--	85.3	--	28.4	--	139	--	97.4
Iron	mg/kg	--	29400	--	9110	--	57700	--	17200
Lead - Coarse Fraction	mg/kg	--	4900 f	--	469	--	1350 f	--	699
Lead - Fine Fraction	mg/kg	--	3180 f	--	543	--	788	--	563
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	--	4620	--	470	--	1210	--	666
Magnesium	mg/kg	--	7010 J	--	14300 J	--	10700 J	--	21300 J
Manganese	mg/kg	--	1170 J	--	336 J	--	1330 J	--	1430 J
Mercury	mg/kg	--	0.21	--	0.11	--	1.5	--	0.020 J
Nickel	mg/kg	--	34.1 J	--	13.7 J	--	54.0 J	--	22.5 J
Potassium	mg/kg	--	1600	--	409 J	--	895	--	1340
Selenium	mg/kg	--	1.1	--	0.38	--	0.98	--	1.5
Silver	mg/kg	--	0.30	--	0.13	--	0.34	--	0.28
Sodium	mg/kg	--	304	--	118	--	333	--	564
Thallium	mg/kg	--	0.34	--	0.10	--	0.16 J	--	0.089
Vanadium	mg/kg	--	27.2 J	--	12.2 J	--	26.8 J	--	17.8 J
Zinc	mg/kg	--	901	--	218	--	702	--	474
PCBs									
Aroclor-1016 (PCB-1016)	mg/kg	--	ND(0.4)	--	ND(0.38)	--	ND(0.81)	--	ND(1.8)
Aroclor-1221 (PCB-1221)	mg/kg	--	ND(0.4)	--	ND(0.38)	--	ND(0.81)	--	ND(1.8)
Aroclor-1232 (PCB-1232)	mg/kg	--	ND(0.4)	--	ND(0.38)	--	ND(0.81)	--	ND(1.8)
Aroclor-1242 (PCB-1242)	mg/kg	--	ND(0.4)	--	ND(0.38)	--	ND(0.81)	--	ND(1.8)
Aroclor-1248 (PCB-1248)	mg/kg	--	1	--	1.1	--	0.98	--	ND(1.8)
Aroclor-1254 (PCB-1254)	mg/kg	--	ND(0.4)	--	ND(0.38)	--	ND(0.81)	--	ND(1.8)
Aroclor-1260 (PCB-1260)	mg/kg	--	2.9	--	4.7	--	5.2	--	15
Total PCBs	mg/kg	--	3.9	--	5.8	--	6.18	--	15
Semi-Volatile Organic Compounds									
2,2'-oxybis(1-Chloropropane)	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,4,5-Trichlorophenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,4,6-Trichlorophenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,4-Dichlorophenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,4-Dimethylphenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,4-Dinitrophenol	ug/kg	--	ND(150000)	--	ND(170000)	--	ND(110000)	--	ND(100000)
2,4-Dinitrotoluene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2,6-Dinitrotoluene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2-Chloronaphthalene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2-Chlorophenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2-Methylnaphthalene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2-Methylphenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
2-Nitroaniline	ug/kg	--	ND(190000)	--	ND(230000)	--	ND(150000)	--	ND(130000)
2-Nitrophenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
3,3'-Dichlorobenzidine	ug/kg	--	ND(1600000)	--	ND(1800000)	--	ND(1200000)	--	ND(1100000)
3-Nitroaniline	ug/kg	--	ND(190000)	--	ND(230000)	--	ND(150000)	--	ND(130000)
4,6-Dinitro-2-methylphenol	ug/kg	--	ND(150000)	--	ND(170000)	--	ND(110000)	--	ND(100000)
4-Bromophenyl phenyl ether	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
4-Chloro-3-methylphenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
4-Chloroaniline	ug/kg	--	ND(150000)	--	ND(170000)	--	ND(110000)	--	ND(100000)
4-Chlorophenyl phenyl ether	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
4-Methylphenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
4-Nitroaniline	ug/kg	--	ND(190000)	--	ND(230000)	--	ND(150000)	--	ND(130000)
4-Nitrophenol	ug/kg	--	ND(320000)	--	ND(380000)	--	ND(240000)	--	ND(220000)
Acenaphthene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
Acenaphthylene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
Acetophenone	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
Anthracene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
Atrazine	ug/kg	--	ND(39000)	--	ND(46000)	--	ND(29000)	--	ND(27000)
Benzaldehyde	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)
Benzo(a)anthracene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--	ND(180000)

TABLE 3.2
SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	004D4	lab composite D1,D2,D3,D4,D5	005E1	lab composite E1,E2,E3,E4,E5	006F2	lab composite F1,F2,F3,F4,F5	007G4	lab composite G1,G2,G3,G4,G5
Sample ID	S-048041-051508-MC-004 D4	S-048041-051508-MC-004	S-048041-051508-MC-005 E1	S-048041-051508-MC-005	S-048041-051508-MC-006 F2	S-048041-051508-MC-006	S-048041-051508-MC-007 G4	S-048041-051508-MC-007
Sample Date	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008
Sample Depth	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final
	Units							
Benzo(a)pyrene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Benzo(b)fluoranthene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Benzo(g,h,i)perylene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Benzo(k)fluoranthene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Biphenyl	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
bis(2-Chloroethoxy)methane	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
bis(2-Chloroethyl)ether	ug/kg	--	ND(78000)	--	ND(92000)	--	ND(59000)	--
bis(2-Ethylhexyl)phthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Butyl benzylphthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Caprolactam	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Carbazole	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Chrysene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Dibenz(a,h)anthracene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Dibenzofuran	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Diethyl phthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Dimethyl phthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Di-n-butylphthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Di-n-octyl phthalate	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Fluoranthene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Fluorene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Hexachlorobenzene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Hexachlorobutadiene	ug/kg	--	ND(39000)	--	ND(46000)	--	ND(29000)	--
Hexachlorocyclopentadiene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Hexachloroethane	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Indeno(1,2,3-cd)pyrene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Isophorone	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Naphthalene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Nitrobenzene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
N-Nitrosodi-n-propylamine	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
N-Nitrosodiphenylamine	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Pentachlorophenol	ug/kg	--	ND(150000)	--	ND(170000)	--	ND(110000)	--
Phenanthrene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Phenol	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Pyrene	ug/kg	--	ND(260000)	--	ND(310000)	--	ND(190000)	--
Volatile Organic Compounds								
1,1,1-Trichloroethane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,1,2,2-Tetrachloroethane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,1,2-Trichloroethane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,1-Dichloroethane	ug/kg	110 J	--	ND(44)	--	ND(43)	--	11 J
1,1-Dichloroethene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,2,4-Trichlorobenzene	ug/kg	ND(260)	--	ND(260)	--	ND(210)	--	ND(210)
1,2,4-Trimethylbenzene	ug/kg	2200 J	--	260 J	--	100 J	--	180 J
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)
1,2-Dichlorobenzene	ug/kg	62 J	--	220 J	--	110 J	--	ND(85)
1,2-Dichloroethane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,2-Dichloropropane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
1,3,5-Trimethylbenzene	ug/kg	840 J	--	220 J	--	77 J	--	130 J
1,3-Dichlorobenzene	ug/kg	ND(100)	--	98 J	--	36 J	--	ND(85)
1,4-Dichlorobenzene	ug/kg	13 J	--	91 J	--	70 J	--	10 J
2-Butanone (Methyl Ethyl Ketone)	ug/kg	120 J	--	ND(660)	--	93 J	--	ND(640)
2-Hexanone	ug/kg	ND(2600)	--	ND(2200)	--	ND(2100)	--	ND(2100)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(2600)	--	ND(2200)	--	ND(2100)	--	48 J
Acetone	ug/kg	130 J	--	ND(660)	--	ND(640)	--	ND(640)
Benzene	ug/kg	45 J	--	ND(44)	--	20 J	--	8.1 J
Bromodichloromethane	ug/kg	ND(100)	--	ND(87)	--	ND(86)	--	ND(85)
Bromoform	ug/kg	ND(100)	--	ND(87)	--	ND(86)	--	ND(85)
Bromomethane (Methyl Bromide)	ug/kg	ND(210)	--	ND(170)	--	ND(170)	--	ND(170)
Carbon disulfide	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)
Carbon tetrachloride	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
Chlorobenzene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
Chloroethane	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)
Chloroform (Trichloromethane)	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
Chloromethane (Methyl Chloride)	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)
cis-1,2-Dichloroethene	ug/kg	33 J	--	ND(44)	--	ND(43)	--	30 J
cis-1,3-Dichloropropene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
Cyclohexane	ug/kg	210 J	--	86 J	--	160 J	--	84 J
Dibromochloromethane	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(100)	--	ND(87)	--	ND(86)	--	ND(85)
Ethylbenzene	ug/kg	230 J	--	21 J	--	25 J	--	20 J
Isopropylbenzene	ug/kg	140 J	--	ND(220)	--	29 J	--	8.9 J

TABLE 3.2
SURFACE SOIL ANALYTICAL DATA STAINED SAMPLING
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		004D4	lab composite D1,D2,D3,D4,D5	005E1	lab composite E1,E2,E3,E4,E5	006F2	lab composite F1,F2,F3,F4,F5	007G4	lab composite G1,G2,G3,G4,G5
Sample ID		S-048041-051508-MC-004 D4	S-048041-051508-MC-004	S-048041-051508-MC-005 E1	S-048041-051508-MC-005	S-048041-051508-MC-006 F2	S-048041-051508-MC-006	S-048041-051508-MC-007 G4	S-048041-051508-MC-007
Sample Date		5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008	5/15/2008
Sample Depth		0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS	0-0.5 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final
	Units								
Methyl acetate	ug/kg	170 J	--	ND(1000)	--	120 J	--	120 J	--
Methyl cyclohexane	ug/kg	620 J	--	110 J	--	570 J	--	98 J	--
Methyl Tert Butyl Ether	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)	--
Methylene chloride	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)	--
Styrene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)	--
Tetrachloroethene	ug/kg	27 J	--	ND(44)	--	ND(43)	--	33 J	--
Toluene	ug/kg	170 J	--	27 J	--	49 J	--	53 J	--
trans-1,2-Dichloroethene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)	--
trans-1,3-Dichloropropene	ug/kg	ND(52)	--	ND(44)	--	ND(43)	--	ND(43)	--
Trichloroethene	ug/kg	68 J	--	ND(44)	--	ND(43)	--	69 J	--
Trichlorofluoromethane (CFC-11)	ug/kg	ND(100)	--	ND(87)	--	ND(86)	--	ND(85)	--
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(260)	--	ND(220)	--	ND(210)	--	ND(210)	--
Vinyl chloride	ug/kg	ND(41)	--	ND(35)	--	ND(34)	--	ND(34)	--
Xylene (total)	ug/kg	1000 J	--	830 J	--	150 J	--	170 J	--

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.
G - Laboratory qualiiier: Elevated reporting limit. The reporting limit is elevated due to matrix interference.

