9803-160

Harding ESE
A MACTEC COMPANY

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September 24, 2001

Mr. Don Harris
General Motors Corporation
Powertrain Group
Mail Code 130
Ypsilanti, Michigan 48198

Subject: Dynamometer Groundwater Sampling - June 2001
Willow Run Transmission Plant
Ypsilanti, Michigan

Dear Mr. Harris:

Enclosed are two copies of the above-referenced report. We have included recommendations for probe boring locations to define the extent of the oil plume in the EE-10 area.

Please contact me if you have any questions or comments.

Sincerely,

HARDING ESE, A MACTEC COMPANY

Craig S. Kielty
Project Manager

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9803-160

TECHNICAL MEMORANDUM

PROJECT: General Motors Powertrain Group – Willow Run Transmission Plant

SUBJECT: Results of Dynamometer Groundwater Sampling

PREPARED BY: Joe Jacobson and Craig Kielty/Harding ESE, a MACTEC Company

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INTRODUCTION

The purpose of this Technical Memorandum is to describe the groundwater sampling activities performed in the Dynamometer area at the Powertrain Plant in Ypsilanti, Michigan. These activities were conducted by Harding ESE, a MACTEC Company (Harding ESE) for the General Motors Powertrain Group (GMPT). The groundwater sampling event has been conducted to evaluate the nature and extent of dissolved-phase contaminants resulting from the former gasoline product plume.

SCHEDULE

Water level measurements and groundwater sampling were performed on June 27 and 28, 2001.

PERSONNEL

Joe Jacobson and Shari Martin of Harding ESE measured groundwater elevations and collected groundwater samples from on-site monitoring wells in the Dynamometer area.

FIELD PROCEDURES

Harding ESE measured water levels, well depths, and collected groundwater samples from the following nine monitoring wells: RW-1, RW-2, RW-3, RW-5, RW-6, MW-11, MW-13, MW-14, MW-15. In addition, water level measurements were collected from MW-10, MW-14, MW-16 and MW-17 to assist in evaluating groundwater flow direction. Figure 1 shows the Dynamometer area layout and well locations.

Prior to sampling, each well was checked for proper identification and location, unlocked, and the well condition noted. An electronic water level indicator was used to measure groundwater levels and well depths to the nearest 0.01-foot. The water level indicator was washed with a

solution of LiquiNox and distilled water between well locations to minimize the potential for cross-contamination.

A new disposable plastic bailer was used for purging and sampling of each of the monitoring wells. A minimum of three well casing volumes of groundwater was removed prior to sampling each well. While purging, groundwater pH, specific conductivity, and temperature were monitored at regular intervals to check that stagnant water had been removed from the well. Appendix A contains groundwater sample records for each monitoring well sample.

Unfiltered groundwater samples from each monitoring well were collected from the bailer into 40-ml vials and 1-liter amber glass bottles. Each sample container was labeled with a sample designation, the date and time of sampling, the sampler's initials, the type of analysis required, Harding ESE's job number, and the sample preservation. Samples were placed into coolers on ice for delivery to CT&E Environmental Services Inc. for analyses of benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020 and polynuclear aromatics (PNAs) by EPA Method 8270. One sample trip blank was present in the cooler throughout the sampling round for quality control purposes.

RESULTS

Groundwater elevations measured during the June 2001 event indicate that groundwater flows to the southeast toward the interior of the plant. This is consistent with the generalized groundwater flow observed historically in the area. No free-phase gasoline was observed in measured wells.

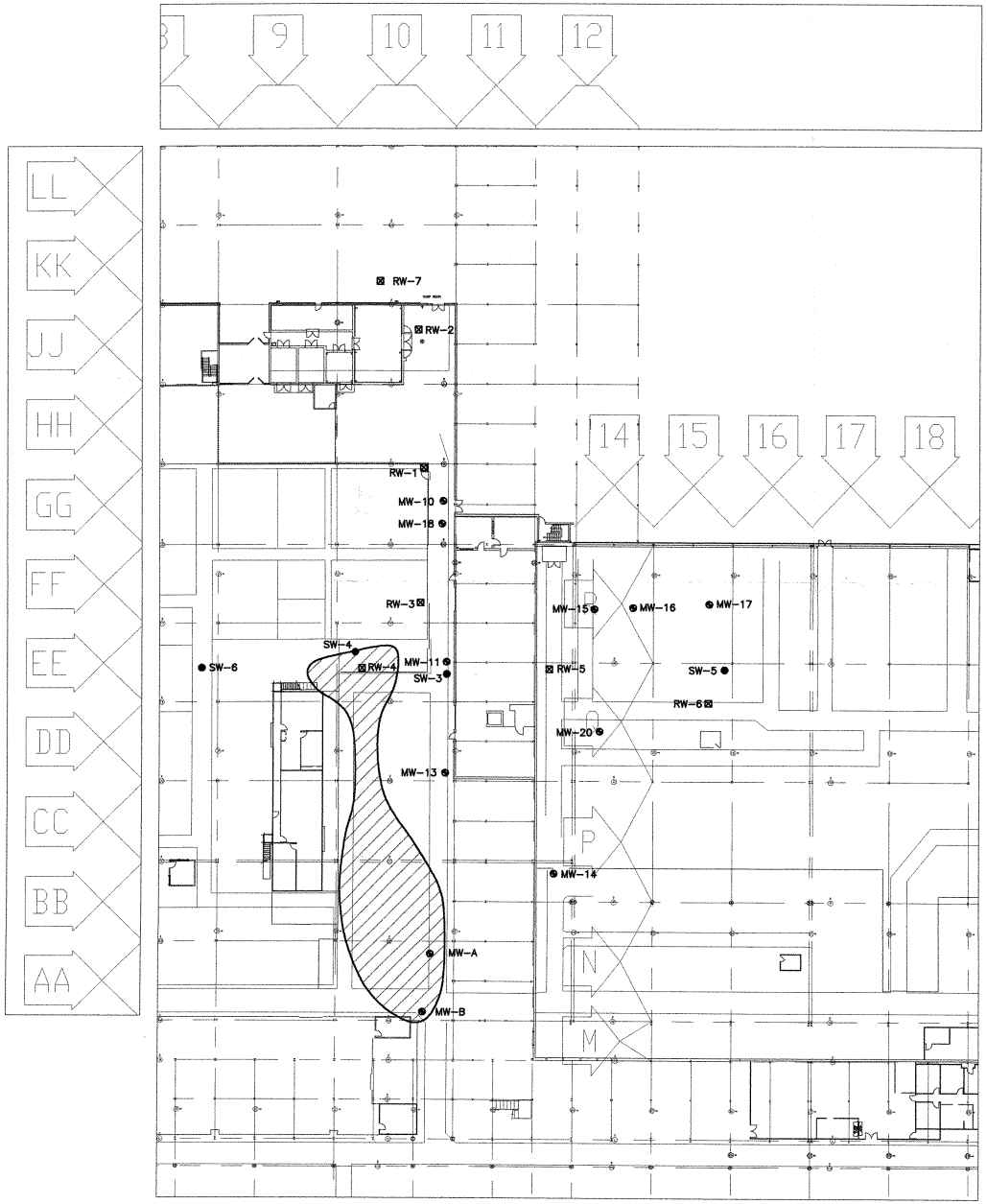
A summary of the analytical results is provided on Table 1. Appendix B contains the laboratory analytical reports. Groundwater samples collected during this sampling event contained detectable levels of BTEX and/or PNA compounds. The analytical results were compared against the Site-Specific Target Levels (SSTLs) developed by Harding ESE in March 2001. None of the detected chemicals exceeded the most conservative SSTL established for each of the individual compounds. BETX and PNA were present in RW-1, RW-2, RW-5 and MW-15 which are located in the former gasoline plume areas. MW-11 contained low levels of fluoranthene and pyrene, and is located between the former gasoline plume and the free product plume.

PROPOSED GEOPROBE™ INVESTIGATION

A Geoprobe™ investigation has been proposed to determine the extent of the free-phase oil in the Dynamometer/EE-10 Area. Free-phase oil has been measured in MW-A, MW-B and RW-4. Figure 2 shows the proposed boring locations.

The proposed scope of work also includes the installation of a free product recovery system in RW-4. Additional free product recovery locations would be evaluated based on the investigation results.

FIGURES



Legend

- RW–Recovery Well
- MW–Monitoring Well
- SW–Sentinal Well
- Estimated Extent Of Freephase Oil

SCALE
500 0 250 500 FT.