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								SB-1	SB-1	SB-2	SB-2	SB-3
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	BH-48041-061208-MC-001	BH-48041-061208-MC-002	BH-48041-061208-MC-003	BH-48041-061208-MC-004	BH-48041-061208-MC-005	
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	
Sample Type	Units	a	b	c	d	e	f	g	Final	Duplicate	Final	Final	Final
Metals													
Aluminum	mg/kg	6900	1000000	NLV	NLV	ID	370000	NA	7490	4340	8150	7650	10000
Antimony	mg/kg	NA	49000	NLV	NLV	5900	670	NA	1.1 J	0.92 J	1.5 J	0.10 J	1.9 J
Arsenic	mg/kg	5.8	2000	NLV	NLV	910	37	NA	23.7 J	12.1 J	6.6 J	3.5 J	49.5 J f
Barium	mg/kg	75	1000000	NLV	NLV	150000	130000	NA	184 J	125 J	342 J	62.7 J	238 J
Beryllium	mg/kg	NA	1000000	NLV	NLV	590	1600	NA	1.1 J	0.41 J	0.96	0.23	1.6
Cadmium	mg/kg	1.2	230000	NLV	NLV	2200	2100	NA	0.94	0.79	3.7	0.32	1.8
Calcium	mg/kg	NA	NA	NA	NA	NA	NA	NA	10100 J	50600 J	46000	22500	54900
Chromium Total	mg/kg	18	1000000	NLV	NLV	150000	1000000	NA	16.4 J	10.9 J	52.2 J	13.3 J	120 J
Chromium VI (Hexavalent)	mg/kg	NA	140000	NLV	NLV	240	9200	NA	ND(0.98)	ND(0.91)	3.3 J	2.0 J	2.8 J
Cobalt	mg/kg	6.8	48000	NLV	NLV	5900	9000	NA	8.7	6.5	3.6	5.8	2.4
Copper	mg/kg	32	1000000	NLV	NLV	59000	73000	NA	512	307	106	16.5	166
Iron	mg/kg	12000	1000000	NLV	NLV	ID	580000	NA	34500 J	11100 J	17100	14700	30700
Lead	mg/kg	21	ID	NLV	NLV	44000	900	NA	--	--	--	35.5	--
Lead - Coarse Fraction	mg/kg	NA	ID	NLV	NLV	NA	900	NA	221	209	984 f	--	1430 f
Lead - Fine Fraction	mg/kg	21	ID	NLV	NLV	44000	900	NA	332	479	1170 f	--	2750 f
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	NA	ID	NLV	NLV	NA	NA	NA	249	269	1030	--	1740
Magnesium	mg/kg	NA	1000000	NLV	NLV	2900000	1000000	NA	1760 J	23000 J	7250 J	6570 J	6210 J
Manganese	mg/kg	440	180000	NLV	NLV	1500	90000	NA	221	175	1670 e	196	3120 e
Mercury	mg/kg	0.13	47	89	62	8800	580	NA	0.16 J	0.61 J	0.80	0.20	0.89
Nickel	mg/kg	20	1000000	NLV	NLV	16000	150000	NA	27.0	27.1	16.7	13.3	8.9
Potassium	mg/kg	NA	NA	NA	NA	NA	NA	NA	426 J	566	745	988	1060
Selenium	mg/kg	0.41	78000	NLV	NLV	59000	9600	NA	1.1	1.1	1.2	0.47	8.9
Silver	mg/kg	1	200000	NLV	NLV	2900	9000	NA	0.50 J	0.14 J	0.33 J	0.041 J	0.44
Sodium	mg/kg	NA	1000000	NLV	NLV	ID	1000000	NA	246	163	234	193	308
Thallium	mg/kg	NA	15000	NLV	NLV	ID	130	NA	0.32	0.18	ND(0.45)	0.14	0.43
Vanadium	mg/kg	NA	1000000	NLV	NLV	ID	5500	NA	18.3 J	15.1 J	28.6 J	20.7 J	18.3 J
Zinc	mg/kg	47	1000000	NLV	NLV	ID	630000	NA	161 J	216 J	500 J	49.7 J	321 J
PCBs													
Aroclor-1016 (PCB-1016)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	ND(1.9)	ND(0.74)	ND(0.2)	ND(0.038)
Aroclor-1221 (PCB-1221)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	ND(1.9)	ND(0.74)	ND(0.2)	ND(0.038)
Aroclor-1232 (PCB-1232)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	ND(1.9)	ND(0.74)	ND(0.2)	ND(0.038)
Aroclor-1242 (PCB-1242)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	ND(1.9)	1.6	0.46	0.2
Aroclor-1248 (PCB-1248)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	ND(1.9)	ND(0.74)	ND(0.2)	ND(0.038)
Aroclor-1254 (PCB-1254)	mg/kg	NA	NA	NA	NA	NA	NA	NA	28	ND(1.9)	3.2	1.4	0.58
Aroclor-1260 (PCB-1260)	mg/kg	NA	NA	NA	NA	NA	NA	NA	ND(4)	7.8	ND(0.74)	ND(0.2)	ND(0.038)
Total PCBs	mg/kg	NA	NLL	16000	810	6500	16	NA	28 f	7.8	4.8	1.86	0.78
Semi-Volatile Organic Compounds													
2,2'-oxybis(1-Chloropropane)	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,4,5-Trichlorophenol	ug/kg	NA	9100000	NLV	NLV	10000000000	73000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,4,6-Trichlorophenol	ug/kg	NA	200000	NLV	NLV	1300000000	3300000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,4-Dichlorophenol	ug/kg	NA	960000	NLV	NLV	2300000000	1800000	1800000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,4-Dimethylphenol	ug/kg	NA	10000000	NLV	NLV	21000000000	36000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(9200)	ND(8600)	ND(25000)	ND(1800)	ND(8500)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾							SB-1	SB-1	SB-2	SB-2	SB-3	
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	BH-48041-061208-MC-001	BH-48041-061208-MC-002	BH-48041-061208-MC-003	BH-48041-061208-MC-004	BH-48041-061208-MC-005	
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	
Sample Type								Final	Duplicate	Final	Final	Final	
	Units	a	b	c	d	e	f	g					
2,4-Dinitrotoluene	ug/kg	NA	170000	NLV	NLV	20000000	220000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2-Chloronaphthalene	ug/kg	NA	2300000	ID	ID	ID	180000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2-Chlorophenol	ug/kg	NA	1900000	ID	ID	ID	4500000	19000000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2-Methylnaphthalene	ug/kg	NA	5500000	ID	ID	ID	26000000	NA	ND(16000)	ND(15000)	ND(45000)	2000 J	15000
2-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(12000)	ND(11000)	ND(34000)	ND(2400)	ND(11000)
2-Nitrophenol	ug/kg	NA	1600000	NLV	NLV	ID	2000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
3,3'-Dichlorobenzidine	ug/kg	NA	4600	NLV	NLV	8200000	30000	NA	ND(98000)	ND(91000)	ND(270000)	ND(19000)	ND(91000)
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(12000)	ND(11000)	ND(34000)	ND(2400)	ND(11000)
4,6-Dinitro-2-methylphenol	ug/kg	NA	190000	NLV	NLV	ID	260000	NA	ND(9200)	ND(8600)	ND(25000)	ND(1800)	ND(8500)
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
4-Chloro-3-methylphenol	ug/kg	NA	3000000	NLV	NLV	ID	15000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(9200)	ND(8600)	ND(25000)	ND(1800)	ND(8500)
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
4-Methylphenol	ug/kg	NA	16000000	NLV	NLV	2900000000	36000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(12000)	ND(11000)	ND(34000)	ND(2400)	ND(11000)
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(20000)	ND(19000)	ND(56000)	ND(3900)	ND(19000)
Acenaphthene	ug/kg	NA	970000	350000000	97000000	6200000000	130000000	NA	920 J	1500 J	ND(45000)	240 J	ND(15000)
Acenaphthylene	ug/kg	NA	440000	3000000	2700000	1000000000	5200000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Acetophenone	ug/kg	NA	1100000	1100000	52000000	14000000000	1100000	1100000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Anthracene	ug/kg	NA	41000	1000000000	1600000000	29000000000	730000000	NA	1600 J	3000 J	ND(45000)	2200 J	ND(15000)
Atrazine	ug/kg	NA	110000	NLV	NLV	ID	330000	NA	ND(2500)	ND(2300)	ND(6800)	ND(480)	ND(2300)
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Benzo(a)anthracene	ug/kg	NA	NLL	NLV	NLV	ID	80000	NA	4200 J	11000 J	ND(45000)	4100	2100 J
Benzo(a)pyrene	ug/kg	NA	NLL	NLV	NLV	1900000	8000	NA	3700 J	9500 J f	ND(45000)	3400	ND(15000)
Benzo(b)fluoranthene	ug/kg	NA	NLL	ID	ID	ID	80000	NA	4500 J	11000 J	1200 J	4300	ND(15000)
Benzo(g,h,i)perylene	ug/kg	NA	NLL	NLV	NLV	350000000	7000000	NA	2400 J	6400 J	ND(45000)	1800 J	1300 J
Benzo(k)fluoranthene	ug/kg	NA	NLL	NLV	NLV	ID	800000	NA	2100 J	5400 J	ND(45000)	1900 J	ND(15000)
Biphenyl	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
bis(2-Chloroethyl)ether	ug/kg	NA	110000	44000	13000	12000000	58000	2200000	ND(4900)	ND(4600)	ND(14000)	ND(960)	ND(4600)
bis(2-Ethylhexyl)phthalate	ug/kg	NA	NLL	NLV	NLV	890000000	10000000	10000000	1200 J	1200 J	4400 J	ND(3200)	ND(15000)
Butyl benzylphthalate	ug/kg	NA	310000	NLV	NLV	21000000000	310000	310000	ND(16000)	ND(15000)	2900 J	ND(3200)	ND(15000)
Caprolactam	ug/kg	NA	1000000000	NLV	NLV	2900000000	310000000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Carbazole	ug/kg	NA	820000	NLV	NLV	ID	2400000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Chrysene	ug/kg	NA	NLL	ID	ID	ID	8000000	NA	3600 J	8800 J	ND(45000)	3600	2300 J
Dibenz(a,h)anthracene	ug/kg	NA	NLL	NLV	NLV	ID	8000	NA	620 J	1600 J	ND(45000)	530 J	ND(15000)
Dibenzofuran	ug/kg	NA	ID	ID	ID	ID	ID	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Diethyl phthalate	ug/kg	NA	740000	NLV	NLV	1500000000	740000	740000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Dimethyl phthalate	ug/kg	NA	790000	NLV	NLV	1500000000	790000	790000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Di-n-butylphthalate	ug/kg	NA	760000	NLV	NLV	1500000000	760000	760000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Di-n-octyl phthalate	ug/kg	NA	140000000	NLV	NLV	ID	20000000	140000000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Fluoranthene	ug/kg	NA	730000	1000000000	890000000	4100000000	130000000	NA	9000 J	22000	2000 J	11000	5900 J
Fluorene	ug/kg	NA	890000	1000000000	150000000	4100000000	870000000	NA	ND(16000)	ND(15000)	ND(45000)	510 J	13000 J
Hexachlorobenzene	ug/kg	NA	8200	220000	56000	8500000	37000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Hexachlorobutadiene	ug/kg	NA	350000	350000	460000	180000000	350000	350000	ND(2500)	ND(2300)	ND(6800)	ND(480)	ND(2300)
Hexachlorocyclopentadiene	ug/kg	NA	720000	56000	60000	5900000	720000	720000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Hexachloroethane	ug/kg	NA	110000	79000	660000	100000000	730000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NLL	NLV	NLV	ID	80000	NA	2200 J	5500 J	ND(45000)	1600 J	1000 J

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾							SB-1	SB-1	SB-2	SB-2	SB-3
Sample ID		Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	BH-48041-061208-MC-001	BH-48041-061208-MC-002	BH-48041-061208-MC-003	BH-48041-061208-MC-004	BH-48041-061208-MC-005
Sample Date		Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008
Sample Depth		Background	Protection	Inhalation	Inhalation		Commercial II	Screening	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS
Sample Type									Final	Duplicate	Final	Final	Final
	Units	a	b	c	d	e	f	g					
Isophorone	ug/kg	NA	2400000	NLV	NLV	8200000000	2400000	2400000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Naphthalene	ug/kg	NA	2100000	470000	350000	880000000	52000000	NA	ND(16000)	ND(15000)	ND(45000)	210 J	ND(15000)
Nitrobenzene	ug/kg	NA	220000	170000	64000	210000000	340000	490000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
N-Nitrosodi-n-propylamine	ug/kg	NA	7200	NLV	NLV	2000000	5400	1500000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
N-Nitrosodiphenylamine	ug/kg	NA	700000	NLV	NLV	ID	7800000	NA	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Pentachlorophenol	ug/kg	NA	4300	NLV	NLV	1300000000	320000	NA	ND(9200)	ND(8600)	ND(25000)	ND(1800)	ND(8500)
Phenanthrene	ug/kg	NA	1100000	5100000	190000	2900000	5200000	NA	6000 J	11000 J	ND(45000)	7100	13000 J
Phenol	ug/kg	NA	12000000	NLV	NLV	18000000000	12000000	12000000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Pyrene	ug/kg	NA	480000	1000000000	780000000	2900000000	84000000	NA	7200 J	18000	3700 J	7000	4100 J
Pyridine	ug/kg	NA	37000	2000	9800	100000000	37000	37000	ND(16000)	ND(15000)	ND(45000)	ND(3200)	ND(15000)
Volatile Organic Compounds													
1,1,1-Trichloroethane	ug/kg	NA	460000	460000	4500000	29000000000	460000	460000	47 J	ND(77)	ND(190)	ND(92)	ND(45)
1,1,2,2-Tetrachloroethane	ug/kg	NA	94000	23000	34000	68000000	240000	870000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
1,1,2-Trichloroethane	ug/kg	NA	420000	24000	57000	250000000	840000	920000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
1,1-Dichloroethane	ug/kg	NA	890000	430000	2500000	15000000000	890000	890000	270 J	100 J	97 J	ND(92)	ND(45)
1,1-Dichloroethene	ug/kg	NA	220000	330	3700	78000000	570000	570000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
1,2,4-Trichlorobenzene	ug/kg	NA	1100000	1100000	34000000	11000000000	1100000	1100000	ND(300)	ND(390)	ND(940)UJ	ND(460)	ND(220)
1,2,4-Trimethylbenzene	ug/kg	NA	110000	110000	25000000	36000000000	110000	110000	340 J	390 J	280 J	560 J	34 J
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	1200	1200	15000	5900000	1200	1200	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	NA	500	3600	5800	18000000	430	890000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
1,2-Dichlorobenzene	ug/kg	NA	210000	210000	46000000	44000000000	210000	210000	ND(120)	ND(150)	92 J	230 J	32 J
1,2-Dichloroethane	ug/kg	NA	380000	11000	21000	150000000	420000	1200000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
1,2-Dichloropropane	ug/kg	NA	320000	7400	30000	120000000	550000	550000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
1,3,5-Trimethylbenzene	ug/kg	NA	94000	94000	19000000	36000000000	94000	94000	79 J	97 J	140 J	77 J	ND(89)
1,3-Dichlorobenzene	ug/kg	NA	51000	ID	ID	ID	170000	170000	ND(120)	ND(150)	ND(380)	92 J	ND(89)
1,4-Dichlorobenzene	ug/kg	NA	140000	100000	260000	570000000	1900000	NA	ND(120)	ND(150)	53 J	390 J	ND(89)
2-Butanone (Methyl Ethyl Ketone)	ug/kg	NA	27000000	27000000	35000000	29000000000	27000000	27000000	ND(900)	ND(1200)	ND(2800)	ND(1400)	93 J
2-Hexanone	ug/kg	NA	2500000	1800000	1300000	1200000000	2500000	2500000	ND(3000)	ND(3900)	ND(9400)	ND(4600)	ND(2200)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	NA	2700000	2700000	53000000	60000000000	2700000	2700000	140 J	ND(3900)	ND(9400)	ND(4600)	ND(2200)
Acetone	ug/kg	NA	110000000	110000000	160000000	170000000000	73000000	110000000	ND(900)	ND(1200)	ND(2800)	ND(1400)	ND(670)
Benzene	ug/kg	NA	220000	8400	45000	470000000	400000	400000	20 J	21 J	99 J	170 J	38 J
Bromodichloromethane	ug/kg	NA	280000	6400	31000	110000000	490000	1500000	ND(120)	ND(150)	ND(380)	ND(180)	ND(89)
Bromoform	ug/kg	NA	870000	770000	3100000	3600000000	870000	870000	ND(120)	ND(150)	ND(380)	ND(180)	ND(89)
Bromomethane (Methyl Bromide)	ug/kg	NA	1400000	1600	13000	150000000	1000000	2200000	ND(240)	ND(310)	ND(750)	ND(370)	ND(180)
Carbon disulfide	ug/kg	NA	280000	140000	1600000	21000000000	280000	280000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
Carbon tetrachloride	ug/kg	NA	92000	990	12000	170000000	390000	390000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Chlorobenzene	ug/kg	NA	260000	220000	920000	2100000000	260000	260000	ND(60)	ND(77)	ND(190)	130 J	ND(45)
Chloroethane	ug/kg	NA	950000	950000	36000000	290000000000	950000	950000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
Chloroform (Trichloromethane)	ug/kg	NA	1500000	38000	150000	1600000000	1500000	1500000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Chloromethane (Methyl Chloride)	ug/kg	NA	1100000	10000	120000	2600000000	1100000	1100000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
cis-1,2-Dichloroethene	ug/kg	NA	640000	41000	210000	1000000000	640000	640000	31 J	ND(77)	240 J	ND(92)	ND(45)
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	92 J	130 J	380 J	390 J	500 J
Dibromochloromethane	ug/kg	NA	360000	21000	80000	160000000	500000	610000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	1000000	1700000	63000000	1500000000000	1000000	1000000	ND(120)	ND(150)	ND(380)	ND(180)	ND(89)
Ethylbenzene	ug/kg	NA	140000	140000	2400000	13000000000	140000	140000	43 J	24 J	98 J	54 J	14 J
Isopropylbenzene	ug/kg	NA	390000	390000	2000000	2600000000	390000	390000	29 J	37 J	30 J	500 J	330
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	110 J	100 J	ND(4500)	ND(2200)	280 J

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	Michigan Act 451, Part 201 Industrial and Commercial II ⁽¹⁾								SB-1	SB-1	SB-2	SB-2	SB-3
Sample ID	Statewide	Groundwater	Soil Volatilization	Infinite Source	Particulate	Direct Contact	Soil Saturation	BH-48041-061208-MC-001	BH-48041-061208-MC-002	BH-48041-061208-MC-003	BH-48041-061208-MC-004	BH-48041-061208-MC-005	
Sample Date	Default	Contact	to Indoor Air	Volatile Soil	Soil Inhalation	Industrial and	Concentration	6/12/2008	6/12/2008	6/12/2008	6/12/2008	6/12/2008	
Sample Depth	Background	Protection	Inhalation	Inhalation		Commercial II	Screening	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	
Sample Type								Final	Duplicate	Final	Final	Final	
	Units	a	b	c	d	e	f	g					
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	82 J	100 J	620 J	1600 J	1200
Methyl Tert Butyl Ether	ug/kg	NA	5900000	5900000	30000000	88000000000	5900000	5900000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
Methylene chloride	ug/kg	NA	2300000	240000	700000	8300000000	2300000	2300000	ND(300)	ND(390)	ND(940)	ND(460)	390
Styrene	ug/kg	NA	270000	520000	3300000	6900000000	520000	520000	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Tetrachloroethene	ug/kg	NA	88000	60000	600000	6800000000	88000	88000	20 J	17 J	54 J	ND(92)	ND(45)
Toluene	ug/kg	NA	250000	250000	3300000	12000000000	250000	250000	470 J	360 J	370 J	47 J	18 J
trans-1,2-Dichloroethene	ug/kg	NA	1400000	43000	330000	2100000000	1400000	1400000	ND(60)	ND(77)	54 J	ND(92)	ND(45)
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	NA	ND(60)	ND(77)	ND(190)	ND(92)	ND(45)
Trichloroethene	ug/kg	NA	440000	37000	260000	2300000000	500000	500000	170 J	130 J	140 J	ND(92)	ND(45)
Trichlorofluoromethane (CFC-11)	ug/kg	NA	560000	560000	11000000	1700000000000	560000	560000	ND(120)	ND(150)	ND(380)	ND(180)	ND(89)
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	550000	550000	21000000	2300000000000	550000	550000	ND(300)	ND(390)	ND(940)	ND(460)	ND(220)
Vinyl chloride	ug/kg	NA	20000	2800	29000	890000000	34000	490000	ND(48)	ND(62)	ND(150)	ND(73)	ND(36)
Xylene (total)	ug/kg	NA	150000	150000	5400000	130000000000	150000	150000	190 J	200 J	430 J	280 J	200

Notes:

-- - Not Analyzed

NA- Not Available

BGS - Below Ground Surface

mg/kg : milligrams per kilogram

ug/kg: micrograms per kilogram

ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.