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FIGURE 1
WELL LOCATIONS
DYNAMOMETER AREA
GM POWERTRAIN PLANT

YPSILANTI, MICHIGAN

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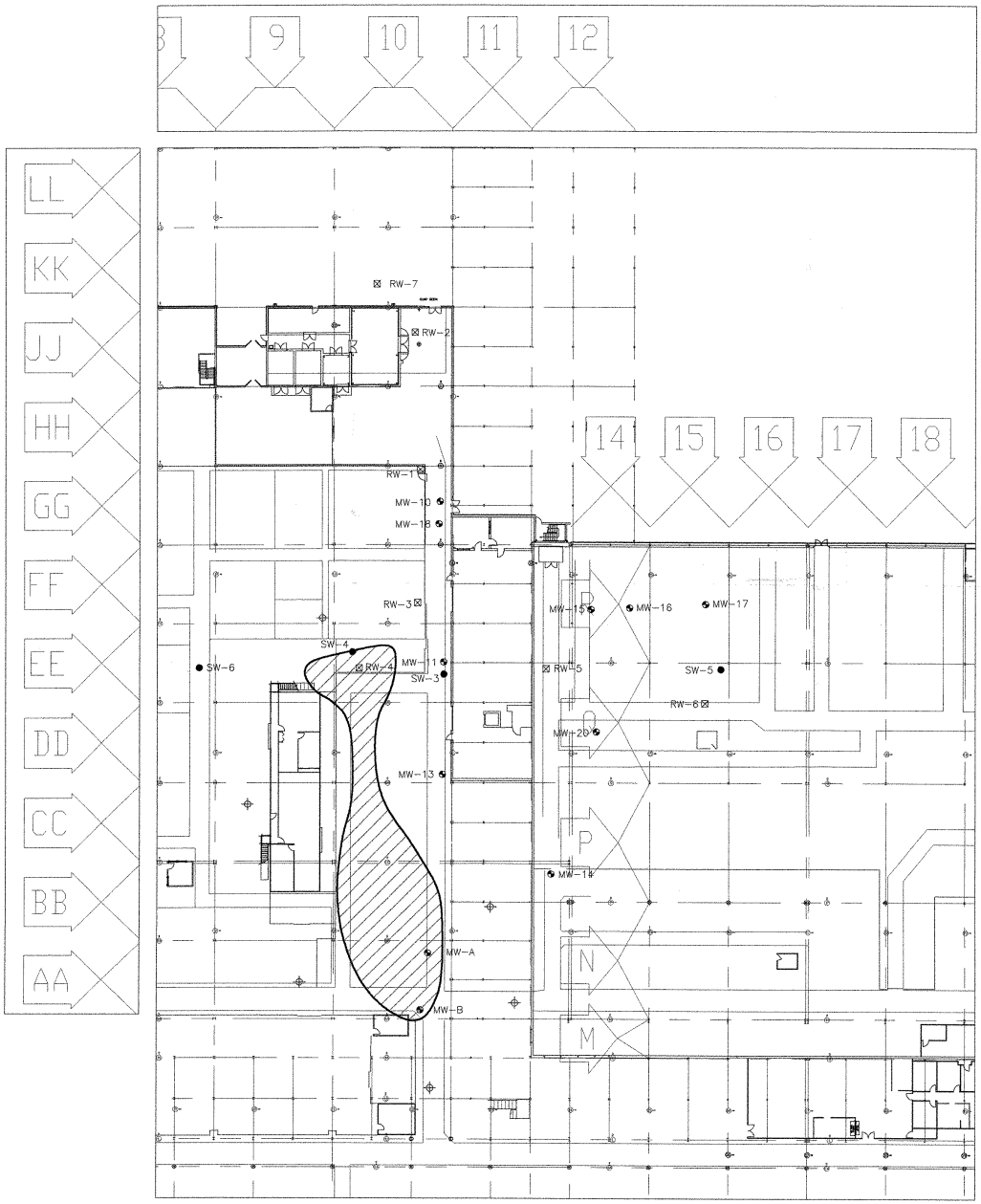

Legend

- RW–Recovery Well
- MW–Monitoring Well
- SW–Sentinal Well
- Proposed Soil Probe Location
- Estimated Extent Of Freephase Oil

SCALE
500 0 250 500 Ft.

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FIGURE 2
PROPOSED SOIL PROBE LOCATIONS
DYNAMOMETER AREA
GM POWERTRAIN PLANT

YPSILANTI, MICHIGAN

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TABLE

TABLE 1
GROUNDWATER ANALYTICAL RESULTS IN DYNAMOMETER AREA
JUNE 2001
GM POWERTRAIN, YPSILANTI, MICHIGAN

	Site SSTL Value*	RW-1	RW-2	RW-3	RW-5	RW-6	MW-11	MW-100 MW-11 DUP	MW-13	MW-14	MW-15
Benzene	4,100	220	77	ND	6.7	ND	ND	ND	ND	ND	ND
Toluene	2,900	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	370	ND	140	ND	ND	ND	ND	ND	ND	ND	24
Xylenes	720	ND	153	ND	ND	ND	ND	ND	ND	ND	10.1
Acenaphthene	390	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Acenaphthylene	NC	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Anthracene	43	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Benzo(a)anthracene	9.4	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Benzo(b)fluoranthene	2	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Benzo(k)fluoranthene	5	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Benzo(a)pyrene	5	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Benzo(ghi)perylene	5	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Chrysene	5	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Dibenzo(a,h)anthracene	NC	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Fluoranthene	33	ND	ND	ND	ND	ND	8.44	9.82	ND	NS	ND
Fluorene	250	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Indeno(1,2,3-cd)Pyrene	5	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Naphthalene	31,000	33.7	45.9	ND	ND	ND	ND	ND	ND	NS	39.8
Phenanthrene	1,000	ND	ND	ND	ND	ND	ND	ND	ND	NS	ND
Pyrene	140	ND	ND	ND	ND	ND	7.32	8.47	ND	NS	ND

Notes:
Concentrations in ug/L
ND - not detected
NS - not sampled, well was dry
* - Most Conservative SSTL
NC - Not Calculated

APPENDIX A

GROUNDWATER SAMPLE RECORDS

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Sample No.: RW-3
Sample Date: 04 28 01
Sample Time: 1027

SITE/SAMPLE LOCATION
Site Name: GMPT
Project No.: 53513
Personnel Present: Joe Jacobson Shari Martin
Activity Start: 0755 Activity End: 1027
Weather: warm sunny 850
Well Type and Location: 8" STICK up

WATER LEVEL/WELL DATA
Well Depth: 14.91 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 9.76 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 14.91 feet (from ground surface)
Protective Casing Stickup: — feet (for above-ground surface)
Protect. Casing Well Casing Difference: — feet
Floating Product Thickness: — feet using — (measuring device)
Well Condition (see Note 1): FAIR
Measuring Device Decontamination Procedure: TSP & distilled H2O
PI Meter ID: — Ambient Air — ppm Well Mouth: — ppm

PURGING PROCEDURES
Height of Water Column 5.15 feet
( ) .041 gal/ft (1 in)
( ) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
(X) 2.61 gal/ft (8 in)
13.5 X 3 casing volumes = 40.3 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	13.5	27	40.3	
Time (Min.)	1036			
Temperature (C°)	23.4			
pH (Units)	7.08			
Conductivity at 25°C (mS/cm)	3.07			

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:)

SAMPLING PROCEDURES
Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor): light tan-gray moderately turbid silty

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2-40ml VOA			Y N	Y N
PHC		1-LAMBER			Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
well dry @ 12 gallons waiting recharge

NAME (Print): Shari L. Martin
SIGNATURE: Shari Martin

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: Blank-1
Sample Date: 08-28-01
Sample Time: 1124

SITE/SAMPLE LOCATION

Site Name: GMPT
Project No.: 53513
Personnel Present: Jr. Nicholson Shari Morton
Activity Start: 1140 Activity End:
Weather: 85° Warm Sunny
Well Type and Location: 8" Stick up

WATER LEVEL/WELL DATA

Well Depth: 16.90 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 10.55 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 16.90 feet (from ground surface)
Protective Casing Stickup: ____ feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: ____ feet using ____ (measuring device)
Well Condition (see Note 1):
Measuring Device Decontamination Procedure: TSP and distilled H2O
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: ____ ppm

PURGING PROCEDURES

Height of Water Column 5.32 feet
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
(X) 2.61 gal/ft (8 in)
16.90 − 10.55 = 6.35 X 3 casing volumes = 50.80 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	16.90 + 6.35	550.00	303 49.49	
Time (Min.)	1123			
Temperature (C°)	22.9			
pH (Units)	7.15			
Conductivity at 25°C (mS/cm)	3.78			

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:)

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor): Slightly turbid to clear

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
Volatiles		2 40ml VOA		HCl	Y N	Y N
PAH		1 1L Amber		none	Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

duplicate 20 gallons purged - discharge then sample

NAME (Print): Shari Morton
SIGNATURE: Shari Morton

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: MW-2
Sample Date: 06 28 01
Sample Time: 1257

SITE/SAMPLE LOCATION

Site Name: GMPT
Project No.: 53513
Personnel Present: Joe Jacobson Shari Martin
Activity Start: 1143
Activity End: 1256
Weather: Warm Clear Sunny 85°
Well Type and Location: Stick up 8"

WATER LEVEL/WELL DATA

Well Depth: 14.85 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 9.55 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 14.85 feet (from ground surface)
Protective Casing Stickup: flush feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: ____ feet using ____ (measuring device)
Well Condition (see Note 1): Fair
Measuring Device Decontamination Procedure: Top and distilled H2O
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: ____ ppm

PURGING PROCEDURES

Height of Water Column 5.3 feet
( ) .041 gal/ft (1 in)
( ) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
(X) 2.61 gal/ft (8 in)
13.83 x 3 casing volumes = 41.50 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	13.83	27.66	41.50	
Time (Min.)	1200	1244	1249	
Temperature (C°)	24.1	24.4	24.2	
pH (Units)	7.20	7.33	7.42	
Conductivity at 25°C (mS/cm)	3.43	3.31	3.19	

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor): pale clear Petroleum odor Sheen present

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor): ____

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2 40ml VOA		HCl	Y N	Y N
PAH		1 1L Amber		-	Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

NAME (Print): Shari Martin
SIGNATURE: Shari Martin

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: RW-5
Sample Date: 6-28-07
Sample Time: 1420

SITE/SAMPLE LOCATION
Site Name: GMPT
Project No.: 535513
Personnel Present: Shari Horton Joe Sedgwick
Activity Start: 805350
Activity End: 1435
Weather: Sunny warm
Well Type and Location: ~~flush~~ 8" stickup

WATER LEVEL/WELL DATA
Well Depth: 11.68 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 6.31 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 11.68 feet (from ground surface)
Protective Casing Stickup: flush feet (for above-ground surface)
Protect. Casing Well Casing Difference: — feet
Floating Product Thickness: — feet using — (measuring device)
Well Condition (see Note 1): fair
Measuring Device Decontamination Procedure: TSP and distilled H2O
PI Meter ID: — Ambient Air: — ppm Well Mouth: — ppm

PURGING PROCEDURES
Height of Water Column 5.37 feet
( ) .041 gal/ft (1 in)
( ) .16 gal/ft (2 in)
(X) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)
3.50 X 3 casing volumes = 10.5 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	~~4~~ 3.50	~~7~~ 7.00	~~10~~ 10.50	
Time (Min.)	1401	1412	1417	
Temperature (C°)	23.1	23.1	23.0	
pH (Units)	7.13	7.21	7.16	
Conductivity at 25°C (mS/cm)	1.84	1.94	1.93	

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:)

SAMPLING PROCEDURES
Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor):

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2-40ml VOA		HCl	Y (N)	Y N
PAH		1-1L Amber			Y (N)	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

NAME (Print): Shari Horton
SIGNATURE: Shari Horton

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: MW-13
Sample Date: 10-28-01
Sample Time: 1527

SITE/SAMPLE LOCATION

Site Name: GNPT Project No.: 53513
Personnel Present: Joe Jacobson Shari Martin
Activity Start: 1517 Activity End:
Weather:
Well Type and Location:

WATER LEVEL/WELL DATA

Well Depth: 14.96 feet using Sounder Water Depth: 7.48 feet using Sounder
(from top of well casing) (measuring device) (from top of well casing) (measuring device)

Historical Well Depth: 14.96 feet (from ground surface) Protective Casing Stickup: Flush feet (for above-ground surface) Protect. Casing Well Casing Difference: feet