ND () - Not present at or above the associated value.

UJ - Estimated reporting limit.

U - Not present at or above the associated value.

J - Estimated concentration.

R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-4	SB-5	SB-6	SB-6	SB-A3	SB-B7	SB-C6	SB-D1	SB-E6
Sample ID		BH-48041-061208-MC-007	BH-48041-061208-MC-008	BH-48041-061208-MC-009	BH-48041-061208-MC-010	S-048041-070808-DD-001	S-048041-070808-DD-007	S-048041-070808-DD-008	S-048041-070908-DD-009	S-048041-070808-DD-002
Sample Date		6/12/2008	6/12/2008	6/12/2008	6/12/2008	7/8/2008	7/8/2008	7/8/2008	7/9/2008	7/8/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	5-6 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units									
Metals										
Aluminum	mg/kg	5900	5830	4400	4620	7280	4910	5570	9740	8860
Antimony	mg/kg	3.7 J	3.6 J	1.6 J	1.8 J	0.051 J	2.8 J	5.1 J	0.56 J	0.41 J
Arsenic	mg/kg	17.5 J	14.3 J	1.2 J	12.2 J	5.2 J	17.2 J	4.3 J	9.6	3.8 J
Barium	mg/kg	322 J	268 J	258 J	692 J	45.3 J	245 J	189 J	110 J	212 J
Beryllium	mg/kg	0.77	0.60	0.39	0.84	ND(0.18)	0.49	ND(0.18)	0.28	1.2
Cadmium	mg/kg	3.0	2.2	1.3	1.8	ND(0.092)	1.8 J	4.9 J	0.51	0.92 J
Calcium	mg/kg	26100	16000	9400	17800	788	37200	12200	46100	40500
Chromium Total	mg/kg	41.2 J	15.9 J	25.2 J	15.3 J	15.6 J	19.3 J	24.2 J	22.5	19.0 J
Chromium VI (Hexavalent)	mg/kg	ND(1.1)	4.3 J	2.9 J	ND(1.1)	2.4	ND(1.0)	0.37 J	0.88 J	0.45 J
Cobalt	mg/kg	11.5	6.0	5.6	3.6	3.3	4.9	3.3	9.8	2.8
Copper	mg/kg	144	152	101	75.7	15.8 J	92.3 J	30.7 J	47.4 J	22.0 J
Iron	mg/kg	51700	31400	22800	15100	20300	28500	30300	33200	8270
Lead	mg/kg	--	--	--	--	12.5	--	--	--	--
Lead - Coarse Fraction	mg/kg	403	576	197	1420 f	--	2690 J f	275 J	233	415 J
Lead - Fine Fraction	mg/kg	544	592	240	1910 f	--	3230 J f	775 J	371	149 J
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	426	580	209	1530	--	2900 J	390 J	264	227 J
Magnesium	mg/kg	3720 J	1680 J	1180 J	2590 J	1730 J	12500 J	1910 J	15400 J	7470 J
Manganese	mg/kg	653	386	264	129	63.3	603	1350	713	836
Mercury	mg/kg	0.68	0.35	0.041 J	0.24	0.021 J	0.22	0.042 J	0.025 J	0.11
Nickel	mg/kg	48.8	25.2	19.1	13.1	8.7	22.3	14.7	29.7	9.9
Potassium	mg/kg	617	552	478 J	470 J	560	563	428 J	1770	1280
Selenium	mg/kg	1.9	2.0	ND(0.98)	1.3	0.44	1.3	0.54	0.74	1.2
Silver	mg/kg	0.32	0.40	0.30	0.28	ND(0.092)	0.26 J	0.26 J	0.096	0.088 J
Sodium	mg/kg	555	161	334	355	ND(91.9)	226	268	176	342
Thallium	mg/kg	0.24	0.23	0.12	0.26	0.13 J	0.19 J	0.070 J	0.17	0.17 J
Vanadium	mg/kg	24.3 J	18.8 J	11.9 J	15.5 J	21.0	14.9	9.4	25.8	15.6
Zinc	mg/kg	655 J	543 J	712 J	479 J	26.7	294	31.2	68.7	139
PCBs										
Aroclor-1016 (PCB-1016)	mg/kg	ND(0.45)	ND(0.078)	ND(0.81)	ND(0.92)	ND(0.038)	ND(0.43)	ND(1.8)	ND(0.38)	ND(1.9)
Aroclor-1221 (PCB-1221)	mg/kg	ND(0.45)	ND(0.078)	ND(0.81)	ND(0.92)	ND(0.038)	ND(0.43)	ND(1.8)	ND(0.38)	ND(1.9)
Aroclor-1232 (PCB-1232)	mg/kg	ND(0.45)	ND(0.078)	ND(0.81)	ND(0.92)	ND(0.038)	ND(0.43)	ND(1.8)	ND(0.38)	ND(1.9)
Aroclor-1242 (PCB-1242)	mg/kg	1.8	ND(0.078)	ND(0.81)	4.4	ND(0.038)	ND(0.43)	ND(1.8)	ND(0.38)	ND(1.9)
Aroclor-1248 (PCB-1248)	mg/kg	ND(0.45)	ND(0.078)	2.9	ND(0.92)	ND(0.038)	ND(0.43)	ND(1.8)	ND(0.38)	ND(1.9)
Aroclor-1254 (PCB-1254)	mg/kg	3.4	0.57	ND(0.81)	7.1	0.22	3.4	ND(1.8)	5.6	16
Aroclor-1260 (PCB-1260)	mg/kg	ND(0.45)	ND(0.078)	3.2	ND(0.92)	ND(0.038)	ND(0.43)	14	ND(0.38)	ND(1.9)
Total PCBs	mg/kg	5.2	0.57	6.1	11.5	0.22	3.4	14	5.6	16
Semi-Volatile Organic Compounds										
2,2'-oxybis(1-Chloropropane)	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,4,5-Trichlorophenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,4,6-Trichlorophenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,4-Dichlorophenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,4-Dimethylphenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,4-Dinitrophenol	ug/kg	ND(20000)	ND(3600)	ND(3700)	ND(21000)	ND(170)	ND(4800)	ND(670)	ND(170)	ND(3400)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-4	SB-5	SB-6	SB-6	SB-A3	SB-B7	SB-C6	SB-D1	SB-E6
Sample ID		BH-48041-061208-MC-007	BH-48041-061208-MC-008	BH-48041-061208-MC-009	BH-48041-061208-MC-010	S-048041-070808-DD-001	S-048041-070808-DD-007	S-048041-070808-DD-008	S-048041-070908-DD-009	S-048041-070808-DD-002
Sample Date		6/12/2008	6/12/2008	6/12/2008	6/12/2008	7/8/2008	7/8/2008	7/8/2008	7/9/2008	7/8/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	5-6 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units									
2,4-Dinitrotoluene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2,6-Dinitrotoluene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2-Chloronaphthalene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2-Chlorophenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2-Methylnaphthalene	ug/kg	8200 J	280 J	ND(6500)	ND(37000)	ND(300)	1100 J	53 J	8.6 J	ND(6000)
2-Methylphenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
2-Nitroaniline	ug/kg	ND(27000)	ND(4700)	ND(4900)	ND(28000)	ND(230)	ND(6400)	ND(900)	ND(230)	ND(4600)
2-Nitrophenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
3,3'-Dichlorobenzidine	ug/kg	ND(220000)	ND(38000)	ND(39000)	ND(220000)	ND(1800)	ND(52000)	ND(7200)	ND(1800)	ND(37000)
3-Nitroaniline	ug/kg	ND(27000)	ND(4700)	ND(4900)	ND(28000)	ND(230)	ND(6400)	ND(900)	ND(230)	ND(4600)
4,6-Dinitro-2-methylphenol	ug/kg	ND(20000)	ND(3600)	ND(3700)	ND(21000)	ND(170)	ND(4800)	ND(670)	ND(170)	ND(3400)
4-Bromophenyl phenyl ether	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
4-Chloro-3-methylphenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
4-Chloroaniline	ug/kg	ND(20000)	ND(3600)	ND(3700)	ND(21000)	ND(170)	ND(4800)	ND(670)	ND(170)	ND(3400)
4-Chlorophenyl phenyl ether	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
4-Methylphenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
4-Nitroaniline	ug/kg	ND(27000)	ND(4700)	ND(4900)	ND(28000)	ND(230)	ND(6400)	ND(900)	ND(230)	ND(4600)
4-Nitrophenol	ug/kg	ND(45000)	ND(7800)	ND(8100)	ND(46000)	ND(380)	ND(11000)	ND(1500)	ND(380)	ND(7600)
Acenaphthene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	740 J	ND(1200)	47 J	ND(6000)
Acenaphthylene	ug/kg	ND(36000)	210 J	ND(6500)	ND(37000)	ND(300)	240 J	ND(1200)	23 J	ND(6000)
Acetophenone	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Anthracene	ug/kg	ND(36000)	160 J	ND(6500)	ND(37000)	ND(300)	1400 J	ND(1200)	130 J	ND(6000)
Atrazine	ug/kg	ND(5500)	ND(950)	ND(980)	ND(5600)	ND(46)	ND(1300)	ND(180)	ND(46)	ND(920)
Benzaldehyde	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Benzo(a)anthracene	ug/kg	2200 J	ND(6200)	ND(6500)	ND(37000)	8.5 J	3800 J	33 J	650 J	180 J
Benzo(a)pyrene	ug/kg	ND(36000)	330 J	ND(6500)	ND(37000)	13 J	3100 J	32 J	670	220 J
Benzo(b)fluoranthene	ug/kg	ND(36000)	560 J	ND(6500)	ND(37000)	20 J	4600 J	44 J	850	380 J
Benzo(g,h,i)perylene	ug/kg	ND(36000)	640 J	ND(6500)	ND(37000)	15 J	2600 J	67 J	430	330 J
Benzo(k)fluoranthene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	7.3 J	1500 J	ND(1200)	420 J	180 J
Biphenyl	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
bis(2-Chloroethoxy)methane	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
bis(2-Chloroethyl)ether	ug/kg	ND(11000)	ND(1900)	ND(2000)	ND(11000)	ND(92)	ND(2600)	ND(360)	ND(92)	ND(1800)
bis(2-Ethylhexyl)phthalate	ug/kg	6800 J	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Butyl benzylphthalate	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	110 J	ND(6000)
Caprolactam	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Carbazole	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	660 J	ND(1200)	89 J	ND(6000)
Chrysene	ug/kg	3900 J	270 J	ND(6500)	ND(37000)	11 J	3900 J	68 J	670	350 J
Dibenz(a,h)anthracene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	590 J	ND(1200)	110 J	ND(6000)
Dibenzofuran	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	24 J	ND(6000)
Diethyl phthalate	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Dimethyl phthalate	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Di-n-butylphthalate	ug/kg	ND(36000)	570 J	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Di-n-octyl phthalate	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Fluoranthene	ug/kg	5100 J	570 J	ND(6500)	1700 J	16 J	8200 J	61 J	1500 J	360 J
Fluorene	ug/kg	7400 J	ND(6200)	ND(6500)	1500 J	ND(300)	1600 J	ND(1200)	60 J	ND(6000)
Hexachlorobenzene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Hexachlorobutadiene	ug/kg	ND(5500)	ND(950)	ND(980)	ND(5600)	ND(46)	ND(1300)	ND(180)	ND(46)	ND(920)
Hexachlorocyclopentadiene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	R	ND(6000)
Hexachloroethane	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Indeno(1,2,3-cd)pyrene	ug/kg	ND(36000)	320 J	ND(6500)	ND(37000)	13 J	2100 J	35 J	390	220 J

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-4	SB-5	SB-6	SB-6	SB-A3	SB-B7	SB-C6	SB-D1	SB-E6
Sample ID		BH-48041-061208-MC-007	BH-48041-061208-MC-008	BH-48041-061208-MC-009	BH-48041-061208-MC-010	S-048041-070808-DD-001	S-048041-070808-DD-007	S-048041-070808-DD-008	S-048041-070908-DD-009	S-048041-070808-DD-002
Sample Date		6/12/2008	6/12/2008	6/12/2008	6/12/2008	7/8/2008	7/8/2008	7/8/2008	7/9/2008	7/8/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	5-6 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units									
Isophorone	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Naphthalene	ug/kg	1900 J	190 J	ND(6500)	ND(37000)	ND(300)	710 J	33 J	10 J	ND(6000)
Nitrobenzene	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
N-Nitrosodi-n-propylamine	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
N-Nitrosodiphenylamine	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Pentachlorophenol	ug/kg	ND(20000)	ND(3600)	ND(3700)	ND(21000)	ND(170)	ND(4800)	ND(670)	ND(170)	ND(3400)
Phenanthrene	ug/kg	13000 J	420 J	ND(6500)	ND(37000)	8.4 J	6000 J	77 J	760 J	270 J
Phenol	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Pyrene	ug/kg	5200 J	530 J	ND(6500)	1300 J	13 J	8200 J	53 J	1100 J	460 J
Pyridine	ug/kg	ND(36000)	ND(6200)	ND(6500)	ND(37000)	ND(300)	ND(8500)	ND(1200)	ND(310)	ND(6000)
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,1,2,2-Tetrachloroethane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,1,2-Trichloroethane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,1-Dichloroethane	ug/kg	80	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,1-Dichloroethene	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,2,4-Trichlorobenzene	ug/kg	89 J	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
1,2,4-Trimethylbenzene	ug/kg	2900	64 J	ND(98)	180 J	ND(92)	450 J	ND(90)	630 J	ND(92)
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
1,2-Dichlorobenzene	ug/kg	270	ND(120)	ND(98)	290 J	ND(92)	410 J	ND(90)	ND(87)	ND(92)
1,2-Dichloroethane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,2-Dichloropropane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
1,3,5-Trimethylbenzene	ug/kg	740	ND(120)	ND(98)	46 J	ND(92)	100	ND(90)	140	ND(92)
1,3-Dichlorobenzene	ug/kg	24 J	ND(120)	ND(98)	55 J	ND(92)	28 J	ND(90)	ND(87)	ND(92)
1,4-Dichlorobenzene	ug/kg	61 J	ND(120)	ND(98)	170 J	ND(92)	89 J	ND(90)	ND(87)	ND(92)
2-Butanone (Methyl Ethyl Ketone)	ug/kg	ND(770)	ND(940)	ND(740)	80 J	ND(690)	110 J	ND(670)	ND(650)	ND(690)
2-Hexanone	ug/kg	ND(2600)	ND(3100)	ND(2500)	ND(2800)	ND(2300)	ND(2400)	ND(2200)	ND(2200)	ND(2300)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(2600)	ND(3100)	ND(2500)	ND(2800)	ND(2300)	ND(2400)	ND(2200)	ND(2200)	ND(2300)
Acetone	ug/kg	ND(770)	ND(940)UJ	ND(740)UJ	ND(840)UJ	ND(690)	ND(710)	ND(670)	ND(650)	ND(690)
Benzene	ug/kg	110	13 J	ND(49)	150 J	ND(46)	360 J	ND(45)	ND(43)	9.0 J
Bromodichloromethane	ug/kg	ND(100)	ND(120)	ND(98)	ND(110)	ND(92)	ND(95)	ND(90)	ND(87)	ND(92)
Bromoform	ug/kg	ND(100)	ND(120)	ND(98)	ND(110)	ND(92)	ND(95)	ND(90)	ND(87)	ND(92)
Bromomethane (Methyl Bromide)	ug/kg	ND(210)	ND(250)	ND(200)	ND(220)	ND(180)	ND(190)	ND(180)	ND(170)	ND(180)
Carbon disulfide	ug/kg	34 J	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
Carbon tetrachloride	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
Chlorobenzene	ug/kg	ND(51)	ND(62)	ND(49)	77 J	ND(46)	25 J	ND(45)	ND(43)	ND(46)
Chloroethane	ug/kg	110 J	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
Chloroform (Trichloromethane)	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	32 J	ND(45)	ND(43)	ND(46)
Chloromethane (Methyl Chloride)	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)	ND(230)
cis-1,2-Dichloroethene	ug/kg	51	ND(62)	ND(49)	25 J	ND(46)	340	ND(45)	ND(43)	54
cis-1,3-Dichloropropene	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
Cyclohexane	ug/kg	370 J	ND(1500)	ND(1200)	690 J	ND(1100)	290 J	ND(1100)	ND(1000)	ND(1100)
Dibromochloromethane	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)	ND(46)
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(100)	ND(120)	ND(98)	ND(110)	ND(92)	ND(95)	ND(90)	ND(87)	ND(92)
Ethylbenzene	ug/kg	140	24 J	ND(49)	68 J	ND(46)	190	ND(45)	23 J	11 J
Isopropylbenzene	ug/kg	180 J	ND(310)	17 J	1300 J	ND(230)	240	ND(220)	49 J	ND(230)
Methyl acetate	ug/kg	ND(1200)	ND(1500)	ND(1200)	110 J	ND(1100)	120 J	ND(1100)	ND(1000)	ND(1100)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	SB-4	SB-5	SB-6	SB-6	SB-A3	SB-B7	SB-C6	SB-D1	SB-E6
Sample ID	BH-48041-061208-MC-007	BH-48041-061208-MC-008	BH-48041-061208-MC-009	BH-48041-061208-MC-010	S-048041-070808-DD-001	S-048041-070808-DD-007	S-048041-070808-DD-008	S-048041-070908-DD-009	S-048041-070808-DD-002
Sample Date	6/12/2008	6/12/2008	6/12/2008	6/12/2008	7/8/2008	7/8/2008	7/8/2008	7/9/2008	7/8/2008
Sample Depth	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	5-6 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Final	Final	Final
	Units								
Methyl cyclohexane	ug/kg	590 J	ND(1500)	69 J	2000 J	ND(1100)	1200 J	ND(1100)	57 J
Methyl Tert Butyl Ether	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(230)
Methylene chloride	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(230)
Styrene	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)
Tetrachloroethene	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	22 J	ND(45)	ND(43)
Toluene	ug/kg	200	32 J	ND(98)	120 J	ND(92)	540 J	ND(90)	ND(87)
trans-1,2-Dichloroethene	ug/kg	40 J	ND(62)	ND(49)	ND(56)	ND(46)	130 J	ND(45)	ND(43)
trans-1,3-Dichloropropene	ug/kg	ND(51)	ND(62)	ND(49)	ND(56)	ND(46)	ND(47)	ND(45)	ND(43)
Trichloroethene	ug/kg	20 J	ND(62)	ND(49)	ND(56)	ND(46)	48	ND(45)	ND(43)
Trichlorofluoromethane (CFC-11)	ug/kg	ND(100)	ND(120)	ND(98)	ND(110)	ND(92)	ND(95)	ND(90)	ND(87)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(260)	ND(310)	ND(250)	ND(280)	ND(230)	ND(240)	ND(220)	ND(220)
Vinyl chloride	ug/kg	ND(41)	ND(50)	ND(39)	ND(45)	ND(37)	60	ND(36)	ND(35)
Xylene (total)	ug/kg	1200	71 J	ND(150)	280 J	ND(140)	850	ND(130)	61 J