Floating Product Thickness: feet using (measuring device)

Well Condition (see Note 1):
Measuring Device Decontamination Procedure: top and bottom that
PI Meter ID: Ambient Air: ppm Well Mouth: ppm

PURGING PROCEDURES

Height of Water Column feet: 7.48
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)

1.2 X 3 casing volumes = 3.6 gallons to purge

Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	1.2	2.4	3.6	
Time (Min.)	1523			
Temperature (C°)	24.0			
pH (Units)	7.12			
Conductivity at 25°C (mS/cm)	3.15			

Total Volume Purged gallons
Water Appearance (describe color, clarity odor:)

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor):

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2-40ml VOA		HCl	Y (N)	Y (N)
EDC		1-1L-Amb			Y (N)	Y (N)
					Y N	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

well dry @ 2 gallons awaiting recharge

NAME (Print): Shari Martin
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: MW-14
Sample Date: 062801
Sample Time: 1535

SITE/SAMPLE LOCATION
Site Name: GMPT
Project No.: 33513
Personnel Present: Shari Clayton for Jason
Activity Start: 1530 Activity End:
Weather:
Well Type and Location:

WATER LEVEL/WELL DATA
Well Depth: 10.92 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 7.22 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 10.92 feet (from ground surface)
Protective Casing Stickup: flush feet (for above-ground surface)
Protect. Casing Well Casing Difference: feet
Floating Product Thickness: feet using (measuring device)
Well Condition (see Note 1):
Measuring Device Decontamination Procedure: TSP and distilled H2O
PI Meter ID: Ambient Air: ppm Well Mouth: ppm

PURGING PROCEDURES
Height of Water Column feet: 3.7
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)
0.6 X 3 casing volumes = gallons to purge
Purge Method (see Note 2):

Purge Vol. (gal)	0.6	1.2	1.8	
Time (Min.)	1532			
Temperature (C°)	23.7			
pH (Units)	7.32			
Conductivity at 25°C (mS/cm)	2.49			
Total Volume Purged	0.75 gallons			
Water Appearance (describe color, clarity odor:)	tan-yellow slightly turbid odor			

SAMPLING PROCEDURES
Sampling Procedure (see Note 2): dipper, bailer
Sample Water Appearance (color, clarity, odor):

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2-40ml VOA		HCl	Y N	Y N
~~TPH~~		~~1-1liter~~			Y ~~N~~	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
well dry @ 0.75 gal. awaiting recharge NO PAH

NAME (Print): Shari Harton
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: MW-15
Sample Date: 062801
Sample Time: 1543

SITE/SAMPLE LOCATION
Site Name: MPT Project No.: 53513
Personnel Present: Shari Martin Joe Jacobson
Activity Start: 1527 Activity End: 1547
Weather: Hot sunny 850
Well Type and Location:

WATER LEVEL/WELL DATA
Well Depth: 13.50 feet using Sounder Water Depth: 6.92 feet using Sounder
(from top of well casing) (measuring device) (from top of well casing) (measuring device)
Historical Well Depth: 12.52 feet Protective Casing Stickup: 2.58 feet Protect. Casing Well Casing Difference: feet
(from ground surface) (for above-ground surface)
Floating Product Thickness: feet using
(measuring device)
Well Condition (see Note 1):
Measuring Device Decontamination Procedure: tap and distilled H2O
PI Meter ID: Ambient Air: ppm Well Mouth: ppm

PURGING PROCEDURES
Height of Water ( ) .041 gal/ft (1 in)
Column feet ( ) .16 gal/ft (2 in)
6.58 ( ) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)
1.05 X 3 casing volumes = 3.15 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	1.05	2.10	3.15	
Time (Min.)	1539	1547	1554	
Temperature (C°)	22.9			
pH (Units)	7.32			
Conductivity at 25°C (mS/cm)	2.39			

Total Volume Purged gallons
Water Appearance (describe color, clarity odor:) Strong odor turbid green

SAMPLING PROCEDURES
Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor):

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX		2 40ml VOA		HCl	Y (N)	Y (N)
TPH		1 1L Amber			Y (N)	Y (N)
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS
WL dry @ 1.80 Sed. recharge

NAME (Print) Shari Martin
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

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Sample No.: MW-11
Sample Date: 06-25-01
Sample Time: 1508

SITE/SAMPLE LOCATION

Site Name: GMPT
Project No.: 53513
Personnel Present: Shane Lichtin for Jeff Dyess
Activity Start: 1500
Activity End: 1530
Weather: hot sunny 85°
Well Type and Location:

WATER LEVEL/WELL DATA

Well Depth: 14.96 feet using Sounder (from top of well casing) (measuring device)
Water Depth: 7.72 feet using Solinist (from top of well casing) (measuring device)
Historical Well Depth: 14.96 feet (from ground surface)
Protective Casing Stickup: 2.81 feet (for above-ground surface)
Protect. Casing Well Casing Difference: ____ feet
Floating Product Thickness: ____ feet using ____ (measuring device)
Well Condition (see Note 1): Flush mount, PVC casing, locking cap, no water inside
Measuring Device Decontamination Procedure: Top and bottom
PI Meter ID: ____ Ambient Air: ____ ppm Well Mouth: ____ ppm

PURGING PROCEDURES

Height of Water Column feet / .24
( ) .041 gal/ft (1 in)
(X) .16 gal/ft (2 in)
( ) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)
1.16 x 3 casing volumes = 3.47 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	1.16	2.32	3.47	
Time (Min.)	1500	1505	1510	
Temperature (C°)	24.2	23.6	23.9	
pH (Units)	7.11	7.21	7.25	
Conductivity at 25°C (mS/cm)	3.41	3.41	3.41	

Total Volume Purged ____ gallons
Water Appearance (describe color, clarity odor:) ____

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor): ____

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?	Cool to 4°C?
BTEX MTBE		3 40ml VOA (1 Duplicate)		HCl	Y (N)	Y N
					Y (N)	Y N
					Y N	Y N
					Y N	Y N
					Y N	Y N

OTHER OBSERVATIONS

MW dup 1400 done here

NAME (Print): Shane Lichtin
SIGNATURE: Shane Lichtin

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

Harding ESE
A MACTEC COMPANY

Sample No.: RW-CC
Sample Date: CC-28-01
Sample Time: 1421

SITE/SAMPLE LOCATION

Site Name: GMPT
Project No.: 33313
Personnel Present: Shari Harten Joe Jacobson
Activity Start: 1350 Activity End: 1424
Weather: hot sunny 85°
Well Type and Location: 8" Stickup

WATER LEVEL/WELL DATA

Well Depth: 11.70 feet using Solinst (from top of well casing) (measuring device)
Water Depth: 5.80 feet using Solinst (from top of well casing) (measuring device)
Historical Well Depth: 11.70 feet (from ground surface)
Protective Casing Stickup: flush feet (for above-ground surface)
Protect. Casing Well Casing Difference: — feet
Floating Product Thickness: — feet using — (measuring device)
Well Condition (see Note 1):
Measuring Device Decontamination Procedure: TSP and distilled H2O
PI Meter ID: — Ambient Air: — ppm Well Mouth: — ppm

PURGING PROCEDURES

Height of Water Column: 5.90 feet
( ) .041 gal/ft (1 in)
( ) .16 gal/ft (2 in)
(X) .65 gal/ft (4 in)
( ) 2.61 gal/ft (8 in)
5.90 − 5.80 = .1 × 3 casing volumes = 11.525 gallons to purge
Purge Method (see Note 2): disposable bailer

Purge Vol. (gal)	3.85	7.65	11.50
Time (Min.)	1402		1418
Temperature (C°)	22.6	21.5	21.2
pH (Units)	6.97	7.05	7.04
Conductivity at 25°C (mS/cm)	4.12	4.38	4.40

Total Volume Purged: — gallons
Water Appearance (describe color, clarity odor:) clear to mild turbidity, small black particles settling, no odor

SAMPLING PROCEDURES

Sampling Procedure (see Note 2): disposable bailer
Sample Water Appearance (color, clarity, odor): clear

ANALYTICAL PARAMETERS

Analysis	Method	No. of Bottles Volume, Type	Bottle Lot	Preservative/ Volume	Field Filtered?		Cool to 4°C?	
BTEX		2-40ml VOA		HCl	Y	N	Y	N
RATH		1-1L amber			Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N
					Y	N	Y	N

OTHER OBSERVATIONS

NAME (Print): Shari Harten
SIGNATURE:

Notes: (1) *Described whether well was locked and the condition of the protective casing and concrete collar.*
(2) *Describe sequence of purging/sampling including equipment type and decontamination method.*

APPENDIX B

ANALYTICAL RESULTS

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID: 3012944007
Client Sample ID: MW 15
Collected: 06/28/2001 15:43
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND D		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 00:54	JDS	1
Ethylbenzene	24 D		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 00:54	JDS	1
o-Xylene	2.2 D		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 00:54	JDS	1
P & M -Xylene	7.9 D		ug/L	4.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 00:54	JDS	1
Toluene	ND D		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 00:54	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Acenaphthylene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Anthracene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Benzo(a)anthracene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Benzo[a]pyrene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Chrysene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Fluoranthene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Fluorene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Naphthalene	39.8		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Phenanthrene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3
Pyrene	ND		ug/L	5.6	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:06	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID: 3012944008
Client Sample ID: MW 14
Collected: 06/28/2001 15:35
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 08:27	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 08:27	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 08:27	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 08:27	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 08:27	JDS	1

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID: 3012944009
Client Sample ID: RW-1
Collected: 06/28/2001 11:24
Received: 06/30/2001 09:00
Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	220 D		ug/L	20	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 12:38	JDS	1
Ethylbenzene	ND D		ug/L	20	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 12:38	JDS	1
o-Xylene	ND D		ug/L	20	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 12:38	JDS	1
P & M -Xylene	ND D		ug/L	40	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 12:38	JDS	1
Toluene	ND D		ug/L	20	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 12:38	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Acenaphthylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Benzo(a)anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Benzo[a]pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Chrysene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Fluorene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Naphthalene	33.7		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Phenanthrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3
Pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 06:52	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: *3012944* | Harding ESE, a MACTEC Company | *Reported:* *7/20/2001*

CT&E Sample ID: 3012944010
Client Sample ID: RW-3
Collected: 06/28/2001 10:50
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:12	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:12	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:12	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:12	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:12	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Acenaphthylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Benzo(a)anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Benzo[a]pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Chrysene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Fluorene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Naphthalene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Phenanthrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3
Pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 07:38	KLF	3