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.
NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-F4	SB-F4	SB-F4	SB-G6	SB-H1	SB-H1	SB-I1	SB-I1	SB-J2
Sample ID		S-048041-070808-DD-003	S-048041-070808-DD-004	S-048041-070808-DD-005	S-048041-070808-DD-006	BH-48041-061208-MC-013	BH-48041-061208-MC-014	S-48041-071808-EV-003	S-48041-071808-EV-004	BH-48041-061208-MC-006
Sample Date		7/8/2008	7/8/2008	7/8/2008	7/8/2008	6/12/2008	6/12/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	4.5-5.5 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS
Sample Type		Final	Duplicate	Final	Final	Final	Final	Final	Final	Final
Units										
Metals										
Aluminum	mg/kg	4160	4320	7170	8920	3040	5230	23700	11400	5040
Antimony	mg/kg	0.44 J	0.52 J	1.2 J	0.50 J	9.3 J	1.4 J	0.044 J	0.11 J	3.6 J
Arsenic	mg/kg	2.9 J	3.5 J	15.2 J	8.5 J	4.2 J	14.5 J	1.4	2.4	11.8 J
Barium	mg/kg	100 J	175 J	303 J	168 J	59.1 J	300 J	251 J	141 J	493 J
Beryllium	mg/kg	0.075 J	0.060 J	0.54	0.38	ND(0.17)	1.4	4.4 J	2.3 J	0.46
Cadmium	mg/kg	1.8 J	1.8 J	1.2 J	0.80 J	0.32	2.1	0.11 J	0.33 J	3.7
Calcium	mg/kg	91300	49700	30600	13800	26700	32500	49000	45400	24100
Chromium Total	mg/kg	23.3 J	21.3 J	17.1 J	19.0 J	11.5 J	17.4 J	6.8 J	11.3 J	58.1 J
Chromium VI (Hexavalent)	mg/kg	ND(0.86)	ND(0.90)	ND(0.96)	ND(0.93)	ND(0.87)	ND(1.1)	0.33 J	1.0	4.8 J
Cobalt	mg/kg	3.1	3.2	5.9	6.3	2.1	6.2	0.65	2.3	6.9
Copper	mg/kg	32.8 J	34.3 J	140 J	42.8 J	23.1	76.0	3.4	143	434
Iron	mg/kg	9240	13000	23200	18100	17800	32400	2820	9140	55300
Lead	mg/kg	--	--	--	--	--	--	11.9	--	--
Lead - Coarse Fraction	mg/kg	435 J	312 J	944 J f	334 J	190	419	--	85.4	4670 f
Lead - Fine Fraction	mg/kg	465 J	406 J	1250 J f	432 J	486	674	--	266	5310 f
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	442 J	337 J	1060 J	366 J	268	487	--	140	4750
Magnesium	mg/kg	7160 J	9160 J	4950 J	5170 J	2660 J	9170 J	45100 J	13200 J	3320 J
Manganese	mg/kg	302	792	322	358	331	371	1910 e	724	374
Mercury	mg/kg	0.037 J	0.079	0.67	0.60	0.020 J	0.18	ND(0.043)	0.033 J	0.42
Nickel	mg/kg	16.1	18.5	22.5	17.9	8.2	20.4	1.1 J	8.2 J	51.2
Potassium	mg/kg	465	444 J	543	1060	211 J	279 J	2500	1170	768
Selenium	mg/kg	0.58	0.66	1.7	1.0	0.40	1.3	2.4	1.3	1.2
Silver	mg/kg	0.092 J	0.098 J	0.29 J	0.11 J	0.085 J	0.18	0.035 J	0.036 J	1.9
Sodium	mg/kg	158	109	415	425	100	295	1190	400	329
Thallium	mg/kg	0.19 J	0.13 J	0.21 J	0.17 J	ND(0.087)	0.18	ND(0.27)	ND(0.089)	0.17
Vanadium	mg/kg	11.9	14.4	19.9	25.9	6.7 J	21.0 J	5.6	12.0	14.8 J
Zinc	mg/kg	202	299	377	120	16.2 J	291 J	23.5	92.1	663 J
PCBs										
Aroclor-1016 (PCB-1016)	mg/kg	ND(3.5)	ND(0.75)	ND(0.39)	ND(1.9)	ND(0.036)	ND(0.045)	ND(0.036)	ND(0.18)	ND(2)
Aroclor-1221 (PCB-1221)	mg/kg	ND(3.5)	ND(0.75)	ND(0.39)	ND(1.9)	ND(0.036)	ND(0.045)	ND(0.036)	ND(0.18)	ND(2)
Aroclor-1232 (PCB-1232)	mg/kg	ND(3.5)	ND(0.75)	ND(0.39)	ND(1.9)	ND(0.036)	ND(0.045)	ND(0.036)	ND(0.18)	ND(2)
Aroclor-1242 (PCB-1242)	mg/kg	ND(3.5)	ND(0.75)	ND(0.39)	ND(1.9)	ND(0.036)	ND(0.045)	ND(0.036)	ND(0.18)	4.7
Aroclor-1248 (PCB-1248)	mg/kg	ND(3.5)	ND(0.75)	6.5	ND(1.9)	ND(0.036)	ND(0.045)	ND(0.036)	ND(0.18)	ND(2)
Aroclor-1254 (PCB-1254)	mg/kg	ND(3.5)	ND(0.75)	ND(0.39)	21	0.45	ND(0.045)	ND(0.036)	ND(0.18)	17
Aroclor-1260 (PCB-1260)	mg/kg	2.6 J	2.8	3.7	ND(1.9)	ND(0.036)	0.49 J	0.35	1.1	ND(2)
Total PCBs	mg/kg	2.6 J	2.8	10.2	21 f	0.45	0.49 J	0.35	1.1	21.7 f
Semi-Volatile Organic Compounds										
2,2'-oxybis(1-Chloropropane)	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
2,4,5-Trichlorophenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
2,4,6-Trichlorophenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
2,4-Dichlorophenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
2,4-Dimethylphenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
2,4-Dinitrophenol	ug/kg	ND(8000)	ND(8500)	ND(9000)	ND(1800)	ND(410)	ND(10000)	ND(160)	ND(170)	ND(18000)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	SB-F4	SB-F4	SB-F4	SB-G6	SB-H1	SB-H1	SB-I1	SB-I1	SB-J2
Sample ID	S-048041-070808-DD-003	S-048041-070808-DD-004	S-048041-070808-DD-005	S-048041-070808-DD-006	BH-48041-061208-MC-013	BH-48041-061208-MC-014	S-48041-071808-EV-003	S-48041-071808-EV-004	BH-48041-061208-MC-006
Sample Date	7/8/2008	7/8/2008	7/8/2008	7/8/2008	6/12/2008	6/12/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth	1-2 ft BGS	1-2 ft BGS	4.5-5.5 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS
Sample Type	Final	Duplicate	Final	Final	Final	Final	Final	Final	Final
Units									
2,4-Dinitrotoluene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
2,6-Dinitrotoluene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
2-Chloronaphthalene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
2-Chlorophenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
2-Methylnaphthalene	ug/kg	ND(14000)	ND(15000)	1100 J	160 J	41 J	3000 J	ND(290)	32000
2-Methylphenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
2-Nitroaniline	ug/kg	ND(11000)	ND(11000)	ND(12000)	ND(2300)	ND(540)	ND(14000)	ND(220)	ND(24000)
2-Nitrophenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
3,3'-Dichlorobenzidine	ug/kg	ND(86000)	ND(90000)	ND(96000)	ND(19000)	ND(4300)	ND(110000)	ND(1700)	ND(190000)
3-Nitroaniline	ug/kg	ND(11000)	ND(11000)	ND(12000)	ND(2300)	ND(540)	ND(14000)	ND(220)	ND(24000)
4,6-Dinitro-2-methylphenol	ug/kg	ND(8000)	ND(8500)	ND(9000)	ND(1800)	ND(410)	ND(10000)	ND(160)	ND(18000)
4-Bromophenyl phenyl ether	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
4-Chloro-3-methylphenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
4-Chloroaniline	ug/kg	ND(8000)	ND(8500)	ND(9000)	ND(1800)	ND(410)	ND(10000)	ND(160)	ND(18000)
4-Chlorophenyl phenyl ether	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
4-Methylphenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
4-Nitroaniline	ug/kg	ND(11000)	ND(11000)	ND(12000)	ND(2300)	ND(540)	ND(14000)	ND(220)	ND(24000)
4-Nitrophenol	ug/kg	ND(18000)	ND(19000)	ND(20000)	ND(3900)	ND(900)	ND(22000)	ND(360)	ND(40000)
Acenaphthene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Acenaphthylene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Acetophenone	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Anthracene	ug/kg	ND(14000)	ND(15000)	ND(16000)	180 J	280 J	ND(18000)	ND(290)	ND(32000)
Atrazine	ug/kg	ND(2100)	ND(2300)	ND(2400)	ND(470)	ND(110)	ND(2700)	ND(43)	ND(4800)
Benzaldehyde	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Benzo(a)anthracene	ug/kg	ND(14000)	ND(15000)	1300 J	510 J	1200 J	ND(18000)	ND(290)	2200 J
Benzo(a)pyrene	ug/kg	ND(14000)	ND(15000)	1400 J	450 J	1100	ND(18000)	ND(290)	ND(32000)
Benzo(b)fluoranthene	ug/kg	ND(14000)	450 J	1700 J	620 J	1400	ND(18000)	ND(290)	ND(32000)
Benzo(g,h,i)perylene	ug/kg	ND(14000)	ND(15000)	1500 J	400 J	720	ND(18000)	20 J	ND(32000)
Benzo(k)fluoranthene	ug/kg	ND(14000)	ND(15000)	720 J	310 J	610 J	ND(18000)	ND(290)	ND(32000)
Biphenyl	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
bis(2-Chloroethoxy)methane	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
bis(2-Chloroethyl)ether	ug/kg	ND(4300)	ND(4500)	ND(4800)	ND(930)	ND(220)	ND(5500)	ND(87)	ND(9700)
bis(2-Ethylhexyl)phthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	120 J	1400 J	ND(290)	63 J
Butyl benzylphthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Caprolactam	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Carbazole	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Chrysene	ug/kg	ND(14000)	450 J	1800 J	560 J	1200 J	ND(18000)	ND(290)	2800 J
Dibenz(a,h)anthracene	ug/kg	ND(14000)	ND(15000)	ND(16000)	88 J	150 J	ND(18000)	ND(290)	ND(32000)
Dibenzofuran	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Diethyl phthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Dimethyl phthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Di-n-butylphthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Di-n-octyl phthalate	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Fluoranthene	ug/kg	380 J	ND(15000)	2600 J	980 J	3200 J	1200 J	ND(290)	52 J
Fluorene	ug/kg	ND(14000)	ND(15000)	760 J	94 J	44 J	ND(18000)	ND(290)	14000 J
Hexachlorobenzene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Hexachlorobutadiene	ug/kg	ND(2100)	ND(2300)	ND(2400)	ND(470)	ND(110)	ND(2700)	ND(43)	ND(4800)
Hexachlorocyclopentadiene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Hexachloroethane	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(32000)
Indeno(1,2,3-cd)pyrene	ug/kg	ND(14000)	ND(15000)	970 J	330 J	640 J	ND(18000)	ND(290)	ND(32000)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-F4	SB-F4	SB-F4	SB-G6	SB-H1	SB-H1	SB-I1	SB-I1	SB-J2
Sample ID		S-048041-070808-DD-003	S-048041-070808-DD-004	S-048041-070808-DD-005	S-048041-070808-DD-006	BH-48041-061208-MC-013	BH-48041-061208-MC-014	S-48041-071808-EV-003	S-48041-071808-EV-004	BH-48041-061208-MC-006
Sample Date		7/8/2008	7/8/2008	7/8/2008	7/8/2008	6/12/2008	6/12/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	4.5-5.5 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS
Sample Type		Final	Duplicate	Final	Final	Final	Final	Final	Final	Final
Units										
Isophorone	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
Naphthalene	ug/kg	ND(14000)	ND(15000)	520 J	100 J	ND(720)	ND(18000)	ND(290)	22 J	ND(32000)
Nitrobenzene	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
N-Nitrosodi-n-propylamine	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
N-Nitrosodiphenylamine	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
Pentachlorophenol	ug/kg	ND(8000)	ND(8500)	ND(9000)	ND(1800)	ND(410)	ND(10000)	ND(160)	ND(170)	ND(18000)
Phenanthrene	ug/kg	ND(14000)	ND(15000)	1700 J	590 J	1000 J	2300 J	9.0 J	53 J	18000 J
Phenol	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
Pyrene	ug/kg	510 J	740 J	3300 J	930 J	2400 J	920 J	ND(290)	60 J	5600 J
Pyridine	ug/kg	ND(14000)	ND(15000)	ND(16000)	ND(3100)	ND(720)	ND(18000)	ND(290)	ND(290)	ND(32000)
Volatile Organic Compounds										
1,1,1-Trichloroethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,1,2,2-Tetrachloroethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,1,2-Trichloroethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,1-Dichloroethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,1-Dichloroethene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,2,4-Trichlorobenzene	ug/kg	110 J	140 J	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
1,2,4-Trimethylbenzene	ug/kg	620	650	640 J	ND(87)	1200	7200 J	ND(100)	58 J	1700
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
1,2-Dichlorobenzene	ug/kg	ND(86)	ND(90)	400 J	31 J	ND(87)	ND(210)	ND(100)	ND(110)	1200
1,2-Dichloroethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,2-Dichloropropane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
1,3,5-Trimethylbenzene	ug/kg	ND(86)	ND(90)	150 J	ND(87)	170	2200 J	ND(100)	ND(110)	670 J
1,3-Dichlorobenzene	ug/kg	14 J	24 J	89 J	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	ND(1200)
1,4-Dichlorobenzene	ug/kg	12 J	14 J	320 J	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	420 J
2-Butanone (Methyl Ethyl Ketone)	ug/kg	ND(640)	ND(680)	ND(750)	ND(650)	ND(650)	ND(1600)	ND(780)	73 J	ND(8600)
2-Hexanone	ug/kg	ND(2100)	ND(2300)	ND(2500)	ND(2200)	ND(2200)	ND(5300)	ND(2600)	ND(2600)	ND(29000)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(2100)	ND(2300)	ND(2500)	ND(2200)	ND(2200)	ND(5300)	ND(2600)	19 J	ND(29000)
Acetone	ug/kg	ND(640)	ND(680)	ND(750)UJ	ND(650)	ND(650)	ND(1600)UJ	ND(780)	ND(790)UJ	ND(8600)
Benzene	ug/kg	ND(43)	ND(45)	180 J	12 J	11 J	32 J	ND(52)	13 J	510 J
Bromodichloromethane	ug/kg	ND(86)	ND(90)	ND(100)	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	ND(1200)
Bromoform	ug/kg	ND(86)	ND(90)	ND(100)	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	ND(1200)
Bromomethane (Methyl Bromide)	ug/kg	ND(170)	ND(180)	ND(200)	ND(170)	ND(170)	ND(430)	ND(210)	ND(210)	ND(2300)
Carbon disulfide	ug/kg	57 J	26 J	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
Carbon tetrachloride	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Chlorobenzene	ug/kg	ND(43)	ND(45)	99 J	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	210 J
Chloroethane	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
Chloroform (Trichloromethane)	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Chloromethane (Methyl Chloride)	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
cis-1,2-Dichloroethene	ug/kg	ND(43)	ND(45)	ND(50)	51	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
cis-1,3-Dichloropropene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Cyclohexane	ug/kg	ND(1000)	ND(1100)	810 J	75 J	ND(1000)	ND(2600)	ND(1200)	42 J	2800 J
Dibromochloromethane	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(86)	ND(90)	ND(100)	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	ND(1200)
Ethylbenzene	ug/kg	72	68	190 J	16 J	39 J	36 J	ND(52)	23 J	240 J
Isopropylbenzene	ug/kg	33 J	29 J	1500 J	14 J	130 J	1000 J	ND(260)	9.4 J	4400
Methyl acetate	ug/kg	86 J	140 J	100 J	ND(1000)	ND(1000)	ND(2600)	ND(1200)	130 J	ND(14000)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-F4	SB-F4	SB-F4	SB-G6	SB-H1	SB-H1	SB-I1	SB-I1	SB-J2
Sample ID		S-048041-070808-DD-003	S-048041-070808-DD-004	S-048041-070808-DD-005	S-048041-070808-DD-006	BH-48041-061208-MC-013	BH-48041-061208-MC-014	S-48041-071808-EV-003	S-48041-071808-EV-004	BH-48041-061208-MC-006
Sample Date		7/8/2008	7/8/2008	7/8/2008	7/8/2008	6/12/2008	6/12/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth		1-2 ft BGS	1-2 ft BGS	4.5-5.5 ft BGS	1-2 ft BGS	1-2 ft BGS	12-14 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS
Sample Type		Final	Duplicate	Final	Final	Final	Final	Final	Final	Final
	Units									
Methyl cyclohexane	ug/kg	55 J	61 J	2100 J	75 J	47 J	150 J	ND(1200)	84 J	5800 J
Methyl Tert Butyl Ether	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
Methylene chloride	ug/kg	ND(210)	ND(230)	190 J	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
Styrene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Tetrachloroethene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	14 J	ND(580)
Toluene	ug/kg	15 J	15 J	140 J	18 J	18 J	59 J	ND(100)	91 J	300 J
trans-1,2-Dichloroethene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
trans-1,3-Dichloropropene	ug/kg	ND(43)	ND(45)	ND(50)	ND(43)	ND(43)	ND(110)	ND(52)	ND(53)	ND(580)
Trichloroethene	ug/kg	ND(43)	ND(45)	ND(50)	120	ND(43)	ND(110)	ND(52)	35 J	ND(580)
Trichlorofluoromethane (CFC-11)	ug/kg	ND(86)	ND(90)	ND(100)	ND(87)	ND(87)	ND(210)	ND(100)	ND(110)	ND(1200)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(210)	ND(230)	ND(250)	ND(220)	ND(220)	ND(530)	ND(260)	ND(260)	ND(2900)
Vinyl chloride	ug/kg	ND(34)	ND(36)	31 J	ND(35)	ND(35)	ND(86)	ND(41)	ND(42)	ND(460)
Xylene (total)	ug/kg	250	260	580 J	36 J	97 J	1200 J	ND(160)	110 J	2200