MZ

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID: 3012944011
Client Sample ID: RW-2
Collected: 06/27/2001 12:52
Received: 06/30/2001 09:00
Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	77 D		ug/L	10	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:10	JDS	1
Ethylbenzene	140 D		ug/L	10	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:10	JDS	1
o-Xylene	23 D		ug/L	10	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:10	JDS	1
P & M -Xylene	130 D		ug/L	20	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:10	JDS	1
Toluene	ND D		ug/L	10	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:10	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Acenaphthylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Benzo(a)anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Benzo[a]pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Chrysene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Fluorene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Naphthalene	45.9		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Phenanthrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3
Pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 17:16	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: *3012944* | Harding ESE, a MACTEC Company | *Reported:* *7/20/2001*

CT&E Sample ID: 3012944012
Client Sample ID: RW-5
Collected: 06/28/2001 14:20
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	6.7		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:56	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:56	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:56	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:56	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 14:56	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Acenaphthylene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Anthracene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Benzo(a)anthracene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Benzo[a]pyrene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Chrysene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Fluoranthene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Fluorene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Naphthalene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Phenanthrene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3
Pyrene	ND		ug/L	5.5	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:04	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID: 3012944013
Client Sample ID: RW-6
Collected: 06/28/2001 14:21
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 13:24	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 13:24	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 13:24	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 13:24	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 13:24	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Acenaphthylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Benzo(a)anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Benzo[a]pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Chrysene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Fluorene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Naphthalene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Phenanthrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3
Pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 18:52	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID:	3012944014	**Matrix:**	Aqueous
Client Sample ID:	MW-11	**Location:**	
Collected:	06/28/2001 15:08	**Project:**	GMPT
Received:	06/30/2001 09:00	**Sampled By:**	CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:45	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:45	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:45	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:45	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:45	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Acenaphthylene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Benzo(a)anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Benzo[a]pyrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Chrysene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Fluoranthene	8.44		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Fluorene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Naphthalene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Phenanthrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3
Pyrene	7.32		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 19:39	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: 3012944 | Harding ESE, a MACTEC Company | Reported: 7/20/2001

CT&E Sample ID:	3012944015	**Matrix:**	Aqueous
Client Sample ID:	MW-13	**Location:**	
Collected:	06/28/2001 15:27	**Project:**	GMPT
Received:	06/30/2001 09:00	**Sampled By:**	CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:00	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:00	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:00	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:00	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/09/01 08:00	07/09/01 23:00	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Acenaphthylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Benzo(a)anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Benzo[a]pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Chrysene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Fluoranthene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Fluorene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Naphthalene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Phenanthrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3
Pyrene	ND		ug/L	5.0	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 20:27	KLF	3

CT&E Environmental Services Inc.
Michigan Division

Workorder: *3012944* | Harding ESE, a MACTEC Company | *Reported:* *7/20/2001*

CT&E Sample ID: 3012944016
Client Sample ID: MW-100
Collected:
Received: 06/30/2001 09:00

Matrix: Aqueous
Location:
Project: GMPT
Sampled By: CK

Comments: Results reported as received.

Test Description	Result	Allowable Limit	Unit	Reporting Detection Limit	Method Analysis / Preparation	Prepared Date / Time	Analyzed Date / Time	Analyst	Cont. ID
GC VOLATILE ORGANIC ANALYSIS									
Benzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:58	JDS	1
Ethylbenzene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:58	JDS	1
o-Xylene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:58	JDS	1
P & M -Xylene	ND		ug/L	2.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:58	JDS	1
Toluene	ND		ug/L	1.0	SW-846 8021B / SW-846 5030B	07/10/01 08:00	07/11/01 09:58	JDS	1
GC/MS SEMIVOLATILE ORGANIC ANALYSIS									
Acenaphthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Acenaphthylene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Benzo(a)anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Benzo[a]pyrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Benzo[b]fluoranthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Benzo[g,h,i]perylene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Benzo[k]fluoranthene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Chrysene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Dibenzo[a,h]anthracene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Fluoranthene	9.82		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Fluorene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Indeno[1,2,3-c,d] pyrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Naphthalene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Phenanthrene	ND		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3
Pyrene	8.47		ug/L	5.3	SW-846 8270C / SW-846 3510C	07/03/01 14:56	07/19/01 21:14	KLF	3

Harding ESE
A MACTEC COMPANY

Harding ESE
511 Congress St.
Portland, ME 04101
Phone: (207) 775-5401
Fax: (207) 772-4762

CHAIN OF CUSTODY

Agreed upon Turnaround Time: ☐ 3 Weeks ☐ 10 Day ☐ 5 Day ☐ 72 Hour ☐ 24 Hour ☒ Other 24 hrs

Lab Batch No.:

Lab SDG ID:

Seals Intact? ☐ YES ☐ NO

Cooler Temp:

PROJECT INFO	LABORATORY INFO		REPORT TO (if other than HLA Contact)		INVOICE TO (if other than HLA Contact)	
HLA Contact: Craig Kelley	Laboratory Name: CT & E	Phone: 518-581-[illegible]	Company Name:	Phone:	Company Name:	Phone:
Project Name: GMPT	Laboratory Contact:	Fax: 518-581-[illegible]	Company Contact:	Fax:	Company Contact:	Fax:
Project Number / Task: 535513-001	Address: 100 Comac Industrial Dr		Address:		Address:	
Purchase Order Number:	City/State/Zip: Lexington NC 27291-2681		City/State/Zip:		City/State/Zip:	