Notes:

-- - Not Analyzed

NA- Not Available

BGS - Below Ground Surface

mg/kg : milligrams per kilogram

ug/kg: micrograms per kilogram

ID - insufficient data to develop criterion.

NLV - hazardous substance is not likely to volatilize under most conditions.

ND () - Not present at or above the associated value.

UJ - Estimated reporting limit.

U - Not present at or above the associated value.

J - Estimated concentration.

R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-K1	SB-K1	SB-L6	SB-M3	SB-M3	SB-N8	SB-N8	SB-O4	SB-O4	SB-P1
Sample ID		S-48041-071808-EV-005	S-48041-071808-EV-006	BH-48041-061208-MC-012	S-048041-070908-DD-012	S-048041-070908-DD-013	S-048041-070908-DD-010	S-048041-070908-DD-011	S-48041-071808-EV-001	S-48041-071808-EV-002	BH-48041-061208-MC-011
Sample Date		7/18/2008	7/18/2008	6/12/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth		1.5-2.5 ft BGS	11-12 ft BGS	1-2 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	2-5 ft BGS	1-2 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Duplicate	Final	Final	Final
Units											
Metals											
Aluminum	mg/kg	7680	6970	7560	6240	5710	10100	13500	12000	5850	3410
Antimony	mg/kg	2.6 J	0.72 J	0.090 J	6.2 J	3.0 J	1.5 J	1.2 J	1.5 J	2.2 J	0.15 J
Arsenic	mg/kg	13.0	9.5	5.7 J	3.9	14.6	14.7	12.2	7.8	10.2	4.6 J
Barium	mg/kg	1390 J	161 J	62.0 J	204 J	690 J	394 J	423 J	342 J	410 J	32.4 J
Beryllium	mg/kg	0.40 J	0.59 J	0.29	0.38	0.91	0.14 J	ND(0.19)	1.6 J	0.48 J	ND(0.17)
Cadmium	mg/kg	4.7 J	1.2 J	0.50	4.5	2.1	1.9	1.7	7.3 J	3.9 J	0.23
Calcium	mg/kg	49700	23200	55000	33500	16400	19400	29300	41900	59000	49600
Chromium Total	mg/kg	39.5 J	19.9 J	14.8 J	22.1	185	55.0	46.0	30.2 J	41.8 J	6.4 J
Chromium VI (Hexavalent)	mg/kg	1.7	0.36 J	ND(0.95)	ND(0.89)	ND(1.0)	1.8 J	2.2 J	0.64 J	2.3	3.4 J
Cobalt	mg/kg	4.5	7.2	8.6	4.0	5.2	9.9	8.3	5.8	6.7	2.7
Copper	mg/kg	119	49.4	20.4	103 J	114 J	115 J	108 J	143	250	12.4
Iron	mg/kg	19700	16800	18500	16900	21500	97800	88600	22900	25300	7380
Lead	mg/kg	--	--	9.3	--	--	--	--	--	--	--
Lead - Coarse Fraction	mg/kg	11000 f	175	--	1540 f	1310 f	682	1120 f	965 f	1830 f	163
Lead - Fine Fraction	mg/kg	10700 f	252	--	906 f	1470 f	490	498	1090 f	1980 f	113
Lead - Total (Calculated by fine/coarse fraction)	mg/kg	11000	191	--	1370	1330	605	860	982	1860	150
Magnesium	mg/kg	10300 J	4870 J	14500 J	3570 J	3170 J	1250 J	1460 J	8720 J	6200 J	16200 J
Manganese	mg/kg	419	399	309	463	193	1640 e	1920 e	960	438	171
Mercury	mg/kg	0.092	0.15	0.019 J	0.26	0.25	0.28 J	0.17 J	0.75	0.80	0.083
Nickel	mg/kg	24.3 J	14.5 J	24.9	14.5	24.7	103 J	21.8 J	25.4 J	25.0 J	11.3
Potassium	mg/kg	1300	1350	1830	704	687	839	1150	1090	778	558
Selenium	mg/kg	1.0	1.1	0.59	0.74	1.3	0.96	1.1	1.2	1.1	0.17
Silver	mg/kg	0.38	0.10	0.037 J	0.15	0.27	0.13	0.14	0.41	0.60	0.021 J
Sodium	mg/kg	1000	ND(314)	157	197	373	228	202	394	ND(269)	159
Thallium	mg/kg	ND(0.26)	ND(0.38)	0.30	0.16	0.32	0.17	0.15	ND(0.22)	ND(0.21)	0.095
Vanadium	mg/kg	26.7	26.7	19.6 J	14.4	20.9	26.1	23.3	17.1	17.5	29.9 J
Zinc	mg/kg	483	70.0	44.8 J	291	551	445	345	605	601	30.6 J
PCBs											
Aroclor-1016 (PCB-1016)	mg/kg	ND(0.41)	ND(0.19)	ND(0.039)	ND(0.37)	ND(0.43)	ND(0.038)	ND(0.039)	ND(0.18)	ND(0.42)	ND(0.035)
Aroclor-1221 (PCB-1221)	mg/kg	ND(0.41)	ND(0.19)	ND(0.039)	ND(0.37)	ND(0.43)	ND(0.038)	ND(0.039)	ND(0.18)	ND(0.42)	ND(0.035)
Aroclor-1232 (PCB-1232)	mg/kg	ND(0.41)	ND(0.19)	ND(0.039)	ND(0.37)	ND(0.43)	ND(0.038)	ND(0.039)	ND(0.18)	ND(0.42)	ND(0.035)
Aroclor-1242 (PCB-1242)	mg/kg	4.2	1.2	ND(0.039)	0.37	0.92	ND(0.038)	ND(0.039)	1.2	ND(0.42)	ND(0.035)
Aroclor-1248 (PCB-1248)	mg/kg	ND(0.41)	ND(0.19)	ND(0.039)	ND(0.37)	ND(0.43)	ND(0.038)	ND(0.039)	ND(0.18)	4.9	ND(0.035)
Aroclor-1254 (PCB-1254)	mg/kg	ND(0.41)	1.9	ND(0.039)	0.23 J	1.7	ND(0.038)	ND(0.039)	ND(0.18)	ND(0.42)	ND(0.035)
Aroclor-1260 (PCB-1260)	mg/kg	3.9	ND(0.19)	ND(0.039)	ND(0.37)	ND(0.43)	ND(0.038)	ND(0.039)	1.5	2.8	ND(0.035)
Total PCBs	mg/kg	8.1	3.1	0	0.6 J	2.62	0	0	2.7	7.7	0
Semi-Volatile Organic Compounds											
2,2'-oxybis(1-Chloropropane)	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
2,4,5-Trichlorophenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
2,4,6-Trichlorophenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
2,4-Dichlorophenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
2,4-Dimethylphenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
2,4-Dinitrophenol	ug/kg	ND(9300)	ND(8900)	ND(180)	ND(33000)	ND(39000)	ND(690)	ND(700)	ND(16000)	ND(95000)	ND(3200)

TABLE 3.3
SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	SB-K1	SB-K1	SB-L6	SB-M3	SB-M3	SB-N8	SB-N8	SB-O4	SB-O4	SB-P1
Sample ID	S-48041-071808-EV-005	S-48041-071808-EV-006	BH-48041-061208-MC-012	S-048041-070908-DD-012	S-048041-070908-DD-013	S-048041-070908-DD-010	S-048041-070908-DD-011	S-48041-071808-EV-001	S-48041-071808-EV-002	BH-48041-061208-MC-011
Sample Date	7/18/2008	7/18/2008	6/12/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth	1.5-2.5 ft BGS	11-12 ft BGS	1-2 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	2-5 ft BGS	1-2 ft BGS
Sample Type	Final	Final	Final	Final	Final	Final	Duplicate	Final	Final	Final
	Units									
2,4-Dinitrotoluene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
2,6-Dinitrotoluene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
2-Chloronaphthalene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
2-Chlorophenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
2-Methylnaphthalene	ug/kg	8600 J	5900 J	ND(320)	3200 J	7700 J	78 J	110 J	1200 J	ND(170000)
2-Methylphenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
2-Nitroaniline	ug/kg	ND(12000)	ND(12000)	ND(240)	ND(45000)	ND(52000)	ND(930)	ND(940)	ND(22000)	ND(130000)
2-Nitrophenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
3,3'-Dichlorobenzidine	ug/kg	ND(100000)	ND(94000)	ND(1900)	ND(360000)	ND(410000)	ND(7400)	ND(7500)	ND(170000)	ND(1000000)
3-Nitroaniline	ug/kg	ND(12000)	ND(12000)	ND(240)	ND(45000)	ND(52000)	ND(930)	ND(940)	ND(22000)	ND(130000)
4,6-Dinitro-2-methylphenol	ug/kg	ND(9300)	ND(8900)	ND(180)	ND(33000)	ND(39000)	ND(690)	ND(700)	ND(16000)	ND(95000)
4-Bromophenyl phenyl ether	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
4-Chloro-3-methylphenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
4-Chloroaniline	ug/kg	ND(9300)	ND(8900)	ND(180)	ND(33000)	ND(39000)	ND(690)	ND(700)	ND(16000)	ND(95000)
4-Chlorophenyl phenyl ether	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
4-Methylphenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
4-Nitroaniline	ug/kg	ND(12000)	ND(12000)	ND(240)	ND(45000)	ND(52000)	ND(930)	ND(940)	ND(22000)	ND(130000)
4-Nitrophenol	ug/kg	ND(21000)	ND(19000)	ND(390)	ND(74000)	ND(85000)	ND(1500)	ND(1500)	ND(35000)	ND(210000)
Acenaphthene	ug/kg	ND(16000)	3300 J	ND(320)	ND(59000)	ND(68000)	120 J	160 J	990 J	ND(170000)
Acenaphthylene	ug/kg	ND(16000)	600 J	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Acetophenone	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Anthracene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	220 J	330 J	ND(28000)	ND(170000)
Atrazine	ug/kg	ND(2500)	ND(2400)	ND(48)	ND(8900)	ND(10000)	ND(190)	ND(190)	ND(4300)	ND(25000)
Benzaldehyde	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Benzo(a)anthracene	ug/kg	ND(16000)	1500 J	16 J	ND(59000)	ND(68000)	2100	2700	ND(28000)	ND(170000)
Benzo(a)pyrene	ug/kg	ND(16000)	1200 J	15 J	ND(59000)	ND(68000)	2900	3500	ND(28000)	ND(170000)
Benzo(b)fluoranthene	ug/kg	ND(16000)	1000 J	18 J	ND(59000)	2000 J	4500	5600	ND(28000)	ND(170000)
Benzo(g,h,i)perylene	ug/kg	ND(16000)	660 J	13 J	ND(59000)	ND(68000)	2300	2900	ND(28000)	ND(170000)
Benzo(k)fluoranthene	ug/kg	ND(16000)	ND(16000)	7.9 J	ND(59000)	ND(68000)	1600	1700	ND(28000)	ND(170000)
Biphenyl	ug/kg	1500 J	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
bis(2-Chloroethoxy)methane	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
bis(2-Chloroethyl)ether	ug/kg	ND(5000)	ND(4700)	ND(95)	ND(18000)	ND(21000)	ND(370)	ND(370)	ND(8600)	ND(51000)
bis(2-Ethylhexyl)phthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Butyl benzylphthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Caprolactam	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Carbazole	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	180 J	240 J	ND(28000)	ND(170000)
Chrysene	ug/kg	1200 J	2400 J	16 J	ND(59000)	2200 J	2800	3400	ND(28000)	ND(170000)
Dibenz(a,h)anthracene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	760 J	850 J	ND(28000)	ND(170000)
Dibenzofuran	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	110 J	ND(28000)	ND(170000)
Diethyl phthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Dimethyl phthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Di-n-butylphthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Di-n-octyl phthalate	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Fluoranthene	ug/kg	2300 J	5300 J	26 J	ND(59000)	4000 J	3000	3700	2200 J	ND(170000)
Fluorene	ug/kg	ND(16000)	2500 J	ND(320)	2000 J	6000 J	76 J	120 J	ND(28000)	ND(170000)
Hexachlorobenzene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Hexachlorobutadiene	ug/kg	ND(2500)	ND(2400)	ND(48)	ND(8900)	ND(10000)	ND(190)	ND(190)	ND(4300)	ND(25000)
Hexachlorocyclopentadiene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Hexachloroethane	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)
Indeno(1,2,3-cd)pyrene	ug/kg	ND(16000)	400 J	8.4 J	ND(59000)	ND(68000)	2000	2500	ND(28000)	ND(170000)