Special Handling Instructions:

Sampler ID:

Lab Sample No. (For Laboratory Use Only)	Date / Time Collected	Type[1]	Media[2]	[C]omposite / [G]rab	Start Depth (ft)	End Depth (ft)	Location Name	Field Sample ID	Preservative	Fraction[3]	Analysis Request: TCL VOC	one 8260	TPH Gasoline Range
013	08/01 1400	FS	GW	G			GMPT	MW-6			1	3	1
014	08/01 1400	FS	GW	G			GMPT	DUP-11			2		1
015	08/01 1501	FS	GW	G			GMPT	MW-13			2		1
016								MW-100			2		1

[1]Type:
FS - Environmental Sample; MSD - Matrix Spike Duplicate; FD - Field Duplicate; FB - Field Blank; TB - Trip Blank; PE - Performance Evaluation Blank; EB - Equip. Rinsate Blank; MS - Matrix Spike; Other: _____

[2]Media:
SOIL - Soil; AIR - Air; BW - Water (Blank); GW - Groundwater; SL - Sludge; TW - Tap Water; WIPE - Wipe; P - Free Product; SED - Sediment; LC - Leachate; SV - Soil Vapor; SW - Surface Water; TIS - Tissue

[3]Fraction:
T - Total; D - Dissolved; S - SPLP; C - TCLP; N - Not Applicable

Comments:

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	8/2/01 1545	[signature]	8/2/01 1545	[signature]		[signature]	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
		[signature]				[signature]	8/3/01 0830 CAM

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

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Harding ESE
A MACTEC COMPANY

Harding ESE
511 Congress St.
Portland, ME 04101
Phone: (207) 775-5401
Fax: (207) 772-4762

CHAIN OF CUSTODY

Agreed upon Turnaround Time: ☐ 3 Weeks ☐ 10 Day ☐ 5 Day ☐ 72 Hour ☐ 24 Hour ☒ Other 2wks

Lab Batch No. | Lab SDG ID

Seals Intact? ☐ YES ☐ NO | Cooler Temp:

PROJECT INFO	LABORATORY INFO		REPORT TO (if other than HLA Contact)		INVOICE TO (if other than HLA Contact)	
HLA Contact: Craig Kelley	Laboratory Name: CT & E	Phone: 231-843-1877	Company Name	Phone	Company Name	Phone
Project Name: GMPT	Laboratory Contact	Fax: 231-845-9712	Company Contact	Fax	Company Contact	Fax
Project Number / Task: 525513-001	Address: 100 Conrad Industrial Dr		Address		Address	
Purchase Order Number	City/State/Zip: Ludington MI 49431-2681		City/State/Zip		City/State/Zip	

Special Handling Instructions

Sampler ID

Lab Sample No. (For Laboratory Use Only)	Date / Time Collected	Type[1]	Media[2]	[C]omposite / [G]rab	Start Depth (ft)	End Depth (ft)	Location Name	Field Sample ID	Preservative: HCL	Preservative: NP	Fraction[3]	Analysis Request: 624	Analysis Request: BTEX
001	10-27-01 1037	FS	SO	G			GMPT	MW-6				2	1
002	10-27-01 1013	FS	GW	G			GMPT	MW-5				2	1
003	10-27-01 1118	FS	GW	G			GMPT	MW-9				2	1
004	10-27-01 1130	FS	GW	G			GMPT	MW-10				2	1
005	10-27-01 1207	FS	GW	G			GMPT	MW-16				2	1
006	10-27-01 1255	FS	GW	G			GMPT	MW-11				2	1
007	10-28-01 1343	FS	GW	G			GMPT	MW-15				2	1
008	10-28-01 1535	FS	GW	G			GMPT	MW-14				2	0
009	10-28-01 1124	FS	GW	G			GMPT	TRIP-1				2	1
010	10-28-01 1052	FS	GW	G			GMPT	RW-3				2	1
011	10-27-01 1252	FS	GW	G			GMPT	MW-2				2	1
012	10-27-01 1420	FS	GW	G			GMPT	MW-5				2	1

[1]Type:
FS - Environmental Sample; MSD - Matrix Spike Duplicate; FD - Field Duplicate; FB - Field Blank; TB - Trip Blank; PE - Performance Evaluation Blank; EB - Equip. Rinsate Blank; MS - Matrix Spike; Other: _____

[2]Media:
SOIL - Soil; AIR - Air; BW - Water (Blank); SL - Sludge; GW - Groundwater; TW - Tap Water; WIPE - Wipe; P - Free Product; SED - Sediment; LC - Leachate; SV - Soil Vapor; SW - Surface Water; TIS - Tissue

[3]Fraction:
T - Total; D - Dissolved; S - SPLP; C - TCLP; N - Not Applicable

Comments: 3°C 6°C

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
[signature]	10-29-01 1745	[signature]	10-30-01 0945	[signature]			
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
		[signature]		[signature]		Shelfield	10-30-01 9AM

WHITE: LABORATORY COPY YELLOW: REPORT COPY PINK: CLIENT'S COPY

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