TABLE 3.3

SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location		SB-K1	SB-K1	SB-L6	SB-M3	SB-M3	SB-N8	SB-N8	SB-O4	SB-O4	SB-P1
Sample ID		S-48041-071808-EV-005	S-48041-071808-EV-006	BH-48041-061208-MC-012	S-048041-070908-DD-012	S-048041-070908-DD-013	S-048041-070908-DD-010	S-048041-070908-DD-011	S-48041-071808-EV-001	S-48041-071808-EV-002	BH-48041-061208-MC-011
Sample Date		7/18/2008	7/18/2008	6/12/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	7/18/2008	7/18/2008	6/12/2008
Sample Depth		1.5-2.5 ft BGS	11-12 ft BGS	1-2 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	2-5 ft BGS	1-2 ft BGS
Sample Type		Final	Final	Final	Final	Final	Final	Duplicate	Final	Final	Final
Units											
Isophorone	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
Naphthalene	ug/kg	2600 J	8100 J	ND(320)	1700 J	2500 J	100 J	150 J	ND(28000)	ND(170000)	ND(5600)
Nitrobenzene	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
N-Nitrosodi-n-propylamine	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
N-Nitrosodiphenylamine	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
Pentachlorophenol	ug/kg	ND(9300)	ND(8900)	ND(180)	ND(33000)	ND(39000)	ND(690)	ND(700)	ND(16000)	ND(95000)	ND(3200)
Phenanthrene	ug/kg	8200 J	12000 J	18 J	4200 J	6300 J	1100 J	1700	ND(28000)	ND(170000)	1000 J
Phenol	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
Pyrene	ug/kg	2400 J	6700 J	24 J	1800 J	3600 J	2600	3300	2000 J	ND(170000)	1800 J
Pyridine	ug/kg	ND(16000)	ND(16000)	ND(320)	ND(59000)	ND(68000)	ND(1200)	ND(1200)	ND(28000)	ND(170000)	ND(5600)
Volatile Organic Compounds											
1,1,1-Trichloroethane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,1,2,2-Tetrachloroethane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,1,2-Trichloroethane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,1-Dichloroethane	ug/kg	140 J	ND(47)	ND(48)	37 J	51 J	ND(45)	ND(49)	58	22 J	ND(46)
1,1-Dichloroethene	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,2,4-Trichlorobenzene	ug/kg	ND(260)UJ	ND(240)	ND(240)	38 J	95 J	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
1,2,4-Trimethylbenzene	ug/kg	3800 J	620	ND(95)	1700	930	ND(90)	ND(98)	160	46 J	ND(92)
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
1,2-Dibromoethane (Ethylene Dibromide)	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
1,2-Dichlorobenzene	ug/kg	130 J	ND(94)	ND(95)	140	270	ND(90)	ND(98)	49 J	33 J	ND(92)
1,2-Dichloroethane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,2-Dichloropropane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
1,3,5-Trimethylbenzene	ug/kg	1200 J	140	ND(95)	490	230	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
1,3-Dichlorobenzene	ug/kg	ND(100)	ND(94)	ND(95)	ND(86)	ND(110)	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
1,4-Dichlorobenzene	ug/kg	14 J	ND(94)	ND(95)	25 J	25 J	ND(90)	ND(98)	37 J	ND(110)	ND(92)
2-Butanone (Methyl Ethyl Ketone)	ug/kg	79 J	ND(710)	ND(720)	ND(650)	ND(820)	ND(670)	ND(740)	140 J	88 J	ND(690)
2-Hexanone	ug/kg	ND(2600)	ND(2400)	ND(2400)	ND(2200)	ND(2700)	ND(2200)	ND(2500)	ND(2600)	ND(2700)	ND(2300)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ug/kg	ND(2600)	ND(2400)	ND(2400)	ND(2200)	ND(2700)	ND(2200)	ND(2500)	ND(2600)	ND(2700)	ND(2300)
Acetone	ug/kg	ND(770)UJ	ND(710)	ND(720)UJ	ND(650)	ND(820)	ND(670)	ND(740)	ND(770)	ND(800)	ND(690)
Benzene	ug/kg	71 J	270	ND(48)	71	150	ND(45)	ND(49)	66	34 J	ND(46)
Bromodichloromethane	ug/kg	ND(100)	ND(94)	ND(95)	ND(86)	ND(110)	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
Bromoform	ug/kg	ND(100)	ND(94)	ND(95)	ND(86)	ND(110)	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
Bromomethane (Methyl Bromide)	ug/kg	ND(210)	ND(190)	ND(190)	ND(170)	ND(220)	ND(180)	ND(200)	ND(210)	ND(210)	ND(180)
Carbon disulfide	ug/kg	31 J	48 J	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	35 J	43 J	ND(230)
Carbon tetrachloride	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Chlorobenzene	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Chloroethane	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
Chloroform (Trichloromethane)	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Chloromethane (Methyl Chloride)	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
cis-1,2-Dichloroethene	ug/kg	35 J	ND(47)	ND(48)	1200	210	ND(45)	ND(49)	67	ND(54)	ND(46)
cis-1,3-Dichloropropene	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Cyclohexane	ug/kg	93 J	38 J	ND(1100)	ND(1000)	140 J	ND(1100)	ND(1200)	290 J	250 J	ND(1100)
Dibromochloromethane	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Dichlorodifluoromethane (CFC-12)	ug/kg	ND(100)	ND(94)	ND(95)	ND(86)	ND(110)	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
Ethylbenzene	ug/kg	640 J	340	ND(48)	430	320	ND(45)	ND(49)	150	36 J	ND(46)
Isopropylbenzene	ug/kg	310 J	67 J	ND(240)	140 J	370	ND(220)	ND(250)	110 J	120 J	ND(230)
Methyl acetate	ug/kg	150 J	82 J	ND(1100)	84 J	130 J	ND(1100)	ND(1200)	270 J	230 J	ND(1100)

TABLE 3.3
SUBSURFACE ANALYTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	SB-K1	SB-K1	SB-L6	SB-M3	SB-M3	SB-N8	SB-N8	SB-O4	SB-O4	SB-P1	
Sample ID	S-48041-071808-EV-005	S-48041-071808-EV-006	BH-48041-061208-MC-012	S-048041-070908-DD-012	S-048041-070908-DD-013	S-048041-070908-DD-010	S-048041-070908-DD-011	S-48041-071808-EV-001	S-48041-071808-EV-002	BH-48041-061208-MC-011	
Sample Date	7/18/2008	7/18/2008	6/12/2008	7/9/2008	7/9/2008	7/9/2008	7/9/2008	7/18/2008	7/18/2008	6/12/2008	
Sample Depth	1.5-2.5 ft BGS	11-12 ft BGS	1-2 ft BGS	1-2 ft BGS	4-5 ft BGS	1-2 ft BGS	1-2 ft BGS	1-2 ft BGS	2-5 ft BGS	1-2 ft BGS	
Sample Type	Final	Final	Final	Final	Final	Final	Duplicate	Final	Final	Final	
	Units										
Methyl cyclohexane	ug/kg	160 J	69 J	ND(1100)	83 J	160 J	60 J	62 J	300 J	640 J	ND(1100)
Methyl Tert Butyl Ether	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
Methylene chloride	ug/kg	180 J	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	130 J	ND(230)
Styrene	ug/kg	ND(51)	130	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Tetrachloroethene	ug/kg	13 J	ND(47)	ND(48)	73	ND(55)	360	350	18 J	ND(54)	ND(46)
Toluene	ug/kg	710 J	180	ND(95)	760	290	ND(90)	ND(98)	410	130	ND(92)
trans-1,2-Dichloroethene	ug/kg	ND(51)	ND(47)	ND(48)	59 J	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
trans-1,3-Dichloropropene	ug/kg	ND(51)	ND(47)	ND(48)	ND(43)	ND(55)	ND(45)	ND(49)	ND(52)	ND(54)	ND(46)
Trichloroethene	ug/kg	70 J	ND(47)	16 J	150	22 J	ND(45)	ND(49)	91	27 J	ND(46)
Trichlorofluoromethane (CFC-11)	ug/kg	ND(100)	ND(94)	ND(95)	ND(86)	ND(110)	ND(90)	ND(98)	ND(100)	ND(110)	ND(92)
Trifluorotrichloroethane (Freon 113)	ug/kg	ND(260)	ND(240)	ND(240)	ND(220)	ND(270)	ND(220)	ND(250)	ND(260)	ND(270)	ND(230)
Vinyl chloride	ug/kg	180 J	ND(38)	ND(38)	83	64	ND(36)	ND(39)	ND(41)	ND(43)	ND(37)
Xylene (total)	ug/kg	2600 J	710	ND(140)	1800	1000	22 J	30 J	690	190	ND(140)

Notes:
-- - Not Analyzed
NA- Not Available
BGS - Below Ground Surface
mg/kg : milligrams per kilogram
ug/kg: micrograms per kilogram
ID - insufficient data to develop criterion.
NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.

TABLE 3.4
GROUNDWATER ANAYLTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location Sample ID Sample Date Sample Type	<i>Michigan Act 451, Part 201 Groundwater: Residential and Industrial-Commercial Generic Cleanmp Criteria ⁽¹⁾</i>						MW1-08	MW1-08	MW1-08	MW3-08	MW3-08	MW3-08	MW4-08	MW4-08
	<i>Industrial & Commercial II, III,& IV Groundwater</i>						GW-048041-031108-DD-026	GW-048041-062708-DD-001	GW-048041-062708-DD-002	GW-048041-031008-DD-024	GW-048041-031008-DD-025	GW-048041-063008-DD-004	GW-048041-032608-DD-028	GW-048041-063008-DD-003
	<i>Volatilization to Indoor Air Inhalation</i>						3/1/2008	6/27/2008	6/27/2008	3/1/2008	3/1/2008	6/30/2008	3/26/2008	6/30/2008
	Units		Groundwater Contact	Water Solubility	Flammability and Explosivity Screening Levels	Acute Inhalation Screening Levels	Final	Final	Duplicate	Final	Duplicate	Final	Final	Final
<i>Metals</i>														
		a	b	c	d	e								
Aluminum	mg/L	NLV	64000	NA	ID	ID	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.2)
Antimony	mg/L	NLV	68	NA	ID	ID	0.00014 J	ND(0.002)	ND(0.002)	0.00014 J	0.00015 J	0.00027 J	ND(0.002)	ND(0.002)
Arsenic	mg/L	NLV	4.3	NA	ID	ID	ND(0.005)	0.0049 J	ND(0.005)	0.0037 J	0.0032 J	0.004 J	ND(0.005)	ND(0.005)
Barium	mg/L	NLV	14000	NA	ID	ID	0.374	0.355	0.359	0.618	0.62	0.539	0.462	0.458
Beryllium	mg/L	NLV	290	NA	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Cadmium	mg/L	NLV	190	NA	ID	ID	ND(0.001)	ND(0.001)	0.00079 J	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Calcium	mg/L	NA	NA	NA	NA	NA	346	308	316	115	116	104	222	214
Chromium Total	mg/L	NLV	290	NA	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Chromium VI (Hexavalent)	mg/L	NLV	460	NA	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	0.13 J	0.003 J	ND(0.005)UJ	0.002 J	ND(0.005)UJ
Cobalt	mg/L	NLV	2400	NA	ID	ID	ND(0.007)	ND(0.007)	ND(0.007)	ND(0.007)	ND(0.007)	ND(0.007)	ND(0.007)	ND(0.007)
Copper	mg/L	NLV	7400	NA	ID	ID	ND(0.002)	0.00075 J	0.00076 J	ND(0.002)	ND(0.002)	0.00056 J	ND(0.002)	0.00044 J
Iron	mg/L	NLV	58000	NA	ID	ID	27.1	26.9	27.5	7.82	7.84	10.4	10.7	8.6
Lead	mg/L	NLV	ID	NA	ID	ID	ND(0.003)	0.0021 J	ND(0.003)	0.0039	0.005	ND(0.003)	0.0021 J	ND(0.003)
Magnesium	mg/L	NLV	1000000	NA	ID	ID	105	86.8	105	37.1	36.9	29	60.7	60.7
Manganese	mg/L	NLV	9100	NA	ID	ID	0.351	0.338	0.348	0.201	0.203	0.207	0.881	0.72
Mercury	mg/L	0.056	0.056	0.056	ID	ID	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Nickel	mg/L	NLV	74000	NA	ID	ID	ND(0.02)	ND(0.02)	ND(0.02)	0.0044 J	ND(0.02)	0.0039 J	ND(0.02)	ND(0.02)
Potassium	mg/L	NA	NA	NA	NA	NA	60.5	61.6	63.4	25.6	25.5	22.1	26.7	24.3
Selenium	mg/L	NLV	970	NA	ID	ID	ND(0.005)	ND(0.005)	0.0047 J	0.0042 J	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.005)
Silver	mg/L	NLV	1500	NA	ID	ID	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.0002)
Sodium	mg/L	NLV	1000000	NA	ID	ID	182	210	217	65.2	64.7	54.4	87.5	82.2
Thallium	mg/L	NLV	13	NA	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.001)
Vanadium	mg/L	NLV	970	NA	ID	ID	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.004)
Zinc	mg/L	NLV	110000	NA	ID	ID	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.02)	0.0078 J	ND(0.02)	ND(0.02)
<i>PCBs</i>														
Aroclor-1016 (PCB-1016)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)
Aroclor-1221 (PCB-1221)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)
Aroclor-1232 (PCB-1232)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)
Aroclor-1242 (PCB-1242)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	0.000065 J	ND(0.0001)	ND(0.0001)
Aroclor-1248 (PCB-1248)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	0.000085 J
Aroclor-1254 (PCB-1254)	mg/L	NA	NA	NA	NA	ID	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)
Aroclor-1260 (PCB-1260)	mg/L	NA	NA	NA	NA	ID	0.000058 J	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	ND(0.0001)	0.000097 J
Total PCBs	mg/L	0.045	0.0033	0.0447	ID	ID	0.000058 J	0	0	0.000066 J	0	0.000065 J	0	0.000182 J
<i>Semi-Volatile Organic Compounds</i>														
2,2'-oxybis(1-Chloropropane)	mg/L	NA	NA	NA	NA	NA	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2,4,5-Trichlorophenol	mg/L	NLV	170	1200	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2,4,6-Trichlorophenol	mg/L	NLV	10	800	ID	ID	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.02)	ND(0.02)	ND(0.016)	ND(0.004)UJ	ND(0.008)
2,4-Dichlorophenol	mg/L	NLV	48	4500	ID	ID	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.05)	ND(0.05)	ND(0.04)	ND(0.02)	ND(0.02)
2,4-Dimethylphenol	mg/L	NLV	520	7870	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2,4-Dinitrophenol	mg/L	NA	NA	NA	NA	NA	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)
2,4-Dinitrotoluene	mg/L	NLV	8.6	270	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2,6-Dinitrotoluene	mg/L	NA	NA	NA	NA	NA	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2-Chloronaphthalene	ID	ID	6.7	6.74	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2-Chlorophenol	mg/L	ID	94	22000	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2-Methylnaphthalene	mg/L	ID	25	24.6	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	0.027	0.028	0.015 J	0.00034 J	ND(0.01)
2-Methylphenol	mg/L	NLV	810	28000	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
2-Nitroaniline	mg/L	NA	NA	NA	NA	NA	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)
2-Nitrophenol	mg/L	NLV	79	2500	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
3,3'-Dichlorobenzidine	mg/L	NLV	0.18	3.11	ID	ID	R	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)UJ	ND(0.001)UJ	R
3-Nitroaniline	mg/L	NA	NA	NA	NA	NA	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)
4,6-Dinitro-2-methylphenol	mg/L	NLV	9.5	200	ID	ID	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)UJ
4-Bromophenyl phenyl ether	mg/L	NA	NA	NA	NA	NA	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
4-Chloro-3-methylphenol	mg/L	NLV	79	3900	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
4-Chloroaniline	mg/L	NA	NA	NA	NA	NA	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.05)	ND(0.05)	ND(0.04)	ND(0.01)UJ	ND(0.02)
4-Chlorophenyl phenyl ether	mg/L	NA	NA	NA	NA	NA	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
4-Methylphenol	mg/L	NLV	810	28000	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
4-Nitroaniline	mg/L	NA	NA	NA	NA	NA	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)
4-Nitrophenol	mg/L	NA	NA	NA	NA	NA	ND(0.02)	ND(0.02)	ND(0.02)	ND(0.1)	ND(0.1)	ND(0.08)	ND(0.02)UJ	ND(0.04)
Acenaphthene	mg/L	4.2	4.2	4.24	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Acenaphthylene	mg/L	3.9	3.9	3.93	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Acetophenone	mg/L	6100	6100	6100	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Anthracene	mg/L	0.043	0.043	0.0434	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Atrazine	mg/L	NLV	5.4	70	ID	ID	ND(0.003)	ND(0.003)	ND(0.015)	ND(0.015)	ND(0.015)	ND(0.012)	ND(0.003)UJ	ND(0.006)
Benzaldehyde	mg/L	NA	NA	NA	NA	NA	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.05)	ND(0.05)	ND(0.04)	ND(0.01)UJ	ND(0.02)

TABLE 3.4

GROUNDWATER ANAYLTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	<i>Residential and Industrial-Commercial Generic Cleanup Criteria</i> ⁽¹⁾						MW1-08	MW1-08	MW1-08	MW3-08	MW3-08	MW3-08	MW4-08	MW4-08
Sample ID	Industrial &						GW-048041-031108-DD-026	GW-048041-062708-DD-001	GW-048041-062708-DD-002	GW-048041-031008-DD-024	GW-048041-031008-DD-025	GW-048041-063008-DD-004	GW-048041-032608-DD-028	GW-048041-063008-DD-003
Sample Date	Commercial II, III,& IV Groundwater						3/11/2008	6/27/2008	6/27/2008	3/10/2008	3/10/2008	6/30/2008	3/26/2008	6/30/2008
Sample Type	Volatilization to						Final	Final	Duplicate	Final	Duplicate	Final	Final	Final
	Units	Indoor Air Inhalation	Groundwater Contact	Water Solubility	Flammability and Explosivity Screening Levels	Acute Inhalation Screening Levels								
Benzo(a)anthracene	mg/L	NLV	0.0094	0.0094	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Benzo(a)pyrene	mg/L	NLV	0.001	0.00162	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)UJ	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Benzo(b)fluoranthene	mg/L	ID	0.0015	0.0015	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)UJ	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Benzo(g,h,i)perylene	mg/L	NLV	0.001	0.00026	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)UJ	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Benzo(k)fluoranthene	mg/L	NLV	0.001	0.0008	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)UJ	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Biphenyl	mg/L	NA	NA	NA	NA	NA	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.05)	ND(0.05)	ND(0.04)	ND(0.01)UJ	ND(0.02)
bis(2-Chloroethoxy)methane	mg/L	NA	NA	NA	NA	NA	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
bis(2-Chloroethyl)ether	mg/L	210	5.7	17200	17000	17000	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
bis(2-Ethylhexyl)phthalate	mg/L	NLV	0.32	0.34	NA	0.34	0.0018 J	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	0.0026 J
Butyl benzylphthalate	mg/L	NLV	2.7	2.69	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Caprolactam	mg/L	NLV	390000	5250000	NA	1000000	ND(0.01)UJ	ND(0.01)	ND(0.05)UJ	ND(0.05)UJ	ND(0.05)UJ	ND(0.04)	ND(0.01)UJ	ND(0.02)
Carbazole	mg/L	NLV	7.4	7.48	ID	ID	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.05)	ND(0.05)	ND(0.04)	ND(0.01)UJ	ND(0.02)
Chrysene	mg/L	ID	0.0016	0.0016	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Dibenz(a,h)anthracene	mg/L	NLV	0.002	0.00249	ID	ID	ND(0.002)	ND(0.002)	ND(0.002)UJ	ND(0.01)	ND(0.01)	ND(0.008)	ND(0.001)UJ	ND(0.004)
Dibenzofuran	mg/L	ID	ID	10	ID	ID	ND(0.004)	ND(0.004)	ND(0.004)	ND(0.02)	ND(0.02)	ND(0.016)	ND(0.004)UJ	ND(0.008)
Diethyl phthalate	mg/L	NLV	1100	1080	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Dimethyl phthalate	mg/L	NLV	4200	4190	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Di-n-butylphthalate	mg/L	NLV	11	11.2	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Di-n-octyl phthalate	mg/L	NLV	0.4	3	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)UJ	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Fluoranthene	mg/L	0.21	0.21	0.206	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Fluorene	mg/L	2	2	1.98	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	0.0044 J	0.0045 J	0.0047 J	0.00041 J	0.00082 J
Hexachlorobenzene	mg/L	3	0.0046	6.2	ID	ID	ND(0.0002)	ND(0.0002)	ND(0.0002)	ND(0.001)	ND(0.0002)UJ	ND(0.0004)	ND(0.0002)UJ	ND(0.0004)
Hexachlorobutadiene	mg/L	3.2	0.4	3.23	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.005)	ND(0.005)	ND(0.004)	ND(0.001)UJ	ND(0.002)
Hexachlorocyclopentadiene	mg/L	0.42	1.6	1.8	ID	ID	ND(0.005)	R	R	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	R
Hexachloroethane	mg/L	50	1.9	50	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Indeno(1,2,3-cd)pyrene	mg/L	NLV	0.002	0.000022	ID	ID	ND(0.002)	ND(0.002)	ND(0.002)UJ	ND(0.01)	ND(0.01)	ND(0.008)	ND(0.002)UJ	ND(0.004)
Isophorone	mg/L	NLV	990	12000	NA	12000	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Naphthalene	mg/L	31	31	31	NA	31	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Nitrobenzene	mg/L	550	11	2090	NA	ID	ND(0.003)	ND(0.003)	ND(0.003)	ND(0.015)	ND(0.015)	ND(0.012)	ND(0.003)UJ	ND(0.006)
N-Nitrosodi-n-propylamine	mg/L	NLV	0.36	9890	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
N-Nitrosodiphenylamine	mg/L	NLV	35	35.1	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	0.0011 J
Pentachlorophenol	mg/L	NLV	0.2	1850	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Phenanthrene	mg/L	1	1	1	ID	ID	ND(0.002)	ND(0.002)	ND(0.002)	0.0019 J	0.0016 J	0.0017 J	ND(0.002)UJ	ND(0.004)
Phenol	mg/L	NLV	29000	82800	NA	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
Pyrene	mg/L	0.14	0.14	0.135	ID	ID	ND(0.005)	ND(0.005)	0.00021 J	ND(0.025)	ND(0.025)	ND(0.02)	ND(0.005)UJ	ND(0.01)
<i>Volatile Organic Compounds</i>														
1,1,1-Trichloroethane	mg/L	1300	1300	1330	ID	1300	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,1,2,2-Tetrachloroethane	mg/L	77	4.7	2970	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,1,2-Trichloroethane	mg/L	110	21	4420	NA	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,1-Dichloroethane	mg/L	2300	2400	5060	380	ID	0.00026 J	0.00029 J	ND(0.0033)	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)	ND(0.001)UJ
1,1-Dichloroethene	mg/L	1.3	11	2250	97	140	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,2,4-Trichlorobenzene	mg/L	300	19	300	NA	300	ND(0.005)	ND(0.005)UJ	ND(0.005)UJ	ND(0.017)	ND(0.005)	0.00038 J	ND(0.005)	ND(0.005)
1,2,4-Trimethylbenzene	mg/L	56	56	55.89	56	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.00078 J	0.00028 J	ND(0.0017)	0.00096 J	ND(0.001)
1,2-Dibromo-3-chloropropane (DBCP)	mg/L	1.2	0.39	1.23	NA	ID	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,2-Dibromoethane (Ethylene Dibromide)	mg/L	15	0.025	4200	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,2-Dichlorobenzene	mg/L	160	160	156	NA	160	ND(0.001)	ND(0.001)	ND(0.001)	0.005 J	0.0015 J	0.0055	0.0002 J	ND(0.001)
1,2-Dichloroethane	mg/L	59	19	8520	2500	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,2-Dichloropropane	mg/L	36	16	2800	550	2800	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
1,3,5-Trimethylbenzene	mg/L	61	61	61.15	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.0027 J	0.00086 J	ND(0.0017)	ND(0.001)	ND(0.001)
1,3-Dichlorobenzene	mg/L	ID	2	111	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.00078 J	0.00025 J	0.00075 J	ND(0.001)	ND(0.001)
1,4-Dichlorobenzene	mg/L	74	6.4	73.8	NA	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.0033 J	0.001 J	0.003	ND(0.001)	ND(0.001)
2-Butanone (Methyl Ethyl Ketone)	mg/L	240000	240000	240000	ID	240000	0.00094 J	0.00059 J	ND(0.025)	0.0027 J	0.001 J	ND(0.042)	0.00076 J	ND(0.025)
2-Hexanone	mg/L	8700	5200	16000	NA	ID	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.17)	ND(0.05)	ND(0.084)	ND(0.05)	ND(0.05)
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	mg/L	20000	13000	20000	ID	20000	ND(0.05)	ND(0.05)UJ	ND(0.05)UJ	ND(0.17)	ND(0.05)	ND(0.084)	ND(0.05)	ND(0.05)
Acetone	mg/L	1000000	31000	1000000	15000	1000000	ND(0.025)	ND(0.025)	0.0016 J	ND(0.083)	ND(0.025)	ND(0.042)	0.003 J	ND(0.025)
Benzene	mg/L	35	11	1750	68	67	ND(0.001)	ND(0.001)	ND(0.001)	0.071 J	0.021 J	0.065	ND(0.001)	ND(0.001)
Bromodichloromethane	mg/L	37	14	6740	ID	ID	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Bromoform	mg/L	3100	140	3100	ID	ID	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Bromomethane (Methyl Bromide)	mg/L	9	70	14500	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Carbon disulfide	mg/L	550	1200	1190	13	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.017)	ND(0.005)	ND(0.0084)	ND(0.005)	ND(0.005)
Carbon tetrachloride	mg/L	2.4	4.6	793	ID	96	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Chlorobenzene	mg/L	470	86	472	160	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.016 J	0.0048 J	0.013	ND(0.001)	ND(0.001)
Chloroethane	mg/L	5700	440	5740	110	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.0066 J	0.0011 J	0.004	ND(0.001)	ND(0.001)
Chloroform (Trichloromethane)	mg/L	180	150	7920	ID	ID	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Chloromethane (Methyl Chloride)	mg/L	45	490	6340	36	210	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0039)	ND(0.001)	ND(0.001)
cis-1,2-Dichloroethene	mg/L	210	200	3500	530	ID	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
cis-1,3-Dichloropropene	mg/L	NA	NA	NA	NA	NA	ND(0.001)UJ	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)UJ	ND(0.001)UJ
Cyclohexane	mg/L	NA	NA	NA	NA	NA	ND(0.001)	ND(0.001)	ND(0.001)	0.032 J	0.0097 J	0.00035 J	0.00065 J	
Dibromochloromethane	mg/L	110	18	2600	ID	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)

TABLE 3.4
GROUNDWATER ANAYLTICAL DATA
SITE INVESTIGATION REPORT
DEARBORN REFINERY SITE
DEARBORN, MICHIGAN

Sample Location	<u>Residential and Industrial-Commercial Generic Cleanup Criteria ⁽¹⁾</u>													
Sample ID	Industrial &		Groundwater	Water	Flammability and	Acute	MW1-08	MW1-08	MW1-08	MW3-08	MW3-08	MW3-08	MW4-08	MW4-08
Sample Date	Commercial II, III,& IV Groundwater		Contact	Solubility	Explosivity	Inhalation	GW-048041-031108-DD-026	GW-048041-062708-DD-001	GW-048041-062708-DD-002	GW-048041-031008-DD-024	GW-048041-031008-DD-025	GW-048041-063008-DD-004	GW-048041-032608-DD-028	GW-048041-063008-DD-003
Sample Type	Volatilization to				Screening Levels	Screening Levels	3/11/2008	6/27/2008	6/27/2008	3/10/2008	3/10/2008	6/30/2008	3/26/2008	6/30/2008
	Units	Indoor Air Inhalation					Final	Final	Duplicate	Final	Duplicate	Final	Final	Final
Dichlorodifluoromethane (CFC-12)	mg/L	300	300	300	ID	ID	ND(0.001)UJ	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)	ND(0.001)UJ
Ethylbenzene	mg/L	170	170	169	43	170	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	0.0015 J	0.00043 J	0.0011 J	ND(0.001)	ND(0.001)
Isopropylbenzene	mg/L	56	56	56	29	ID	ND(0.005)	ND(0.005)	ND(0.005)	0.021 J	0.0061 J	0.012	0.0013 J	0.0015 J
Methyl acetate	mg/L	NA	NA	NA	NA	NA	ND(0.01)	ND(0.01)	ND(0.01)	ND(0.033)	ND(0.01)	ND(0.017)	ND(0.01)	ND(0.01)
Methyl cyclohexane	mg/L	NA	NA	NA	NA	NA	ND(0.001)UJ	ND(0.001)	ND(0.001)	0.014 J	0.0042 J	0.0032	ND(0.001)	ND(0.001)
Methyl Tert Butyl Ether	mg/L	47000	610	46800	ID	ID	0.00026 J	0.00023 J	0.0002 J	0.00066 J	0.0002 J	0.00048 J	ND(0.005)	ND(0.005)
Methylene chloride	mg/L	1400	220	17000	ID	ID	ND(0.005)	ND(0.005)	ND(0.005)	ND(0.017)	ND(0.005)	ND(0.0084)	ND(0.005)	ND(0.005)
Styrene	mg/L	310	9.7	310	140	310	ND(0.001)	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)	ND(0.001)UJ
Tetrachloroethene	mg/L	170	12	200	ID	200	ND(0.001)UJ	ND(0.001)UJ	ND(0.001)UJ	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)	ND(0.001)UJ
Toluene	mg/L	530	530	526	61	ID	ND(0.001)	ND(0.001)	ND(0.001)	0.0042 J	0.0012 J	ND(0.0036)	ND(0.001)	ND(0.001)
trans-1,2-Dichloroethene	mg/L	200	220	6300	230	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
trans-1,3-Dichloropropene	mg/L	NA	NA	NA	NA	NA	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)UJ	ND(0.001)UJ	ND(0.001)UJ
Trichloroethene	mg/L	97	22	1100	ID	1100	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Trichlorofluoromethane (CFC-11)	mg/L	1100	1100	1100	ID	1100	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Trifluorotrichloroethane (Freon 113)	mg/L	170	170	170	ID	170	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)
Vinyl chloride	mg/L	13	1	2760	33	ID	ND(0.001)	ND(0.001)	ND(0.001)	ND(0.0033)	ND(0.001)	ND(0.0017)	ND(0.001)	ND(0.001)UJ
Xylene (total)	mg/L	190	190	186	70	190	ND(0.002)UJ	ND(0.002)UJ	ND(0.002)UJ	0.0088 J	0.0028 J	0.0083 J	ND(0.002)	ND(0.002)UJ

Notes:
-- -Not Analyzed
NA- Not Available
mg/L: milligrams per Liter

ID - insufficient data to develop criterion.
NLV - hazardous substance is not likely to volatilize under most conditions.
ND () - Not present at or above the associated value.
UJ - Estimated reporting limit.
U - Not present at or above the associated value.
J - Estimated concentration.
R - Rejected.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 1/23/2006, pursuant to 1994 PA 451 as amended.
Organics:
J - Laboratory qualified as an estimated value.
B - Laboratory qualifier: Method blank contamination. The associated method blank contains the target analyte at a reportable level.
Inorganics:
J - Laboratory qualifier: Method blank contamination. The associated method blank contains the target analyte at a reportable level.
B - Laboratory qualified as an estimated value

TABLE 5.1

DETAILED COST ESTIMATE
ALTERNATIVE 1: NO ACTION
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Capital Costs</u>					
1.	Site Maintenance (Existing Fence Repairs)	--	L.S.	--	\$ 2,500
				Item 1 Subtotal	\$ 2,500
	Estimated Capital Cost				\$ 2,500
	Engineering (10%)				\$ 250
	Subtotal				\$ 2,750
	Contingency (10%)				\$ 275
	Total Estimated Capital Cost				\$ 3,025
<u>Groundwater Monitoring Costs</u>					
1.	Groundwater Monitoring ⁽¹⁾				
a)	Miscellaneous costs (sampling, equipment, PPE)	--	--	--	\$ 5,000
	Subtotal				\$ 5,000
	Contingency (10%)				\$ 500
	Total Groundwater Monitoring Cost				\$ 5,500
<u>Total Present Worth</u>					
	Capital Cost				\$ 3,025
	Groundwater Monitoring ⁽¹⁾⁽²⁾				\$ 5,500
	Total Present Worth ⁽²⁾				\$ 9,000

Notes:

- (1) Groundwater sampling (2 events, 3 wells. Groundwater samples analyzed for VOCs/SVOCs/PCBs, Metals).
(2) Total Costs have been rounded to three significant figures.

TABLE 5.2

DETAILED COST ESTIMATE
ALTERNATIVE 2: INSTITUTIONAL CONTROLS
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Capital Costs</u>					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	\$ 5,000
	b) Groundwater Use Limitations	--	L.S.	--	\$ 1,000
	c) Legal Counsel	--	L.S.	--	\$ 10,000
	Item 1 Subtotal				\$ 16,000
2.	Site Maintenance (Existing Fence Repairs)	--	L.S.	--	\$ 2,500
3.	Permits/Coordination with City of Dearborn/Wayne County	--	L.S.	--	\$ 5,000
	Estimated Capital Cost				\$ 23,500
	Engineering (10%)				\$ 2,350
	Subtotal				\$ 25,850
	Contingency (10%)				\$ 2,585
	Total Estimated Capital Cost				\$ 28,435
<u>Groundwater Monitoring Costs</u>					
1.	Groundwater Monitoring ⁽¹⁾				
	a) Miscellaneous costs (sampling, equipment, PPE)	--	--	--	\$ 5,000
	Subtotal				\$ 5,000
	Contingency (10%)				\$ 500
	Total Groundwater Monitoring Cost				\$ 5,500
<u>Total Present Worth</u>					
	Capital Cost				\$ 28,435
	Groundwater Monitoring ⁽¹⁾				\$ 5,500
	Total Present Worth ⁽²⁾				\$ 34,000

Notes:

(1) Groundwater sampling (2 events, 3 wells. Groundwater samples analyzed for VOCs/SVOCs/PCBs, Metals).

(2) Total Costs have been rounded to three significant figures.

cu yd - cubic yard

ft - feet

ea. - each

L.S. - Lump Sum

TABLE 5.3

DETAILED COST ESTIMATE
ALTERNATIVE 3.1: COVER SYSTEMS - SOIL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Capital Costs</u>					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	\$ 5,000
	b) Groundwater Use Limitations	--	L.S.	--	\$ 1,000
	c) Legal Counsel	--	L.S.	--	\$ 10,000
	Item 1 Subtotal				\$ 16,000
2.	Site Maintenance (Existing Fence Repairs)	--	L.S.	--	\$ 2,500
3.	Permits/Coordination with City of Dearborn/Wayne County	--	L.S.	--	\$ 5,000
4.	Site Demolition/Decommissioning ⁽¹⁾	--	L.S.	--	\$ 200,000
5.	Site Grading				
	a) Excavation and grading	25,000	C.Y.	\$ 3.00	\$ 75,000
	Item 5 Subtotal				\$ 75,000
6.	Cover System				
	a) Geotextile Fabric	290,000	sq. ft.	\$ 0.22	\$ 63,800
	b) 9 inch Common Fill Layer	290,000	sq. ft.	\$ 0.56	\$ 162,400
	c) Vegetative Cover	290,000	sq. ft.	\$ 0.10	\$ 29,000
	d) 3 inch Topsoil	290,000	sq. ft.	\$ 0.20	\$ 58,000
	Item 6 Subtotal				\$ 313,200
7.	Drainage System				
	a) Drainage piping	3,000	ft	\$ 15	\$ 45,000
	b) Culvert	3	ea.	\$ 1,500	\$ 4,500
	c) Riprap protection	750	S.Y.	\$ 40	\$ 30,000
	d) Gravity discharge to POTW/Street	300	ft	\$ 30	\$ 9,000
	Item 7 Subtotal				\$ 88,500
	Subtotal Items 1, 2, 3, 4, 5, 6 and 7				\$ 700,200
8.	Bonds/Insurance	3	%	--	\$ 21,006
9.	Mobilization/Demobilization	5	%	--	\$ 35,010
10.	Permits/Coordination with City/County	1	%	--	\$ 7,002
11.	Health and Safety	3	%	--	\$ 21,006
12.	Construction Facilities/Temporary Controls	2	%	--	\$ 14,004
	Estimated Capital Cost				\$ 798,228
	Engineering (10%)				\$ 79,823
	Subtotal				\$ 878,051
	Contingency (10%)				\$ 87,805
	Total Estimated Capital Cost				\$ 965,856

TABLE 5.3

DETAILED COST ESTIMATE
ALTERNATIVE 3.1: COVER SYSTEMS - SOIL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Groundwater Monitoring Costs</u>					
1.	Groundwater Monitoring ⁽²⁾				
	a) Miscellaneous costs (sampling, equipment, PPE)	--	--	--	\$ 5,000
				Subtotal	\$ 5,000
				Contingency (10%)	\$ 500
				Total Groundwater Monitoring Cost	\$ 5,500
<u>Total Present Worth</u>					
	Capital Cost				\$ 965,856
	Groundwater Monitoring ⁽²⁾				\$ 5,500
				Total Present Worth ⁽³⁾	\$ 971,000

Notes:

- (1) City of Dearborn cost.
 (2) Groundwater sampling (2 events, 3 wells. Groundwater samples analyzed for VOCs/SVOCs/PCBs, Metals).
 (3) Total Costs have been rounded to three significant figures.
 cu yd - cubic yard
 ft - feet
 ea. - each
 L.S. - Lump Sum

TABLE 5.4

DETAILED COST ESTIMATE
ALTERNATIVE 3.2: COVER SYSTEMS - GRAVEL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Capital Costs</u>					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	\$ 5,000
	b) Groundwater Use Limitations	--	L.S.	--	\$ 1,000
	c) Legal Counsel	--	L.S.	--	\$ 10,000
	Item 1 Subtotal				\$ 16,000
2.	Site Maintenance (Existing Fence Repairs)	--	L.S.	--	\$ 2,500
3.	Permits/Coordination with City of Dearborn/Wayne County	--	L.S.	--	\$ 5,000
4.	Site Demolition/Decommissioning ⁽¹⁾	--	L.S.	--	\$ 200,000
5.	Site Grading				
	a) Excavation and grading	25,000	C.Y.	\$ 3.00	\$ 75,000
	Item 5 Subtotal				\$ 75,000
6.	Cover System				
	a) Geotextile Fabric	290,000	sq. ft.	\$ 0.22	\$ 63,800
	b) 6 inch Common Fill Layer	290,000	sq. ft.	\$ 0.38	\$ 110,200
	c) Gravel Base 6 inch Layer	290,000	sq. ft.	\$ 0.58	\$ 168,200
	Item 6 Subtotal				\$ 342,200
7.	Drainage System				
	a) Drainage piping	3,000	ft	\$ 15	\$ 45,000
	b) Culvert	3	ea.	\$ 1,500	\$ 4,500
	c) Riprap protection	750	S.Y.	\$ 40	\$ 30,000
	d) Gravity discharge to POTW/Street	300	ft	\$ 30	\$ 9,000
	Item 7 Subtotal				\$ 88,500
	Subtotal Items 1, 2, 3, 4, 5, 6 and 7				\$ 729,200
8.	Bonds/Insurance	3	%	--	\$ 21,876
9.	Mobilization/Demobilization	5	%	--	\$ 36,460
10.	Permits/Coordination with City/County	1	%	--	\$ 7,292
11.	Health and Safety	3	%	--	\$ 21,876
12.	Construction Facilities/Temporary Controls	2	%	--	\$ 14,584
	Estimated Capital Cost				\$ 831,288
	Engineering (10%)				\$ 83,129
	Subtotal				\$ 914,417
	Contingency (10%)				\$ 91,442
	Total Estimated Capital Cost				\$ 1,005,858

TABLE 5.4

DETAILED COST ESTIMATE
ALTERNATIVE 3.2: COVER SYSTEMS - GRAVEL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Groundwater Monitoring Costs</u>					
1.	Groundwater Monitoring ⁽²⁾				
	a) Miscellaneous costs (sampling, equipment, PPE)	--	--	--	\$ 5,000
			Subtotal		\$ 5,000
			Contingency (10%)		\$ 500
	Total Groundwater Monitoring Cost				<u>\$ 5,500</u>
<u>Total Present Worth</u>					
	Capital Cost				\$ 1,005,858
	Groundwater Monitoring ⁽²⁾				<u>\$ 5,500</u>
	Total Present Worth ⁽³⁾				<u>\$ 1,011,000</u>

Notes:

- (1) City of Dearborn cost.
 (2) Groundwater sampling (2 events, 3 wells. Groundwater samples analyzed for VOCs/SVOCs/PCBs, Metals).
 (3) Total Costs have been rounded to three significant figures.
 cu yd - cubic yard
 ft - feet
 ea. - each
 L.S. - Lump Sum

TABLE 5.5

**DETAILED COST ESTIMATE
ALTERNATIVE 4: SOIL COVER/HOT SPOT REMOVAL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN**

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Capital Costs</u>					
1.	Institutional Controls				
	a) Deed restrictions	--	L.S.	--	\$ 5,000
	b) Groundwater Use Limitations	--	L.S.	--	\$ 1,000
	c) Legal Counsel	--	L.S.	--	\$ 10,000
	Item 1 Subtotal				\$ 16,000
2.	Site Maintenance (Existing Fence Repairs)	--	L.S.	--	\$ 2,500
3.	Permits/Coordination with City of Dearborn/Wayne County	--	L.S.	--	\$ 5,000
4.	Hot-Spot Removal ⁽¹⁾				
	a) Excavation	90,500	tons	\$ 5	\$ 452,500
	b) Transportation	90,500	tons	\$ 10	\$ 905,000
	c) Disposal - RCRA Subtitle 'D' Regulated	67,875	tons	\$ 10	\$ 678,750
	d) Disposal - TSCA Regulated	22,625	tons	\$ 100	\$ 2,262,500
	e) Restoration	90,500	tons	\$ 10	\$ 905,000
	Item 4 Subtotal				\$ 5,203,750
5.	Site Demolition/Decommissioning ⁽²⁾	--	L.S.	--	\$ 200,000
6.	Cover System				
	a) Geotextile Fabric	290,000	sq. ft.	\$ 0.22	\$ 63,800
	b) 9 inch Common Fill Layer	290,000	sq. ft.	\$ 0.56	\$ 162,400
	c) Vegetative Cover	290,000	sq. ft.	\$ 0.10	\$ 29,000
	d) 3 inch Topsoil	290,000	sq. ft.	\$ 0.20	\$ 58,000
	Item 6 Subtotal				\$ 313,200
7.	Drainage System				
	a) Drainage piping	3,000	ft	\$ 15	\$ 45,000
	b) Culvert	3	ea.	\$ 1,500	\$ 4,500
	c) Riprap protection	750	S.Y.	\$ 40	\$ 30,000
	d) Gravity discharge to POTW/Street	300	ft	\$ 30	\$ 9,000
	Item 7 Subtotal				\$ 88,500
	Subtotal Items 1, 2, 3, 4, 5, 6 and 7				\$ 5,828,950
8.	Bonds/Insurance	3	%	--	\$ 174,869
9.	Mobilization/Demobilization	5	%	--	\$ 291,448
10.	Permits/Coordination with City/County	1	%	--	\$ 58,290
11.	Health and Safety	3	%	--	\$ 174,869
12.	Construction Facilities/Temporary Controls	2	%	--	\$ 116,579
	Estimated Capital Cost				\$ 6,645,003
	Engineering (10%)				\$ 664,500
	Subtotal				\$ 7,309,503
	Contingency (10%)				\$ 730,950
	Total Estimated Capital Cost				\$ 8,040,454

TABLE 5.5

DETAILED COST ESTIMATE
ALTERNATIVE 4: SOIL COVER/HOT SPOT REMOVAL
SITE INVESTIGATION REPORT
DEARBORN REFINING SITE
DEARBORN, MICHIGAN

<i>Item</i>	<i>Task</i>	<i>Quantity</i>	<i>Unit</i>	<i>Unit Cost</i>	<i>Cost</i>
<u>Groundwater Monitoring Costs</u>					
1.	Groundwater Monitoring ⁽³⁾				
	a) Miscellaneous costs (sampling, equipment, PPE)	--	--	--	\$ 5,000
				Subtotal	\$ 5,000
				Contingency (10%)	\$ 500
	Total Groundwater Monitoring Cost				<u>\$ 5,500</u>
<u>Total Present Worth</u>					
	Capital Cost				\$ 8,040,454
	Groundwater Monitoring ⁽³⁾				<u>\$ 5,500</u>
	Total Present Worth ⁽⁴⁾				<u>\$ 8,046,000</u>

Notes:

- (1) Based on analytical results and approximate areas requiring removal (Approximately 50% Removal).
 - (2) Total Costs have been rounded to three significant figures.
 - (3) Groundwater sampling (2 events, 3 wells. Groundwater samples analyzed for VOCs/SVOCs/PCBs, Metals).
 - (4) City of Dearborn cost.
- cu yd - cubic yard
ft - feet
ea. - each
L.S. - Lump Sum